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16. Abstract Constant growth in rural areas and extensive suburban development have contributed to increasingly more people needing seamless and adequate public transportation to and from nearby cities. Coordinating existing services or determining the need for expanded services tends to require new paradigm thinking for those interested in servicing growing potential markets in interregional travel markets. Added to the travel pressures in these growing regions is the call from funding agencies and planners to better integrate medical and other human service transportation with more traditional public transportation service. Increasingly, Texans are commuting from outlying communities to jobs, universities, and for other trip purposes to nearby urban and suburban areas. The current separation of urban and rural public transportation services means that Texans who travel between jurisdictions – from rural or suburban communities to cities or the reverse – often find public transportation a difficult or unviable mode of transportation. The need for regional public transportation is likely to grow, not diminish. This report documents the research performed regarding public transportation coordination practices and transit travel demand estimation, and summarizes the tools and guidelines developed as products of the research project.					
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PUBLIC TRANSPORTATION SOLUTIONS FOR REGIONAL TRAVEL: TECHNICAL REPORT

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TABLE OF CONTENTS

	Page
Introduction.....	1
Background.....	1
Methodologies.....	3
Findings.....	5
Benefits of Coordinated Transit Service.....	7
Challenges to Successful Coordination	7
Research Products.....	9
Appendix: Stakeholder Interviews and Survey Instrument Per Task 4.....	11

LIST OF TABLES

Table 1. Specific Tasks Conducted for Project 0-5345.....	4
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Introduction

Increasingly, Texans are commuting from outlying communities to jobs, universities, and for other trip purposes to nearby urban and suburban areas. The current separation of urban and rural public transportation services means that Texans who travel between jurisdictions – from rural or suburban communities to cities or the reverse – often find public transportation a difficult or unviable mode of transportation. The need for regional public transportation is likely to grow, not diminish.

To truly serve the future transportation market, transit service will need to become less stratified and more regional, with seamless connections for passengers traveling between one provider and the next. Coordinating public transportation across traditional agency or jurisdictional boundaries, in many instances, will require new paradigms of service delivery. Benefits of coordinated, seamless transit services include improved accessibility to medical services, jobs and other activities, as well as relief for congested roadways. Potential challenges include relaxing parochial perspectives and yielding longtime service practices.

Background

Public transit providers in the state of Texas fall into four basic funding and operating categories:

- metro regional transit authorities serving the state's largest urban centers,
- smaller urban transit systems serving communities of 50,000 to 200,000,
- rural transit districts serving jurisdictions with less than 50,000 people, and
- transportation provided for the clients of human services agencies or specifically for seniors and persons with disabilities.

Urban transit service usually operates on fixed routes and schedules, in areas of sufficient population density to support regular transit service. Rural, human services, and elderly/disabled transit services usually operate on a demand-response basis, often across a larger geographical service area than that of an urban service. In many cases, these different transit services operate entirely separately within a region, with different fare structures, few or no transfer points from one system to another, and sometimes different ridership eligibility requirements.

As increasing numbers of Texans commute to urban-area jobs from rural or suburban communities, or travel across transit jurisdictions for medical care, these barriers to public transportation use are likely to contribute to a declining ridership share for transit in many significant travel corridors. Constant growth in rural areas and extensive suburban development have contributed to increasingly more people needing seamless and adequate public transportation to and from nearby cities. Added to the travel pressures in these growing regions is the call from funding agencies and planners to better integrate medical and special trips with more traditional public transportation service. To meet these demands, transit providers have looked for new ways to provide

transit services. Flex-route services, suburb-to-suburb and reverse-commute transit, and “community circulator” buses are some of the innovations that public transit providers have implemented around the country to accommodate the changing needs of their communities. However, with limited resources, many transit services are increasingly challenged to provide service to everyone who needs it or to attract new ridership.

Recent changes in federal funding and state law are bringing further change to public transit operations in Texas. SAFETEA-LU (1) includes provisions for interagency coordination of transit services in several of its transit funding programs. Texas House Bill 3588 (2) temporarily required medical trips that were once under the jurisdiction of the Department of Health to be contracted through the Texas Department of Transportation (TxDOT). The bill also requires transit providers to work with TxDOT to find ways to maximize transportation resources and service coverage and to reduce waste.

While “regional transit coordination” is now a statewide effort in Texas, many transit providers in the state and elsewhere already have a history of pooling resources and working together to accomplish their mutual service objectives. Reasons for encouraging some level of coordination among the transit providers in a region include the following:

- **Growing area, growing congestion.** While public transit tends to represent only a small percentage of the total travel in any given community, transit trips during the heaviest travel times have the potential to relieve congestion along major travel corridors. In areas where those travel corridors extend beyond the urban transit provider’s service boundary, coordination between the urban transit provider and adjacent suburban or rural provider(s) will allow transit to remain or become a viable travel option for more area residents.
- **Some transit, but disparate and uncoordinated.** Small cities, towns, and rural areas, faced with a geographically scattered population, can have trouble stretching transit resources to cover all of the area and potential riders. The result can be “pockets” of transit service that leave significant numbers of potential destinations and riders unserved or under-served.
- **Need for cross-region travel.** Patients who must travel across counties to a medical center, residents of one city that work in another, non-drivers who want to travel to retail or services not available in their own area – these are just some of the people who benefit from transportation services that can travel past the usual county or city boundaries of a single transit provider. Small urban or rural transit providers also benefit when long trips can be shared or linked among neighboring jurisdictions.
- **Many separate transit providers competing for the same funding.** Transportation funds are limited with greater demand for dollars than dollars available. A portion of funds from the Federal Transit Administration are calculated on the basis of a formula, which includes the region’s population as one determinant of the amount received. Predetermined coordination arrangements can specify how funding will be allocated, decreasing competition and increasing efficiency resulting in more service within the available funding.

An example of coordination among human services transportation providers is the collaboration among the Red Cross, the Mental Health and Mental Retardation Center (MHMR) and other social service agencies, Association of Retarded Citizens, Fort Bend County Senior Citizens, and Connect Transit to better serve medical and social service trips in Fort Bend County. The recent Fort Bend Transit Plan recommends options for more extensive coordination among these agencies (3). The TxDOT Public Transportation Division's (PTN) new role in administering the state's Medical Transportation Program (MTP) will bring more need and additional opportunity for coordination among several regions' public transportation providers.

Methodologies

The research team approached this study per the following objectives:

- to examine existing or past transit coordination efforts in Texas and elsewhere, particularly those that provide or enable suburban-to-urban or rural-to-urban trips;
- to determine unmet public transportation needs in selected areas and travel corridors, including commuter and medical trip demand, that could be filled through coordination between existing transportation providers in each selected area; and
- to develop location-specific guidelines for potential public transportation coordination solutions to travel demand.

To accomplish these objectives, the research team reviewed previously published studies on transit coordination activities and existing demographic and trip origin-destination data and interviewed key agency stakeholders to identify opportunities and hindrances for coordination in a large urban and small urban area, Houston and Waco communities, respectively. For each urban area selected, the researchers worked with agency stakeholders to determine coordination options and strategies and to explore the institutional and financial implications of implementing those options.

The research process and results are documented in several products and research reports. One of these is a brochure, 0-5345-P2, developed for use by transportation agencies and policy makers as a public education tool and is available at www.regionalserviceplanning.org/coordination/. Specific tasks and outcomes are described in Table 1.

Table 1. Specific Tasks Conducted for Project 0-5345.

<i>Task</i>	<i>Lead Agency</i>	<i>Outcomes</i>
1. Review of Literature and Update Previous Studies	Texas Southern University (TSU) and Texas Transportation Institute (TTI)	Information for Brochure and Guidebook; Identification of Denver, Seattle, Atlanta, Los Angeles, and Phoenix as Communities Addressing the Need for Regionalized Public Transportation
2. Establish Baseline for Existing Areas; Large Urban Areas, Rural to Suburban; Small Urban	TSU and TTI	Identification of Houston as the Large Urban; Waco as the Small Urban, and the Austin /San Antonio Corridor for Study
3. Identify Elements for Consideration	TSU and TTI	Review of previous research into transit coordination identified basic strategies for successful coordination planning. Examples include the following: <ul style="list-style-type: none"> ■ Build a Broad Coalition of Stakeholders ■ Focus on Flexibility and Sustainability <ul style="list-style-type: none"> □ Relinquish traditional service methods ■ Seek long-term financial support ■ Establish legal and institutional framework.
4. Develop Survey Instrument and Interview Stakeholders	TSU and TTI	Stakeholder lists were used from the Metropolitan Planning Organization (MPO) Regional Coordination Plan. All stakeholders were contacted; those responding were interviewed in person or by telephone. Four key questions were asked (see the Appendix).
5. Develop Coordination Strategies	TSU and TTI	Case Studies for Waco and Houston included as Appendices 6 and 7 in the Regional Coordination Guidebook (0-5345-P1).
6. Review Travel Routes, Geographic Information Systems (GIS), and Medical Transportation Program (MTP)	Texas State – San Marcos (TSSM)	Input for Tasks 8, 9, and 10.

Table 1. Specific Tasks Conducted for Project 0-5345 (continued).

<i>Task</i>	<i>Lead Agency</i>	<i>Outcomes</i>
7. Review Existing Travel Data for Austin-San Antonio	TSSM	Utilized Database from Census to Determine Corridor Volumes between Austin – San Antonio. Verified the high volume travel between the Austin and San Antonio Counties.
8. Identify Travel Corridors that Carry a Significant Amount of Commute Traffic	TSSM	Outcomes for Task 11.
9. Develop Location-Specific Guidelines for Potential Public Transportation	TSSM	Outcomes for Task 11.
10. Document all Tasks and Results in a Technical Report	TSSM	Research 0-5345-2
11. Review Origins-Destinations of Clients in the MTP	Prairie View A&M University (PVAMU)	Align the MTP data within the ArcGIS technology as input to Task 13.
12. Assess MTP Data and Public Service Accessibility	PVAMU	Developed User-Friendly Web Page and Document Tasks in 0-5345-1.

Findings

Communities thinking about integrating existing public transportation services or creating new region-wide services will see a number of configurations that are working for other regions. The work products from this research include criteria that can help with a determination as to whether coordination might be a positive option. Public transportation entities around the nation are forging partnerships that facilitate travel for transit riders across large metropolitan areas beyond historical geographic, jurisdictional, or political boundaries. Most of Texas’ urban areas are embracing this trend by improving sources of information and through a variety of formal and informal arrangements. Generally, the arrangements focus on a few routes or destinations. Urban

areas are encouraged to formally regionalize their public transportation services and systems to improve delivery to patrons and make more efficient use of resources. Regional transit coordination arrangements were found in three basic configurations:

- New regional transit entity. Some areas have established a regional transit service organization encompassing multiple counties and cities, sometimes meshing transit services that were originally provided by multiple transit providers.
- Umbrella agency. These regions create an organizational entity responsible for coordinating the services provided by its member agencies. Transit providers under the umbrella agency maintain their own operations, are represented on and financially contribute to the umbrella agency.
- Joint or coordination agreements. Member agencies in these regions remain autonomous while agreeing to coordinate certain aspects of service and/or operations. As one example, the Greyhound intercity bus company has developed guidelines and agreements for interlining its service with local transit services.

Continual advances in transit-related technologies are making regional transit information systems more feasible to develop, even with limited resources. Transit “directory” information is found on several 511 (travel information) and 211 (human services information) services across the United States. Transit software companies are beginning to offer packages designed to aid the coordination of information among multiple transit providers. Mobile data computers (MDCs) are both more powerful and less expensive than their earlier counterparts.

The GIS-based systems developed by both Prairie View A&M and Texas State (described in 0-5345-2 and 0-5345-3) proved to be effective tools for analyzing the travel patterns of Medicaid-related trips and commuter trips, respectively. The Texas State analysis discovered the following trends for commute travel in the five-county Austin-San Antonio region:

- Commute flows between urban and rural areas account for about 20 percent of the total commute traffic, and inter-county commute accounts for 13 percent of the total commute traffic.
- The majority of the top rural communities with high commute flows to urban communities are located in northern and northwestern parts of Travis County and scattered in the western, northern, eastern, and southeastern parts of Bexar County.
- Road segments with high traffic volumes are on IH-35 between East Martin Luther King Jr. Boulevard and US-290 in Austin. This observation indicates that this section of IH-35 receives significantly more commuting traffic than the rest of roadways in the study area.

The guidebook (0-5345-P1) developed as a product of this study includes an overview of transit coordination options, recommendations for developing coordination plans, recommendations for coordinating transit provider information, and descriptions of the GIS methods developed for analyzing regional transit demands for commute and non-emergency medical trips.

Benefits of Coordinated Transit Service

The most fundamental benefit to current and potential transit riders of a coordinated, regionalized transit system is increased mobility. The current disconnect between many rural transit networks and their nearest urban counterparts creates a barrier to potential transit riders who live in (often lower-cost) rural and suburban communities and commute to jobs or services in nearby cities. For transit-dependent populations, including lower-income workers, the elderly, and persons with disabilities, removal of these barriers in the public transportation system means significantly increased access to jobs, medical care, social and human services, and education.

For transit agencies, human service organizations and client transportation providers, coordination of transportation services with other providers in the region can help to eliminate duplicated services – for example, vehicles from multiple providers each delivering a single passenger to a medical center at similar times. When transit providers and other service agencies can pool their resources and client bases to eliminate overlap and improve operating efficiency, resources can often be freed to improve transit services and support other agency goals (4).

Finally, coordinated transit service can help to improve and preserve the transportation networks in and around urban areas. With many Texas metropolitan and other urban areas experiencing increasing (and expanding) congestion, expansion of transit availability along major urban-to-rural travel corridors has the potential to slow the growth of vehicle traffic along these corridors. Shifting more trips to transit can only be accomplished, however, by making the transit trip convenient and timely, with a seamless transition from one transit “jurisdiction” to another.

Challenges to Successful Coordination

One set of challenges to coordination efforts originates with the funding mechanisms of different types of transportation services. Urban transit, rural public transit, and human services transportation are each funded separately, with different regulations and reporting requirements attached to each funding source. These regulations also form the basis for each transportation provider’s overall mission and goals. As a result, the service missions for urban transit providers, rural transit providers, and human services agencies providing client transportation services develop separately, and can be seen to be incompatible with each other. This incompatibility is often more perceived than actual; as described later in this section, there are numerous examples of transit providers that have worked within existing regulations and guidelines to achieve their coordination goals.

Beyond the issues of funding and administrative requirements, a common barrier to coordination among transportation providers in a given region is the problem of “turf.” Agencies can perceive coordination efforts as a threat to control of their operations, or may fear losing clients and associated funding to other transportation providers. Turf issues can be minimized through early and continual communication among all participants, and by emphasis on building consensus at each stage of the coordination process.

Logistical challenges to coordination can include lack of physical infrastructure, differing fare mechanisms, scheduling and dispatching issues, and staffing. Early coordination efforts will often need to be small in scale, with new elements added as funding will permit (5).

Research Products

Research under the project number 0-5345 yielded a number of reports that elaborate the information presented in this Research Report. Additional detail regarding the points made in this Research Report can be found as follows:

- 0-5345-P1 – Transit Coordination Guidelines
- 0-5345-P2 – Brochure for Policy Makers and Transit Agencies
- 0-5345-3 – Technical Report Assessing MTP Trip Integration and GIS Potential
- 0-5345-2 – Research Report Detailing the GIS Commute Model and SA/Austin Travel Corridors
- 0-5345-S – Summary of Work Performed, Findings and Conclusions

References

1. Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). Federal Highway Administration, U.S. Department of Transportation, Washington, D.C., 2005. Downloaded from <http://www.fhwa.dot.gov/safetealu/index.htm>, September 21, 2007.
2. “Summary of Enactments: Transportation.” 78th Legislature, State of Texas, downloaded from <http://www.tlc.state.tx.us/pubssoe/78soe/S140.htm> on September 21, 2007.
3. Fort Bend Transit Plan (draft), Prepared by the Goodman Corporation, A&R Consulting, and Texas Southern University for the Houston-Galveston Area Council and the Texas Department of Transportation, October 2004.
4. Improving Public Transportation Services through Effective Statewide Coordination. NGA Center for Best Practices, National Governors Association, Washington, D.C., 2002.
5. Toolkit for Rural Community Coordinated Transportation Services. TCRP Report 101, Transportation Research Board, Washington, D.C., 2004.

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**Appendix:
Stakeholder Interviews and Survey Instrument Per Task 4**

Houston Area Interviews – Conducted the Month of June 2007

Transit Agency	Interviewee
Metropolitan Transit Authority of Harris County (METRO)	John Sedlak
Harris County Coordinated Transportation	Vernon Chambers
Island Transit	Not Interested
Brazos Transit District	Lyle Nelson
Fort Bend Transit	Paulette Shelton
Connect Transit	David Jones
Colorado Valley Transit	Austin, Colorado, Waller, Wharton, Fort Bend Counties
American Red Cross Transportation Services	Martha Mayes, Transportation Manager
TREK (Uptown Galleria Transportation Management Associate)	Janet Redeker
Baytown Senior Citizens	Ferni Greene-Small

Waco Area Stakeholders and Interviews – Conducted June and July 2007

Transit Agency	Interviewee
Hill Country Transit	Carole Warlick
HOTCOG	Jacque Wolske
Waco Transit	No direct contact made; information from Matt Penney (TxDOT, formerly of Waco Transit), Jeff Arndt (TTI)
TxDOT, Waco District	Matt Penney

Primary Interview Questions

1. Have you received input from your patrons indicating interest in being able to move across more of the region? Does there seem to be interest in establishing easy transfer points with other transportation providers?
2. Is your agency already offering some degree of coordination? If yes, describe.
3. Are there statutory limitations hindering coordination among public transit services? Elaborate.
 - a. Who do you consider key players in coordination for your region?
 - b. Is there a champion or major supporter for regionalization? Who could be that person?
4. Do you have standard operating procedures that would hinder coordination with other public transit services?