Barriers and Catalysts for Statewide Coordination of Transportation Services

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SOUTH CAROLINA COORDINATION of TRANSIT SERVICE
CLEMSON TRANSPORTATION SYSTEMS RESEARCH

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Nomenclature

ADA	Americans with Disabilities Act (1990)
APTA	American Public Transportation Association
COG	Council of governments
COA	Council on aging
CTAA	Community Transportation Association of America
DDSN	Department of Disabilities and Special Needs, a department in the State of South Carolina
DHHS	Department of Health and Human Services, a federal administrative department
DSN	Disabilities and special needs
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991 (succeeded by TEA-21 and SAFETEA-LU)
JARC	Job Access and Reverse Commute
MPO	Metropolitan planning organization
RTAP	Rural Transit Assistance Program
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act – A Legacy for Users (2005)
SCDOT	South Carolina Department of Transportation
SSI	Supplemental Security Income
TANF	Temporary Assistance for Needy Families
TEA21	Transportation Equity Act for the 21st Century (1998… succeeded by SAFETEA-LU)
TTAP	Tribal Technical Assistance Program
USDA	United States Department of Agriculture

Regional Organizations in South Carolina

Metropolitan Planning Organizations

MPO	Full Name	Primary City
ANATS	Anderson Area Transportation Study	Anderson
ARTS	Augusta Regional Transportation Study	Aiken/North Augusta
CHATS	Charleston Area Transportation Study	Charleston
COATS	Columbia Area Transportation Study	Columbia
FLATS	Florence Area Transportation Study	Florence
GPATS	Greenville-Pickens Area Transportation Study	Greenville
GSATS	Grand Strand Area Transportation Study	Myrtle Beach
RFATS	Rock Hill-Fort Mill Area Transportation Study	Rock Hill/Fort Mill
SPATS	Spartanburg Area Transportation Study	Spartanburg
SUATS	Sumter Area Transportation Study	Sumter

Regional Transit Authorities and Agencies

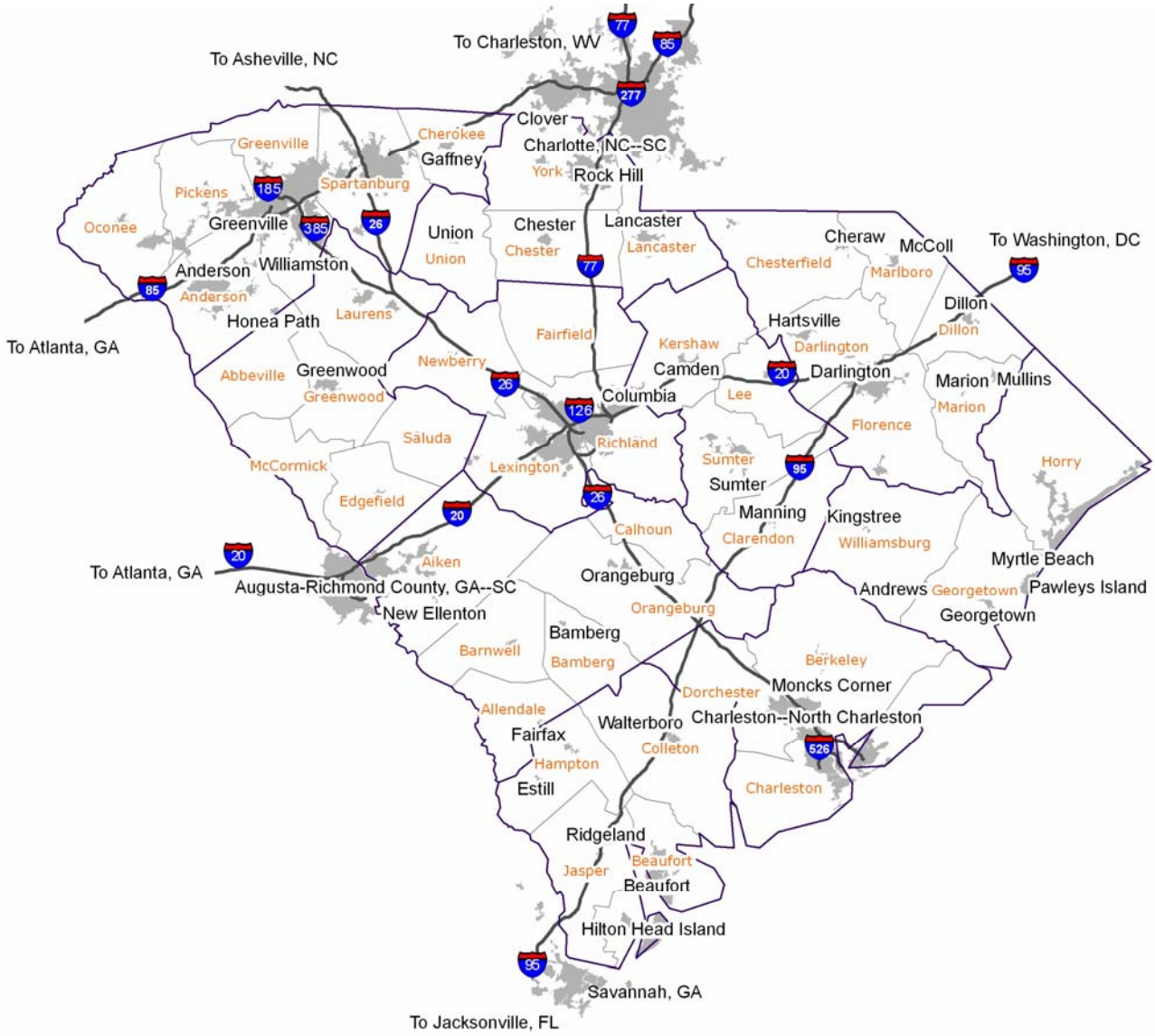
Provider	Full Name	Primary City
BCDRTMA	Berkeley-Charleston-Dorchester Regional Transportation Management Association	Charleston (outlying)
CARTA	Charleston Area Regional Transportation Authority	Charleston
CATS	Charlotte Area Transit System	Charlotte, NC
CMRTA	Central Midlands Regional Transit Authority	Columbia
GTA	Greenville Transit Authority	Greenville
	Palmetto Breeze	Hilton Head
LSRTMA	Lower Savannah Regional Transportation Management Agency	Aiken
PDRTA	Pee Dee Regional Transportation Authority	Florence
SWRTA	Santee Wateree Regional Transit Authority	Sumter
SPARTA	Spartanburg Area Regional Transit Agency	Spartanburg
The Coast (fka LYMO)	Waccamaw Regional Transportation Authority	Myrtle Beach

Councils of Governments

Councils of Governments

	Council of Governments
ACOG	Appalachian Council of Governments
BCD COG	Berkeley-Charleston-Dorchester Council of Governments
Catawba	Catawba Regional Council of Governments
Central Midlands	Central Midlands Council of Governments
Lowcountry	Lowcountry Council of Governments
LSCOG	Lower Savannah Council of Governments
PDCOG	Pee Dee Regional Council of Governments
SLCOG	Santee-Lynches Council of Governments
Upper Savannah	Upper Savannah Council of Governments
WRCOG	Waccamaw Regional Council of Governments

Population Centers



Summary

Most public transit in the United States suffers from low ridership, high per-unit costs, and inadequate supply of service provision. Congress added provisions requiring coordination of transportation services before states can receive some federal monies authorized in the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). Transportation coordination can take the form of shared operations, coordinated planning, or consolidated administration. South Carolina is creating state-level coordination guidelines as well as regional coordination plans through a statewide interagency effort. Creating these guidelines requires familiarity and understanding of who current stakeholders are, how they work individually and collaboratively, and what encourages or impedes coordinated service in South Carolina. This study contributes to South Carolina's efforts with objectives including:

- to make recommendations and provide guidance to eliminate service duplication,
- to identify any restrictive rules or policies,
- to suggest the pooling or consolidating of resources and activities,
- to recommend means of information sharing among service providers,
- to identify ways to tap into other federal and state sources of funding utilized by other state agencies to provide transportation,
- to propose expanding service to unserved or underserved areas of the state, and
- to offer ideas for improving access to jobs, medical services, and education.

To achieve these objectives, Clemson University researchers identified 1,494 public transit stakeholders in South Carolina (transportation operators, agencies providing health and human services, government agencies, special interest groups, and common destinations for transit trips). A sample of 247 of these stakeholders (±4.8-percent confidence interval at 90-percent confidence) completed a survey in 2006 to indicate existing or potential transit coordination activities. The research team followed up on the survey with case study site visits to three council-of-governments regions in the state. This study examined five primary types of stakeholders and characterized their needs.

- **Regional transit providers** handle the large-scale transit needs of regions. Their role in coordination depends largely on how to define which human-service transportation can and should mingle with the general traveling public. Problems with coordination largely arise from the differences in agency size between regional transit agencies and smaller human-service providers. This difference in scale can alternatively provide strength in that regional transit authorities typically invest in technology and administrative systems beyond the reach of smaller agencies.
- South Carolina's survey responses have demonstrated that stakeholders directly involved with transportation needs in the state feel the basic needs of the **elderly** are left unmet. Expanded transportation services could enable the baby boomers to remain mobile and involved in their communities as they age, but anticipated increases in demand pose a threat against already insufficient levels of funding.
- Service providers for people with **disabilities and special needs** have many clients who cannot mix with the general public due to behavioral disabilities; however, some providers have found positive results when hand-selecting which of their consumers can participate in shared transportation.
- **Head Start** programs serve small children and work under legislative mandate (South Carolina's Jacob's Law) to use vehicles with school-bus chassis; differing

programmatic requirements between Head Start programs and state school systems make coordination with school districts difficult, thus sharing of planning or maintenance resources might be more plausible than shared operations.

- Finally, **Native American tribes** have their own governments, making them individual entities that need to come to the table for coordination. South Carolina currently recognizes thirteen tribes. Increasing awareness of tribal transportation needs and opportunities forms the first critical step in serving frequently-isolated Native American populations.

The body of research literature has documented the barriers that inhibit coordination, as indicated in the table.

Table: Categorized Barriers to Transit Coordination

Financial • We would need start-up money for coordination. • There are not sufficient financial incentives for coordination. • Federal monies are designated for specific purposes. • Different matching requirements exist. • We are uncertain about cost allocation between participants and funding agencies. • We lack information about funds. **Operational** • Insurance and liability issues • Incompatible client needs and characteristics • Different service standards • Vehicle specifications/availability • Labor arrangements • Incompatible communications equipment • Resolute service area boundaries	**Policy/Regulatory** • Federal leadership disallows coordination. • State leadership disallows coordination. • Systems for paying for authorizing, tracking, & paying for transportation are different. • Planning criteria differ. • The use of vehicles has restrictions. • Fares have restrictions. **Informational** • Client and data confidentiality issues • Lack of uniformity data collection, reporting, and accounting • Burden of data collection **Attitudinal** • Lack of trust among organizations • Uncertainty about shared use of resources • Skepticism about benefits • Reluctance to mix client groups • Communication barrier among organizations

The process for coordinating transportation involves seven basic steps.

1. Identify stakeholders.
2. Set goals and objectives.
3. Define performance criteria and data needs.
4. Evaluate regional improvements.
5. Develop alternative plan scenarios.
6. Evaluate alternatives and select best option.
7. Implement process or plan.

The "eighth step" in this seven-step process is iteration. Stakeholders will change, populations will evolve, and coordination partners must correspondingly re-evaluate goals and strategies. Partners must create short-term victories and long-term planning.

1.0 Introduction

Public transit in the United States suffers from low ridership, high per-unit costs, and inadequate supply of service provision. These problems are particularly acutely realized in small- to mid-sized cities and rural areas, and a mismatch between high demand and low supply can be expected to grow especially in areas with increasing transit-dependent populations, such as states attracting elderly or immigrant populations. While traditional transit providers and transit funding agencies struggle to muster resources to meet demand, many social service agencies are piecing together resources to provide basic transportation for clients to reach medical appointments and other services. Recent years have brought increased national interest in pooling transportation resources from traditional and non-traditional sources to maximize public benefit.

One of the recent initiatives to address this issue is the United We Ride program at the federal level that is attempting to band together human service agencies. The federal United We Ride program involves ten agencies including the U.S. Departments of Transportation, Health and Human Services, and Labor. The 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act – A Legacy for Users (SAFETEA-LU), which authorizes transportation funding to be distributed to states and specific projects, specifically required that states seeking to take advantage of a number of transit funding programs must provide a statewide and local plans for transit coordination. Such plans should address areas of common concern among agencies, areas of overlapping services, and options for coordinating transit services.

To add efficiency to transit provision in South Carolina and maximize benefits gleaned from State resources, South Carolina is creating its own state-level coordination guidelines as well as ten regional coordination plans through a statewide interagency effort. Creating these guidelines requires familiarity and understanding of who current stakeholders are, how they work individually and collaboratively, and what encourages or impedes coordinated service in South Carolina.

This report contributes to the South Carolina Department of Transportation's efforts by combining experience from the nation with detailed analysis of regions within South Carolina. The objectives of the research contributing to this report were:

- to make recommendations and provide guidance to eliminate service duplication,
- to identify any restrictive rules or policies,
- to suggest the pooling or consolidating of resources and activities,
- to recommend means of information sharing among service providers,
- to identify ways to tap into other federal and state sources of funding utilized by other state agencies to provide transportation,
- to propose expanding service to unserved or underserved areas of the state, and
- to offer ideas for improving access to jobs, medical services, and education.

To achieve these objectives, Clemson University researchers identified 1,494 agencies and organizations in South Carolina that each hold a stake in coordination of transit services in the state. These stakeholders included transportation operators, agencies providing health and human services, government agencies, special interest groups, and common destinations for transit trips, such as retirement homes and airports. A sample of 247 of these stakeholders completed a survey in 2006 to indicate existing or potential transit coordination activities. The survey results, which in aggregate provide a ±4.8-percent confidence interval at 90-percent confidence, provide the basis for much of the discussion in chapters three and four. The research team followed up on the survey with case study site visits to three council-of-governments regions in the state. Comparison and context came from national experience and data from the Census, the American Public Transportation Association, and existing academic and professional literature on transit coordination. The appendix provides a detailed description of the full research methodology. This report represents the findings of this research effort.

This report is organized to make it a functional reference document for planning regional and statewide transit coordination. The next section defines transit coordination and indicates the coordination interest and activities that have occurred in recent years around the nation. The third chapter provides statistical analysis of U.S. Census data and survey responses from South Carolina stakeholders to characterize the existing environment and its natural propensity to coordinate. The fourth chapter derives primarily from South Carolina case studies and archival records to provide information on specific types of stakeholder agencies and organizations, according to their needs and interests in transit coordination. The fifth chapter integrates all research results in the form of a toolkit for planning transit coordination for regions according to a consensus of regional objectives. The conclusion chapter offers long-range considerations to guide transit coordination efforts. Finally, the appendices provide detailed

research results, including an inventory of transit coordination stakeholders in South Carolina, case study reports on three South Carolina regions, a complete discussion of the research methodology for this report, and the full text of the Internet survey and survey logic used to gage the activities, perspectives, and expectations of South Carolina stakeholders.

2.0 National Interest and Activities in Other States

This chapter applies national state-of-the-practice ideas as they pertain specifically to South Carolina's transit service needs. South Carolina needs a strategic means of characterizing current service offerings and identifying how to improve service while increasing efficiency with limited resources.

2.1 Motivation for Current Initiatives in Transit Coordination

The recent resurgence of interest in transit and human-service transportation primarily emerged out of federal actions, though the transit industry and governments at state and local levels have contributed to the momentum. This section discusses the recent motivation for coordination.

2.1.1 Federal Coordination and United We Ride

The United States government has been providing funding for transportation services through multiple departments, leading frequently to distinct and separate systems in the same localities. Many times, these systems have used overlapping routes or have managed more capacity than necessary without sufficient transportation demand to use that capacity. For instance, school buses frequently operate in areas where public transit authorities run routes, and the school buses sit idle during the midday and evening peak period whereas public transit agencies might have difficulties allocating sufficient capacity to meet public demand for the commute home. Also, many social service agencies for the disadvantaged provide human-service transportation necessary for delivering their other functions.

At the federal level, the United We Ride program was launched to show that coordination of services can bring scale economies of resources currently spent by agencies not traditionally considered to have a transportation component. By order of President George W. Bush, the United We Ride program brings together the secretaries of a number of federal agencies to coordinate transportation programs (Table 2-1). All of these represented agencies have an important stake in collaborating to create transit and human-service transportation efficiencies.

Table 2-1: Coordinating Council on Access and Mobility

• Attorney General	• Secretary of Housing and Urban Development
• Chair of the National Council on Disability	• Secretary of Interior
• Commissioner of Social Security	• Secretary of Labor
• Secretary of Agriculture	• Secretary of Transportation
• Secretary of Education	• Secretary of Veterans Affairs
• Secretary of Health and Human Services	

2.1.2 Public Transportation Partnership for Tomorrow (PT^2)

The public transit industry has recognized the value of pooled resources and established a nationwide education and outreach to strengthen transit support. This initiative, called the Public Transportation Partnership for Tomorrow (PT^2), has 630 partners in the public transportation industry. These partners share goals to:

- increase federal funding for public transportation,
- broaden support at the regional, state and local levels,
- improve perceptions about the value and benefits of public transit, and
- increase appreciation for transit's contributions to local communities.

The Partnership uses six strategies to address these goals:

- policy research,
- advocacy and coalition building,
- local toolkits for education and outreach,
- enhanced efforts to educate congress and the new administration,
- communications/public affairs, and
- advertising geared to activists and opinion leaders (*1*).

Individually, few transit agencies can afford to launch such expensive and time-intensive strategies; however, the results of following these strategies can bring substantial benefit. The collaborative effort of the Partnership makes these strategies attainable.

2.1.3 Federal Funding Tied to Coordination in SAFETEA-LU

Transit coordination figured prominently in the 2005 reauthorization of federal transportation funding entitled the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). This legislation provided substantial support for planning and improving coordination. As Table 2-2 describes, three programs explicitly require transportation service coordination to qualify for federal funding: section 5310 for the elderly and disabled, section 5316 for low-income and welfare recipients, and section 5317 to assist the disabled beyond the requirements of the Americans with Disabilities Act of 1990. The U.S. Department of Transportation emphasizes,

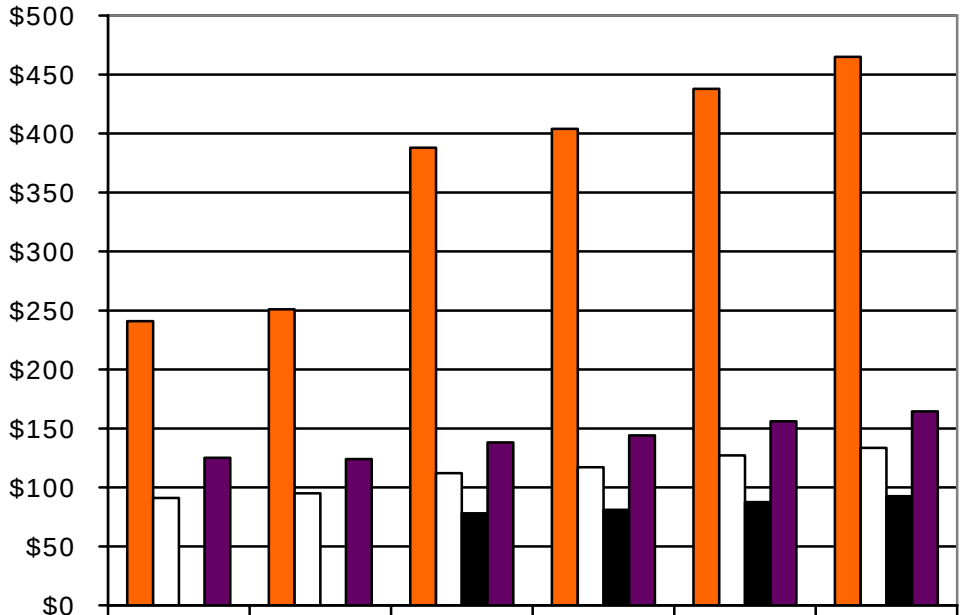
> "This new requirement reinforces the broadened list of entities to be involved in the [metropolitan planning organization's] Participation Plan (23 U.S.C. 134 (i)(5)(A) and 49 U.S.C. 5303 (i)(5)(A)) [...]. In preparing the local public transit-human service transportation plans, service providers seeking assistance under these programs should ensure full coordination with the applicable metropolitan and statewide planning processes" (*2*).

The transportation services coordination plan must include stakeholders who do not typically participate in local, regional, or statewide transportation planning.

Table 2-2: SAFETEA-LU and Transit Coordination

Statewide Planning 49 USC 5304	States may enter into agreements for planning cooperation and coordination for multi-State projects. States must consider the economic vitality for rural areas as well as urbanized areas in statewide transportation planning.
Special Needs of Elderly Individuals and Individuals with Disabilities 49 USC 5310	These funds have historically been available only for capital Purposes, such as vehicle purchases. Some states have used these funds for contracted services. A pilot program now allows operating expenses to be funded on a limited basis in designated states to facilitate coordination.
Job Access and Reverse Commute (JARC) 49 USC 5316	Funding is based on ratios of eligible low-income and welfare recipients. • 60% for urbanized areas > 200,000 • 20% for urbanized areas < 200,000 • 20% to states for use in rural areas Direction for the Federal Transit Administration (FTA) to provide maximum flexibility for projects for people who are not effectively served by public transportation. Coordination is required between private, non-profit, and public transportation providers and other federal programs
New Freedom 49 USC 5317	Formula funding is provided for new transportation services beyond ADA requirements to assist the disabled. Apportionment is based on a state's disabled population. • 60% for urbanized areas > 200,000 • 20% for urbanized areas < 200,000 • 20% to states for use in rural areas The program mandates coordination of transportation services with other federal human service programs.
Eligible Capital Expenses 49 USC 5302(a)(1)	New eligibility is allowed for mobility management: "projects for improving coordination among public transportation and other transportation service providers"
SAFETEA-LU for the first time has allowed federal grant money from an agency other than the Federal Transit Administration (FTA) (such as grants dedicated to health and human services) to be used as **matching funds** for federal transit funding programs.	

Rural states have particular motivation to comply with federal designs toward statewide transit coordination planning because the programs that address rural mobility needs have received the greatest percentage increases in funding of any category in the SAFETEA-LU reauthorization of the transportation bill (Figure 2-1).



	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009
5311 Rural Area	$241	$251	$388	$404	$438	$465
5310 Elderly & Disabled	$91	$95	$112	$117	$127	$133.5
5317 New Freedom	-	-	$78	$81	$87.5	$92.5
5316 JARC	$125	$124	$138	$144	$156	$164.5

Figure 2-1: Rural transit and human-service transportation received substantial increases in SAFETEA-LU funding.

2.1.4 State Roles in Coordination Implementation

Coordination at the local and regional levels inherently deals with the unique characteristics of individual communities and the local leadership that currently exists; however, state governments have motivated action by executive order and by legislative acts. Lessons can be learned from coordination practices in many different types of communities. The following examples show how some coordination strategies have been launched at the state level.

- In 1996, Louisiana's governor re-established the Inter-Agency Transportation Coordination Committee within the Office of the

Secretary of the Louisiana Department of Transportation and Development. The Committee was tasked to increase efficiency through coordination as indicated in Figure 2-2 (*3*).

The Inter-Agency Transportation Coordination Committee shall:

A) Develop and maintain a consolidated inventory of all transportation providers operating within the state. Accordingly, each state agency involved in providing transportation services shall provide such information to the IATCC as is necessary for it to compile the consolidated inventory including, but not limited to, information relative to funding, expenses, revenues, ridership, areas of service and evaluations of performance.

B) Review and evaluate the transportation provision policies of each agency to determine the most efficient methods for facilitating the coordination of transportation services.

C) Make recommendations specifically addressing:

1) the standards of financial and activity reporting; and

2) the contents of interagency agreements including service assurances, financial commitments, monitoring plans and compliance plans, and the most appropriate and least costly service that can be accomplished through the coordination or consolidation of intra-departmental transportation resources.

Source: Louisiana Executive Order MJF 96-18

Figure 2-2: A Louisiana executive order launched coordination efforts at the top echelon of that state's transportation department.

- North Carolina Governor Easley created the North Carolina Human Services Transportation Council by executive order in 2002 to facilitate coordination efforts in the state. Membership was designated to include representation from any division of state government that administers state or federal transportation funds, including the Department of Health and Human Services, the Department of Commerce, the Employment Security Commission, the Department of Administration, the Department of Public Instruction, and the Department of Transportation. Committee tasks were designated as indicated in Figure 2-3. Notably, the committee and tasks focus solely on state government roles to the exclusion of local and regional community involvement (*4*).

The Council shall have the following duties:

A) To undertake studies and demonstration projects that will enhance the coordination and delivery of human-service transportation services in the safest, most cost-effective, efficient and customer-focused means possible.

B) To advise and make recommendations to the DHHS, DOT and other state agencies concerning human-service transportation policy.

C) To identify opportunities and barriers and recommend solutions to improve community transportation services.

D) To develop and present an Annual Executive Summary of the Status of Human Service Transportation in North Carolina.

Source: North Carolina Executive Order Number 21

Figure 2-3: North Carolina's governor established coordination among state agencies.

- Virginia has experienced some success with implementing a transit coordination plan that involved nine agencies. The Northern Shenandoah Valley Public Mobility Program has served clients in a 1650-square-mile rural area. The nine agencies involved has provided transportation services to the communities in the area by using existing vehicles and allowing clients from various agencies to ride together. Virginia believes that integrating compatible clients creates social and educational growth opportunities for all parties involved (*5*).

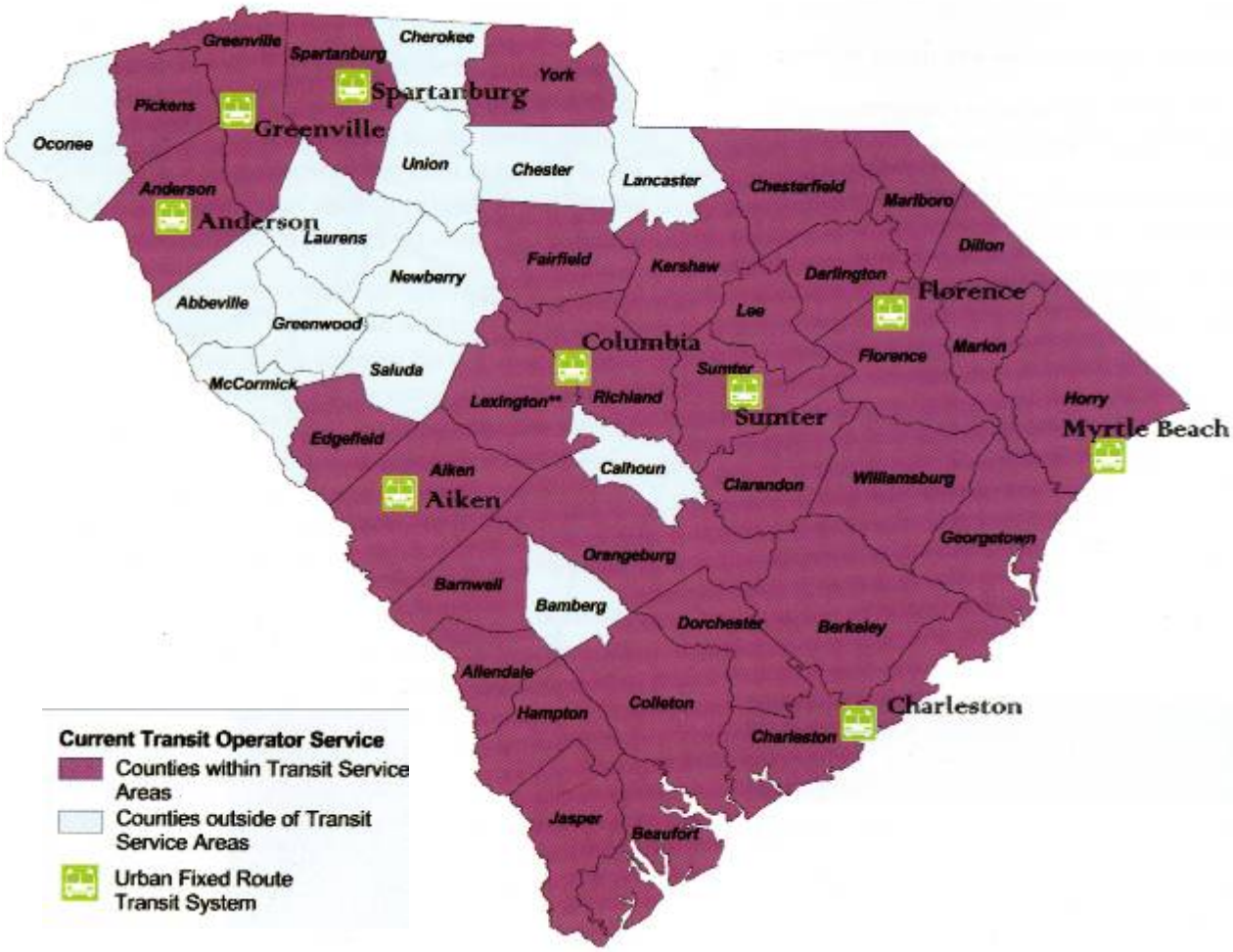
2.1.5 South Carolina Initiatives

South Carolina has placed a priority on transportation coordination for a number of years. The South Carolina Department of Transportation's 2002 *Multimodal Transportation Plan through 2022* included language directed at establishing and enhancing coordination (*6*):

- "*Expand transit services* to currently unserved communities.
- "Combine other community uses with transit facilities.
- "Establish information exchange and partnerships with other modal operations.
- "Establish *interregional cooperation* between existing transit providers in the state.
- "Provide funding incentives for multimodal transportation activities."

The South Carolina Department of Transportation has set a vision for the state to improve its public transit offerings because "building effective public

transportation systems improves access to community facilities and enhances the performance of the state's transportation system." Transit services range from cities with multiple fixed-route bus services to rural areas with demand-responsive service. At the time of writing the *Multimodal Plan*, many South Carolina counties had no transit service whatsoever, as indicated in Figure 2-4 (an updated map resulting from this Clemson University research effort appears in the next chapter in Figure 3-19).



Source: South Carolina's *Multimodal Transportation Plan through 2022*

Figure 2-4: Several South Carolina counties, primarily in the Upstate, had no public transit operator in 2002.

In particular, the Plan cites that Catawba, Upper Savannah, Lower Savannah, and Lowcountry Councils of Government have made concerted efforts to use transit funding efficiently to implement these strategies.

2.1.6 Identified Local and Regional Community Benefits

America has discussed the concept of transit coordination for several decades. Starting from 1956 or earlier, proponents saw coordination as means of improving supply and efficiency (*7*). Advocates have identified the following potential benefits to coordination:

- stimulating regional cooperation among agencies,
- minimizing or eliminating fragmentation of services,
- facilitating a multi-jurisdictional approach to planning and problem solving,
- engaging a wide range of groups including human-service and public providers,
- encouraging coordination of public transportation,
- submitting one consolidated grant application, and
- moving allocation of funds to local decision making.

Coordination can take many forms, and the benefits can be just as varied. In Portland, Oregon, demand-response transit providers work in league with local taxi companies. Senior citizens there can qualify for service based on age and regardless of standards of personal mobility. Paratransit operators cannot afford to dispatch fully-equipped vehicles to perform a service equivalent to taxi operations; therefore, the operator subcontracts such calls to cab companies. The cab companies benefit from a steady flow of revenue, and the paratransit operator can dispatch wheelchair-accessible vehicles to people who need them. In the long run, a paratransit operator can save money on vehicle acquisition. Nationally, seven percent of all demand-response fleets do not comply with the wheelchair accessibility requirements of the Americans with Disabilities Act (Figure 2-11), which might suggest that a number of demand-response agencies are servicing non-essential trips.

In addition to improved access to employment, health, and social services, tourism areas have found their own means of collaborating to achieve scale economies in their investments. Because many tourist destinations must operate in seasonal environments, summer resort areas like those found along the South Carolina coast do well to pair themselves with other activities that may have a heavier winter demand for services. Rather than purchasing a fleet of buses for service in five months of the year and storage in seven, some summer coastal areas send their buses to the mountains for winter duty at ski resorts.

Improved transit services provide better access to employment, schools, medical services, shopping, and community activities. Ultimately, the benefits of collaboration include:

- efficient use of resources available,
- equitable distribution of resources,
- avoidance of service duplication, and
- opportunity for service expansion given operational efficiencies.

Many transit agencies in the United States already engage in coordination. A number of fixed-route transit agencies have improved service efficiency by collaborating and subcontracting to smaller operators, particularly for demand-response service. In fact, only seven percent of America's fixed-route operators operate all demand-response service in house, though most of them retain a role in this service. Most prevalently, two-thirds of large agencies outsource service delivery, but 43 percent of large agencies manage reservation systems in house. About one-third of large agencies also schedule their service providers (*8*).

Operators might find reason to coordinate with other agencies based on a variety of common factors such as:

- same routes or service areas,
- nearby routes or service areas,
- compatible service times,
- compatible or equivalent types of passengers (elderly, disabled, young, general public, and so forth),
- equivalent or compatible trip purposes, or
- business competition.

2.2 Types of Coordination and Current Activities

2.2.1 Types of Transportation Service Coordination

Although the term "transit coordination" might arouse images of operators sharing passengers and coordinating transfers, coordination can take many forms and involve agencies that never operate their own services. Table 2-3 shows different strategies for coordination.

Table 2-3 Coordination Strategies by Category

Category	Coordination Strategy
Operational Strategies	• Share vehicles • Share vehicle maintenance • Share drivers • Share driver recruitment or training • Share dispatch • Share software
Planning Strategies	• Adjust to uniform hours, service frequencies, or rates • Share planning resources
Administrative Strategies	• Share grant writing duties • Share reporting • Share insurance • Consolidate offices

2.2.2 Technology as a Tool and Catalyst of Coordination

Just as the Internet has facilitated global business coordination and partnerships, many organizations that coordinate transportation consider technology a quintessential element. If transit operators within one district or in adjacent service delivery areas agree on standard technology platforms from the start, they can purchase compatible equipment and train staff to use the technology simultaneously, which can lead to reduced prices through combined purchasing power and compatible technology to facilitate further communication and collaboration.

As mentioned previously, two thirds of America's large transit agencies outsource service delivery for demand-response transit. Given that these agencies put their names to the outsourced service, they need to stay involved and monitor performance. Reservation systems for 43 percent of the outsourced services are managed in house with agency technology, and one-third of the outsourced services are scheduled in house with agency dispatch technology (*8*). Benefits of sharing dispatch include:

- software costs,
- cost of training and expertise, and
- a centralized system resulting in less confusion when calling for a ride.

For smaller agencies, routing software is expensive and requires a skilled operator, yet many agencies do not have sufficient requirements to justify purchasing the software and hiring or training a staff member. Multiple agencies pooling their needs and resources might find that their pooled needs and resources provide sufficient justification to acquire the efficiencies that modern routing and dispatch technology can offer.

2.3 Case Studies

A number of examples of growing transit coordination around the country have evolved over the past two decades. The following cases describe program initiatives in three geographic areas. Two of the cases are state programs that addressed rural as well as urban needs. In New Mexico, the effort to link transit providers and social-service entities brought stakeholders together and developed an integrated documentation and reporting system. This Client Referral, Ridership, and Financial Tracking (CRRAFT) system demonstrated that transit coordination could work well in a state like New Mexico, one of the most rural states in the U.S. (*9*). In North Carolina, a major focus on public transportation needs of the 21st century was initiated with the Transit 2001 Commission. This Commission addressed the needs of rapidly growing urban areas as well as rural parts of the state that were not being addressed with a new organizational structure. For metro areas, Portland is often cited for innovative practices. Portland's TriMet system linked the city with adjacent counties into an effective regional system with urban streetcars, light rail and bus lines interacting. Elements of that system might be appropriate for metro areas in South Carolina as they approach critical mass and transit issues become still more regional in scope.

2.3.1 Rural Transportation Coordination in New Mexico

2.3.1.1 Background

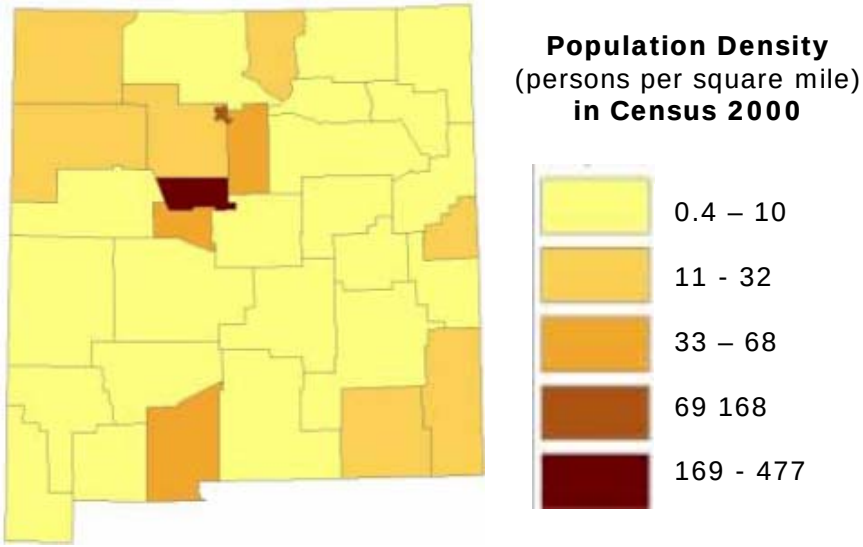
Like many states, New Mexico has struggled to link human-service needs with rural transportation delivery systems. A major impetus for better coordination came with the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 that ended the Aid to Families with Dependent Children (AFDC) entitlement program, replacing it with the Temporary Assistance for Needy Families (TANF) work program and subsequent Welfare to Work and Child Support Amendments. In addition, under the 1998 Transportation Equity Act for the 21st Century (TEA-21), the Federal Transit Administration offered grants to improve workplace access under the Job Access and Reverse Commute (JARC) provision. JARC offered the opportunity to leverage federal transit funds with federal human service funds.

One of the major problems in implementing these new program initiatives in New Mexico as well as other states was the difficulty in reporting for multiple funding streams. Human-service reporting is case-centered, focusing on the number of unique clients served and reductions in case loads. For transit purposes, reporting is trip-centered focusing on the number of trips provided, the cost per trip, and cost per passenger mile. For small rural systems, multiple reporting requirements proved difficult and left little time for creativity in terms of service delivery.

Rural public transit in New Mexico is particularly challenging, and there was reluctance on the part of some agency heads to participate in interagency coordination. One of the agency comments was "(c)oordination will never work in New Mexico. Rural New Mexico is not like rural Ohio. The situation here is far different from most other states because we are one of the poorest states and lack the kind of infrastructure that most states take for granted." The situation was particularly problematic in New Mexico because of the low densities in rural areas of the state influenced by multi-generational ties to the land among Native Americans, descendants of Spanish land-grants, and farmers and ranchers.

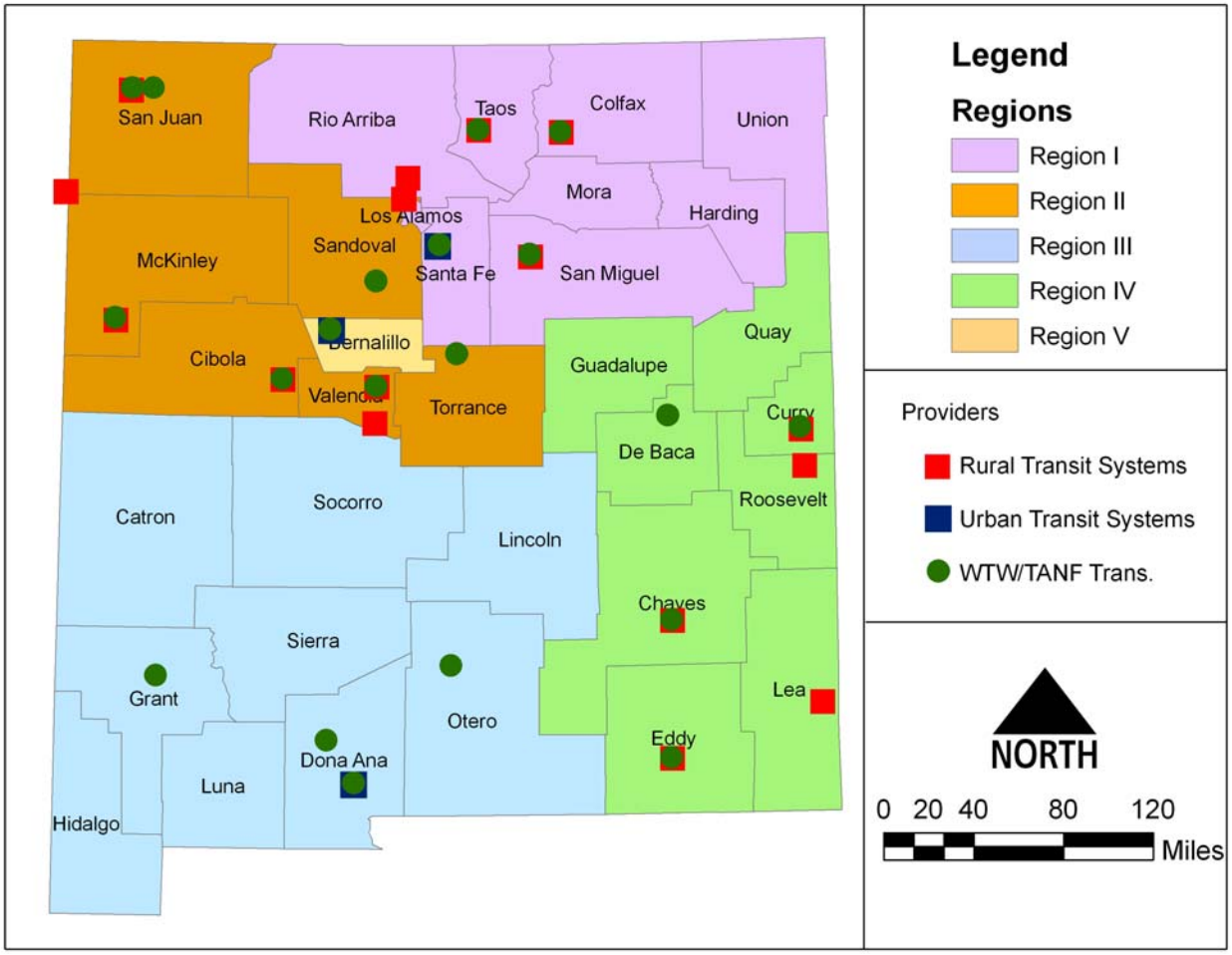
2.3.1.2 Service Area

The CRRAFT system provides statewide coverage for rural areas in the state of New Mexico. That makes for a large service area as New Mexico is the fourth largest state in the US in terms of geographic area, an area equivalent to the combined areas of Pennsylvania and New England. The population density for the state is 15.0 persons per square mile, but most of the population is in the 12 most populous counties. Among the remaining 32 counties, population densities drop to 0.4 to 10.0 persons per square mile as indicated in Figure 2-5. The state is divided into five income support regions with combinations of transit systems for rural and urban areas, as well as systems serving welfare-to-work needs, and the Temporary Assistance for Needy Families (TANF) program (Figure 2-6).



Source: ATR Institute (2006) "Client Referral, Ridership, and Financial Tracking System: An ITS Application." University of New Mexico.

Figure 2-5: Population in New Mexico by county in 2000.



Source: Alliance for Transportation Research Institute (2006) "Client Referral, Ridership, and Financial Tracking System: An ITS Application." University of New Mexico.

Figure 2-6: Public transit providers and WTW-TANF systems appear in many counties in New Mexico.

2.3.1.3 Issues Addressed

To address key issues affecting rural transit delivery in the state, the Alliance for Transportation Research Institute (ATRI) at the University of New Mexico, under contract to the Public Transportation Programs Bureau (PTPB) of the New Mexico State Highway and Transportation Department conducted a series of regional workshops followed by a statewide conference involving transit users and providers, legislators and the public. The project report identified a lack of accessible and affordable transportation options.

A follow-up study in 1999 included a needs assessment based on surveys of transit users and providers and social-service program directors and clients. A report entitled *Moving Forward: A Transportation Toolkit for Welfare*

Reform identified gaps in terms of personal vehicle and public transportation access and made recommendations on how to stretch available resources to meet transit needs. Issues of interagency coordination and differing agency cultures were cited as impediments to public service provision. The study found that social service providers were case-centered, with success measured in terms of clients served and reductions in case loads. Transit providers were trip-centered focusing on the number of trips provided operating costs. The different program objectives made program reporting cumbersome and time consuming to the point that further coordination was jeopardized.

2.3.1.4 Partners

The Alliance for Transportation Research Institute working with Public Transportation Programs Bureau adopted an approach used by the National Partnership for Highway Quality to bring stakeholders together using a series of one day forums. Partners included federal officials from Federal Transit Administration Region VI in Dallas, the Federal Highway Administration Office in New Mexico, members of the legislature, a highway commissioner, directors of rural transit systems including tribal systems, urban transit planners, county officials and planners, representatives of social service providers and faith-based organizations, members of advocacy groups and individual citizens (*10*).

2.3.1.5 Approach

To address the reporting issue, the Alliance for Transportation Research Institute looked to see what other states were doing and eventually settled on a “home grown” solution. The solution was a web-based software program designed by ATRI, the Client Referral, Ridership, and Financial Tracking Transit Management System (CRRAFT TMS), which integrates human resource transportation utilization with rural transit operations. By consolidating system development and maintenance at a central location, individual operators were not required to develop individual computerized reporting systems. Client confidentiality and security was maintained through local operator passwords and data encryption.

The CRRAFT Transit Management System began with end products to determine what information was necessary for report generation including referrals, ridership and financial tracking. The system is divided into five modules:

- transit system management module,
- fiscal management module,
- reporting module,
- client management module, and
- schedule management module.

The system was pre-tested and refined over an eight month period. Users were given twelve hours of training on the software with a user manual provided.

To track clients and accounts as well as provide for electronic fare collection, the Alliance for Transportation Research Institute developed a smart card technology as a demonstration project for the U.S. Department of Transportation Federal Transit Administration/Federal Highway Administration Joint Program Office. In the process, the state became a national leader in implementing Intelligent Transportation Systems in non-urban areas. The smart card technology is now interfaced with CRRAFT software for electronic universal fare collection and system reporting. For human services passengers, cards are encoded with a magnetic chip that is tied to the state's electronic benefits transfer card indicating eligibility criteria and responsible funding entity. Similar cards are sold to tourists and other members of the public to prevent stigma associated with card use.

The system provides seamless transmittal of information from transit providers to human service entities. Transit operators equipped with handheld computers and GPS units pull down schedules at the beginning of the day. Trip information for individual users is recorded during the shift and transmitted at the end of the day to individual social service providers.

2.3.1.6 Funding

Funding was provided by the Public Transportation Programs Bureau of the New Mexico State Highway and Transportation Department along with initial support from the New Mexico Human Service Department, New Mexico Department of Labor, New Mexico Economic Development Department, and the New Mexico Children, Youth, and Families Department. Later funding was provided by a "Job Access and Reverse Commute" grant from the New Mexico Department of Labor's "Welfare-to-Work" program and the New Mexico Human Service Department's "Temporary Assistance for Needy Families" program. These programs provided a 50-percent match to leverage funding from the Federal Transit Administration.

2.3.2 County Coordination in North Carolina

2.3.2.1 Background

North Carolina established the Mass Transit Division in the State Department of Transportation in 1974 to coordinate and assist both urban and rural transit operations in the state. Like other states, transit operations in North Carolina received increased attention with the coordination of public transportation and state highway plans under the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and subsequent reauthorizations of funding legislation. That initiative was followed by the appointment of the Transit 2001 Commission by Governor Jim Hunt in 1995. The charge of the Transit 2001 Commission was to provide recommendations to improve public transportation in the state for the 21st Century. The state was growing rapidly with emerging urban centers and the lack of adequate transit options. One of the state's consultants predicted that North Carolina might become "Los Angeles with seasons" (*11*). At the same time, the state had large rural pockets where public transportation services were not adequate particularly for the growing elderly population and for the disabled and others who cannot afford cars to get to work, churches and shopping areas.

Transit 2001 set an aggressive agenda to address urban and regional transit issues that included passenger rail and included attention to land-use and development issues. Governor Hunt indicated: "(w)hen I recruit business to our state, I want to be able to say 'Come to North Carolina, you won't get stuck in traffic congestion.' We need regional high speed rail transportation to keep North Carolina moving" (*11*). At the same time, a primary focus of the plan was on rural and human-service transportation. New state legislation in 2000 reorganized rural planning operations in the state and restructured the state's consultation process with local officials.

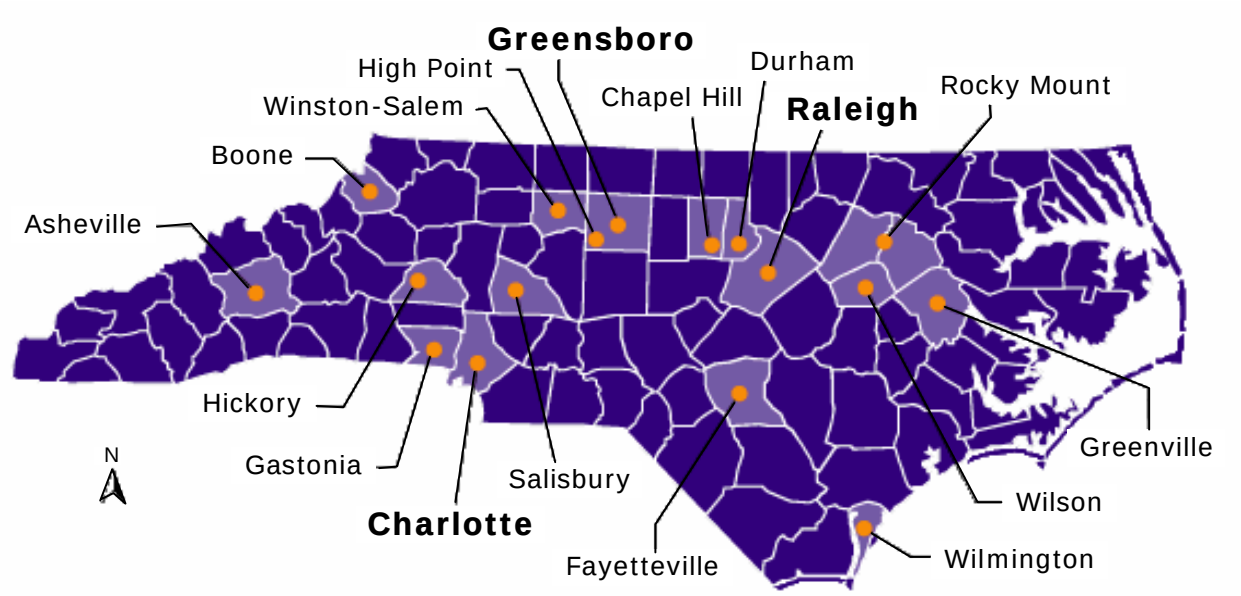
Notably, North Carolina has traditionally coordinated transportation services at the county level but is currently transitioning to a regionally-based coordination network. This transition suggests that North Carolina sees benefit to addressing transportation needs at that scale.

2.3.2.2 Service Area

The state of North Carolina is divided into planning organizations fashioned from existing regional councils of government. All counties must be a part of either a metropolitan planning organization or rural planning organization (*12*). The system includes twenty rural planning organizations (RPOs) servicing areas outside of the seventeen metropolitan planning organizations (MPOs) (Figure 2-7). Rural planning organizations serve between three and fifteen counties that must have a combined population of 50,000.

Combinations of metropolitan planning organizations serve large regional areas: the Charlotte Area Transit System (CATS), the Piedmont Authority for Regional Transportation (PART), and Research Triangle Regional Public Transit Authority (TTA). Each has its own local funding structure for transit. Charlotte uses a half-cent sales tax; Piedmont uses rental vehicle fees; and, Research Triangle uses a combination of rental vehicle fees and vehicle registration fees within the covered region.

This case study focuses on the Research Triangle Regional Public Transit Authority because this regional system developed through active state and local commitment involving multiple counties and because 80 percent of the Authority's budget is generated from local sources. This system operates regional fixed-route bus service with commuter rail planned for the future.



Source: North Carolina Department of Transportation (2007) "Public Transportation in North Carolina."

Figure 2-7: Rural planning organizations and metropolitan planning organizations span the state of North Carolina.

2.3.2.3 Issues Addressed

Key issues addressed in Transit 2001 were: rural and human-service transportation, urban and regional transit, intercity rail passenger service, and land use and development. The report stressed that expansion of transit service to accommodate a greater share of the travel market must go

beyond extension of the traditional transit services. Important issues to be addressed included increases in frequency, type, quality, reliability, and cost effectiveness. At the same time, a continuous expansion of quality was deemed necessary to accompany the expansion of services.

Among the key issues to be addressed were to:

- initiate a new generation of regional system plans and multimodal major investment studies,
- evaluate the scope and effectiveness of current service coordination efforts at both the state and local levels,
- initiate rural and human service improvements to support Work First initiatives in rural areas of the state, and
- inventory current, nontraditional services, fare policies and marketing programs (*11*).

2.3.2.4 Partners

In the late 1970s, the North Carolina Department of Transportation (NCDoT) and the state Department of Health and Human Services (DHHS) began coordinating transportation services. In addition to NCDoT and DHHS, partners for human service transportation include county social serviced departments – for Title XX, Work First and Medicaid recipients; private, non-profit programs for older adults: mental health programs; sheltered or vocational workshops; and county health departments (*13*).

2.3.2.5 Approach

Central to transit coordination efforts has been the reorganization of rural transportation operations. Each of the Rural Planning Organizations has five core functions:

- coordinate, assist and develop local and regional plans,
- provide a forum for public participation in the transportation planning process,
- develop and prioritize projects the organization believes should be included in the state transportation improvement program,
- provide transportation related information to local governments, and
- coordinate regional issues between contiguous metropolitan planning organizations, rural planning organizations, and other regional organizations (*12*).

Each of the state's 100 counties is required to prepare and implement a transportation development plan (TDP). The system provides a framework for local planning as well as increased access to regional and state planning initiatives. The intent is to provide a seamless intermodal system meeting

the needs of both urban and rural interests. Specific activities include the delineation of clear roles for each of the partners, delivering targeted programs, and educating local officials. The program also addresses boundary issues, coordination of service delivery, and sharing of information including GIS data, computer-aided dispatching, and customer information systems.

In terms of human services, 55 human-service transportation systems currently are working in the state meeting the needs of individuals with limited mobility. Human service transportation systems work with human service providers transporting clients to work, school, medical services or shopping activities. Riders must be referred by human service agencies. Receipts from agency contracts and fees meet 100 percent of operating costs for the service.

In addition, there are 28 community transit systems operating in the state providing transportation for both human service agency clients and the general public. They operate as both single-county and multi-county operations. Most providers offer subscription service prearranged through individuals, groups, or human service agencies. Options include dial-ride-service and deviated fixed-route service. Rural community transit ridership has been increasing at about two percent per year due to increased requests for human service agency clients and job opportunity programs now operated as “Work First” and “Smart Start” initiatives (*13*).

2.3.2.6 Funding

The Public Transportation Division of the North Carolina Department of Transportation administers $30 million in annual transit funding to more than 120 public transit systems in the state. State funding represents a small fraction of transit operating revenues, but for smaller systems, state funding generally represents a higher percentage of funding. Federal funding, fare receipts, and local assistance typically make up equal shares in urban systems. For human-service transportation, combined receipts from agency contracts and fares cover all operating costs, although local systems are free to set their own fare structures. For The Research Triangle Regional Public Transit Authority, approximately 80 percent of its funding is generated locally including passenger fares and a $5 vehicle registration fee collected from the three-county primary service area (*13*).

A high priority has been placed on making sure that the state receives a fair share of Federal transportation allocations. At the same time, efforts continue to increase state funding and to provide more revenue options for local government entities.

2.3.3 Coordination in the Growing Metropolitan Area of Portland, Oregon

Coordinated transportation in Portland, Oregon, offers the final case study in this section. Portland was selected as an innovative metropolitan area slightly larger than South Carolina's population centers to indicate a potential means of handling growth. Portland stands as a national model with a long track record of attention to transit. The transit initiatives described here substantially took hold around 1980 with an urban population of 366,383 and a metropolitan population of 1,333,623. Comparatively, the Greenville/Spartanburg/Anderson center in South Carolina had an urban population of 121,175 and a growing metropolitan population of 962,441 in 2000 (Table 2-4). The 2005 American Community Survey indicated a 2005 combined metropolitan population of 1,002,510 in this metropolitan region, which is already larger than the size of Portland when its local leaders began transit efforts. Portland's story offers a model of proactive regional efforts to anticipate transportation needs associated with population growth.

Table 2-4: Comparison of City and Metropolitan Populations

	1980		2000	
	City	Metropolis	City	Metropolis
Charleston/ North Charleston*	132,044	430,346	172,894	549,033
Columbia	101,208	409,955	115,876	536,691
Greenville/ Spartanburg/ Anderson	129,523	744,429	121,175	962,441
Portland, OR/ Vancouver, WA**	366,383	1,333,623	529,121	1,918,009

**City values only include the city of Portland

Sources: South Carolina Population Reports. "Population 1950-2000: Population of Counties and Incorporated Places." http://www.ors2.state.sc.us/population/pop2002.asp
Real Estate Center. "Metropolitan (MSA) Population Data." http://recenter.tamu.edu/data/popm/
Oregon Blue Book. "City and County Populations: City Populations 1970-2006." http://www.bluebook.state.or.us/local/populations/pop03.htmCensus Bureau,

2.3.3.1 Background

The Tri-County Metropolitan Transportation District of Oregon (TriMet) Transit System is a municipal corporation providing public transportation for three counties in the Portland Metro Area. After steadily falling ridership during the 1950s and 1960s, Tri-Met (hyphen dropped in later years) was established in 1969 taking over the Rose City Transit System that was on the verge of bankruptcy. A special act of the legislature in that year allowed

the creation of transit districts and the power to raise revenue through payroll taxes. A critical early step was to consolidate local bus service under Tri-Met followed by a report by the Oregon Public Utility Commission proposing a light rail system using abandoned railroad rights of way. A fareless zone was established in the downtown area followed by the opening of the 22 block Portland Transit Mall in the city center in 1978. The first leg of the light rail system opened in 1986 with the fifteen-mile Banfield Light Rail segment (*14*).

TriMet has evolved into a comprehensive transit system including 93 bus lines, a 44-mile, 64-station light rail system called MAX, the Portland Streetcar, and service for seniors and for individuals with disabilities. In fiscal year 2005, the system provided 63.9 million bus trips and 31.9 million MAX trips. The system carries more people than any other US transit system of its size (*15*).

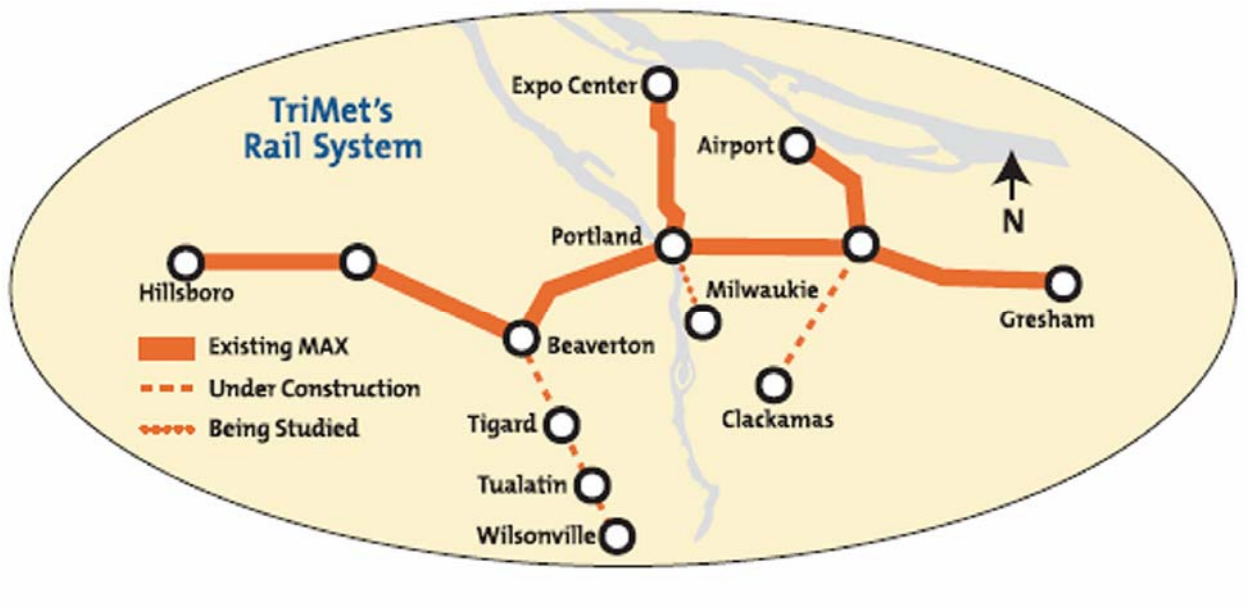
2.3.3.2 Service Area

TriMet serves 575 square miles of the urban portions of the tri-county area.

Source: TriMet (2005) "Facts About TriMet." Tri-County Metropolitan Transportation District of Oregon.

Figure 2-8: TriMet serves the Portland area.

The TriMet system serves three counties in the Portland Metro Area – Multnomah, Washington, and Clackamas - covering 575 square miles as indicated in Figure 2-8. The MAX light rail system extends 15 miles east to Gresham (the initial Banfield line), 18 miles west to Hillsboro, and north to both the airport and Expo Center with work underway to extend south along two lines to the Clackamas Town Center and to Milwaukie (Figure 2-9).



Source: TriMet (2005) "Facts About TriMet." Tri-County Metropolitan Transportation District of Oregon.

Figure 2-9: TriMet's MAX light rail links cities around Portland.

Of Tri-Met's 93 bus lines, 79 connect with MAX and to 18 major transit centers and the Portland Streetcar. Sixteen frequent-service buses operate every fifteen minutes or fewer. The 164-mile frequent service network accounts for 55 percent of all bus riders. Rides are free in the 330 square block Fareless District of Downtown Portland.

2.3.3.3 Issues Addressed

At issue initially was how to save an urban transit system on the verge of bankruptcy. Low ridership and labor pressure forced the previous operator, Rose City Transit Company, in financial jeopardy. Without further rate hikes the company threatened to discontinue service. From this early crisis, a series of issues surfaced immediately and in the ensuing years that began to shape the new Tri-Met system.

Alternative Revenue Source - The first issue was the need to secure a reliable source of revenue. Heavy dependence on ridership fares in the midst of declining ridership was not sustainable, and operating revenues would need to be supplemented to make the system viable.

Increased Ridership – Historic efforts to increase ridership have been well-documented. To address the transit system's decline, the 1990 master plan originally released in 1973 recommended consolidating regional transit service and concentrating downtown service in transit malls.

Intermodal Connections – Fortifying system bus service is a critical first step but linking bus service with rail for commuter travel as well as downtown connections was deemed critical for both efficient transportation as well as environmental quality purposes.

Growth Management – The regional transit program complemented the statewide urban growth boundary legislation promoting transit oriented development.

2.3.3.4 Partners

Partners in this process have included the city of Portland and the three counties of the service region – Multnomah, Washington, and Clackamas. Federal support from the Federal Highway Administration and the Urban Mass Transit Administration (now known as the Federal Transit Administration) was critical in expanding local infrastructure. Other partners include local employers encouraging carpooling of transit options and human service agencies promoting transportation to work and accessibility for the elderly and disabled.

2.3.3.5 Approach

The Tri-County Metropolitan Transportation District of Oregon (Tri-Met) was established in January 1969 to take over local bus service and provide regional transit service. Two months later the state legislature passed legislation allowing the establishment of transit districts and providing them with the power to raise revenue through a payroll tax. Rose City Transit agreed to turn over its operations later that year.

In 1973, Tri-Met completed an immediate action plan and a 1990 Master Plan. The plan recommended consolidating local bus service and concentrating downtown service in transit malls. The plan also called for expanding bus service and developing primary transit corridors. That same year, the city rejected federal monies for the Mt. Hood Freeway and diverted those monies to transit projects. The Oregon Public Utility Commission called for using abandoned railroad corridors for light rail service.

Tri-Met began operating Fareless Square in 1975 to encourage utilization of downtown transit, to take cars off the street, and to reduce air pollution from short auto trips. The downtown Transit Mall opened later that year. Metro Portland adopted its urban growth boundary to manage regional land use, and corridor transit-oriented development would become an integral part of that development strategy.

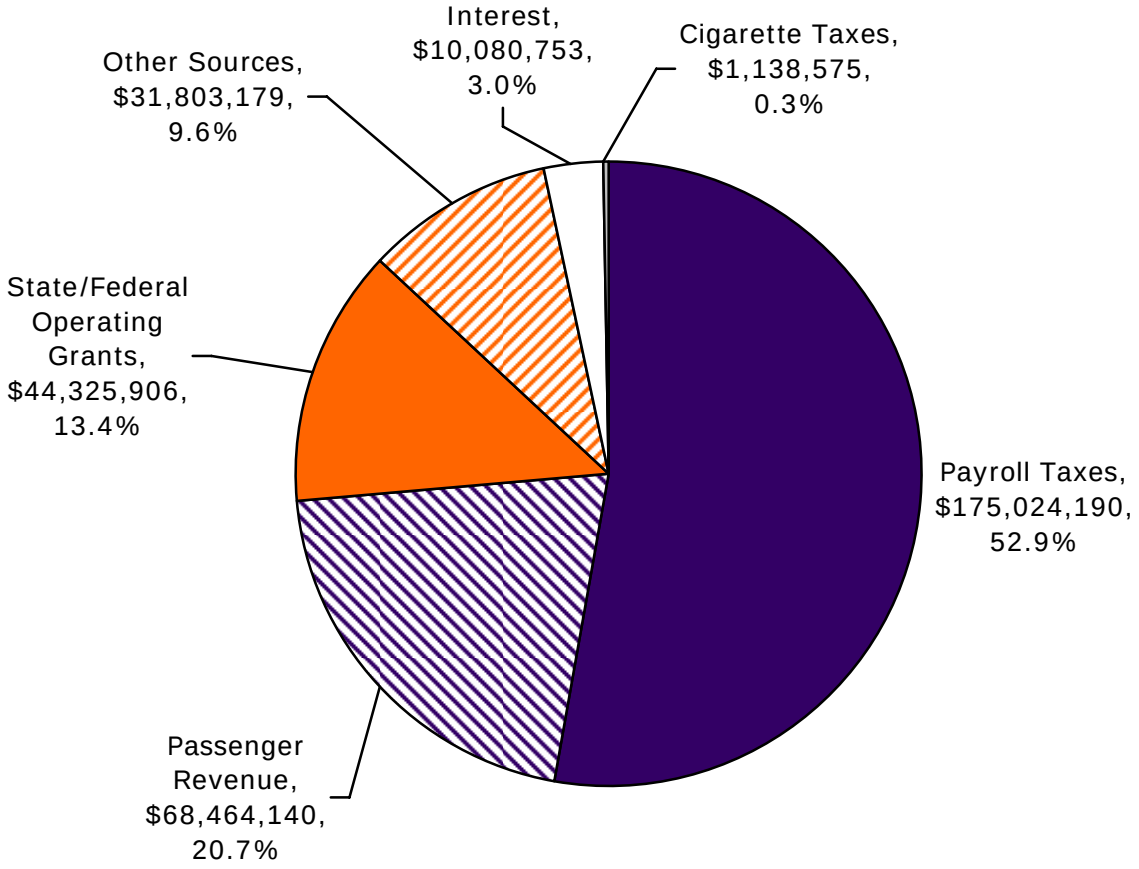
The first MAX line, the Banfield or East Line was approved using money diverted from freeway construction in 1980. The 15-mile line opened in 1986 connecting the eastern suburb of Gresham to the downtown. The West Line, an 18-mile extension from downtown to Hillsboro, was completed in 1999, and rail service to the airport from downtown began in 2000. In 2004, the 5.8-mile Yellow Line traveled north to Expo Center and brought the MAX system to 44 miles with 64 stations. Construction has begun on the I-205 light rail project, an 8.3-mile extension south into Clackamas County to be completed in 2009. Another rail extension is planned from Portland State University south to Milwaukie with completion scheduled for 2014.

While much of the attention has been focused on light rail extension, TriMet now operates 93 bus lines with 79 of those lines connecting to MAX. Ridership on system buses now totals 63.9 million bus trips per year, twice the number of trips on MAX trains. Frequent service is now provided along sixteen bus lines providing service at fifteen-minute intervals or better. Riders can catch buses on 47 lines out of the downtown Portland Mall, and the Fareless Square has been extended to a 330 square-block area. Outside the central city, 21 TriMet park-and-ride lots offer free parking. Within downtown, the Portland Streetcar line extends six miles with 40 platform stops. The Portland Streetcar connects the South Waterfront, Portland State University, and Legacy Good Samaritan Hospital in northwest Portland.

To address issues of special needs among system users, TriMet issued the Coordinated Human Services Transportation Plan and the Tri-County Elderly and Disabilities Transportation Plan this past year. A primary focus is on serving disadvantaged individuals including the elderly and disabled populations. The plans call for expansion of the RideWise consumer education and training program in conjunction with the TriMet LIFT paratransit eligibility process. Neighborhood shuttles are recommended to provide access to local shopping and activity centers and to connect with fixed route transit. The plans also call for coordination and pooling of resources with community organizations and churches to help transport individuals (*16*).

2.3.3.6 Funding

Payroll taxes account for over half of the system's operating revenues (52.9 percent). Passenger revenues account for 20.7 percent of the total, while state and federal grants account for another 13.4 percent of the total as indicated in Figure 2-10 (*15*).



Local funding comes from payroll-related taxes at a rate of .6518% ($6.52 per $1,000) on gross payroll.
Operating cost per boarding ride: $2.58 (Bus); $1.52 (MAX)

Source: TriMet (2005) "Facts About TriMet." Tri-County Metropolitan Transportation District of Oregon.

Figure 2-10: TriMet operating revenues in fiscal year 2006.

2.4 Documented Barriers to Coordination

Researchers investigating transit coordination came to mixed conclusions about the wisdom of focusing resources and workforce on transit coordination. Some forums pose that coordination of transit brings no increase to transportation supply even as agencies assume the added efforts

of coordination. Notably, most research appears to have been conducted in urban areas where transportation services tend to be concentrated. Relatively little research has defined the impacts of transit coordination in rural areas.

Past research has already documented many barriers to coordination. These barriers can be placed into five primary categories (Table 2-5): policy or regulatory, financial, operational, informational, and attitudinal.

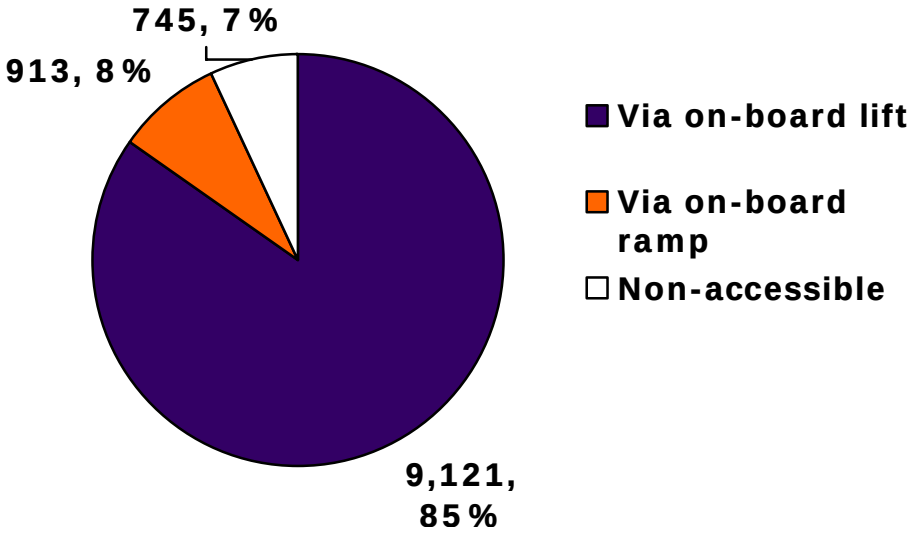
Table 2-5: Categorized Barriers to Transit Coordination

Financial • We would need start-up money for coordination. • There are not sufficient financial incentives for coordination. • Federal monies are designated for specific purposes. • Different matching requirements exist. • We are uncertain about cost allocation between participants and funding agencies. • We lack information about funds.	**Policy / Regulatory** • Federal leadership disallows coordination. • State leadership disallows coordination. • Systems for paying for authorizing, tracking, & paying for transportation are different • Planning criteria differ. • The use of vehicles has restrictions. • Fares have restrictions.
Operational • Insurance and liability issues • Incompatible client needs and characteristics • Different service standards • Vehicle specifications/availability • Labor arrangements • Incompatible communications equipment • Resolute service area boundaries	**Informational** • Client and data confidentiality issues • Lack of uniformity data collection, reporting, and accounting • Burden of data collection **Attitudinal** • Lack of trust among organizations • Uncertainty about shared use of resources • Skepticism about benefits • Reluctance to mix client groups • Communication barrier among organizations

Notably, many of these barriers are perceived rather than actual barriers, which make the informational (misinformation) and attitudinal (miscommunication) categories more important than they might originally appear. Agencies and other transit coordination stakeholders frequently believe they understand the situation and conclude that coordination is infeasible or undesirable based on inaccurate information.

2.5 Coordination for South Carolina

In South Carolina, transit service inefficiencies exist in both fixed-route and demand-response systems. Even in the state's largest cities, ridership is low and per-passenger costs are high making it difficult to maintain metropolitan transit systems. The situation is most difficult still for rural paratransit or demand-response systems. One of the distinguishing characteristics of demand-response vehicles is their unique needs for accessibility for users. According to the American Public Transportation Association, 93 percent of vehicles are accessible by lift or ramp (Figure 2-11). Low ridership, irregular schedules and the need for vehicle enhancements make rural service delivery a particularly high cost transportation alternative. Yet, for many in rural areas of the state, demand-response service is the only option. If that option is to be available at current or higher levels of service, better coordinated and more efficient service delivery systems are essential.



Source: American Public Transportation Association survey, 2003.

Figure 2-11: Accessibility of Demand-response Vehicles Nationwide

Aside from rural outlying areas, transit coordination can bring benefits in contexts of cities and the transition zones between cities and outlying areas.

Within cities such as Columbia, communication between university and municipal transit services can bring greater coverage of destinations of interest to university students, local residents, and downtown employees. Transit providers operating in the same area stand to improve total service offerings and quality by combining resources in bids for funding or allocation of equipment. In Upstate South Carolina, coordinating schedules and stops between providers such as Clemson Area Transit, Greenville Transit, and Electric City Transit brings potential to mitigate growing traffic between Clemson, Anderson, and Greenville, which sit along the congested I-85 corridor in an area that the South Carolina Department of Transportation expected to require widening to ten lanes before 2022 (*6*).

2.6 Conclusion

Governments of all levels and local regions have recognized the inefficiency of providing transportation services through multiple streams, and transit coordination has re-emerged as an initiative to improve efficiencies of existing resources while expanding the services offered to the public. Coordination can take many forms, and motivations for different agencies to participate vary. The extremely disparate motivations and goals of the stakeholders and the many forms of coordination available make a generic cookie-cutter approach impracticable.

As South Carolina establishes coordination plans for its internal regions, coordination leaders need to consider a number of questions.

- What is important in each region? How does current public transit and human-service transportation work in the different areas?
- Who are the stakeholders who will participate in the transit coordination planning and implementation processes? What are their goals? What can they contribute, and what would they like to receive from coordination?

The next chapters will address these questions with data gathered from a 2006 survey of South Carolina transit stakeholders and case studies derived from site visits and interviews. These chapters describe the public transit service resources in the state and culminate in tailored guidance of state-of-the-practice thought on effective coordination for the state's communities. A full description of the research methodology and the complete stakeholder survey can be found in appendixes available on compact disc.

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3.0 Regional Considerations within South Carolina

South Carolina is home to a range of transportation service providers from major metropolitan transit authorities to private taxi providers operating with only a single vehicle each. Some providers have highly-organized fixed routes with coordination between multiple locations while some providers operate demand-response service from a single location. The diversity of environments, transportation needs, and transit providers results in a wide range of advantages and disadvantages to transit coordination. Propensity to coordinate depends on the location of service provision, the types of service needed and available, and the willingness of stakeholders to participate in coordination. Further affecting coordination and transit in general is how density, vehicle types, and budget constraints all correlate with the transit conditions. Characterizing the conditions of the providers helps identify the barriers and catalysts for coordination within the state.

3.1 Settlement Patterns of Service Regions

Figure 3-1: All counties in South Carolina fall in council-of-government regions.

Table 3-1: South Carolina Counties and Councils of Governments

County	Council of Government	County	Council of Government
Abbeville	Upper Savannah	Greenwood	Upper Savannah
Aiken	Lower Savannah	Hampton	Lowcountry
Allendale	Lower Savannah	Horry	Waccamaw
Anderson	Appalachian	Jasper	Lowcountry
Bamberg	Lower Savannah	Kershaw	Santee-Lynches
Barnwell	Lower Savannah	Lancaster	Catawba
Beaufort	Lowcountry	Laurens	Upper Savannah
Berkeley	Berkeley-Charleston-Dorchester	Lee	Santee-Lynches
Calhoun	Lower Savannah	Lexington	Central Midlands
Charleston	Berkeley-Charleston-Dorchester	Marion	Pee Dee
Cherokee	Appalachian	Marlboro	Pee Dee
Chester	Catawba	McCormick	Upper Savannah
Chesterfield	Pee Dee	Newberry	Central Midlands
Clarendon	Santee-Lynches	Oconee	Appalachian
Colleton	Lowcountry	Orangeburg	Lower Savannah
Darlington	Pee Dee	Pickens	Appalachian
Dillon	Pee Dee	Richland	Central Midlands
Dorchester	Berkeley-Charleston-Dorchester	Saluda	Upper Savannah
Edgefield	Upper Savannah	Spartanburg	Appalachian
Fairfield	Central Midlands	Sumter	Santee-Lynches
Florence	Pee Dee	Union	Catawba
Georgetown	Waccamaw	Williamsburg	Waccamaw
Greenville	Appalachian	York	Catawba

3.1.1 Land Area and Population Density

South Carolina is divided into ten council-of-government (COG) regions (Figure 3-1 and Table 3-1). Those regions include Appalachian COG, Upper Savannah COG, Catawba COG, Central Midlands COG, Lower Savannah COG, Santee Lynches COG, Pee Dee COG, Lowcountry COG, Berkeley-Charleston-Dorchester COG and Waccamaw COG. These COGs each contain several counties, and no counties cross COG borders. Each COG region has its own specific nature. Some are more densely populated than others, but most have at least some area that is rural. The Appalachian COG is the largest in land area (3,834 square miles) with the greatest total population density, but it also has large rural areas.

As Figure 3-2, Figure 3-3, and Table 3-2 show, three regions stand out with the greatest population densities, densities of more than 200 people per square mile. These regions each have major metropolitan cities within their limits. Appalachian COG contains Greenville, Spartanburg, and Anderson. Columbia, the state capitol, sits within the Central Midlands COG and Charleston is located within the Berkeley-Charleston-Dorchester COG. The

areas of medium density, more than 100 people per square mile include Catawba and Waccamaw. Waccamaw holds the Myrtle Beach area along its coast, and Catawba includes Rock Hill and other local areas as well as the southern border of the Charlotte metropolitan area. The COGs with the lowest densities, less than 100 people per square mile, include Upper Savannah, Lower Savannah, Lowcountry, Santee-Lynches, and Pee Dee. The population of the regions follows the densities. In other words, the denser areas have the highest overall populations.

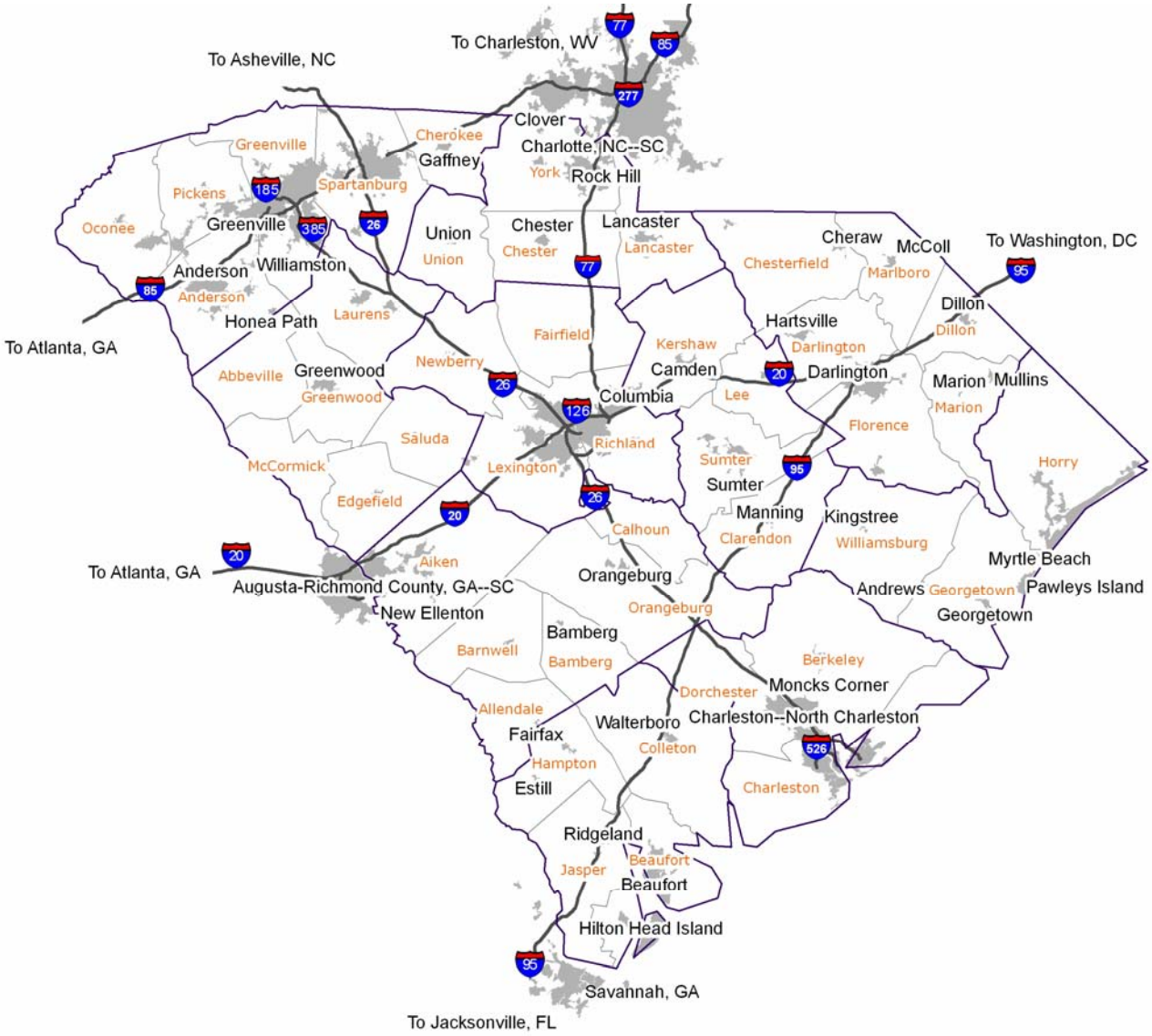
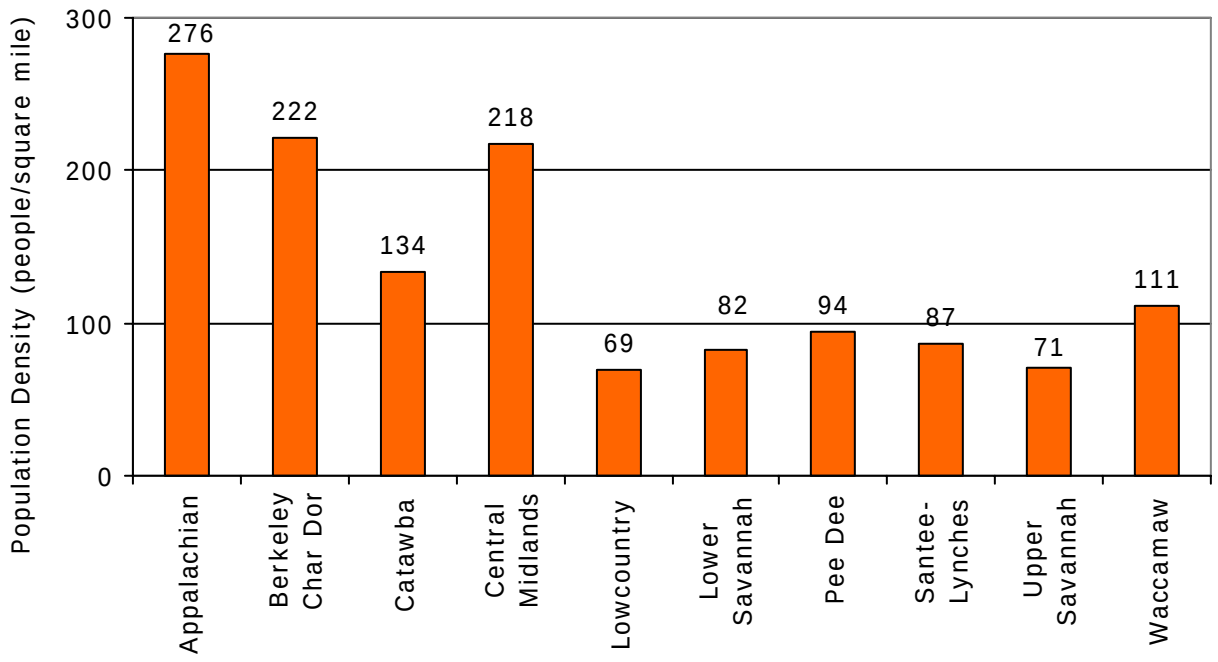


Figure 3-2: Population centers in South Carolina span the state and some interstate borders.



Data source: American Community Survey 2005

Figure 3-3: Population densities vary across South Carolina with low densities in much of the state.

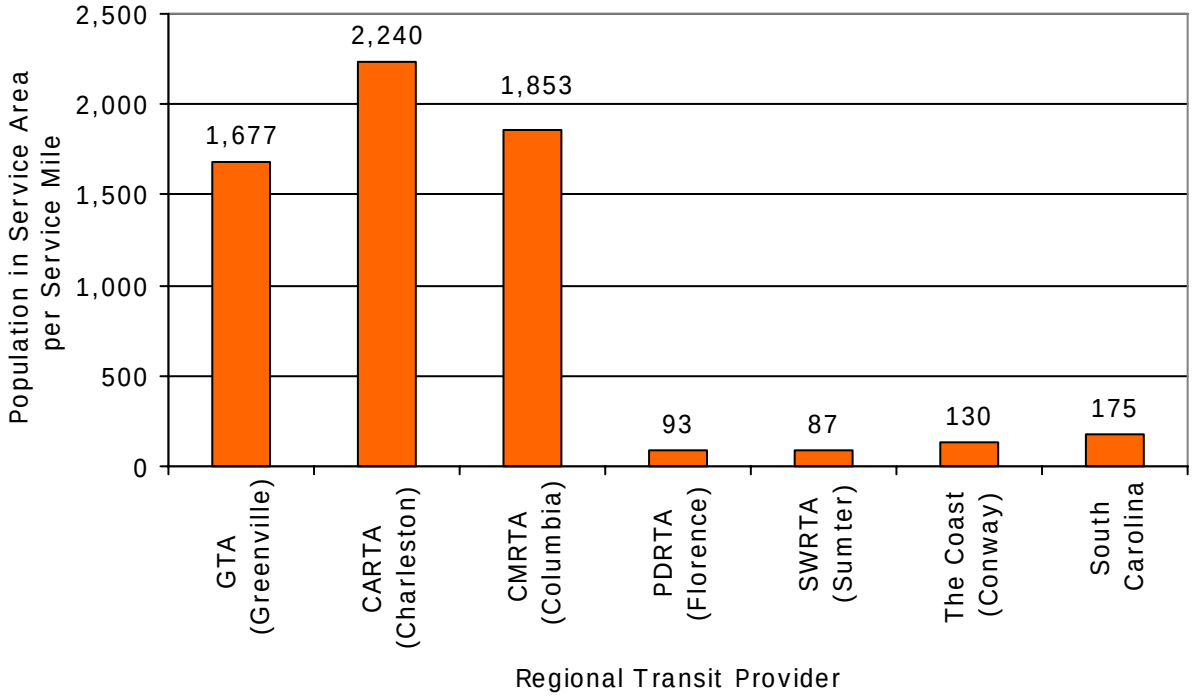
Table 3-2: Characteristics of South Carolina Regions

Council of Governments	Population	Land Area (miles^2)	People per mile^2
Appalachian	1,057,735	3,834	**276**
Berkeley Charleston Dorchester	575,297	2,591	**222**
Catawba	310,611	2,326	134
Central Midlands	603,992	2,773	**218**
Lowcountry	236,652	2,857	82
Lower Savannah	276,905	3,909	69
Pee Dee	330,699	3,533	94
Santee-Lynches	208,794	2,409	87
Upper Savannah	213,656	2,993	71
Waccamaw	320,865	2,882	111
South Carolina	**4,135,206**	**30,109**	**137**

Data source: American Community Survey 2005

The service density of each area is an important piece of data when comparing the different providers. The service density is the residential population within the area served by a given provider. Service density affects both major regional transit as well as the smaller providers, but it affects them differently.

For major regional transit providers, every person in a region's residential population will possibly ride. Major transit providers in the nation can commonly have service densities over 2,000 people per service mile, but only CARTA in Charleston meets this service density expectation. Some regional authorities in South Carolina, such as Pee Dee Regional Transportation Authority and Santee-Wateree Regional Transportation Authority, have as low as 100 people per service mile (Figure 3-4). Service provision for these providers is difficult because transportation needs and demands exist in areas where public transit cannot operate efficiently.



Data sources: National Transit Database 2004

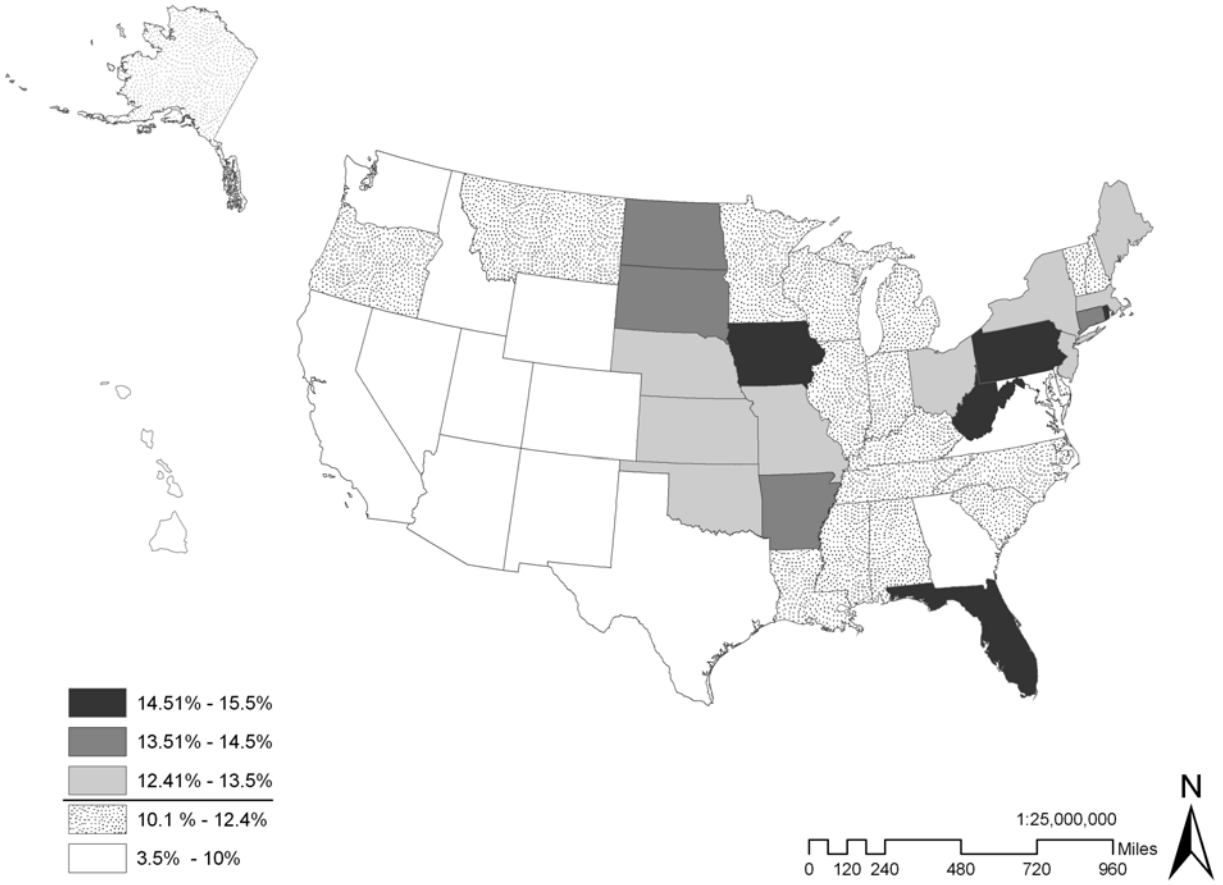
Figure 3-4: Regional transit providers in South Carolina serve areas with vastly different population densities.

Many small providers target service for people with special needs (e.g. the elderly, the poor, children, the disabled, and so forth), not the general public. Small special-needs providers even in areas of relatively high population density might have significantly lower service densities than the least dense regional providers because special needs consumers of transportation service comprise only a small fraction of the total population. Service densities ultimately affect the operating cost per passenger mile.

Large the areas with low service density increase the inefficiency of both fixed route services and demand response routes.

3.1.2 Seniors in Relation to the Total Population

South Carolina does not currently have an abnormally large population of elderly residents, but the demographic is expected to grow in the state. The percentage of people over the age of 65 in the United States in Census year 2000 was 12.4 percent. Figure 3-5 shows the percentage of residents over age 65 by state. States with percentages significantly below the national average are Nevada, Utah, and Colorado. States with percentages significantly above the national average are Rhode Island, Pennsylvania, and Florida. South Carolina had 10.1 percent people over age 65 in 2000.

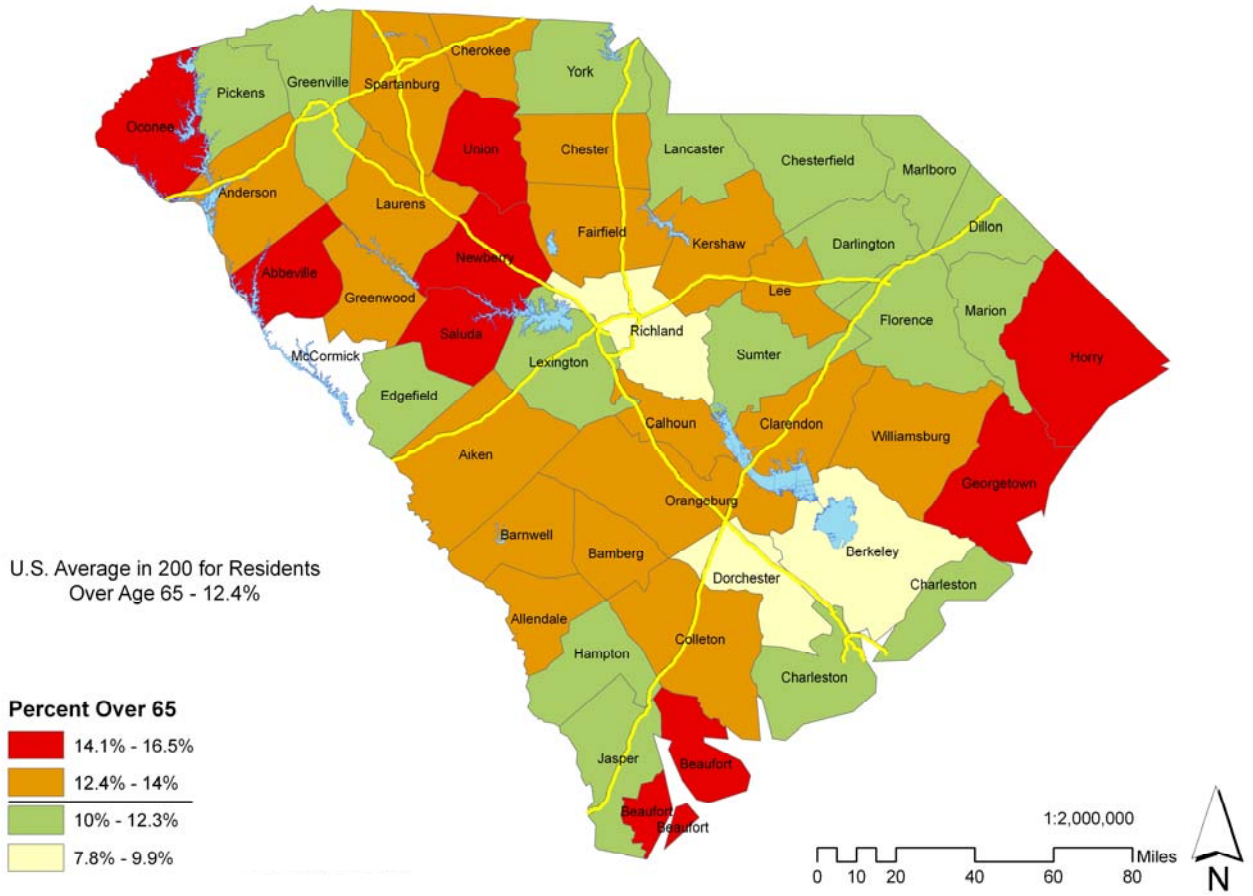


Data source: Census 2000

Figure 3-5: South Carolina has a proportionate number of residents over age 65 compared to the rest of the United States.

Figure 3-6 shows a general trend in South Carolina toward the higher concentrations of people over age 65 living in counties with lakes or along the Atlantic coastline. The map presents South Carolina by county with the

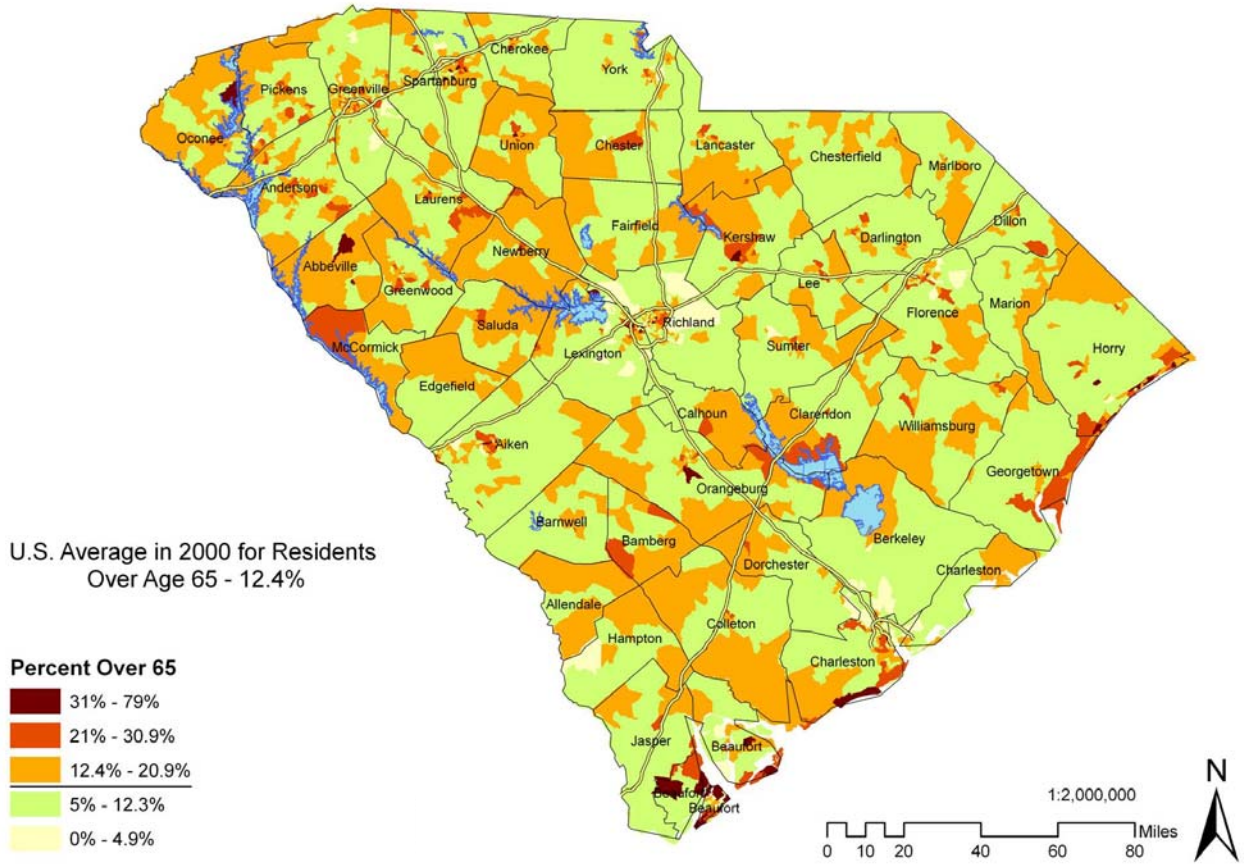
percentage of the people over age 65 in 2000. Union County is the one exception to this trend. Abbeville, Beaufort, Georgetown, Horry, Oconee, McCormick, and Newberry are all counties that have 14.5 percent to 16.5 percent of their residents over age 65 and have lakes or are along the Atlantic coast.



Data source: Census 2000 counties

Figure 3-6: Many South Carolina counties surpass the national average proportion of residents over age 65.

Closer examination of South Carolina in Figure 3-7 affirms the trend of older residents often locating near lakes or the Atlantic Coast. Census block groups provide this more detailed presentation of where people over age 65 are living in each county. At this level Berkeley County is demonstrated to have a percentage point higher concentration above the national average in residents over age 65 living near the lake.



Data source: Census 2000 block groups

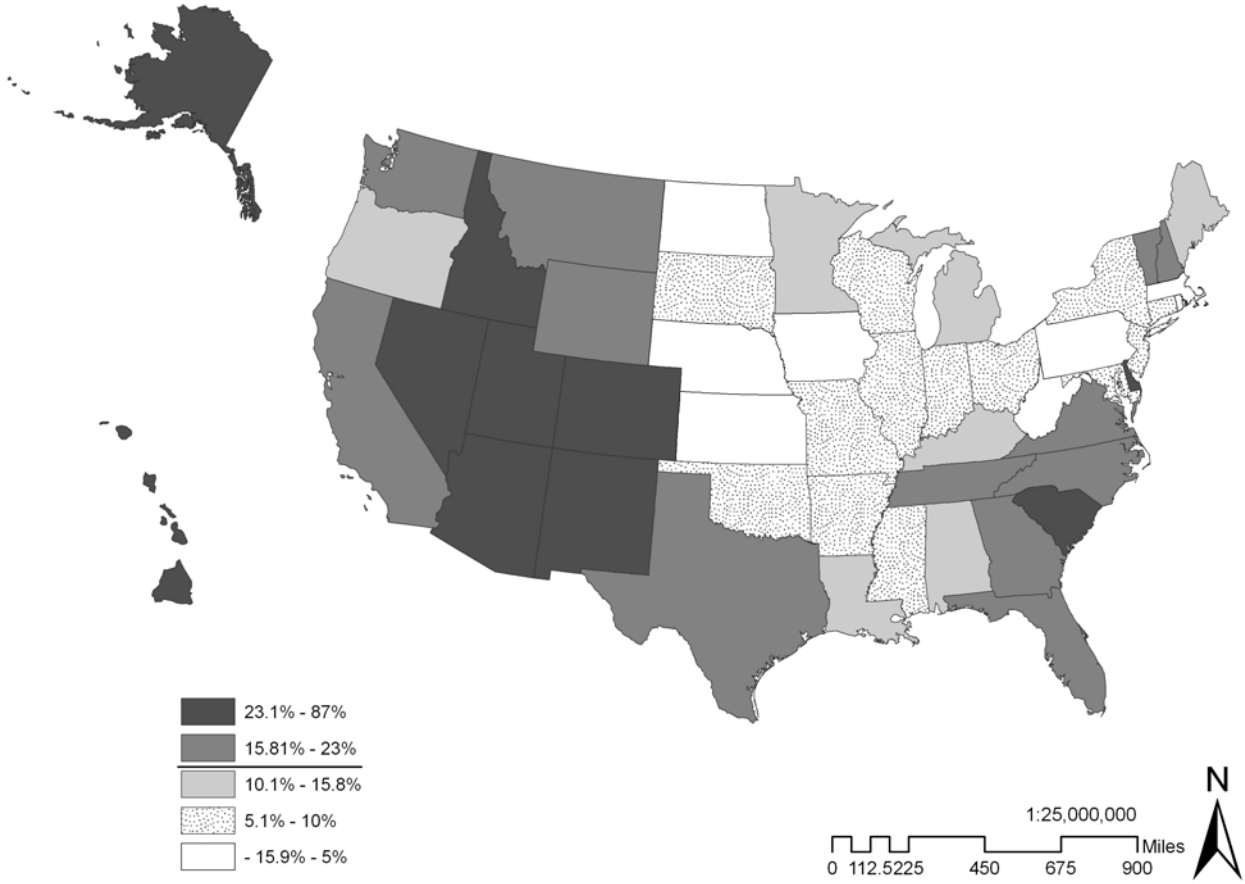
Figure 3-7: Block-group data reveal settlement patterns of residents over age 65 in South Carolina living along the shores.

Figure 3-7 demonstrates that there are many areas within South Carolina that have significant populations of older residents that are not identified in the county-level map. For example, Dorchester County appears to have a small percentage of its population above age 65 in Figure 3-6; however, Figure 3-7 shows that a portion of the county is comprised of between 12.4 and 20.9 percent people over 65, and one Census block group in Dorchester County has between 21 to 30.9 percent of its population over age 65. Other counties that are shown at the county level to have percentages of people over 65 below 12.4 percent, but have many Census block groups above national averages are Charleston, Edgefield, Florence, Greenville, Lancaster, Lexington, Marion, Marlboro, and Pickens.

High-density areas can facilitate economies of scale in the provision of public transit, making the cost to the provider lower per person served. The existing and emerging low-density elderly settlement pattern will increase the challenge of providing transit to residents as they age and seek the medical care that is often located in higher density areas. The analysis of

Census block groups has shown that most of the areas that have concentrations of older residents above 12.4 percent are located away from areas of high population density. Concentrations of elderly in rural areas could result from attractiveness of rural areas for the elderly, unattractiveness of rural areas for the young seeking jobs and other opportunities, or both.

Population estimates from the American Community Survey for July 2004 were used to examine more current trends in county population changes. These estimates were only available at a county level, so a more-detailed presentation of block groups was not possible.



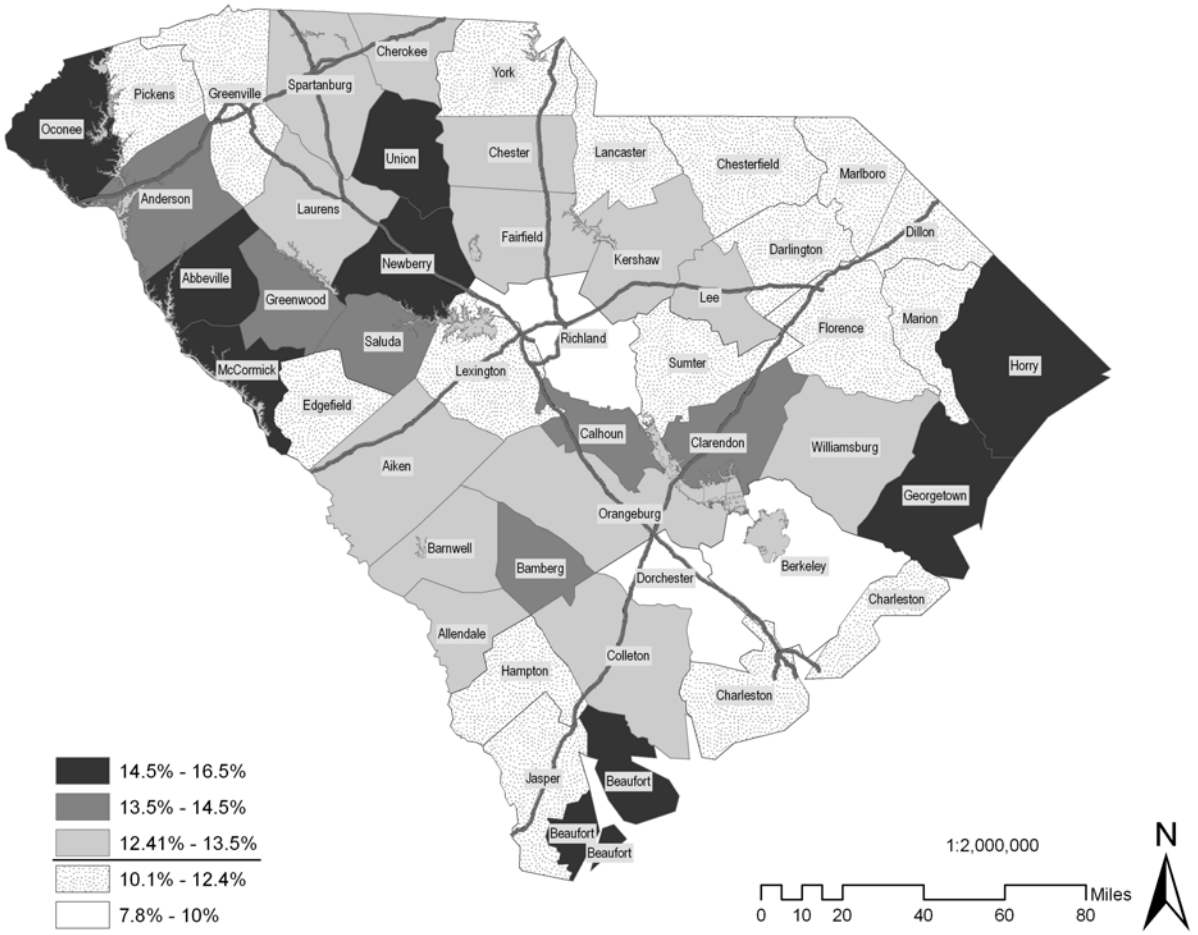
Data sources: Census 1990 and American Community Survey 2004

Figure 3-8: Changes in elderly populations in the United States.

Examining the rate of change from 1990 to 2004 in the population over age 65 showed areas of the United States that have experienced dramatic changes (Figure 3-8). The average percentage change for the nation was 15.8 percent. Many states are understood to serve as attractors of retiring adults. Figure 3-8 confirmed some of those known states, as well as other

states that have not been commonly identified as states with significant increases in their older populations. South Carolina ranked ninth in the nation for percent of change in residents over age 65 with 23.7 percent.

Comparing Figure 3-5 to Figure 3-8 shows that many states that had the lowest percentage of change in older adults were the states that already had populations in 2000 that were above the national average, such as North and South Dakotas, Iowa, Pennsylvania, and West Virginia. Many states in the West that previously had below-average percentages of people over 65 were shown as areas with a high percentage of change in people over 65. Nevada and Arizona had less than 10 percent people over 65 in 2000, but between 1990 and 2004 grew between 50 and 105 percent. South Carolina transitioned to a state with a percentage of people over 65 above the national average with its 31-percent rate of change. It was the only state east of the Mississippi River in the highest rate-of-change category.

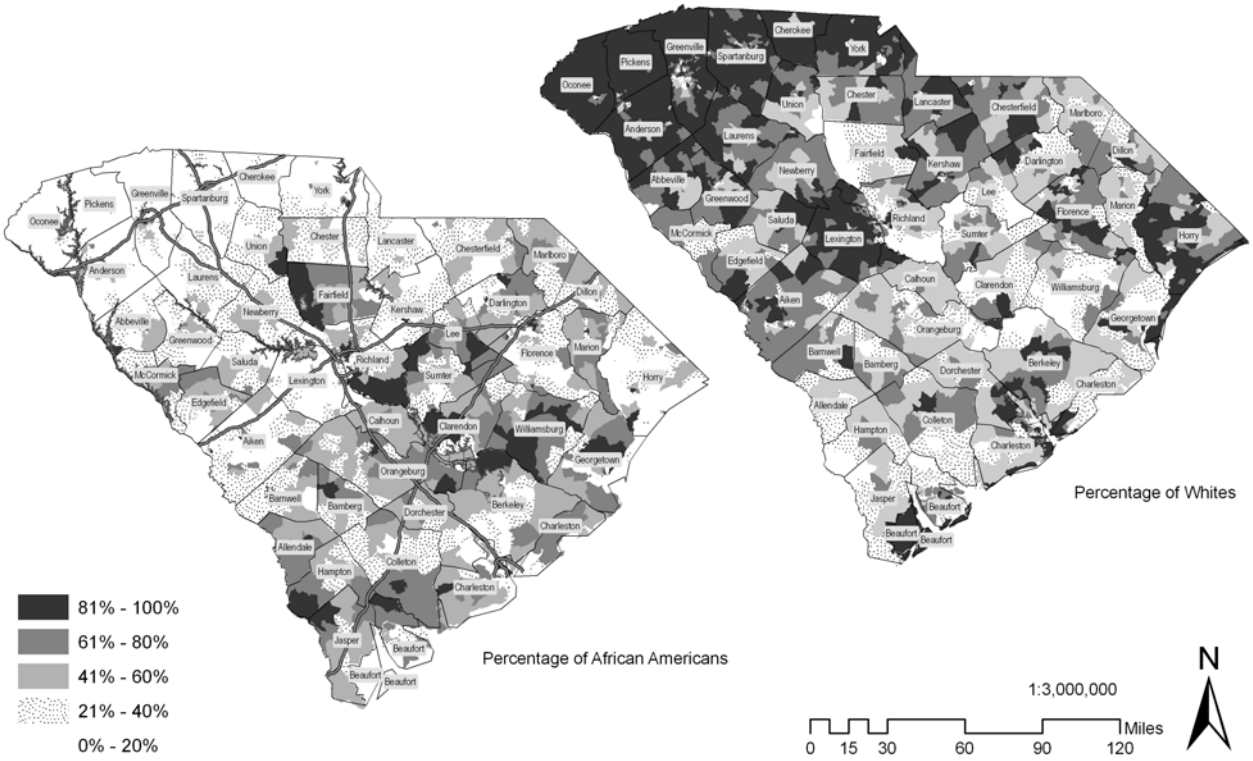


Data sources: Census 1990 and American Community Survey 2004

Figure 3-9: Changes in South Carolina elderly populations from 1990 to 2004.

Figure 3-9 presents the percent change of people over 65 by county in South Carolina from 1990 to 2004. The 2004 population estimates indicated that the population over age 65 in South Carolina increased to 13.2 percent from 10.1 percent in 2000. Two counties in South Carolina were estimated to have dropped from the highest concentrations over age 65 to the second-highest percentage category, namely Abbeville and Newberry. Lancaster and Marion Counties increased from below to above the national average. The map shows that some counties in the state (Allendale, Chester, and Marlboro) have experienced declining populations of older residents. Allendale and Chester counties declined by more than seven percent while Marlboro County declined by less than one percent. Beaufort County more than doubled its older population over the fifteen-year period with a growth rate of 112 percent. Berkeley and Horry counties' populations of people over 65 grew at above 80 percent. Although Berkeley County experienced significant growth, it remained below the national and state averages for residents over age 65; in 1990 the county had 5.79 percent residents over age 65, in 2004 the percentage increased to 9 percent.

3.1.3 Race and Ethnicity in South Carolina



Data source: Census 2000 block groups

Figure 3-10: African-American and white residents have tended to cluster in regions in South Carolina.

3.1.3.1 African Americans

The American South is known to have a high percentage of people of African-American descent. South Carolina is not an exception: the national percentage of African Americans living in the United States during Census year 2000 was 12.3 percent, while South Carolina had 29.5 percent. Figure 3-10 shows that within the state there has been a strong tendency for African Americans to reside in the central or coastal counties. Richland County in the center of the state and Williamsburg County (near the coastal county of Georgetown) both had several Census block groups that comprised of more than 90 percent people of African American descent in 2000.

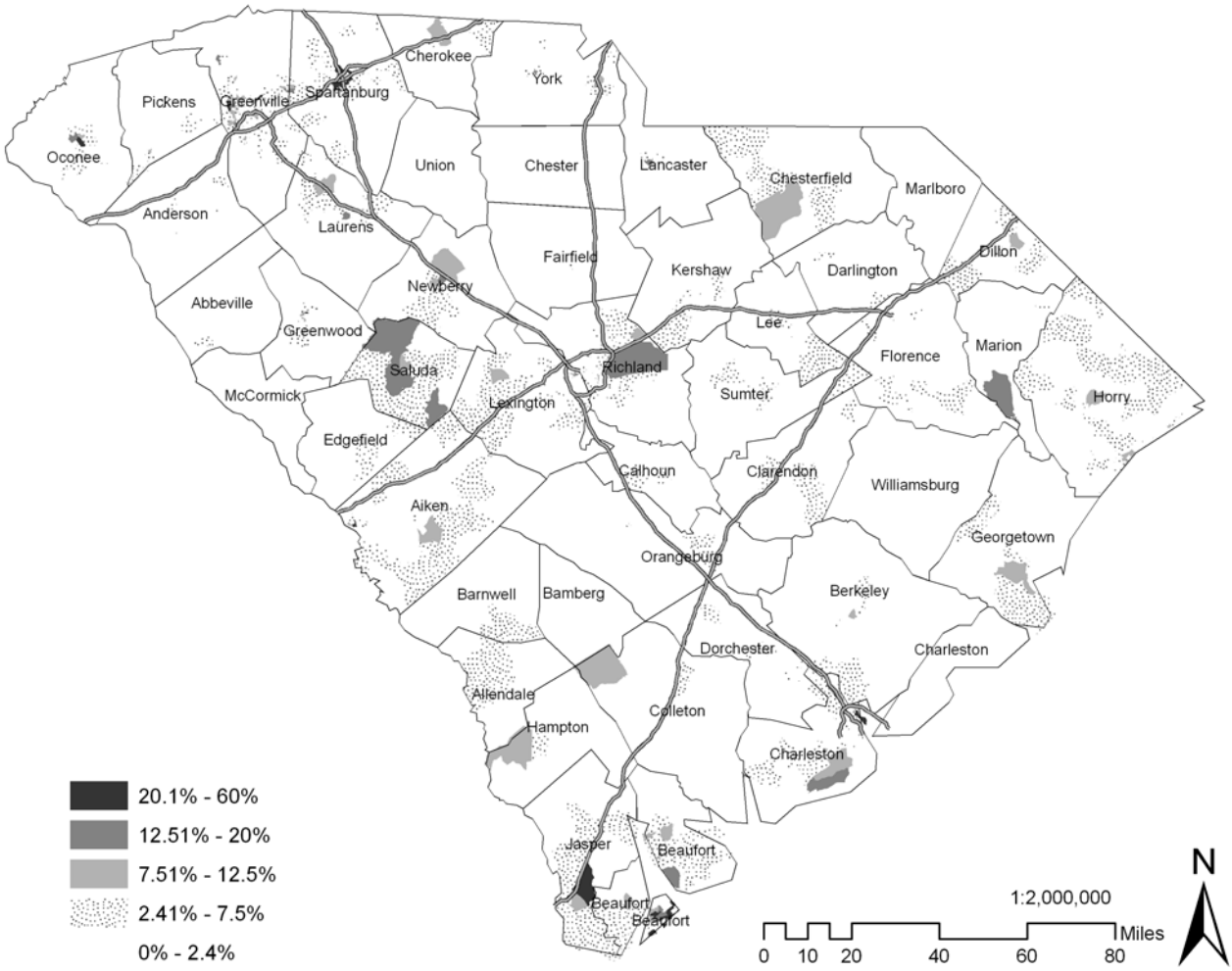
3.1.3.2 Whites

Figure 3-10 further shows that counties in the South Carolina's Upstate have generally had high percentages of whites. Anderson, Greenville, Oconee, Pickens, and Spartanburg were largely comprised of Census blocks that contain more than 90 percent whites in 2000; however, Anderson, Greenville, and Spartanburg Counties did all have a few Census block groups with 40 percent or more African American population. Oconee and Pickens had two or fewer Census block groups with at least 40 percent African American residents.

The residential settlement patterns for whites in South Carolina were almost the inverse of that of African Americans in 2000. The Upstate was generally comprised of Census block groups over 80-percent white. Figure 3-10 shows the concentrations of whites declining in the center of the state toward the coast, but increasing again in the Census block groups directly along the Atlantic Coast. The national percentage of whites for 2000 was 75.1 percent; South Carolina had 67.2 percent. South Carolina had 153 Census block groups with concentrations of 97 percent or higher of white residents; all were located in Upstate counties. Greenville, Oconee and Pickens all had these 97-percent-white Census block groups in the northern portion of their counties, bordering North Carolina and the Appalachian Mountains.

3.1.3.3 Hispanics

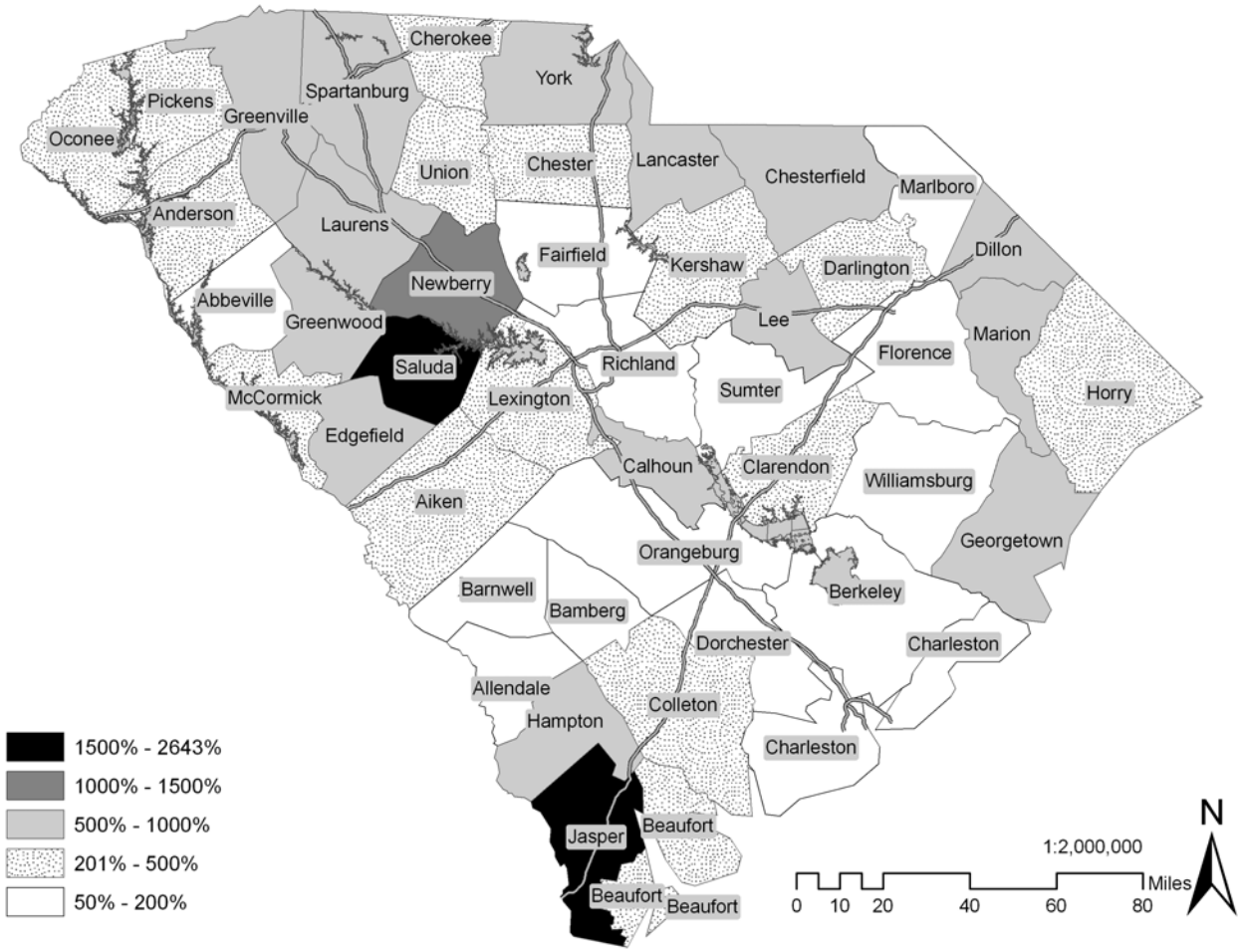
The Hispanic population of the United States has been rapidly growing, though a strong Hispanic presence has not yet been strongly evidenced in South Carolina. In 2000, 2.4 percent of South Carolina was Hispanic, compared to a national population of 12.5 percent. Figure 3-11 shows the location of Hispanic residents in South Carolina. This map demonstrates that the Hispanic population is dispersed throughout the state. Concentrations of over 20 percent Hispanic residents in 2000 were located in the Upstate, the Midlands, and along the Coast. Two Census block groups located in Beaufort County had over 50 percent Hispanic residents.



Data source: Census 2000 block groups

Figure 3-11: South Carolina percentage of Hispanic residents.

The state of South Carolina has only recently begun to establish a sizable Hispanic population. Figure 3-12 shows the percentage change in the Hispanic population by county for the years 1990 to 2004. This map indicates that South Carolina has experienced recent increases in its Hispanic population in many counties. The overall Hispanic population grew to 3.1 percent in the state in 2004, a percentage change of 37 percent from 1990. The counties with the greatest percentage change of Hispanics were Jasper, which grew by 2,634 percent to a total of 8.9 percent of the county population, and Saluda, which grew 2,403 percent to 11.4 percent of the total population.

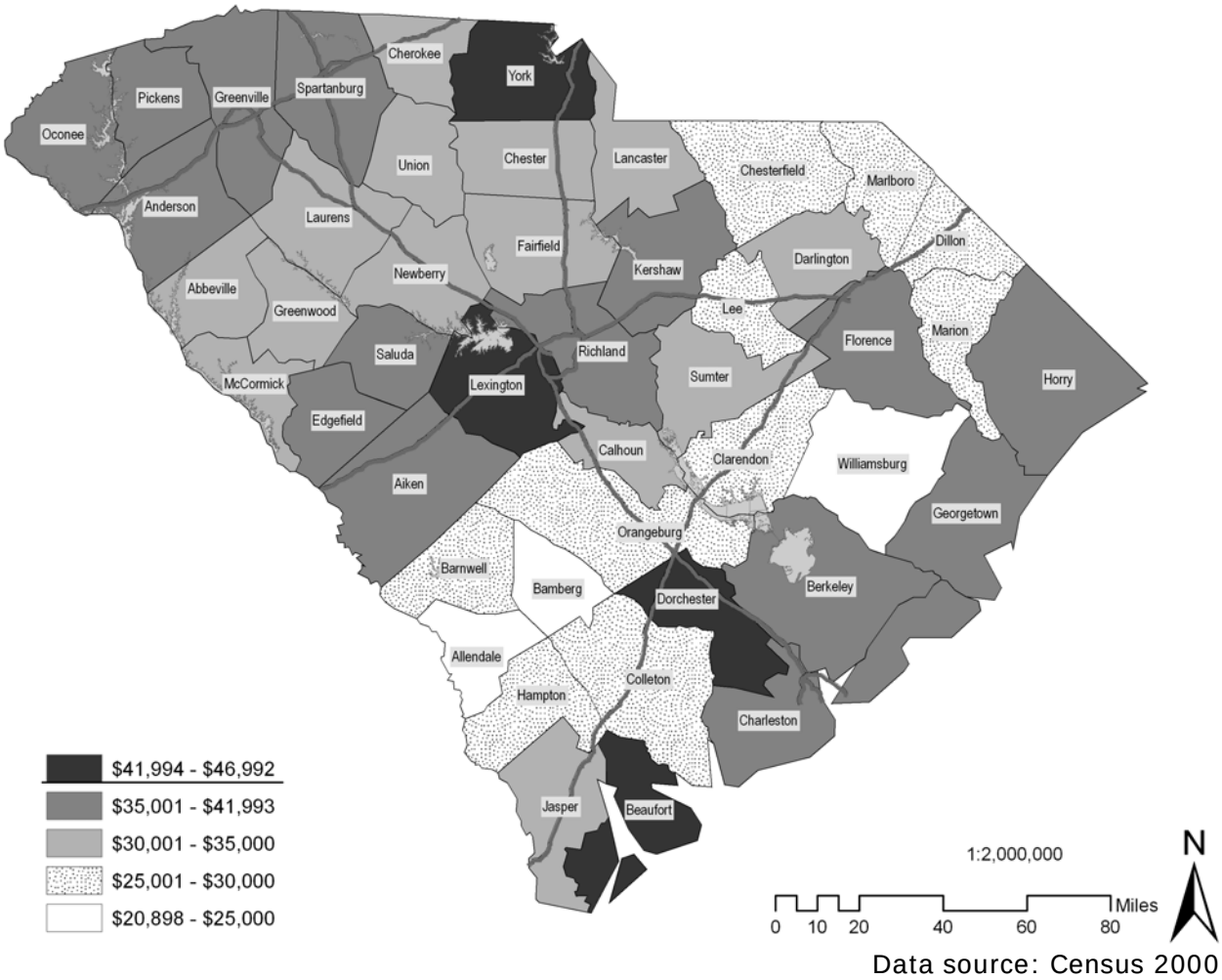


Data sources: Census 1990 and American Community Survey 2004

Figure 3-12: South Carolina percent change Hispanic population by county - 1990 to 2004.

3.1.4 South Carolina Income and Poverty

As a rule South Carolina residents have had lower incomes that the rest of the nation. According to Census 2000, the estimated national median household income was $41,994; in South Carolina the estimate was $37,082. Beaufort, Dorchester, Lexington, and York Counties were the only counties in the state at or above the national median household income level (Figure 3-13). Beaufort County had the highest county median household income in the state at $46,992. Allendale, Bamberg, and Williamsburg counties had the lowest median household income levels, all below $25,000.



Data source: Census 2000

Figure 3-13: South Carolina median household income by county.

3.1.4.1 Income for Older Residents

Household income levels for senior citizens in South Carolina were different than for the population as a whole. In all counties except Beaufort and McCormick, the Census-reported median household income was less for residents over age 65 to 74 than the state average median household income for all ages. Beaufort County residents aged 65 to 74 had a household income level of $54,805, compared to $46,992 for all ages. The income levels of residents over age 74 in Beaufort dropped to $39,844, which was still above the average household income for all ages statewide.

In McCormick County the residents aged 65 to 74 had household incomes of $32,539 compared to $31,577 for all ages. The income levels of people over age 74 in McCormick County ($15,288) were dramatically lower than the 65-to-74 age group and the county average for all ages. The Savannah Lakes

Village in McCormick County is a retirement community located on Lake Thurmond that has attracted wealthy in-migrating residents (*17*). These new residents likely contributed to the higher income levels for senior residents age 65 to 74. The low household income levels for people over age 74 likely represented longtime county residents who had aged in place and located in the more rural areas.

The national median household income for people aged 65 to 74 in 2000 was $31,368; statewide in South Carolina, it was $28,293. Eight counties in the state were above the national median household income for the nation, besides Beaufort and McCormick. They were Charleston, Dorchester, Georgetown, Horry, Richland, and York. The national median household income for people over age 75 in 2000 was $22,259, and statewide in South Carolina, it was $19,525. Four counties in the state had residents over age 75 with household incomes higher than the national average: Beaufort, Charleston, Horry, and Richland.

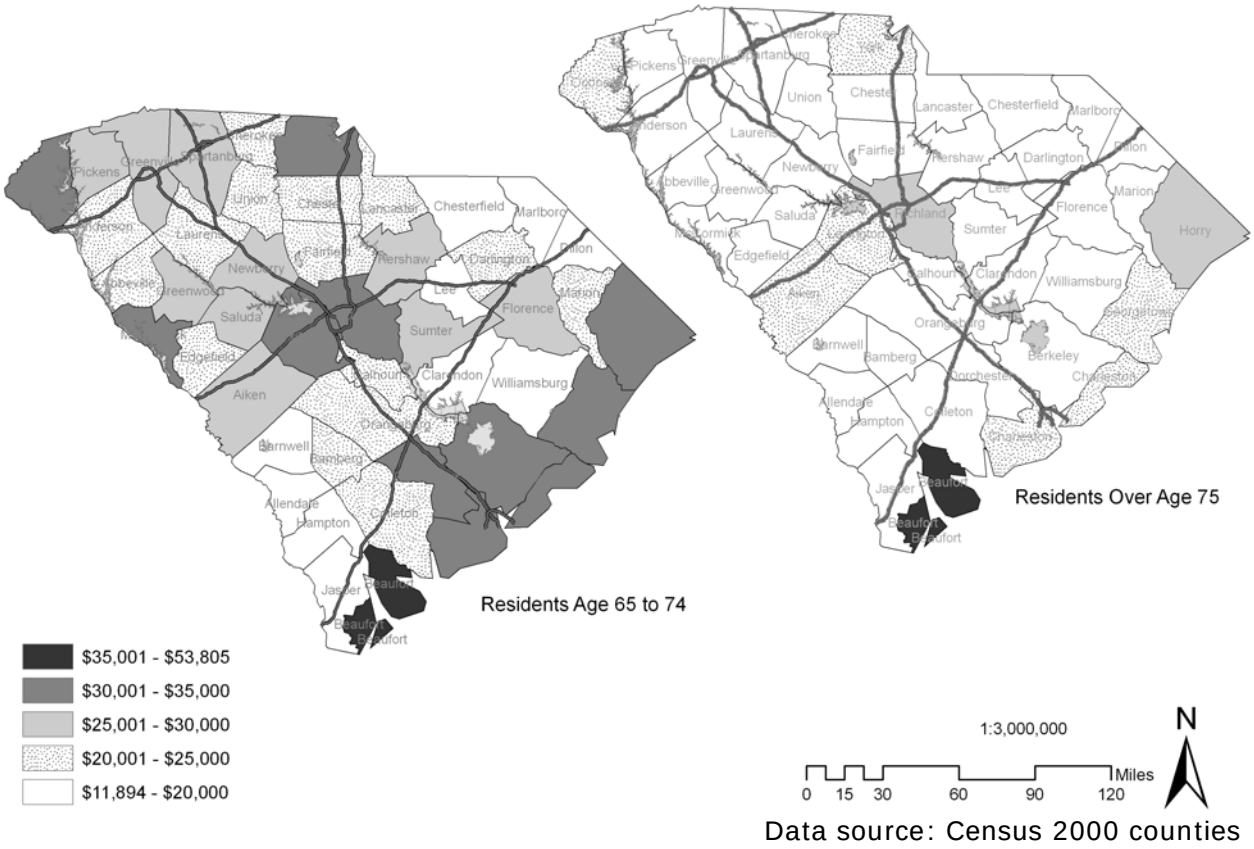


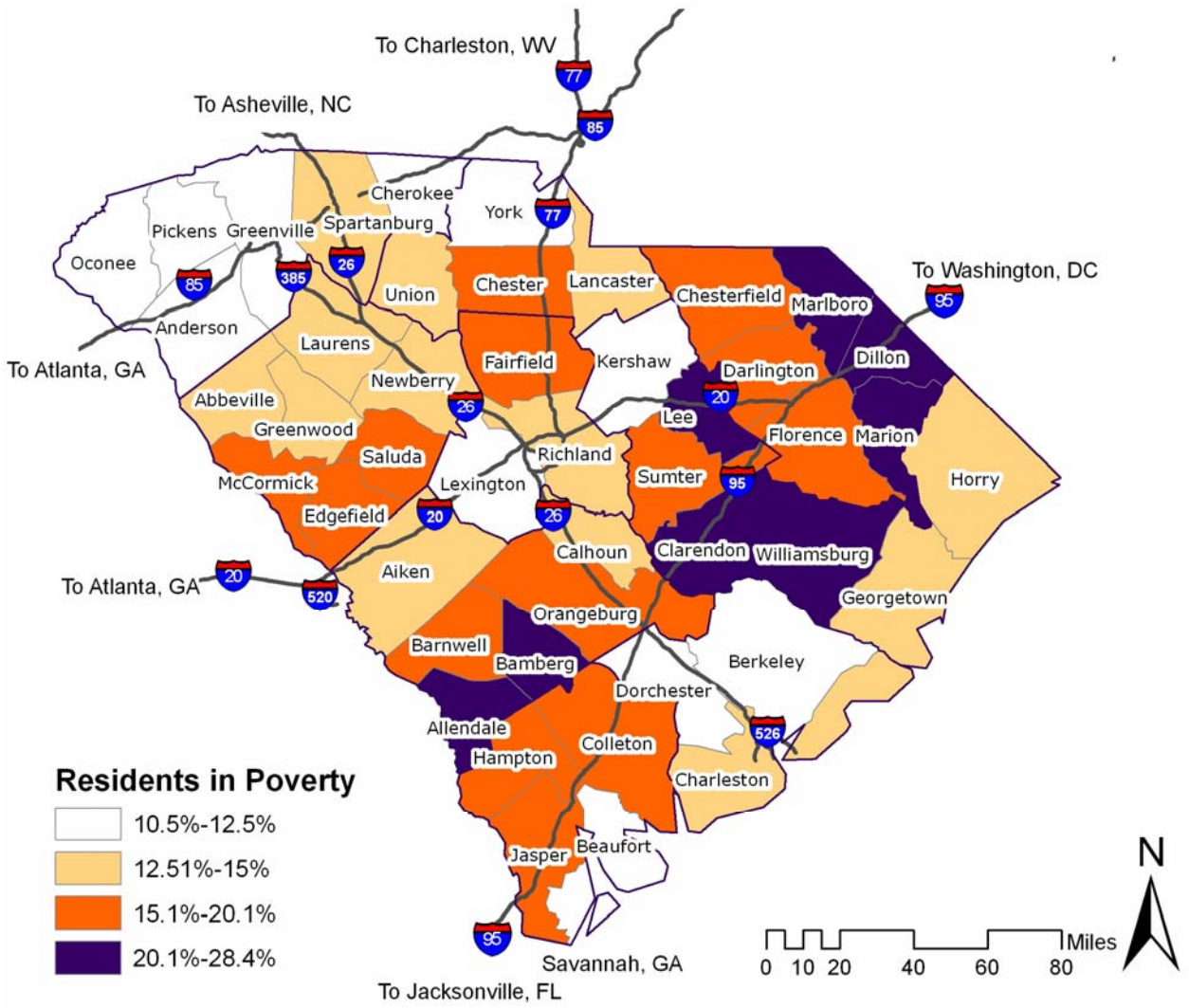
Figure 3-14: Household incomes in South Carolina have substantially dropped as seniors have aged.

The disparity demonstrated in Figure 3-14 for residents over age 74 is noteworthy. Most counties in South Carolina have a much lower median household income for people over age 74 than the overall median household income for the county. In fact, the statewide median household income of $19,525 for residents over 74 is 48 percent lower than the statewide median household income of $33,597 for all ages. Beaufort County had the highest income levels in the state for residents over age 74: $39,844. Saluda County had the greatest disparity between the average household income for all ages and the household income for people over age 74: 64 percent less. Allendale and Dillon Counties' residents over age 74 had household incomes below $12,000, nearly half the national average for the same age group. In all but ten counties the income levels for people over 74 is below $20,000. Overall, the most aged of South Carolina's citizens have less money than their peers across the nation and their younger neighbors within the state.

3.1.4.2 Poverty

In 2003, the Census Bureau estimated that 12.5 percent of the nation's residents were living at the poverty level. The poverty thresholds for 2003 were set by the Census Bureau at $18,810 for a family of four, $14,680 for a family of three, $12,015 for two people and $9,393 for unrelated individuals. The estimated percentage of the total population in South Carolina for 2003 was 13.8 percent, relatively close to (though above) the national average.

Figure 3-15 shows the estimates for the percentage of residents of all ages living in poverty for each county in the state in 2003. The counties with the highest poverty rates were Allendale at 28.1 percent and Williamsburg at 22.9 percent. Lexington County had the lowest poverty rate in South Carolina at 10.5 percent. Anderson, Beaufort, Berkeley, Dorchester, Greenville, Kershaw, Lexington, Oconee, Pickens, and York were the only counties in the state with the same percentages or lower than the national average of their populations living in poverty.



Data sources: American Community Survey 2004

Figure 3-15: Most South Carolina counties had a larger percentage of residents in poverty than the 2003 national average of 12.5 percent.

3.1.4.3 Elderly in Poverty by Race

Figure 3-16 shows that South Carolina had significant disparity in the standard of living for African Americans over 65 compared to whites over age 65, as reported in Census 2000 (the most recent data available regarding the age and race of people living in poverty). Disparity also existed among older white residents and their younger white counterparts.

The left side of Figure 3-16 shows that several counties had poverty rates above 17.5 percent among their older white populations (Bamberg, Chesterfield, Dillon, Marlboro, and Williamsburg). Williamsburg County had the state's highest percentage of whites living in poverty at 31.4 percent.

Seventeen counties had below ten percent poverty rates among older whites, and Beaufort County had the lowest poverty rate for older whites in the state at 3.5 percent.

The right side of Figure 3-16 demonstrates the dramatic difference in poverty rates that older African Americans have faced througout South Carolina. All counties in the state had at least 23 percent of their African Americans above age 65 reporting living in poverty. Only one county, Williamsburg, had older white residents reaching that threshhold of 23 percent or more of that population living in poverty. Nineteen counties in the state had at least one in three older African Americans living in poverty. Lee County had the highest percentage of African Americans over age 65 living in poverty, with 44.6 percent. This disparity between the poverty rates of African Americans and whites is not exclusive to the state of South Carolina. The national percentage for African Americans over age 65 living in poverty in 2000 was 30.7 percent compared to 8.9 percent for whites.

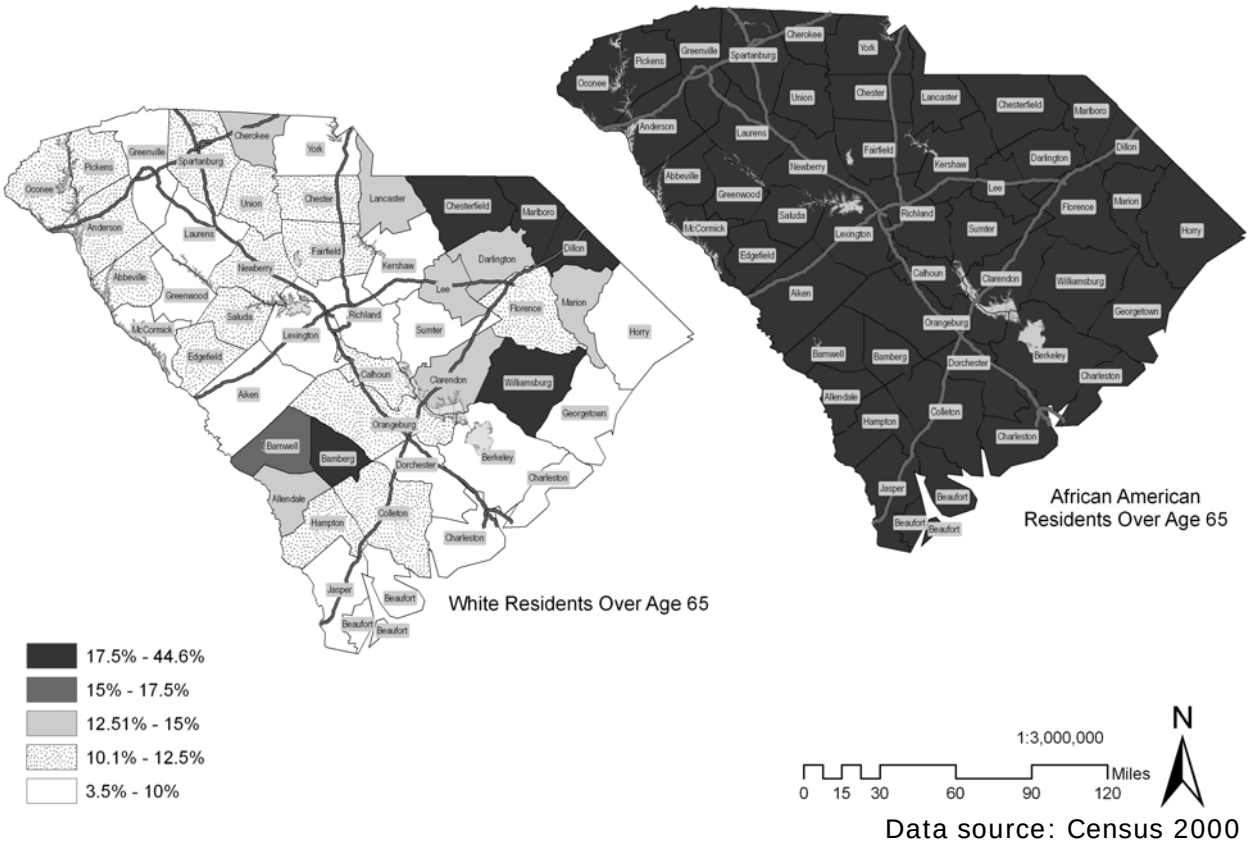
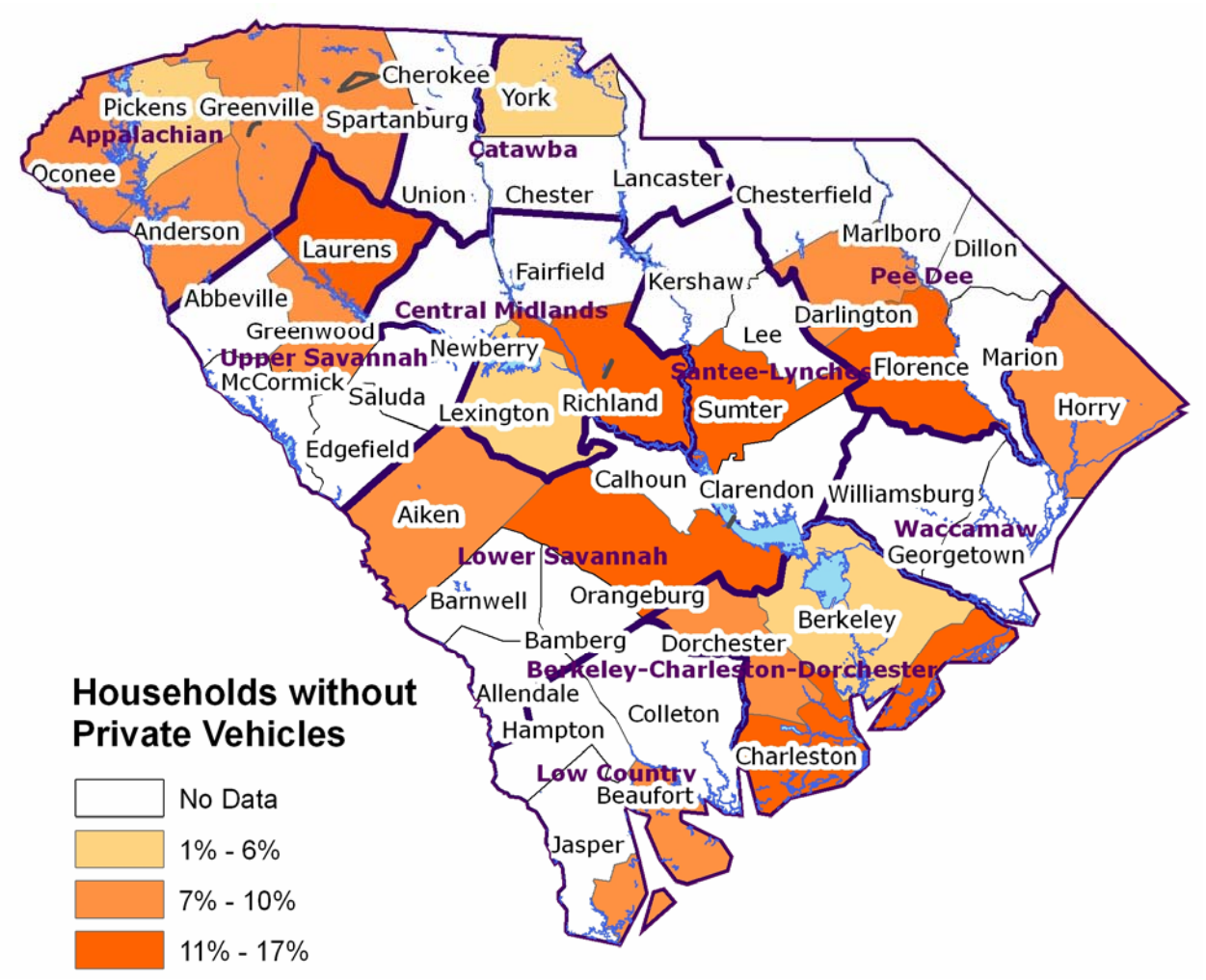


Figure 3-16: Whereas South Carolina has pockets of elderly whites living in poverty, the state's elderly African Americans face poverty in every county in the state.

3.1.5 Automobile Ownership

While the demographics discussed thus far have strong implications on the equitable distribution of public resources for transportation, this section specifically addresses the transportation-oriented population characteristic of automobile ownership. The American Community Survey has reported household automobile ownership data for some counties, including the 20 largest counties in South Carolina (Figure 3-17).



Data source: American Community Survey 2005

Figure 3-17: South Carolina counties span a range in the percentage of households without any private automobiles.

Data from South Carolina showed correlation between housing tenure and automobile ownership, as indicated by the percentages in Table 3-3. Owner-occupied households showed a strong positive correlation with automobile ownership and the ownership of multiple vehicles. Only three percent of homeowners in South Carolina reported not owning vehicles compare to the

sixteen percent of the state's renter-occupied households who did not own a vehicle. In addition, 70 percent of owners owned two or more vehicles while only 36 percent of renters owned two or more vehicles. Unlike the homeowners, renter-occupied households showed negative correlation with automobile ownership and the number of vehicles owned, meaning that counties with larger rental populations had residents who were likely to own fewer vehicles.

Table 3-3: Propensities of Home Owners & Renters to Have Vehicles

	Owners	Renters	State Total
No vehicle available	3%	16%	7%
1 vehicle available	27%	48%	33%
2 vehicles available	44%	29%	40%
3 or more vehicles available	26%	7%	20%
Overall State Distribution *(not a sum of the above numbers)*	70%	30%	100%

Data source: American Community Survey 2005

The correlation between renter-occupied housing and the lack of automobile ownership supports that areas with a high percentage of renters depend on transit and transportation services. This renter dependency on transit can be applied statewide, including counties excluded from the American Community Survey for 2005.

One anomaly in the relationship between renter occupancy and private vehicle ownership should be noted: counties with large state universities have student renters who have access to a private vehicle. These concentrations of people in temporary living situations distort the relationship between renter-occupied households and vehicle ownership in a few counties because students form a unique demographic with apparently-low incomes but relatively-high vehicle ownership. Transit might still be highly-relevant in these counties because while students might have private automobiles, they also frequently seek transit options to minimize their transportation costs. Universities also frequently attract foreign students who tend to use transit rather than buy vehicles in this country.

3.2 Fleets and Operations within the Regions

This discussion of fleets and operations differentiates between small providers of transportation services and larger regional transit authorities.

Data on the small operators came primarily from responses to Clemson University's 2006 survey of transit stakeholders. These operators were mostly small localized transportation providers that frequently provided other services such as health care. For this reason the transportation aspect

of their operations were not their only concerns… and perhaps not their primary concerns. In addition the survey respondents provided mostly demand response and did not have fixed routes.

Data on regional transportation providers came from 2004 reporting to the National Transit Database. The Federal Transit Administration maintains this latter database of all agencies receiving funding through the Urbanized Area Formula Program (§ 5307) and Nonurbanized Area Formula Program (§ 5311), which amounts to 650 transit agencies across the nation. The agencies are required by statute to report data annually in order to qualify for the funding programs.

3.2.1 Small Operators

In the survey, small operators reported that transportation capital and operating costs received only a portion of total agency resources, yet the operation and capital cost for operating service was significant for small localities to absorb. The different roles and nature of the small multi-function providers made them behave differently than regional transit authorities.

3.2.1.1 Fleets

The vast majority of responding operators (85 percent) reported owning fewer than 60 vehicles, and 50 percent had fewer than 15 vehicles. Roughly one quarter of responding small carriers with budgets under $60,000 had only six or fewer small vehicles.

Small operators reported heavy reliance on fleets of small vehicles such as cars and vans. Vehicles that could carry fewer than fifteen passengers made up 67 percent of small provider vehicle fleets. The majority of these small vehicles (79 percent) were not equipped to comply with the Americans with Disabilities Act. Larger vehicles defined as buses with capacity to carry fifteen passengers or more made up a much smaller percentage of total vehicles, and buses over 24 passengers only made up 10 percent of the respondents' fleets. The small size of vehicles in these respondents' fleets substantially differs from large regional transportation providers that might consider a fifteen-passenger bus to be a small vehicle.

Small vehicles can be either more or less efficient depending on application. These vehicles cost less to buy and operate per vehicle mile for small demand response trips; however, they might contribute to a high cost per passenger mile because of the inability to serve large numbers of passengers simultaneously.

Although many private taxi and transportation providers were invited to participate in the survey, few responded. These operators frequently have a

small number of vehicles. The small sample of respondents reported operations with a range of fleet sizes from 36 to a single vehicle. Experience with contacting these operators for this research also showed that the industry experiences rapid turnover of operators.

3.2.1.2 Operating Costs

The operating costs for the survey respondents varied significantly depending on the types of service they offered and the types of agencies they represented. While no specific type of agency appeared to receive more funding than another, the regional transportation providers that responded to the survey had a relatively large operating budget. Survey respondents indicated a wide range of operating costs from $12,000 to $6.7 million dollars. Half of the respondents (50 percent) operated with less than $110,000 in annual operating costs.

Regional provider operating costs did not strongly associate with low or high costs per passenger mile, but survey data on small operators showed a slight correlation (+0.25) between increased total operating costs and increased costs per passenger mile. The survey results suggested that small providers could not take advantage of the economy of scale related to moving many passengers on few vehicles. Half of the respondents with high operating costs per passenger mile had total operating costs over $1 million. Conversely, much of the other half of providers with high operating costs per passenger mile had total operating costs below $100,000 dollars. Many small providers did not serve dense service populations, so increasing their services would increase travel distances without substantially increasing the populations served.

3.2.2 Regional Transportation Providers

This study addresses the ten regional transportation authorities and agencies identified in Table 3-4. The data in discussed in this section come from the 2004 National Transit Database of the Federal Transit Administration. As indicated in the table, not all of the state's regional transportation providers reported to the database. Federal data reporting requirements depend on agency size and resources received; therefore, not all of South Carolina's major providers would have been required to report. Federal data on major providers are used as a comparison with the typically smaller operators that responded to Clemson's survey. The multiple data sources help describe differences between small- and large-scale providers.

Table 3-4: South Carolina Regional Transportation Providers

Provider	Full Name	Primary City	2004 Data Reported
BCDRTMA	Berkeley-Charleston-Dorchester Regional Transportation Management Association	Charleston outlying areas	✓
CARTA	Charleston Area Regional Transportation Authority	Charleston	✓
CMRTA	Central Midlands Regional Transit Authority	Columbia	✓
GTA	Greenville Transit Authority	Greenville	✓
LRTA	Palmetto Breeze (formerly Lowcountry Regional Transportation Authority)	Hilton Head	
LSRTMA	Lower Savannah Regional Transportation Management Agency	Aiken	
PDRTA	Pee Dee Regional Transportation Authority	Florence	✓
SWRTA	Santee Wateree Regional Transit Authority	Sumter	✓
SPARTA	Spartanburg Area Regional Transit Agency	Spartanburg	✓
The Coast (fka LYMO)	Waccamaw Regional Transportation Authority	Myrtle Beach	✓

3.2.2.1 Fleets

Regional transportation providers owned and operated substantially larger fleets than the average survey respondents. The majority of the small providers had fleets of 15 vehicles or fewer while all major providers' fleets (except for Greenville Transit Authority) numbered above 50. Regional authorities were larger than most survey respondents and operated on a more consistent basis. The regional providers also used types of vehicles unique to their operations, i.e. larger vehicles to serve mass transit needs. The major providers did not provide enough feedback on the survey to support analysis or conclusions relative to the possibilities of vehicle coordination.

3.2.2.2 Operating Costs

The operating costs of the major providers varied from region to region, but their total operating costs were significantly higher than almost all of the small providers. Larger total operating costs could be expected based on the large operations, and service demand of regional transit authorities, as well

as the broad base of clientele rather than targeted groups with specific foreseeable characteristics. For instance, regional providers might need wheelchair accessibility for most vehicles in their fleets, whereas boards for disabilities and special needs might allocate such equipment only to physically disabled clients and use less-expensive equipment for mentally-challenged clients capable of riding in standard vehicles.

As a substantial advantage, major regional transportation providers serve areas with relatively high population densities and relatively large available resources directed solely towards transportation. Major provider operations particularly distinguish themselves from small operations based on the opportunity to exploit operational economy of scale. Major providers can extend their service areas in some locations and immediately attract ridership to support the service, thus keeping operating cost per passenger mile low. Smaller providers would add mileage faster than they could add passengers. While the Coast, SWRTA and PDRTA have covered large service areas, the other major providers have covered relatively smaller areas with denser populations and gained the advantage of the scaled economy.

3.3 Analysis of Data from Individual Regions

In many ways, providers shared characteristics regardless of the regions where they operated, such as high operating costs per passenger mile, large numbers of non-ADA equipped vehicles, and special populations served. These characteristics depend more on types of service and size of provider than on location.

Location within the state does affect transit provision in other ways. The types of services provided by the respondents, densities of service areas, and demand for particular services can depend on population and regional resources. Table 3-5 provides some data for regional comparison based on the U.S. Census and Clemson's survey. The following discussions of individual regions provide greater detail on specific attributes affecting or manifesting from each region.

Table 3-5: Regional Operating Costs and Environments

	Appalachian	Berkeley-Charleston-Dorchester	Catawba	Central Midlands	Lowcountry	Lower Savannah	Pee Dee	Santee-Lynches	Upper Savannah	Waccamaw
Population density (people per square mile)	276	222	134	218	69	82	94	87	71	111
Land area (square miles)	3,834	2,591	2,326	2,773	3,408	3,360	3,533	2,409	2,993	2,882
Operating cost (dollars per passenger mile)	$5.35	$0.39-$2.82	$0.71-$3.16	$0.52	$2.21	❈	$2.94	$0.50	❈	❈

Note that these reported data should be used for general guidance; however, survey participation did not provide sufficient sample size for statistical significance. Average operating costs disguise the inherent cost differences between fixed-route and demand-response service.

❈ Unreported data.

Data sources: American Community Survey 2005 and Clemson survey of South Carolina transit stakeholders (2006)

3.3.1 Appalachian

The Appalachian Council of Governments is the both the most densely populated and the largest land area of any council-of-governments area in South Carolina. In addition to being the biggest, it also has the highest cost per passenger mile out of any region ($5.35). Population density would normally reduce costs per passenger mile because the increased number of people in an area means multiple people can ride in a single vehicle. Despite this natural advantage, survey responses from the Appalachian region indicated the benefits of higher density competed with the disadvantages of a large land area.

It should be noted that survey data for the Appalachian Council of Governments were somewhat skewed. Most of the survey respondents who reported their passenger miles and operating costs were based in the more rural and lower-density areas of the Appalachian region.

The combination of a greater population with a larger land area has caused significantly higher costs due to higher vehicle miles with little gain in

passengers. The Appalachian Council of Governments has larger fleets than the other regions with half of the respondents citing fleets over twenty vehicles. Most of the vehicles (79 percent) were cars, mini-vans and vans which do not comply with Jacob's Law (discussed in section 4.4.4). In addition, 66 percent of total vehicles in the Appalachian Council of Governments did not comply with the Americans with Disabilities Act.

3.3.2 Berkeley-Charleston-Dorchester

Berkeley-Charleston-Dorchester is the second-densest council-of-governments area, but like the Appalachian Council of Governments, this jurisdiction has significant differences between rural and urban providers within the region. The reported sizes of fleets in Berkeley-Charleston-Dorchester varied greatly. More than half of the transportation providers had over twenty vehicles, but the rest had only four to seven vehicles. In addition, operating budgets ranged from $68 thousand to $6.7 million.

Providers with smaller budgets also operated vehicles with smaller maximum occupancy loads. Berkeley-Charleston-Dorchester respondents reported less dependency on passenger cars, mini vans and full size vans than the Appalachian region. The Berkeley-Charleston-Dorchester transit providers had a greater percentage (85 percent) of fifteen-passenger and larger buses.

Respondents did not include enough information to compare the difference in operating costs per passenger mile between small vehicles and buses. Using data from the 2004 National Transit Database, Charleston Area Regional Transportation Authority (CARTA) had operating costs per passenger mile at $0.39 for fixed route bus transit and $2.82 for demand response. Considering that CARTA also has had the highest density of population in it's service area, the transit providers outside the urbanized areas of Berkeley-Charleston-Dorchester have likely incurred significantly higher costs per passenger mile because of smaller service populations and increased distance between origins and destinations. A situation like the Appalachian region with operating costs per passenger mile likely provides a reasonable estimate of operating costs for small providers.

3.3.3 Catawba

Catawba provided few survey respondents, which resulted in general inconclusiveness for the region. Agencies that did respond were smaller transit providers with fleets of 25 total vehicles or fewer. Catawba, while having the smallest land area, has had population density closest to the South Carolina average; therefore, costs per passenger mile would have been useful to compare to other regions of South Carolina. With the low response rate for this region, little quantitative analysis of the small

providers can be offered, though their contributions are significant. The appendix includes qualitative discussion of these contributions.

Because the Charlotte Area Transit System (CATS) has operated in Catawba, this region has had unique transit conditions. Much of the transit activity has served the Charlotte metropolitan area as a regional economic engine; however, compared to Berkeley-Charleston-Dorchester and CARTA, CATS has incurred a higher cost per passenger mile with fixed-route bussing costing $0.71 and $3.16 for demand response. The higher costs could have resulted from higher spending, lower efficiency, or a larger service area across the entire Charlotte-Mecklenberg region. North Carolina tax structures and costs of living would also affect the numbers. Notably, the Atlantic Ocean bounds Charleston, which curbs sprawl in one direction, whereas Charlotte has no natural barriers to encourage population density.

3.3.4 Central Midlands

Central Midlands providers reported small fleets fundamentally made up mostly of cars and vans. None of the respondents' fleets were larger than sixteen vehicles. The larger passenger vehicles were fifteen-passenger buses compliant with the Americans with Disabilities Act, though most transportation service vans in the Central Midlands did not comply. The reported cost per passenger mile was lower than other regions with the mean cost per operating per mile of $0.52.

A few respondents reported that they do not own or operate any vehicles The Richland/Lexington Disabilities and Special Needs Board and Sumter County Department of Social Services responded that they had no vehicles and used public and contracted transportation services, which indicates a propensity to coordinate.

3.3.5 Lowcountry

The Lowcountry fleets varied from either small fleets of four or six vehicles to fleets of 16 vehicles or as high as 52 vehicles. Veolia Transportation, a contract provider in the region and for CARTA, operated 52 vehicles, all of which were vans with no buses or cars. Veolia Transportation maintained a low operating cost with its standardized fleet, through the contractor's provisions likely supported this type of operation. Lowcountry Regional Transportation Authority (now Palmetto Breeze), which reported a diversified fleet of vans and buses, had an operating cost per passenger mile of $2.21.

3.3.6 Lower Savannah

The Lower Savannah transportation providers had a mix of fleet sizes ranging mostly between 14 and 33 vehicles, but some fleets were as small as 3 and as large as 69. The providers depended on cars and vans, a large

percentage of which (59 percent) did not comply with the Americans with Disabilities Act.

The region also had smaller budgets compared to the other regions, which also equated to fewer passenger miles. Respondents of the survey did not provide sufficient information to attain operating cost per passenger mile, but the lower density of the region suggests a higher operating cost per passenger mile.

3.3.7 Pee Dee

The Pee Dee region declared a high number of vehicles incompliant with the Americans with Disabilities Act, substantial use of cars for transportation service provision, a mix of small and large fleets among providers, and a high operating cost per passenger mile. The fleets ranged in size of less than 16 to over 50. The operating cost per vehicle mile, which was only reported for providers operating between eleven and sixteen in their fleets, came in over $2.94 dollars per passenger mile. The major provider in the Pee Dee region, the Pee Dee Regional Transportation Authority also pays a high cost per passenger mile for its bus service at $2.14, which was lower than the smaller regional providers, but still higher than many other major providers. Low population density in the region would push this cost upward.

Pee Dee respondents cited 75 percent of their fleets were incompliant with ADA. This high percentage is comprised by a large proportion of vans and 30-passenger buses. The incompliant vehicles were reported from multiple providers with a wide range of fleet sizes.

3.3.8 Santee Lynches

Survey respondents from Santee Lynches had a lower cost per passenger mile than other regions: averaging just over $0.50 per passenger mile, but this figure only represents two respondents. The region had a significantly higher number of vehicles unequipped to handle wheelchairs, totaling about 80 percent of the vehicles reported in the survey. In addition to the high number of non-ADA equipped vehicles, the survey respondents heavily depended on cars and vans for their transit services. Fleet sizes ranged mostly between 9 and 15, but a few providers operated with fleets over 40 vehicles; one provider had 111 vehicles. The Santee Wateree Regional Transportation Authority (SWRTA) covered a particularly large service area.

3.3.9 Upper Savannah

The Upper Savannah region lacked sufficient survey response to define or summarize a particular pattern for the region based on the survey responses; however, the region would likely follow neighboring regions' costs and demand needs. Upper Savannah would likely have high vehicle

mileage with few passengers per trip. This pattern would likely cause a high operating cost per passenger mile. The low density of the Upper Savannah region complements the likelihood of higher costs per passenger miles.

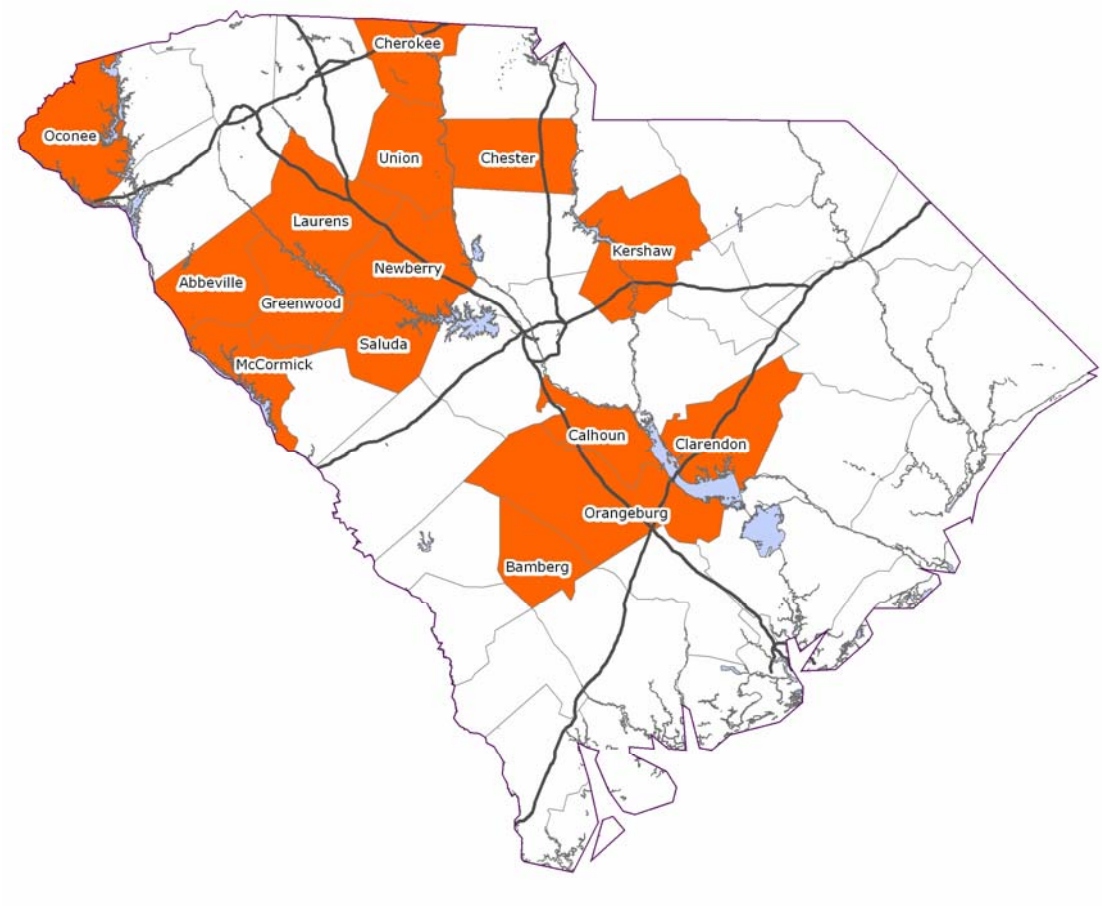
3.3.10 Waccamaw

As in a few other regions, survey respondents for Waccamaw depended on cars and vans with few vehicles complying with the Americans with Disabilities Act. Most of the fleets were large in number (about 18 to 30 vehicles), though at least one provider had fewer than three vehicles.

While sufficient data supported analysis of fleet sizes and compositions, survey respondents did not provide information on costs, vehicle mileage, and costs per passenger mile. Like Upper Savannah, the Waccamaw region would likely have a high cost per passenger mile based on the low density of the region. Waccamaw has a larger population than the Upper Savannah region, but the density is not significantly larger and the development is not concentrated like other metropolitan areas of South Carolina.

3.3.11 Counties in South Carolina without Public Transportation

Fifteen counties in South Carolina (Figure 3-18) were not served by public transit authorities, as reported in the 2002 multimodal plan for South Carolina. They were Abbeville, Bamberg, Calhoun, Chester, Cherokee, Clarendon, Greenwood, Kershaw, Laurens, McCormick, Newberry, Oconee, Orangeburg, Saluda, and Union. These counties had 618,527 residents in 2000 (15.4 percent of the total state population). As Table 3-6 shows, these fifteen counties together comprised of a population in 2000 that was 63.3 percent white, 35.6 percent African American, and 2.0 percent Hispanic. The statewide average for these same population groups in the year 2000 was: 67.2 percent white, 29.5 percent black, and 2.4 percent Hispanic. The percentage of the population in these counties that was over age 65 in 2000 was 13.8 percent, compared to the statewide average of 10.1 percent. The percentage of the population in these fifteen counties living in poverty was slightly higher than the overall state population 15.5 percent, compared to 15.3 percent statewide. The median family income in these counties was approximately $4,500 less than the state average: $32,537 compared to $37,082 statewide.



Data source: South Carolina's *Multimodal Transportation Plan through 2022*

Figure 3-18: As of 2002, several South Carolina Counties had no public transit services.

Table 3-6: Summary Statistics for Counties without Public Transit

	15 Counties without Transit	State
Total Population	618,527	4,012,012
African Americans	34.56%	29.5%
Whites	63.29%	67.2%
Hispanics	2.02%	2.4%
Over 65	13.82%	10.1%
Average in Poverty	15.54%	15.3%
Average African Americans 65+ in Poverty	30.49%	31.9%
Average Whites 65+ in Poverty	11.45%	11.39%
Median Household Income	$32,537	$37,082
Median Household Income Age 65-74	$25,120	$28,293
Median Household Income Age 75+	$16,380	$19,525

Data source: Census 2000

The fifteen counties without public transportation had slightly fewer African Americans over age 65 living in poverty than the state average. The percentage of whites over 65 (11.45 percent) living in poverty was nearly the same as the state average (11.39 percent). The household incomes for ages 65 to 74 in these counties were lower than the state average, $25,120 compared to $28,293, which represents 12.6 percent less income for this age group living in these fifteen counties. For residents over age 74 living in these fifteen counties, the median household income was $16,380, compared to a statewide income level in the same age group of $19,525. People over age 74living in South Carolina counties without public transit had 19.2 percent less median household income than residents with public mobility options.

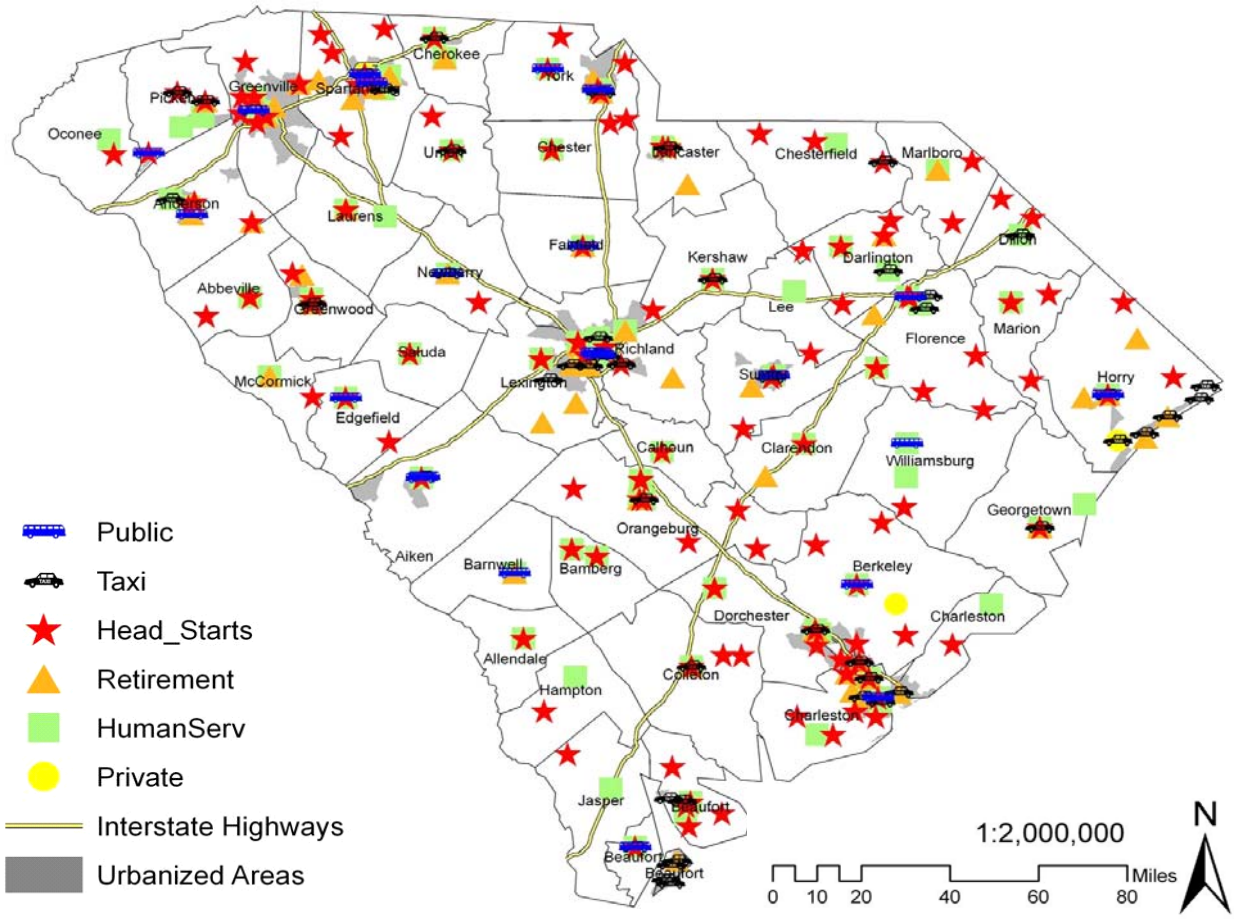


Figure 3-19: Transportation service options expand dramatically when accounting for health and human-service providers.

Public transportation has been appearing in some South Carolina counties previously devoid of service. Bamberg County began offering public transportation in March 2006 following the same model as the existing

neighboring Allendale County Scooter (*18*). Clemson Area Transit which has historically served Pickens and Anderson Counties began offering a route into Oconee County in 2006 (*19*).

Importantly, the geographic coverage of mobility options expands dramatically when considering the presence of non-traditional transportation service providers typically involved in coordination efforts (Figure 3-19). The appendix of this report includes the full inventory of transportation service providers identified in this Clemson University research project.

3.4 Regional Characteristics and Transit Operations

Providers must necessarily behave differently based on the environments where they perform. For instance, rural operators will travel longer distances than their urban counterparts, and urban operators might have more overlap of routes between operators. This section identifies the relationships between regional characteristics and transit operations, as indicated by the correlations in Table 3-7.

Table 3-7: Correlations of Operating Measures

	Population	Land area (miles^2)	Density	Operating expense per passenger mile (survey)	Operating expense per passenger mile (major)	Vehicles	Vehicle miles	Operating expense
Population	1.00							
Land area (miles^2)	0.38	1.00						
Density	0.94	0.08	1.00					
Operating cost per passenger mile (survey)	**0.72**	**0.76**	**0.47**	1.00				
Operating cost per passenger mile (major)	**-0.60**	**0.41**	**-0.82**	0.18	1.00			
Vehicles	0.08	-0.01	0.01	0.23	-0.08	1.00		
Vehicle miles	-0.34	0.22	-0.42	**-0.26**	**-0.64**	-0.29	1.00	
Operating cost (total)	**0.58**	0.19	**0.60**	**0.25**	**-0.68**	0.16	0.19	1.00

Data sources: Clemson survey of South Carolina transit stakeholders (2006), APTA *Public Transportation Fact Book* (2004), and American Community Survey (2005)

Population and total operating costs shared a positive correlation among the small operators (+0.58). As population increases, operating costs increase because of an increase of both demand and resources. Increased population does not make transportation more expensive, rather the opposite according to rules of scale economies, but higher population allows for greater resources. Smaller population areas with lower population density have more expensive costs per passenger mile, but they also receive less funding.

Increased operating cost per passenger mile for survey respondents (small operators) had a strong positive correlation with larger population regions (+0.72). For small providers, frequent long trips with small numbers of passengers result in high expense, particularly for target-market transportation providers serving just a fraction of the general population. Major transportation providers have a negative correlation between operating cost per passenger mile and regional population (-0.60) because passenger miles increase rapidly with fixed routes within dense population centers while costs remain relatively stable.

Population density negatively correlated with vehicle miles (-0.42), which means that vehicles traveled fewer miles as density increased. High densities allow larger populations to be served within a smaller service area. Likewise, low-density service areas increase vehicle miles because the service population is spread across a greater service area, requiring vehicles to travel longer distances to serve each passenger. Major regional providers can take advantage of an economy of scale with passengers in close proximity, while smaller providers must travel greater distances to serve their targeted populations.

Similar to population density, larger land service areas correlated with increased cost per passenger mile. Small providers that responded to the survey had a much stronger correlation (0.76) than the costs reported by major metropolitan transportation providers (0.41).

A particularly strong negative correlation (-0.82) emerged between population density and the operating costs per passenger mile for major transportation providers, meaning that operating costs were substantially lower per passenger mile in high-density environments. On the other hand, smaller operators responding to the Clemson survey positively correlated (0.47) between density and operating costs per passenger mile. Presumably, increased demand for service for small operators with target audiences has required more spending, but narrowly-targeted audiences did not allow great increases in vehicle occupancy.

Negative correlations appeared between vehicle miles and operating costs per passenger mile, indicating that costs per passenger mile decreased as vehicles covered more distance. The major transportation providers had a moderate negative correlation in this category (-0.64) because they could increase vehicle occupancy by expanding service areas, thus reducing costs per passenger mile even as vehicle mileage increased. Small operators did not experience as strong a negative correlation (-0.26), presumably due to low vehicle occupancy even as service areas expanded to increase populations served.

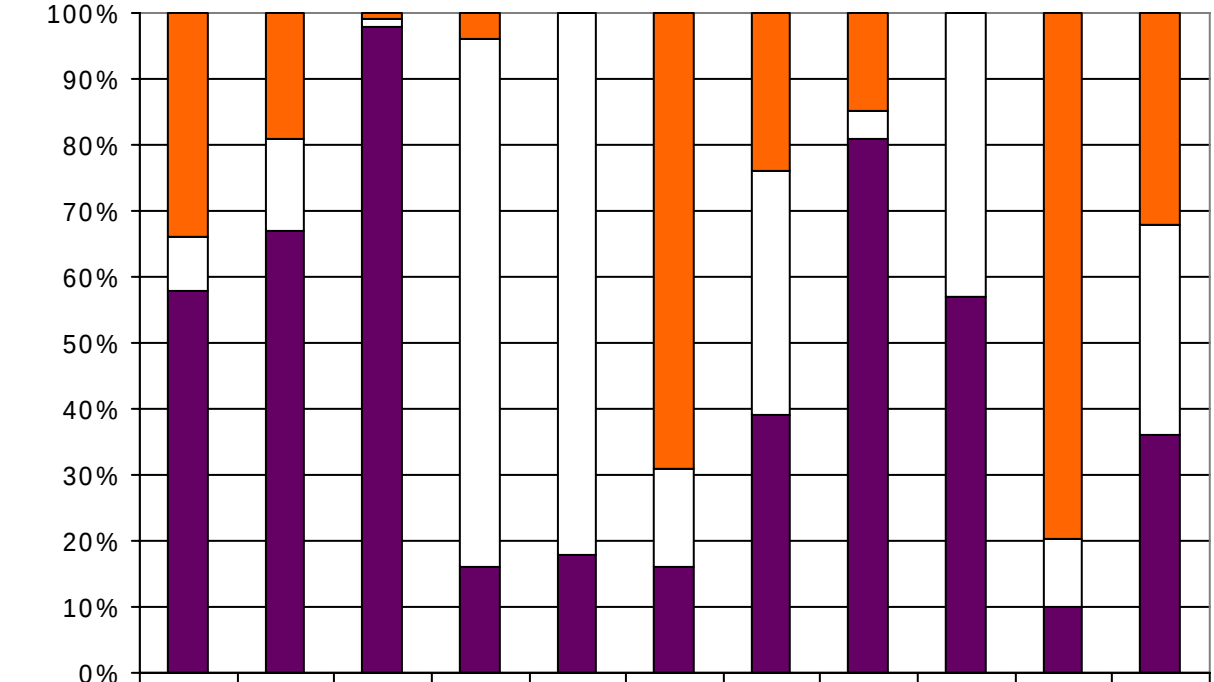
Total operating costs strongly negatively correlated with operating costs per passenger mile for major transportation providers (-0.68), meaning that as investment in transit service increased for major operators, every dollar provided a larger number of service miles to passengers. Major providers were taking advantage of high-density service areas, such that traveling heavily-populated routes allowed gathering increasing numbers of passengers in each vehicle… an important economy of scale.

Small providers had the opposite relationship between total operating costs and operating costs per passenger mile (a weak positive correlation of +0.25). Increases in money going to operations did not increase the number of people served in each vehicle overall; therefore, costs per passenger mile increased slightly. Increased passenger miles would increase operating costs because trips generally involved a small number of passengers covering greater distances. For most small providers investment to increase passenger miles actually caused an increase in the cost per passenger mile. It is important to note that small providers typically targeted specific public needs and purposes that did not directly relate to transportation, such as health care.

3.5 Funding

3.5.1 Regions and Funding

The various regions across South Carolina reported pursuing different mixes of funding sources (Figure 3-20). Highly-populated areas received more federal support while more rural areas with the exception of the Lower Savannah region sought more support from state and local funds as a percent of total funds. Overall, service providers were more likely to receive most of their funds from federal sources rather than state and local funding. Local funding was scarcest in the distribution and state funding provided the lowest total dollar amounts awarded.



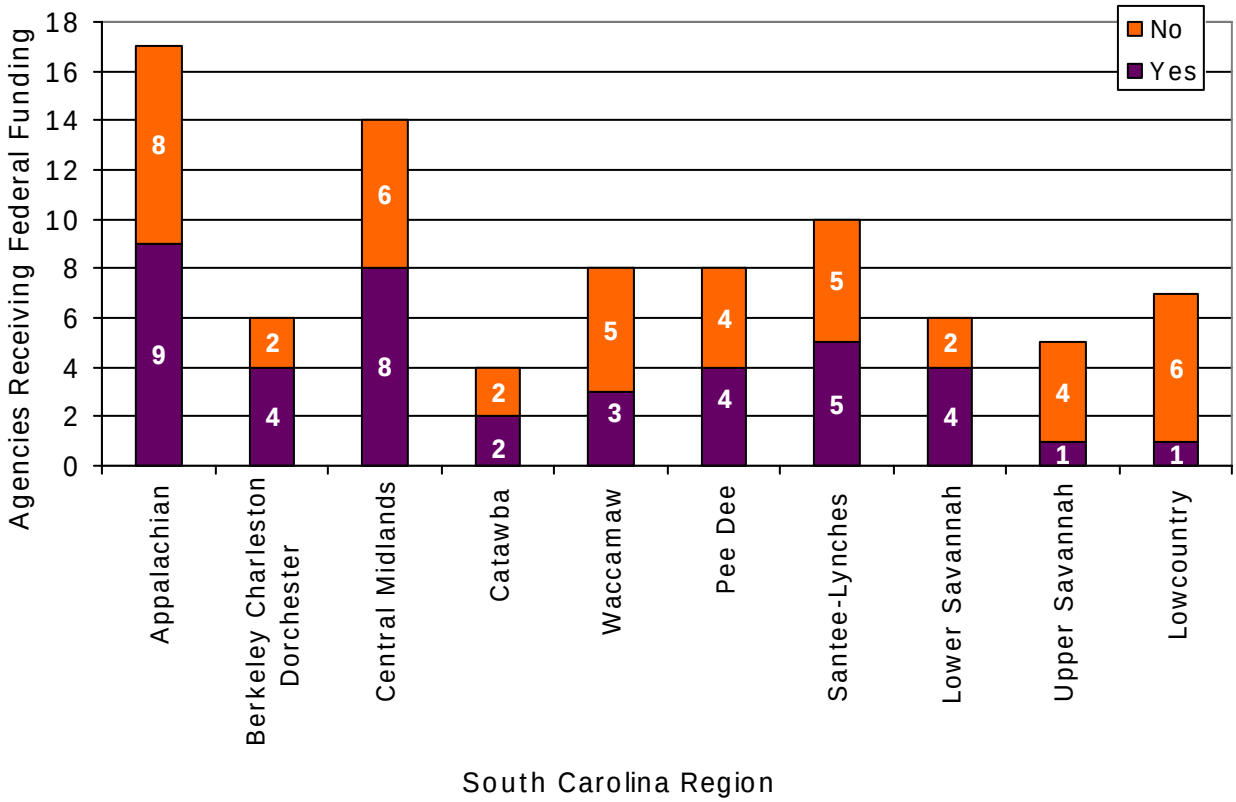
	Appal-achian	Berk Chaz Dorch	Cent Mid-lands	Cat-awba	Wacc amaw	Pee Dee	Sant-Lynch	Lower Sav-annah	Upper Sav-annah	Low coun-try	State Total
Local	34%	19%	1%	4%	0%	69%	24%	15%	0%	79%	32%
State	8%	14%	1%	80%	82%	15%	37%	4%	43%	10%	32%
Federal	58%	67%	98%	16%	18%	16%	39%	81%	57%	10%	36%

Regions are ordered from highest to lowest in regional population density.
Data source: Clemson survey of South Carolina transit stakeholders (2006)

Figure 3-20: Regions across the state used substantially different mixes of funding sources.

3.5.2 Federal Funding

Federal funds are typically distributed based on funding formulas related to population with large population areas receiving the most funding. The number of transit providers receiving any amount of federal funds is greatest in South Carolina's highly-populated areas (Figure 3-21). The most populated region, the Appalachian Council of Governments, did not receive the largest portion of federal funding, but it did receive three times more than the average low-population area. The high number of federal recipients is associated at least in part by a high number of providers within the more populated areas.

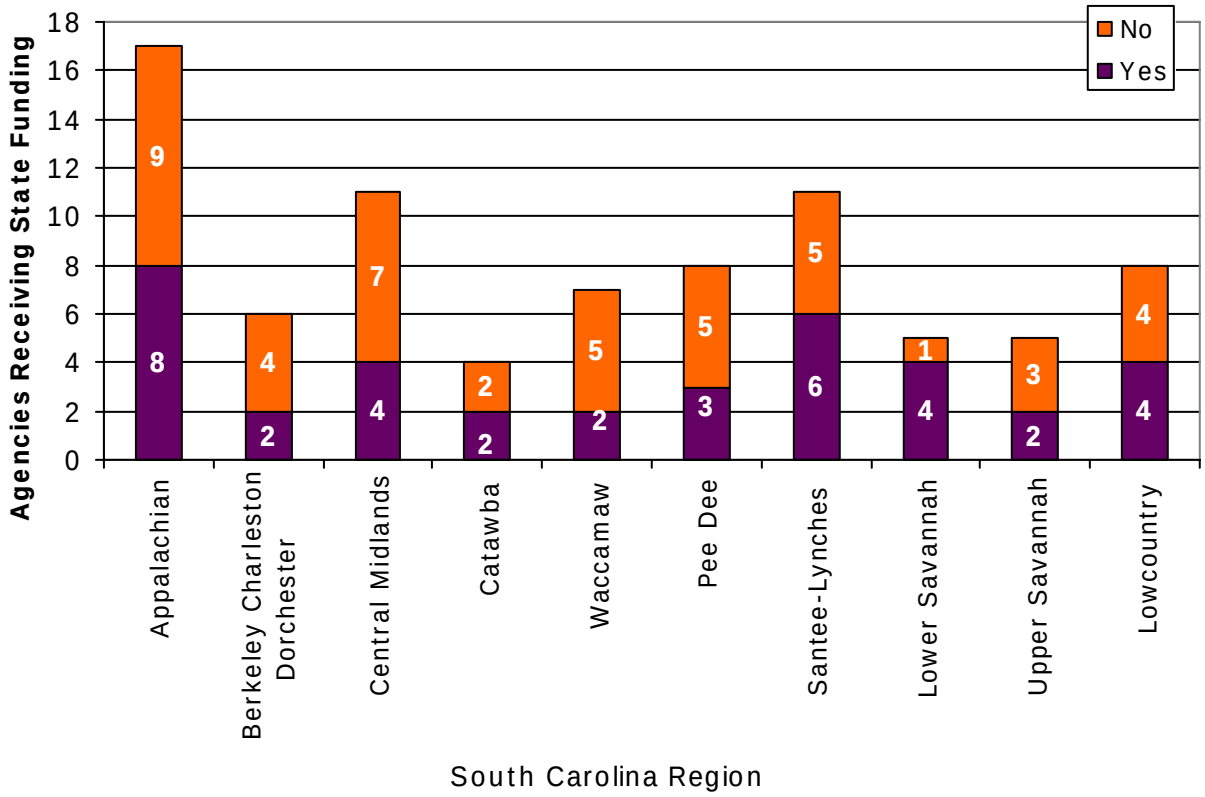


Regions are ordered from highest to lowest in regional population density.
Data source: Clemson survey of South Carolina transit stakeholders (2006)

Figure 3-21: Regions containing metropolitan areas tend to have more providers receiving federal funding.

Rural regions received less money through federal sources both in the percentage of providers receiving any funding and the actual dollar amounts provided. The Lowcountry, Catawba, Waccamaw and Pee Dee received less than twenty percent of their funds through the federal government. In comparison, Berkeley-Charleston-Dorchester and Central Midlands received over 67 percent of their funding from the federal government while the Appalachian region received 58 percent. Contrary to the general pattern of the state, Lower Savannah received a large portion of its funding from the federal level. Three providers each reported receiving over $300,000 during the fiscal year, which is more than some regions' entire federal provisions.

The number of providers not receiving funding from federal sources is much higher by a percentage for low-population areas than it is for more-populated regions. Overall, the areas with population densities less than 150 people per square mile had the largest percentages of providers operating without federal funding: 58 percent for low-density areas compared to 42 percent in more populated regions.



Regions are ordered from highest to lowest in regional population density.
Data source: Clemson survey of South Carolina transit stakeholders (2006)

Figure 3-22: State funding is distributed across regions of the state.

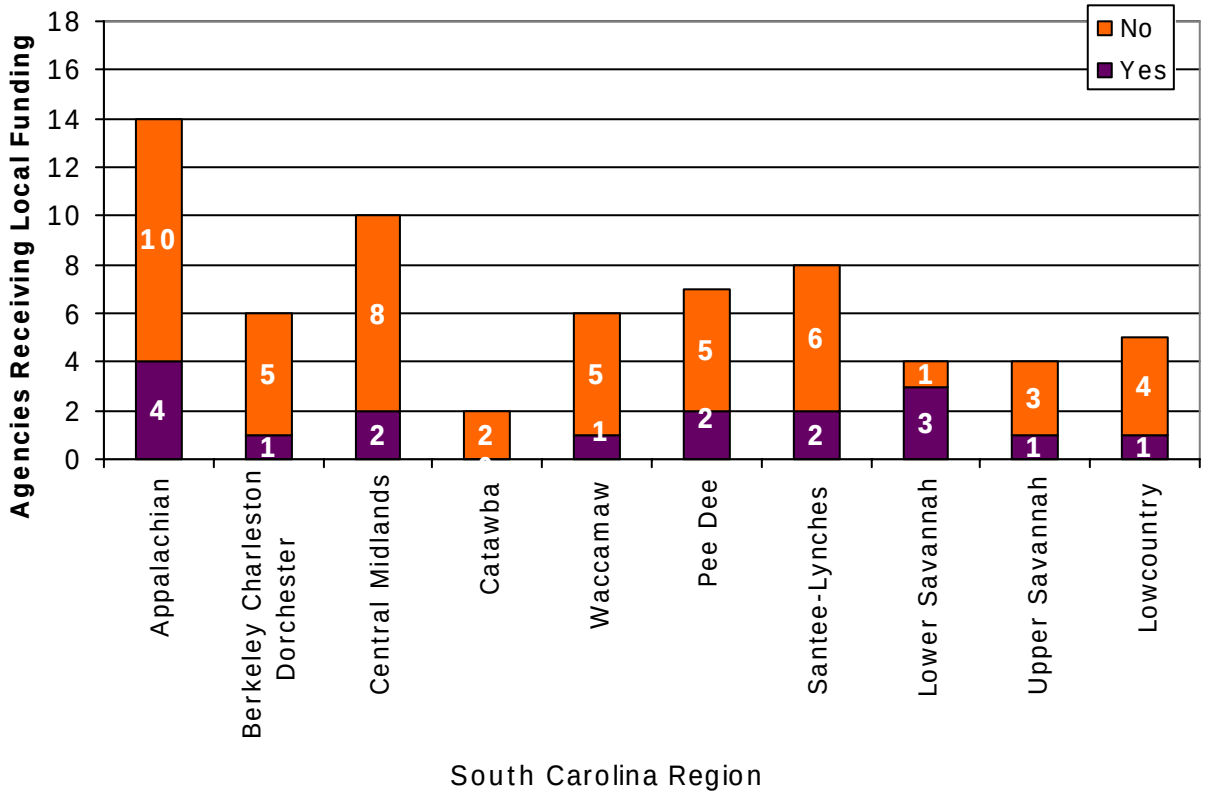
3.5.3 State Funding

Whereas federal funding favors distribution in populated areas, operators reported a more even distribution of state funds across all regions, including the least-densely populated (Figure 3-22). Nearly as many operators reported receiving state funding as federal funding (37 state recipients versus 41 federal recipients), and state funding appeared to be working complementarily to assist areas with minimal federal assistance. Some rural areas had more providers receiving state than federal funds; however, not all rural providers received state funds. The number of providers receiving state funds did not always correspond with dollar values. While Waccamaw had fewer providers receiving state funds than not, this region reported the greatest dollar amount of state support. All Waccamaw providers reporting receiving state funds said that the state provided a significant portion of their total funds.

3.5.4 Local Funding

Local funding is the least common type, but it amounts to a significant portion of total funding for some regions (Figure 3-23). The Pee Dee and Lowcountry regions received significant proportions of total support from

local sources: 69 percent or more of their reported funds. Local funds primarily came from farebox revenue and contracting or leasing services. City and local government funds supplemented these local revenue sources, but such government sources rarely exceeded farebox or leasing revenue.



Regions are ordered from highest to lowest in regional population density.
Data source: Clemson survey of South Carolina transit stakeholders (2006)

Figure 3-23: Local funding provided the least support for transit.

3.5.5 Combined Funding from All Regions and Conclusion

A total of $14 million dollars of funding was reported on the coordination survey (Table 3-8), which is likely a small percentage of total funding required to support current transit services in the state. Much of this $14 million went to a few large providers, while many providers received small funds for specialized services to various areas. On average, regions received $1.64 million in total funds with a substantial standard deviation at $1.55 million (suggesting that insufficient dollar values were reported to support substantial funding analysis or recommendations). The regions with the lowest reported funding were Pee Dee and Santee-Lynches, but neither had major regional transportation providers reporting funding data. Conversely, major regional transportation providers or national private transit providers contributed their funding data for the regions with the most-reported funding (Berkeley-Charleston-Dorchester and Lowcountry).

Table 3-8: Total Fiscal Year Transit Funding and a Source Breakdown

	Total Funding	Federal	State	Local
Appalachian	$1,657,031	58%	8%	34%
Berkeley Charleston Dorchester	$4,693,922	67%	14%	19%
Catawba	$1,245,253	16%	80%	4%
Central Midlands	$845,633	98%	1%	1%
Lowcountry	$4,103,885	10%	10%	79%
Lower Savannah	$1,900,000	81%	4%	15%
Pee Dee	$314,000	16%	15%	69%
Santee-Lynches	$486,740	39%	37%	24%
Upper Savannah	$530,000	57%	43%	0%
Waccamaw	$2,897,500	18%	82%	0%
State Total	**$14,003,042**	**36%**	**32%**	**32%**

Data source: Clemson survey of South Carolina transit stakeholders (2006)

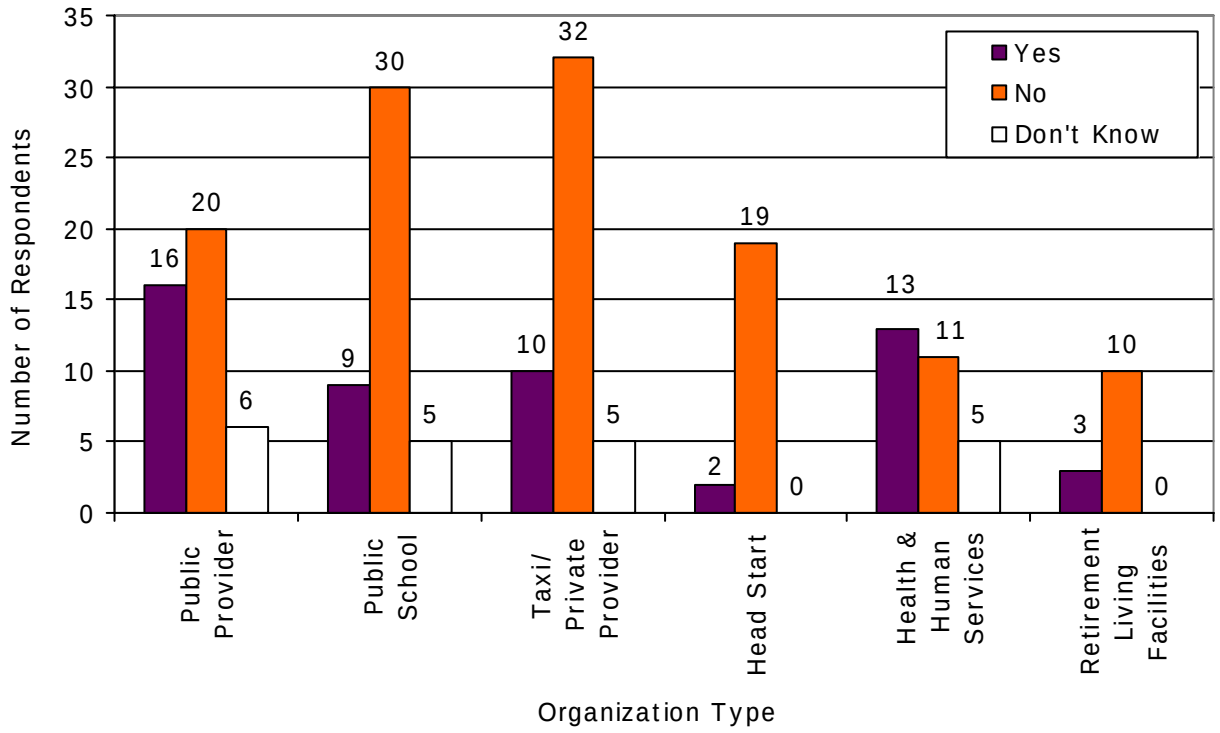
3.5.6 About the Funding Data

The funding data were derived entirely from responses to the 2006 Clemson survey. The data set does not include any information on providers who did not respond to the survey. Because of a limited number of survey respondents, the data did not represent entire regions, and the types of agencies that responded were overrepresented. Despite these data limitations, the varying patterns of funding sources by region were apparent. The numbers should be taken as rough estimates of representation.

3.6 Propensity to Coordinate

Survey respondents showed uncertainty and hesitation towards coordinating with other transit stakeholder organizations. Only 37 percent stated they had attempted to coordinate while the other 63 percent had made no attempt or were unsure of any past coordination attempt. A nearly two-to-one ratio of lacking even to attempt to coordinate suggests that transportation providers either preferred not to coordinate or did not have enough information about benefits or procedures of coordination. Combined with data about willingness to coordinate, the lack of coordination attempts appeared to emerge more from lack of unawareness of coordination options than from opposition to coordination. Only a fraction of survey respondents

completed this portion of the survey, making the responses informative, but not necessarily statistically representative.



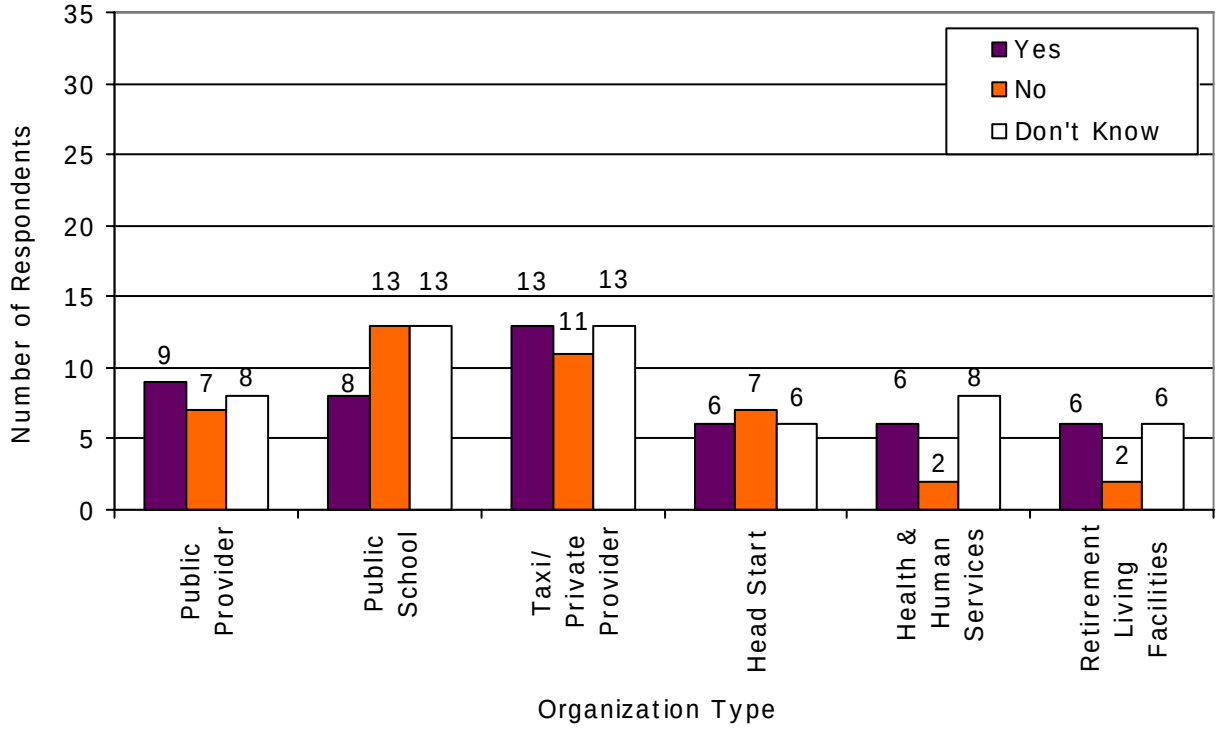
Data source: Clemson survey of South Carolina transit stakeholders (2006)

Figure 3-24: With which types of organizations have agencies already attempted coordination?

Attempts to coordinate most typically involved public transportation operators and providers of health and human services (Figure 3-24). Taxis and other private operators, public school operators, and Head Start programs were reported as the least frequent partners in coordination whether because they did not wish to coordinate themselves or because they were not perceived to have services that could contribute to coordination.

Some differences exist between revealed attempts to coordinate (Figure 3-24) and stated willingness to attempt coordination (Figure 3-25). Stated opinions on future possibilities indicated even distributions of willingness to try, unwillingness, and uncertainty: one-third of respondents were willing to coordinate as a whole while 29 percent were unwilling and 38 percent were uncertain. Survey respondents were much more willing to coordinate with private and public providers than with niche providers catering to specific demographics of the population. Only coordination possibilities with public schools were generally negative with only 24 percent of respondents stating they were willing to try working with these potential partners. Taxis and

private providers received the most declarations of interest in having them as partners (13), but the ratio of willing, unwilling and uncertain members (13:11:13) was similar to the overall coordination ratio.



Data source: Clemson survey of South Carolina transit stakeholders (2006)

Figure 3-25: With which types of organizations would agencies consider coordinating?

According to survey respondents, perceived barriers to coordination mostly related to different systems for paying for authorizing, tracking, and remitting; vehicle restrictions; and, different planning criteria (Table 3-9). Public providers, taxis and other private providers, and Head Start program offices reported perceiving the largest number of barriers. The data might be skewed by differences in experience: public providers, private providers, and health and human service agencies reported they had the most previous experience with coordination; therefore, they would have had a more definitive understanding (and potentially heightened awareness) of the details involved. Head Start agencies, public schools, and retirement facilities had made fewer attempts to coordinate; therefore, they largely had to speculate on what barriers they might have to overcome to make coordination succeed. Respondents felt state and federal restrictions posed barriers to coordination with public and school providers and especially partnerships with private providers. Public provider coordination was deemed difficult due to different operating and budgeting systems. Head

Start representatives felt confined by barriers stemming from planning criteria and restrictions on vehicle use.

Table 3-9: Barriers to Coordination by Reporting Agency Type

Barriers to Coordination	Public Provider	Public School	Taxi / Private Provider	Head Start	Health & Human Services	Retirement Living Facilities	Total
Different systems for paying for authorizing, tracking, & paying	5	1	2	2	0	0	**10**
Fares have restrictions.	1	0	1	0	0	0	**2**
Federal leadership disallows coordination.	1	0	0	0	0	0	**1**
Planning criteria differ.	2	0	2	3	1	2	**10**
State leadership disallows coordination.	1	1	3	0	0	0	**5**
The use of vehicles has restrictions.	2	2	2	4	1	0	**11**
Total	**12**	**4**	**10**	**9**	**2**	**2**	**39**

Data source: Clemson survey of South Carolina transit stakeholders (2006)

3.7 Synthesis of Regional Considerations

3.7.1 Rural versus Urban Communities

The rural nature of South Carolina lends itself to a necessity for coordinated transit services. Sparsely distributed populations have made fixed-route service provision inefficient and expensive; therefore, rural areas typically have required demand-response services to accommodate mobility needs for people who could not drive for physical, mental, or financial reasons. In 2003, demand-response trips in the United States averaged 8.4 miles, compared to the mere 3.7-mile average trip by bus, reflecting the distances associated with trips in sparsely populated areas. Not only do transit providers need to cover the extra distance, but the cost of driving that distance does not amortize across the needs of a large number of people, leading to trips that cost eight times as much on demand-response service as on fixed-route ($21.34 per unlinked trip, as opposed to $2.68) with fares only covering one-tenth of the cost (Table 3-10). With the high costs

intrinsic in the demand-response transportation that South Carolina must use in most of its communities, the coordination of transportation providers is desirable if it can reduce the financial burden through cost efficiencies.

Table 3-10: Demand-response and Bus Service National Comparison

	Demand Response	Bus
Number of agencies	5,960	1,500
Average trip length, (miles)	8.5	3.7
Average fare per unlinked trip	$2.17	$0.75
Operating expense per trip	$22.17	$2.80
Farebox recovery ratio	0.100	0.284

Data source: American Public Transportation Assoc. *Public Transportation Fact Book*, 2004.

National-level research has examined the situation and trends of demand-response transit service and found alarming realities. Overall, demand response transit has declining performance in terms of cost efficiency (the cost of operating service per revenue-hour of service), cost effectiveness (cost of service per passenger served), and service effectiveness (the number of passengers served per revenue-hour of operation). Unfavorable increases in service scale (system size) and service scope (an increase in the types of service or hours of service offered) likely combine with the decreasing population densities of the American landscape to create these problems. Additional contributing factors include the increasing circuity of travel habits, paratransit service agreements that contract per passenger with no incentive for scale economies, and the increasing need for passenger assistance as the American population ages (*20*).

Data from Clemson's 2006 survey of transportation service stakeholders corroborated these national findings. South Carolina needs to pay particular attention to that last contributing factor (increasing needs for assisting the aged) because many communities in the state are aggressively working to attract a retirement population without necessarily considering implications of mobility requirements for an aging population.

The data and analysis in this chapter demonstrated striking differences in ridership and operations between small and large operators, and these differences typically corresponded with differences in community sizes. Urban and rural communities have different motivations to use transit. In rural areas, private vehicles typically offer the easiest access to all destinations with no wait time; therefore, typically only transit-dependent populations ride public transportation. In urban areas, traffic congestion and

high costs of parking can reduce accessibility for private vehicles, raising the relative attractiveness of public transit. Especially in areas where transit vehicles have some form of priority, such as dedicated right of way, high-occupancy vehicle lanes, and traffic signal prioritization, public transit can attract both transit-dependent and choice riders.

3.7.2 Operators

Data showed that many small service providers lacked advantages, but they provided a vital role for many individuals who needed transportation. The disadvantages mostly related to their small sizes and their dependence on population densities and land uses in local environments. Most of these operators were demand-response providers that covered low-density suburban and rural areas. They incurred substantial vehicle miles and operating costs due to long distances traveled. The small providers also had small vehicles and low occupancies per trip, further increasing operating costs per passenger mile.

The infeasibility for small operators to take advantage of economies of scale in operations posed a challenge for planning. Increasing the funding of these agencies individually would increase service qualities, but efficiencies would not improve without changes in land use and service population sizes. Decreasing funding might increase efficiency; however, vital public services would be cut, resulting in a loss of mobility for the state's most disadvantaged populations. Because of this relationship between rural providers and cost efficiency, coordination of transit services should be considered as a means of minimizing costs while improving service quality.

Small providers responding to Clemson's survey reported services provided and agency needs that differed from the needs and offerings of larger regional providers. Small providers shared more similarities with other small providers in similar regions across the state than they shared with larger providers within their own regions.

Conditions experienced by transportation service providers such as population, land area, density, vehicle mileage and the cost per passenger mileage were experienced and absorbed differently depending on the size and service of the provider. Major providers could more efficiently take advantage of economies of scale for fixed routes, relatively high-density service populations, and relatively high returns in passenger miles for minimal investment in operating costs. Small providers were much more dependent on area characteristics and types of clientele targeted. Small providers were limited by both expensive operating costs per passenger mile and large service areas.

It could be detrimental to consider, handle, organize and hold small providers to the same standards of major regional providers. For many small service providers, increasing budgets might improve performance, but because they do not share the same efficiency as larger services, an increase in monetary resources cannot be used with the efficiency expected in urban areas. Ultimately, there are many different "species" of transportation providers and specific situations affect providers differently.

Regarding funding, structures, sources, and availability differed from region to region. Funding stood as one of the greatest perceived barriers to coordination of services: for many survey respondents, maintaining and not losing revenue to coordinate with different providers was a major issue. Respondents further reported trepidation at the prospect of dealing with different funding sources (with all of the associated administration) across providers with different requirements under state and federal law. Finally, the different regions received different amounts of funding and could not always contribute equally to coordination efforts. Sizes of coordination partners and their locations within and outside different council-of-governments regions posed problems for designating roles in coordination.

3.7.3 Socioeconomic Characteristics

South Carolina should further pay attention to equity issues. African American residents have disproportionately lived in poverty, particularly for elderly populations. This research has yielded no indication that race creates a greater or lesser propensity to use or to need to use public transit (this study did not target this question); however, other studies have shown that foreign and immigrant people accustomed to cultures that use public transit will gravitate toward public transit at least when they initially arrive in the United States (*21*). Culture appears to have a greater impact than race. South Carolina does not yet have a sizable Hispanic population to examine unique transportation behavior for this ethnicity, but the anticipated rapid growth of this population merits attention and observation in the near and long-term future.

Transportation services differ according to the needs of target populations. In poverty-stricken areas, public need for mobility dictates the types of service needed. In wealthier areas, congestion mitigation contributes to the motivation for public transit. In all areas, disadvantaged populations, such as the disabled, the poor, and the elderly, have their own unique characteristics and needs.

The next section of this report delves more deeply into the needs of users and providers serving special populations. Recognizing the needs and

conditions of operations of these important potential coordination partners can offer a strong foundation for formulating coordination plans.

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17 Broach, Jackie R. (2005). "Greenwood County Looking to Lure More Retirees". *Index Journal.* December 27.

18 Firsttransit.com. Lowcountry Regional Transportation Authority Website. Accessed April 3, 2006.

19 Simon, Anna (2006). "CAT Routes May Reach to GSP". *Greenville News.* March 25.

20 Transit Cooperative Research Program (TCRP) Report 31: *Funding Strategies for Public Transportation*, 1998.

21 Pisarski, Alan E. *Commuting in America III: The Third National Report on Commuting Patterns and Trends*, National Cooperative Highway Research Program Report 550 and Transit Cooperative Research Program Report 110 prepared for the Transportation Research Board of the National Academies of Science, 2006. http://onlinepubs.trb.org/onlinepubs/nchrp/CIAIII.pdf

4.0 Stakeholder needs and interests

4.1 Regional Transit Providers

Regional transit authorities and agencies (RTAs) are the largest public transit providers, and they primarily serve the major cities of South Carolina. Compared to many of the smaller special-needs transportation providers, regional transit authorities have greater capabilities, resources, and access to federal funding, particularly for capital goods. Regional transit authorities stand apart from special-interest providers in that their goals relate strictly to mobility for the general public. All special-needs transportation could theoretically fall under the aegis of these authorities, whereas the special-needs providers do not have a dedicated mission to serve the general public. In practice, the special-needs providers necessarily supplement (or often provide the majority of) transportation for specific populations; however, regional transit authorities can provide complementary service for those populations, and in some cases, the special-needs providers can supplement mobility for the general public. Regional transit authorities could make natural coordination partners for other transportation service providers.

This research has focused primarily on smaller providers and special needs transportation services; however, this section discusses findings gathered about regional transit authorities. Although only one authority responded to Clemson's stakeholder survey and the research case studies focused on rural areas, this section provides basic qualitative information on these important service providers. Detailed quantitative analysis from nationally-reported performance data has been provided in section 3.2.2.

4.1.1 South Carolina's Regional Transit Providers

Major cities and metropolitan areas typically house regional transit authorities, though in some cases, rural regions have their own authorities. South Carolina currently has eleven authorities (Table 4-1), including both metropolitan and rural providers, which can be distinguished by land use and population densities of the service areas. Goals, operating characteristics, and available funding differ depending on whether primary service areas are metropolitan or rural in nature. South Carolina's largest metropolitan areas rank much lower in population and population density than many of the prominent metropolises and megalopolises in the nation; therefore, this state's transit authorities often look small compared to national benchmarks.

Table 4-1: Regional Transit Providers Operating in South Carolina

Provider	Full Name	Primary City
BCDRTMA	Berkeley-Charleston-Dorchester Regional Transportation Management Association	Charleston (outlying)
CARTA	Charleston Area Regional Transportation Authority	Charleston
CATS	Charlotte Area Transit System	Charlotte, NC
CMRTA	Central Midlands Regional Transit Authority	Columbia
GTA	Greenville Transit Authority	Greenville
	Palmetto Breeze	Hilton Head
LSRTMA	Lower Savannah Regional Transportation Management Agency	Aiken
PDRTA	Pee Dee Regional Transportation Authority	Florence
SWRTA	Santee Wateree Regional Transit Authority	Sumter
SPARTA	Spartanburg Area Regional Transit Agency	Spartanburg
The Coast (fka LYMO)	Waccamaw Regional Transportation Authority	Myrtle Beach

Regional transit authorities in South Carolina typically offer fixed-route fixed-schedule bus service as their core functions. In downtown areas, this service might come frequently enough to make transit equally or more convenient than travel by private vehicle. In rural areas, demand and funding rarely support high-frequency service; therefore, only people dependent on transit for mobility typically use it. Table 4-2 indicates standards for fixed-schedule level or service (*22*).

Table 4-2: Frequency and Level of Service for Fixed-Schedule Routes

Level of Service	Average Headway (minutes)	Frequency (vehicles/ hour)	Effect on Riders
A	<10	>6	Passengers do not need schedules
B	10-14	5-6	Frequent service, passengers consult schedules
C	15-20	3-4	Maximum desirable time to wait if bus/train missed
D	21-30	2	Service unattractive to choice riders
E	31-60	1	Service available during the hour
F	>60	<1	Service unattractive to all riders

Source: *Transit Capacity and Quality of Service Manual, 2nd Edition*

Demand-response service makes up another large part of service offerings for transit authorities. The demand-response service offerings might provide independent coverage of service areas, or it might supplement fixed-route service. To ensure equal mobility in compliance with the Americans with Disabilities Act, public transit agencies must provide demand-response service within one half mile of all fixed routes; therefore, such service has a place in every public transit service area. Demand-response service requires special passenger appointments and scheduling, which affects service quality, as indicated in Table 4-3 (*22*).

Table 4-3: Response Time and Level of Service for Demand-Response

LOS	Response Time	Comments
1	Up to ½ hour	Very prompt response; similar to exclusive-ride taxi service
2	More than ½ hour, and up to 2 hours	Prompt response; considered immediate response for demand-response transit service
3	More than 2 hours, but still same day service	Requires planning, but one can still travel the day the trip is requested
4	24 hours in advance; next day service	Requires some advance planning
5	48 hours in advance	Requires more advance planning than next-day service
6	More than 48 hours in advance, and up to 1 week	Requires advance planning
7	More than 1 week in advance, and up to 2 weeks	Requires considerable advance planning, but may still work for important trips needed soon
8	More than 2 weeks, or not able to accommodate trip	Requires significant advance planning, or service is not available at all

Source: *Transit Capacity and Quality of Service Manual, 2nd Edition*

4.1.2 Fleets

Most transit authority fleets are comprised of large numbers of buses that can carry between sixteen and sixty passengers, along with a complementary fleet of smaller vehicles for special transportation needs such as demand-response service. Typically, transit authority vehicles have high utilization. At the time of this study, the major providers' fleets (except for Greenville Transit Authority and Spartanburg Regional Transit Agency) numbered over 50 vehicles each, though South Carolina fleets were still relatively small compared to other authorities in the nation. For example, the Pee Dee Regional Transportation Authority had 135 vehicles (mostly cars and vans) available for service, making this rural provider the largest in

South Carolina. In comparison, the much larger Charlotte Area Transit System (CATS), which operates some routes into South Carolina could have up to 486 vehicles (mostly buses) available for service.

Figure 4-1: Regional transit authorities frequently own and operate large fleets of vehicles. The Pee Dee Regional Transportation Authority depot features a variety of high-capacity vehicles.

4.1.3 Needs and Goals

On the surface, the primary goal of regional transit authorities appears clear: provide **publicly-accessible transportation that enhances mobility of a community**. The clarity of this goal turns murky as authorities try to define who constitutes the publics they serve, how far their service areas extend, and what level of service they must provide.

The question of who to serve divides into two primary types of riders:

- *transit-dependent riders* such as non-drivers (the disabled, elderly, children under driving age, and so forth) and people who cannot afford private vehicles or

- *choice riders* who have access to private vehicles but choose to ride transit to avoid traffic congestion, parking fees, the environmental impact of private vehicle use, and so forth.

In rural areas, transit service cannot typically attain sufficient frequency and area coverage to make transit an attractive alternative to the automobile; therefore, transit-dependent populations constitute ridership for these authorities. Urban transit authorities serve transit-dependent populations; however, they also have potential to attract choice riders in dense corridors. Urban transit authorities must make decisions about whether to allocate resources to provide the most benefit for enhancing public mobility for transit-dependent populations or to make service more attractive to attract choice riders. Resource availability rarely supports optimum service for both types of populations.

In many cases, regional transit authorities cite **service expansion** as a primary goal. Service can be expanded in terms of scale (e.g. more vehicles or shorter headways) or scope (e.g. more routes and stops). Expanded scale serves an existing client base with better service; expanded scope reaches more potential consumers.

Many providers in South Carolina have identified demand for transportation beyond their current service areas. Covering greater area can reach a larger number of people, but it comes at a cost. Several Medicaid transportation providers already need to provide long-distance travel for patients who want to travel for medical care in various cities across South Carolina, as well as Georgia and North Carolina. Medicaid contracts send drivers with one or two passengers across the state and state borders daily. Low funding availability means that this kind of demand for distance comes at the cost of high-

quality reliable service in a more focused area. Funding availability often limits potential for service expansion, but coordination offers possible means of expansion.

Serving the general public requires public awareness of transit service; therefore, regional transit authorities must establish goals for marketing and raising **visibility and public awareness**. This transit-authority goal contrasts with the goals of many human-service agencies that provide transportation to a closed clientele.

4.1.4 Funding

The 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) has provided several major programs for regional transit authorities. Table 4-4 summarizes fundamental programs in that legislation (*23*). Some of the most relevant legislative sections for regional transit operations in South Carolina are:

- 5307 (Urbanized Area),
- 5310 (Elderly and Disabled),
- 5311 (Rural Area),
- 5316 (Job Access and Reverse Commute), and
- 5317 (New Freedom).

Operational funding comes in the form of formula funding that is distributed according to population. Most federal transportation funding requires local matching funds.

Only one regional transit authority presented funding sources in the Clemson University's 2006 survey of transit stakeholders, so analyzing the funding sources and patterns for all the agencies in South Carolina is not possible. It is possible to discuss some funding issues by looking at operating costs that major transit agencies reported to the National Transit Database.

While operating costs of the major transit authorities varied, their total operating costs were significantly higher than most of the human-service agencies providing transportation in the state. South Carolina regional transit authorities reported multi-million dollar operations and greater total operating costs due to the large scale of their operations, as well as the service demand of major metropolitan areas. In contrast, regional transit authorities in the Pee Dee and Santee-Lynches regions have not had the population densities of major metropolitan areas. These rural regional transit authorities have had the large rural expanses to service, yet they have not received funding commensurate with the higher costs of transportation in low-density areas.

Table 4-4: SAFETEA-LU Funding Authorizations for Transit

Program	Six-Year Total Authorization (millions)
Formula Programs Total	**$28,484.6**
§ 5307 Urbanized Area	$22,183.2
§ 5340 Growing States and High Density States	$1,695.0
§ 5311 Rural Area	$2,186.5
§ 5310 Elderly and Disabled	$674.7
§ 5317 New Freedom	$339.0
§ 5338(a)(2)(C) Alaska Railroad	$10
§ 5308 Clean Fuels Formula	$288.1
§ 3038 Over-the Road Bus	$46.0
§ 5316 Job Access and Reverse Commute	$851.5
§ 5320 Alternative Transportation in Parks	$96.9
§ 5335 Reports and Audits	$14.0
§ 5339 Alternatives Analysis	$100.0
§ 5309 Capital Investment Programs Total	$22,692.9
Fixed-Guideway Modernization	**$8,486.7**
New Starts Total	**$9,339.9**
New Starts Less Than $75 Million	*$600.0*
New Starts $75 Million or More	*$4,475.3*
Bus and Bus Facilities	**$4,866.3**
Planning Total	**$559.9**
§ 5305(d) Metropolitan Planning	$463.2
§ 5305(e) State Planning	$96.8
Research Total	**$373.8**
§ 5311(b)(2) RTAP	$10.5
§ 5313(a) TCRP	$54.3
§ 5315 National Transit Inst.	$25.2
§ 5314 National Research	$243.9
§ 5506 University Centers	$40.0
FTA Operations	**$510.9**
Total All Programs	**$52,622.0**

Data source: American Public Transportation Association
http://www.apta.com/government_affairs/safetea_lu/brochure.cfm

4.1.5 Barriers to Coordination

The Clemson University 2006 survey of transit stakeholders and subsequent case study interviews both provided insight into what barriers might hinder coordination. These barriers frequently related to the difference between large-scale and small-scale operators.

4.1.5.1 Administrative Systems

According to survey results, the most significant barrier for coordination with regional transit authorities is the **differences in systems for payroll,**

authorization, and tracking that exist between public providers and smaller operators. This barrier affected 42 percent of the survey respondents answering a question about barriers to coordinating with regional transit authorities. Of those respondents, 50 percent had attempted coordination with private or public providers. Apparently, experience has taught transit authorities that differing administrative systems make coordination difficult to undertake. **Planning criteria** differences were also minor barriers.

4.1.5.2 Vehicle Incompatibilities

Vehicle restrictions emerged in the survey as a minor barrier. Vehicles that can carry sixteen or more passengers can only be operated if the driver carries a commercial driver's license (CDL). In South Carolina, a class "C" commercial driver's license allows a person to operate "any single vehicle, or combination of vehicles, [...]designed to transport 16 or more passengers, including the driver [...]" (*24*).

- **Shared driving** – This licensure requires extensive and expensive training, which puts these drivers into a special class in terms of their availability and the wages they can command.

- **Shared vehicles** – Not everyone can operate the large vehicles that regional transit authorities might typically own.

4.1.5.3 Scheduling

Another potential barrier for coordination is mutual requirements during **peak period travel demand**. Medical appointments scheduled for 9:00 in the morning require vehicles and drivers at exactly the time when the general public most needs capacity. When medical appointment times coincide with a regional transit authority's busy time, problems arise; whereas, most transit authorities have overcapacity from mid-morning to mid-afternoon. Medical appointment times are often set without coordination between the medical services and transit authorities, and overtaxing the transit authorities can lead to late and unreliable service, leaving health service providers unsatisfied with transportation service. Midday medical appointments would allow transit authorities to dedicate resources to medical transportation efficiently.

The degree to which Medicaid appointments can be scheduled to accommodate transportation needs to be resolved. Some interviewees said that transportation providers were prohibited from participating in scheduling, but other interviewees reported that doctors' offices willingly interacted with them to ensure transportation problems did not lead to missed appointments.

4.1.5.4 Mixing Human-Service Transportation with the General Public

Mixing the general public with people with special needs requires resolution of several issues.

- The first question is whether a regional transit authority wants to provide Medicaid and human-service transportation. Some regional transit authorities actively seek Medicaid contracts, but other regional transit authority providers resist coordinating services for human service needs because of **differing service needs** and potential **traveler incompatibilities**. Does it make sense to mix fragile elderly travelers and mentally-challenged people with teenagers and the general public? Do mentally- or physically-challenged passengers require a caretaker to ride with them and take another seat on transit vehicles? Should transit authorities sacrifice on-time performance to take time to provide extra assistance to special-needs travelers?

- The **level of care** offered to passengers can differ between transit authorities and human service agencies. Transit authorities must operate within the **liability** standards of the transit industry, which typically means curb-to-curb service for demand-response trips; touching passengers is discouraged. In contrast, some human service agencies prefer to offer their own transportation because they want to assist mobility-challenged people out of their homes and into their destinations in door-through-door service that might involve hands-on care. **Training in handling special-needs** travelers also varies.

- **Health privacy issues** arise, as the limits of interaction between medical providers and transit authorities are not well defined.

Overcoming these barriers likely requires identifying the most viable agencies and passengers to mix with the general public on vehicles. A medical patient who is behaviorally functional does not pose any discomfort to a general passenger. Where compatibility can be a problem, scheduling separate trips during periods of low public travel demand might enable coordination of vehicles and drivers.

4.1.5.5 Resource Allocation

Resource allocation emerged as a problem in multiple interviews. Regional transit authorities need to charge fares sufficient to cover costs, but human-service providers believe they can provide transportation for less money. Several human service agencies reported they ceased or never started to use transit authority services because they considered fares too high to pay. Transportation professionals questioned whether those agencies were considering the full costs of in-house service, such as driver salaries

(particularly if they were using professional social workers as drives). In some cases, human-service agencies cut costs by using volunteer drivers. Overall, coordination processes should include time spent examining the full cost structures of all transportation providers to allow fully-informed comparison of in-house and contracted costs.

4.1.5.6 Leadership and Intimidation

Based on transportation expertise and full-time dedication of resources to transportation, regional transit authorities are positioned well to take leadership roles in transit coordination; however, this **leadership strength** can cause intimidation in small human-service providers. Somehow, the size, funding, and human resources dedicated to transportation in regional transit authorities cannot overshadow smaller provides. In addition, given that funding for many projects is divided rather than pooled among participating agencies, fair allocation of funding could become a delicate matter in light of the different sizes, capacities, and needs.

4.1.6 Coordination Opportunities

The Regional Transit Authorities have greater resources than the smaller transportation providers. While this does not mean they have a surplus and deficiencies often exist, the Regional Transit Authorities are more likely to possess modern technology and capital resources such as dispatch centers and maintenance facilities. It may be possible for these facilities to be accessed by small providers at a reduced rate when they are not being fully utilized the regional transit authority.

Technology sharing can benefit small providers by providing them with access to technology that they could not otherwise afford. It can also benefit a regional transit authority because it can share the cost burden for a technology that would be used regardless of coordination.

As mentioned previously, the large vehicles of regional transit authorities might form a barrier to coordination due to the requirement to have drivers with commercial driver's licenses operating them; however, this barrier also leads to an opportunity: **shared maintenance facilities**. Given that regional transit authorities frequently have substantial fleets of large vehicles, they often run their own maintenance facilities. In contrast, agencies that use large vehicles but have a primary mission outside the realm of transportation, such as Head Start programs and public schools, might have difficulty finding maintenance shops with equipment that can lift a large bus. In rural regions, interviewees representing these programs described how they needed to drive vehicles for four hours to reach a maintenance shop, while the regional transit authority had maintenance facilities in the region. Through coordinating maintenance facilities, special-

purpose operators can save money and time by using proximate facilities, and regional transit authorities can receive the benefit of side revenue, perhaps with a contract to ensure the income stream.

While there are many smaller provider coordination opportunities, regional transit authorities must not expect them to be equal financial partners, but rather autonomous supplements to the regional transit authority services. This arrangement can still benefit the transit authorities. For instance, **subcontracted demand-response service** commonly occurs across the nation. Nationally, only seven percent of fixed-route operators operate all of their demand-response in house (*25*). The requirement for demand-response service within one-half mile of fixed routes might push a transit authority to move out of its area of expertise (fixed-route fixed-schedule service), whereas small local operators might have particular strengths in knowing the community and individuals with their special needs.

Figure 4-2: Large park-and-ride capacity for the Charlotte Area Transit System has been established in Rock Hill, South Carolina.

In a less formal arrangement than a subcontract, small transportation providers can support regional operations through **locally-provided feeder service**. In Rock Hill for instance, the Charlotte Area Transit System has

been operating express service into Charlotte. Large park-and-ride lots provide the only local access to this express service (Figure 4-2), but local providers could coordinate short routes in downtown Rock Hill and from major apartment or housing developments to prevent both traffic congestion in the parking area and the air-quality impacts of private-vehicle engines cold-starting in the morning to access transit. The local service would likely open access to Charlotte for some of the transit-dependent population in Rock Hill, and ridership on the express route would likely increase.

In 43 percent of large agencies across the nation, regional transit authorities handle reservations for their subcontracted service and one-third schedule their subcontract providers (*25*), which leads to the next opportunity for coordination with transit authorities: **shared dispatch**. Regional transit authorities necessarily have employees trained in the art of dispatch, and they command systems and software to allocate large numbers of vehicles and drivers. Coordinating their dispatch systems with smaller transportation service providers should create a relatively small marginal impact on the transit authorities while providing a major benefit to the smaller providers.

In Clemson University's 2006 survey, transit stakeholders identified a number of potential barriers to coordination with regional transit authorities. Table 4-5 lists these barriers and poses potential solutions to consider.

Table 4-5: Coordination Barriers and Strategies

Barrier	Strategy to Overcome
Administrative systems for processes like payroll differ between providers.	• If integrating administrative systems poses too great a challenge, then mechanisms that allow multiple systems to work together but separately might work. For instance, subcontracting will create only a line item on the transit authority's budget, leaving payroll entirely in the subcontracting agency's system.
Health privacy and similar medical issues	• Target coordination to populations without such concerns first. • Establish procedures to ensure privacy.
Strong peaks in regional transit authority transportation demand correspond to potential coordination partner's peaks	• Work with health service providers to schedule appointments at off-peak times. • Manage expectations so that all parties understand the challenges of peak time transportation.
Funding	• Start coordination with activities that maximize existing resources, such as technology and maintenance sharing. • Use coordination to free time for an administrator to pursue existing or new funding sources.

4.1.7 Conclusion

Regional transit authorities handle the large-scale transit needs of regions. In metropolitan areas, they might help mitigate congestion and air-quality problems, but in all environments, they provide important mobility for transit-dependent populations. Their role in coordination depends largely on how to define which human-service transportation can and should mingle with the general traveling public. Problems with coordination largely arise from the differences in agency size between regional transit authorities and smaller human-service providers. This difference in scale can also provide strength in that regional transit authorities typically invest in technology and administrative systems beyond the reach of smaller agencies.

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22 Kittelson and Associates, KFH Group, Parsons Brinkerhoff Quade and Douglass, and Katherine Hunter-Zaworski (2003). *Transit Capacity and Quality of Service Manual, 2nd Edition*, Transit Cooperative Research Program Report 100, Transportation Research Board. http://www.trb.org/news/blurb_detail.asp?id=232

23 American Public Transportation Association (2003). "Safe, Accountable, Flexible, Efficient Transportation Equity Act - A Legacy for Users: A Guide to Transit-Related Provisions," web document accessed March 29, 2007. http://www.apta.com/government_affairs/safetea_lu/brochure.cfm

24 South Carolina Department of Motor Vehicles (2007). "Applying for a New CDL," web site accessed March 27, 2007. http://www.dmv.org/sc-south-carolina/apply-cdl.php

25 Kessler, David S (2004). Computer-Aided Scheduling and Dispatch in Demand-Responsive Transit Services, Transit Cooperative Research Program Synthesis 57., Transportation Research Board. http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_syn_57.pdf

4.2 Elderly communities and aging populations

The average age of the population of the United States is getting older at an unprecedented rate. According to the 2000 US Census, the United States is home to more than 35 million people over the age of 65. This segment of the population "will grow at a rate nearly four times faster than the population as a whole in the two decades from 2010 to 2030." The rapid growth of the senior citizen population will create an environment where "one out of five people in the United States will be age 65 or older" (*26*).

A good deal of research has predicted substantial societal changes and increasing needs stemming from the approaching retirement of the baby-boomer generation. Baby boomers are considered to be any person born between 1946 and 1964, which includes nearly 77 million in the United States (*27*). The population over 65 will double by 2030, and the accompanying effects will be felt in many aspects of daily life, for example: housing, transportation, shopping, and health care. The impact of the boomers will be compounded by the increased life expectancy in the United States. In 1900, life expectancy at birth was 47.9 for men and 50.7 for women; in 2000, it had increased to 74.1 for men and 79.5 for women (*28*). A longer life expectancy will lead to a longer retirement, as well as, longer utilization of public services.

4.2.1 Senior Citizens and Mobility

Senior citizens need mobility to gain "access to the goods, services, and social contacts that support their day-to-day existence" *(29).* As people age, their level of mobility can become restricted, leading to a decrease in overall quality of life. Communities must be cognizant of the barriers to mobility that exist with senior citizen populations and invest in policy and infrastructure that can be used to overcome them.

Mobility brings with it opportunity and a higher quality of life. Having transportation can "mean the difference in whether a senior can get to basic services as well as to enjoyable quality of life activities" *(26).* Senior citizens' attitudes toward mobility reiterate this fact as a 2005 survey of 404 adults aged 65 and over found:

- nearly universal agreement (98 percent) among older Americans that maintaining a sense of independence and mobility is extremely important,
- 87 percent of respondents agreeing with the statement "As I get older, maintaining my independence and ability to get around is extremely important,"
- desire to maintain independence for as long as possible, and

- worry that loss of driving privileges will lead to feeling stranded and unable to get around *(30).*

This desire for independence creates the need for a menu of mobility options tailored to meet the demands of senior citizens.

4.2.2 The Need for Mobility

Greater life expectancy, better mental and physical health, and greater personal satisfaction have been linked to a person's level of involvement in community and with family or friends (*31* and *33*). Transportation is a critical piece in facilitating high levels of involvement. It has been documented that seniors who do not drive make "65 percent fewer trips for social, family, religious, and other life-enhancing purposes" than seniors who drive (*31*). It has also been found that non-driving senior citizens make 15 percent fewer trips to the doctor than their driving counterparts. The percentage of older non-drivers who leave their homes in small towns or rural areas is notably different than the percentage living in urban and suburban areas. For non-drivers living in small towns, 63 percent stay home on a given day; this number is 60 percent for seniors in rural areas, and 51 percent for seniors living in suburban or urban locations (*31*).

Older adults tend to perform most of their daily travel during the midday between 10 a.m. and 12 p.m. and over 60 percent of their travel occurs during the typical non-peak travel times of 9 a.m. to 4 p.m. Residential location choice amongst seniors suggests a preference for suburban and exurban places: 56 percent of senior citizens live in the suburbs, 23 percent live in rural areas, and 21 percent live in central cities (*36*). The vast majority of the seniors who live in the suburbs or rural areas plan to stay in their current homes as they grow older. To facilitate seniors staying in the suburbs, transportation will be necessary. Within rural areas, there are documented deficiencies in provision of public transportation. "Approximately 40 percent of rural residents of all ages live in areas with no public transportation, another 20 percent live in areas with negligible service" (*32*).

Regardless of residential location, today's older population actively participates in part-time work, volunteering, continuing education, and social activities (*33*). Distribution of trip purposes for people over the age of 65 demonstrates their activity. Daily trips for people over age 65 are: 3.1 percent for work, 18.3 for shopping, 17.5 for family/personal business, 0.1 percent for school, 2.6 percent for religious purposes, 2.9 percent for medical or dental care, 19.4 percent for social/recreation, and 34.8 percent to return home (*36*). These travel percentages for people over the age of 65 are higher than people aged 19 to 64 in all categories, except for work and

school. Travel for work by seniors is only 13 percentage points less than travel by younger people to work, and is mostly compensated for by higher percentages of travel in other categories. Seniors travel 5.0 percent more for shopping, 1.1 percentage points more for family/personal business, 1.3 percentage points more for religious purposes, 1.6 percentage points more for medical and dental, and 2.3 percentage points more for social and recreational purposes.

4.2.3 Seniors and the Automobile

The baby-boomer generation grew up with the automobile embedded in American culture. Focus groups with senior citizens have found that most participants believe access to a private automobile is critical to overall life satisfaction (*34*). The majority of seniors also believe that their happiness is linked to the ability to drive. They expect that when they stop driving their lives will become more difficult, and they will be less happy (*35*).

Mode choice among seniors demonstrates a strong preference for private vehicles, either as the driver (74.1 percent) or as a passenger (15.2 percent). In terms of the remaining modes, 8.4 percent of seniors walk, 1.2 percent use public transportation, and 1.2 percent use other modes (*36*). The 1.2 percent of people over the age of 65 who use public transportation has declined since 1995 when the elderly made 2.2 percent of all trips with public transportation (*37*).

Today's older people retain their driver's licenses at a higher percentage than earlier generations. "The percentage of persons age 65 and older who are licensed drivers has increased from 61 percent in 1980, to 72 percent in 1990, and to 80 percent in 2003." By the time the youngest baby boomers reach age 65, seniors will be nearly 25 percent of the total number of all licensed drivers (*38*).

The driving habits of the current senior population differ from earlier generations. Today's driving senior citizens drive more daily miles than previous generations. In 1983, people over the age of 65 traveled an average of 12.0 miles per day, this figure rose to 18.4 miles in 1990 and to 27.5 miles in 2001 (*39*). It is expected that the miles driven per day will continue to rise. "Between 1990 and 2020, the total annual mileage driven by male older drivers will increase by 465 percent. For female elderly drivers, the total annual vehicle miles driven will increase almost 500 percent" (*40*).

Senior drivers are also making more daily trips than previous generations. In 1983 people over the age of 65 made 1.8 average daily trips, this number rose to 2.4 in 1990, and to 3.4 by 2001 (*39*). There is, however, a

difference in number of trips made based on a person's residential location, with suburban and rural senior citizens traveling longer than their urban counterparts. There is also a stark difference in the number of trips made by those who maintain a driver's license and those who no longer drive. The number of weekly trips made by senior drivers compared to non-drivers is six compared to two (*41*).

While the automobile can provide mobility in an auto-oriented society, use of this mode by senior citizens brings many challenges. Older drivers often face many difficulties operating a vehicle, increasing their risk of being involved in potentially fatal motor-vehicle crashes. An older driver's ability to drive an automobile competently can be threatened as:

- visual acuity decreases,
- less light gets into the eye due to decreased pupil size and yellowed or opaque lenses,
- glare sensitivity increases and recovery takes longer,
- contrast sensitivity for small detail deteriorates,
- night vision is reduced,
- focusing on the instrument panel becomes more difficult, especially when wearing bifocal lenses, and
- eye movements slow *(42).*

In addition, older people have a harder time surviving and recuperating from crashes. All of these characteristics of senior citizens, as well as compromised perception-reaction time, emphasize the importance of mode diversification away from the automobile; however, changing old mindsets remains an arduous task.

For seniors who have been independent with their own personal vehicles, the transition to life as a passenger can be traumatic and humiliating. The baby boomers were raised in the "tradition of independence and self-sufficiency," asking for and accepting "rides from family and friends is difficult". Focus groups have demonstrated how trying this transition can be. One woman stated that when asking for rides, "You really get humble, you hate to ask". For some there is outright refusal to make the transition. One man stated that "I can't see, can't hear, can't walk, but I have my car" (*40*).

Extending beyond the anticipated limitation and detriment to quality of life that driving cessation is likely to cause an older person, several other segments of society also will feel the effects. In fact, the notion that a person's life is severely negatively affected by driving cessation may be jeopardizing the safety of all drivers on the nation's roads. A survey conducted in 1995 found that "licensing examiners and supervisors in all 50

states often hesitate to suspend or revoke the licenses of elderly drivers" because of the fear of "imposing unfair restrictions on his/her mobility". Medical professionals have also been found to be reluctant to advise revocation of drivers' licenses if there is an "absence of transportation alternatives that offer choice and dignity" (*43*).

4.2.4 Seniors and Public Transit

For the elderly who do not drive, public transportation could provide critical access to society. With a decrease in the ability to operate a vehicle as a person ages, public transportation (bus, demand response, vanpool, rail, and so forth) might become a mobility choice for senior citizens; however, a 2005 survey conducted by the American Public Transportation Association showed that only five percent of respondents over age 50 used public transportation as their primary modes of transportation. Although only a small percentage of people over 65 uses public transportation the percentages increase as the population ages. Of people over age 75, 14.3 percent use public transportation as their primary mode choice (*38*). If the 15.2 percent of seniors who ride in private vehicles as passengers (*36*) were given access to more flexible and responsive public transportation, they might become users of public transportation. Additionally, public transit could have a greater impact on minority populations over the age of 65, as they are less likely to drive than Caucasians. At least 40 percent of Hispanics, African Americans, and Asian Americans over the age of 65 are non-drivers (*34*). For a significant portion of minority populations, alternative transportation will be essential to maintaining mobility.

Existing transportation provisions for senior non-drivers do not meet the needs of the senior population. Unsatisfied trip types include trips to multiple destinations, trips with purposes that involve carrying packages, and trips to "life-enhancing" activities (Figure 4-3). Transportation is beginning to be identified as a major area of need for seniors. "In 2001, approximately 26 percent of state units on aging surveyed by the Aging States Project identified transportation as a top health issue for older adults, and 38 percent identified inadequate transportation as a barrier to promoting health among older adults" (*34*).

Figure 4-3: Seniors frequently use shopping trips for recreation but require transportation services to access the stores.

Switching to public transportation from the automobile can bring fear and anxiety. An 80-year-old woman who has never used a public or community transit service will probably find the transition from the automobile to transit both socially and psychologically difficult. The fears and anxieties (both from real and perceived dangers) that this woman and other seniors have present barriers to public transit ridership *(26).* Table 4-6 indicates particular concerns seniors hold relative to traveling on public transportation. Seniors typically identify public transportation and specialized transportation as having negative attributes, as opposed to the positive attributes of driving their own automobiles (*34*).

Table 4-6: Perceived and Experienced Problems of Elderly Transit

Non-rider Perceptions of Problems	Complaints of Experienced Riders
• safety • affordability • awareness of options • walking distance • difficulty getting into vehicles • fear of getting lost or traveling alone • perception that elderly passengers are not wanted	• lack of flexibility or spontaneity with advance scheduling requirements • limited hours or days of service • limited service area, wait times • a lack of assistance with entering and exiting vehicles

Source: The Beverly Foundation (26)

These perceptions and concerns may increase the likelihood that a senior will rely on friends and relatives for rides to needed locations or be reluctant to choose driving cessation. Generally, lack of transit use stems from:

- a lack of transit provision due to the sprawling land use in areas where senior citizens live,
- anxiety and fear of riding public transit, and
- transit service that does not accommodate needs (times, destinations, frequencies, and so forth).

If provided in a manner that meets the needs of senior citizens, public transit can be a viable mobility option and provide senior citizens with the ability to live independently, access to medical and social services, contact with the outside world, and a feeling of belonging to the community *(26)*

Innovative strategies and solutions are needed to overcome the real or perceived barriers that exist between senior citizens and public transit ridership. A 2004 study conducted by the Community Transportation Association of America and the Beverly Foundation surveyed 96 transit providers that "have developed and implemented innovative programs or services that improve their ability to serve the older adult population or that improve the ability of the older population to access their services" *(26).* These transit providers were asked to identify problems and barriers to senior citizen transit ridership and describe the tools used to overcome them. Table 4-7 summarizes these findings.

The main theme in these solutions is providing a level of customer service that will afford senior riders with a sense of security and confidence in the system. These strategies are innovative in the fact that they respond to a problem by providing a mechanism to stimulate change. As the United States population grows older at a rapid rate, transit agencies and providers can use these innovations as a starting point to begin the out-of–the-box thinking needed to increase senior citizen transit ridership in their areas.

Table 4-7: Senior Citizen Public Transit Problems and Solutions

Problem	Solution/Strategy
Seniors have always driven their own automobiles.	• Driver assures safe ride • Provide a senior travel buddy • Schedule group trips with peers • Offer subsidized taxi vouchers • Provide 1-on-1 travel training • Offer alternative choices • Refer to counselor/caseworker • Offer some rides in autos
Seniors need help getting to vehicles.	• All receive door-to-door service • Driver assists: door to vehicle • Provide arm-in-arm assistance • Trained to assist: couch-to-van • Collaborate with family members • Invite family members along • Require an aide • Operators help upon request
Seniors cannot sit for long periods of time.	• Schedule around peak traffic • Schedule to pick up seniors last • Use pager to shorten time • Make direct trips and returns • Take seniors home in 2 groups • Place 1-on-1 with volunteers • Provide individual v. group trips • Provide breaks on long trips • Make frequent trips
Seniors need someone to stay during appointments.	• Care providers ride free • Driver may stay if requested • Transportation technician helps • Refer to a local agency • Assign a volunteer escort • Require an escort
Seniors have memory loss.	• Assist seniors in scheduling trips • Passenger profile-impairment noted on file • Senior carries an information ID • Trip sheets logged for driver • Required escort rides free • Driver never leaves passenger • Make calls to rider • Write-on calendar for rider use

Source: The Beverly Foundation

4.2.5 Policy in the United States

The Older Americans Act of 1965 created the Administration on Aging, which has served as the national leader of programs for the older population at the federal level. This act does not explicitly have a provision of transportation as one of its objectives (*44*); since it was enacted, however, "state units on aging have been greatly involved with transportation coordination activities at the state level" (*31*). At a federal level, transportation for older adults has been explicitly identified as an area of need for a decade. The White House Conference on Aging of 1995 resolved that in order to help ensure the social well being of seniors, transportation choices should be maximized and accessible low-cost transit ensured (*33*).

Much of the direction for making changes in transportation for senior citizens comes from the Community Transportation Association of America and the Transportation Research Board. These groups facilitate research and conferences with senior transportation as a focus that leads to the identification of best practices and recommendations for states and localities. The principal recommendation that appears to permeate American public transportation is simply to make transit more "senior friendly." In 2000, the Beverly Foundation, a senior citizen research and policy non-profit organization and partner with the Community Transportation Association, developed the five A's of senior friendly transportation as a means of highlighting senior transportation needs (Table 4-8).

Many of the existing programs offered by public and private groups in the Untied States have attempted to meet the needs of their seniors by improving their services following recommendations of federal-level agencies. Means have generally focused on improving efficiency with technology, coordinating services with other providers, offering training sessions for staff and seniors, acquiring vehicles that accommodate seniors, increasing the level of service, using volunteers, and forming financial partnerships (*34*). These methods of improvement follow the five A's and have generally resulted in improvements to the quality of service communities offer.

The United States Administration on Aging and the Federal Transit Administration signed a memorandum of understanding intended to facilitate collaboration among their respective networks of transportation providers. Together, both agencies will provide technical assistance and resources at the state level for facilitation of coordination amongst stakeholders working to establish coordinated transportation solutions for seniors (*34*). The memorandum identified the following objectives:

Table 4-8: The "Five A" Characteristics of Senior-Friendliness

Characteristic	Application
Availability	Transportation exists and is available when needed (e.g., transportation is at hand, evenings and/or weekends).
Accessibility	Transportation can be reached and used (e.g., bus stairs can be negotiated; bus seats are high enough; van comes to the door; bus stop is reachable).
Acceptability	Deals with standards relating to conditions such as cleanliness (e.g., the bus is not dirty); safety (e.g., bus stops are located in safe areas); and user-friendliness (e.g., transit operators are courteous and helpful).
Affordability	Deals with costs (e.g., fees affordable; fees are comparable to or less than driving a car; vouchers or coupons help defray out-of-pocket expenses).
Adaptability	Transportation can be modified or adjusted to meet special needs (e.g., wheelchair can be accommodated; trip chaining is possible).

Source: The Beverly Foundation

- Increase the awareness of transportation needs of older adults and the importance of developing strategies to address them.
- Work with stakeholders at the national, state, and local levels to identify barriers and solutions to accessing transportation services.
- Work together to coordinate funding opportunities for the aging services and transportation networks.

By working together, these networks can make a significant impact in efforts to coordinate transportation with the intention of providing better service to older people and the rest of the citizenry at the same time.

4.2.6 South Carolina Policy on Seniors

The State of South Carolina actively markets to attract older people seeking to relocate for retirement (*45*). There is a focus on marketing the state as a tourist destination, as well as a retirement location because "there is a strong link between tourism and retiree migration" (*46*). Marketing the state as a tourist destination has a twofold benefit of encouraging tourists to vacation and beginning to "sell" the state to potential in-migrant retirees.

Tourism marketed at older populations can have a significant economic impact if they relocate in the future, but also because people over the age of 50 contribute 70 percent of all tourism spending (*47*).

The economic impact to South Carolina has not been quantified in tourism money spent by people over the age of 50; however, marketing the state has helped contribute to the development of many retirement communities. In 1991, it was estimated that the development of 128 retirement communities in South Carolina had resulted in a $4-billion stimulus (*45*).

Table 4-9: South Carolina Benefits for Senior Citizens

Age	Benefits
All seniors	• No state income tax on Social Security that has been taxed federally • Annual $3,000 retirement exclusion before calculating taxable income prior to age 65 • Tax credit up to $300 for expenses paid for care in the home or at a licensed institution • 7% deduction from state income taxes for hired in-home care for an elderly relative
55 years	• Credit toward car insurance upon completion of a driver training course
60 years	• Free tuition at any state-supported educational institution • Eligibility for services through the Aging Network
65 years	• Homestead Tax Exemption – no property tax on the first $50,000 of assessed value of a home after one year of residence in South Carolina • $15,000 deduction from taxable income on state income taxes • Vehicle registration fee of $20 for two years on passenger vehicles
80 years	• Exemption from 1% sales tax dedicated to the Education Improvement Act

Source: South Carolina Lieutenant Governor's Office

State taxes have been structured to encourage South Carolina as a relocation choice for retirees and to keep current residents in place as they age. The State has implemented many financial benefits for people above age 55. Table 4-9 summarizes some of the benefits as expressed by South Carolina's lieutenant governor. These benefits are cumulative for residents as they age. The tax benefit for seniors that receives the most recognition is the homestead tax exemption. Through this benefit residents over the age of 65 can exempt the first $50,000 of fair market value of their home from municipal, county, school, and special assessment property taxes. In 2001, there were 287,894 households that received this exemption for a total tax

benefit totaling $114 million (*48*). In 2002, *Kiplinger's* magazine ranked South Carolina as the fourth most tax-friendly state for people over the age of 65, considering property, state income, and sales taxes. In 2004, the Tax Foundation ranked the state at 47th in the country for tax burden on seniors, considering property, state income, and sales taxes (*49*).

Many communities view retiree migration as an economic development opportunity. It is especially attractive for rural areas that struggle economically. Migrating retirees can account for growth in jobs, population, and taxes paid to local governments and school districts. They also donate volunteer service hours and dollars to communities and can bring an influx in savings to local banks (*45* and *47*); however, they also can contribute to increased land values and property taxes, which can make housing less affordable. Also, increases in any residential population can cause issues such as traffic congestion and costly expansion of water and waste disposal systems (*45*).

Models predict that adding between one and four retirees leads to the creation of one job. The majority of the jobs created are in the service sector, with some job growth in construction, real estate, and health care. For areas with high unemployment, these service jobs contribute to a higher median family income (*45*). In this way, the benefits of service-sector jobs are more significant in areas with high unemployment than areas with relatively low unemployment.

Population growth is more advantageous for areas that have experienced population decline than for areas that are rapidly growing. In fact, additional population growth in rapidly-growing areas can place cumulative burden on municipalities to provide new infrastructure. It has been determined that new residents reduce per-capita costs of local government until a density of 250 persons per square mile is reached, after that point, the cost per capita rises exponentially (*46*). Thus, marketing an area as a retirement destination may be detrimental to areas that are already perceived as destinations. Additionally, potential conflicts may arise in areas that attract a large number of retirees relative to the number of long-time residents. These conflicts may center on issues such as land use or social norms such as hunting (*45*). In declining areas, however, population growth can help keep businesses open, schools functional, and services available.

The tax growth that retirees can bring is regarded as one of the most attractive reasons to market an area as a retirement location. Most studies have found that although retirees draw on public spending for public transportation and health services, they do not draw for expensive uses like education (*45* and *50*). This scenario results in a net benefit in property tax

revenue to the community. In Broward County Florida, retirees "pay $189 million in county and school taxes over the amount they require in services" (*47*). Senior citizens also contribute to taxes when they make purchases and "seniors tend to have a high propensity to spend compared with the rest of the population" (*46*). They can contribute to an overall significant increase in sales tax revenue.

It is important to note that the economic benefits for rural areas may be less in direct spending within the community than anticipated; there may be more benefit to the outlying region. If a community does not have the goods and services that retirees seek, the retirees will go to another area to purchase the goods and services they want. In Loudon County, Tennessee retirees with average annual expenditures of $40,000 migrated to a planned rural retirement community located in the county. Due to a lack of sufficient goods and services, the county only captured 34 percent of the retirees' expenditures, while neighboring metropolitan Knox County captured nearly two-thirds of the retirees' expenditures (*46*).

Sequim, Washington demonstrated an example of a rural community that changed when it became identified as a retiree destination. In comparing the number of shops and services available in the town in 1970 and 1990, a dramatic difference is noted. The number of physicians went from 5 to 29, the number of restaurants from 8 to 37, attorneys from 1 to 9, beauty shops from 3 to 12, and travel agents 0 to 4 (*47*). The town is no longer a small town. It is now a small city. The diversity of goods and services available are available to all members of the community and contribute to greater consumer choice. There is also, however, increased traffic congestion and a change in community character.

Senior citizens tend to volunteer and donate money to charity and work as a significant portion of America's volunteer workforce (*33*). This activity can dramatically affect the quality and quantity of civic and charitable organizations in a community. In Florida, 2.1 million people over the age of 50 volunteer a total of 7.5 million person-days to their communities per year. They also donated $3.6 billion to charities in 2000 (*47*).

From 2002 to 2003 the Sage Institute conducted a "Senior Service Needs Assessment" that asked South Carolina senior citizens to identify the strengths and weaknesses of health services offered and potential gaps in service. In response to questions about health services, seniors identified transportation as a service gap. They also stated that non-Medicaid transportation was a service that they would like to see developed in their areas. The seniors who lived in the state expressed their desire for transportation alternatives that enable them to maintain mobility (*52*).

Statewide in South Carolina, some transportation services can be identified by accessing the Lieutenant Governor's Office on Aging website. This website identifies "accessible/lift equipped transportation" for seniors; however, the site does not provide information on transportation options for seniors without physical limitations. Even so, many of the listed agencies are local providers of public transportation and a person could identify transit providers in this manner. Initial searches on the website indicated that there were counties in the state that did not identify any specific transportation services for seniors with physical limitations.

The priorities of the State of South Carolina for senior citizens do not explicitly address transportation for the population of seniors, though transportation is arguably implicit in agency priorities. The Lieutenant Governor's Office on Aging set priorities through initiatives called "5 for 2005." The five initiatives are:

- to address *health and safety* needs by working to create a program that will forgive student loans for medical students who choose geriatrics… additionally, to increase the number of long-term care ombudsmen;

- to work to establish legislation that gives *tax credit* for purchase of long-term care insurance;

- to increase revenue from the *tax on bingo* gaming that provides grant money for senior centers and home-based services;

- to work with the newly established Commission for Aging Review and Evaluation, a group of business, civic, and non-profit leaders, to *identify ways to streamline costs and improve service* to seniors; and,

- to *participate* in the White House Conference on Aging and to hold the South Carolina White House Conference on Aging (*51*).

At the 2005 South Carolina White House Conference on Aging, the nearly-500 participants voted to determine the issues and priorities facing senior citizens in the state. Transportation was not a stated stand-alone issue; it was, however, embedded in the second-priority issue that is the need to develop senior-friendly communities (*52*). The community forums on the topic of developing senior-friendly communities indicated that transportation is a primary concern in many areas of the state. In 8 of the 12 meetings held throughout the state, participants listed transportation as a high-need

issue (*53*). At the state level, transportation has been identified in a secondary way as a priority issue. At a local level, many South Carolina communities have recognized the limitations a lack of transportation services places on their citizens as they age.

Although the Office on Aging did not explicitly include transportation in its "5 for 2005" priorities, in 2004 the State Lieutenant Governor's Office on Aging did identify transportation as an issue in the "State Plan on Aging 2005-2008." This state plan has served as a guideline for the management of programs in the state that pertain to older residents. In the chapter regarding issues, outcomes, and strategies, transportation is identified as a needed enabler for seniors to maintain independence. The growing size of the senior population is identified and it is stated that in order to meet the needs of that population, "alternatives must be explored, implemented and evaluated and coordination among different types of transportation service providers is essential" (*52*). Working with the state department of transportation on coordination efforts has been stated as a strategy to achieve broader transportation coverage for seniors.

4.2.7 Elderly Migration Trends

The benefits that South Carolina affords its seniors makes the state a desirable residential destination for them, which can result in greater need for public transportation. Migration of people as they retire is perceived to be a strong trend in the United States. In fact, older people are less likely to move than younger people. Of all people who moved from 1995 to 2000, moves by people over the age of 65 only accounted for seven percent of the total moves (people over 65 made up twelve percent of the total population); inclusion of people aged 55 to 64 increases this figure to 12.5 percent (people over 55 made up 21 percent of the total population) and within the total older population 22.8 percent did move. Of the moves by older people, 32.3 percent were people over the age of 85, followed by people between age 75 and 84, 21.9 percent, and people age 65 to 74, 21.2 percent (*54*).

Many communities need to consider patterns of migration amongst older citizens; however most seniors choose to age in place; the current senior generation is less likely to move than the one three decades ago. Many people who relocate for retirement do so before age 65. The moving rates for one- and five-year moves are lowest for people over 65 than any other age group (*37*). The majority of the moves that older people make are within the same state or county. Of all moves by people over the age of 65 between 1995 and 2000, 59.7 percent were within the same county. Even 57 percent of the mobile population aged 55 to 64 stayed within the same county. The moves to a different county within the same state were 21.5

percent of the moves by people over 65. Only 18.8 percent of the people over age 65 who moved relocated to a different state (*54*).

Prior to the 1980s, South Carolina did not realize significant gains in retirees; however, from 1985 to 1990 34,251 people over the age of 60 moved to the state (*46*). This in-migration slowed slightly from 1995 to 2000 to 31,789. Accordingly, of all people who moved to South Carolina during 1985 to 1990, people over 65 accounted for just 8.6 percent of the total. This percentage slipped during 1995 to 2000 to just 6.3 percent, compared to the national average of seven percent for the same period (*54*). In the 2000 Census, twelve percent of the total population was over age 65, which means that in-migration has been making South Carolina's population younger overall, rather than older.

While these figures indicate a downward trend, it is important to consider the net migration rates for the state. As shown in Table 4-10, from 1995 to 2000, South Carolina had the fourth highest net migration rate in the country, 33.6. This number expresses how many people over age 65 per 1,000 residents each state is gaining. From 1995 to 2000, South Carolina gained 33.6 people over the age of 65 for every 1,000 people of the general population (*54*). In the context of the state, in-migrants have been younger than the existing population; in the context of the nation, South Carolina is taking in an unusually high number of seniors.

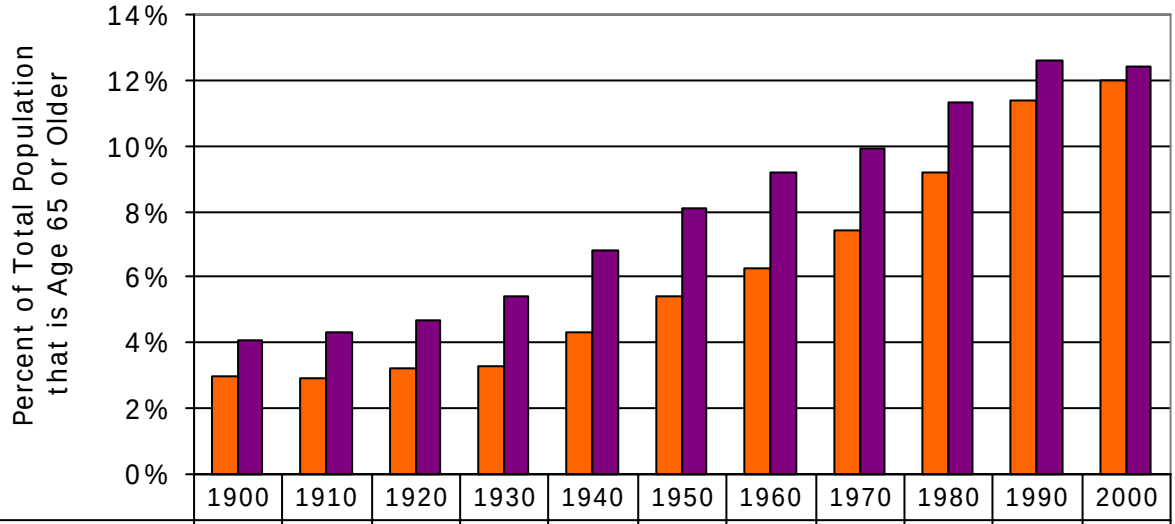
Table 4-10: United States Net Elderly Migration Rates 1995 to 2000

Rank	State	Rate
1	Nevada	114.2
2	Arizona	87.4
3	Florida	56.9
4	South Carolina	33.6

Source: Census 2000 Special Report, "Internal Migration of the Older Population: 1995 to 2000," Wan He and Jason P. Schachter.

The percentage of the total population represented by people over age 65 in South Carolina has been consistently increasing. In 1970, people over the age of 65 represented 9.2 percent of the total population, this number rose to 11.4 percent in 1990, and nearly 12.1 in 2000 (*46* and *55*). These numbers compare with national averages of 12.6 percent people over 65 in 1990 and 12.4 percent in 2000 (Figure 4-4). Notably, the percentage of change for people over the age of 65 in South Carolina was 22.3 percent from 1990 to 2000, twice the national average of 12 percent (*55*). The decrease in the national senior proportion of the population can likely be

attributed to immigration expanding the young population faster than the existing population is aging.



	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000
South Carolina	3.0%	2.9%	3.2%	3.3%	4.3%	5.4%	6.3%	7.4%	9.2%	11.4%	12.0%
United States	4.1%	4.3%	4.7%	5.4%	6.8%	8.1%	9.2%	9.9%	11.3%	12.6%	12.4%

Data Source: United States decennial Census

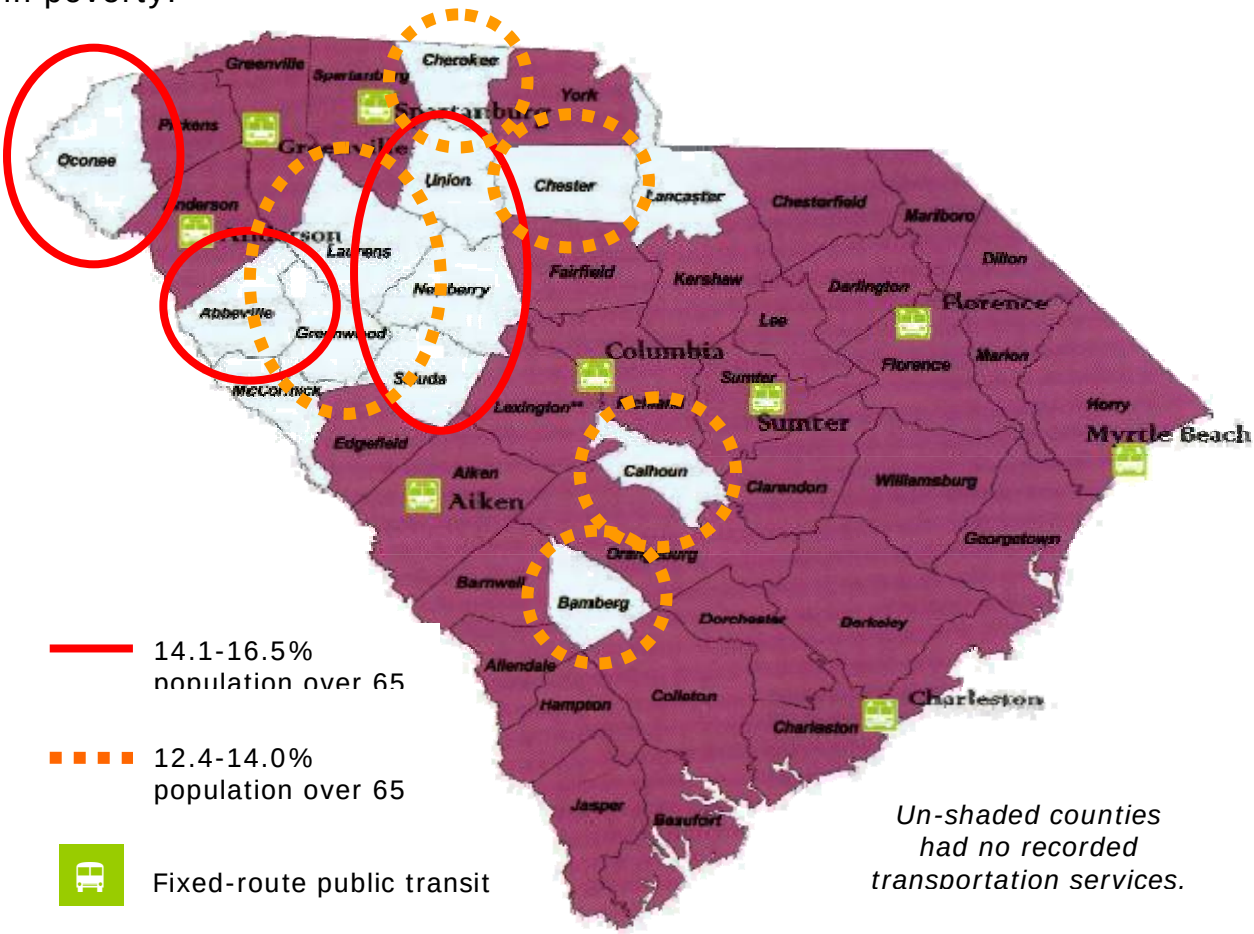
Figure 4-4: The percentage of state and national population over age 65 continues to grow, but South Carolina has traditionally lagged behind the national average.

New evidence has pointed to a net return migration from southern retirement destinations to northern homes with family and social services. Census data since 2000 have indicated that older seniors over age 75, who typically have little wealth and greater need for support services, are leaving retirement destinations after spending years in them since their 60s. More older seniors moved northward than southward for the first time between 1995 and 2000 (*56*). Mobility provisions have likely contributed to motivating second migrations.

4.2.8 Current and Future Elderly Mobility Needs in South Carolina

As discussed in section 3.1, South Carolina's elderly population has historically lived in rural areas with incomes significantly below the national average, and public transit service has not reached into many of the counties where the elderly have lived (Figure 4-5). The problem has a racial-equity component to consider, as well, because elderly African Americans in the state live disproportionately in impoverished and isolated conditions. While race does not appear to affect propensity to use or need transit, poverty and the inability to afford private transportation does make

an impact. The equitable spirit of transportation legislation such as the 2005 Safe, Accountable, Flexible, Efficient Transportation *Equity* Act: A Legacy for Users (emphasis added) sets precedent to ensure that no populations disproportionately face transportation challenges. The disproportionate poverty of South Carolina's African Americans and elderly merit scrutiny to ensure that a lack of transportation options does not facilitate keeping them in poverty.

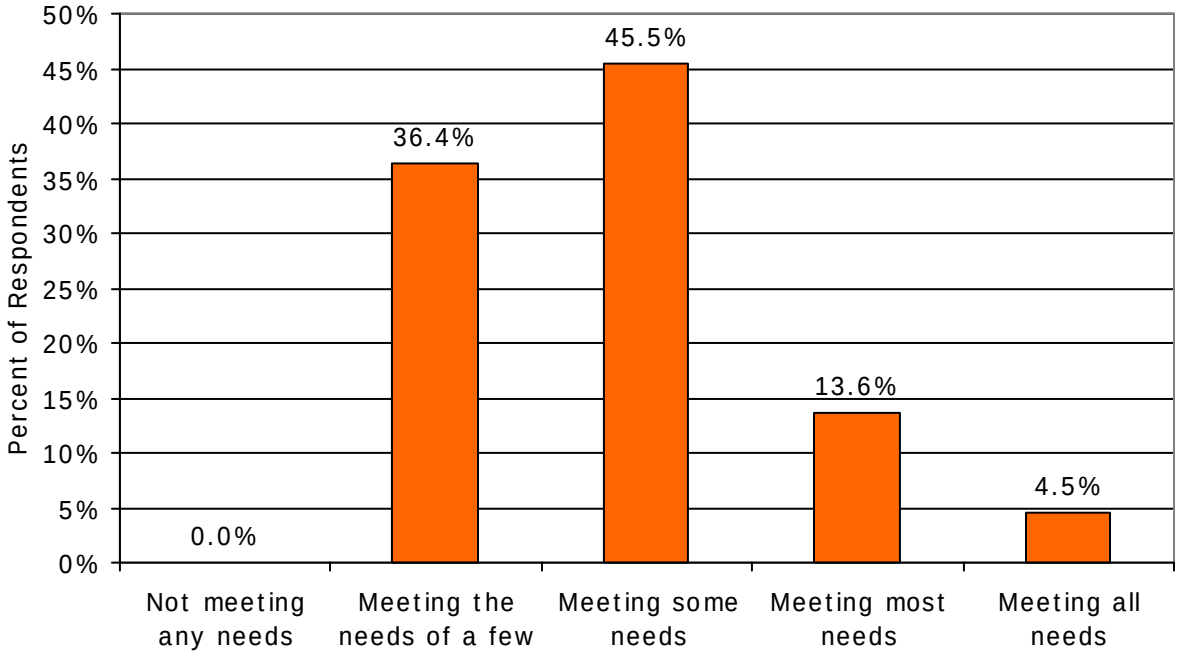


Data sources: *South Carolina's Multimodal Transportation Plan through 2022* and United States Census 2000

Figure 4-5: As of 2002, South Carolina had eight counties without public transit service but with elderly populations above the national average of 12.4 percent.

Clemson University's 2006 survey of South Carolina transit stakeholders dedicated several questions to the issue of elderly mobility. Outlooks on current demands, populations, and transportation availability, as well as future predictions on these concepts, were gauged to see the state of elderly mobility and what direction it is expected to take.

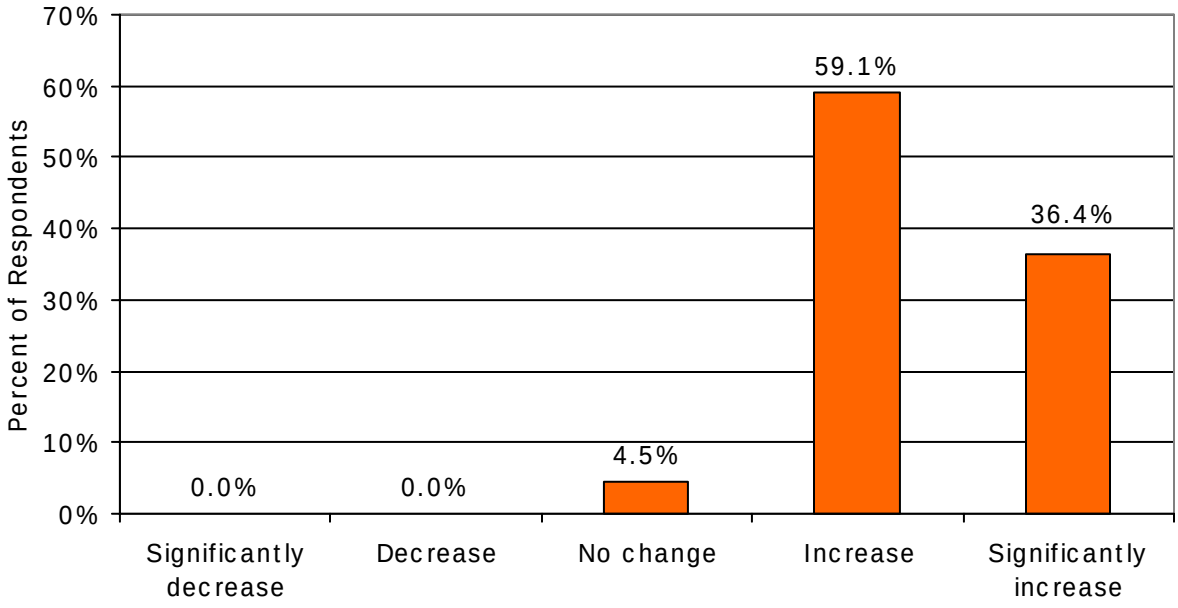
With a total of 81.9 percent of transportation service stakeholder respondents believing that only some or a few of the transportation needs of the elderly are being met currently, the lack of transportation available to older residents of the state was well understood (Figure 4-6). The 4.5 percent of survey respondents who declared that all of the elderly population's needs were already met likely came from a certain context of elderly living: around the state, some councils on aging were found to provide full-service transportation to their clients, hence meeting all of their clients' transportation needs. These full-service situations appeared to be the exception rather than the rule in the state.



Data source: Clemson survey of South Carolina transit stakeholders (2006)

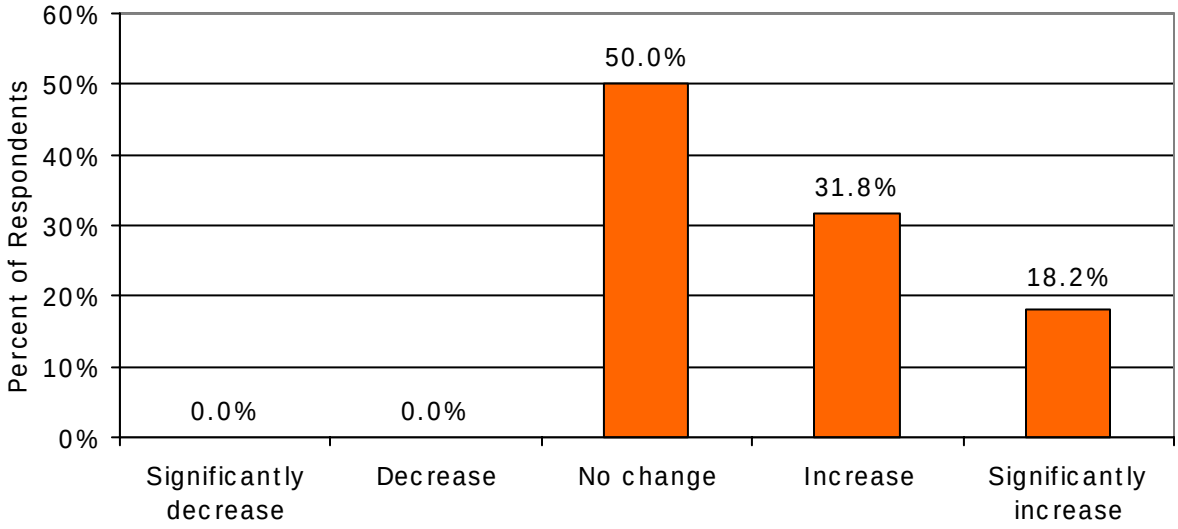
Figure 4-6: More than 80 percent of stakeholders rated current availability of transportation options to the elderly in South Carolina as meeting no more than some of the needs.

There is cause for concern with regard to the anticipated availability of transportation to the elderly over the next ten years. As Figure 4-7 shows, survey respondents anticipated that the baby boomers will place increased demand on transportation in the state in coming years. Over 95 percent of them believed that the demand for transportation from the elderly will increase or significantly increase over the next ten years. Just 4.5 percent of the respondents expected that there would be no increase in elderly transportation service demand in the state.



Data source: Clemson survey of South Carolina transit stakeholders (2006)

Figure 4-7: When asked how they thought demand for transportation for the elderly will change in the next ten years, survey respondents overwhelmingly expected an increase in demand.



Data source: Clemson survey of South Carolina transit stakeholders (2006)

Figure 4-8: Survey respondents split evenly between expecting no change in the availability of transportation for the elderly in the next ten years and anticipating an increase in availability.

In the face of widely-expected increases in demand for elderly transportation services, one half of respondents foresaw an increase in transit available for the elderly over the next ten years; only 18.2 percent said availability would significantly increase (Figure 4-8). This conflict between expected needs and availabilities shows that even though the stakeholders believed that there would be a large increase in demand from the elderly, no change in transit supply is projected. The opinions came from all sectors: there was no relationship between the agencies the respondents represented, the locations in the state, and their opinions regarding transportation provisions to the elderly.

If survey respondents indicated an expectation of increased demand for transportation services, they were given an opportunity to indicate verbatim how they felt increases in demand for transportation services would be accommodated. Several indicated they felt coordination of transportation services would provide a means to increase the capacity of the system so that more users could be accommodated. A respondent who represented a county government said that in order to meet future demand the best way "will be to utilize and somehow coordinate service among human service agencies that already provide some transportation services." A social services agency stated, "Currently we participate as a member of the Regional Transit Council with the goal of coordinating with both public and private providers to promote transit service delivery to the general public. Several pilot projects and studies are ongoing to help attain the goal." There is recognition from some survey respondents that transportation coordination can be a successful strategy to increase the availability of transportation alternatives to users.

Many respondents commented that limited funding impeded the ability to accommodate future transportation demand. A senior-services center stated, "Unless there are new resources there can be no increases. [There will] probably be reductions due to gasoline, maintenance and staffing." Funding was not generally a singular problem; the capacity to increase transportation availability would require that localities and the public lend their support to the solutions. A representative of a council of governments indicated, "Unless we can get local entities to realize that there must be a local commitment of resources, there will not be much change. We need to mobilize the public to understand how they can influence the provision of transportation services. Also, we should look at trying to maximize what is currently in place to provide more transportation options. [The] answer is not just to throw money after a problem, but rather to look at how we can do things differently."

One verbatim response indicated there might be severe problems in working towards accommodating the anticipated increase in demand for transportation services. A disabilities and special needs board declared it faces an expected increase in demand, but currently has difficulties with an aging fleet of vehicles. The board's respondent stated, "We have not developed a plan to address future demands for transportation service because of budgetary restraints and [an] aging fleet." South Carolina has many pre-existing challenges, which will make increased demand for senior transportation even more difficult to accommodate in the future and might present difficulties if the state seeks equity in the provision of transportation services to provide equitable service to the African-American poor.

4.2.9 Funding

Most, if not all, South Carolina councils on aging that participated in site visit interviews reported that lack of funding posed a severe barrier to their ability to perform services for the elderly. Agency funding providers have included the South Carolina Department of Transportation, the Department of Social Services, the Department of Health and Human Services, foundations, vocational rehabilitation agencies, and private entities. The funding scenarios were generally consistent, though interviews revealed some creative alternatives.

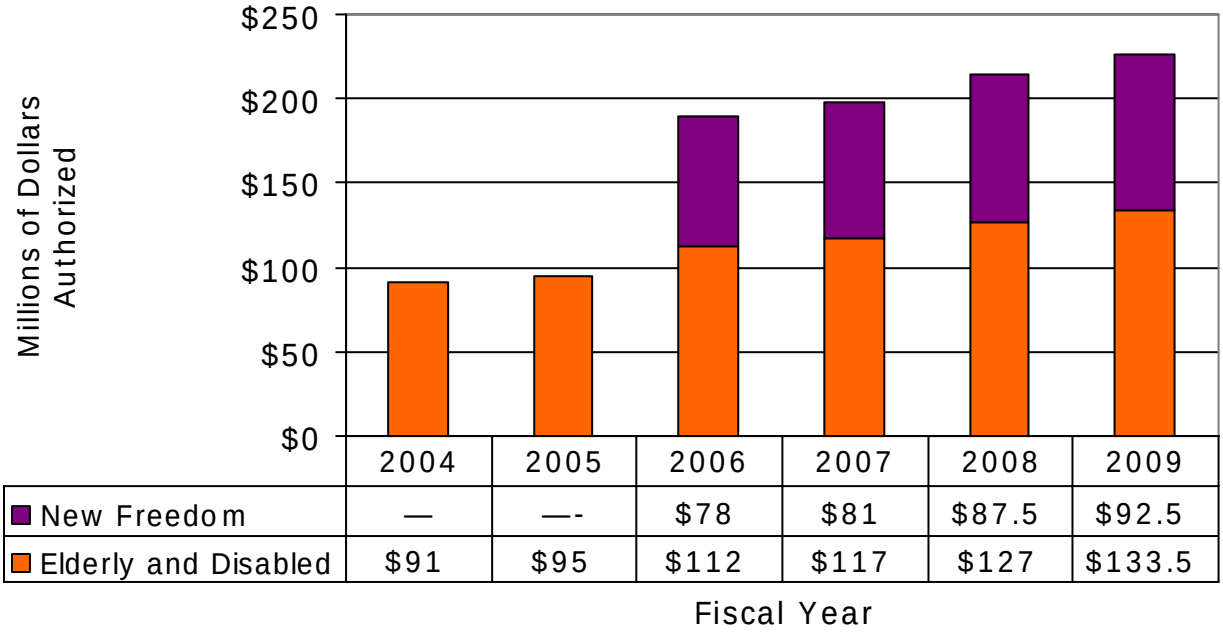
4.2.9.1 Federal Transportation Funding

The 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: a Legacy for Users (SAFETEA-LU) established significant changes in funding programs that will better enable communities to use funding for transit provision. SAFETEA-LU for the first time has allowed federal grant money from an agency other than the Federal Transit Administration (FTA) (such as grants dedicated to health and human services) to be used as matching funds for federal transit funding programs.

The level of federal funding dedicated to the elderly and disabled has increased (Figure 4-9). Allocations for the Elderly and Disabled Persons program (49 USC 5310) are planned to increase by 50 percent through the term of the authorization legislation. SAFETEA-LU has also developed the New Freedom program (49 USC 5317) as a new formula funding program to establish transportation services to assist the disabled beyond the baseline of the Americans with Disabilities Act. Apportionment under this program has been based on a state's disabled population with:

- 60 percent for urbanized areas with population greater than 200,000 residents,
- 20 percent for urbanized areas with fewer than 200,000 residents, and
- 20 percent to states for use in rural areas.

South Carolina stands to benefit greatly from the legislative provision for rural areas.



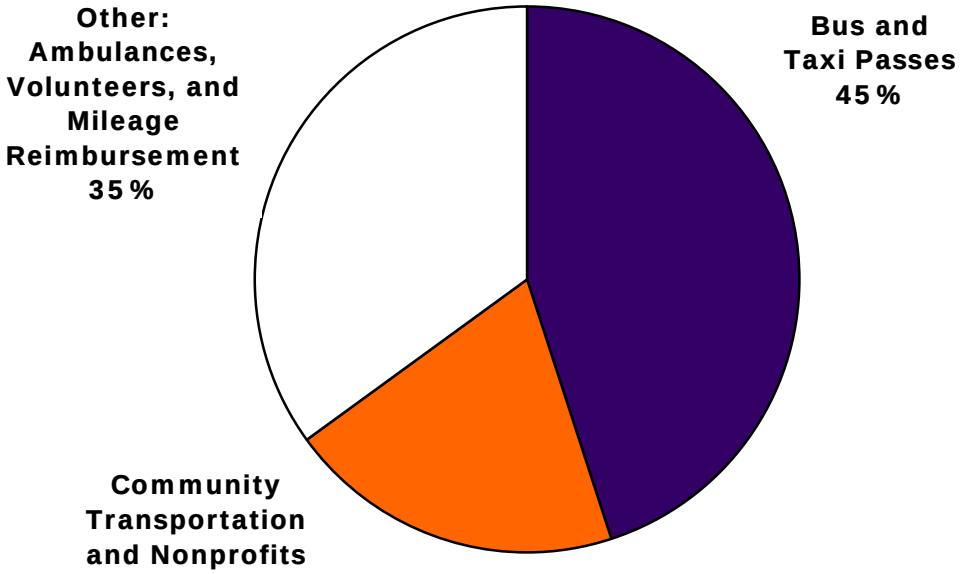
	2004	2005	2006	2007	2008	2009
New Freedom	—	—-	$78	$81	$87.5	$92.5
Elderly and Disabled	$91	$95	$112	$117	$127	$133.5

Figure 4-9: SAFETEA-LU has increased existing funding for elderly transportation and started the New Freedom funding category as of fiscal year 2006.

Federal funding for senior transportation has expanded substantially; however, recent legislation has added the caveat that states must implement transportation service coordination planning to take advantage of the funds. Councils on aging and other providers of human services all need to participate to ensure that seniors receive the maximum benefit of federal transportation funding available.

4.2.9.2 Medicaid Transportation

The federal Medicaid program, which financially supports healthcare for low-income, elderly, and disabled Americans, provides funding to states to distribute to qualified citizens according to individual state policies. Federal law requires states to ensure transportation to and from healthcare (both emergency and non-emergency) for Medicaid recipients, and the combined federal and state contributions to Medicaid transportation total $1.75 billion annually. Medicaid recipients across the nation have used a variety of transportation options, as indicated in Figure 4-10. The Medicaid program uses a cost-reimbursement system (*57*).



Source: Burkhardt, John (Summer 2006). "Medical Transportation: Challenges of the Future," *Community Transportation*, volume 24, number 4. http://www.ctaa.org/ct/summer06/

Figure 4-10: A mix of public and private transportation services provide Medicaid trips across the nation.

Given the Medicaid program's substantial spending on transportation, the SAFETEA-LU provision allowing federal non-transportation money to serve as local match for federal transportation money creates opportunity for coordination of medical transportation. The Medicaid money can support regional transit authorities and other transportation service providers. Based on this new provision, localities can use Medicaid money to help create limited public transportation services.

The South Carolina Department of Health and Human Services (DHHS) handles Medicaid administration within the state. A number of different types of agencies (Table 4-11) are qualified to provide transportation under Medicaid provision (*58*). The Department differentiates between contractual, ambulance, and individual transportation service. Medicaid recipients are allowed one escort for individual and contractual transportation, which means that transportation providers must allow vehicle capacity to accommodate both the patient and an escort.

Table 4-11: Medicaid Transportation Scenarios in South Carolina

Types of Medicaid Transportation Providers	Types of Visits
• Councils on aging • Transit authorities • Community action agency • Regional medical center • Private for profit provider • Individual transportation providers • Wheelchair ambulance	• Dialysis clinic visits • Early periodic screening, diagnosis and treatment (EPSDT) • Medical appointments • Doctor's visits for pregnancy • Dentist visits • Eye care • Adult day care centers • Mental health and other clinical and special medical needs

Source: South Carolina Department of Health and Human Services
http://www.dhhs.state.sc.us/dhhsnew/transportation.asp

Importantly, just before this report went to print, South Carolina declared it would transition to a brokerage system for Medicaid transportation, following trends in other states (Kentucky, Pennsylvania, Oregon, Washington, Missouri, and Georgia). The brokerage system revolves around a broker acting as administrator for the overall system. Their responsibilities include:

- registration information for eligible individuals;
- contracting for transportation with private for-profit and private not-for-profit operators;
- making reservations, scheduling, dispatching and maintaining equipment;
- driver training and vehicle procurement;
- risk management and quality assurance;
- agency billing and record keeping;
- providing reimbursement to operators; and
- maintaining insurance (*59*).

The goal of a brokerage system for Medicaid transportation is to improve access to clients. Cited benefits of such systems include “making more funding readily available for use, providing more transportation services overall, avoiding service duplication between agencies, improving the efficiency of transportation providers, and molding comprehensive transportation systems” (*59*).

Upon implementation of the brokerage system, preexisting relationships between local transportation providers necessarily change. This change

might create a shock in regions where interagency relationships and responsibilities have developed through years of painstaking effort. On June 7, 2007, South Carolina created the Medicaid Transportation Advisory Committee with a bill that states that, "The advisory committee shall meet at least quarterly to review issues and complaints concerning the Medicaid Transportation Brokerage System and shall make recommendations for the resolution of these issues and complaints. The advisory committee shall issue a report quarterly to the Governor, Senate, and House of Representatives" (60).

4.2.9.3 Other Funding Sources

County and municipal funding sources often fill gaps, but few local governments have sufficient resources to serve as primary funding providers. Local faith-based organizations have also made small contributions, but they do not likely have sufficient resources to provide substantial operating assistance.

Several interviewees reported finding substantial support and funding through nonprofit agencies and foundations. United Way has demonstrated interest in providing leadership for coordination efforts while the Sisters of Charity has provided at least two grants to help launch service. Grants frequently fund seed projects over a short term with the intent that a seed is planted and resources emerge later to sustain the new growth.

4.2.10 South Carolina Elderly Transportation Provision and Coordination

Councils on aging tend to be relatively small organizations, but structured and motivated to provide high service quality to promote quality of life for their clients. Several of these agencies provided extensive services, and many interviewees from these agencies had considered or explored different means of coordinating transportation services.

4.2.10.1 Transportation Services Provided

Case study interviews with councils on aging and other providers of transportation for the elderly across South Carolina revealed a wide range of service offerings. Service provisions ran the spectrum from periodic home delivery of meals to full service transit offerings. Typical destinations included senior centers (sometimes known as nutrition centers, as shown in Figure 4-11), healthcare facilities, grocery stores, and other shopping locations. The destinations were sometimes standard, which offered the potential for fixed routes (e.g. routes between nutrition centers and shopping venues) and potentially fixed schedules. Drivers could be volunteers working odd hours or full-time vehicle operators with commercial driver's licenses; part timers most frequently drove the vehicles. Care from drivers ranged from the standard regional transit authority door-to-door

service to full door-through-door personalized service. Service operations ranged from the relatively simple delivery of meals to full-time dispatch through RouteMatch software and vehicle tracking with Nextel global positioning radios.

Figure 4-11: Councils on aging provide transportation services to take seniors to nutrition centers where they can eat a meal and socialize.

Transportation made up varying proportions of the roles of councils on aging. Some councils on aging kept their transportation fleets and services to the minimum necessary whereas others considered transportation the biggest service they were providing such that they were willing to expand their services to provide for the general public through coordination. In one case, a council on aging that had recently expanded its transportation service offerings nearly tripled its annual budget by pursuing transportation funding; however, this tripling in benefit needs to be reviewed in context that costs would have risen proportionately as well.

Many of the councils on aging appeared to struggle with the extents of their **transportation service areas** (technically called catchment areas). In most cases, interviewees reported that they wished they could find

resources to expand services to reach seniors living in rural areas in their regions. Some councils on aging had reduced their service regions due to lack of funding. The spread-out nature of senior settlement patterns in rural areas frustrated the efforts of a number of service providers; one interviewee suggested that educating seniors on transportation offerings might increase demand and create viable pockets of demand to justify service costs. Border issues also discouraged some senior transportation service providers because no council on aging could enter the territory of another like agency. One agency reported receiving frequent requests for transportation service that it had left unfulfilled due to the jurisdiction of another council.

4.2.10.2 Coordination Potential

South Carolina's stakeholders in senior transportation brought up a number of issues they felt needed to be addressed when considering coordinating transportation service. The specific needs of the elderly almost always underlay coordination concerns.

Differences in service scope stood as one of the biggest barriers to transportation service coordination for the elderly. Some councils on aging insist on providing full door-through-door service, which might entail going into homes, helping clients dress, locking the door, and assisting the person to the vehicle. Other agencies (including many regional transit providers) consider that much physical contact and access to a client poses too much potential liability. Most agencies standardized on curb-to-curb service. Variations between these extremes could include meeting passengers outside their doors and providing hands-on assistance for boarding and alighting.

Clientele characteristics could stand as either a barrier or a catalyst to coordination. Some clients can be difficult because seniors tend not to like change; therefore, they want to see the same drivers at the same time and in the same vehicles. On the other hand, seniors tend not to burst out in violence or participate in other behaviors that make sharing vehicles with them unappealing. Some transportation providers standardized on serving only seniors. One council on aging specifically opted not to pursue section 18 Medicaid funding because the grant would require serving people of all ages. Other providers considered mixing generations feasible and possibly even desirable. Insurance and liability issues loomed underneath comments related to clients of varying ages sharing vehicles. Mixing Medicaid and non-Medicaid passengers also emerged frequently in interviews with differing results. Some senior service providers believed that Medicaid required its passengers to receive dedicated service while other agencies offered seats on Medicaid trips to the general public.

Public transit research has demonstrated repeatedly that **out-of-vehicle wait time** stands as one of the biggest deterrents to riding public transit (*61*); senior riders do not differ. Interviewees commonly referred to wait time as one of the biggest reasons why councils on aging have opted to offer their own transportation service rather than contracting with dedicated transit agencies. In past experience, regional transit authorities have made seniors wait for hours for their return trips from stores or healthcare facilities, and providers of senior care considered these long waits detrimental to health. One interviewee recommended running more buses. Another pointed out that if delays must occur, dispatchers should allocate resources wisely: seniors enjoy spending time in nutrition centers and might not mind delays as much as people waiting at a healthcare facility.

Figure 4-12: Councils on aging tended to use a variety of vehicles, including fifteen-passenger vans (left) and cutaways (right).

Interviewees all described similar types of vehicles used in the transportation **fleets** of councils on aging (Figure 4-12). Fleet sizes of councils on aging in the site visits ranged from 6 to 29 vehicles (Figure 4-13) and included minivans, fifteen-passenger vans, cutaways, and cars. Cutaways appeared to be favored vehicles of these service operators. Not all vehicles were necessarily equipped for wheelchairs. Special fleet requirements did not appear to pose a problem for councils on aging to coordinate with other providers.

Figure 4-13: Many of the senior centers visited were running fleets with a substantial number of vehicles.

4.2.10.3 Coordination Partners

Several councils on aging have at least considered sharing vehicles with **disabilities and special needs boards**. One council on aging reported it had created an agreement to share vehicles with a board, but the fixed routes and fixed demands of the board's clientele made it so the vehicles were not touched. Although this one case suggests vehicle sharing between boards and councils on aging might require more effort than the benefit justifies, vehicle sharing appeared to be the most common form of coordination between the councils and the boards.

A number of stakeholders in the case study regions had had experience with contracting to a **regional transit authority**. Primary reasons for switching from contracted service through a transit authority to in-house service included long wait times after medical appointments or shopping and high costs of contracts.

Not all of the councils on aging appeared to understand the costs associated with providing transportation service fully. Some saw owning and operating vans as cheaper than contracting for service trough a transit authority, but they tended not to consider the salaries of the relatively high-wage social workers who were driving their vehicles. One council on aging reported that it had considered the cost of the driver and found it cheaper to hire in house because title 5 senior employment funding made it cheaper to own and operate vehicles. Another council chose to work with contracted service because the regional transit authority contract could save money in personnel, insurance, maintenance, fuel, and other aspects of operations.

The concept of coordinating with practitioners in the **medical industry** drew varied responses. One interviewee declared that seniors who cancelled medical appointments usually did so due to lack of transportation. Another council on aging reported that it coordinated with a specific doctor to arrange transportation for dialysis patients. That council on aging would even leave the state to bring patients to that doctor to support the relationship. In another case, doctors' offices would call dispatchers three days in advance of patient appointments to ensure transportation arrangements. In contrast, some Medicaid transportation providers reported that the Medicaid program prohibited them from calling doctors to adjust appointment schedules. These transportation providers reported costly wait times because appointments did not fit well in their dispatch schedules.

If coordination with the medical industry can work, several potential benefits can emerge. Primarily, medical appointments can be scheduled according to when transportation logistics work best.

- For example, vehicles primarily come available after peak morning traffic; therefore, routine medical care for seniors could most efficiently be served in the midday. One provider of senior transportation reported that it kept "forever lists" of people on chemotherapy, dialysis, and other long-term care requiring standing medical appointments; these predictable appointments could easily work with transportation service schedules if medical practitioners are called into the transportation provision process.

- Medical trips take some agencies frequently to other cities with medical facilities, such as Columbia, Charleston, Charlotte, and Augusta. Given that passengers choose similar long-distance destinations for medical care, potential exists to coordinate multiple passengers before vehicles make long trips.

Unusual forms of coordination with the medical industry included paying drivers through the local hospital and arranging contracts with local hospitals to fill empty seats.

Most interviewees saw no potential for coordinating with **other councils on aging**. Because most councils on aging provide transportation to nutrition centers and these centers serve lunch, councils on aging could not likely share vehicles and drivers that must be allocated to different locations at the same time of day.

4.2.11 Conclusion

Transportation is vital for quality of life, and access to it is often a point of distinction among age, income levels, race or ethnicity, and overall health and welfare. An efficient network of public transportation will provide a higher quality of life for incoming senior citizens, residents of low incomes, people who are isolated in poverty or rural areas, and those elderly who wish to age in place, as well as the citizenry in general. Improvements to public transportation like kneeling buses, feeder routes, deviated-fixed routes, and coordination with human services or private providers can benefit senior citizens along with every other citizen. Coordination among transportation providers can be used to expand service, reduce costs, and increase funding opportunities thus making transit available more frequently or to areas that were devoid.

South Carolina's survey responses have demonstrated that stakeholders directly involved with transportation needs in the state feel the basic needs of the elderly are left unmet. Expanded transportation services could enable the baby boomers to remain mobile and involved in their communities, but anticipated increases in demand pose a threat against already insufficient levels of funding. Community leaders and planners must start now to find creative solutions to mobility and needs of access.

State and local governments and transportation agencies must take a proactive role to address the needs of the growing elderly population. Emphasis should be placed on current and anticipated needs of baby boomers. Retirees will continue to search for places to retire that have mild climates and beautiful landscapes. Strategies for migrating retirement should focus on the advantages of a high quality of life rather than low cost of living, while transit planning must find ways to coordinate and regionalize transit service particularly to geographically remote communities where people are likely to retire in place. Ensuring mobility and access to needs and amenities will sustain a healthy population and quality of life.

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4.3 People with Disabilities and Special Needs

About six million Americans with disabilities experience difficulties getting the transportation that they need, and 1.9 million of them never leave their homes; 560,000 attribute their isolation entirely to transportation difficulties (*62*). A survey of 644 disabled adults in New Mexico found that 37 percent had missed out on job opportunities due to lack of transportation, and 23 percent had lost jobs because they could not reliably access work (*63*).

In South Carolina, disabilities and special needs boards provide services to disadvantaged populations, primarily with physical and mental handicaps. The ability to provide transportation services to the disadvantaged population is a necessity. This section discusses the unique role that disabilities and special needs boards play in the transportation industry.

4.3.1 Legal and Governmental Foundations

Transportation service for citizens with disabilities and special needs has its foundation in institutions spanning federal, state, and local levels of government. This section discusses national commitment, federal resources and public resources designated within South Carolina.

4.3.1.1 National Commitment to Equity

The Americans with Disabilities Act of 1990 set the stage to improve social equity for people with a variety of disabilities (Figure 4-14). This Act has affected practically every aspect of transportation provision for people with disabilities and special needs, prompting federal, state, and local governments to develop standards, services, and agencies geared toward assisting disabled populations.

It is the purpose [...]

(1) to provide a clear and comprehensive national mandate for the elimination of discrimination against individuals with disabilities;
(2) to provide clear, strong, consistent, enforceable standards addressing discrimination against individuals with disabilities;
(3) to ensure that the Federal Government plays a central role in enforcing the standards established in this chapter on behalf of individuals with disabilities; and
(4) to invoke the sweep of congressional authority, including the power to enforce the fourteenth amendment and to regulate commerce, in order to address the major areas of discrimination faced day-to-day by people with disabilities.

Source: Americans with Disabilities Act - Title 42 of the U.S. Code

Figure 4-14: The Americans with Disabilities Act provides basis for social equity for Americans with disabilities and special needs.

The Community Transportation Association of America and Easter Seals Project ACTION put together a reference document in 2002 that identifies an array of federal funding sources for transportation for the disabled (*64*). Table 4-12 lists the federal agencies and their respective funding programs identified in that document.

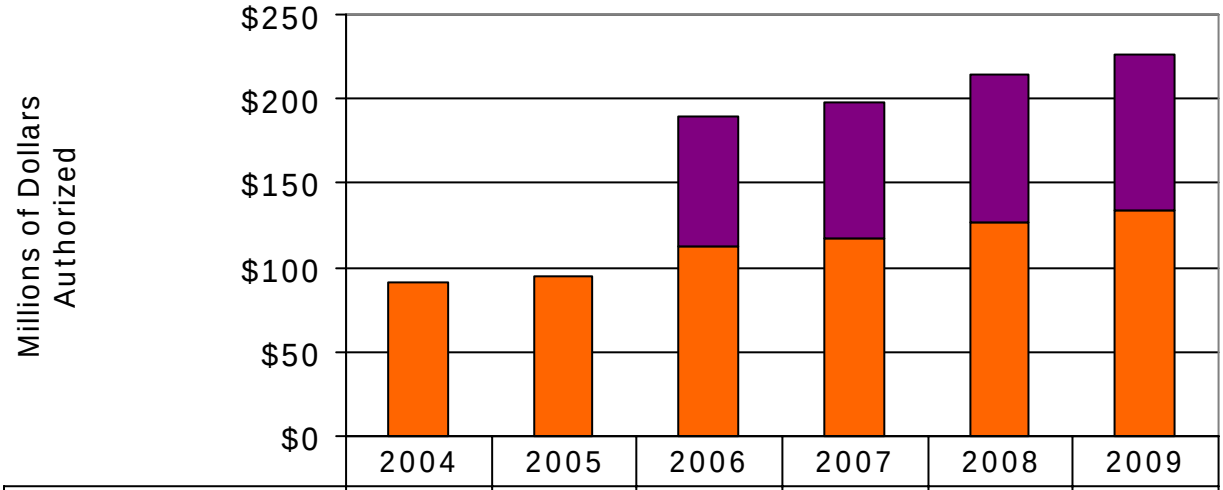
Table 4-12: Federal Funding Sources for Transporting the Disabled

Federal Office	Programs
Department of Education **Office of Special Education and Rehabilitative Services**	• Centers for Independent Living • Individuals with Disabilities Education Act Amendments of 1997 • Vocational Rehabilitation Demonstration and Training • Vocational Rehabilitation Grants
Department of Health and Human Services **Administration for Children and Families**	• Developmental Disabilities Basic Support and Advocacy Grants • Developmental Disabilities Projects of National Significance • Head Start • Temporary Assistance for Needy Families (TANF)
Department of Health and Human Services **Administration on Aging**	• Older Americans Act, Title III – Grants to States and Community Programs
Department of Health and Human Services **Centers for Medicare & Medicaid Services**	• Medicaid Home and Community-Based Services 1915(c) Waivers
Department of Labor **Employment and Training Administration**	• Senior Community Service Employment Program • Workforce Investment Act Programs
Department of Labor **Office of Disability Employment Policy**	Unspecified
Department of Transportation **Federal Highway Administration**	• Federal-Aid Highway Program
Department of Transportation **Federal Transit Administration**	• Job Access and Reverse Commute Grants • Metropolitan Transit Planning Grants • Nonurbanized Area Formula Transit Grants • Over-the-Road Bus Accessibility Program • Transit Capital Assistance Program for Elderly Persons and Persons with Disabilities
Social Security Administration	• Social Security PASS • Ticket to Work Incentives Improvement Act of 1999

Source: Community Transportation Association of America and Easter Seals

The federal Department of Health and Human Services oversees provision and administers funding for many of the services related to disabilities and special needs. These services include Medicaid, which is discussed in detail in section 4.2.9.2. People who must access Medicaid services frequently cannot drive or cannot afford travel costs to facilities. Medicaid makes provision for transportation through contracts to transit operators and through transportation funding to care-giving agencies that also transport their clients.

Within the realm of traditional transportation funding through the U.S. Department of Transportation, the latest reauthorization act (the 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act – A Legacy for Users (SAFETEA-LU)) provided substantial increases in funding dedicated to transportation for the disabled. The previously-established Elderly and Disabled Persons program (49 USC 5310) received a strong increase in financial support, and the New Freedom Initiative (49 USC 5317) launched for the first time in 2006 with funding dedicated to assisting the disabled beyond requirements of the Americans with Disabilities Act. Figure 4-15, which is repeated here from section 4.2.9 for ease of reference, shows the new availability of funding under these two programs.



	2004	2005	2006	2007	2008	2009
New Freedom	—	—-	$78	$81	$87.5	$92.5
Elderly and Disabled	$91	$95	$112	$117	$127	$133.5

Fiscal Year

Figure 4-15: SAFETEA-LU has increased existing funding for elderly transportation and started the New Freedom funding category as of fiscal year 2006.

SAFETEA-LU brought some noteworthy administrative changes. Fundamental to provision for the disabled, this Act allows federal funding from agencies other than the U.S. Department of Transportation (such as the Department of Health and Human Services) to stand as local match for these human-service-based programs. This new provision should substantially benefit communities (particularly small and rural communities) that would otherwise have substantial difficulty meeting local match requirements.

A second administrative change in SAFETEA-LU requires service coordination planning to qualify for the federal funding under these programs. Disabilities and special needs boards must participate in the coordination efforts to gain access to federal transportation funds.

4.3.1.2 Care and Transportation in South Carolina

The State of South Carolina has a governmental department dedicated to serving people with disabilities: the Department of Disabilities and Special Needs. The Department's mission is to "assist people with disabilities and their families through choice, pursuing possibilities and achieving life goals, and minimize the occurrence and reduce the severity of disabilities through prevention" (Figure 4-16). This mission statement manifests in two primary types of service at locations indicated in Figure 4-18:

- residential care at five 24-hour facilities in the state (Columbia, Florence, Clinton, Ladson, and Hartsville) and
- community residential services and in-home support services through 39 local disabilities and special needs boards and other community providers (*65*).

Clemson's research has focused on the latter services. Disabilities and special needs boards typically house consumers in:

- non-institutional group homes dispersed across communities,
- day activities offered at a community center (Figure 4-17), and
- job placement and mainstreaming.

Housing typically took the form of group homes in standard single-family houses in neighborhoods. Often four or five residents would live in each house. Board stakeholders who were interviewed described a philosophy of spreading consumers thinly in the community to avoid stigma of institutionalization and isolation. This strategy serves the best interests of individual consumers, and transportation planners must recognize that although the housing situation sets up the least efficient land-use scenario for transportation provision, transportation efficiency is not and should not be the highest priority of the boards.

Mission and Values

The South Carolina Department of Disabilities and Special Needs, as defined in the South Carolina Code of Law, serves persons with mental retardation, autism, traumatic brain injury and spinal cord injury and conditions related to each of these four disabilities.

VISION: Where We Are Going

To provide the best in services to assist persons with disabilities and their families in South Carolina.

MISSION: What We Do

Assist people with disabilities and their families through choice in meeting needs, pursuing possibilities and achieving life goals, and minimize the occurrence and reduce the severity of disabilities through prevention.

VALUES: Our Guiding Beliefs

Health, safety and well-being of each person
Dignity and respect for each person
Individual and family participation, choice, control and responsibility
Relationships with family, friends and community connections
Personal growth and accomplishments

PRINCIPLES: Features of Services and Supports

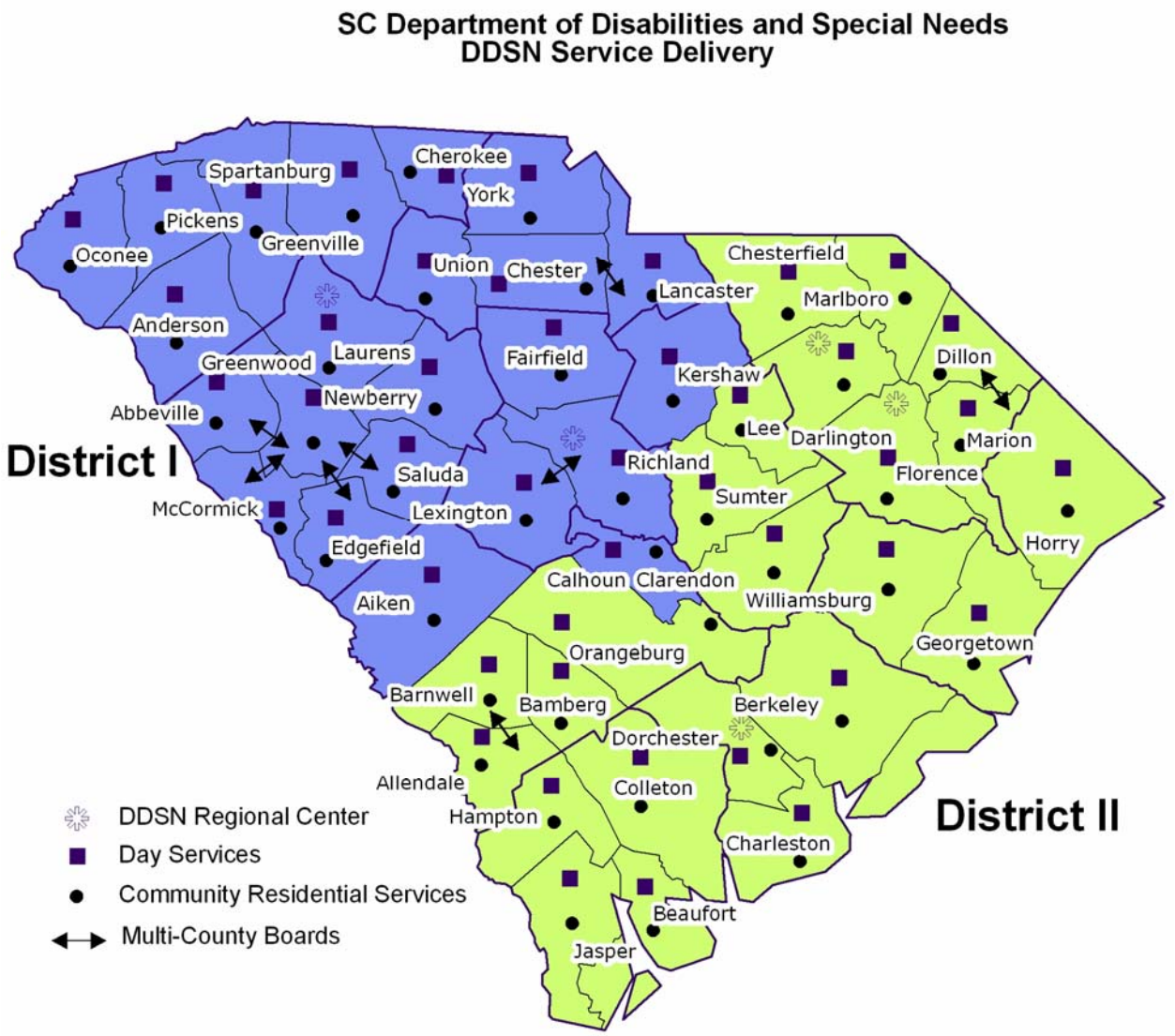
Person-centered
Responsive, efficient and accountable
Practical, positive and appropriate
Strengths-based, results-oriented
Opportunities to be productive, and maximize potential
Best and promising practices

Adopted 11/20/03

Source: South Carolina Department of Disabilities and Special Needs
http://www.state.sc.us/ddsn/mission/mission.htm

Figure 4-16: The guiding mission and values of the South Carolina Department of Disabilities and Special Needs establish the basis for services for people with mental disabilities.

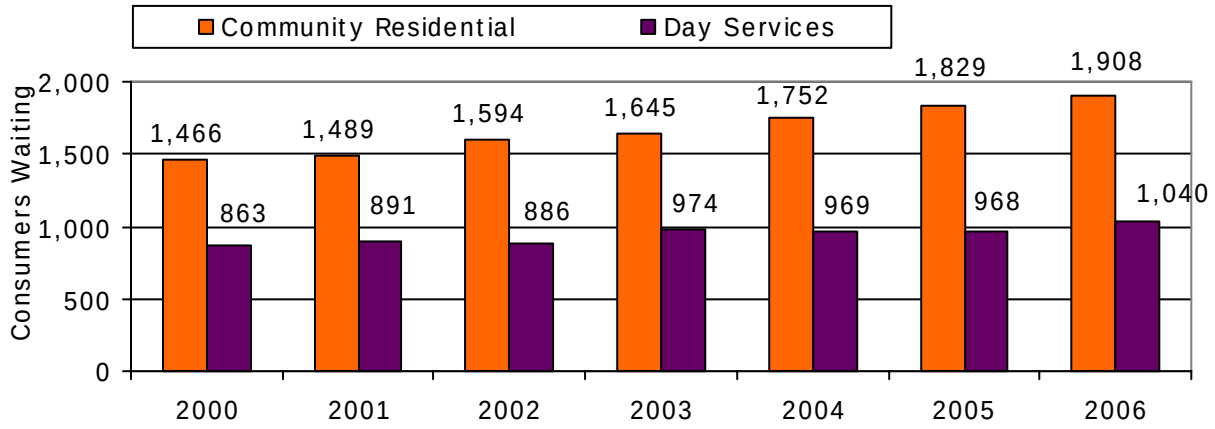
Figure 4-17: The South Carolina Department of Disabilities and Special Needs has created facilities to serve disabled populations.



Source: South Carolina Department of Disabilities and Special Needs (2006). "Annual Accountability Report: Fiscal Year 2005-2006." http://www.state.sc.us/ddsn/BestPractices/DDSN_AccountabilityReport.pdf

Figure 4-18: The South Carolina Department of Disabilities and Special Needs supports a network of regional centers, day service centers, and community residential services in every county.

The Department serves about 27,500 persons with disabilities and special needs, and this service often lasts a lifetime. More than 1,900 people are waiting to receive the benefit of services (Figure 4-19). Services would need to expand by 39.2 percent in the state to meet the need, compared to an 18.0 percent average need for expansion in the nation as a whole (*65*).



Data Source: South Carolina Department of Disabilities and Special Needs (2006). "Annual Accountability Report: Fiscal Year 2005-2006." http://www.state.sc.us/ddsn/BestPractices/DDSN_AccountabilityReport.pdf

Figure 4-19: South Carolina's Department of Disabilities and Special Needs maintains a waiting list for community residential services.

4.3.1.3 Local Organizations and Transportation Services

The mission statement, vision, values, and principles of the South Carolina Department of Disabilities and Special Needs website do not explicitly include provisions in transportation service (Figure 4-16); however, boards must provide these services to the community in order to accomplish the overall vision of "providing the best in services to assist persons with disabilities and their families." Transportation is considered a necessity for disabilities and special needs boards because they cannot provide their services without having access to the disabled population. Disabilities and special needs boards have typically acquired sizable fleets of vans to move their consumers from housing to day activities.

Public transit is a vital component for enabling job placement and access to work for people ready for mainstreaming who cannot drive. Most of the disabilities and special needs boards retained job coaches who helped their clients get placed in employment opportunities. Most coaches set up the transportation services for their clients to maintain their jobs.

One of the major problems with providing the necessary transportation services to the community is acquiring and maintaining sufficient vehicles to provide an effective service. In Clemson's research interviews, one disabilities and special needs board stated that one of their goals was to have as many vehicles as the number of homes they serve, "If we have 80 homes that we serve, we should have 80 vehicles to utilize." Only one

participating board had met that goal; the board was ordering ten-to-twelve more vehicles so it could potentially expand its sphere of influence.

Lack of funding has caused services to suffer because boards across the state have had to focus on day-to-day transportation operations. Budget shortfall and uncertainty lead to inefficient client management.

4.3.2 Consumers of Transportation Services

People with disabilities and special needs had a range of transportation needs that depended on the level of disability, necessary services and care, and residential locations. Transporting consumers to workshops constituted a major portion of transportation services. Consumers had a choice of which workshops and facilities they want to attend; however, they were encouraged to attend the one at the closest facility.

Consumers in community homes required transportation provision for all of their mobility, including access to care services. These people lived together in groups, and the groups largely traveled together in vehicles dedicated to their groups. For instance, one disabilities and special needs board expressed that while all of its consumers were mentally disabled, some of those people also had physically handicaps. They required constant monitoring while they were being transported. About 100 of them lived in homes provided by the board and between 70 and 80 more of them lived in their own homes in the community. The majority of these people needed transportation to day programs in and around the area.

The people living in their own homes might need transportation similar to the mobility needs of average citizens. These people require less care and perhaps less transportation service; however, their destinations are more distributed. These people make trips as individuals and might need transportation to access mainstream jobs in a variety of locations where local land use does not allow access by non-motorized means.

Disabilities and special needs boards face unique transportation challenges because they usually have to cover large geographical areas to serve clients scattered throughout local communities. Housing for consumers of board services covers large areas because disabilities and special needs boards wanted to avoid the institutional look of housing grouped together. Housing might be spread all across a populated area. Conversely, the correspondingly-long commute times can be detrimental to individual clients.

The majority of consumers at disabilities and special needs boards are extremely resistant to change. Emotional and physical stress and tension can arise from simple changes such as vehicle color or drivers. This

characteristic makes many endeavors of coordination between disabilities and special needs boards and other agencies difficult.

4.3.3 Existing Transportation and Fleet Conditions

All of the disabilities and special needs boards interviewed saw needs for transportation beyond their individual agency capabilities. Because the majority of vehicles in their fleets operated on tight schedules with high utilization, boards could not expand services without purchasing new vehicles. Although representatives from local boards wanted to see more transportation, they directed the focus of their own time on their primary mission of serving the disabled.

Driver training differed from agency to agency: some of the disabilities and special needs boards trained for defensive driving while others trained for higher awareness of consumer needs because most of the consumers could not and should not drive.

One of the most unique features of disabilities and special needs boards is that they usually have as many vehicles as they have homes to serve within their spheres of influence. Fleet sizes of boards interviewed ranged from 36 vehicles to as many as 84. These numbers depended on factors such as service area, number of clients, number of routes, and so forth.

Most of the fleets were made up of minivans, wheelchair vans, seven-passenger vans, fifteen-passenger vans, cutaways, and administrative cars (Figure 4-20). The majority of the cutaways had mechanized lifts, but wheelchair vans required two people to operate them effectively. Some boards also operated four-door sedans and box trucks.

Figure 4-20: Vans comprise typical fleets for moving passengers with disabilities and special needs.

Uses of each type of vehicle varied from board to board. One disabilities and special needs board used one-third (12 of its 36 vans) of its fleet for day-program fixed routes while another used just one-quarter (15 of its 60 vehicles) for transporting consumers to day programs. Other vehicle uses included medical appointments, grocery shopping, and other necessities for the consumers who needed constant attention and interaction.

Wheelchair accessibility in vehicles varied from board to board. One disabilities and special needs board stated that most, if not all, of its vehicles complied with the Americans with Disabilities Act while another said that only a few of its vehicles currently comply. Not all vehicles would need to comply because the boards knew which consumers needed specially-accessible vehicles and who could comfortably ride in standard vehicles. Some disabilities and special needs boards had community training homes where each home had its own dedicated vehicle to serve a specific household's mobility needs, such as medical appointments.

4.3.4 Barriers to Coordination

The **unique characteristics of consumers** of the services of disabilities and special needs boards pose the most significant challenge to coordinated operations between the boards and other transportation service stakeholders. Mentally-challenged people can be prone to unpredictable behavior such as violent outbursts or defecation on vehicles. They also tend to find changes in their routines substantially threatening: bus color changes were considered big changes and emotional distress would increase with drivers of other agencies because the consumers would, in essence, be riding with a stranger. Even with calmer individuals with special needs, the general traveling public might fear riding with people with unknown, unpredictable, and misunderstood behaviors.

Fleet capacity was mentioned as a barrier at some of the meetings. The majority of the vehicles in their fleets were full, which left no room for vehicle sharing with other agencies outside of the disabilities and special needs boards. Vehicles were needed on site and on the road to serve the consumers of board services.

Other common concerns with coordinating vehicle operations between disabilities and special needs boards and other agencies related to:

- **human capital investment,**
- **vehicle cleanliness,**
- **vehicle maintenance costs,**

- **liability insurance, especially when it comes to insurance policy expansions due to mixing passengers between agencies, and**
- **hidden or unforeseeable costs.**

Lack of funding consistently emerged as a barrier for many stakeholders. One associate for a disabilities and special needs board representing two counties expressed that while one county received funding for providing transportation services as part of an SCDOT pilot program to use Section 5310 funding for some operating costs, the other county had no transportation money because county leadership did not consider agency transportation as part of the public transportation network. Another disabilities and special needs board stated that it received funding from the South Carolina Department of Transportation to operate its own vehicles. Three years ago, the South Carolina Department of Transportation said that the disabilities and special needs board could not continue receiving money to operate its own fleet until it coordinated with the nearby regional transit authority; however, when the rates for the regional transit service increased, the disabilities and special needs board went back to its own provisions. Lack of funding frequently forces agencies to focus almost exclusively on day-to-day operations rather than long-term planning for the future.

4.3.5 Coordination Opportunities

Participation in transportation service coordination depended on individual agencies and local agency leadership.

- Some disabilities and special needs boards that were interviewed stated that they had been working with their local councils on aging for providing transportation services while others expressed that their local councils on aging did not want to mix vehicles, drivers or clients.

- Some coordination had also taken place between disabilities and special needs boards, regional transit authorities, and local transit services. For example, one regional transit authority served a disability and special needs board at specific times during the day when only the board's consumers rode the bus.

- Another case involved a disabilities and special needs board that allowed the general public to ride in available seats in the board's vehicles, while local transit service transported disabled clients to and from job sites. No interaction problems had arisen with people with special needs riding along with the public, although some people in the general public were hesitant to ride with them. The only problem has come if one of their consumers has needed to be picked up or taken

home from work. The consumer might have to wait too long or leave too early, which can raise anxiety for the ride.

- In a unique case, a disabilities and special needs board would lend its buses to the local Clemson extension service. To address liability concerns, Clemson carried insurance for disabilities and special needs.

Transportation service coordination immediately brings shared vehicles and drivers to mind, and limited opportunity does exist in these sectors for disabilities and special needs boards. Most disabilities and special needs boards transport their clients to workshops during the day. An idea that one disabilities and special needs board expressed was that they could possibly **adjust times for their workshops** so that coordination could take place. Instead of running their workshops from 8:00 am until 2:00 pm they could change it from 9:00 am until 3:00 pm to coordinate with other disabilities and special needs boards in the area and rotate their services between agencies (Figure 4-21). This idea could turn into opportunity for coordination between just disabilities and special needs boards. If implemented and successful, there could also be opportunities for coordination with other agencies.

Figure 4-21: Vans bring consumers of service to special facilities for day activities; these vans might be parked for several hours.

If **financial arrangements with regional transit authorities** can be negotiated, other coordination related to vehicle operations might succeed. One disability and special needs board said that it had experimented with

joint ridership between its consumers and the general public with some success; however, when the rates for the regional transit authority were increased, the board's ability to participate was adversely affected. It must be noted that not all disabilities and special needs boards would embrace such arrangements even if financial obstacles can be overcome through negotiation. The boards need to be trusted to know their own consumers' adaptabilities and tolerances for change.

Given the concerns of mingling people with disabilities and special needs with the general public, the boards might more easily embrace a coordination role that takes advantage of their administrative prowess and exchanges for the transportation expertise of other agencies. The disabilities and special needs boards within South Carolina showed themselves as highly organized, which made them viable entities to come to the table and take responsibility for partnership in coordination. They might have capacity to take leadership in **pursuing grants** or handling **administrative needs** of coordination processes.

To make coordination with the boards work, board leaders need to see benefit for themselves as well as the community at large, and **technology** is another way that disabilities and special needs boards can coordinate their transportation services. One disabilities and special needs board said that it used cell phones installed in vehicles for routing purposes while another board used only common knowledge for routing. A third board said that it would like to have Nextel phones with global positioning capabilities for its vehicles. In-vehicle technology should be standardized at least within regions to facilitate the ability of agencies to interact with each other, and state contracting for technology can benefit disabilities and special needs boards (as well as other human-service transportation providers) statewide.

Each of the interviewed disabilities and special needs boards expressed to the research team that they had considerable demand for their day programs that translated into high transportation demand. One interviewee's agency was in the process of rescheduling its day-program routes because of high demand for service. The manual process of scheduling routes made the endeavor lengthy, suggesting that the state contract for RouteMatch routing software might benefit dynamic disabilities and special needs boards. While the disabilities and special needs boards might not be well served by investing in routing software themselves and training their in-house employees, the boards could substantially benefit from sharing the **routing and routing software expertise** of agencies dedicated to transportation. Similarly, **dispatch** for consumers' trips that do not fall on fixed routes and fixed schedules might be a service that other agencies in the region could supply.

Finally, an option that may work for disabilities and special needs boards that are involved with border issues between states, one disabilities and special needs board indicated some success in developing **interstate contracts** to transport their clients across borders.

4.3.6 Conclusion

While human service transportation coordination stands as a federal goal and unprecedented levels of federal funding have come available for people with disabilities, the unique needs of disabilities and special needs boards present context that must be addressed. Extremely emotionally-challenged consumers of the boards' services cannot face the stress of interacting with the general traveling public, and even mildly disabled consumers might make the general public uncomfortable. Due to the distinctive characteristics of board consumers, mixing passengers should only be considered in highly-specified coordination situations.

Although sharing vehicles, drivers, or passengers might pose too great a challenge for some situations, disabilities and special needs boards can participate in other roles in coordination processes. Technology, organization, leadership, and administration stand as possible avenues to explore. Above all, coordination planning must recognize that the goals of the boards focus on "providing the best in services to assist persons with disabilities and their families" (*65*). Transportation coordination has a role in meeting that goal, but overall service and welfare of those persons and their families must necessarily stand as top board priorities with precedence over other community transportation objectives.

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62 Bureau of Transportation Statistics (April 2003). "Transportation Difficulties Keep over Half a Million Disabled at Home," *BTS Issue Brief*, number 3. http://www.bts.gov/publications/issue_briefs/number_03/pdf/entire.pdf

63 Espinosa, Judith M; Baca, Matthew Baca; Estelle, Amy; and, Mary E White (2002). *At the Crossroads: Disability and Transportation in New Mexico*, chapter 4. http://www.unm.edu/~atr/crossroads.html

64 Community Transportation Association of America and Easter Seals Project ACTION (June 2002). "Building Mobility Partnerships for People with Disabilities: Opportunities for Federal Funding and Promising Practices" http://www.ctaa.org/AccessChicago/Resources/ESPA%20CTAA%20Funding%20Guide%20and%20JARC%20Practices.pdf

65 South Carolina Department of Disabilities and Special Needs (2006). "Annual Accountability Report: Fiscal Year 2005-2006." http://www.state.sc.us/ddsn/BestPractices/DDSN_AccountabilityReport.pdf

4.4 Head Start Programs and Transportation for Children

Whereas rural areas contend with insufficient transit capacity to serve the general population, including the disabled and elderly who have greater needs, substantial operations serve children through Head Start programs and public schools. Vehicles for these programs can sit fallow during the midday and after-school hours. To what extent and effect can rural transit coordinators make use of the unused midday and late afternoon capacity offered by transportation services for children?

Both traditional school systems and federal Head Start programs for pre-school children are potential coordination partners to improve the provision of transportation services in local areas. Many schools and Head Starts provide transportation services as a part of serving their larger educational goals. Usually, transportation is provided for students and children in the morning and mid-afternoon hours, leaving the vehicles unused middays and evenings. The purpose of this section is to investigate how coordination with Head Start providers in South Carolina might improve the provision of transportation services for all. Some of what can be applied to Head Starts may also be applicable to the much larger public school system. Although this research does not address private and religiously-affiliated schools, transit coordination stakeholders should consider them as potential partners, as well.

4.4.1 Head Start Programs

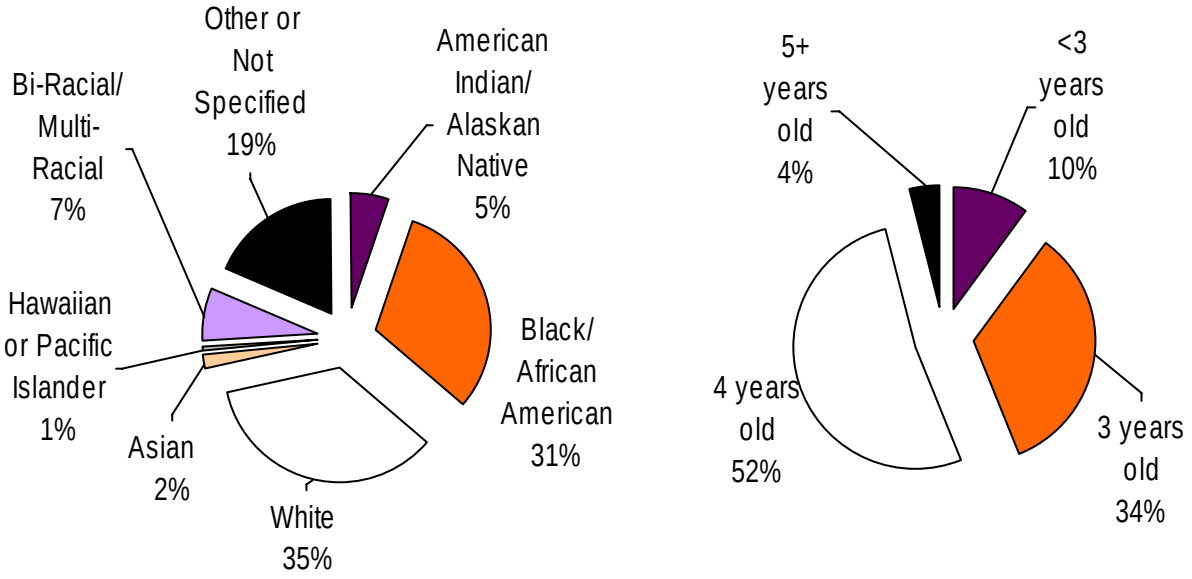
Head Start, a federal program operated under the Administration for Children and Families as a part of the Department of Health and Human Services, started in 1965 to help stop the cycle of poverty by meeting the social, nutritional, psychological, and health needs of children in low income families in order promote school readiness. The Head Start program provides grants to local agencies to further the objectives of a number of programs and services. Efforts are directed primarily towards children between three and five years of age. In practice, children below school age from families living under the federal definition of poverty (Table 4-13) spend their days in an educational environment to prepare them for the traditional school system.

Table 4-13: 2007 Federally-defined Poverty Levels

Persons in Family Unit	48 Contiguous States and D.C.	Alaska	Hawaii
1	$10,210	$12,770	$11,750
2	$13,690	$17,120	$15,750
3	$17,170	$21,470	$19,750
4	$20,650	$25,820	$23,750
5	$24,130	$30,170	$27,750
6	$27,610	$34,520	$31,750
7	$31,090	$38,870	$35,750
8	$34,570	$43,220	$39,750
For each additional, add	$3,480	$4,350	$4,000

Source: Department of Health and Human Services

Children eligible for Head Start live in families with incomes under the federally-defined poverty line or that receive Temporary Assistance for Needy Families (TANF) or Supplemental Security Income (SSI). Depending on resources, Indian tribal groups serve children whose families do not meet the low-income criteria, contingent that service is predominantly for the low-income. Figure 4-22 shows the national demographic breakdown of program participants in fiscal year 2005.



Data source: U.S. Department of Health and Human Services
http://www.acf.dhhs.gov/programs/hsb/research/2006.htm

Figure 4-22: Nationally, Head Start reaches young children from a variety of racial groups, as indicated by fiscal year 2005 data.

Because Hard Start participants come from poor households likely to face significant transportation difficulties, part of the challenge for Head Start programs and services is transportation to and from Head Start sites. Rural areas exacerbate the problem because distance and time become substantial barriers to transportation efficiency.

4.4.2 Head Start Transportation Services

Head Start transportation consumers have been primarily pre-school-age children on their way to or from the Head Start pre-school programs. Not all Head Start children use Head Start transportation: it is provided as a courtesy for families that would otherwise have difficulty accessing Head Start programming. The United States Government Accounting Office estimated that Head Start providers spent $514.5 million on transportation in the 2001 fiscal year (*66*). With the size of this federal program, Head Start agencies around the nation provide one of the largest-scale operations of transportation services.

Special policies and requirements govern Head Start transportation operations and make the systems incongruous with many local- and state-based transportation services.

- Head Start agencies uphold uniquely stringent standards for vehicle maintenance and safety infrastructure. Vehicles must undergo extensive maintenance and maintenance reporting, and in 1993 Congress required that all children be restrained with seat belts and in 2002 a special seat-belt design was instituted for children under 50 pounds. Now multiple restraint device models have been federally approved (Figure 4-23). All of these vehicle requirements add up to a greater-than-typical investment in fleet.

- Service hours for transportation are dictated by the schedule of pre-school programs, and the demanding expectations of Head Start transportation clients (e.g. pre-school-age children) leaves little tolerance for late service and other mishaps.

- A chaperone must ride with Head Start children.

- Federal regulations require at least one qualifying vehicle must remain on premises during Head Start program sessions with children present in order to handle unexpected or emergency transportation demand.

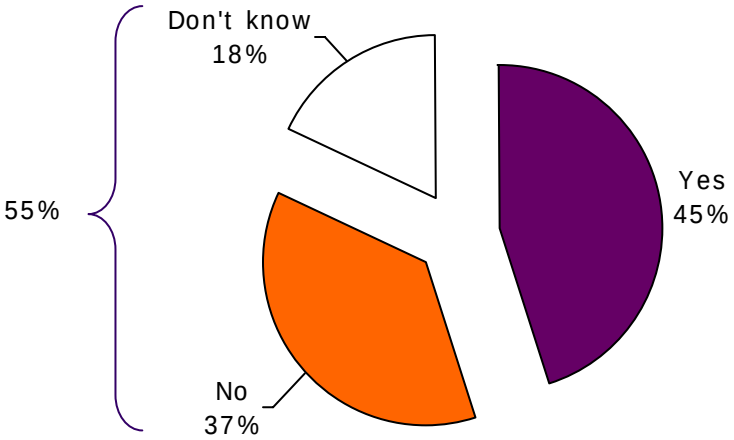
These special requirements for Head Start could pose barriers to many transit coordination practices involving other types of service providers.

Figure 4-23: Federal Head Start program regulations require safety harnesses specially designed for small children.

In South Carolina, Head Start agencies participating in interviews generally indicated that they had a difficult time keeping up with transportation demand within their Head Start programs while operating within existing constraints, especially funding. At the same time, they only used their vehicles during a short portion of the day. Part of the fleet inactivity stemmed from the federal requirement to maintain a vehicle on site. Lengthy rural routes exacerbated service costs and made it difficult to keep time spent en-route within an acceptable one-hour parameter for the pre-school consumers.

4.4.3 South Carolina Coordination with Head Starts

From Clemson University's 2006 survey of transit stakeholders, 151 received questions directly aimed at coordination with Head Start programs and public schools and 52 stakeholders responded. Of those 52, 45 percent of respondents knew about Head Start agencies providing transportation in or near their service areas, but 18 percent did not know, and 37 percent indicated no Head Start agencies operated nearby (Figure 4-24). The majority of respondents (55 percent) did not know about Head Start agencies transportation activities in their areas even though Head Start agencies have been providing transportation in every county in South Carolina (Figure 4-25). Improving awareness of the existence of these field offices could stand as an important first step to opening possibilities for transit coordination. Additionally, 44 respondents (85 percent) indicated a public school existed in their areas, yet 68 percent of those 44 were not actively attempting coordination techniques.



Data source: Clemson survey of South Carolina transit stakeholders (2006)

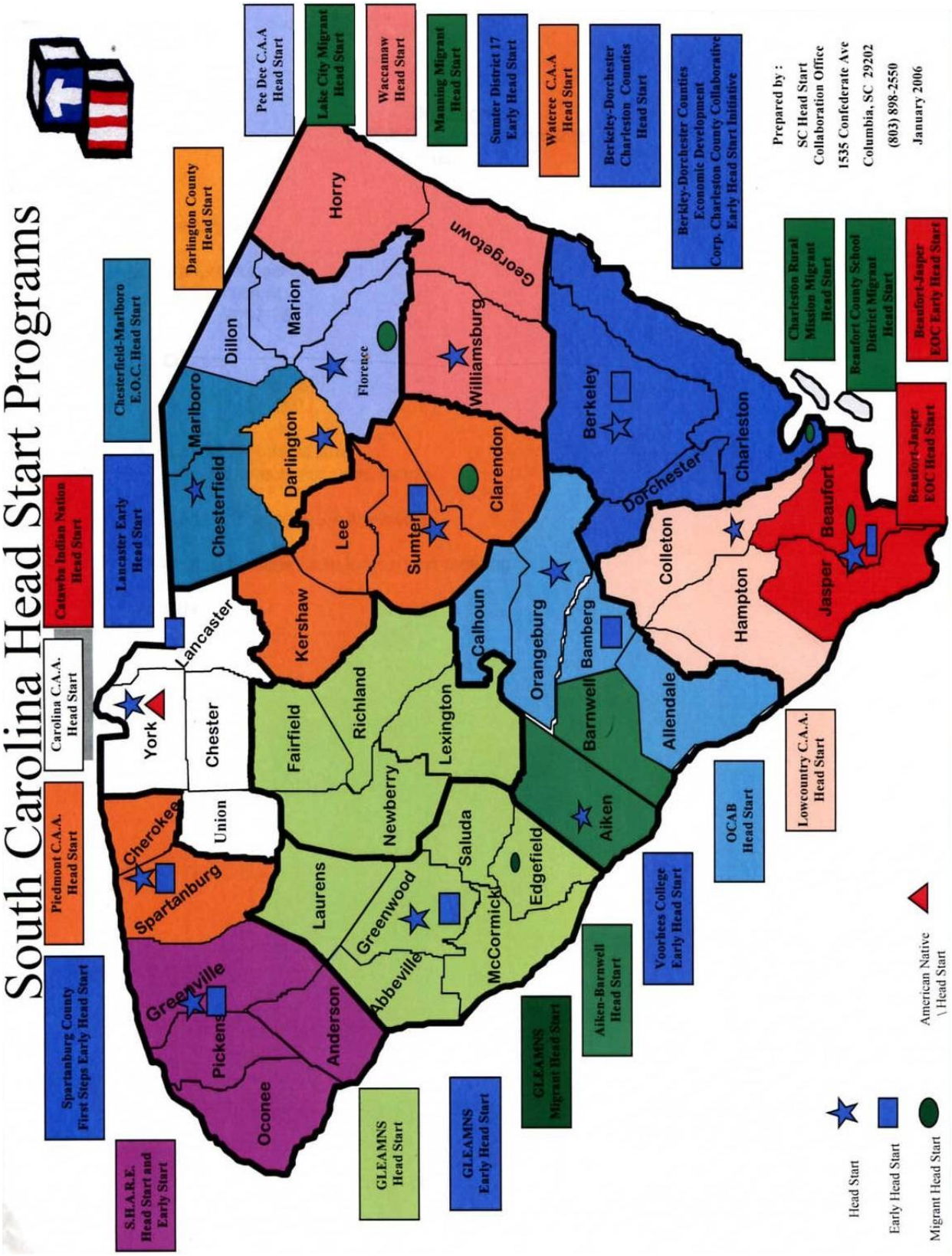
Figure 4-24: Survey responses demonstrated that many transit stakeholders in South Carolina are unaware of the potential to coordinate with local Head Start programs.

Of the survey respondents who were aware of nearby Head Start agencies, only 3 out of 58 were currently coordinating in some way or another. Notably, two of the three agencies reporting ongoing coordination were regional governance agencies rather than transportation service providers. The one public transportation provider that reported coordination was sharing vehicles with its Head Start agency (Table 4-14).

Table 4-14: Stakeholder Experience Coordinating with Head Start

Agency Type	Coordinating	Not Coordinating
Metro Planning Organization (MPO) or Council of Gov (COG)	2	3
City or County Government	0	3
City or County Planning	0	3
Airport	0	1
Public Transportation provider	1	3
Head Start Agency	0	32
Health and Human Service or Community or Religious Agency	0	10
Totals	**3**	**55**

Data source: Clemson survey of South Carolina transit stakeholders (2006)



Source: South Carolina Head Start Collaboration Office

Figure 4-25: Head Start programs reach all South Carolina counties.

The 55 respondents who were not currently coordinating did not foresee many changes in that situation. When asked if they would be willing to coordinate with Head Start, 71 percent proclaimed themselves unwilling, while only 16 percent declared willingness and the remaining 13 percent expressed uncertainty. The willing respondents said they would consider sharing software, dispatch, vehicles, and vehicle maintenance. Some also indicated that they would consider adjusting route schedules.

Overall, survey results painted a bleak picture of the short-term outlook for coordination with Head Start agencies, but also highlighted the magnitude of opportunities for future developments.

4.4.4 Barriers to Coordination with Head Starts

Many barriers have impeded coordination with Head Start agencies in the past, and future coordination will continue to pose a challenge. Some barriers are technical, brought on by technical requirements or operational realities; others are administrative challenges that require planning and communication to address. An example of the former is restriction on permissible vehicle uses. An example of the later is assigning cost allocations between agencies.

4.4.4.1 Common Barriers to Head Start Coordination

In the 1990s, the North Carolina Department of Transportation investigated reasons that Head Start agencies did not actively coordinate with other transportation providers. The authors of the study grouped the barriers into two broad categories: policy and service (Table 4-15). From the findings, many barriers to coordination had root in similarities between Head Start transportation and school bus transportation, such as the unique needs of children and schools as a venue (*67*). While these barriers might make coordination difficult between Head Start agencies and most types of transportation service providers, the shared child-related requirements might point to an opportunity to coordinate with school districts and/or private schools that provide transportation.

Table 4-15: Barriers to Head Start Transportation Coordination

Policy Barriers	Service Barriers
Head Start Federally Funded: Head Start programs are directly funded through the federal government while county transportation programs are funded through the state. As a result, Head Start agencies are not represented on the decision-making committees at the state level. **Increased Coordination Costs:** While NCDOT's experience with coordination has shown that coordination generally decreases cost, that opinion is not universal. Head Start agencies cited increased costs as the primary reason they aren't coordinating and pointed to their own operating expenses, typically among the lowest of local human services agencies, as sufficient reason not to switch. **Federal Vehicle Regulations:** Federal Motor Vehicle Safety Standards for Head Start vehicles are perceived as similar to those for school buses. Many agencies believe that these standards preclude using the modified vans often used by human services providers. **Passing a School Bus:** North Carolina, like most states, has laws pertaining to passing a stopped school bus. Head Start wants these same laws applied to their vehicles, and operating coordinated vehicles of varying color and design would hamper their effort. **Day Care:** State day care regulations require monitors on the Head Start vehicle. Participants wondered how a coordinated system could meet this requirement. **Acquiring Vehicles:** Head Start agency officials believe they can obtain vehicles more quickly than they could through a coordinated system since funds for Head Start come from one source and coordinated systems derive theirs from many.	**Mid-day Emergencies:** An attractive benefit to advocates of coordinated systems is that Head Start trips generally occur in the morning and afternoon. However, Head Start agencies are concerned that mid-day emergencies may arise (snow day, sickness) and the coordinated system will not be able to modify its schedule. **Guaranteed Vehicle Availability:** When a Head Start agency operates its own vehicles it has complete control over its vehicles. Coordination means losing part of that control to which many agencies are deeply opposed. **Mixing Children and Adults:** Some agencies are concerned about having Head Start children ride with the clients of other human services agencies in a coordinated system. **Rigorous Training:** Recently proposed regulations would mandate that Head Start drivers must be trained as rigorously as school bus drivers--which may differ from drivers in coordinated systems. **Level of Service:** Since Head Start is a subscription transportation service, it serves people door-to-door, and cancellations are taken care of by the Head Start network. Head Start agency officials question whether a coordinated system could handle either of these in a timely manner. **Maintenance and Parts:** Head Start agencies expressed their doubts that a coordinated system's maintenance facility would be able to keep school bus parts in stock as well as the local school district."

Source: Winters, Chris. "Head Start Transportation Not Yet a Full Participant in Coordination: NCDOT study reveals variety of barriers thwarting streamlined transportation," *Community Transportation Reporter, v*olume 13, number 9, December 1995. http://www.ctaa.org/ct/dec95/hstart.asp

Interviews with South Carolina transportation service stakeholders, which included five Head Start field offices, echoed many of the concerns identified in North Carolina. Differences in funding sources, guaranteed vehicle availability, and problems of intermingling children and adults on buses emerged in discussions most frequently.

4.4.4.2 Barriers Unique to South Carolina

In regard to the concept of sharing vehicles between public school systems and Head Start program offices, South Carolina Head Start agencies particularly emphasized a discrepancy in fleet maintenance priorities between Head Start agencies and the State's public school systems. The difference stems from the fact that Head Start operates under federal regulations and public schools answer to state stipulations. The stringent federal standards for Head Start fleets contrast sharply with the reputation of South Carolina school buses as some of the oldest (average age of fourteen years), least safe, and most polluting in the nation (*68*). In contrast, Head Start agencies invest heavily in maintenance and replacement of the fleets that carry program participants, even to the detriment of other areas of maintenance (Figure 4-26).

Figure 4-26: Head Start program requirements dictate stringent vehicle maintenance for passenger transportation, but support vehicles might not receive the same funding and maintenance.

South Carolina Code of Laws
Title 56 - Motor Vehicles
CHAPTER 5. UNIFORM ACT REGULATING TRAFFIC ON HIGHWAYS
ARTICLE 3. DEFINITIONS
SUBARTICLE I. VEHICLES AND EQUIPMENT

SECTION 56-5-195. School bus safety standards.

(A) Effective July 1, 2000, any entity transporting preprimary, primary, or secondary school students to or from school, school-related activities, or child care, and utilizing a vehicle defined as a "school bus" under 49 U.S.C. Section 30125, as defined on April 5, 2000, must transport these students in a vehicle meeting federal school bus safety standards, as contained in 49 U.S.C. Section 30101, et seq., or any successor statutes, and all applicable federal regulations. Nothing in this section prohibits the transportation of children to or from child care in nonconforming vehicles by a State of South Carolina human service provider or public transportation authority as long as each child is accompanied by a parent or legal guardian whose transportation is in connection with his work, education, or training.

(B) Notwithstanding subsection (A) of this section, any vehicle that is purchased before July 1, 2000, and is utilized to transport preprimary, primary, or secondary students to or from school, school-related activities, or child care is not subject to the requirements contained in subsection (A) of this section until July 1, 2006. A vehicle that is purchased on or after July 1, 2000, and is utilized to transport preprimary, primary, or secondary students to or from school, school-related activities, or child care is subject to the requirements contained in subsection (A) of this section once the vehicle is utilized for those purposes.

(C) Before July 1, 2006, nothing in this section may be construed to create a duty or other obligation to cease utilizing nonconforming vehicles purchased before the effective date of this act.

(D) To facilitate compliance with the provisions contained in this section, any entity contained in this section may purchase conforming vehicles under the State of South Carolina contracts for purchase of these vehicles.

(E) Nothing in the section prohibits the transportation of students by common carriers that are not exclusively engaged in the transportation of school students or by the entities subject to this section which own or operate these vehicles. However, the motor carriage used by the common carrier or entity to transport students must be designed to carry thirty or more passengers.

Figure 4-27: Jacob's Law (section 56-5-195 of South Carolina's Code of Laws) stipulates standards for vehicles transporting minors.

Expanding from school-program transportation to services for the general population, South Carolina has its own legislative barrier to mixing children with adult passengers. Jacob's Law, a South Carolina state statute created in 2000 and set into full effect in 2006 as indicated in Figure 4-27, requires any entity transporting primary- or secondary-school students to and/or from school, activities related to school, or any transportation that deals with child day care to use a vehicle that meets federal safety standards for school buses. These standards include crashworthiness (joint strength and roof rollover) and the use of high-backed padded seats. The law passed in response to the 1994 death of six-year-old Jacob Strebler, who had been injured when an eighteen-wheeler struck the left side of the Ford Econoline fifteen-passenger van transporting children from an Episcopal school to a swim lesson (*69*).

While the North Carolina study showed that the unique needs of children can impede coordination, Jacob's Law has magnified the differences between children and the general population in South Carolina. As one result of this law, many programs for children in South Carolina must find new ways to transport children with limited funding. Fifteen-passenger vans and private vehicles can no longer be used even to transport one child or a small number of children. Providers of transportation service for children face increased operating costs due to larger and more massive vehicles.

This law came up in a number of case-study interviews, regardless of whether the responding agencies primarily served children. Some interviewees providing transportation services indicated that they would no longer allow children on their vehicles due to Jacob's Law, thus limiting mobility for South Carolina's children. Other agencies made special provisions, such as special restraints for children or a requirement for an escort for riders under age sixteen. As long as South Carolina requires this additional regulation, transportation coordination that involves mixing adults and minors will pose a fleet challenge.

Some providers that would like to serve minors posed questions about whether cutaway buses would qualify under Jacob's Law (Figure 4-28). Many respondents believed that cutaways could not transport children in compliance with the law; however, the South Carolina Department of Transportation indicated otherwise, saying that cutaway manufacturers can (and must) certify their vehicles as complying with school-bus requirements under 49 U.S.C. Section 30125 in order to comply with Jacob's Law. Official documentation from the South Carolina Department of Motor Vehicles regarding requirements appears in Figure 4-29.

Figure 4-28: The sturdy chassis of traditional school buses (top) meets South Carolina safety standards under Jacob's Law; many agencies want to use less-expensive and commonly-available cutaways (bottom) as comparable equipment.

	South Carolina Department of Motor Vehicles **Jacob's Law Information Sheet** SC Code of Laws § 56-5-195	DL-JL (IS) (Est. 11/05)

Effective July 1, 2006, the following vehicles and licenses will be required to transport preprimary, primary, or secondary school students to or from school, school-related activities, or child care.

Type of Facility	Type of Vehicle required effective July 1, 2006	# of Passengers	
		Rated for 10 to 15	Rated for 16 or more
			Class CDL required
DAY CARE	School Bus* (any size)	No CDL required, driver will need US DOT Medical Card	CDL with a passenger endorsement required, either a Class B or Class C depending upon the GVWR of the vehicle
CHURCH without Daycare	No School Bus Required	No CDL required	CDL with a passenger endorsement required, either a Class B or Class C depending upon the GVWR of the vehicle
CHURCH with Daycare	School Bus* (any size)	No CDL required, driver will need US DOT Medical Card	CDL with a passenger endorsement required, either a Class B or Class C depending upon the GVWR of the vehicle
SCHOOL (Public or Private)	School Bus* (any size)	No CDL required, driver will need US DOT Medical Card	CDL with a passenger endorsement required, either a Class B or Class C depending upon the GVWR of the vehicle

*A School Bus is identified by the manufacturer's label located inside the vehicle. The label should have a classification or vehicle type which would indicate school bus. That is, the label must indicate that the vehicle meets federal school bus standards.

Comparison of Vehicles		
	Small School Bus	Large Passenger Van
Capacity	10 to 30	15
Crashworthiness (Joint Strength and Roof Rollover)	Yes *	No
High Backed Padded Seats	Yes*	No
Seat Belts	No	Yes*
Cost	$26,000 to $36,000	$22,000 to $25,000
License Required	Commercial driver's license for buses designed to hold 16 people or more.	Regular driver's license.
Widely Used By	Head Start, private schools, public schools for special-needs students.	Day cares, YMCAs, YMCAs, other youth programs.

* Federal Standard

Source: National Highway Traffic Safety Administration

Figure 4-29: The South Carolina Department of Motor Vehicles has provided guidance about what types of vehicles can be used for various juvenile trip purposes.

4.4.5 Coordination Opportunities

A number of coordination opportunities could counteract the identified barriers. Table 4-16 provides an overview of these opportunities, and this section discusses primary prospects.

Table 4-16: Head Start Transportation Problems and Solutions

Problem	Solution/Strategy
Long distances in rural environments lead to high operating costs.	• Coordinate with parents' travel and schedules when possible to reduce cost and distance. • Use route management software to limit service distances. • Coordinate with school districts to eliminate duplication of service.
In some places, Head Start routes duplicate service by public school buses.	• Investigate combining public school and Head Start routes with transfer points. • Shift Head Start program hours so school buses may be used during normal public school down times.
Head Start program requirements make sharing vehicles with agencies outside the program difficult.	• Place a trained Head Start chaperone in addition to the driver, who can make the time more productive and enjoyable for the children, in addition to protecting them from the other riders. • Designate sections of the bus for Head Start use and keep seat restraints for preschoolers permanently installed in their designated areas.
Federal Head Start rules mandate restraints. South Carolina child transportation must meet expensive school bus vehicle standards.	• Share maintenance costs with other providers. • Share vehicles during down times. • Use route management software to limit service distances.
Documentation and administration require time and energy.	• Investigate sharing these costs with other transportation providers or Head Starts. • Share software and communication technology with other service providers.

Few South Carolina Head Start agencies interviewed were using **route software**. This tool might provide an opportunity for Head Start agencies to improve operational and administrative efficiency while sharing fixed costs with other transportation providers. Routing software can lead to a reduction in service miles and trip lengths, as well as planning time. The South Carolina Department of Transportation's established state contract with

RouteMatch has provided some agencies with software and expertise, which Head Start agencies could share by bartering, for example, excess service capacity of vehicles available at midday. Licensing issues would need to be examined. Even if more intensive participation in coordination is not possible for Head Start agencies, sharing route software with other providers is one way to share costs and benefits to everybody's advantage.

Because most head start transportation is provided in the early morning and afternoon hours, **time-of-day vehicle sharing** might be possible. Other transportation providers could use vehicles when Head Start classes are in session or after hours ("after hours" for Head Start programs would include the afternoon peak period for commuter traffic). South Carolina Head Start agencies interviewed did not appear to have yet entertained the idea of time-of-day vehicle sharing seriously, typically due to concerns of liability, complexity, and difficulties amortizing cost sharing given stringent federal vehicle maintenance standards. A compelling benefit to Head Start agencies will need to be devised to make vehicle sharing attractive. While there is a federal requirement for a school bus to remain on the Head Start location premises, partial-fleet sharing poses an opportunity even though full-fleet sharing is impossible.

A significant source of cost for any transportation provider is the **maintenance of the vehicle fleet**. Head Starts might find ways to reduce these costs by combining these activities with other transportation providers, particularly given that maintenance on large-chassis vehicles requires special equipment and Head Starts only use large vehicles for service operations. Because South Carolina law requires the use of vehicles meeting school bus standards for transporting children, school districts might be the natural partner for this sort of coordination. Regional transit authorities also frequently have maintenance facilities for large chassis.

In many cases, Head Starts have been operating transportation services that have **paralleled traditional school bus services**. While many challenges must be overcome, it might be possible to put Head Start children on regular school buses and collect multiple age groups together to transfer at a hub to school or Head Start locations. This consolidated service might reduce trip lengths and times for both transportation providers, as the service densities of riders on routes will increase. Increased service density can result in shorter average route lengths, which can make a particularly substantial difference in service quality and costs in rural areas. The reductions in costs and improvements in service quality will require managing multiple age groups on buses and entail an en-route chaperone for the Head Start children. Head Start agencies interviewed expressed reservations about mixing age groups based on the federal requirement for Head Start vehicles

to have seatbelts which do not exist for standard school buses, and this issue must be addressed. Allocating cost between the participating agencies is also a significant administrative challenge.

4.4.6 Conclusion

Differences in vehicle requirements pose the largest barrier to coordination with agencies that provide transportation services for children in South Carolina. Jacob's Law has required using vehicles meeting school bus standards to move children; furthermore, not all school buses are the same, as evidenced in differences between federal Head Start safety requirements and South Carolina public school fleet standards. Effectively navigating this challenge might require rethinking the applicable safety regulations in order to achieve both important safety and necessary mobility for children. Substantial coordination opportunities with Head Starts lie in sharing vehicles and possibly drivers with other transportation providers if these issues can be resolved. Less invasive coordination techniques, such as sharing of fixed costs for maintenance facilities and route planning, offer opportunities for easily-attained first steps to the potential for developing larger-scale transportation service coordination.

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66 United States General Accounting Office. *Transportation Disadvantaged Populations, Some Coordination Efforts among Programs Providing Transportation Services, but Obstacles Persist.* June 2003, p. 13. http://www.gao.gov/new.items/d03697.pdf

67 Winters, Chris. "Head Start Transportation Not Yet a Full Participant in Coordination: NCDOT study reveals variety of barriers thwarting streamlined transportation," *Community Transportation Reporter, v*olume 13, number 9, December 1995. http://www.ctaa.org/ct/dec95/hstart.asp

68 "New Set of Wheels? Bill would mandate 400 new school buses yearly," *The State*, March 13, 2007.

69 Gergel, Richard Mark. "The Jacob Strebler Case," presented at School Transportation News Western States Conference and Trade Show, Las Vegas, Nevada, August 11, 1998. http://www.stnonline.com/stn/nonconformingvans/court/strebler_case.htm

4.5 Tribal Involvement and Interests

Native Americans have long faced a limited number of mobility options, which has adversely affected their quality of life through lack of access to employment centers, health care, education, and other necessary services. The federal government provides funding for public transit on reservations with much of the responsibility for the transportation systems resting with the tribes. Transportation coordination could help address many of the difficulties that American Indians face while attempting to provide transit for their communities.

4.5.1 Tribal Presence in South Carolina

Native Americans seek empowerment and assert the sovereignty that is theirs by treaty rights. It is vitally important that non-Indians approach the provision of tribal transit with deference and a sincere appreciation for the Native American culture and process of doing business. Ron Hall, an attorney for the Three Affiliated Tribes of North Dakota, noted that, "we can't take something out [to the tribes] if they don't ask for it. That has been tried and shown not to work" (*70*).

Tribal nations must have official recognition by governments in the United States to qualify for assistance programs. Federal recognition stands as a prerequisite for obtaining federal funding dedicated for tribal nations. The bilateral nature of such programs needs to be recognized. Although the United States might offer money, tribal nations typically cannot take such funding without first declaring tribal approval for receiving the money.

Currently the Catawba Indian Nation is the only federally-recognized tribe in the state of South Carolina (Figure 4-30). This tribe occupies a 640-acre reservation near Rock Hill in York County. Today over 2,165 Catawba are listed on the official tribal roll, with a majority living either on or within twenty miles of the reservation. The reservation serves as home to 97 families totaling 300 persons (*71*).

Figure 4-30: While tribal lands have familiar transportation programs such as government-imposed speed limits and nonprofit involvement in litter control, the tribes set their own laws and governmental structures, making them unique entities in transit coordination.

While the Catawba Nation is the only federally-recognized tribe in the state, South Carolina is home to other Native American groups. Table 4-17 lists all tribes active in South Carolina, provides the city in which they are headquartered, and acknowledges their level of recognition.

Transportation-providing agencies located within regional proximity to these tribes should look to these populations as potential coordination partners. Interacting with these populations can stimulate mobility solutions across cultural borders and open access to opportunities vital to Native American quality of life, and federal recognition is not a prerequisite for coordination with tribes.

Table 4-17: Recognized Active Indian Tribes in South Carolina

Tribe Name	Location	Recognition
Beaver Creek Indians	Lexington	State
Catawba Indian Nation	Rock Hill, York County	Federal and state
Chicora Indian Tribe of South Carolina	Conway	State
Croatan Indian Tribe of South Carolina	Cordova	State
Edisto Indian Organization	Ridgeville	State
Marlboro, Chesterfield, Darlington County Pee Dee Indian Tribe	McColl	State
Natchez Tribe of South Carolina	Columbia	State
Pee Dee Indian Nation of Beaver Creek	Neeses	State
Pee Dee Indian Tribe of South Carolina	McColl	State
Pee Dee Indian Nation of Upper South Carolina	Little Rock	State
Santee Indian Organization	Holly Hill	State
The Waccamaw Indian People	Conway	State
Wassamasaw Tribe of Varnertown Indian People	Moncks Corner	State

Source: SCIWAY

4.5.2 Coordination with Local Tribes

Case study site visits revealed that South Carolina local governments have rarely engaged tribes in transportation coordination programs. Contact and communication form the foundation for all transportation coordination efforts. Without an inclusive, collaborative environment in place, coordination will not exist.

Local governments that seek to coordinate transportation across tribal borders must recognize the distinctiveness of Native American communities. Having a strong working knowledge of tribal customs, culture, and government structure will prove paramount for sustained, successful coordination. Being aware of the many intricacies associated with interacting with tribal entities will help to encourage tribal involvement with coordination efforts and remove potential barriers.

4.5.3 Barriers to Tribal Transportation Provision and Coordination

Many obstacles stand in the way of adequate transit provision in reservation communities. These obstacles combine to put Native Americans at a

disadvantage when it comes to mobility options and access to vital services and employment opportunities. The following barriers emerge as some of the most crucial in tribal transportation planning initiatives:

- Inadequate representation and funding
- Limited assets
- Insufficient in-house transportation planning expertise
- Planning process neglect
- Government-to-government relations
- Rural and remote locations of reservations

4.5.3.1 Inadequate Representation and Funding

Lack of representation in local, state, and federal politics has led to countless policies and programs that act counter to the Native American way of life. Without a voice at all levels of government, programs and policies cannot represent the goals and objectives of tribes. The 1990 U.S. Census failed to count twelve percent of all persons living on reservations, diminishing all tribal funding allocations that are based on population counts (*72*). Without accurate data and adequate representation, the social status of Native Americans remains tenuous at best.

4.5.3.2 Limited Assets

Often existing transit systems are extensions of human service provisions, like Head Start or health services programs. In recent years, tribes have increased their public transit offerings through the U.S. Department of Agriculture (USDA) Tribal Transit Technical Assistance Program, which is funded through the USDA Rural Business Cooperative Service. Reservations have managed to provide minimal services with vehicles that are often shared (*73*). Providing transit in this fashion truly is better than nothing, but it does little for conveying a sense of permanence and reliability in local transit programs.

In 1995, the Community Transportation Association of America published the document “Transportation in Indian Country: Getting Started” as a means of assisting tribes operating public transportation systems. In this document, the first step for tribes is to take a vehicle inventory. Tribes are encouraged to consider a “wide range of possibilities” for shared vehicles for use by tribal transportation providers. They are advised to “Look at programs such as: Head Start, senior centers, job training programs, rehabilitation, education, and health care facilities. Talk with the people who administer these programs and find out how participants reach their services” (*73*). These suggestions encourage Native Americans to assemble a variety of vehicles rather than establish a recognizable fleet of transit vehicles. There are rural areas of America that serve the members of their community in much the

same fashion, yet many rural communities have uniformed drivers who operate uniquely identifiable vehicles.

4.5.3.3 Insufficient In-house Transportation Planning Expertise

Few local tribal governments have an in-house source of expertise for transportation planning, leading to the need for an outside consultant in cultures with historic reasons for mistrusting external influence. An outside planner might bring potentially inhibiting obstacles because plans that are formulated by outsiders are often greeted with skepticism, increasing the probability of failure to implement. Outside planners will also lack knowledge of idiosyncrasies and political climates that exist in tribes. This ignorance can restrict public involvement and participation, making plans less representative of the entire population.

4.5.3.4 Planning Process Neglect

The idea of long-range land use planning differs greatly between tribes and municipalities. Most communities use a comprehensive planning process to guide transportation planning. Future land use drives the planning efforts in these municipalities (*74*). Because the federal government holds tribal lands in trust, reservations lack incentives to focus on land use planning. Tribal planning is thus often shortsighted and project-oriented, reducing attention to future land use and transportation patterns. Without this necessary focus, the reservation will continue to be at a disadvantage when it comes to being equipped to handle the needs of its residents.

4.5.3.5 Government-To-Government Relations

Tribes must work independently with many different levels of government to make transportation projects a reality. Cities, counties, states, the federal Bureau of Indian Affairs, and regional councils of governments are just some of the various agencies and levels of government with which a tribe must interact externally (in addition to internal organizational relations). The government-to-government relations that should exist between tribal nations and the United States federal government are complex processes that are frequently not understood by key decision makers.

The current trend of the devolution of federal programs to the states places great importance on tribal-state relations. Because the government-to-government agreement exists only between the United States and individual federally-recognized tribes, tribes must negotiate with local, state, and federal governments on a tribe-by-tribe basis. Inter-governmental agreements are often difficult to arrange due to jurisdictional and institutional power struggles and the overlap that inherently exists between United States governments and tribes. Tribes must compete for transit funds like any other area within a state.

Communication between local governments and tribes also proves itself a complex task. A 1997 study prepared by the American Indian Research and Policy Institute revealed, "no formal venue exists for American Indian tribes to work with city, county, and local municipalities. As a result, communications about issues between tribes and their neighboring communities often occurs only when conflicts arise on a crisis-by-crisis basis" (*75*). This atmosphere fosters the incremental planning paradigm, inhibiting sustainable long-range comprehensive transportation planning.

4.5.3.6 Rural and Remote Locations of Reservations

Reservation lands are often found in rural and isolated locations, which bring problems inherent to transit. The Federal Highway Administration identified the following challenges when planning for rural transportation:

- long distances between population centers,
- steep grades and mountain passes,
- dramatic weather events and effects on road conditions, and
- dispersed systems with high unit costs for service delivery, operations, and maintenance (*76*).

The distances that must be covered, coupled with low-density populations, create an inefficient scenario for transit provision. Demand response operations are the only viable option though high costs per passenger or vehicle mile can hinder implementation (*77*). Transit coordination can help connect tribal lands with population and employment centers found in more urbanized areas.

4.5.4 Overcoming Barriers to Tribal Transportation Coordination

While coordination with tribal entities brings unique challenges, examples of success have emerged. According to a report prepared by the Federal Highway Administration's Indian Reservation Roads Program, tribes and agencies that desire to coordinate transportation services should take the following steps.

"Initiate meetings and strategy sessions with other agencies to discuss transportation plans, priorities and cooperative projects."

- The Seneca Nation, working with the Tribal Technical Assistance Program (TTAP) Center, arranged and hosted a meeting among the Indian Tribal Governments, the New York State Department of Transportation, and the Federal Highway Administration to discuss transportation issues of particular concern to the Indian Nations.

“Encourage other agencies to include tribal transportation issues in their transportation planning efforts.”

- Although some of the State of Arizona's and Navajo Nation's laws conflict, these two governments are working towards issue resolution. A demonstration of cooperative spirit is the construction of the Window Rock Airport Bridge which Arizona Department of Transportation (ADOT) funded through the Highway Bridge Replacement and Rehabilitation program. The Navajo Nation owned the bridge; however, ADOT could not enter into a contractual agreement with the Navajo Nation for the Navajo Nation to build the bridge. The conflict in the laws was resolved through taking a different path. The ADOT used the Federal Highway Administration, which transferred the funds to the Bureau of Indian Affairs, which issued a Public Law 93-638 contract for construction to the Navajo Nation. Relative to transportation planning, the Navajo Nation's department of transportation worked with the Arizona Transportation Board and ADOT Holbrook District to put this project in the Arizona’s annual and five-year construction programs.

- The Jicarilla Apache Tribe participates with a regional planning organization established by the State of New Mexico to address transportation issues for the rural area within which much of the tribal lands are located.

- The ISTEA/tribal handbook entitled "Transportation Guide for Indian Governments" was developed in 1995 through cooperation with various Indian tribal members, Washington State Department of Transportation offices, the Governor's Office of Indian Affairs, the Bureau of Indian Affairs, Northwest Tribal Local Technical Assistance Program, and the Federal Highway Administration Division Office.

“Increase awareness and gain knowledge by attending transportation meetings, seminars, and conferences.”

- The Intertribal Transportation Association provides a forum for Indian tribal governments to discuss issues of common concern and to formulate strategies to address these issues cooperatively.

- Tribes in Nebraska and North Dakota routinely attend meetings with their respective state departments of transportation to discuss transportation issues. The Federal Highway Administration division offices arranged and hosted the first of these meetings in each state.

- The Transportation Research Board Subcommittee on Native American Issues originally focused on archeological, historic, cultural and sacred sites; however, it has expanded to deal with planning and other transportation issues (*78*).

4.5.5 Tribal Transportation Funding

Funding for transportation on tribal lands has historically been limited in quantity and reach, and local matching requirements have likely deterred the establishment, continuation, and expansion of tribal transit programs. One decade ago, only 18 of the 562 federally-recognized tribes in the United States had public transportation systems that received federal money from the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) section 18 program (*79*).

The transportation authorization under the 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: a Legacy for Users (SAFETEA-LU) provided tribes money through section 5311, which designated funds for "other than urban areas." Section 3013 of SAFETEA–LU also created the Public Transportation on Indian Reservations program (colloquially known as the "Tribal Transit Program") by amending 49 U.S.C. 5311(c). Funding for this program was designated to follow *eligibility requirements* of the Federal Transit Administration's Nonurbanized Area Formula Program, 49 U.S.C. 5311; however, the Tribal Transit Program *"should not replace or reduce"* tribal funding through the Nonurbanized Area Formula Program (*80*). Annual funds for the Tribal Transit Program nearly double over the term of the legislation (Table 4-18), but the amount designated remains small in relation to the extent to which it must be distributed across all Indian Nations of the United States.

Table 4-18: SAFETEA-LU Funding for §5311 Tribal Transit

Fiscal Year	Funding Allocated
2006	$8,000,000
2007	$10,000,000
2008	$12,000,000
2009	$15,000,000

Projects eligible for the two SAFETEA-LU programs must serve the general public in areas with populations under 50,000 and meet accessibility needs of the disabled. The funding can support public transportation capital needs, operating costs of equipment and facilities, planning, and the acquisition of

public transportation services (including service agreements with private providers). Eligibility does not require cost sharing or matching (80).

Due to the wide variety of tribal situations and needs across the nation, §5311 did not specify an allocation method based on population or land area beyond the basic eligibility requirements. The Federal Transit Administration provides funds in direct grants to tribes, though state governments still hold responsibility to allocate the funds. Applications for the funds can go either through state governments or directly from the tribes to the Federal Transit Administration. The federal Rural Transit Assistance Program (RTAP) can fund technical assistance for tribal transit, and that assistance can include defining a state government's role in tribal transit programs (*81*).

4.5.6 South Carolina Tribal Transportation

This research involved interviewing the Catawba Indian Nation (the only federally-recognized tribe in the state) during case study investigation. The tribal representative saw a definite need for public transit coordination internally and externally. The Catawbas operated Head Start transportation, and other limited transportation service providers operated between tribal lands and other jurisdictions. Reportedly, the Cherokees already operated their own transportation service, but funding has been an issue.

Notably, interviews revealed discrepancies in perceptions of even basic facts, such as what services were available in the region and what agencies provided those services. Tribal transportation issues surrounded the same issues considered by other stakeholders and other regions, such as access to the senior center and Head Start program bussing.

Frequently across the nation, coordination efforts with tribal nations must start by defining the connections that must be created and identifying the issues to address. It appeared that the Catawba tribe, which appears to have worked independently on many transportation issues, would benefit from greater information on coordination systems, contacts, and resources. Before inviting anyone to come to a table, the motivation for accepting that invitation needs to be clear.

Another issue that arose related to tribal structure, authority, and ability to speak for the tribe when interacting with outside entities. The tribal member who handles and understands transportation issues is not necessarily the person who can participate in coordination efforts. While this issue needs to be handled internally, the internal situation will substantially impact the effectiveness of external coordination efforts. Given that tribal nations historically place strong pride in tradition, transportation coordination efforts

might need to include particular sensitivity to a tendency to stay with the way things have always been done.

Communication and support within the tribe must serve as a critical foundation for building external relationships. Such communication needs to start with identification of internal and external contacts, as well as their domains and responsibilities. Communication efforts must also include a strong component of education about the funding and programmatic opportunities available to support and expand tribal transportation. Potentially, tribes will more readily share information with each other than with state and other government entities.

4.5.7 Conclusion

Recognizing that each tribe is a sovereign nation with unique issues is critically important. Political structures, tribal politics, and priorities are as varied as the tribes are. While Native Americans represent only a single racial category to the United States government, that category is comprised of hundreds of different nations. Coordinating tribal transit should not be expected to be a uniform process among reservations.

Many tribes that provide some form of public transit have worked with service providers to establish fleets of vehicles and drivers. Tribes seeking to provide public transit for the first time could examine services provided by agencies on reservations, such as Head Start and elderly services, and then seek to work together to offer more varied and frequent service through combining internal resources.

If the tribes can establish good networks with local and state governments, they could gain access to additional funds, training, and transportation provisions. Many tribes that have been creative in finding funding sources, such as Head Start, have been rewarded with the ability to offer a better form of tribal transit.

Many Native Americans critically need public transit and would benefit dramatically from transportation coordination. Access to employment, medical care, education, and cultural events are just a few activities for which Native Americans could use transit. Few tribes offer public transportation to their tribal members. While some tribes have been successful in their transportation ventures, most struggle with a bare minimum of vehicles and resources. An ideal public transportation system for American Indians should offer a uniform fleet of vehicles, creating a reliable and recognizable transit service. Funding public transit for Native Americans is difficult and circuitous, leaving many tribes with little assistance in transit start-up and operational costs, and transit-planning expertise is

rarely available in the rural areas of India reservations. Programs are available to assist tribes in coordinating with neighboring tribes or governmental agencies to combine resources. Many tribes appreciate the efforts that enable them to establish a social environment conducive to transit. Coordinating tribal transit has the possibility to improve significantly the lives of South Carolina's Native Americans.

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75 Poupart, J. and T. Becker. *Communications and Relationships between Reservation American Indians and Non-Indians from Neighboring Communities*, 1997, www.airpi.org/research/relation.html.

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80 Federal Register Notices, "Public Transportation on Indian Reservations Program; Tribal Transit Program," Vol. 71, No. 157, Docket No. FTA–2006–24143, Tuesday, August 15, 2006 pages 46959-46973. http://a257.g.akamaitech.net/7/257/2422/01jan20061800/edocket.access.gpo.gov/2006/pdf/06-6911.pdf

81 Federal Transit Administration. "Frequently Asked Questions: Tribal Transit Provisions of SAFETEA-LU," accessed February 20, 2007. http://www.fta.dot.gov/documents/FAQ_Tribal_Transit_Program.doc

5.0 Guidance for Coordination: A Regional Transit Toolkit

The South Carolina Department of Transportation has emphasized the importance of implementing the results of this project to create tangible real-world improvements in transit provision. Beyond a simple enumeration of potential strategies to employ for facilitating collaboration, this toolkit includes analysis and prioritization of which strategies will fit best within the context of South Carolina and its specific communities in terms of culture, politics, resources, existing service provision, and other factors.

Notably, the South Carolina Department of Transportation is currently engaged in a large-scale effort for statewide and regional transportation coordination. South Carolina has worked for several years towards coordination of transit services. Commitment to coordination has been declared explicitly in policy documents, such as the following statements in a 2004 report to the South Carolina Senate Transportation Committee and the House Education and Public Works Committee (*82*).

- "SCDOT is partnering with state, regional, and local agencies and organizations to enhance transportation while encouraging state leadership that SCDOT remain as the lead agency for coordinated transportation.
- "SCDOT continues to place more emphasis on coordination of transportation through committees and partnering meetings with regional planning agencies.
- "SCDOT is committed to ensure stability for public transportation providers while providing good quality service which is responsive to passengers and clients, while developing a statewide coordinated system.
- "SCDOT is committed to ensuring that passengers experience a safe, reliable, and efficient transportation system that meets the needs of every community and offers opportunities for a better quality of life for our citizens."

This implementation plan recognizes stakeholder interests. The resistance to centralized coordination that local communities have already demonstrated underscores that they feel they have interests to protect. The alternative perspective holds that centralized coordination spawns greater efficiency and benefit for all stakeholders. The implementation plan attempts to acknowledge the legitimacy of both of these positions and offer strategies and recommendations for proceeding in a way that respects the interests of various participants.

5.1 The Basic Process of Transportation Coordination Planning

This section describes seven basic processes commonly identified as vital to coordination. Based on the Transportation Research Board's publication *Toolkit for Rural Community Coordinated Transportation Services (83)* and the Federal Highway Administration's *Getting More by Working Together: Opportunities for Linking Planning and Operations* (*84*), this section applies recognized frameworks, specific coordination tools, and ingenuity to meet the specific needs of South Carolina.

5.1.1 Identify Stakeholders

An inventory of stakeholders in transportation provision forms the foundation for building coordination and cooperation within a region. The *Toolkit for Rural Community Coordinated Transportation Services* identifies the various public agencies that could and should participate in coordination of service, such as public transit providers, departments of social services, departments of health and mental health, and developmental disabilities departments (*83*).In addition to the most obvious partnership with transportation providers, the Federal Highway Administration identifies that local communities, businesses, environmental organizations, and the general public should be involved to provide the best service possible. This Clemson University research project has created a snapshot of these stakeholders, stakeholder resources, and stakeholder goals in various regions across South Carolina. The complete inventory as of spring 2006 is included in an appendix on an accompanying compact disc.

After the identification of stakeholders, resources, and goals, the next step towards coordination is to engage the stakeholders. Stakeholders must willingly and voluntarily **come to the table** in order for coordination to be successful. The engagement of potential stakeholders should not be limited to basic notification about a possibility for coordination, but rather the planning process should foster involvement by all stakeholders at an early stage of the process (*84*).

Once stakeholders take an active role in coordination efforts, the next step is to **establish leadership**. Rather than centralized decision making, leadership for coordination needs to be characterized by facilitation of involvement by many local leaders. The results of the case studies clearly demonstrate the importance of leadership in building successful coordination. While effective leadership will further coordination efforts, one size does not fit all. Leadership should have a flexible structure based on locally derived demands and the individuals available. A good way to start the process of building leadership is to identify stakeholder strengths. All individuals and organizations have specific talents, contacts, and experiences that make them adept at specific roles. For example, some people or

organizations are good at finding and writing grants; others can effectively administer and dispatch; and, others might work well with the latest advances in technology and infrastructure. An effective facilitating coordination leader will first encourage local leaders to identify their strengths and abilities to contribute to coordination efforts, then the leadership role mutates into combining those contributions and filling gaps to ensure a smooth and effective system.

5.1.2 Set Goals and Objectives

Following the identification and engagement of stakeholders, the parties need to identify and adopt a unified set of goals and objectives. These goals and objectives should target both the short and long terms to meet different stakeholders' needs, recognizing that the ultimate needs to address belong to the traveling public. The Federal Highway Administration identified that near-term goals will better activate coordination stakeholders to engage the business and local citizen communities while long-term goals are more useful in motivating public agencies (*84*). Established objectives should be **achievable and measurable steps** toward reaching a larger goal, which might be less tangible.

In addition to identifying goals, the coordination team should **prioritize** the goals and objectives. While identifying the more important goals or objectives, coordination leadership needs to take great care to avoid dismissing some groups' goals as less important than others. If a group or organization feels that its needs or goals are slighted, it might either actively work against the other groups' needs or withdraw from the coordination process. Prioritizing goals and objectives can be a powerful tool for maximizing coordination effectiveness, but it can also sabotage coordination if all groups cannot satisfactorily achieve individual stakeholders' goals.

Passenger needs must be considered on a disaggregate level. In other words, identifying that some passengers have a need does not mean that all passengers have that need. Wheelchair accessibility provides a strong example. Every transportation service provider must have capability to serve wheelchairs under the Americans with Disabilities Act; however, only people in wheelchairs need wheelchair-equipped vehicles, which means that not all vehicles in a fleet need lift equipment. Coordination leaders need to inventory region-specific needs and means of meeting those needs. Rather than looking at total need, coordination stakeholders must define where and when those needs currently exist or will emerge in the future.

5.1.3 Define Performance Criteria and Data Needs

Following the identification of the goals and objectives, local leaders need to establish criteria to measure or assess how the environment may impact the

implementation of coordinating tools and actions. Performance criteria can determine whether the resources and processes are utilized efficiently and effectively to meet the established goals and objectives (*84*). Current technology can provide a vast amount of information for transportation services and can determine the most effective and economically efficient means of providing service.

Sharing data, making data readily available, and determining future studies to identify and assess untapped data can improve coordination attempts and processes. Different partners can combine their knowledge, data, and expertise to identify further needed services and service areas. In addition, identifying or defining needed data collection, data collection tools, and collection technologies will influence the nature and the direction of coordination efforts.

5.1.4 Evaluate Regional Improvements

Identifying the areas within a transportation network requiring the most attention is critical for any coordination attempt. This process substantially differs from identifying goals and objectives. While goals and objectives might set an agenda, sometimes these goals and objectives omit an area that might potentially need improvement, and coordination could draw attention to this oversight. For example, some transportation providers might see a need to extend or improve service in their respective areas if they often turn away potential clients or trips due to the limits of their existing service. Because the providers are often keenly aware of the challenges their clients experience on a day-to-day basis, they will know how services should expand.

The uniform objective to increase performance should be coordinated to maximize the positive impact while preventing excess costs and waste. Evaluating regional improvements enables providers of all sizes not only to recognize their roles within their regions, but also to identify organizations which could be beneficial partners to help meet regional objectives.

5.1.5 Develop Alternative Plan Scenarios

Identifying multiple plans of action with different outcomes is important in realizing the possible and the best outcome for a coordination plan. Multiple scenarios can provide a means of showing how different near-term, mid-term and long-term goals can be actualized. Alternative scenarios also promote choice. Giving coordinating groups a choice of many options enables them to select with a uniform vision while not being forced to accept a single top-down mandate. A group of scenarios should include a “no change” option, which can draw attention to what will likely happen if nothing is done, while another scenario can represent total change with

many differences from the status quo. In addition, different scenarios can demonstrate and conceptualize a middle-ground compromise, where older traditions and new ideas complement each other. Finally, single well-developed elements from many scenarios can be developed freely and later incorporated into the final plan.

5.1.6 Evaluate Alternatives and Select Best Option

The coordination process must yield decisions of which plans of action will best serve the region. At this stage in the process, the stakeholders need to evaluate possible outcomes and use available data and performance criteria to determine which scenario best meets the needs, goals, and objectives of the participating parties, the public, and the clientele. All stakeholders should be involved, and each stakeholder should be treated as an equal partner in the decision-making process.

5.1.7 Implement Process or Plan

Like any process or plan, the selected option is only successful if it makes its way from the conceptual and development phase into the implementation phase. It is important for coordination partners to act upon agreed decisions and provide positive reinforcement for other partners to pursue the coordination objectives. Accomplishing short-term objectives will increase morale and focus greater attention towards accomplishing long-term goals.

5.1.8 Iterate the Process

As the “eighth step” of this seven-step process, coordination partners and leaders need to realize that they must iterate this process. Coordination is an ongoing effort because transportation service consumers in local populations, coordination environments, and stakeholder needs continually evolve. Coordination processes should include periodic re-evaluation of new stakeholders, newly-relevant goals and objectives, and so forth. Periodic re-evaluation might occur every five years, but the level of dynamism of a community will affect how often to iterate the process.

5.2 Sample Objectives for Coordination

Each region has unique needs and resources; therefore, no two regions will have identical transit coordination plans. Regional leaders need to define their own objectives. Table 5-1 identifies and explains typical objectives that emerged through survey and case study findings, as well as past studies. Regional leaders should look to these objectives as a menu for creating locally-relevant selections. Objectives are categorized to consider demand (mobility and access) or supply (service provision).

Table 5-1: Sample Objectives for Mobility and Service Provision

Mobility Objectives	Service Provision Objectives

• Daily life needs (grocery store, pharmacy, social engagements, post office)
• Mobility for the poor
  o Work
  o Daily life needs
  o Medical care
  o Day care
  o Education
• Transportation to work
  o Metropolitan (everyone)
  o Rural (tourist workers)
• Elderly connection to the community
• Medical care according to traveler demand for destination
• Local, particularly dialysis
• Regional connections for medical care
• Medicaid transportation
• Disability and Special Needs services
• Children and youth
  o Head Start
  o School
  o Activities
• "Our fair share" of service (tribal)
	• Expand reach of services
	• Increase efficiency
	• Reduce time and resources spent traveling for maintenance
	• Meet federal requirements
	• Meet state requirements
	• Save money
	• Address perceptions of empty vehicles
	• Improve service reliability
	• Evidence that we have a local community identity and function (as opposed to a bedroom community in the shadows)
	• Demonstration of political contribution to the community
	• Economic development

5.3 Tools to Reach Objectives

5.3.1 Catalysts to Overcome Barriers

Research has identified that several barriers inhibit coordination, but regional stakeholders can get past them by working through unique individual needs and concerns. Chapter three identifies many of the positions according to their stakeholder roles, and it poses means of overcoming reservations that these stakeholders might have. Coordination participants need to consider multiple options. There are many different ways to coordinate, so no one role needs to be imposed on a given stakeholder in an attempt to replicate something that has happened in another location. Different agencies and regions will be more amenable to different types of coordination. Outright sharing of vehicles, routes, and service might scare stakeholders away from the idea of coordination, so smaller steps (at least initially) might make the most sense.

5.3.2 Addressing South Carolina's Rural and Urban Diversity

An important issue when addressing transportation coordination is the dynamism of population distribution. A mix of large urban populations, large rural agrarian areas, and booming suburban neighborhoods means that coordination partners must address how transportation coordination is successfully implemented between different population densities and land-use patterns. When coordination between agencies begins, groups should be aware that the local development pattern will affect many different goals, funding sources, and operational costs. In many cases, local leaders will need to rely on transportation planners in metropolitan planning organizations and councils of government to inform them of the interactions of land use and transportation. Coordinating agencies should attempt to identify both similar partners with similar strengths and shortcomings and also partner with agencies with different sets of complementary attributes.

5.4 Coordination Strategies to Consider

This section summarizes coordination strategies, many of which were discussed in further depth in other sections of this report. The *Toolkit for Rural Community Coordinated Transportation Services (83)* and *Getting More by Working Together: Opportunities for Linking Planning and Operations* (*84*) have also identified and discussed many of these strategies.

5.4.1 Communications, Technology, and Data

Countless transportation initiatives fall short of their potential due to a lack of communication with both stakeholders and the general public. Communication programs must be designed in consideration of target audiences and how best to reach them. Telephone-based dissemination of information might not work well where cellular coverage does not reach, but web pages might serve well in the same community if coordination partners regularly use the Internet from the office. As coordination gains stability with stakeholders, technology can be introduced to facilitate communication.

The global wave of interest in intelligent transportation systems (ITS) has communication and data sharing at its core because the technology facilitates flow of information to the general public, transportation providers, and other stakeholder agencies. Free-flowing access to information is important for collaborating partners to make informed decisions. Data also enable regions to identify areas in which service can be improved or extended, as well as to identify duplication and waste.

Recent innovations in information technology have led to services such as car sharing and rideshare matching. The technology underlying these advances can be harnessed to facilitate coordination of transportation

services. For example, multiple small providers of transportation services can pool their vehicle fleets to increase utilization and lower maintenance costs. The pooled fleet can then be used in a way similar to car sharing services, where vehicles are reserved and paid for as they are used. Similar technology might also be helpful to pool trips as in rideshare matching.

5.4.2 Performance Monitoring

Performance monitoring can be useful for several aspects of coordination. Tracking measurable performance objects before and during the creation of a new coordination effort can help the participating agencies evaluate the effects and effectiveness of their efforts as well as plan for continuous improvement. Useful measures might relate to expenses or cost efficiency, quantitative measures of customer service like wait times, or qualitative customer service measures such as comfort or overall satisfaction. Each established objective should have one or more performance measures and a plan for monitoring performance on a regular basis.

5.4.3 Funding and Resource Sharing

Funding and resource sharing enable many providers to pool their available resources and allows them to take advantage of economies of scale. Capital-resource sharing might be one of the easiest and most effective means of coordination. When vehicles are shared, they might be owned by a central organization, as is the case with most car-sharing programs, or owned by participating agencies and shared when not in use by the owning agency. Coordination between two agencies has definite benefits, but achieving coordination between three or more partners has greater benefit, even if the complexity of such a system would make it traditionally too difficult to undertake. The sharing of dispatch centers, maintenance facilities and intelligent transportation systems technologies can increase operational efficiency. With more partners coordinating, agencies should be able to provide better services at lower costs than if each agency provided its own independent dispatch center, maintenance facility, and technology. The traveling public should benefit from improved or expanded services.

5.4.4 Institutional Arrangements and Consolidation

Human-service organizations frequently provide demand-response services under contract to transit authorities. It might be a better financial option for some human-service providers to contract out transportation needs rather than operating their own transportation. In addition, there can be overall cost reduction by coordinating and consolidating human-service transportation among several agencies to reduce overlap or inefficient provision of human-service transportation. This option can facilitate cost reduction, service improvement, and mobility enhancement strategies (*83*).

It should be noted that South Carolina already has examples of human-service agencies that provide efficient and reliable transportation services within their communities. For example, human-service agencies provide service to the general public in both the Lower Savannah and Catawba regions. If something works in a local community, stakeholders in the area should seriously consider the costs and benefits of changing who provides local transportation if the current system is working well.

5.4.5 Identity and Local Pride

Like many other public services, transportation services are most successful when they are home-grown with a visual identity that creates local pride. Local pride helps ensure long-term political support from both riders and community leaders. Experiences with both the Allendale Scooter and the Bamberg Handy Ride have shown that giving community involvement in developing a logo for local identity can generate local support and pride.

5.4.6 Migrating Demand-Response Riders to Fixed-Route Transit

Individuals who frequent demand-response service and yet have an accessible fixed-route option should be encouraged to use the less-expensive fixed-route option. As indicated in Table 3-10, the cost to provide a demand-response trip averaged at twenty times the cost of a fixed-route trip according to 2004 statistical reporting from the National Transit Database. Incentives such as fare reductions or passes should be designed to lure riders onto fixed routes. In order to maintain good will in communities, these incentives should create attractive options rather than requirements and mandates.

5.4.7 Land-Use Coordination with Local Planning Agencies

The land-use geography of a service area affects operation costs and service efficiency. Planning departments and Metropolitan Planning Organizations can assist in long-range transportation goals and assist in concentrating or developing land-use patterns to reduce distances for target populations.

5.4.8 Volunteer and Volunteer Networking

Volunteers can easily reduce costs by reducing expenses of maintaining a compensated staff. While volunteers may have different personnel obstacles, any reduction in the operational costs can enable reallocation of funds into other needed areas.

5.5 Strategies to Avoid

Opposite to many of the strategies to consider, several strategies have been identified in literature as detrimental to coordination. Table 5-2 summarizes these strategies (*83*).

Table 5-2: Strategies that Inhibit Coordination

- Vehicles and drivers used to serve only one client or trip type
- Multiple dispatch facilities and other administrative operations
- Unutilized vehicles, empty seats, or low-productivity routes
- Duplication of routes and services in a service area
- Unusually high per-trip cost compared to local, state, or national statistics

Source: Toolkit for Rural Community Coordinated Transportation Services

5.6 Near-Term Considerations

As the goals, objectives, and strategies for transportation coordination take shape, they must be followed with concrete steps for action, as well as benefits and rewards that reveal themselves early in the process. The following near-term considerations can help communities launch coordination efforts and gain early support.

- Identify coordination motivators such as jobs, congestion, or scarcity of resources that encourage transit providers, local leaders, business leaders, and the general public to support coordination efforts.

- Look to sister regions with similar characteristics that have had rewarding coordination programs. Ambassadors from such regions who can vouch for the processes and benefits can build local confidence in coordination efforts.

- Use a few immediate partnerships as demonstration examples for other transportation providers.

- Make the process of using transportation services seamless and pleasant for consumers.

- Display the success and financial savings to the public to promote political motivation towards supporting more new coordination strategies.

- Work to overcome territorialism by bringing all issues to the discussion table and remaining respectful to all concerns.

- Do not expect immediate success in all coordination attempts. Some benefits take time to manifest.

- Determine and identify potential negative consequences at an early stage, create a solution or mitigation plan, and calibrate the expectations of all stakeholders in advance. For example, if a doctor's office agrees to coordinate scheduling, the transit provider must ensure service capacity before coordination begins. If wait times will be one hour, the expectation for that wait time must be established.

- Identify creative solutions that incorporate non-traditional stakeholders who might be specific to a particular region. In Catawba, a citizen who cared about the community started a taxi service to ensure transportation for neighbors. In other instances, people with no apparent stake might take a strong interest. Such individuals and entities should be sought and invited to participate.

- Take small initiatives and grow them into bigger projects. Small demonstrations of success can inspire large-scale commitments and contributions as perception of risk decreases and perception of benefits to the community rise.

5.7 Long-Term Considerations

Although short-term considerations will demand a prominent role at the beginning of coordination efforts, stakeholders should work to focus on long-term community goals. Local coordination leaders might make a point of addressing established long-term goals at all formal stakeholder meetings.

5.7.1 Build Relationships for the Long Term

Near-term working relationships can lead to potentially greater and larger coordination partnerships in the future. Significant barriers to coordination include unfamiliarity or even distrust between organizations. These relationships can help to form effective leadership, but more importantly create mutual trust and understanding. Relationships can be built quickly in order to deal with near-term challenges, but over time they become a strong foundation for coordination.

5.7.2 Statewide Intercity Transit Hubbing

A number of transportation providers were found to provide transportation services across the entire state, as well as the neighboring states of Georgia and North Carolina. For instance, the Pee Dee Regional Transportation Authority has provided transportation to destinations as far away as Augusta, Georgia; Durham, North Carolina; and, Charleston, South Carolina every day. These extremely long trips are expensive, as many costs are accrued based on distance or trip time. A central hub in Columbia could link regional and local transit systems with intercity destinations in the state and

just beyond its borders, particularly where Greyhound no longer serves. A new statewide transit authority serving only long-distance trips should be considered to add efficiency across the state.

While this report has looked most directly at regional coordination focused on improving service and efficiency within or between counties, there may also be significant opportunities for coordination on a statewide or even interstate basis. The creation of hubs at regional centers could allow for multiple agencies' trips to be pooled together to reach more distant destinations. The framework and strategies for this type of coordination might replicate at a larger scale what this report has found for local regions, but key differences will exist. These differences should be investigated to further coordination efforts in the state. The Federal Transit Administration has just started looking into how funding mechanisms could support such shared service provision.

5.7.3 Land Use: Urban Centers and Rural Villages

Land-use patterns directly affect transportation capabilities and costs. Low-density sprawling settlement patterns increase costs and decrease efficiency, while well-designed and planned concentrated settlement patterns can support pedestrian access and transit service more effectively. Even a rural state can take advantage of compact settlement patterns if community design preserves access to both community services and rural quality of life. With even small villages of concentrated services or housing, transportation provision becomes dramatically more efficient and cost effective than in a community with randomly-located facilities and populations.

South Carolina currently has a deficiency of public transportation offerings to many of its populations; the deficiency has implications for social equity. The populations in the counties that are not served are older, command less household income, and have higher percentages of African-American residents than the average statewide. This dilemma of equity and need will be compounded by the aging baby boomers and the continuing in-migration of older people. The current preference among homeowners for low-density rural living makes initiating and continuing transportation service especially challenging. Also, existing demographic patterns have placed minority, poor, and elderly residents in some of the most underserved areas of the state, which presents questions about the equitable allocation of access to public transportation.

The forecast for the future without significant land use and transportation changes is for a significant portion of South Carolina's older population to be left stranded with limited access and mobility opportunities. The mainstream media has begun to forecast impending doom for society and

older populations if land use and transportation alternatives are not resolved before the baby boomers begin to transition to non-drivers. It has been said that, to stop driving is akin to a "prison sentence;" that millions of seniors will be left "stranded," and their lifestyle of independence will be destroyed. Some have called for a nationwide concerted effort to "redesign the suburbs where so many aging Americans live so that they are more walkable and bikable, more compact, with parks and sidewalks and accessible town centers" (*85*).

Land use design that emphasizes the pedestrian rather than the automobile has been shown to have a positive connection to increased mobility for all ages. It has also been shown to have a positive connection to the "likelihood of an older person to take a trip by transit" (*86*). Further, the likelihood of an older person to take a trip in an automobile is negatively associated with the aspects of a good pedestrian design. "More livable communities have lower rates of staying home, and higher rates of public transportation use and walking among non-drivers aged 65 and over." In fact, in areas with higher densities, "one in three older non-drivers walks on a given day", compared to rural and suburban areas where only one in fourteen older non-drivers walks on a given day (*87*).

Communities that are interwoven with neighborhood shops and amenities are beneficial for senior citizens as they become less mobile. Neighborhoods with health care, shopping, and recreation in close proximity to a senior's residence can eliminate or dramatically reduce the need for personal transportation and transportation services. This relationship has reciprocal benefits to the community because as seniors' mobility declines it "increases their propensity to spend locally rather than in regional shopping centers," which in turn helps provide more diversity in goods and services for other consumers in the area (*88*); in some studies, however, it has been found that transit-friendly environments do not necessarily encourage the elderly to shift to alternative transportation modes. They seem to "prefer automobile travel and compensate for physical limitations by traveling less" (*89*). It will be necessary to link higher-density land use to high-quality transportation service in order to attract older people to transportation alternatives. The lower densities of the suburbs and unplanned rural areas create additional challenges in the provision of transit. The costs of operating transit in the suburbs and rural areas that serve fewer people who are spread over greater distances can be severely prohibitive due to a lack of economies of scale (*90*).

5.7.4 Development Fees

An option for providing capital and operating revenue for transportation services lies in the continuing development of new large-scale residential

communities. Local governments can impose a development on fee on new communities to offset the financial impact of increased public services and infrastructure that must be provided to new residents. The fee can function similar to the development fees charged to large-scale developments that use expensive community resources like water and sewer lines. The fee can be charged for the demand expected to be placed on transportation services.

The use of impact fees is a different approach to funding public services than the traditional approach of implementing property taxes. Impact fees directly link use of a public service and payment for that service *(*91*)*. Impact fees place the cost of the additional public services expected to be needed directly on the development, rather than on the existing community. This funding source can help many areas of South Carolina generate funds for transportation services that are currently difficult to secure.

By charging a fee on new homes only, no additional burden of increased expenditures falls on existing residents unless they purchase new homes. The new-home fee might also encourage investment in existing properties that need redevelopment, leading to fewer dilapidated or abandoned buildings. This strategy places the burden of developing transportation services on people who are adding to the impact on the county and who likely have more disposable income. The revenue can provide public transportation to all users and improve local quality of life.

As an example, Washington State's King County has implemented impact fees that generate funds dedicated to transportation and roadway improvements. The fee is designed to "ensure adequate transportation facilities are available to serve new growth and development, to implement the transportation policies of the capital facilities element of the King County Comprehensive Plan, and to provide additional funding for growth-related transportation improvements." The fees charged are proportional to both the expected amount of increased peak evening traffic the development will generate and the costs of roadway improvements needed to accommodate the increase (*92*). King County charges the fee to all new development, including commercial. South Carolina should consider implementing a fee only on single-family residential development in order to avoid placing charges on businesses and employers critical to local economies.

In order to ensure that people with lower incomes are not discouraged from purchasing new homes, communities might design the fee to exempt homes targeted at people with low and moderate incomes. This strategy will help preserve the ability of many of the state's existing elderly, who have fixed incomes below national averages, to age in place. It will also allow them to take advantage of the additional transportation services provided.

In order to promote clustering of retirement communities and other residential communities, developers might be given exemptions from the fee for transportation if they follow higher-density standards for urban development or multi-use rural villages. This strategy will promote the preservation of open space and the rural atmosphere that serves as an attractor for many new residents and as a way of life for lifetime residents. Clustered development will also bring together more people in smaller areas and facilitate the cost advantages of economies of scale in the provision of public transportation and other public services. Higher-density land use that encourages pedestrians and access to nearby shops also will provide residents opportunities to acquire goods and socialize without the necessity of vehicular travel.

The use of development fees to fund transit is an alternative that many communities are just beginning to implement, and the legal validity of them has not been fully tested. As of 2000, 22 states in the country had legislation that allowed the imposition of "impact fees to finance a variety of municipal public purpose projects". Arizona, California, Colorado, Illinois, Maryland, New Hampshire, North Carolina, and Utah all are using impact fees to "finance sewer, roadways, transit, schools, and other publicly funded services." Specific to transportation, the Transportation Research Board issued a request for proposals for lawyers to evaluate the legality of "the use of fees or alternatives to fund transit." The application of the fees follows models for fees charged that have been determined to be constitutionally valid, but the specific application to generate transportation funding has not been fully vetted. In the case of Russ Building Partnership v. City and County of San Francisco, "the California Court of Appeals upheld a San Francisco ordinance imposing a transit impact fee on developers of office space in the downtown area as a valid fee, and not a tax" *(93)*. The California court found that if the public had opportunity for input, due process was followed, and the calculations for the fees bore scrutiny, the fee was valid.

5.7.5 Transportation and Health Care Together

Linking multi-modal centers with health care centers can allow regions to capitalize and coordinate on the extensive network of healthcare transportation services that already exist. Chief among these services is Medicaid, the largest recipient of federal transportation service dollars in the state. The State of South Carolina is required by law to provide transportation to Medicaid patients to and from their medical appointments if it is needed. In 2005 South Carolina spent $47 to $48 million providing transit to 54,000 to 56,000 Medicaid patients (*94*). By coupling the need of providing transportation to the general public with the money already

dedicated to Medicaid transportation, communities devoid of public transportation can develop the framework of a transportation network.

If a series of transportation centers is built throughout the state, citizens can link between them to travel via public transit to anywhere in the state. Healthcare centers can serve as a primary criterion for locating transportation centers. Then following precedent already set in South Carolina's Allendale County, providers of Medicaid transit can provide transportation in open seats to non-Medicaid passengers located at a transportation center.

By linking transportation centers with healthcare centers, communities might access funding that is otherwise not available. Organizations like the Robert Wood Johnson Foundation offer grant money for programs targeted at improving health care, especially in rural areas, and transportation is viewed as a component of the provision of such health care. Additionally, federal rural health programs may help initiate programs targeted at improving the health of rural populations where a coinciding need for medical transportation exists. The federal government is encouraging this kind of coordination through provision in the 2005 Safe, Accountable, Flexible, Efficient, Transportation Equity Act – a Legacy for Users (SAFETEA-LU) that allows federal grant money from agencies other than the Federal Transit Administration to be used as matching funds for transportation programs.

The linking of transportation and healthcare capitalizes on the opportunities afforded from the existing human services transportation network. Funding for construction of the combined centers come from the federal government, charitable foundations, or from state or local capital project funds.

5.7.6 Alternatives in Senior Transportation

Transportation alternatives must enable seniors to maintain the high level of mobility and satisfaction seniors receive from cars. Communities must not only provide rides, "but also a sense of security, independence, and dignity" (*95*). Public policies will need to be refocused and redirected to be responsive to the identified dilemma facing senior citizens today, as well as the anticipated in-migrating senior population. State and local leaders will need to target older public transportation users, as well as support alternative programs and transportation options (*96*). At the local level, communities will need to experiment and be innovative as they seek to meet the transportation needs of seniors (*97*). Transportation goals will need to focus on "not replacing the car, but to provide more viable alternatives" at a cost that is less than that of operating a private vehicle (*95* and *98*).

A point of opportunity for providers of public transportation lies in working to appeal to senior citizens and people under the age of sixteen in conjunction. Both demographic groups seek independence and mobility, have poor perceptions of public transit, and can use transit during non-peak hours (*99* and *100*). Safety concerns are also an important factor for both groups. One of the reasons that the baby boomers do not use public transportation is because many of them did not use it as young adults (*101*). By familiarizing young people with the advantages and alternatives public transportation can provide, communities can create a transit-accepting culture for the future.

Strategies that seek to appeal to young people could also be used for senior citizens. For example, in King County, Washington, the area transit provider established the Youth Transportation Action Council comprised of fourteen teens who met regularly to work at producing a marketing campaign targeted at youth. A transportation council comprised of seniors might attract other seniors to public transportation. In Texas, El Paso used a different youth-targeting strategy that likely would also appeal to seniors. With the purchase of a summer bus pass, El Paso teenagers could obtain free items and admissions. The teenagers were encouraged to explore El Paso to get free ice cream and pretzels, a free tennis lesson and a bowling game, and a visit to a state historic site for free (*102*). Seniors who like free ice cream, pretzels, bowling, and admission to local sites might also try public transportation, which might increase ridership and improve perceptions through familiarity.

Coordination partners must make seniors citizens aware of the transportation alternatives available to them and educate them on their use. In a study of drivers over the age of 65 conducted by the University of Arizona it was found that 57 percent of all respondents believed they would still rely on a car if they were forced to stop driving. "Most respondents did not actively consider using the bus or even walking." In considering how they would make trips to get groceries, only 4.5 percent said they would take the bus, and for social trips 3 percent would use the bus. The most striking result was how many people did not know how they would make trips for groceries (15.4 percent) and social trips (20.3 percent) (*96*). All Americans should know they have transportation alternatives; coordination efforts should particularly target people who would otherwise be stranded.

5.8 Future Research

5.8.1 The Demand Side

It is fundamentally important to note that this study focused on the supply side of transportation, and the demand side was only cursorily investigated. In other words, this research methodology focused on transportation

provision, but it did not extensively investigate public opinion and how the riding and non-riding public has felt about current service provision and unmet needs. A comprehensive investigation of stakeholders must include public opinion, but gauging public opinion for statewide transportation service coordination would require survey sampling across the state. The sample would have to be stratified by type of user, as well as by geography. The data gathered in such a study will provide invaluable information to guide service providers and policy makers to establish transportation services designed to meet specific consumer needs.

5.8.2 Effects of Coordination on Rural Mobility

While research into transit coordination has been conducted for decades, little objective evidence exists to show the effect of coordination on personal mobility. Can transit coordination be shown to create an identifiable increase in trip making, or does the effort of coordination make no significant change in quality of life? This research project has pointed to likelihood that well-established coordination programs in rural areas have increased personal mobility in those communiites. This preliminary finding should be investigated to create a body of defensible evidence proving or refuting the importance of transportation coordination on rural mobility and quality of life.

5.8.3 The Brokerage System

As mentioned in section 4.2.9.2, South Carolina recently adopted a brokerage system that centralizes the administration of Medicaid transportation. This system will likely bring scale economies, but it will also unbalance existing stakeholder relationships and allocations of duties for coordination. As this brokerage system takes hold, both quantitative performance measures and qualitative examination of relationships should be monitored to ensure that South Carolina provides the best possible services to system users.

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6.0 Conclusion

Transportation is vital and access to it often varies among people according to income levels, race or ethnicity, and overall health and welfare. An efficient network of public transportation can enhance quality of life for residents of low incomes, people who are isolated in poverty or rural areas, and elderly residents who wish to age in place, as well as the citizenry in general. Unfortunately, maintaining the current status quo in regards to transportation in South Carolina will not continue to be acceptable. Survey responses have demonstrated that people directly involved with transportation needs do not feel those needs are being met in the state, and anticipated increases in demand pose a threat against already insufficient levels of funding. Community leaders and planners must find creative solutions to mobility and access needs.

Transit coordination is not a new concept, but the most recent federal reauthorization for transportation funding has brought new mandates for statewide coordination. Funding allocations for sections 5310 (Formula Grants for Special Needs of Elderly Individuals and Individuals with Disabilities), 5316 (Job Access and Reverse Commute), and 5317 (New Freedom provision for the disabled) of the 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) all require a transportation service coordination plan for eligibility. While all states have transportation service needs that would fall under these categories, predominantly rural states like South Carolina have particularly strong motivation to meet eligibility requirements for these allocations because the majority of needs in these states fall into these categories.

While discussions of transit often evoke images of metropolitan mass transit, predominantly-rural states have substantial public transit needs for access to medical care, transportation to work, and connection to society. Rural transit needs differ from metropolitan needs not just in scale, scope, and resource availability, but also in substantive need and viable methods of delivery. Coordination of transportation in rural areas must be treated differently from coordination in and around major metropolitan areas. Rural and metropolitan transportation goals vary, and stakeholders have differing motivations and abilities to contribute to coordination efforts.

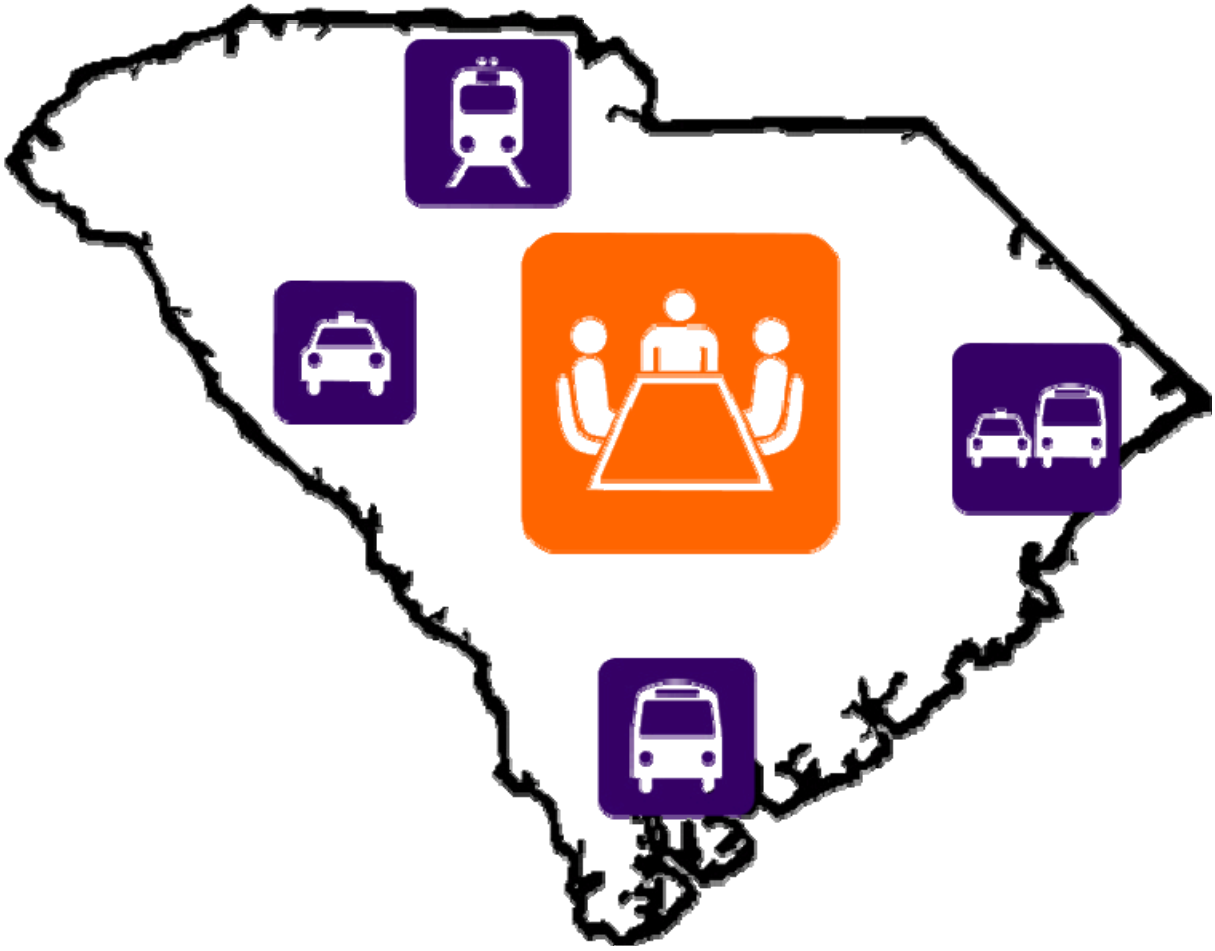
Stakeholder roles and contributions to coordination must necessarily vary substantially. Various types of transportation service operators will advocate for the unique needs of their clients and formalized agency goals. With the exception of regional transit authorities, no stakeholder agency holds mobility for the general public as its primary goal; however, each agency type has its own reasons to support that goal and unique resources to

contribute. All coordination processes must begin with open discussion and understanding of the priorities that each stakeholder brings to the table.

The key to making a coordination plan effective is to consider the needs, goals, and resources of the stakeholders that make up a unique region. A cookie-cutter approach will not bring the best results, nor will it meet the needs of each region's citizenry. Each region has its own unique combination of agencies and individual personalities within those agencies. Local conditions will dictate where leadership, organization, and operating prowess will likely reside; combinations of agencies and agency leader personalities will come together in uniquely local interactions. Regions have distinctive topographic, socioeconomic, and land-use characteristics. All of these attributes must be blended with intent to make an organic coordination plan suited to region-specific stakeholders and conditions.

Regions must recognize the long-term impact of land use: current land-use decisions determine current and future transportation needs. Proximity between elderly housing and healthcare could help reduce or even eliminate the needs for vehicle trips for some seniors. Transportation hubs co-located with health care or job training centers can increase efficiency of transportation services provided. Land use will not solve all needs (for instance, the mission of disabilities and special needs boards will continue to require housing distributed broadly across a populated area); however, proactive attention to land-use planning in advance of new development can reduce expensive demand-response transportation service needs. The South Carolina Department of Transportation cannot advise communities on land-use strategies because the inherently local nature of land use takes it out of the realm of state government; localities must, therefore, turn to planning experts in their regions and the extensive existing body of literature about the interactions of land use and transportation. Premeditated visioning for communities will help define and improve local quality of life and character.

South Carolina faces ever-growing transportation needs and challenges, and the stakeholders who deal with transportation needs daily foresee demand outpacing available resources. Taking advantage of the federal resources available requires coordination of transportation services, and South Carolina has experience that has demonstrated community benefits of coordination. Regions in the state must take advantage of this moment to develop public transit and transportation service coordination plans that grow out of unique community character and enhance it. As regions take ownership of their transportation needs and services, mobility can grow to the best benefit of South Carolina' citizens.



Appendix A: Research Methodology

This project broke down into three distinct phases: inventory of the agencies and stakeholders involved in transportation service provision in South Carolina, examination of current practices of transportation service provision and barriers to collaboration between providers, and creation of a toolkit and overall statewide coordination plan.

A.1 Phase I: Inventory of agencies and stakeholders

South Carolina first needed an inventory of the various agencies offering transit and paratransit service, as well as stakeholders involved in such transportation service planning. Taking this inventory posed complexity because in many cases, social service agencies or nonprofit organizations provide transportation without considering themselves transit operators. Table A-1 indicates the list of categories targeted as potential agencies and stakeholders.

Table A-1: Potential Transit Operators and Stakeholders

SC Department of Transportation	Police and regulators
County planning agencies	Agencies across state borders • Rock Hill – Charlotte • North Augusta – Augusta • Beaufort – Savannah
City governments	
Metropolitan planning organizations (MPOs)	
Councils of government (COGs)	
Local transit authorities	Interest groups • Transportation • Transit • Aged and disabled • Environmental • Medical services • Social services • Retirement communities
Taxi services	
Airport limousines	
Less formal paratransit • Area councils on aging • Mental health agencies • Social health agencies • Medicaid service providers	

Finding the actual list of agencies and stakeholders required a multi-stage approach. The South Carolina Department of Transportation provided existing lists of known providers and stakeholders. The research team checked that list against the categories of stakeholders sought in each region and researched via the Internet, federal listings, and telephone listings for agencies in those categories where gaps existed. Next, Clemson researchers called each of the stakeholders on the list to verify or gather contact information and asked about the existence of other stakeholders. Unexpectedly, few faith-based operators were identified even by local

leaders. The survey described later was used as a final check to gather stakeholder information by showing the list of stakeholders identified in each region to other stakeholders in the region and asking if any others existed. The final stakeholder list appears in its own appendix section.

A.2 Phase II: Evaluation of practices and barriers to coordination

In the second initiative of this research project, the research team focused on practices developed both within and outside South Carolina in order to identify best practices, as well as barriers to transit coordination. Again, several steps comprised this initiative:

A.2.1 Literature Review of Best Practices and Evaluation

The research team examined recent professional and academic literature to characterize the state of the practice for transit coordination. The research team evaluated findings from other states and providers for their applicability within this state. This review of literature also guided research development based on the methodologies used in previous research.

A.2.2 Survey of South Carolina Stakeholders

A survey was conducted to determine current transportation service availability and expectations for future service demand and provision. Survey question development considered research questions identified, literature review findings, and questions developed by other researchers in this field, such as survey work of the *Urban Transportation Monitor (103*).

The survey of stakeholders and transportation providers was distributed via the Internet in May 2006 (see Appendix F (available electronically) for the full survey). This survey went to organizations appearing on the stakeholder list generated in the first phase of this research. In order to develop a representative perspective, this research methodology stratified the survey sample by geography (regions of South Carolina) and type of agency.

The research team anticipated a strong response rate because funding for stakeholders or stakeholder interests would soon depend on South Carolina's ability to form a statewide coordination plan; however, the response rate was not as strong as hoped (Table A-2 and Table A-3). Based on the large confidence intervals, particularly by region, much of the statistical analysis for this research was conducted at an aggregate level; however, disaggregate distributions were investigated where statistical significance could be achieved. For instance, while data on destinations could not be examined without a large margin of error, government and human service agency data could be isolated for richer analysis.

Table A-2: Survey Participation by Agency Type

Agency Type	Population	Survey Sample	Percent of Population	Confidence Interval at 90% Confidence
Operator	857	20	2%	±18.2%
Human services	367	134	37%	±5.7%
Destination[+]	94	8	9%	±28.1%
Government	146	68	47%	±7.3%
Special interest	30	16	53%	±14.3%
Transit operators[++]	27	14	52%	±15.6%

[+] This category included common transit destinations like retirement homes and airports.
[++] The last row shows data from the first row except without private taxis.

Table A-3: Survey Participation by Region

Council-of-Governments Region	Population	Survey Sample	Percent of Population	Confidence Interval at 90% Confidence
Appalachian	193	29	15%	±14.1%
Berkeley Charleston Dorchester	282	48	17%	±10.9%
Catawba	75	13	17%	±20.9%
Central Midlands	151	30	20%	±13.5%
Lowcountry	98	12	12%	±22.4%
Lower Savannah	84	11	13%	±23.3%
Pee Dee	153	30	20%	±13.6%
Upper Savannah	94	25	27%	±14.2%
Santee-Lynches	93	15	16%	±19.6%
Waccamaw	201	11	5%	±24.2%
Not applicable	70	23	33%	±14.2%
Total	**1,494**	**247**	**16.5%**	**±4.8%**

A.2.3 Statistical and Spatial Analysis

Descriptive and inferential statistical analysis determined if responses were dependent on the agencies survey respondents represented, their regional locations, or neither. Presentation of data in map format helped develop a spatial characterization of data. Thematic maps using 2004 Census Bureau were created to help illuminate the state of South Carolina in relation to the rest of the United States. The maps also were intended to identify patterns within specific counties or areas in South Carolina and examine information regarding those areas.

The locations of transportation services, both public and private, were depicted via geographic information systems. These data were then further examined to determine the demographic characteristics of areas in South Carolina that did not have access to a public transportation network. Demographic information was examined to develop a spatial understanding of the composition of the citizens of South Carolina. Race, income, age, and poverty rates were used to examine demographics. Further investigation into the ranking of South Carolina as fourth in the nation in net migration of people over the age of 65 for the years 1995 to 2000 was conducted to determine if this pattern had continued. Examining the percentage change in residents over the age of 65 by county for the years 2000 to 2004 identified residential location choices.

Through these analysis techniques, the survey created a general sense of existing levels of inter-agency coordination and barriers to expanding coordination, as well as characterized the magnitude and ability of each barrier to impede collaboration. While statistical analysis can indicate quantities and trends, it tends to fall short of capturing how and why things happen. The next phase of research targeted a deeper characterization of aptitude to coordinate in specific situations.

A.2.4 Focused Interviews

The Clemson research team followed up on the survey with three site visits including numerous focused interviews to record in greater depth the practices used in the state and to gage stakeholder reactions to ideas that emerged out of the literature review. As with the survey stratification in the second step of this phase, focused interviews represented even coverage of interests across different stakeholder characteristics.

The objectives of the site visits were to categorize the transit service and service coordination occurring at each site and to capture the story of coordination: why and how it happened. Table A-4 indicates the substantive topics discussed with stakeholders during site visit interviews.

Table A-4: Interview Topics According to Site Visit Objectives

Categorize the service and service coordination:	Capture the story of coordination:

• Ability to meet demand
• Extent of area and time
• Enthusiasm of participants
• Level of coordination
	• Environment
	• Barriers
	• Motivation, champions, strategies, technologies, and other catalysts
	• Benefits and costs experienced
	• Funding
	• Longevity of coordination
	• Future expectations, plans, & hopes
	  – Support
	  – Barriers

The three regions visited were Catawba in the northeast, Lower Savannah in the west-southwest, and Pee Dee in the eastern part of South Carolina. Clemson researchers selected these sites in conjunction with the South Carolina Department of Transportation according to specific criteria. The combination of sites needed to represent the state with:

- a history of some transit coordination;
- a mix of populations including metropolitan, small town, and rural settlement patterns;
- a socioeconomic mix of poverty and wealth;
- geographic spread across the state; and,
- demonstrated willingness to participate in this project through a survey response.

Interview results revealed holes in the survey data obtained in this research. For instance, a number of service providers visited described fleets that had been unreported or underreported in survey responses. The discrepancy likely emerged due to survey respondent fatigue and a reluctance to seek data while responding to the survey.

A.3 Phase III: Coordination Toolkit

The third phase synthesized the results of the first two initiatives to produce a practical and implementable tool for South Carolina to use to streamline its transit services through coordination favorable to local planning and local providers. As noted above, the second initiative produced a characterization of best practices for transportation system coordination, limits to applying these practices in South Carolina, and an analysis of existing barriers in the state. The third initiative took that analysis forward to create a toolkit for

applying best practices that can work in South Carolina and overcoming surmountable barriers.

This toolkit provided recommendations regarding location, timing, funding and regulatory considerations. This document identified elements that required additional resources, changes in regulations, opportunities for South Carolina Department of Transportation leadership, and responsibilities of other agencies.

The final research product as it has appeared in this report was targeted to meet the needs of multiple stakeholders in the transit coordination process:

- The **South Carolina Department of Transportation** needed a plan for state coordination and a plan for facilitating that coordination from a centralized position. This coordination required basic information, such as key contacts in individual agencies, as well as more complex information, such as an understanding of the subtle interests of various stakeholders at the local level and the full array of services provided. That information was geared toward providing a basis for targeted funding to meet areas of greatest need and highest return on investment. With increasing demand and limited transit funding availability, targeted funding strategies will be necessary to address transit needs.
- **Councils of government** needed a plan for coordination that would help them to spread their resources efficiently while protecting the needs of the regions they represent. Better information on service providers and their operations will allow for regional coordination. It is expected that the metropolitan planning organizations and councils of government will be an important part of the implementation strategy.
- **Local service providers** needed a mechanism to allow them to share services while protecting the interests of their jurisdictions and operations. Similarly, **local advocacy groups** and other stakeholders needed information to protect their unique interests.

A.4 Outreach

The South Carolina Department of Transportation made clear from the start of this research that it considered outreach an important part of the project. Clemson researchers actively participated in and contributed to numerous events during the research timeline. The Clemson team of researchers participated at South Carolina events such as formal conferences of the Transportation Association of South Carolina and the Rural Health Association. Clemson also presented to representatives of a council of governments.

This research methodology brought an unexpected benefit of coordination. By virtue of going on site and interacting with stakeholders in multiple regions, Clemson researchers were able to create new connections between stakeholders both within council-of-government regions and across regional boundaries. This research also generated cooperation between Clemson and the University of South Carolina's School of Public Health, which had a research initiative for transporting people to healthcare in the Pee Dee.

Table A-5: Research Products from this Project

Presentations to South Carolina Audiences	Dunning, Anne E. "Rural Health and Public Transportation" presented to the South Carolina Rural Health Association Conference, Columbia, South Carolina, March 9, 2006. Dunning, Anne; Mathias, Angela; and, Almeida, Elinor. "Public Health, Rural Service, and Transit Coordination" presented to the Transit Association of South Carolina (TASC) Annual Meeting, Myrtle Beach, South Carolina, March 14, 2006. Boyles, Benjamin Lee and Boyles, William A. "Research the Barriers to Statewide Coordination of Transportation Services" presented at the Meeting of the Councils of Government in Columbia, South Carolina, July 11, 2006.
Presentations at National Venues	Dunning, Anne E. and Boyles, Benjamin L. (October 2007). "Native American Transportation Service Needs and Provision," presented at the American Collegiate Schools of Planning (ACSP) 2007 Annual Conference, Milwaukee, Wisconsin. Mathias, Angela and Dunning, Anne E. (November 2006). "Meeting the Mobility Needs of Aging Baby Boomers through Transit Coordination," presented at the American Collegiate Schools of Planning (ACSP) 2006 Annual Conference, Fort Worth, Texas. Boyles, William A.; Dunning, Anne E.; and Boyles, Benjamin Lee (October 2006). "Cultivating Coordination: Using Existing Transit Resources Targeted at Children to Meet Rural Mobility Challenges of the General Population," presented at the 17th National Rural Public and Intercity Bus Transportation Conference in Stevenson, Washington.
Documents	Mathias, Angela. *A Transportation Dilemma: Maintaining the Mobility of an Aging Population in a Rural State*, a master's thesis written for the City and Regional Planning program at Clemson University, May 2006. Boyles, BL; Mathias, A; Dunning, Anne; and, Boyles, WA (January 2007). "Elderly Mobility: Current Transit Practices and Future Needs" paper number 07-3459 pending revision and review; presented at the 86th Annual Meeting of the Transportation Research Board and recommended for publication in *Transportation Research Record*.

Research results were also placed before the scrutiny of experienced transportation researchers at national venues such as the biennial National Rural Public and Intercity Bus Transportation Conference and annual meetings of the American Collegiate Schools of Planning and the Transportation Research Board. Clemson posed ideas to research leaders, practitioners, and representatives of the Federal Transit Administration to review and validate methodologies and findings.

At the time of final report preparation, Clemson had created research products based on this project as indicated in Table A-5. Further presentations and publications were anticipated.

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103 *Urban Transportation Monitor*. "Coordination/Support of Transit and Transit Agencies: this Week's Survey Results," volume 18, number 6, April 2, 2004.

Glossary

catchment area: the geographical area served by an institution (*104*); *often used synonymously with service area*

choice rider: a person with access to private vehicle transportation who choose to ride public transit instead; *see also transit-dependent population*

coordination: a cooperative arrangement between transportation providers and organizations needing transportation services (*105*)

council of governments (COG): a multi-service entity with state- and locally-defined boundaries that delivers a variety of federal, state, and local programs while continuing its function as a planning organization, technical assistance provider, and "visionary" to its member local governments. (*106*)

deadhead (miles and service): the miles and hours that a vehicle travels when out of revenue service (*107*); for example, driving to the maintenance shop while carrying no passengers

demand-response: transportation service offered by individual request typically with no fixed route and no fixed schedule

door-to-door (realistically curbside pickup): demand-response service that picks up and drops off passengers at specific addresses they designate; *see also door-through-door*

door-through-door: door-to-door service where the driver physically assists passengers out of and into buildings

fixed-route: a system of providing designated public transportation on which a vehicle is operated along a prescribed route [usually] according to a fixed schedule (*108*)

human services: a broad field that encompasses human, social, and public-sector jobs providing a variety of needed services to specific portions of our population (*109*)

Jacob's Law: a South Carolina state law (not a federal law) that does the following:

1. Beginning July 1, 2000, any entity transporting pre primary, secondary school students to or from school, school related activities, or child care must use a school bus as defined by federal law. School buses must meet all federal safety regulations and standards.
2. A vehicle purchased before July 1, 2000 does not have to comply with the requirements of this section until July 1, 2006. Vehicles acquired on or after July 1, 2000 must meet the requirements of this section at the time of purchase.
3. During the six year phase in period, nothing in this act shall be considered to create a duty or obligation to quit using nonconforming vehicles.
4. Private organizations may purchase conforming vehicles under State of South Carolina contracts for purchase of such vehicles.
5. Schools may still contract with common carriers, provided that the carrier is not exclusively engaged in transporting students and the vehicle can carry 30 or more passengers. This exception will continue to allow the use of large passenger buses for field trips.
6. If a student is eligible to receive public school bus transportation, the parents or legal guardians must have the option of designating a child day care center or other before or after school program as the student's origin or destination for school transportation. (*110*)

Medicaid: a program of medical aid designed for Americans unable to afford regular medical service and financed by state and federal governments (*104*)

metropolitan planning organization (MPO): an agency created by federal law to provide local input for urban transportation planning and allocating federal transportation funds to cities with populations of greater than 50,000 (*106*)

paratransit: types of passenger transportation which are more flexible than conventional fixed-route transit but more structured than the use of private automobiles (*107*)

public transit: transportation by a conveyance that provides regular and continuing general or special transportation to the public as defined by the federal government (*111*); *also known as public transportation*

public transportation: transportation by a conveyance that provides regular and continuing general or special transportation to the public as defined by the federal government (*111*); *also known as public transit*

service area: a measure of access to transit service in terms of population served and area coverage (square miles) (*107*); *often used synonymously with catchment area*

service density: population density within a service area

transit: *see public transit*

transit-dependent population: non-drivers (the disabled, elderly, children under driving age, and so forth) and people who cannot afford private vehicles; *see also choice riders.*

transportation service: public transportation, typically with the connotation in this report of transportation provided by agencies with a primary mission other than transportation

United We Ride: an inter-agency Federal national initiative that supports States and their localities in developing coordinated human service delivery systems. In addition to State coordination grants, United We Ride provides State and local agencies a transportation-coordination and planning self-assessment tool, help along the way, technical assistance, and other resources to help their communities succeed. (*112*)

utilization: hours per day of vehicle use.

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104 Merriam-Webster Online Dictionary. 2007. http://www.merriam-webster.com

105 Shawn, Kelly. "American Indian Transportatio n: Issues and Successful Models". RTAP National Transit Resource Center Technical Assistance Brief Number 14. http://www.ctaa.org/ntrc/rtap/pubs/ta/am-ind.asp

106 National Association of Regional Councils. http://narc.org

107 National Transit Database. "Glossary." http://www.ntdprogram.com/ntdprogram/Glossary.htm

108 Independent Living Research Utilization. "Transportation: Fixed Route Systems." http://www.dlrp.org/html/topical/transportation/trans_frs.html

109 St. Edwards University. “Human Services FAQs.” http://www.stedwards.edu/newc/humanservices/ba-faq.html

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111 American Public Transit Association. “Public Transit Overview” http://www.apta.com/research/stats/overview/overview.cfm

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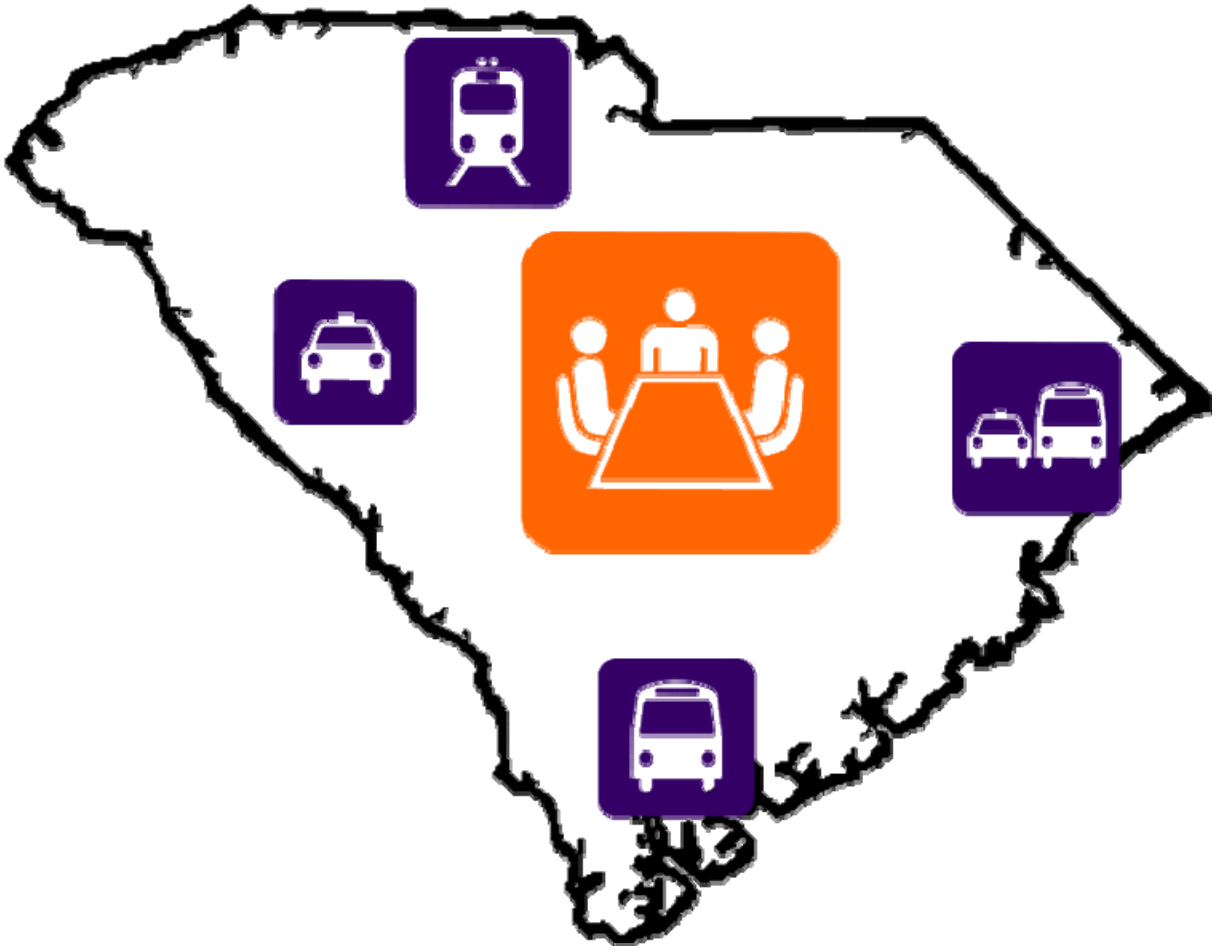
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