



Last Mile Package Delivery via Rural Transit: Project Summary and Pilot Outcomes

Technical Report 0-6891-R1

Cooperative Research Program

TEXAS A&M TRANSPORTATION INSTITUTE
COLLEGE STATION, TEXAS

in cooperation with the
Federal Highway Administration and the
Texas Department of Transportation
<http://tti.tamu.edu/documents/0-6891-R1.pdf>

1. Report No. FHWA/TX-17/0-6891-R1		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle LAST MILE PACKAGE DELIVERY VIA RURAL TRANSIT: PROJECT SUMMARY AND PILOT OUTCOMES				5. Report Date Published: January 2019	
				6. Performing Organization Code	
7. Author(s) Zachary Elgart, Kristi Miller, and Shuman Tan				8. Performing Organization Report No. Report 0-6891-R1	
9. Performing Organization Name and Address Texas A&M Transportation Institute The Texas A&M University System College Station, Texas 77843-3135				10. Work Unit No. (TRAVIS)	
				11. Contract or Grant No. Project 0-6891	
12. Sponsoring Agency Name and Address Texas Department of Transportation Research and Technology Implementation Office 125 E. 11 th Street Austin, Texas 78701-2483				13. Type of Report and Period Covered Technical Report: September 2015–August 2017	
				14. Sponsoring Agency Code	
15. Supplementary Notes Project performed in cooperation with the Texas Department of Transportation and the Federal Highway Administration. Project Title: Using Public Transportation to Facilitate Last Mile Package Delivery URL: http://tti.tamu.edu/documents/0-6891-R1.pdf					
16. Abstract Rural transit districts and intercity bus carriers are an important link within Texas' multimodal transportation system. Without such service providers, many rural residents that are transit dependent would be forced to either relocate or find other means of transportation. Furthermore, with continued growth of business to consumer e-commerce demand for package shipping services and rural areas face a particular challenge in finding efficient "last mile" delivery of goods (from freight drop to final destination). Rural transit districts operate demand response door-to-door service throughout Texas, providing critical connections to goods and services. The network of Texas rural transit districts may effectively bridge the last mile gap in package shipping from the freight drop point to the final destination by providing last mile package delivery services in cooperation with freight companies. Last mile package delivery service may present an opportunity for rural transit operators to diversify revenue sources and improve overall cost effectiveness while maintaining existing door-to-door service. This project researched the potential to address current gaps in existing package delivery service with the network of intercity bus and rural transit districts in Texas. Documentation includes best practices, challenges, policy implications, and the potential for revenue generation, and a guidebook. The guidebook is designed to inform rural transit operators of how to implement a package delivery service includes documentation of lessons learned from pilot package delivery services implemented as part of the research project.					
17. Key Words Package Delivery, Bus, Package, Rural Transit Agencies, E-Commerce, Last Mile, Intercity Bus			18. Distribution Statement No restrictions. This document is available to the public through NTIS: National Technical Information Service Alexandria, Virginia http://www.ntis.gov		
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		21. No. of Pages 176	22. Price

**USING PUBLIC TRANSPORTATION TO FACILITATE LAST MILE
PACKAGE DELIVERY: TECHNICAL REPORT**

by

Zachary Elgart
Assistant Research Scientist
Texas A&M Transportation Institute

Kristi Miller
Associate Transportation Researcher
Texas A&M Transportation Institute

and

Shuman Tan
Associate Transportation Researcher
Texas A&M Transportation Institute

Report 0-6891-R1
Project 0-6891

Project Title: Using Public Transportation to Facilitate Last Mile Package Delivery

Performed in cooperation with the
Texas Department of Transportation
and the
Federal Highway Administration

Published: January 2019

TEXAS A&M TRANSPORTATION INSTITUTE
College Station, Texas 77843-3135

DISCLAIMER

This research was performed in cooperation with the Texas Department of Transportation (TxDOT) and the Federal Highway Administration (FHWA). The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official view or policies of the FHWA or TxDOT. This report does not constitute a standard, specification, or regulation.

The United States Government and the State of Texas do not endorse products or manufacturers. Trade or manufacturers' names appear herein solely because they are considered essential to the object of this report.

ACKNOWLEDGMENTS

This project was conducted in cooperation with TxDOT and FHWA. The authors thank the TxDOT Project Monitoring Committee, Sonya Badgley, Kelly Kirkland, and Kris Dudley. The authors also thank members of the project team—Suzie Edrington, Jonathan Brooks, and Mark Szyperski—for their contributions, the public and private agencies who participated in the industry questionnaire and stakeholder workshops in Arlington, Austin, Odessa, and Pharr, Dave Marsh from Capital Area Rural Transportation System for presenting at the Austin workshop, and the TxDOT offices in Odessa and Pharr for hosting project workshops.

TABLE OF CONTENTS

	Page
List of Figures	x
List of Tables	xi
Executive Summary	1
State-of-the-Practice Scan	1
Fact-Finding Questionnaire.....	2
Rural and Intercity Bus Workshops	3
Guidebook	4
Pilot Package Delivery Service	4
Potential Future Opportunities	5
Introduction	7
State-of-the-Practice Scan	9
History of Package Delivery in the United States	9
Mid-1800s to Early 1900s	9
Early 20th Century	10
Late 20th Century	10
Regional Package Delivery Companies	11
Lone Star Overnight	12
OnTrac	13
LaserShip	15
Eastern Connection.....	16
United Delivery Service	17
Golden State Overnight Delivery Service	18
SpeedDee.....	19
U.S. Cargo	20
Greyhound Package Express	21
Amazon.....	22
Demand for Package Services.....	24
United States Postal Service.....	24
FedEx.....	24
UPS.....	25
E-commerce Contributions to Package Volumes.....	26
Examples and Opportunities in Rural Transit Package Delivery.....	29
Texas RTDs and Intercity Bus Operators.....	30
Intercity Bus Operators Package Delivery Service	32
Package Delivery Brokers for GPX Service	37
Challenges Associated with Service Provision	39
Incorporating Package Delivery into Existing Operations	39
Liability	39
Perception and Marketing	39
Managing Perception.....	40
Marketing For-Profit Endeavors.....	40
Regulations and Operational Considerations	41

Infrastructure Deterioration	43
Aging and Dispersed Population	44
Increased Costs to Deliver Packages	45
Fiscal.....	47
State and Federal Agencies	49
Fact-Finding Questionnaire	51
Rural Transit Districts	51
Questionnaire Participation	51
Questionnaire Findings.....	51
Involvement in Delivery.....	53
RTDs with Experience	53
Current Transit-Based Package Delivery Practices in Texas	55
Intercity Bus Operators	56
Current Partnerships with Transit Agencies in Texas	57
Innovations in Package Delivery.....	58
Challenges in Package Delivery.....	58
Opportunities and Lessons Learned	59
Workshop/Pilot Participation	59
Rural and Intercity Bus Workshops	61
Workshop Locations	61
Workshop Agenda.....	62
Key Findings from the Workshops	63
SCOT Analysis.....	63
Stakeholder Objectives	66
Markets	67
Community Connections	67
Operational Considerations	68
Conclusions from the Workshops	70
Strategy for Implementing Last-Mile Package Delivery Service via Rural Transit	73
Goals, Objectives, and Performance Measures	73
Insurance and Liability.....	74
Service Partners.....	74
Rural Transit Agencies.....	74
Private Package Delivery Companies	75
Service Agreement Structure.....	75
Training	76
Infrastructure Requirements	76
Scheduling/Routing/Planning.....	76
Potential Service Models and Example Service Prices	76
Interlining Carrier without Local Delivery.....	77
Pickup/Dropoff Facility.....	78
Complete Service.....	78
Service Pricing.....	79
Pilot Project	81
Pilot Project Timeline.....	81
September 2016.....	81

October 2016	81
November 2016	82
January–March 2017	83
April 2017.....	83
Goals, Objectives, and Performance	84
Status—Goals and Objectives	84
Performance Outcomes	86
Lessons Learned.....	88
Communication/Education	88
Marketing	89
Operations.....	89
Strengths, Challenges, Opportunities, and Threats Analysis	90
Guidebook.....	93
Project Summary	95
Appendix A. Rural Transit District Poll.....	97
Appendix B. Supplemental Materials	99
Workshop Supporting Information	99
FTA Programs, Rules, and Reporting Requirements	99
Intercity Bus Package Express Overview.....	102
Rural Transit Overview	102
Rural Texas.....	104
Texas Rural Transit	104
Workshop Presentation	110
SCOT Analysis Worksheet	130
Agency Information Form.....	131
Appendix C. Example Package Delivery Service Agreement.....	133
Appendix D. Example Training Documents.....	145
References.....	159

LIST OF FIGURES

	Page
Figure 1. LSO Delivery Area.....	12
Figure 2. OnTrac Service Area.	14
Figure 3. OnTrac Messenger Service Area.....	15
Figure 4. LaserShip Coverage Map.	16
Figure 5. Eastern Connection Service Area.....	17
Figure 6. UDS Area.	18
Figure 7. GSO Service Area.	19
Figure 8. SpeedDee Service Area.	20
Figure 9. U.S. Cargo Service Area.	21
Figure 10. Amazon Prime Same Day Delivery Locations.....	23
Figure 11. FedEx Annual Total Package Volume.	25
Figure 12. UPS Average Daily Package Volume (in Thousands).....	26
Figure 13. Number of Digital Shoppers, 14 Years and Older, in the United States from 2010 to 2018 (in Millions).	27
Figure 14. Net Revenue of Amazon from 1st Quarter 2007 to 2nd Quarter 2015 (in Billion U.S. Dollars).	27
Figure 15. B2C Volume in the United States from 2006 to 2013 (in Billion U.S. Dollars).....	28
Figure 16. Evolution of Logistics Needs.	29
Figure 17. Texas RTDs.	30
Figure 18. Texas Intercity Bus and Amtrak Network.....	32
Figure 19. Projected Percent Population Change by County, 2010–2040.....	45
Figure 20. Rural Transit Operators Interested in Pilot Participation.	82
Figure 21. SWART Package Service Availability.....	84
Figure 22. Data Reporting Spreadsheet.	88
Figure 23. Balance of SCOT Findings.....	92
Figure 24. Bus and Rail Network in the United States.	102
Figure 25. Map of RTDs in Texas.	103
Figure 26. Rural Transit Vehicle Types.....	107

LIST OF TABLES

	Page
Table 1. SCOT Analysis—Pilot Package Delivery Service.	5
Table 2. Future Opportunities.	6
Table 3. USPS Total Shipping/Package Volume (in Billions).*	24
Table 4. NBTA Interlining Revenue Share Process.	33
Table 5. Intercity Bus Operators—Package Delivery Options.	34
Table 6. Intercity Bus Freight—Brokerage Services and Fees.	38
Table 7. Cost of Delivery per Package.	46
Table 8. Workshop Locations, Dates, and Attendees.	62
Table 9. Stakeholder Objectives.	66
Table 10. Interlining Carrier without Local Delivery Specifics.	78
Table 11. Pickup/Dropoff Facility Specifics.	78
Table 12. Complete Service Specifics.	79
Table 13. Status of Pilot Goals as of May 31, 2017.	85
Table 14. Status of Pilot Objective as of May 31, 2017.	86
Table 15. SCOT Analysis – Pilot Package Delivery Service.	91
Table 16. Future Opportunities.	96
Table 17. Rural Transit Average Span of Service.	108

EXECUTIVE SUMMARY

Texas is home to over 26 million residents—a number that is expected to grow to approximately 45 million by 2040 (*1*). Commerce and quality of life in Texas depend on the daily delivery of millions of tons of goods shipped efficiently and affordably over the Texas freight transportation system by a network of highways, railways, waterways, ports, airports, pipelines, and land ports-of-entry. The multimodal freight transportation system efficiently connects local, regional, national, and global markets. With population levels increasing and growth in online purchasing and e-commerce, the state’s transportation network can expect increasing levels of freight movements.

The last portion of the freight delivery trip is referred to as the last mile and represents the largest and most inefficient portion for carriers. This inefficiency is especially true in rural areas where customers may be spaced far apart. One consequence is that large package delivery carriers add fuel surcharges to rural packages, increasing the costs for rural residents. Improved efficiency of last-mile deliveries will benefit rural residents and freight carriers.

Rural transit agencies and intercity bus carriers are an important component of the Texas multimodal transportation system. Rural transit agencies operate demand-response, door-to-door, or curb-to-curb service throughout Texas, providing critical connections to goods and services for rural residents. In addition, intercity bus carriers offer package delivery services that can often deliver a package the same day it is shipped and provide direct connectivity between origins and destinations without the need for a distribution center.

This network of rural transit agencies and intercity bus carriers may effectively bridge the last-mile gap in package shipping from the freight drop point to the final destination by providing last-mile package delivery services in exchange for a service fee. These service fees, an alternative revenue stream, could offer rural transit operators the opportunity to operate more sustainably and potentially leverage additional state- and federal-level funding sources by providing funding for local match. Additionally, new service and greater connections in rural areas could improve quality of life.

This research project investigates current gaps in existing package delivery service that the network of intercity bus and rural transit districts (RTDs) in Texas could fill. The Texas Department of Transportation (TxDOT), transit agencies, and freight stakeholders will benefit from knowledge of best practices, challenges, policy implications, and the potential for revenue generation that result from this research and pilot implementation.

This report documents the research about coordinating package delivery service between private package delivery providers and rural public transit operators. The following sections briefly describe the research activities and key outcomes from each task.

STATE-OF-THE-PRACTICE SCAN

Researchers describe the current last-mile package delivery environment through a scan of the historic and current state of the practice to establish a baseline understanding of package delivery

services in the United States and provide a better understanding of the opportunity for rural transit agencies to participate in freight delivery as a last-mile solution.

Documentation for this activity provided the following:

- The history and current state of the practice of last-mile package delivery services.
- The involvement (depth and breadth) of transit agencies in such services.
- Non-transit last-mile package delivery options.
- The network of intercity bus carriers that may interline with rural transit agencies.
- Relevant legislation, policies, and practices that affect package delivery operations.
- Specific examples found in existing literature of last-mile package delivery using rural transit.

The scan included a review of relevant literature, currently available services, and other information including local, regional, state, and federal laws pertaining to package delivery.

Key findings from the state-of-the-practice scan are:

- In recent years, large service providers have documented increased demand for package delivery. The growth of online shopping (or e-commerce) contributed most to the increase of package volumes.
- Package deliveries in rural areas of Texas face challenges from infrastructure deterioration and a population that is decreasing, aging, and dispersed.
- The last mile of the logistics chain, which accounts for a large proportion of shipment costs and complexity of operations, is often the most inefficient. In rural areas, low residential density adds distance and time to delivery routes.
- Package delivery companies are investing in methods to reduce the cost of delivering packages. Possible solutions may include the utilization of centralized package pickup, dropoff locations, and package delivery on buses.
- The Federal Transit Administration (FTA) has no specific guidance on package delivery using public transportation vehicles. Due to considerations of complying with regulations and ensuring safe operations, adding cargo operations to a passenger service may require adjustments to operational and procedural practices for both the operating agency and driver performing the movement.
- The literature review indicated that providing package delivery services as a means of augmenting transit agency revenue is not a concept that is currently under investigation by researchers and public transit agencies; however, private intercity bus operators have a long history with package delivery.

FACT-FINDING QUESTIONNAIRE

To gather data directly from stakeholders through a fact-finding questionnaire, researchers identified relevant types of stakeholders for package/freight delivery coordination between public rural transit agencies and the private sector. Types of stakeholders included FTA, TxDOT, rural transit agencies, and private-sector companies. The scope of work envisioned primarily using an online questionnaire, but researchers expanded the data collection effort to include virtual meetings with private-sector companies.

Findings from the stakeholder questionnaire built upon the baseline state-of-the-practice information collected and ascertained current experience with an interest in freight delivery as a last-mile solution.

Key findings from the questionnaire are as follows:

- Seven out of 37 Texas rural transit agencies have experience with at least one of the following forms of delivery: meals-on-wheels, package delivery, and freight haul. Five out of the seven are involved in package delivery now or were in the past.
- The primary motivation for delivering packages on buses is that this service can generate additional revenue, facilitate coordination between agencies, and benefit community partnership. Package delivery revenue averaged approximately \$4,724 each year and ranged from \$1,800 to \$10,000.
- Keys to success for package delivery or freight haul include good communication, mutually beneficial arrangements, sufficient marketing, and detailed procedure on package tracking.
- Barriers to adopting package delivery on buses include lack of a proper contact person in package carrier companies, relative low revenue compared to the effort to coordinate package delivery, and the increasing need to provide on-demand package delivery service.

RURAL AND INTERCITY BUS WORKSHOPS

To develop dialogue between stakeholders and investigate findings from the state-of-practice scan and fact-finding questionnaire more thoroughly, researchers facilitated a series of stakeholder workshops to capture rural transit agency and private intercity bus carrier perspectives on using public transit to facilitate last-mile package delivery in rural areas. The workshops acted as a platform to inform participants and gain feedback on possible options, challenges, barriers, advantages, and disadvantages of using public transit to facilitate package delivery, as well as to discuss opportunities for coordination of package delivery between the public and private sectors. Stakeholders, including representatives from the 37 Texas rural transit agencies, private and public intercity bus operators, private package delivery interests, TxDOT, and others, were invited to participate in the workshops.

The workshops revealed that transit agencies and private package carriers are equally interested in the concept of last-mile package delivery and perceive similar benefits:

- Additional reach and market share.
- Increased ridership.
- Increased revenue.
- Opportunities to collaborate on service provision beyond package delivery.

There is not a one-size-fits-all way to implement package delivery in rural areas. The type of package delivery service is dependent upon local/regional markets and the size/capacity of the local partner. The diversity of potential markets is substantial.

Package delivery can offer transit agencies the opportunity to provide an additional service to their customers and improve rural residents' access to goods and services. It can provide additional service points from private carriers. Funding partners (FTA, TxDOT, metropolitan planning organizations [MPOs], and others) may need to develop an understanding of this concept to ensure that such programs are executed in the same way throughout Texas. It is crucial to have support from funding agencies to ensure successful programs.

GUIDEBOOK

The research supported development of a guidebook to aid TxDOT and its partners and stakeholders in how to best identify and implement these mobility programs (available at <http://tti.tamu.edu/documents/0-6891-P3.pdf>).

This guidebook is designed to inform rural transit operators of how to implement a package delivery service using information and input gathered from the state-of-the-practice scan, the fact-finding questionnaire, and stakeholder workshops. The guidebook summarizes the fiscal, coordination, and transportation impacts of rural transit package delivery service and provides elements for consideration in developing and implementing package delivery service using rural transit services.

The guidebook includes the following sections:

- Review of the state of the practice.
- Opportunities for services and markets.
- Challenges associated with service provision.
- Potential service models and example service pricing.
- Documentation of pilot package delivery service outcomes and lessons learned.
- Appendices.

PILOT PACKAGE DELIVERY SERVICE

To test the guidebook and learn more about implementing a package delivery service provided under a partnership between a rural transit agency and a private package delivery service, researchers solicited transit agencies to participate in a pilot package delivery service in collaboration with Greyhound Package Express (GPX). Eight rural transit agencies stated interest in participating, and Southwest Area Regional Transit District (SWART) and Concho Valley Transit District (Concho Valley) were selected to join the pilot. Researchers selected the pilot transit agencies because of unique service areas and the potential to generate meaningful lessons for the pilot. Using the guidebook as a reference, researchers worked to facilitate coordination between SWART and Concho Valley and GPX to establish a service plan and implement package service. The final guidebook documents the pilot's outcomes and lessons learned including an analysis of the pilot's strengths, challenges, opportunities, and threats (SCOT) analysis as presented in Table 1.

Table 1. SCOT Analysis—Pilot Package Delivery Service.

		Internal			
Positive Contributions/Outcomes	Strengths	<p>Low cost of entry</p> <ul style="list-style-type: none"> • Service uses existing transit vehicles, drivers, and dispatchers. • Technology requirements are limited to desktop computers and, optionally, tablets. <p>Service diversity</p> <ul style="list-style-type: none"> • Package delivery service provides customers with additional connections to their home regions, the state, and nation. • Transit agencies gain experience operating innovative service and thinking outside the box, which could contribute to future transit service innovation. 	Challenges	<p>Low demand for service</p> <ul style="list-style-type: none"> • During the performance period, the pilots did not receive requests for service. Without demand, the service cannot be successful. <p>Insurance requirements</p> <ul style="list-style-type: none"> • Liability insurance that covers package delivery activities is required for transit agencies to accept the additional risk associated with a new service. During the performance period, the transit agencies were unable to obtain adequate insurance. 	Future Considerations
	Opportunities	<p>Economic development</p> <ul style="list-style-type: none"> • Package service has the potential to facilitate low-cost shipping for local businesses and generate demand for secondary service-sector businesses such as couriers. <p>Buy-in from TxDOT and stakeholders</p> <ul style="list-style-type: none"> • TxDOT and stakeholders throughout Texas signaled support for this type of service during workshops and through the project period. 	Threats	<p>Appearance of limited profitability</p> <ul style="list-style-type: none"> • Because the pilots did not receive service requests, it could appear as though the service concept may not be profitable. Given a longer performance period, it is likely that demand and profitability would increase. 	
		External			

POTENTIAL FUTURE OPPORTUNITIES

Based on the research outcomes and challenges associated with the pilot implementation of package delivery service, researchers developed a series of potential future research and technical assistance opportunities. Table 2 presents these potential opportunities.

Table 2. Future Opportunities.

Market Analysis and Feasibility	Perform in-depth market research in areas throughout Texas to document potential for transit-based package delivery service and coordination between transit agencies and intercity bus providers.
Document Insurance Availability, Requirements, and Risk Profiles	Review the options to insure transit-based package delivery service, the requirements set forth by insurers and legislation, and produce risk profiles that identify the perceived risk of different example service types.
Technical Assistance for an Alternative Service Working Group	Coordinate and facilitate a working group to enable information sharing between transit agencies in Texas that are implementing alternative service types (including but not limited to package delivery).

INTRODUCTION

Texas is home to over 26 million residents—a number that is expected to grow to approximately 45 million by 2040 (*I*). Commerce and quality of life in Texas depend on the daily delivery of millions of tons of goods shipped efficiently and affordably over the Texas freight transportation system by a network of highways, railways, waterways, ports, airports, pipelines, and land ports-of-entry. The multimodal freight transportation system efficiently connects local, regional, national, and global markets. With population levels increasing and growth in online purchasing and e-commerce, the state’s transportation network can expect increasing levels of freight movements.

The last portion of the freight delivery trip is referred to as the last mile and represents the largest and most inefficient portion for carriers. This inefficiency is especially true in rural areas where customers may be spaced far apart. One consequence is that large package delivery carriers add fuel surcharges to rural packages, increasing the costs for rural residents. Improved efficiency of last-mile deliveries will benefit rural residents and freight carriers.

The Texas Freight Mobility Plan recognizes this issue and recommends facilitation of connections between local governments and the freight industry to enhance connectivity and develop solutions to last-mile challenges (*I*). Additionally, it states that Texas, “should invest in strategies and solutions that link the different freight transportation modes” and cites the following opportunities:

- Ensure the development of a system with adequate and available access points that facilitates the use of alternative modes beyond trucking to alleviate capacity concerns on highways (e.g., truck-rail facilities).
- Emphasize project selection criteria in the TxDOT planning process that support and prioritize funding of first- and last-mile connectors in locations with regional, statewide, and national significance, including both urban and rural connectors (*I*).

Rural transit agencies and intercity bus carriers are an important component of the Texas multimodal transportation system. Rural transit agencies operate demand-response, door-to-door, or curb-to-curb service throughout Texas, providing critical connections to goods and services for rural residents. In addition, intercity bus carriers offer package delivery services that can often deliver a package the same day it is shipped and provide direct connectivity between origins and destinations without the need for a distribution center.

This network of rural transit agencies and intercity bus carriers may effectively bridge the last-mile gap in package shipping from the freight drop point to the final destination by providing last-mile package delivery services in exchange for a service fee. These service fees, an alternative revenue stream, could offer rural transit operators the opportunity to operate more sustainably and potentially leverage additional state- and federal-level funding sources by providing funding for local match. Additionally, new service and greater connections in rural areas could improve quality of life.

Continued growth of business to consumer e-commerce has increased demand for package shipping services. Rural areas face a particular challenge in finding efficient last-mile delivery of

goods (from freight drop to final destination). Last-mile package delivery service may present an opportunity for rural transit operators to diversify revenue sources and improve overall cost effectiveness while maintaining existing door-to-door service.

This report documents the research about coordinating package delivery service between private package delivery providers and rural public transit operators. TxDOT, transit and freight stakeholders (such as, regional package delivery companies, United Parcel Service [UPS], FedEx Corporation, and United States Postal Service [USPS]), and transit agencies will benefit from knowledge of best practices, challenges, policy implications, and the potential for revenue generation. Researchers developed a guidebook to aid TxDOT and its partners and stakeholders in how to best identify and implement these mobility programs.

The report is organized as follows:

- State-of-the-practice scan.
- Fact-finding questionnaire.
- Rural and intercity bus workshops.
- Strategy for implementing last-mile package delivery service.
- Pilot project.
- Guidebook.
- Project summary.

A series of appendices provide additional supporting research for this report:

- RTD poll.
- Supplemental materials used in the workshops.
- Package delivery service agreement.
- Training documents.

STATE-OF-THE-PRACTICE SCAN

The state-of-the-practice scan summarizes the current last-mile package delivery environment. Researchers conducted a scan of historic and current state-of-the-practice to establish a baseline understanding of package delivery services in the United States, the involvement (depth and breadth) of transit agencies in such services, non-transit last-mile package delivery options, the network of intercity bus carriers that may interline with rural transit agencies, relevant legislation, policies/practices that affect package delivery operations, and specific examples found in existing literature of last-mile package delivery using rural transit. The scan provides a better understanding of the opportunity for rural transit agencies to participate in freight delivery as a last-mile solution.

The scan includes a review of relevant literature, currently available services, and other information including local, regional, state, and federal laws pertaining to package delivery. Researchers created maps of current Texas rural and intercity bus services, existing package delivery services and volumes, costs of package delivery to regions of the state, package delivery deserts, and other relevant findings.

HISTORY OF PACKAGE DELIVERY IN THE UNITED STATES

The package delivery industry has changed over the years in:

- The type of goods transported.
- The geographic scale of the marketplace.
- Customers' needs.
- Range of service options that carriers offer.
- Transportation and communications technology available to carriers and consumers.

The following provides a brief overview of the history of the package delivery industry and the key players.

Mid-1800s to Early 1900s

Private express companies, like Adams Express, American Express, and Wells, Fargo & Company, began delivering packages in the mid-1800s to destinations throughout the eastern states—eventually expanding service south and west with the California gold rush (2). By 1858, private express companies delivered almost anything, anywhere and offered coast-to-coast service.

USPS began experimenting with last-mile rural delivery in 1890 and started the rural free delivery program on October 1, 1896, with three routes in West Virginia. Within one year, the rural free delivery program had expanded to 44 routes in 29 other states and became a permanent service in July 1902 with over 8,500 rural carriers (3). Rural carriers could only deliver packages weighing up to 4 lb; heavier packages had to be shipped using private express companies. In 1911, the Post Office began experimenting with delivering larger packages—this experiment would later become the USPS Parcel Post service.

Early 20th Century

In the early 20th century Parcel Post, UPS, and Railway Express Agency (REA) were the key providers of package delivery services.

Parcel Post

Parcel Post Service began service on January 1, 1913, and expanded rapidly. The service was widely used due to its pricing and availability. During the first five days of service, post offices providing city delivery service reported handling over 4 million Parcel Post packages (4), and within the first six months of operation, approximately 300 million parcels were handled. The popularity of parcel post was also evident as postal officials increased the allowable weight of parcels. In 1913, the maximum weight was increased from 11 to 20 lb for the first and second zones, and soon thereafter, the maximum increased again, from 20 to 50 lb. In February 1983, a uniform weight and size limit was set at 70 lb, 108 inches, for parcels mailed from any Post Office to any destination within the United States (5). In 1999, the size limit for increased to 130 inches.

UPS

In 1907, Jim Casey and Claude Ryan started the American Messenger Company in Seattle, Washington, whose messengers ran errands, delivered packages, and carried notes, baggage, and trays of food from restaurants. The company changed its name to Merchants Parcel Delivery in 1913 and focused on delivering small parcels for local department stores. In the same year, they developed consolidated delivery, combining packages addressed to a certain neighborhood onto one delivery vehicle, to use manpower and motorized equipment more efficiently, and keep rates low. The company expanded outside Seattle in 1919 with the acquisition of Oakland, CA, based Motor Parcel Delivery and was renamed UPS. In the early 1920s, UPS began the process of expanding its services by acquiring common carrier rights in the Los Angeles area to begin offering services including scheduled daily pickup calls, acceptance of checks and collection-on-delivery, additional delivery attempts, streamlined documentation, and weekly billing (6).

Railway Express Agency

During the First World War, the United States Railway Administration took control of U.S. railroads and consolidated the four main railway express companies to create American Railway Express, Inc. (ARE). In 1929, the assets and operations of the ARE were transferred to REA. Collectively owned by 86 railroad companies, REA moved packages and freight across the United States for over 50 years—providing a nationwide service similar to modern package delivery companies. REA operated over 190,000 miles of rail lines and employed over 45,000 people at its peak. Despite the size of REA, technology progressed, road infrastructure expanded, and truck travel became more affordable, railroads could not compete with express delivery and the company filed for bankruptcy in 1975 (7).

Late 20th Century

As the 20th Century progressed, trucks and planes increasingly dominated the package delivery industry. The establishment of the Interstate Highway System in 1956, airline deregulation in

1978, interstate trucking deregulation in 1980, and intrastate trucking deregulation in 1994, all contributed to the shift to truck and air transport.

UPS Airlines

The demand for air parcel delivery in the 1980s created new opportunities for UPS. UPS Airlines entered the overnight air delivery business in 1981, and by 1985, UPS Next Day Air service was available in the 48 contiguous states, Puerto Rico, Anchorage, Alaska, and Oahu, Hawaii.

In 1988, the Federal Aviation Administration authorized UPS to operate its own aircraft. Today, UPS Airlines is one of the largest airlines in the United States and features advanced information systems, like the Computerized Operations Monitoring, Planning and Scheduling System, which provides information for planning, scheduling, and load handling (8).

Federal Express (FedEx)

Federal Express Corporation was founded in 1971 in Little Rock, Arkansas, but later moved to Memphis, Tennessee, and changed the name to FedEx in 1994. The company started overnight delivery operations in 1973, connecting 25 cities in the United States. FedEx introduced the drop box in 1975, which allowed customers to drop off packages without going to a company local branch. FedEx launched air delivery services in 1978 and became the first company to use computer software to manage operations with a program called COSMOS (Customers, Operations, and Services Master Online System), a centralized computer system to manage people, packages, vehicles, and weather scenarios in real time. In 1986, FedEx introduced the SuperTracker, a handheld bar code scanner system that captures detailed package information and introduced parcel tracking to the freight industry (9).

REGIONAL PACKAGE DELIVERY COMPANIES

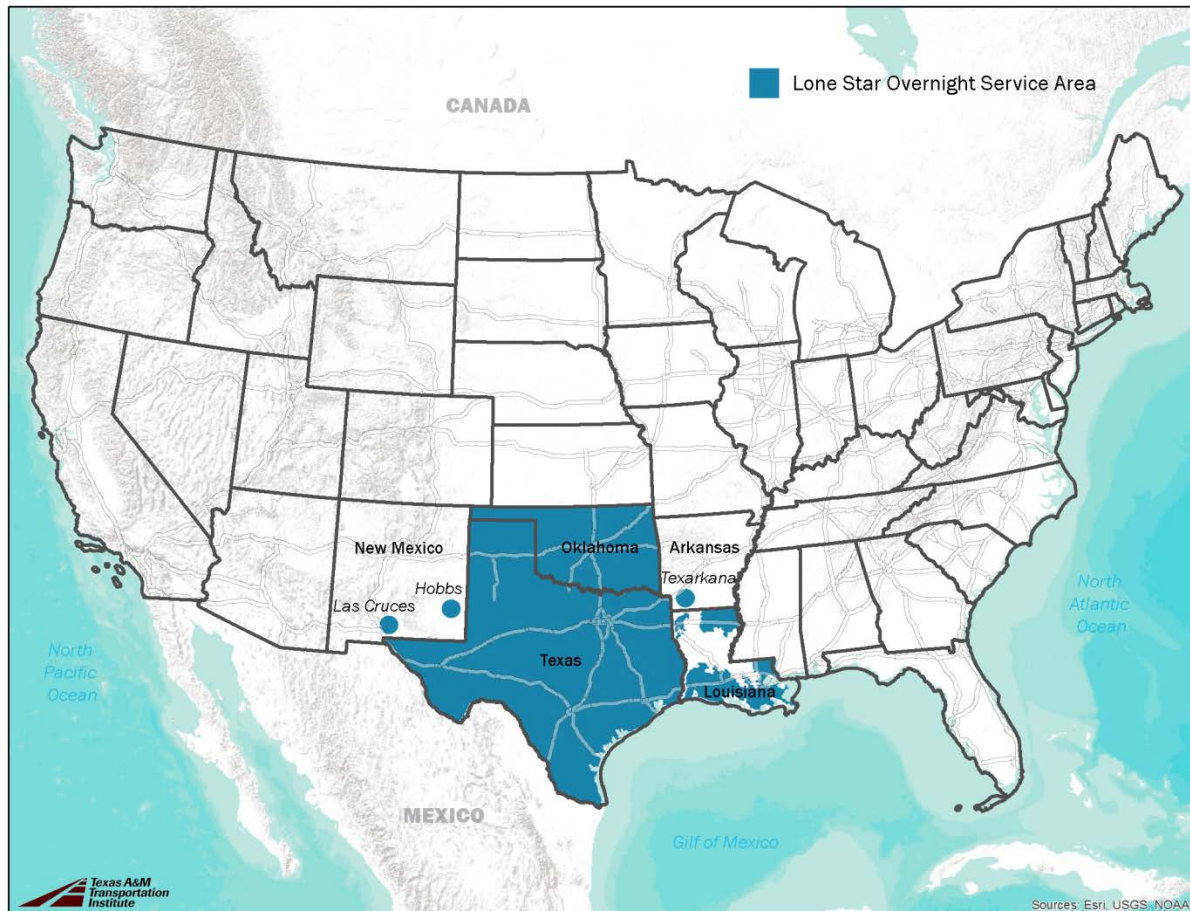
Many regional package delivery companies combine the track and trace capability of the national carriers with the ability to guarantee next day delivery at ground rates over a larger delivery footprint. Because they are regionally based, they are able to improve shipment time in transit and increase shippers' productivity with later pick up times. Not all rural areas in the United States are served by the regional package delivery companies—an absence of service may be an opportunity for package delivery service by public transit providers.

Package delivery in rural areas often requires customers to either pay increased shipping fees or accept service that does not provide as many options. UPS and FedEx often include an array of accessorial charges (such as fuel and residential delivery surcharges) in addition to their standard fees when delivering to rural residents and businesses. USPS offers lower-cost options for small package delivery to the home but does not offer the same package tracking option as UPS and FedEx. Despite having an affordable option, many customers sacrifice low cost shipping to gain better and more detailed tracking options.

The following introduces several regional package delivery companies across the United States.

Lone Star Overnight

Based in Austin, Lone Star Overnight (LSO) is the most prominent regional package delivery company in Texas. Since its inception in 1991, LSO uses both air and ground transportation to cover overnight delivery to the entire state of Texas, Oklahoma, western Louisiana, eastern New Mexico, Texarkana, Arkansas, and portions of Mexico (Figure 1) (10).



Source: (11)

Figure 1. LSO Delivery Area.

LSO offers various delivery options for packages up to 150 lb and up to 72 inches by 130 inches (12):

- Early Next Day – delivered the next business day by 8:30 a.m. to most cities within the LSO service area. This service can be added to LSO Basic Service for \$27.00 per package and is not available for Saturday deliveries.
- Priority Next Day – delivered the next business day by 10:30 a.m. to most areas, by noon or by the end of the next business day to some rural areas. This service ranges in price

from \$15.86 for a 1 lb envelope in Zone 2 to \$668.10 for a 150 lb package delivered in Zone 5.¹

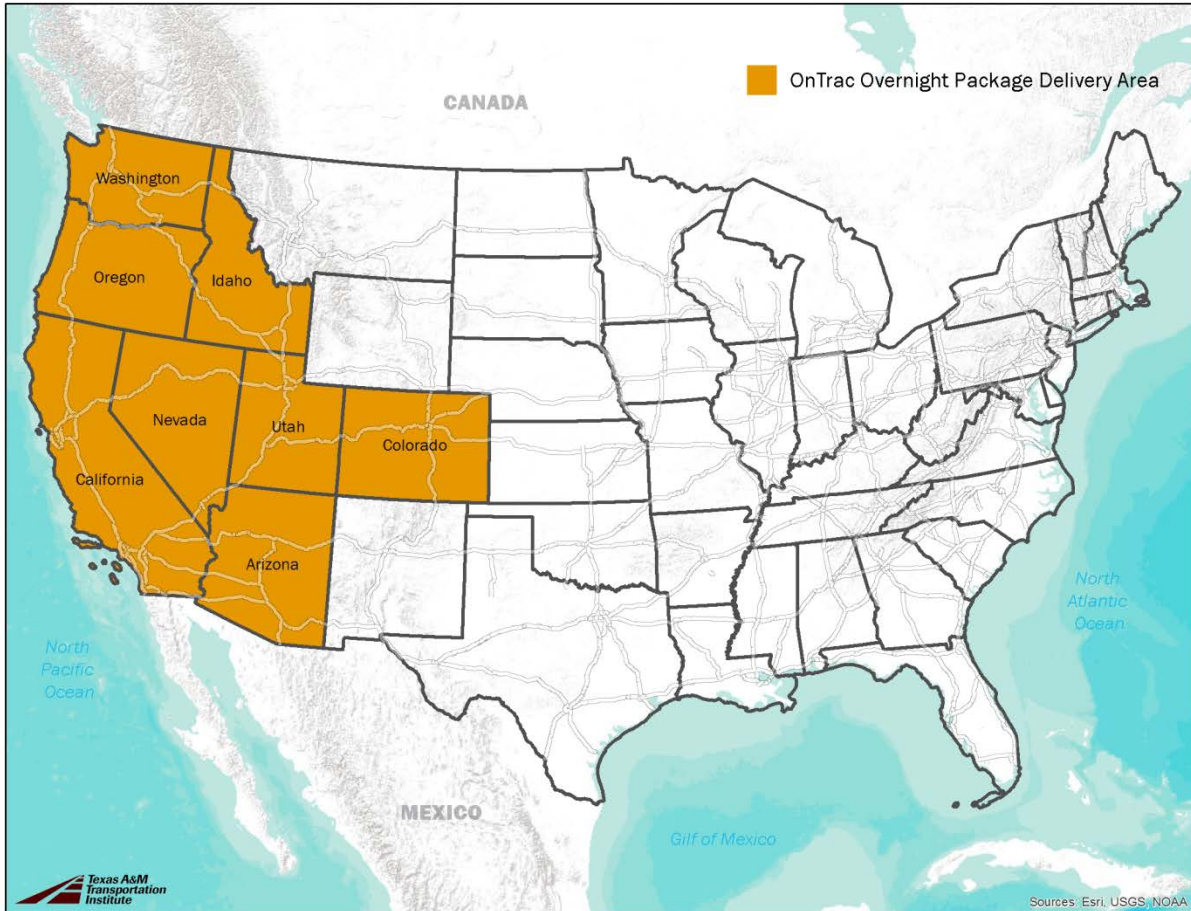
- Economy Next day – delivered the next business day by 3:00 p.m. to most areas, or the end of the next business day to some rural areas. This service ranges in price from \$14.93 for a 1 lb envelope delivered in Zone 2 to \$652.80 for a 150 lb package delivered in Zone 5.
- 2nd Day – guaranteed delivery by the second business day. This service ranges in price from \$12.42 to \$307.28.
- Saturday – delivered on Saturday by noon to most areas, but later in some rural areas. Saturday delivery is \$16.00 per package.
- Ground – guaranteed delivery within one to three business days. This service is \$3.35–\$3.80 per package.
- Mexico – delivery available to any city in Mexico within two to three business days. This service ranges in price from \$22.32 for a 1 lb envelope delivered in Zone 1 to \$621.22 for a 150 lb package delivered in Zone 5.
- LSO Omniship – an all-in-one, integrated, web-based multicarrier shipping solution. Omniship enables customers choose the best way to ship their package, regardless of carrier (13).
- LSO Simple – shipping option that matches the published prices of competitors for the equivalent delivery options in the same zone and weight combinations. This service is available in combination with early next day, priority, economy next day, and Saturday deliveries.

OnTrac

Founded in 1991, OnTrac is a regional overnight package delivery service operating throughout California, and in the metropolitan areas of Arizona, Nevada, Oregon, Washington, Utah, Colorado, and Idaho (Figure 2). OnTrac has over 1,100 Drop Boxes throughout their service area and offer several services and shipping rates (14), including:

- Sunrise Gold—delivery by 8:00 a.m. on weekdays and 12:00 p.m. on Saturdays. Rates range from 1 lb in-state, \$29.75 for a 1 lb package being delivered in-state to \$469.85 for a 150 lb delivered out of state.
- Sunrise—delivery by 10:30 a.m. on weekdays and 2:00 p.m. on weekends. Rates range from 1 lb in-state, \$20.75 for a 1 lb package being delivered in-state to \$335.30 for a 150 lb delivered out of state.
- OnTrac Ground—next day or two-day ground service with guaranteed delivery by the end of the business day. Deliveries on Saturdays must be pre-arranged: 1 lb, Zone 2, \$6.59; 150 lb, Zone 6, \$94.90.
- Palletized Freight—delivery for pallets weighing 300–1500 lb, delivered the next day by 5:00 p.m. Shipping rates range from \$104.00 for a 300 lb pallet delivered to Zone 2 to \$1,035.00 for a 1500 lb pallet delivered to Zone 6.

¹ LSO Zones: Zone 2 = 0–150 miles, Zone 3 = 150–300 miles, Zone 4 = 300–600 miles, Zone 5 = 600–1000 miles.



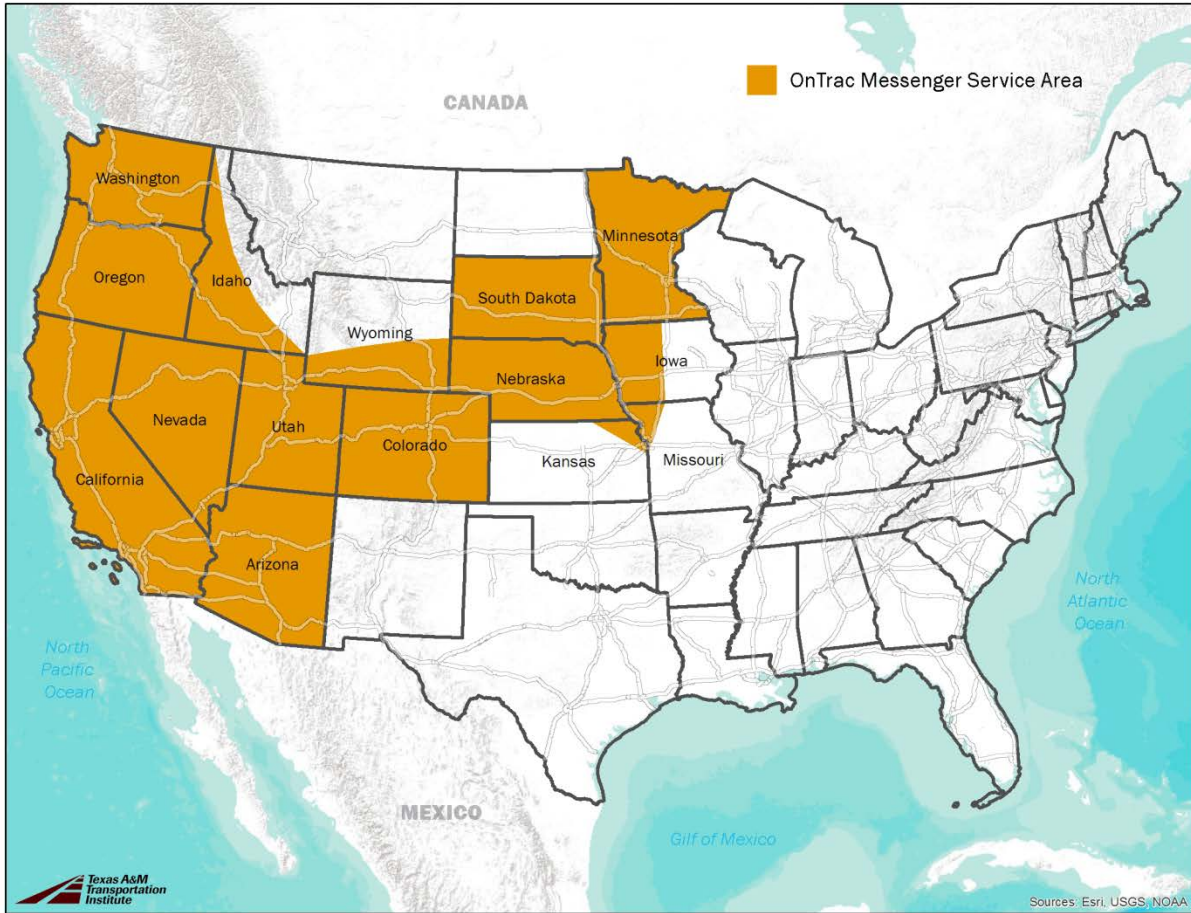
Source: (15)

Figure 2. OnTrac Service Area.

OnTrac has also provided professional messenger services for over 50 years. OnTrac Messenger operates in Minnesota, South Dakota, Nebraska, Iowa, Missouri, Kansas, Colorado, Wyoming, Utah, Nevada, Arizona, Oregon, Washington, Idaho, and California (Figure 3) (16). Messenger offers various services to help customers with their delivery needs, including:

- Direct Delivery (point-to-point) – shipment is picked up and immediately delivered.
- Rush Service – same day pick up with delivery options (ASAP, 1–6 hour, end of business day).
- Same-Day Delivery – picks up at 10:00 a.m. and delivers by the end of the business day.
- Next-Day Delivery – delivers by the end of the next business day.
- Point-to-Point Nationwide – shipment is put on the next available flight to the destination then uses a regional partner to deliver to destination.
- Scheduled Route Work – versatile route scheduling tailored to meet the needs of each clients, from scheduled daily pickups to pre-arranged time-specific deliveries.

OnTrac Messenger services are available to account holders. The cost for each service varies with the amount of service requested by a customer—more service requested results in lower per service costs.



Source: (17)

Figure 3. OnTrac Messenger Service Area.

LaserShip

Founded in 1989, LaserShip is a regional carrier with a delivery network servicing the east coast (Figure 4). LaserShip focuses on last-mile deliveries for e-retailers, but works with various industries such as healthcare, pharmaceutical, life sciences, supplies, and professional services. This company offers several service types to meet the needs of its customers, but it does not publish service costs (possibly because the cost of service is variable as a result of fuel and other changing input costs):

- Next Day.
- Same Day—available in 28 metropolitan areas on the east coast.
- Global Priority.
- Routed Delivery.
- Fleet Outsourcing.
- Pool Distribution.
- Destination Delivery Unit (DDU) services.

LaserShip also offers real-time tracking at the package, route, stop, driver, and scan levels, digital signatures, comprehensive and automated reporting, electronic invoicing, online integration, weekend delivery, accessorial fee flexibility, and integration with transportation management and warehouse management systems (18).



Source: (18)

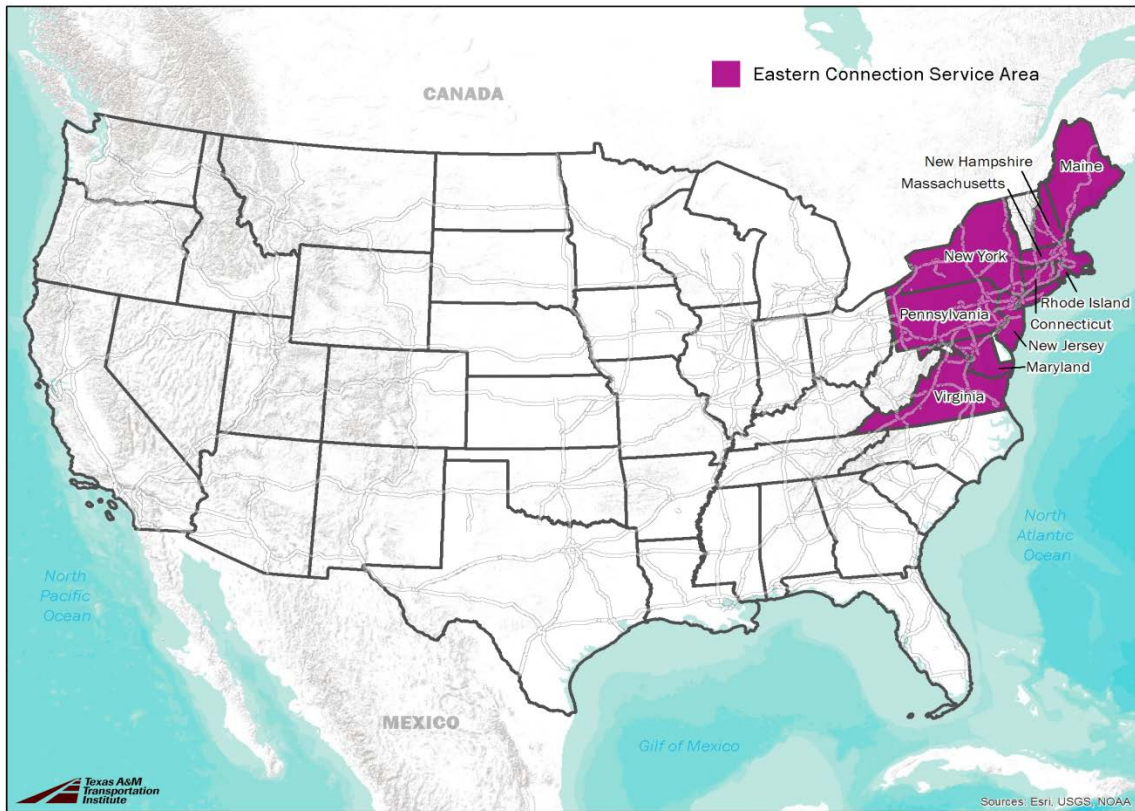
Figure 4. LaserShip Coverage Map.

Eastern Connection

Eastern Connection is a regional overnight shipping company servicing the northeast, from Maine to Virginia, and as far west as Buffalo, New York (Figure 5). Eastern Connection offers various services, including:

- Ground – guaranteed next day delivery within the service area. Rates range from \$5.84 for a 1-lb package delivered to Zone 2 to \$76.09 for a 150-lb package delivered to Zone 4.
- Priority – guaranteed to be delivered by 10:30 a.m. the next business day, and delivered on Saturday by 12:00 p.m. Rates range from \$19.80 for a 1-lb package delivered to Zone 2 to \$664.50 for a 150-lb package delivered to Zone 4.

- Same Day – a specialized service with rapid response, direct drive couriers, and next flight out shipments. Rates are based on specific pickup and delivery locations, and the weight of the package (19).

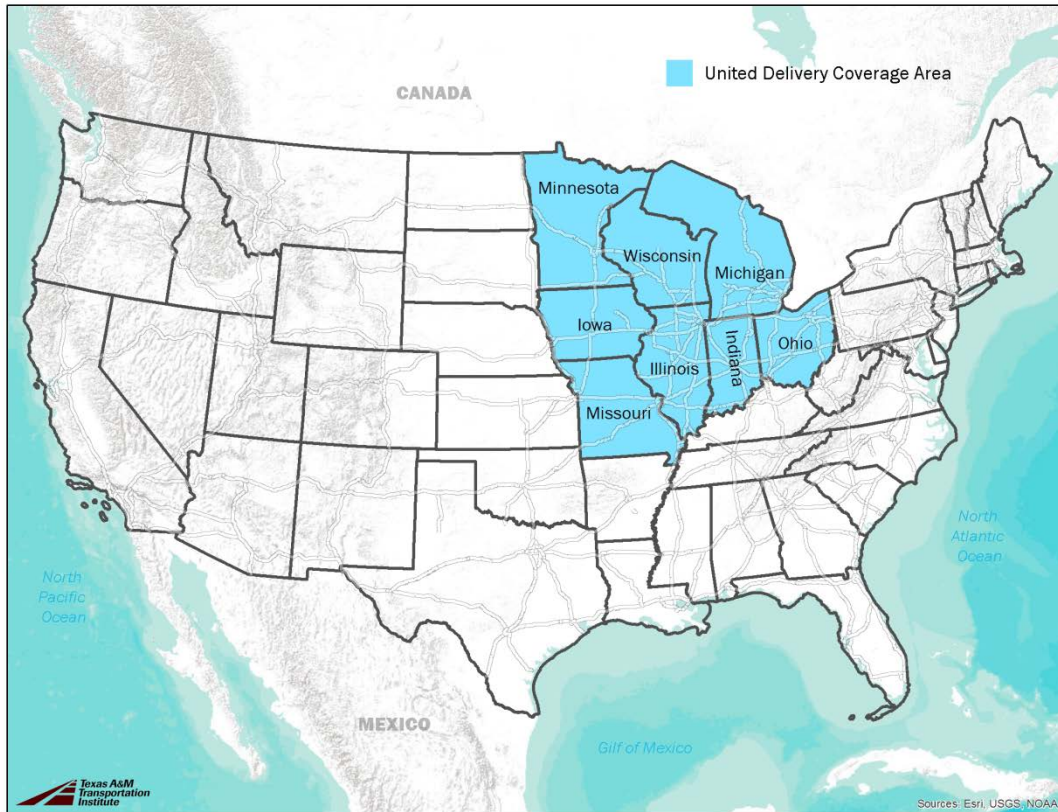


Source: (20)

Figure 5. Eastern Connection Service Area.

United Delivery Service

Headquartered in Chicago, United Delivery Service (UDS) was founded in 1972 and now serves the Midwest region (Figure 6). UDS offers optimized routes with next day service, late pickups and deliveries, same day courier service, bulk distribution, less-than-full truckload freight shipping, warehouse storage, and scheduled routing services. The company uses real-time tracking, exception tracking (damaged, short, delayed), electronic signatures, and GPS geolocation technology. UDS does not provide fixed rates for its services, instead the company quotes prices on demand to reflect real-time costs (21).

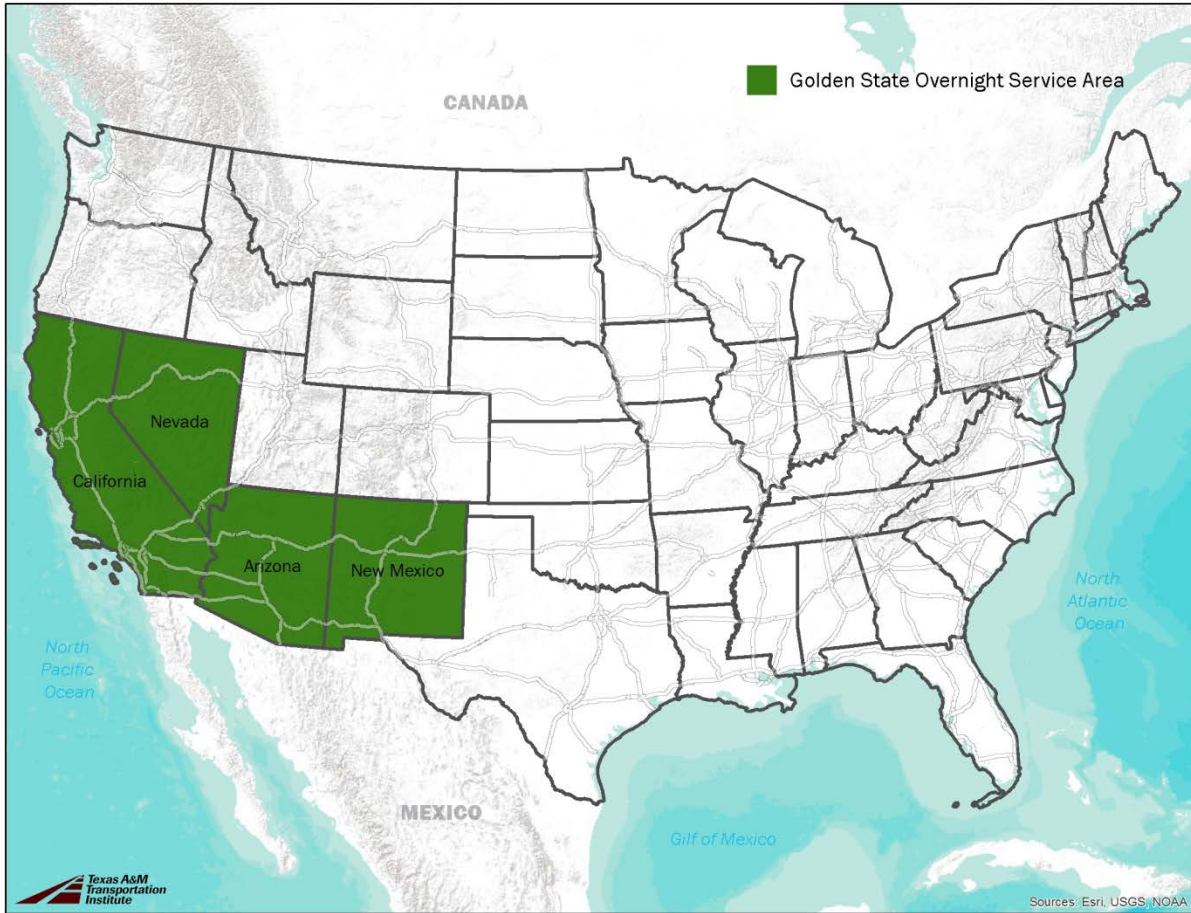


Source: (22)

Figure 6. UDS Area.

Golden State Overnight Delivery Service

Golden State Overnight Delivery Service (GSO) was founded in California in 1995 to provide affordable overnight delivery service for in-state shipments. The company operates throughout the state of California, and in the metropolitan areas of Nevada, Arizona, and New Mexico (Figure 7). GSO offers priority, early priority, Saturday delivery, early Saturday delivery services, late pick up times, and an online tool for label production, scheduling, tracking, and ordering supplies. Rates range from \$12.90 to \$201.35 (23).

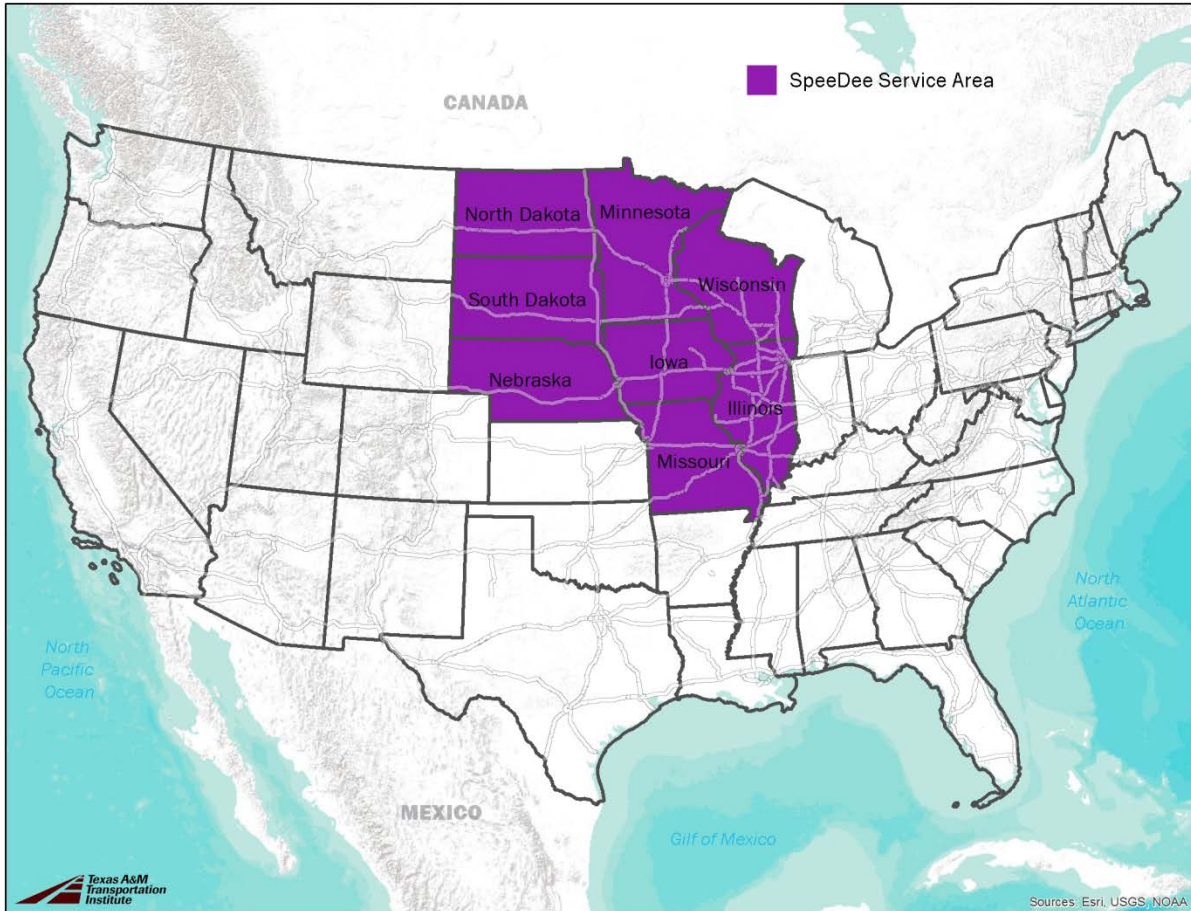


Source: (24)

Figure 7. GSO Service Area.

Speedee

Speedee was founded in 1978 as a single-operator, on-call courier service used to deliver packages to local businesses in rural Minnesota. The company now has over 1,800 employees in the Upper Midwest, with walk-in counter locations, public shipping locations, on-call services (Figure 8). Next day shipping rates at Speedee range from \$4.11 for a 1 lb package delivered in Zone 1 to \$60.03 for a 150 lb package delivered in Zone 5. On-call Pick-up Service is available for an additional \$6–10 charge (25).

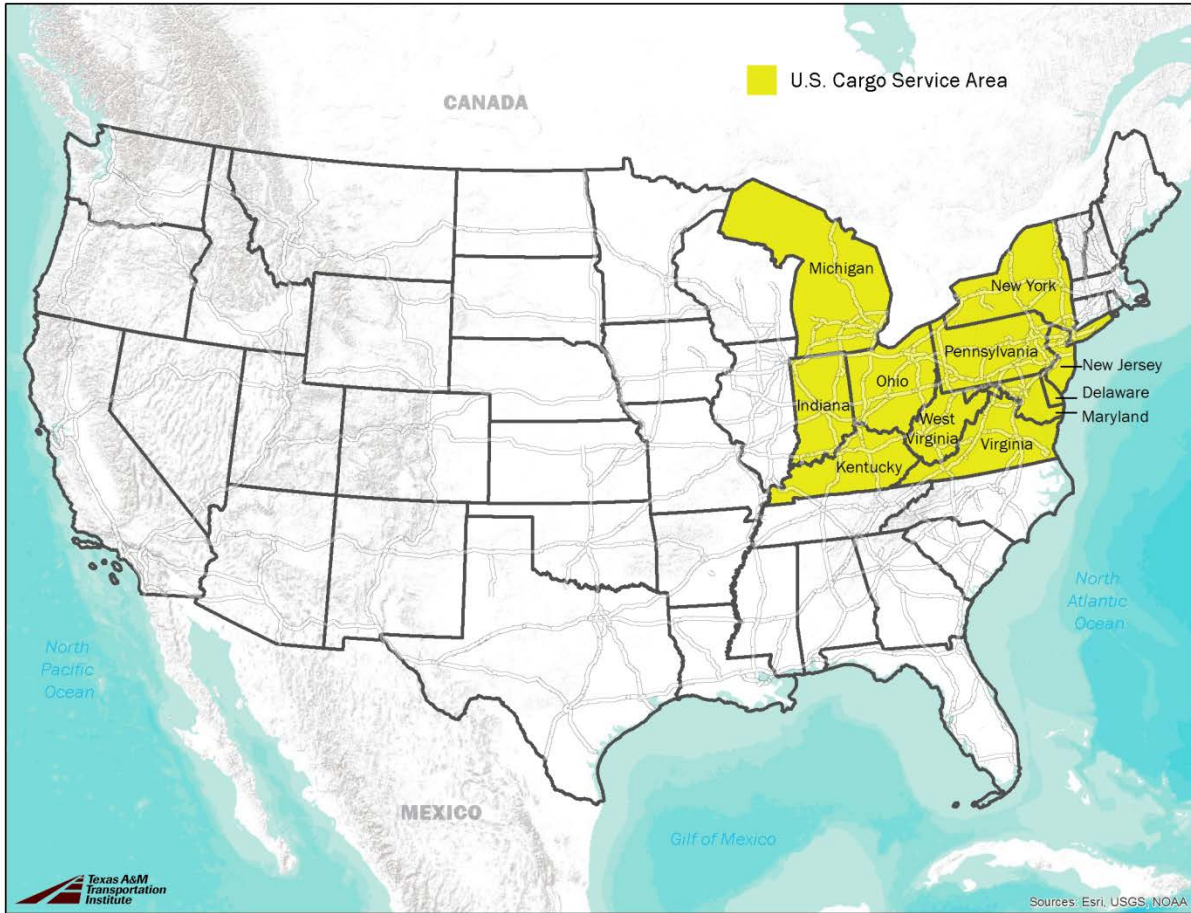


Source: (26)

Figure 8. SpeedDee Service Area.

U.S. Cargo

U.S. Cargo has been serving as a regional carrier in major cities, small towns, and rural areas of Ohio, Pennsylvania, and portions of the surrounding states since 1972 (Figure 9). U.S. Cargo offers several types of services tailored to meet the needs of their customers, including: same day, residential, on-demand, next day, and time sensitive/fragile shipments, as well as an array of cargo shipping, warehouse, and fulfillment services. Customers can track their shipments and deliveries using U.S. Cargo's *iDeliver* RSS feed. Shipping rates are quoted on a per package basis (27).



Source: (27)

Figure 9. U.S. Cargo Service Area.

Greyhound Package Express

Greyhound Lines is the largest private intercity bus carrier in the United States and Texas. The company also provides package delivery services—GPX. GPX offers two services for package delivery (standard and priority) each with multiple daily departures, 365 days per year (28). The maximum allowable weight is 100 lb, although some locations can accept packages up to 150 lb.

- Standard – the most economical delivery choice. Using the standard delivery method, packages are shipped on a space-needed basis with no guaranteed delivery date or time. Typical arrival times for each zone are: Zone A = 1 day, B = 2 days, Zone C = 3 days, Zone D = 4 days, and Zone E = 5 to 7 days. Delivery fees for standard shipments range from \$14.15 for a package weighing 1 lb delivered to Zone A, to \$107.30 for a package weighing 100 lb delivered to Zone E.
- Priority – is best suited for time-sensitive shipments of less than 800 miles. Pick-up and drop-off is available after hours, and shipments are guaranteed to go on the next available service to the drop-off destination. Priority service is not available for Zone E. Delivery

fees for priority shipments range from \$20.15 for a package weighing 1 lb delivered to Zone A, to \$159.95 for a package weighing 100 lb delivered to Zone D.

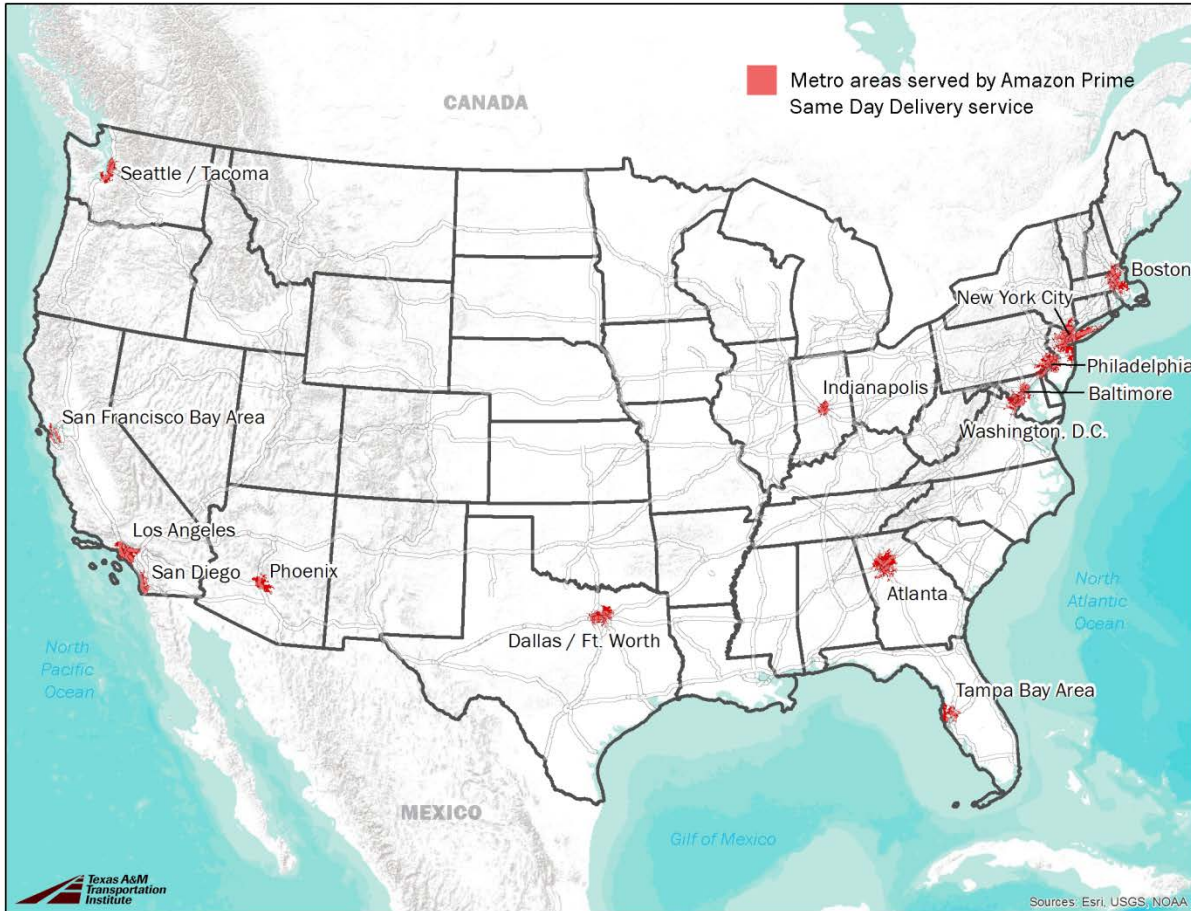
- Direct Drive – is the fastest, most specialized delivery service. This service is only available for shipments within 400 miles of the pick-up address (29).

Amazon

Amazon is an online retailer that ships product directly to consumers in locations throughout the United States. While Amazon is not a package delivery company, some of the shipping options it offers operate as distinct elements of the main retail business and emphasize convenience for customers—shoppers pay extra for delivery via one of Amazon’s proprietary shipping services. These services include Prime Same Day delivery, Prime Now, Flex, and Lockers.

Prime Same Day Delivery

Amazon Prime Same Day Delivery is available to Prime members in 14 metro areas across the United States. In Texas, Prime Same Day is available in the Dallas-Fort Worth market. Figure 10 displays all the markets that provide Prime Same Day Delivery. This service is available seven days per week on over 1 million Amazon items and includes the cost of shipping for qualifying orders over \$35. For orders under \$35, Prime members pay \$5.99 for shipping and non-members pay \$9.98. An Amazon Prime membership costs \$99 per year and includes guaranteed two-day shipping on Prime eligible products and other non-shipping benefits (30).



Source: (30)

Figure 10. Amazon Prime Same Day Delivery Locations.

Prime Now

Another service from Amazon available exclusively for Amazon Prime members is Prime Now. With this service, Amazon offers one-hour delivery for \$7.99 and free two-hour delivery on over 10,000 items. In some markets, groceries and prepared foods are available for Prime Now delivery. Initially launched in Manhattan, New York, in December 2014, Prime Now is now available in select zip codes in cities across the United States and internationally. In Texas, Prime Now is available in Austin, Dallas, Houston, and San Antonio (31).

Flex

Amazon Flex is a delivery service that hires individual vehicle owners to deliver Amazon Prime Now packages using their personal vehicle. Drivers pick up deliveries at a predetermined location and make deliveries with the driver's specified radius. Drivers must be 21 years old, and can choose to work in 2, 4, or 8 hour blocks of time, up to 12 hours per day. As of October 2015, Amazon Flex is only available in Seattle, WA. Amazon plans to implement the program in Manhattan, NY; Baltimore, MD; Miami, FL; Chicago, IL; Indianapolis, IN; Atlanta, GA; and Portland, OR, as well as Austin and Dallas, TX, in the near future (32).

Locker

Amazon Lockers are self-service kiosks placed in areas with high package density, such as shopping centers, retail stores, and transit stations. Customers use an Amazon Locker as their shipping address and receive a pickup code via text or email when their package is ready to be retrieved from the locker. The recipient must collect the package within three business days after delivery. Amazon Locker is available in Los Angeles, San Diego and San Francisco, CA; New York City, NY; Philadelphia, PA; Portland, OR; and Seattle, WA, as well as some locations in Delaware, New Jersey, and Virginia (33).

DEMAND FOR PACKAGE SERVICES

Package delivery is principally performed by large service providers (FedEx, UPS, and USPS) and regional carriers, such as LSO. The large package delivery companies present, publicly, basic statistics about package delivery volumes. Each provider has documented increased demand for package delivery service in previous years. This section outlines the amount of package deliveries completed by the USPS, FedEx, and UPS.

United States Postal Service

USPS grew its share of package delivery; increasing from 3.3 billion packages in 2008 to 4.0 billion in 2014. Table 3 displays USPS' annual growth from 2008 through 2014—a 21 percent increase in total package delivery volume for USPS over that period. However, growth was not consistent over the seven years as levels reduced from 2008 before increasing steadily after 2010. The reduction in USPS' package delivery service between 2008 and 2010 could be a result of economy-wide reductions in spending related to the global financial crisis.

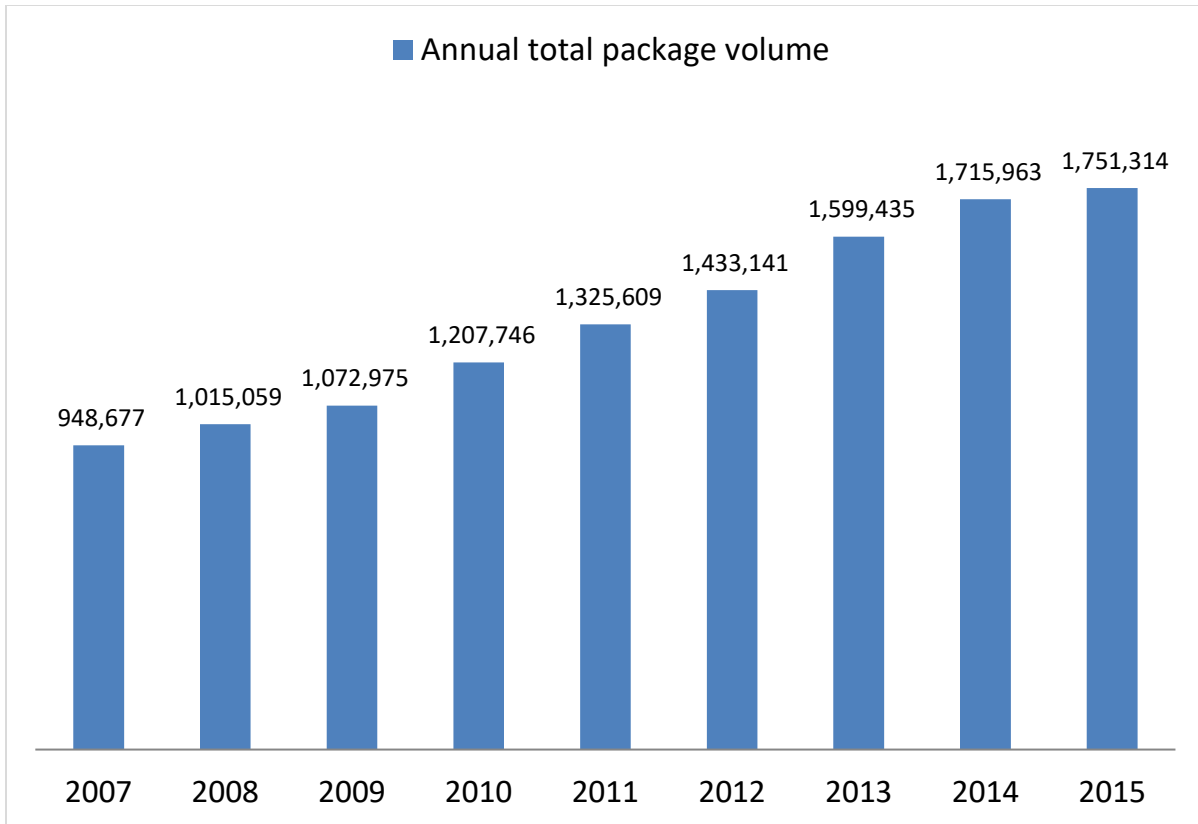
Table 3. USPS Total Shipping/Package Volume (in Billions).*

2008	2009	2010	2011	2012	2013	2014
3.3	3.1	3.1	3.3	3.5	3.7	4.0
*Includes Priority Mail, Priority Mail Express, First-Class Packages, Package Services, Parcel Return Service, and Parcel Select						

Source: (34)

FedEx

FedEx reported shipping over 1.75 billion ground packages in 2015. Compared to 2007 levels, this volume of packages represents 85 percent growth. Figure 11 presents FedEx's annual package volume from 2007 through 2015. During this period, the company experienced steady growth.

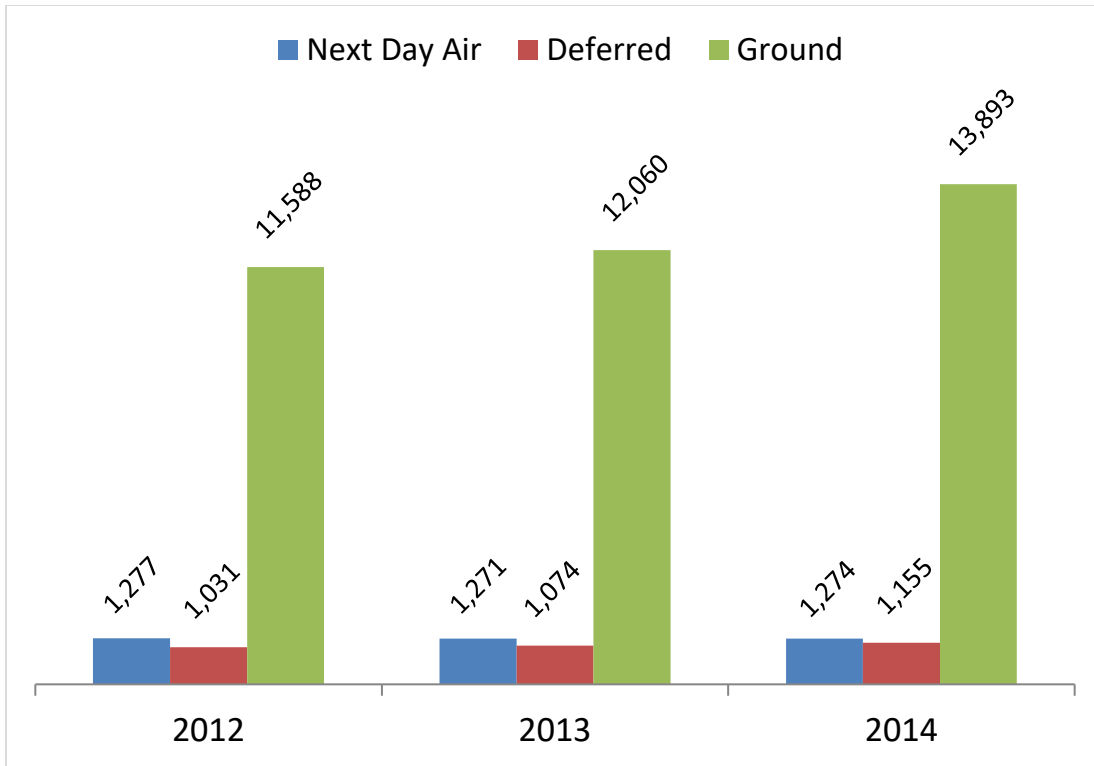


Source: (35)

Figure 11. FedEx Annual Total Package Volume.

UPS

UPS reports package volume in terms of average daily package volume. In 2014, UPS moved an average of 15.3 million packages, with the basic Ground service accounting for almost 14 million of those packages. Over the three-year period publicly reported by UPS, daily ground shipments grew by 20 percent. Figure 12 displays UPS' annual growth by service type from 2012 through 2014. For comparison, in 2014, UPS shipped an average daily Ground package volume of 13.9 million while FedEx Ground shipped more than 6.8 million daily shipments in the same year.



Source: (36)

Figure 12. UPS Average Daily Package Volume (in Thousands).

E-COMMERCE CONTRIBUTIONS TO PACKAGE VOLUMES

Perhaps the most significant factor contributing to the growth in package volumes is the growth of online shopping, or e-commerce. In recent years, large service providers (UPS, FedEx, and USPS) have documented increased demand for package delivery. Online shopping allows for access to goods that may not be available in all areas because of limited local demand or scarcity of the good. E-commerce provides an economic development opportunity for people to participate in customer-to-customer exchange of goods.

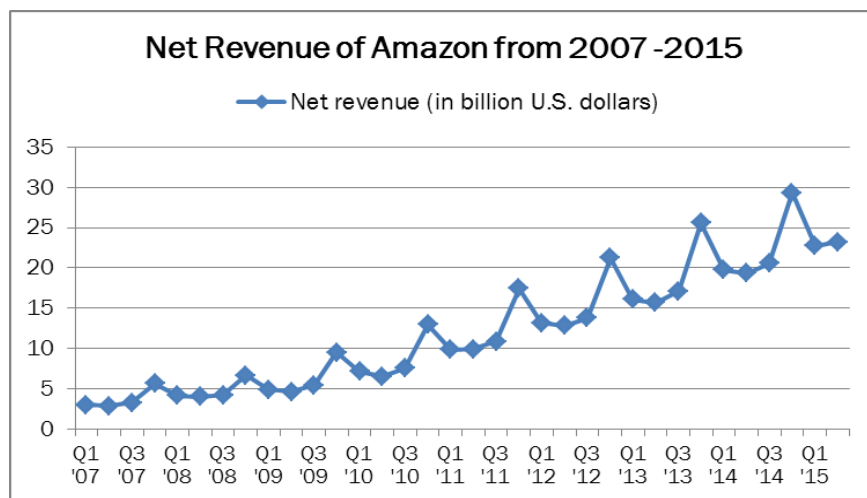
Figure 13 displays historical and forecasted levels of e-commerce shopping in the United States from 2010 through 2018. Forecast assumptions reflect previous years' growth. By 2018, the forecast predicts that there will be 215 million online shoppers—an increase of 25 percent over the 2010 value of 172 million online shoppers.



Source: (37)

Figure 13. Number of Digital Shoppers, 14 Years and Older, in the United States from 2010 to 2018 (in Millions).

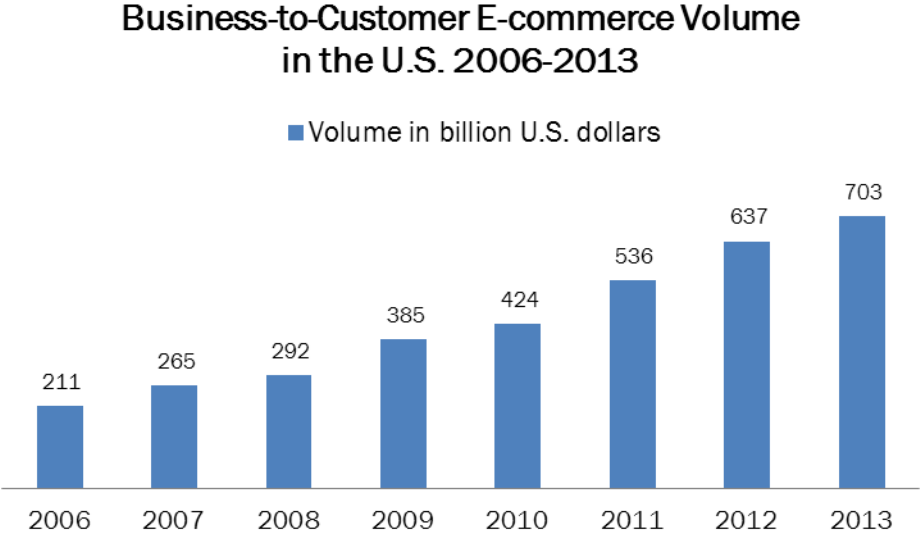
Much of the development of online shopping and growth in online shopping is attributed to the online retailer Amazon. Launched in 1995 as a U.S. only online bookstore, Amazon has grown to have an international online presence selling virtually every type of product and has increase revenue to exceed \$23 billion in quarterly revenue in 2014, as shown in Figure 14. Also shown in Figure 14 is the dramatic growth in quarterly revenue since Amazon’s first quarter 2007, which totaled \$3 billion. The total increase between Amazon’s first quarter 2007 and first quarter 2015 is 652 percent. This increase represents a compound annual growth rate of 29 percent. Additionally, Amazon’s revenues dramatically increase during the fourth quarter of every year as a result of holiday sales.



Source: (38)

Figure 14. Net Revenue of Amazon from 1st Quarter 2007 to 2nd Quarter 2015 (in Billion U.S. Dollars).

The service that Amazon and the other major retailers that offer online shopping provide is referred to as “business-to-customer (B2C) e-commerce.” Figure 15 shows the growth in B2C e-commerce volume in the United States from 2006 to 2013. Exceeding \$703 billion in 2013, B2C e-commerce has grown by over 233 percent, representing a compound annual growth rate of 19 percent.

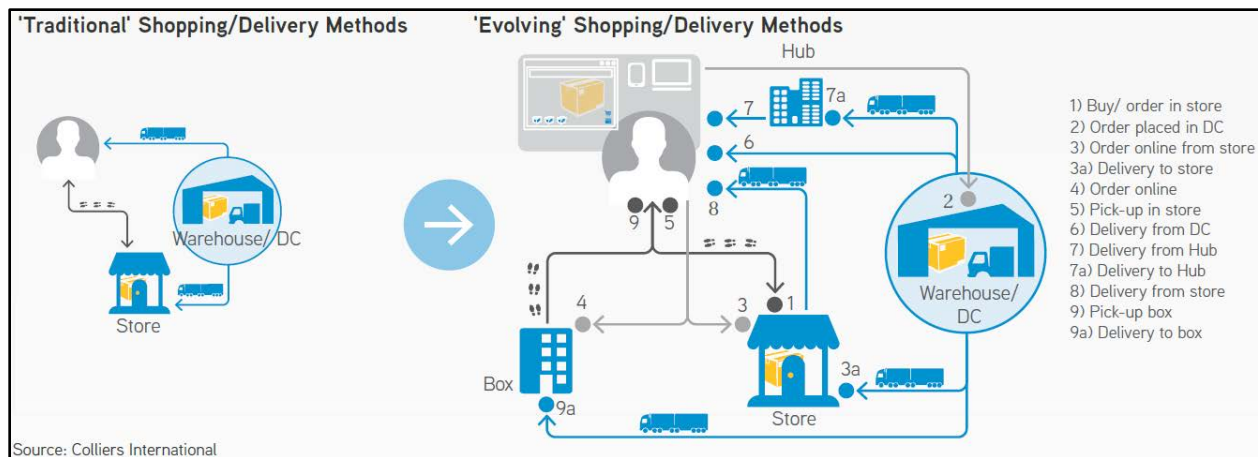


Source: (39)

Figure 15. B2C Volume in the United States from 2006 to 2013 (in Billion U.S. Dollars).

E-commerce includes customer-to-customer sales, in which customers are purchasing items from an individual instead of a major retail business. The online auction website eBay is a good example of this practice, as are Etsy and Craigslist. Customer-to-customer transactions involve the direct delivery of purchased items from the sellers to the buyers—deliveries most likely completed by one of the major package delivery companies or the USPS—and potentially involve partnerships with public transit agencies.

E-commerce services add an additional shopping option for consumers. Traditional shopping, as described by the diagram on the left side of Figure 16, involves the customer traveling to a store and either purchasing a product or choosing an item to be delivered to the customer’s residence. On the right, Figure 16 shows how the traditional retail pattern becomes more complex with the inclusion of online shopping. In addition to the store and major warehouse/distribution center, the infrastructure is expanded to include smaller warehouse hubs and pick up locations. All of these extra points require additional transport links. These additional links have the potential to increase overall transportation costs.



Source: (40)

Figure 16. Evolution of Logistics Needs.

Beyond the additional transportation links required to serve e-commerce shoppers, additional logistics considerations are generated when customers need to return or exchange goods purchased online. Colliers International reports that, in the UK, an estimated 25 to 40 percent of all goods purchased online are returned. In Germany, up to 50 percent of online purchases are returned (40). In the United States, the USPS partners with both UPS and FedEx to handle the first mile pickup service for return packages due to the USPS practice of collecting outgoing mail and packages while delivering (41).

EXAMPLES AND OPPORTUNITIES IN RURAL TRANSIT PACKAGE DELIVERY

Package delivery is already occurring on buses, with the major and regional intercity bus companies offering different levels of service. According to Higgins et al. Concho Coaches', a small regional intercity bus service, largest portion of revenue comes from the freight services the company provides. The Midland Reporter Telegram states that Concho Coaches delivers plumbing supplies, smaller oil field service equipment, and other packages/products as requested (42, 43). Additionally, regional package delivery carriers, such as LSO are growing and providing a different array of services and service levels compared to the major carriers. They can offer, on many occasions, direct delivery from origin to destination without first entering the package into a major sorting facility.

Intercity bus operators provide package delivery services in Texas and throughout the United States. Like intercity bus operators, transit agencies could conceptually function as package delivery providers by allocating vehicle space and stops to package services. According to existing literature, review of agency websites, and analysis of National Transit Database (NTD) data, American transit agencies have not diversified to include package delivery services within existing business portfolios and agency goals. According to the Transit Cooperative Research Program report 79, *Effective Approaches to Meeting Rural Intercity Bus Transportation Needs*, a few transit agencies that operate intercity bus service as interlining partners with private intercity bus companies to provide package delivery service, but service details are not included in this report. For example, in the documentation (and from reviewing agency websites) it is not clear whether these agencies make final package deliveries, or if they simply act as package transfer services to connect gaps in private intercity bus service.

Research on alternative funding sources for transit agencies does not include anything similar to a package delivery concept for augmenting existing revenue sources. The absence of this concept within the literature pertaining to alternative transit revenue further indicates that providing package delivery services as a means of augmenting transit agency revenue is not a concept that is currently under investigation by researchers or transit agencies. Additionally, the National Bus Traffic Association (NBTA) (the association of intercity bus operators) has identified rural transit operators as potential partners to expand service, but such agreements have not yet garnered expanded package delivery service through rural transit partners.

The following sections briefly describe rural and intercity transit in Texas and package delivery services provided by intercity bus operators.

Texas RTDs and Intercity Bus Operators

Thirty-seven RTDs serve the residents of Texas and operate in all counties except Newton and Chambers in southeast Texas, and Collin County in north Texas (see Figure 17). All RTDs operate demand response service or flexible route service that transports passengers to their door. In Texas, many rural areas have lost population, and rural transit providers act as a lifeline to connect persons to goods, services, jobs, and education.

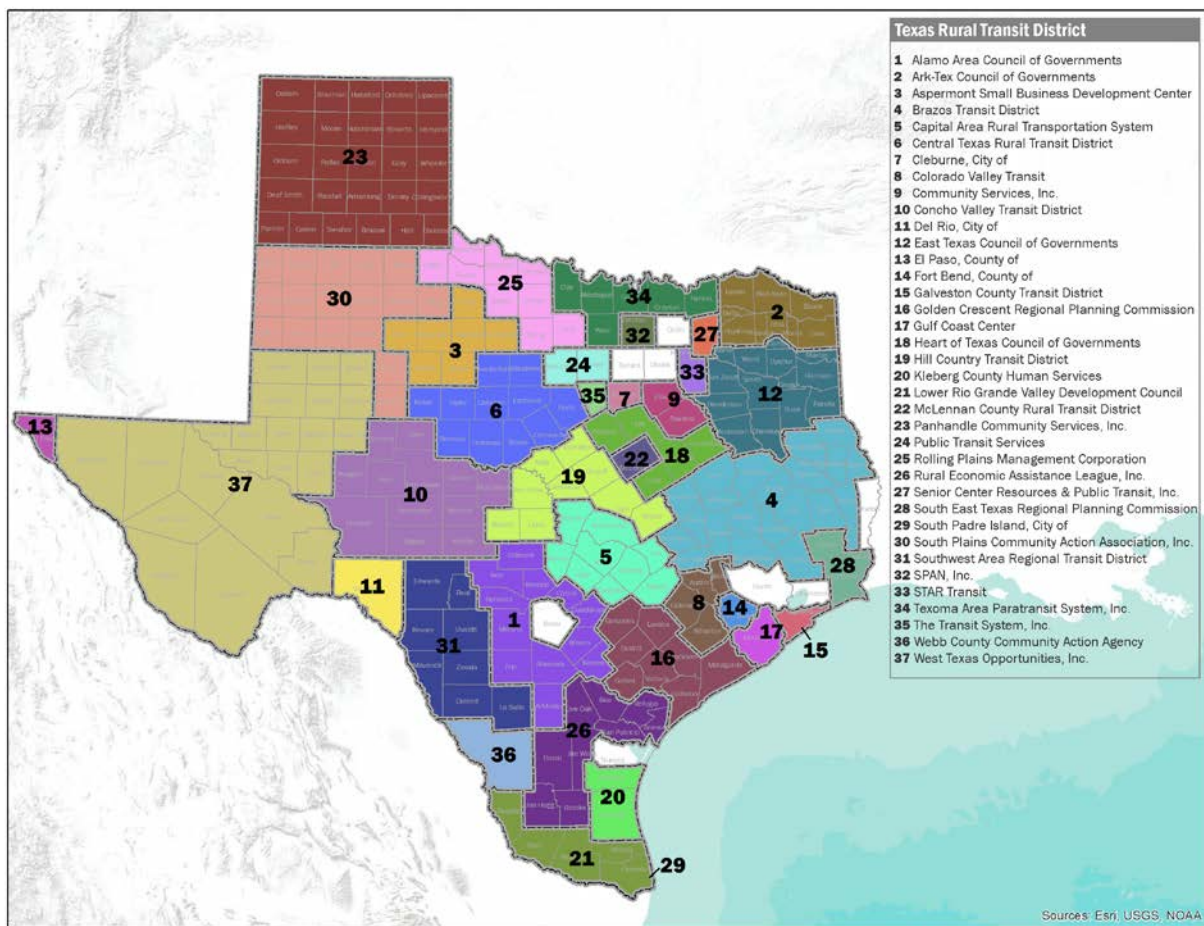


Figure 17. Texas RTDs.

Many Texas RTDs connect with intercity bus carriers. Texas RTDs that have interlining agreements with intercity bus carriers include: Capital Area Rural Transportation System (CARTS), Texarkana Council of Governments, Texoma Area Paratransit System, The Hop (Killeen/ Temple area), and SWART.

The FTA Section 5311(f) grant program provides funding to support rural intercity bus service—a funding opportunity that incentivizes connections/transfers between rural transit agencies and intercity bus operators. In Texas, Section 5311(f) funds have been used to implement several multimodal facilities that serve both rural transit and intercity bus. Under the Section 5311(f) program, intercity bus service is defined as regularly scheduled bus service for the general public, which operates with limited stops over fixed routes connecting two or more urban areas not in close proximity, has the capacity to carry passenger baggage, and makes meaningful connections with scheduled intercity bus service to points outside the service area. Feeder services to intercity bus services are also eligible for Section 5311(f) funding. This funding section specifically excludes funding for commuter service.

Major public or private intercity bus carriers in Texas include:

- Greyhound Lines.
- Valley Transit Company.
- Coach USA.
- Echo Coach Lines.
- All Aboard America.
- Echo Coach Lines.
- Autobuses Latinos.
- Megabus.
- Autobuses Americanos.
- Trailways.
- TRAX (Ark-Tex Council of Government [ATCOG]).
- Jefferson Lines.
- Concho Coach Lines.
- Tornado Bus.
- El Paso-Los Angeles Limo.

Public and private intercity bus operators provide service throughout Texas. Because of diminished populations in rural areas, many of these companies do not operate routes through the most remote areas of Texas (see Figure 18). With the decline in rural intercity bus passenger service in Texas, rural package delivery service provided by intercity bus operators will also decline—coaches that provide passenger service are used to transport packages to the same destinations; so if passenger service is discontinued, package service is canceled by default. The connections that RTDs provide will become even more critical in the future as intercity bus carriers reduce service in response to diminished demand. These rural transit connections have the potential to augment/replace lost passenger and package delivery service.

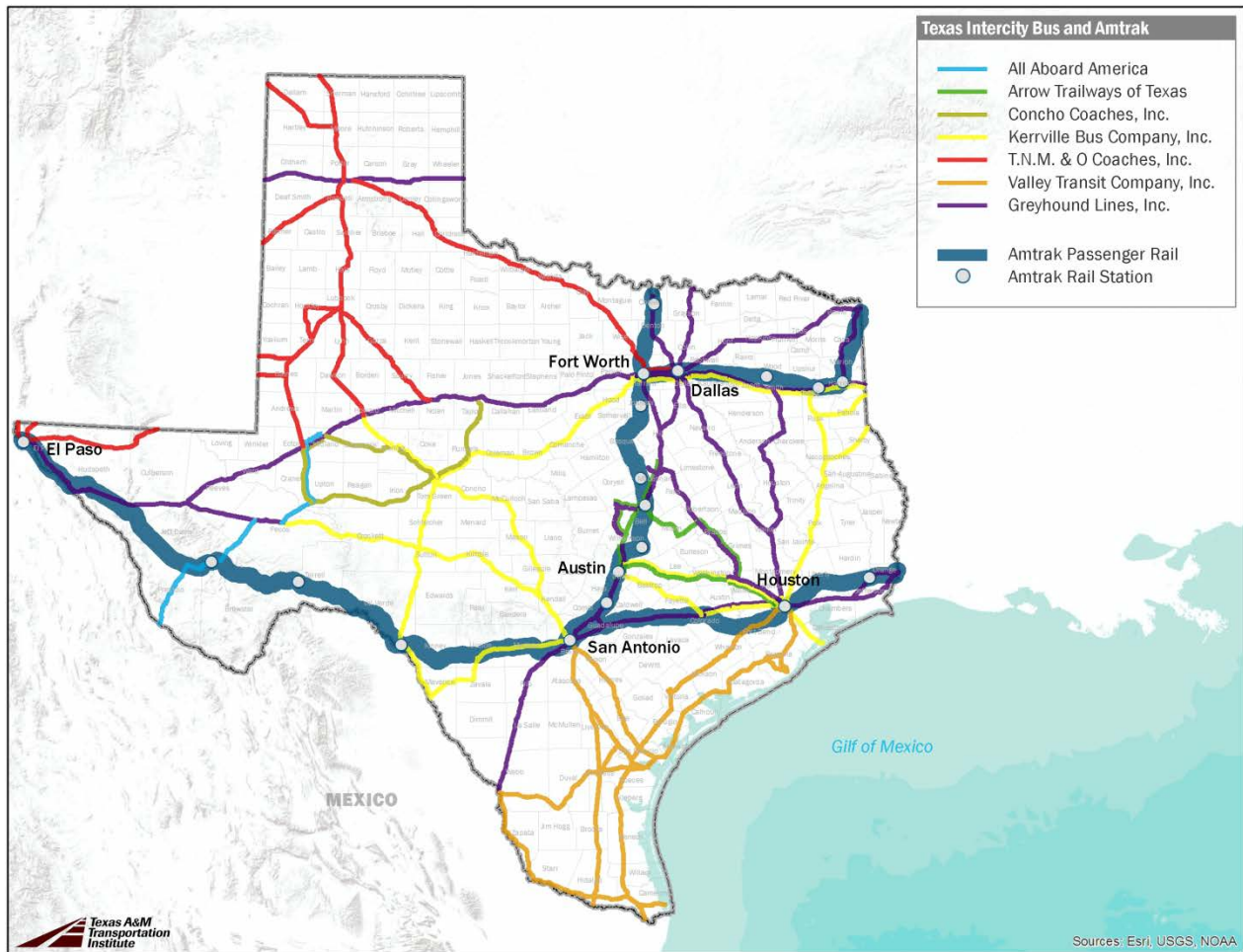


Figure 18. Texas Intercity Bus and Amtrak Network.

Intercity Bus Operators Package Delivery Service

Intercity bus operators have a long history with package delivery. The largest intercity bus operator in the United States, Greyhound, introduced package delivery services (GPX) in the 1960s and grew the division quickly (44). By 1976, GPX sales broke \$100 million (45). GPX dominates the package delivery segment of the intercity bus industry; however, regional operators offer package delivery service within their service areas and transfer packages to GPX and other service providers to complete package delivery routes through interlining agreements. GPX and regional intercity bus operators participate as members of the NBTA and provide connecting service under interlining agreements that allow passengers to purchase one ticket and travel throughout the country by transferring between NBTA member bus operators. NBTA is responsible for establishing and managing these agreements. NBTA members deliver packages throughout the country under the same agreements—customers deliver packages for shipment to one intercity bus operator that forwards the package, as needed, through interlining partners to its final destination. Part of NBTA’s role is to function as a clearinghouse for revenue generated by selling tickets and providing package express services. The organization distributes revenue generated from ticket sales and package delivery fees according to the percent of service

provided by each member bus operator involved in each transaction. NBTA has implemented an electronic sales interface that tracks sales and reconciles revenue distribution according to the miles traveled on each system to deliver a passenger or package to their final destination. Additionally, NBTA’s system allows intercity bus operators to bill other operators directly for services rendered on the other company’s behalf. As of 2012, NBTA facilitated \$180 million worth of transactions to share revenue from passenger and package delivery service between its members.

Table 4 presents an example, according to NBTA, of the interlining revenue sharing process. This example tracks the process from the initial purchase of service to the final revenue distribution to each involved intercity bus operator.

Table 4. NBTA Interlining Revenue Share Process.

Package delivery service worth \$50 is purchased from Operator A		
Three operators (A, B, and C) share responsibility to deliver the package from origin to destination—a total of 1,000 miles		
Operator A transports the package for 200 miles (20%)	➔	Operator B transports the package for 400 miles (40%)
		➔
		Operator C transports the package 400 miles (40%) to its destination
Revenue from the package delivery service is allocated to each operator according to the percent of service provided:	20% =	\$10.00 for Operator A
	40% =	\$20.00 for Operator B
	40% =	\$20.00 for Operator C

Peter Pan Bus Lines, Burlington Trailways, New York/Adirondack/Pine Hill Trailways, Valley Transit Company, Concho Coach, and other intercity bus operators offer regional package delivery services using the companies’ vehicles/routes and by transferring packages to GPX vehicles. Jefferson Lines and the Trailways network of regional intercity bus operators contract directly with Greyhound to offer GPX services from those companies’ terminals. YO! Bus, a regional intercity bus operator in the northeast United States, provides package delivery service between its three terminals located in New York City, Boston, and Philadelphia. Table 5 presents service details for each intercity bus operator with unique package delivery service, including the levels of service, delivery fees, insurance fees, and a description of the service area.

Table 5. Intercity Bus Operators—Package Delivery Options.

<u>Scope</u>	<u>Name</u>	<u>Shipping Options</u>	<u>Shipping* Cost</u>		<u>Package Tracking</u>	<u>Insurance Fees</u>		<u>Service Area</u>
			*Shipping a 10 lb package, longest side = 12", \$100 value				<u>Declared Value</u>	
			<u>Origin/Destination</u>	<u>Fee</u>				
<u>National Package Delivery</u>	Greyhound Package Express (GPX)	Standard <ul style="list-style-type: none"> • Shipped when space is available • Available as door-to-door, counter-to-counter or variation • Oversize shipments require additional transit time • Pick-up and drop-off are available during normal business hours 	Austin/Houston	\$24.50	Yes, included in price	\$0–\$100	None	Service available throughout the United States
		Priority <ul style="list-style-type: none"> • 100% money-back guarantee that packages arrive on-time • Available as door-to-door, counter-to-counter or variation • After-hours pickup/dropoff • Guaranteed to ship on next available bus to destination • Limited to 800 miles or less 	Austin/Houston	\$34.55	Yes, included in price	\$101–\$300	\$2.00	
		Direct Drive <ul style="list-style-type: none"> • Non-bus service • Limited to 400 miles • Door-to-door only 	n/a	requires corporate account	Yes, included in price	\$310–\$500	\$4.00	
						\$501–\$700	\$6.00	
						\$701–\$1,000	\$8.00	

Scope	Name	Shipping Options	Shipping* Cost		Package Tracking	Insurance Fees		Service Area
			Origin/Destination	Fee		Declared Value	Fee	
Regional Package delivery	Yo! Bus Package Express	Shipping Pack			Tracking service not provided	\$0-\$100	None	Yo! Bus will ship packages between its three terminals in New York, Philadelphia, and Boston
		Small Shipping		\$5.00	Tracking service not provided	\$101-\$300	\$2.00	
		Large Shipping		\$10.00	Tracking service not provided	\$301-\$500	\$4.00	
				\$20.00	Tracking service not provided	\$501-\$700	\$6.00	
					\$701-\$1,000	\$8.00		
Regional Package delivery	Peter Pan Bus Lines	Standard only	Albany/Boston	\$25-\$26	Yes, included in price	\$300	None	Peter Pan Bus Lines will ship throughout their northeast service area to designated stations
	Burlington Trailways Package Express	Standard Only	<ul style="list-style-type: none"> Maximum weight per package is 100 lb The extreme measurements of length, width and height should not exceed 30" x 47" x 82" 	Cedar Rapids/Rockford	\$28.17	Tracking service not provided	\$0-\$100	None
							\$101-\$300	\$2.00
							\$310-\$500	\$4.00
							\$501-\$700	\$6.00
							\$701-\$1,000	\$8.00
	Trailways - Adirondack, Pine Hill, New York	Standard		Albany/New York	\$25	Tracking service not provided	\$0-\$100	None
				Albany/New York	\$35	Tracking service not provided	\$200	\$2.00
							\$1,000	\$8.00

Scope	Name	Shipping Options	Shipping* Cost		Package Tracking	Insurance Fees		Service Area
			Origin/Destination	Fee		Declared Value	Fee	
Regional Package Delivery	Valley Transit Company	Standard	Brownsville/Corpus Christi	\$26	Yes, included in price	\$0-\$100	None	Washington, D.C., Maryland, Pennsylvania, New Jersey, New York
		Priority	Package express contracted through Greyhound			\$200-\$500	\$3.00	
		Standard only	<ul style="list-style-type: none"> Maximum weight per package is 100 lb The extreme measurements of length, width and height should not exceed 30" x 47" x 82" 	Wilkes Barre/Clearfield (161 miles)	\$24.35	Tracking service not provided	free	
Texas Specific Service	Concho Coach	Standard	San Angelo/Midland	\$24.50	Tracking service not provided	\$100	None	Only ship to Midland, Odessa and San Angelo

Source: Company websites and phone calls to company customer service representatives.

Package Delivery Brokers for GPX Service

Beyond providing service directly to consumers and through interline agreements with other intercity bus operators, GPX works with brokers to provide package delivery service. Table 6 outlines each brokers' service fees, additional charges (if any), and service area. If rural transit agencies were to begin providing package delivery service, package delivery brokers represent a potential connection to the nationwide delivery network. Such brokers may be interested in working directly with rural transit operators to deliver packages to destinations that GPX and GPX's interlining partners no longer serve.

Table 6. Intercity Bus Freight—Brokerage Services and Fees.

Broker	Freight Servicer	Shipping Options	Shipping Cost	Package Tracking	Notes	Service Area	
Box on a Bus (46)	Greyhound GPX	Self Service	Station-to-Station	• 10 lb package \$33.75	Additional parcels shipped results in reduced overall fee	Greyhound GPX Service Area	
		Semi-Full Service	Door-to-Station	• 12" square \$65.00			
		Semi-Full Service	Station-to-Door	• \$100 value \$65.00			
		Full Service	Door-to-Door	• From: Austin, TX \$96.25 • To: Houston, TX			
Busfreighter (47)	Greyhound GPX	Self Service	Station-to-Station	• 10 lb package \$60.00	Included in price. Only confirms departure and arrival	Greyhound GPX Service Area	
		Semi-Full Service	Station-to-Door	• 12" square \$120.00			
				• \$100 value			
				• From: Austin, TX			
				• To: Houston, TX			
		Additional Fees					
			Additional Weight	\$0.70 Per lb			
			Courier Pickup/Delivery	\$65.00 Per Pickup/Delivery			
			Saturday Pickup/Delivery	\$100.00 Per Pickup/Delivery			
			Courier Wait Time	\$1.00 Per Minute			
			P&D Attempt Charge	\$65.00 Per Attempt			
			Oversized (Item's Longest Dimension)	\$10.00 (per) 36"-47"			
			Oversized (Item's Longest Dimension)	\$18.00 (per) 48"-82"			
	Additional Piece(s)	\$17.25 Per Box, Self Service \$27.25 Per Box, Full Service					
	Storage Charges	\$5.00 Per Day/Per Shipment (GPX rule)					
1-800 Courier (48)	Greyhound GPX	<p>Broker's Service Example: We'll make an AM pickup in Bozeman, MT, of a 24" x 24" x 24" package with delivery to Everett, WA. We will pick it up and put on the bus in Bozeman, one of our professional couriers will retrieve your package from the bus in Everett and deliver to door by 12:40 p.m. the next day for \$105.60. Our competition offers service by 3:00 p.m. for \$13.58. Or, you can ship from New York to Washington, D.C., in as little as eight hours for only \$80.00.</p>				Couriers at each end deliver/pickup package from GPX and complete the first/last mile	Greyhound GPX Service Area

CHALLENGES ASSOCIATED WITH SERVICE PROVISION

This section describes the challenges faced by rural transit agencies that provide or facilitate package delivery service. These agencies may be challenged by incorporating package delivery into existing operations, liability, public and agency perception, marketing, regulations, operational requirements, infrastructure deterioration, aging and dispersed population, increased costs to deliver packages, and fiscal constraints.

Incorporating Package Delivery into Existing Operations

To successfully add package delivery service to existing passenger transportation services, a transit agency needs to consider the additional operating time and additional space required to execute a meaningful service. Important issues when incorporating package delivery into existing operations also include technology, liability, delivery destination, pricing, processing and paperwork, package handling and storage, safety and security of passengers, time and scheduling, vehicle design, and concurrent passenger and cargo trips.

Liability

Potential risks associated with package delivery service include customer and employee injuries and lost, stolen, or damaged packages. Most transit agencies are part of the Texas Municipal League Intergovernmental Risk Pool (TML). According to TML staff, package delivery service is not included in the pool's liability coverage and is not available as an addendum, but existing liability coverage is not affected by a transit agency's decision to implement package delivery service.

The liability associated with lost, damaged, or stolen packages broadens a transit agency's risk exposure. For example, the maximum insurable value for packages that travel via GPX is \$1,000, so risk exposure is still low. Additionally, in the case of the pilot, GPX is responsible for handling all customer service issues related to lost or damaged packages and SWART is not required to handle such matters after referring customers to GPX.

ATCOG has its package delivery services (an interlining agreement with GPX) insured under a separate policy from its public transportation services. This policy is provided by National Fire & Marine Insurance Company and provides up to \$500,000 in liability coverage for any single accident or loss that occurs related to package delivery service. This policy only covers nine TRAX vehicles that the agency uses to transport packages for GPX and requires that vehicle operators are at least 35 years of age.

PERCEPTION AND MARKETING

Transit agencies that implement package delivery service may be challenged by public perception and the need to market this new service as a for-profit enterprise (instead of marketing services as a public good). According to the Texas Freight Mobility Plan (1), "The lack of awareness and understanding by the general public regarding the importance of freight movement in their daily lives impacts public support of projects and policies relating to freight." This section documents strategies for managing perception and for marketing a new type of service.

Managing Perception

Public funding, derived from tax dollars, grants, and other sources, is used to provide public transit, so public transit is a public good. Because of this fact, many people view transit service as a right and believe that it is something that should always be available and should always work. When a transit agency begins to offer package delivery service, public perception could be challenging if the transit agency does not preempt misconceptions and inform their riders of how this new service will benefit them by engaging in targeted outreach. From the perspective of improving financial sustainability, package delivery service is similar to other contracted service delivery.

Here are important elements to consider/include when developing an outreach strategy:

- Data collection about current perceptions of transit and package delivery services.
- Information for riders that shows what it costs to provide current service.
- Descriptions of existing funding sources and the amount of revenue each generates.
- Descriptions of how new revenue may improve service.
- Policies that ensure that transit riders will always take precedence over packages.

Marketing For-Profit Endeavors

Transit agencies that implement package delivery service may be challenged by the need to market a service that is unlike anything the agency has offered previously. Package delivery service is a for-profit enterprise, unlike transit service, which is typically provided for the lowest possible cost to the rider and is not designed or intended to generate a profit. If a transit agency takes on package delivery, the service will be delivered as a for-profit endeavor specifically to increase revenue while providing additional access and connectivity. Typical transit marketing may not generate business at a level that would sustain the package delivery service.

According to Erik Weber et al., transit marketing should be considered a “core investment” and a, “better public image attracts riders, leading to higher revenue and greater demand for transit service” (49). For perspective, major auto companies (key competitors of transit) spent \$21 billion on advertising in 2009 (49). After reviewing relevant literature, Hess and Bitterman suggest that transit agencies would benefit from a defined brand for the services the agency offers and that transit agencies have a unique opportunity to advertise because transit vehicles that travel throughout cities and regions (50). Additionally, transit agencies may see more of a return on marketing investments by focusing on indirect competition with other service. For example, transit agencies might make assertions related to the environmentally friendly nature of transit or the ability to do other things while traveling, such as reading or socializing (50).

Transit agencies that implement service may benefit from working with either internal or contracted marketing professionals to assess the local market and develop a specific market-focused advertising strategy that responds to consumer preference and needs. No matter the final strategy, marketing campaigns must be responsive to community perceptions to be successful. Additionally, transit agencies that implement package delivery services should assess the chosen marketing campaign at regular intervals to determine effectiveness and whether it could be improved.

Some marketing strategies that transit agencies might consider include one or more of the following:

- Soliciting feedback from consumers about what services they currently use, what their needs are, what they might be willing to pay for package delivery service, and how they perceive existing services and the new transit-based solution.
- Educating consumers on the benefits of the new service.
- Highlighting the fact that transit riders will not experience diminished service and that service could be expanded/improved.
- Encouraging transit users to spread the word about the package delivery service as a way of supporting their transit provider and community.
- Benefitting consumers/community by including a connection to intercity bus for both passengers and packages.
- Offering same-day delivery in some areas.
- Offering economic development opportunities such as:
 - Couriers to connect complement transit package service with door-to-door and other package services.
 - Shipping dependent businesses (e.g., art galleries or crafts stores) located in the transit agencies' service area to take advantage of package delivery service.
 - The potential to grow an agriculture business by using package delivery service for lab work and to obtain needed tools quickly.
- Maintaining a social media presence.
- Hiring empowered drivers that represent the package delivery service via word-of-mouth and handouts (could be incentivized in exchange for commissions or something similar).
- Creating a specific/dedicated package delivery service logo to brand the new service and create a unique identity for the new service.
- Tracking performance before and after the implementation of package delivery service and making the data publically available to enhance transparency.

Regulations and Operational Considerations

There are numerous laws and regulations, both at the state and federal levels, associated with the commercial package delivery. Regulations outline requirements for operator registration, driver licensing, and safety standards. Adding package delivery to a passenger service may require adjustments to operational and procedural practices for both the operating agency and driver performing the movement. Instituting a cargo transportation service requires a full understanding of federal and state operating requirements. This section provides an overview of some of the regulations and operational considerations that should be considered as part of a cargo service.

Operational Considerations

Combining passenger transportation and package delivery service needs consideration of the time and space required to incorporate the cargo within existing operations. The integration of package delivery service may be performed with dedicated cargo trips or as part of passenger transport trips—the time required to pick-up or deliver to locations along a route will contribute to decisions related to mixed trips (passengers and cargo) or cargo-only trips. The amount of

time required to load and unload the packages at each stop may also be a contributing factor when designing service. Vehicles designed to transport passengers are designed to address passenger needs; so adding non-passenger-related activities within trips may take away from the mission of a transit operator. The addition of package delivery service could also cause uncertainty within the passenger service schedule. Passenger ingress and egress (especially under emergency conditions) must be considered when combining passenger and cargo services—the delivery service must not impact the safety of passengers. The ability to add cargo shipments without interfering with passenger utilization is an additional consideration. Taking seats away from passengers for cargo may interrupt current route capacity and vehicle use rates. Having the ability to handle these shipments without interfering with passenger seating, such as underbelly storage, could eliminate this concern. As an example of how one company handles cargo within the existing operations, Concho Coaches indicated in an article from 2011 that they operate 15-passenger vans with the last row of seats removed to accommodate luggage and packages (42).

Driver and Operator Requirements

Commercial vehicle operators (both passenger and cargo) are required to obtain a commercial driver license (CDL). In Texas three classes of CDLs exist, each defined by the vehicle weight characteristics or the number of passengers transported. In addition, operators of specialized commercial motor vehicles must pass additional tests and obtain endorsements on their CDLs, including endorsements for passengers, hazardous materials, and school bus operation (51).

While operating commercial motor vehicles, drivers must operate within a regulated number of hours. For interstate carriers, the hours-of-service rules are slightly different between property-carrying drivers and passenger-carrying drivers. These regulations address both driving hours and on-duty hours, which includes driving and other non-driving responsibilities, such as loading and unloading. Drivers are required to log and report these hours in most situations (a few rare exceptions may exempt drivers from maintaining the daily log documentation). For interstate carriers, the hours-of-service rules are slightly different between property-carrying drivers and passenger-carrying drivers. Intrastate carrier hours-of-service requirements are the same for all commercial motor vehicle drivers (51).

Commercial motor vehicle operators must maintain a designated minimum level of insurance. For bus operators, insurance must cover \$500,000 of liability for vehicles designed or used to transport more than 15 passengers (including driver) but less than 26 passengers (not including driver) or \$5,000,000 of liability for vehicles designed or used to transport 26 or more passengers (not including driver). The insurance requirement for private or for-hire cargo carriers operating above defined weight levels is \$500,000 of liability, with transporters of hazardous materials required to maintain a minimum insurance level of \$5,000,000 of liability coverage (52).

Transit agencies that perform package delivery will need to ensure that transit operators' CDLs are adequate for the addition of package delivery service. Drivers may need additional training to learn how to properly lift packages to prevent injuries. Driver retention can also be a major issue in many regions.

Passenger and Cargo Carrier Regulations

State and federal regulations may differ between passenger and cargo carriers. Adding cargo operations to a passenger service may require adjustments to operational and procedural practices, for both the operating agency and driver performing the movement. Additionally, anyone acting as a broker or a freight forwarder is required to register and obtain broker or freight forwarding authority from the United States Department of Transportation Federal Motor Carrier Safety Administration (53).

Package Handling and Storage

Package handling and storage is another major consideration for cargo operations. Handling and storage of packages may require additional employee training to ensure the employees properly lift, handle, store, transport, and deliver packages. Addressing the security of packages is paramount. Depending on the type of service provided, packages may need to be stored in secure locations at stations or designated locations, secured while in transit, and secured at the final destination. In rural areas, the final delivery destination represents a challenge for package delivery services. Existing package delivery companies (UPS, FedEx, USPS) vary in delivery practices in rural areas—delivering to the recipient’s house or mailbox as conditions warrant. A rural homeowner may live down a gravel driveway; practice decisions may include whether to deliver package to the mailbox on roadway or travel the driveway and deliver at the homeowner’s house and whether delivery to a house is going to occur within an operation with passengers on-board? The liability associated with lost, damaged, or stolen packages is a major consideration given these issues. The agency also needs to be prepared for handling and managing the additional paperwork related to each shipment, such as bills of lading.

Infrastructure Deterioration

Researchers examined the draft Texas Freight Mobility Plan and found that of the 768 projects that are not currently under planning or development, 511 projects (67 percent) are located in rural areas of Texas (54). TxDOT identifies several strategies that address connections between rural and urban areas and first- and last-mile connectors, many that occur in rural areas. The condition of the infrastructure in rural areas is a concern for cargo and package pick-up and delivery.

Researchers have identified several policies that address connections between rural and urban areas and first- and last-mile connectors, and many apply to rural areas. The objectives of the policies are listed as follows:

- Emphasize project selection criteria in the TxDOT planning process that support and prioritize funding of first- and last-mile connectors in locations with regional, statewide, and national significance, including both urban and rural connectors.
- Identify, preserve, protect, and invest in first- or last-mile connector routes from the Texas Freight Network to freight gateways and generators, such as ports, international ports-of-entry, and intermodal facilities.

- Improve and strengthen Texas’s rural freight transportation system to enable the transport of energy, food, and other critical raw materials.
- Strengthen rural economic development opportunities through alternative modal options and connectivity.

Aging and Dispersed Population

An aging, dispersed rural population introduces challenges related to the ability of people to drive themselves to goods and services. Online shopping with package delivery presents an alternative to visiting a retail establishment and may be a means to acquire products for those with limited mobility options. Online shopping also allows for access to goods that may not be available in all areas because of limited local demand or scarcity of the good. Beyond the access to goods that online shopping provides to rural residents, e-commerce also provides an economic development opportunity people located in rural areas to participate in customer-to-customer exchange of goods. However, a dispersed population in low-density rural counties reduces the sustainability of private carriers due to greatly increased delivery cost.

Texas has the largest rural population in the United States—6,197,604 in 2010. Rural population increased 7.5 percent from 2000 to 2010, but rural population is aging while increasing. The Texas State Demographer’s Office estimates that as baby boomers continue aging and longevity increases, the percentage of the population that is age 65 or over is expected to grow nearly 300 percent over the next 30 years. Projections indicate that as people retire, they are expected to leave large urban centers and settle in rural areas of the state.

The average population density in rural transit agencies was 24 persons per square mile in 2010—indicating very low-density, dispersed populations. Although total rural population in Texas is increasing because counties near metropolitan areas and along the border are growing rapidly, the percentage of the state’s population residing in rural areas is expected to decrease over time. In counties in west Texas, the Panhandle, and some counties south of San Antonio, population is declining, and the migration of seniors is not expected to increase the density of population in rural areas. Figure 19 illustrates the projected decline in population in several counties around the state by 2040.

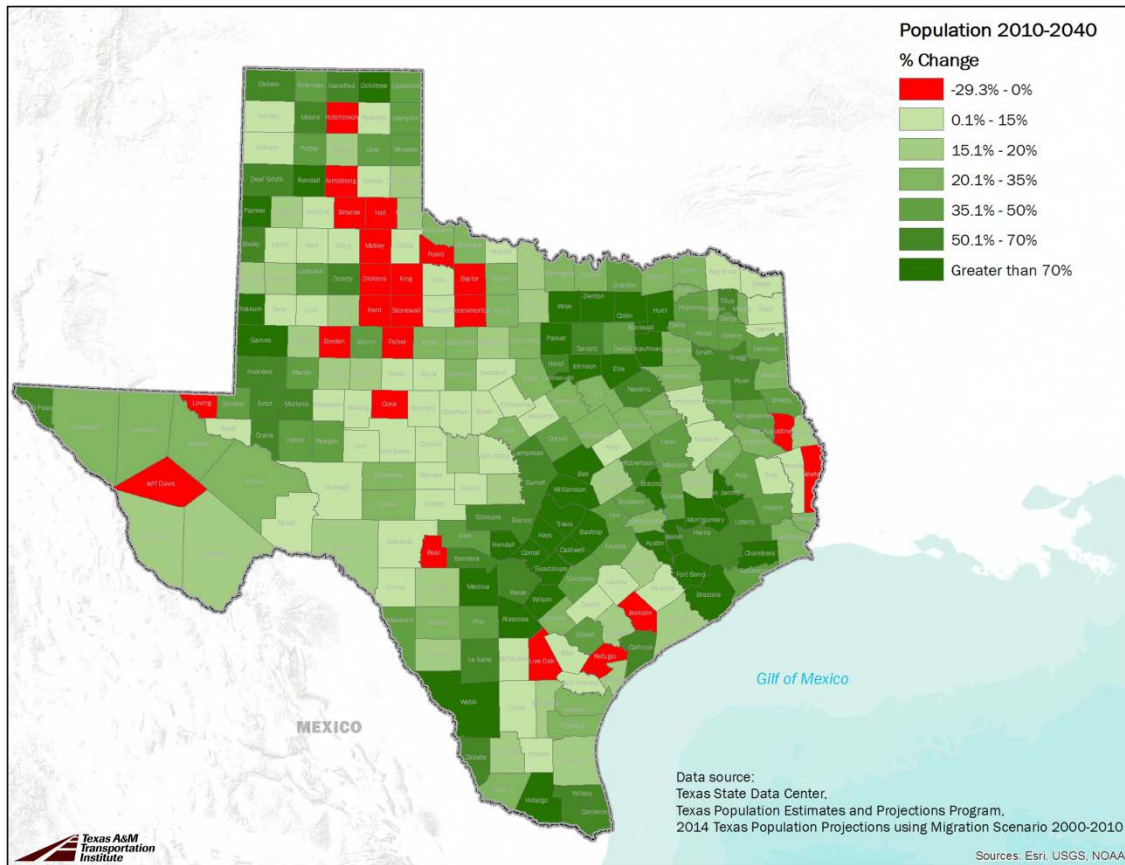


Figure 19. Projected Percent Population Change by County, 2010–2040.

Increased Costs to Deliver Packages

A recent report from Colliers International highlights that the last mile of the logistics chain, which accounts for a large proportion of shipment costs and complexity of operations, is often the most inefficient (40). In growing urban areas, the inefficiencies stem from the increasing number of delivery points, which add distance and time to current delivery routes. In rural areas, the challenge of increased delivery distance is exacerbated by the fact that, due to low residential density, there are fewer customers to cover the costs of providing delivery service.

A report, commissioned by the Postal Regulatory Commission in 2011, discusses the January 1999 implementation of Delivery Area Surcharges (DAS) by both UPS and FedEx. These companies introduced DAS to offset the costs associated with higher costs per delivery stop (41). The two types of DAS fees identified by the report are regular DAS fees and Extended DAS fees; extended fees are specifically for rural delivery. The report estimated that 16 percent of the United States’ population pays Extended DAS fees. This population lives in areas that total 73.5 percent of the land area in the continental United States. According to the report, the density of non-DAS zip-codes is, on average, 460.8 people per square mile; whereas, the population density for the Extended DAS zip-codes is 20.8 people per square mile.

Table 7 presents the 2011 estimated last-mile delivery cost per package for UPS, FedEx, and USPS. These costs include both fixed and variable delivery costs. Although UPS and FedEx’s costs are costs associated with both commercial and residential deliveries and USPS’s costs are for residential service only, the average cost per package in an urban setting is comparable among UPS, FedEx, and USPS—between \$1 and \$2. In a rural setting, the additional cost to provide delivery service compared to the cost of providing similar service in urban settings is the basis for extended DAS fees. USPS’s DDU rate of \$1.92 per package is the fee that USPS charges private carriers to complete last-mile delivery. This service avoids the extended DAS fee, reducing UPS and FedEx’s rural delivery costs by nearly \$1.20 per package (Table 7).

Table 7. Cost of Delivery per Package.

Carrier	Urban	Rural (Extended DAS)
UPS	\$1.40	\$3.10
FedEx Ground/HD	\$1.52	\$3.19
USPS Parcel Post	\$0.87	\$0.57
USPS Bound Printed Matter Parcels	\$0.43	\$0.37
USPS DDU Rate	\$1.92	\$1.92

Note: DDU rate for a 4-lb parcel in 2011.

Source: (41).

As of October 2015, both FedEx and UPS recently increased the companies’ fuel surcharges despite significant decreases in fuel costs over the previous year. FedEx indicates the increase is in response to heavier packages and a rise in residential deliveries, according to the *Wall Street Journal* (55). The same article states that, “though e-commerce has taken off, margins on that business are narrower because of the higher costs of making deliveries to scattered homes” (55). USPS also serves more delivery locations than in previous years. USPS reports that their delivery points increased from 149.2 million locations in 2008 to 153.9 million points in 2014 (34). A 3 percent increase in delivery points (as experienced by USPS) can contribute to a significant amount of extra mileage, which increases fuel use and cost.

Possible Delivery Cost Reduction Solutions

Package delivery companies and major retailers are investigating ways to reduce the cost of delivering packages other than sharing the cost of delivery with customers (in the form of fees and surcharges, as discussed above). In urban areas, Amazon has introduced Amazon Lockers (as presented above) to enable customers to pick up items ordered through Amazon at a locker location (such as a convenience store, hardware store, or grocery store), instead of having the item delivered to their home or office (56). Centralized delivery locations, such as Amazon Lockers, reduce the number of delivery destinations, reducing the costs associated with making deliveries (fuel, vehicle maintenance, staff costs, and others).

Similar to Amazon Lockers, USPS has also piloted a package pickup and delivery box system. The gopost® parcel delivery locker concept is a free alternative delivery option that is available 24 hours a day. USPS initiated this system to increase their parcel readiness efforts and prepare

for future online retail growth (57). Additionally, gopost® addresses common customer concerns related to normal parcel deliveries, such as missed deliveries, address mix-ups, stolen packages, and weather-damaged goods (57).

UPS has also introduced a new concept for package delivery that centralizes delivery points and offers customers more security. UPS Access Points is a program that coordinates with local business, such as dry cleaners or pharmacies, to allow packages to be placed at a near-by secure location after the first attempt to deliver is unsuccessful. According to Bloomberg, UPS plans to begin offering Access Points service in 100 cities. UPS stated that the service will reduce delivery costs by ending second and third delivery attempts, and will save consumers a trip to UPS customer centers (which are more spread out and less convenient than local business) (58). Also according to Bloomberg, each home delivery attempt costs UPS \$1.50 to \$2.00, so multiple delivery attempts could become so costly that UPS' profit margin might be reduced to zero. Additionally, Bloomberg notes that that UPS would prefer that people living near Access Points forgo even a single home delivery attempt, opting instead for pickups at the nearby Access Point, likely because of the opportunity to increase profit margins (58).

Fiscal

Funding sources that are dedicated to specific uses reduce flexibility and diminish opportunities for public and private entities to collaborate and identify innovative solutions to freight funding needs. This section documents fiscal challenges that transit agencies should consider when initiating a package delivery service.

Public Funds for Provision of Transit Services

Transit agencies in the United States receive funding from the federal government as a subsidy to support transit operation. The government controls the use of federal funds with detailed legislative code and FTA guidance and rules. If an agency uses federal money to fund any part of the agency's operation, that agency's services, policies, and practices must comply with federal guidance.

As of July 2016, FTA has not drafted guidance for transit agencies that operate package delivery services. Package delivery service is not included in current FTA guidance on incidental use; however, two examples may have regulatory similarities: charter service and meals-on-wheels. While the existing legislation does not specifically mention package delivery, it governs non-mission specific activities and, pending interpretation by FTA, may be similar to future package delivery service guidance/regulations.

Charter Service—Charter service describes service provided on an exclusive basis to a specific group of paying customers. Some transit agencies operate charter services to augment revenues. According to Title 49 of the Federal Transportation Code, transit operators that receive federal funding may provide chartered service as an incidental service as long as the service “does not: (1) interfere or detract from the provision of the mass transportation service for which the equipment or facilities were funded under the Act; or (2) does not shorten the mass transportation life of the equipment or facility” (49 C.F.R. § 604.5[f]).

Meals-on-Wheels—Federal funding guidance associated with *Federal Section 5310, Formula Grants for Special Needs of Elderly Individuals and Individuals with Disabilities* outline requirements for transit agencies that deliver meals to people that are homebound. Section 5310 states that “Public transportation service providers receiving assistance... may coordinate and assist in regularly providing meal delivery service for homebound individuals if the delivery service does not conflict with providing public transportation service or reduce service to public transportation passengers.”

Federal Grant Funding

Rural transit agencies receive federal Section 5311 non-urbanized area (rural) transit program formula funding for support of public transportation in rural areas with a population of less than 50,000. In addition to federal funding, rural transit agencies receive state and local funds for rural transit, including contract, county, and municipal government funds. In Texas, the state distributes Section 5311 funds in the following manner and order:

- Intercity bus allocation— unless the state certifies, after consultation with affected intercity bus service providers and other stakeholders that the intercity bus service needs of the state are being adequately met, TxDOT will allocate not less than 15 percent of the annual Section 5311 federal apportionment for the development and support of intercity bus transportation.
- Administration—TxDOT may use up to 10 percent of the annual federal apportionment to defray its expenses incurred for administration.
- Needs and performance formula allocation (Texas Transit Funding Formula)—an amount not to exceed \$20,104,352 after administration and intercity bus amounts are distributed is allocated based on needs and performance.
- Discretionary allocation—if the amount of the Section 5311 federal apportionments exceeds the \$20,104,352 maximum amount, a part of that excess not to exceed 10 percent will be available to the commission for award at any time during the fiscal year on a pro rata basis, competitively, or combination of both. Consideration for the award of these additional discretionary funds may include, but is not limited to, coordination and technical support activities, compensation for unforeseen funding anomalies, assistance with eliminating waste and ensuring efficiency, maximum coverage in the provision of public transportation services, adjustments for reduction in purchasing power, and reductions in air pollution.
- Vehicle revenue mile formula allocation—any amount of the annual Section 5311 federal apportionment that is not otherwise allocated will be allocated to non-urbanized areas based on the proportion of vehicle revenue miles for that non-urbanized area to the total vehicle revenue miles for all non-urbanized areas.
- Adjustments to allocation—adjustments are determined in the case of a change due to a transit agency’s service area or declaration of a previously designated urbanized area as non-urbanized.
- Application and contract—new subrecipients may receive funds by completing and complying with all application requirements, rules, and regulations applicable to the Section 5311 program.

States may not use more than 10 percent of apportioned Section 5311 funds, including funds apportioned under Section 5340 but not the Rural Transit Assistance Program allocation, to administer the Section 5311 program and to provide technical assistance to subrecipients.

Under Section 5311, the federal share for capital assistance is 80 percent, and the federal share for operating assistance is 50 percent of net operating expenses. Net operating expenses are those expenses that remain after a transit provider subtracts operating revenues from eligible operating expenses. States may further define what constitutes operating revenues, but at a minimum, operating revenues must include farebox revenues. Some projects—to meet the requirements of the Americans with Disabilities Act, the Clean Air Act, or bicycle access projects—may be funded at 90 percent federal contribution. State or local funding sources may provide the local share.

State and Federal Agencies

Transit agencies in the United States receive funding from the federal government as a subsidy to support transit operation. The federal government controls the use of federal funds with detailed legislative code and FTA guidance and rule-makings. TxDOT is the official designated recipient for RTDs in Texas. FTA passes down funds for rural and small urban transit systems to TxDOT. TxDOT distributes the funds to subrecipients across the state. Please note this is an extremely high-level summary of the process meant only to illustrate the relationship of RTD to TxDOT to FTA to federal legislative code. If an agency uses federal money to fund any part of the agency's operation, that agency's services, policies, and practices must comply with federal guidance. As of January 2016, transit operators in the United States have not begun to make deliveries as an additional or incidental service, and FTA has not drafted guidance for transit agencies to operate package delivery services.

Despite the lack of guidance specific to package delivery services, the federal transportation code does address other incidental services that transit agencies may opt to provide. Charter service—service provided on an exclusive basis to a specific group of paying customers—is an example of a service provided by some agencies in an effort to augment revenues. According to Title 49 of the federal transportation code, transit operators that receive federal funding may provide chartered service as an incidental service as long as the service, “does not: (1) interfere or detract from the provision of the mass transportation service for which the equipment or facilities were funded under the Act; or (2) does not shorten the mass transportation life of the equipment or facility. 49 C.F.R. § 604.5(f).” Additionally, the funding guidelines associated with *Federal Section 5310 Formula Grants for Special Needs of Elderly Individuals and Individuals with Disabilities* outline requirements for transit agencies that deliver meals to people that are homebound. Section 5310 states that, “Public transportation service providers receiving assistance... may coordinate and assist in regularly providing meal delivery service for homebound individuals if the delivery service does not conflict with providing public transportation service or reduce service to public transportation passengers.”

While the existing legislation, discussed above, does not specifically mention package delivery, it governs non-mission specific activities and, pending interpretation by FTA, may be applicable to package delivery service provided by transit agencies.

Researchers collected information from private sector intercity bus operators and public sector RTDs first to ascertain if the concept of package delivery or freight haul was even remotely feasible and interesting to stakeholders. GPX expressed clear interest, as did several RTDs. In Task #3, Rural and Intercity Bus Workshops, researchers organized four workshops. A central objective of the workshops was to facilitate exploratory discussions between FTA, TxDOT, RTD, and private sector organizations.

A last-mile package delivery pilot must ensure transit services are not adversely effected. For example, vehicle passenger compartments may not be modified to exclusively hold parcels/freight. Rather, a successful last-mile package delivery pilot would maintain existing or improve/increase transit service in effected rural areas.

FACT-FINDING QUESTIONNAIRE

The fact-finding questionnaire enabled researchers to gather data directly from stakeholders about rural package delivery. Researchers identified relevant types of stakeholders for package/freight delivery coordination between public RTDs and the private sector, including FTA, TxDOT, RTDs, and private sector companies. An online questionnaire was the primary tool for distributing the questionnaire, but researchers also conducted virtual meetings with private sector companies.

Findings from the questionnaire build upon the baseline state-of-practice information initially collected. The state-of-the-practice scan established a baseline understanding of package delivery services in the United States and provided a better understanding of the opportunity for rural transit agencies to participate in freight delivery as a last-mile solution. The fact-finding questionnaire ascertained current experience with and interest in freight delivery as a last-mile solution. In addition, potential workshop participants are identified.

The following sections summarize the fact-finding approach and conclusions for the following stakeholders:

- RTDs (public sector, potential freight delivery partner).
- Intercity bus operators (private sector, potential freight delivery partner).
- State and federal agencies (oversight/regulatory entities with vested interest).

RURAL TRANSIT DISTRICTS

All 37 RTDs were invited to complete a brief online poll about their agency's past or present role and interest in last-mile package delivery in rural Texas. A secondary, but extremely important, aim of outreach was to identify stakeholders interested in participating in the workshops planned for the next phase of the research effort. Appendix A is the poll instrument. The following sections describe the rural transit agency delivery experience.

Questionnaire Participation

Fifteen RTDs completed the poll (41 percent). The average time to complete the poll was 3 minutes. Three responding agencies are mixed small urban and rural service providers covering multicounty regions and one or more small urban areas. The other 12 agencies are purely rural service providers with various service contexts: two serving their respective city limits/area, two serving their respective county, and eight serving multicounty regions. The following three sections summarize findings for these 15 RTDs. Responses are reported in aggregate. Researchers used agency-specific information to determine workshop locations, develop content, and coordinate participation.

Questionnaire Findings

In the questionnaire about delivery programs, researchers asked rural transit agencies in Texas which types of delivery services they are involved in or were involved in in the past. Of the seven agencies that responded to the questionnaire:

- Three have been involved with meals-on-wheels.
- Five have experience with package delivery.
- Two have experience with freight haul.

Agencies with package/freight experience briefly described the nature of their involvement in the industry in the questionnaire. The following is a summary of their involvement:

- An agency delivered packages that arrived at our transit facility to various entities in their service area.
- An agency had freight haul and package delivery contracts with intercity bus providers. The agency would (a) operate a pickup and delivery station for freight/packages, (b) process payment, (c) cost-share, and (d) transfer freight/packages with intercity bus providers.
- A health clinic uses a transit agency's services to send packages to a different healthcare provider in another city. The transit agency picks up the package and takes it to one of their facilities, where a driver from a neighboring rural transit agency picks up the package and takes it the rest of the way to its final destination.
- An agency worked with an intercity transit facility to deliver packages to smaller communities already served by their transit services.
- An agency picks up medication from one rural health clinic and delivers it to their partner rural health clinic in another city.

The questionnaire asked respondents what motivated them to get involved in package delivery/freight haul. The following is a list of their motivating factors:

- Contracts with multiple intercity bus providers.
- Increased services to the community and establishment of a positive working relationship with intercity bus providers.
- Increased revenues.
- Services for which the transit agency will make extra revenue.
- Coordination between two rural transit agencies and intercity bus providers.
- Community and agency partnerships.

The questionnaire asked respondents for examples of characteristics of successful delivery programs. Agencies shared the following remarks:

- On-time delivery.
- Good and open communication with intercity bus providers.
- Already-established relationship with the community used beneficially.
- Tracking/reporting requirement maintained.
- Arrangements that are mutually beneficial logistically.
- Marketing and coordination.
- Set procedures for where/when to pick up packages, contact names, and phone numbers for each end, and delivery confirmation signatures.

Involvement in Delivery

The first question of the poll inquired about an agency's experience with delivery services, such as meals-on-wheels, package delivery, or freight haul (past or present). Seven agencies indicated yes they have experience with at least one of three forms of delivery mentioned. Six agencies indicated no. Two agencies were unsure. The next section summarizes findings specific to the seven agencies with experience. The following section summarizes findings for the eight agencies without experience or which were unsure.

RTDs with Experience

The seven agencies with experience in delivery were asked which types of delivery services they are involved in, or were in the past: three of seven checked meals-on-wheels, five of seven marked package delivery, and two marked freight haul (both of these agencies also marked package delivery). No respondent used the write-in option.

The five agencies with package/freight experience were invited to briefly describe the nature of their involvement in the industry:

- We delivered packages that arrived at our [XYZ] transit facility to various entities in [our service area].
- [We] had freight haul and package delivery contracts with intercity bus providers. [We] would operate a pick-up and delivery station of freight/packages, process payment, cost-share, and transfer freight/packages with intercity bus providers.
- [ABC Health Clinic] in [city1] uses [our services] to send packages to [DEF Health Clinic] in [city2]. [We] pick up the package in [city1] and take it to [one of our facilities] where a driver from [neighboring RTD] picks it up and takes it the rest of the way to [city2].
- [We] worked with [intercity bus operator] to deliver packages to smaller communities [already served by our transit services].
- We pick up medication from one rural health clinic, and deliver it to their partner rural health clinic in another city.

The same five agencies were also asked what motivated them to get involved in package delivery/freight haul:

- Contract with [intercity bus operator 1] and [intercity bus operator 2].
- To provide increase services to the community while establishing a positive working relationship with intercity bus providers and generate revenues.
- Services for which [we] make extra revenue, coordination between two rural transit districts, and community partnerships.
- [Part of] a coordination effort since [intercity bus operator] was housed at our multimodal in [city in service area].
- The clinic asked for our help.

Researchers were interested to learn about how much revenue delivery coordination generated for agencies each year. Please note the following values are unconfirmed estimates and may or

may not be present year values. Meals-on-wheels revenue responses included a blank (non-response), \$4,000 each year, and \$650,000 each year. Package delivery revenue responses averaged \$4,724 each year and ranged from \$1,800 to \$10,000. Freight haul revenue was noted by one agency as \$10,000 each year (the same agency marked \$10,000 on package delivery, unclear if the amounts are unique revenues).

The final follow-up question for seven agencies with package delivery or freight haul experience was about keys to success. Agencies shared the following remarks:

- On-time delivery.
- Good and open communication with intercity bus providers, established relationship with the community, meeting tracking/reporting requirements.
- Finding arrangements that are mutually beneficial logistically. Marketing and coordination.
- Get a signature at each pick up /drop off. Have a set procedure for where/when to pick up packages, and contact names and phone numbers for each end.

RTDs Interested but Inexperienced

Eight of 15 agencies noted they have no experience in coordinating meal, package, or freight delivery. The poll contains logical functions to inquire if the agency had ever considered, or been approached about, generating local match revenue by delivering packages or freight. Most agencies had not considered the possibility nor been approached (six of the eight agencies). Two agencies had previously considered the possibility and shared the following insight:

- It was a Board decision not to add...delivery service.
- [We] could not reach the proper person at primary carrier.

All eight agencies were presented with the following scenario and question:

Consider the idea for a moment: imagine [Agency] coordinates package/freight delivery and passenger trips/routes remain at their existing high-level of customer service.

9) What minimum level of revenue would make the endeavor interesting and worthwhile to [Agency]?

- () About \$5,000 each year
- () About \$10,000 each year
- () About \$25,000 each year
- () About \$50,000 or more each year

Researchers were interested to learn the relative revenue return necessary to make the effort to coordinate package delivery/freight haul worthwhile. Zero agencies marked about \$5,000 revenue. Five agencies marked \$10,000 revenue. One agency marked \$25,000. Two agencies marked \$50,000. The average of the eight responses is \$21,875 in annual revenues necessary to motivate participation in last-mile package or freight delivery in rural Texas. The amount is higher than the average \$4,724 revenue earned by RTDs already involved in delivery.

Comments about Delivery

Agencies shared the following comments in response to the final question of the poll, which was “Please share any final insight or comments about rural transit involvement in package/freight delivery”:

- [Package delivery] is a small source of income which requires very little work. In our case we place packages on buses going in [the] direction [the bus is already traveling].
- Any additional service that could contribute to our local revenues without adversely affecting our core service (transporting passengers) is worth consideration. We’re interested in learning more about this.
- Have been in the package delivery business before and am very familiar with the process and benefits. We would enjoy exploring this as applied to rural transit. We cover [multiple] counties and have 30 buses out, every day. A good opportunity for coordination, efficiency, and revenue.
- [We] are very much interested in participating in workshops.
- [Package delivery] can be a great source of increased revenue while increasing a service to the public.
- [We] are very interested in finding more opportunities in this arena for final mile delivery, partnerships with FedEx/UPS/etc. (even Amazon), and further monetization of rural routes creating more infrastructure in rural areas.

Workshop Participation

Fourteen of the 15 responding agencies expressed interest in participating in a workshop about last-mile package/freight delivery.

Current Transit-Based Package Delivery Practices in Texas

Rural transit agencies are creating community partnerships through package delivery services with local agencies in some areas in Texas. According to Higgins et al., Concho Coaches, a small regional intercity bus service, receives their largest portion of revenue from the freight services the company provides. The *Midland Reporter Telegram* states that Concho Coaches delivers plumbing supplies, smaller oil field service equipment, and other packages/products, as requested (42, 43). Additionally, regional package delivery carriers, such as LSO, are growing and provide a different array of services and service levels compared to the major carriers. On many occasions, they can offer direct delivery from origin to destination without first entering the package into a major sorting facility. This section describes the package delivery programs at ATCOG’s TRAX, CARTS, SWART, and South Plains Community Action Association (SPARTAN), as well as partnerships with Greyhound.

ATCOG TRAX

ATCOG TRAX rural public transportation service is an interlining partner with Greyhound. Under this agreement, TRAX transports GPX packages on TRAX intercity bus routes to Paris from Mount Pleasant, Linden, and Texarkana. Additionally, customers with pre-paid package

shipments may send their packages GPX out of Paris. TRAX stores packages in a separate cargo compartment at the rear of the transit vehicle.

According to Ark-Tex staff, the agency and its customers benefit from the relationship with GPX and Greyhound because service is streamlined and the agency has gained the ability to provide service to additional destinations.

CARTS

CARTS is an interlining partner with Greyhound. Under their agreement, CARTS provides connecting service to Greyhound passengers and packages in the Austin, Texas, area. CARTS is also a Greyhound agent and sells Greyhound passenger tickets and GPX services. All of CARTS's routes are available for Greyhound passenger and package delivery services.

According to CARTS's staff, the transit agency's connection with Greyhound allows CARTS to better serve its customers by providing increased accessibility and connectivity. The transit agency specifically views package delivery as an additional service that it can offer to improve the quality of life of its constituents and provide a more well-rounded service.

SWART

SWART began providing package delivery services within the transit agency's region in 2016. These services are conducted under contract with Advance Headstart and include transportation of interoffice mail and other business-related items.

SPARTAN

SPARTAN, in partnership with West Texas Opportunities' transportation program TRAX, has developed a community partnership with South Plains Rural Health to transport packages between health clinics. SPARTAN picks up the package in Levelland and takes it to a SPARTAN office in Lubbock, where a driver from TRAX picks it up and transports the package to Lamesa.

INTERCITY BUS OPERATORS

Researchers contacted private package delivery companies to learn more about challenges, coordination with transit, innovation, potential market opportunities, and lessons learned. Additionally, researchers asked whether the respondent's firms would be interested in participating in the project's workshops. GPX and Jefferson lines (two intercity bus-based package delivery providers) consented to provide feedback. This section presents the questions that researchers asked each respondent and summarizes the findings collected through this outreach effort.

Researchers asked each respondent the following questions:

1. Does your company struggle with delivering packages/freight to rural areas in Texas at a cost-competitive rate?

2. Is your organization currently involved in coordinating package delivery with a public transit agency partner (anywhere in United States, but especially Texas)?
 - a. If YES,
 - i. Will you please describe how the partnership was formed and how it functions today?
 - ii. What benefits does the partnership provide to your business?
3. How does your company handle re-delivery if recipient is not home and the address is remote?
4. Are there innovative solutions used now or will be in the near-future? (e.g., box drop/pick-up at high-traffic locations like grocery stores)
5. We are looking for locations where a partnership between an RTD and a private delivery company could likely prove mutually beneficial.
 - a. Please share any of the following information you are willing to:
 - i. Do you have any information about freight/package volume in rural Texas? By package size/weight. By delivery timeframe.
 - ii. Is there a particular region or county where rural package delivery is especially challenging?
6. What information can you share about keys to a well-functioning package delivery partnership agreement between a public agency and a private company?
7. Are you interested in participating in a workshop about package delivery partnerships between private companies and RTDs in Texas?

Current Partnerships with Transit Agencies in Texas

To learn more about existing service and partnerships between private sector organizations and transit agencies, researchers asked each respondent whether their firm coordinates with a transit agency to provide package delivery service. Jefferson Lines' representative stated that Jefferson Lines does not currently work with any transit agencies in Texas.

Greyhound works with CARTS and the Wichita Falls Transit System (Falls Ride) to provide pickup and delivery service for Greyhound's package delivery service—GPX—in the service area of each transit agency. CARTS uses its transit vehicles, and Falls Ride uses a maintenance van (labeled with GPX decals) for the service. Because both CARTS and Falls Ride operate on-demand service, they represent ideal partners for pickup and delivery service because of the on-demand nature of the current package delivery market. CARTS and Falls Ride provide GPX pickup and delivery service under Greyhound's standard contract for this type of service.

According to Greyhound's representative, approximately 25 percent of the company's GPX service occurs in Texas, and new strategies/services are typically tested in Texas first. Assuming the required infrastructure is in place (a local agent and last-mile delivery provider), the company would consider entering any market as a package delivery provider.

Beyond GPX, Greyhound is also pursuing partnerships with transit agencies to increase Greyhound's passenger service area. These agreements, ideally, would enable the company to access transit agency facilities, such as transit centers, for passenger pickup/dropoff as well as coordinate passenger transfers to transit-operated services so that Greyhound can offer passenger

service (and potentially package service) to more destinations. Transit agencies may act as Greyhound agents to sell Greyhound tickets and GPX services.

Innovations in Package Delivery

When researchers asked respondents about current industry innovations Greyhound's representative shared two innovative concepts that GPX is working on—neighborhood pickup/drop-off points and electronic consumer shipment management.

To provide service to as many customers as possible, while minimizing the costs associated with door-to-door delivery, GPX is working to establish neighborhood pickup and delivery locations. Under the GPX concept, local businesses (such as convenience stores or dry cleaners) would act as a package pickup and drop-off location. Packages would be delivered to or collected from each location by the same providers that now pickup and delivery GPX packages to home addresses. In the case of pickups, recipients would be notified that their package is available when it arrives. For outgoing shipments, customers would be able to pre-pay for service online, or purchase service at the drop-off location. Greyhound's representative stated that this type of arrangement has the potential to reduce GPX costs because it removes the variability of pickup and delivery locations and could increase foot traffic and revenue for local partner business (those acting as pickup/drop-off locations).

To better compete with other shipping companies, GPX, according to representatives, is developing a, "shipping management solution" that will include electronic ordering, package tracking, online billing, and integration with other platforms (such as smartphone shopping apps and online stores) through an open Application Programming Interface. Any entity that contracts with GPX will have access to this system and will be required to use it for processing of GPX packages.

Challenges in Package Delivery

The representatives from both Greyhound and Jefferson Lines identified on-demand service and tracking as key challenges related to package delivery, from the perspective of intercity bus operators. Greyhound also identified a need for better access to rural customers. This section discusses these challenges in more detail.

On-Demand Service

Intercity bus operators operate according to fixed schedules, to accommodate passenger trips. The package delivery market, according to both Greyhound and Jefferson Lines representatives, is quickly transitioning to an on-demand delivery model where customers can receive their purchases in as little as a few hours and typically in less than a week. This quick turn-around requires package delivery providers to respond to demand quickly, and to offer flexible service. Additionally, according to Greyhound's representative, to meet the short timeframe delivery demands of consumers, goods must be transported overnight and package delivery companies must be capable of receiving and beginning transport for outgoing shipments late into the day. Because of the challenge of meeting the demands of current consumers looking for more immediate delivery, Greyhound focuses on commercial/business shipping services. According to the company's representative, these customers ship goods regularly, according to scheduled

service, and do not require on-demand delivery options. The consumer shipping market is growing and Greyhound, according to the company's representative, is interested in developing this segment of the company's shipping market.

Access to Rural Customers

Greyhound's representative explained that access to customers in rural areas is a significant challenge as the company tries to expand its package delivery services and provide more deliveries in rural areas. According to the company's representative, Greyhound works with local agents to transfer packages from its buses. Once packages are transferred from the buses, the agents either retain the packages for the recipient to pick up or transfer the packages to contracted couriers for direct-to-recipient (last-mile) delivery. Without having agents in rural areas (such as the small towns/villages where Greyhound picks up at a curbside bus stop or simply passes through), Greyhound cannot accept packages to be delivered in these areas. The lack of rural access minimizes the GPX service area. Additionally, according to Greyhound's representative, the company's parent company, First Group, "encourages Greyhound to take advantage of public facilities where possible." Under this directive, Greyhound is heavily interested in developing its relationships with transit agencies and finding partners to gain access to intermodal facilities.

Delivery Tracking

The large package delivery companies (UPS, FedEx, and USPS) offer varying levels of tracking service for the packages they deliver. As of January 2016, GPX and Jefferson Lines package express services do not offer customers the ability to track, in real time, their packages. According to both Greyhound and Jefferson Lines representatives, technology for tracking and dispatching packages is a key element of a competitive package delivery service and without this capability a company will struggle to compete effectively with large providers. As discussed previously, Greyhound is actively pursuing this technology and expects to introduce tracking features and other related technology advancements in the coming year. Greyhound's representative emphasize that any tracking system must allow consumers to check on packages, determine expected wait times, and answer other questions for themselves—this type of system reduces the need for customer service agents and increases customer satisfaction.

Opportunities and Lessons Learned

Greyhound's representative stated that approximately 25 percent of the companies GPX service occurs in Texas and that they typically test new strategies/services in Texas first. Additionally, Greyhound's representative stated that, assuming the required infrastructure is in place (a local agent and last-mile delivery provider), there are no markets that the company would not consider entering as a package delivery provider.

Workshop/Pilot Participation

Greyhound's representative states that the company would be interested in participating in a pilot package delivery service in collaboration with a transit agency. Jefferson Lines representatives, because of the company's limited Texas service, stated that the company is not interested in piloting opportunities.

RURAL AND INTERCITY BUS WORKSHOPS

As a catalyst for pilot implementation and to develop dialogue between stakeholders and investigate findings from the fact-finding questionnaire more thoroughly, researchers with TTI and On Your Mark Transportation facilitated a series of workshops in May 2016 to capture rural transit agency and private intercity bus carrier perspectives on using public transit to facilitate last-mile package delivery in rural areas.

These workshops informed participants and gained feedback on possible options, challenges and barriers, and advantages and disadvantages of using public transit to facilitate package delivery, as well as discussed opportunities for coordination of package delivery between the public and private sectors. Researchers were also able to identify potential pilot project participants for a last-mile package delivery project. This section documents locations of each workshop, the agenda used, and the key topics that surfaced during the workshops.

WORKSHOP LOCATIONS

The workshops were held in several regions throughout Texas—Arlington, Austin, Odessa, and Pharr. With input from the TxDOT project advisors and TxDOT’s Public Transportation Division (PTN), these cities were chosen because of their geographic convenience to Task 2 questionnaire respondents interested in attending workshops. The workshops in Arlington and Austin were held at TTI facilities, and the meetings in Odessa and Pharr were held at TxDOT facilities. TTI invited stakeholders including representatives from the 37 Texas RTDs, private and public intercity bus operators, private package delivery interests, TxDOT, and others.

Table 8 displays the location, date, and attendees for each workshop.

Table 8. Workshop Locations, Dates, and Attendees.

Location	Date	Attendees
Arlington	May 5, 2016	<ul style="list-style-type: none"> • City County Transportation • East Texas Council of Governments • GPX • Heart of Texas Council of Governments • Public Transit Services • SPAN, Inc. • STAR Transit
Austin	May 11, 2016	<ul style="list-style-type: none"> • Arrow Trailways • Capital Area Rural Transit System • Colorado Valley Transit • Golden Crescent • GPX • SWART District
Odessa	May 24, 2016	<ul style="list-style-type: none"> • Concho Valley Transit • GPX • SPARTAN Public Transportation • West Texas Opportunities
Pharr	May 26, 2016	<ul style="list-style-type: none"> • Fort Bend County Transit • GPX • Lower Rio Grande Valley Development Council • REAL, Inc.

WORKSHOP AGENDA

Workshops followed a basic agenda:

- Inform the participants of possible options, challenges and barriers, advantages, and disadvantages.
- Discuss opportunities for coordination of package delivery.
- Identify potential pilot project participation in a last-mile package delivery project.

Appendix B includes the workshop presentation, SCOT analysis, and agency info sheet used for the workshops. Workshops included facilitated discussion on the following topics:

- Policies relevant to implementing and operating package delivery services.
- Necessary legal protections for delivery service providers.
- Transit-specific legal issues.
- Firsthand experience with package delivery services.
- Tracking packages with technology.
- Central drop or last-mile drop locations.
- Making connections.
- How to connect schedules between carriers.
- Security/safety.
- Markets.

- Pricing.
- Transit-specific requirements/policies.
- Stakeholder interest in participating in the pilot project(s) developed during this project's Task 5.

KEY FINDINGS FROM THE WORKSHOPS

Participants were asked to provide their perspective and understanding of using public transit to facilitate last-mile package delivery. The following sections describe the key findings revealed during the SCOT analysis and during discussions of stakeholder objectives, markets, community connections, and operational considerations.

SCOT Analysis

Participants completed a SCOT analysis during the workshop to determine internal and external factors that would impact their agency if rural package delivery were implemented.

Strengths are internal characteristics that give an agency an advantage to achieve performance goals. The following are strengths identified by the agencies:

- Potential for additional revenue and matching funds.
- Availability of extra capacity on transit vehicles.
- Availability of additional personnel already employed by the agency.
- Lack of competition from other transit providers or package delivery carriers.
- Knowledge of local geographic area.
- Flexibility.
- Daily frequency that already exists within service schedule.
- Vehicle fleet size and quality.
- Large service area.
- Excellent communication.
- Existing sales and marketing structure.
- Availability of centralized operations center.
- Availability of package tracking capabilities.
- Experience with multimodal transportation.
- Additional service points.
- Opportunity to expand brand/brand exposure.
- Existing market knowledge.
- Location of transit facilities (proximity to interstates).
- City serving as existing hub for regional activity.
- Existing partnerships.
- Provide additional access for customers.
- Ability to use existing infrastructure.
- Brand recognition.
- Existing trained personnel.
- Potential for job creation.

Challenges are internal characteristics that can place the agency at risk for not achieving performance goals. The following are challenges identified by the agencies:

- Lack of funding.
- Scheduling.
- Training (drivers, dispatch).
- Additional bureaucratic compliance.
- Additional reporting requirements.
- Package securement in buses.
- Varying package attributes; package size and weight.
- Lack of internal vehicle space/capacity.
- Interchange locations.
- Delivery time span.
- Lack of adoption by public transit agencies.
- Over-thinking.
- Ability to staff this service.
- Vehicle types.
- Package-to-rider ratio.
- Determining where to deliver packages.
- Getting the package delivered on time.
- Liability.
- Lack of available/appropriate vehicles.
- Availability and cost of necessary technology.
- Individual opinion.
- Lack of marketing.
- Maintaining schedules.
- Disrupting core competency and mission of agency.
- Lack of awareness/knowledge of existing services.
- Ability to meet partner requirements.
- Delivery expectations.

Opportunities are external opportunities to improve transit performance. The following are opportunities identified by the agencies:

- Increased revenue and local match funding opportunity.
- More exposure, which may lead to increased ridership.
- Courier-type service.
- Increased public awareness of services available.
- Additional service points.
- Market-based pricing for package delivery.
- Additional service partners with local relationships.
- Strengthening of existing partnerships with local businesses and social service agencies.
- Additional capacity already available on transit vehicles.
- More trips.

- Co-advertising.
- Business buy-in of public transit.
- Helping people get things faster.
- Public outreach.
- Creation of a replicable model for other agencies.
- Potential for growth.
- Ability to be accessible within the community.
- Regional coordination and coordination among agencies.
- Potential for economic development.
- Development of service markets (gaming, international, etc.).
- Expansion of capacity.
- Ability to impact last-mile delivery.
- Public perception.

Threats are external elements that could cause problems for an agency. The following are threats identified by the agencies:

- Incorrect/improper reporting leading to withdrawal of funding.
- Changing government policies.
- Regulatory issues.
- Capital requirements.
- Discontinuation of the program by FTA/TxDOT after implementation.
- Impacts on future programs to sustain ridership.
- Liability and potential for worker's compensation claims.
- Vehicle restrictions.
- Governmental regulations.
- Poor customer service.
- Not meeting customer expectations.
- Abuse by providers.
- Maintaining identity of transit agency.
- Issues with FTA.
- Ability to meet demand.
- Lack of funding.
- Political wind.
- Lack of coordination.
- Smaller market segments.
- Competition.
- Fluctuating market segments.
- Reduction or loss of rural markets.
- Public perception.
- Safety.
- Abuse by providers.

Stakeholder Objectives

Workshop participants identified potential stakeholders for package delivery service and the objectives for each. Table 9 summarizes the outcomes of the stakeholder objectives discussion.

Table 9. Stakeholder Objectives.

Stakeholder	Objectives
Private Intercity Bus Carriers	<ul style="list-style-type: none"> • Increase revenue/profit. • Increase number service points. • Increase number of partner agencies and community connections. • Increase cost effectiveness. • Expand brand alternatives. • Expand markets. • Expand expertise and share existing knowledge of package delivery. • Reduce costs for package delivery.
Public Transit	<ul style="list-style-type: none"> • Increase local match funding opportunities. • Increase passenger base. • Increase marketing. • Increase markets. • Increase connections. • Provide access. • Expand service destinations. • Create partnerships and network. • Reduce duplicate services.
Customers (Residential and Business)	<ul style="list-style-type: none"> • Ensure convenience. • Provide efficient delivery and same-day delivery options. • Increase service points. • Increase shipping options. • Increase shipping markets/diversify types of packages. • Reduce shipping costs.
TxDOT	<ul style="list-style-type: none"> • Focus on performance. • Focus on sustainability. • Consider local investment/operating expenses. • Focus on regional coordination. • Concentrate on implementable research.
MPO/Council of Government	<ul style="list-style-type: none"> • Ensure compliance with regional planning. • Secure funding. • Support public transit. • Focus on regional coordination. • Consider economic development potential.
FTA	<ul style="list-style-type: none"> • Ensure compliance with federal regulations. • Create links and connections. • Support connections. • Support travel needs in rural and intercity areas. • Support infrastructure. • Encourage partnerships and public transit enhancement.

Markets

The diversity of potential markets' rural package delivery services is substantial. Specific markets will vary depending on the area in the state. The following is a list of potential markets identified by participants at the workshops:

- Auto industry parts and equipment.
- Medical (biological samples, prescriptions, pharmaceutical).
- Environmental (air, water, soil, oil, agricultural).
- Military.
- College campuses.
- Restaurants, wholesale foods, and convenience stores.
- Perishables (fish, eggs, dairy).
- Private homeowners.
- Small businesses and artisans.
- Mail, documents, printed materials, and courier services.
- Same-day shipping needs.
- Small quantity shipping.
- Regional employment centers/large companies (e.g., Cargill).

The partnership between rural transit agencies SPARTAN and TRAX is a good example of rural package delivery services for medical products. A local health clinic uses the SPARTAN service to send packages to a different healthcare provider in Lubbock that is within the service area of neighboring rural transit agency TRAX. SPARTAN picks up packages and delivers them through the agency's commuter buses to its Lubbock office. TRAX drivers pick up the package in the Lubbock office and deliver packages to the final destination.

The package delivery market is quickly transitioning to an on-demand delivery model where customers can receive their purchases in as little as a few hours and typically in less than a week. This quick turnaround requires package delivery providers to respond to demand quickly and to offer flexible service. To meet the short timeframe delivery demands of consumers, goods must be transported overnight, and package delivery companies must be capable of receiving and beginning transport for outgoing shipments late into the day.

Community Connections

Implementing a package delivery program can be advantageous for both the public and private transportation sectors because of the potential to increase revenue, increase markets and service points, and create economic development opportunities within a community. The following section summarizes the discussion related to the connections necessary for a rural package delivery service.

Connections between public transit agencies and private intercity bus carriers are crucial to a successful rural package delivery program, especially when transferring packages from main carrier (i.e., GPX, UPS, FedEx) to the last-mile carrier (i.e., transit agency). Collaboration and coordination with rural transit agencies and private package carriers can reinforce the first- and last-mile connection for package delivery. It is important to create central package drop and

pickup locations that are convenient to both customers and package carriers. Integrating schedules and frequencies has the potential to increase both ridership and package delivery.

Community buy-in is also important for a successful rural package delivery program. Package delivery service may result in confusion or pushback from riders, or riders may view the new service as a loss of passenger service. Transit agencies are responsible for communicating service changes to their ridership. Public outreach and education should reiterate that passenger service will not be affected (and cannot legally be reduced to deliver packages) and that package delivery service has the potential to fund transit service and expand service.

Furthermore, improved collaboration and coordination with state agencies, local governments, and MPOs is necessary to leverage freight and transit infrastructure improvements and increase support for coordinated package delivery.

Operational Considerations

To successfully add package delivery service to existing passenger transportation services, a transit agency needs to consider the additional operating time and additional space required to execute a meaningful service. There are many varied operational issues agencies must consider when implementing a package delivery program, such as package securement, driver requirements, technology, and safety. The following section is a summary of the discussion related to operation considerations.

The addition of package delivery service will create unique operational considerations for transit agencies. Considerations are as follows:

- Trip type—Will the agency combine package delivery service and passenger service, or schedule vehicles for dedicated package service? Several public transit agencies indicated they would prefer to have a dedicated vehicle to deliver packages, but not all agencies have extra transit vehicles or fleet vehicles to dedicate to the program.
- Timing and scheduling—If package delivery service is integrated with passenger service, how does the time required to make deliveries affect overall transit performance and customer experience? Many public transit agencies indicated they would incorporate package delivery into regularly scheduled trips and service schedules, or deliver packages during off-peak times. Integrating package delivery service with passenger service could increase dwell time and contribute to additional slack in the transit agency's schedule. The amount of time required to load and unload the packages at each stop must be considered when designing service. Because of the additional variable it introduces, package delivery service could also cause uncertainty within the passenger service schedule. The agency also needs to be prepared for handling and managing the additional paperwork related to each shipment, such as bills of lading.
- Vehicle design—Is the vehicle capable of transporting packages and passengers safely and securely? Transport of packages requires a vehicle that has adequate cargo space that is separate and secure from passengers, and is capable of carrying a specific load (in pounds). The agencies discussed several ideas to retrofit existing vehicles to accommodate packages but noted that retrofitting may violate regulations set forth by the funding agency. Adequate cargo space may be defined as a secure storage compartment

in the location of a passenger seat or stock cargo areas (as in a van) or an aftermarket storage compartment installed in place of some passenger seats (without impeding safe access or passenger load minimums).

- Package handling and storage—Does the transit agency have a secure facility to store packages while in transit? How will the transit agency handle instances when a package is undeliverable? Where will the package be delivered alternatively? Handling and storage of packages may require additional employee training to ensure the employees properly lift, handle, store, transport, and deliver packages. A private-sector partner indicated it would be willing to provide online package handling training modules to public transit agencies. The concept of lockers, similar to those used by Amazon, was discussed as a potential opportunity for a central pickup and drop point. Packages may need to be stored in secure locations at stations or designated locations, secured while in transit, and secured at the final destination. Basic package security training can be provided to public transit drivers, and transit terminals can be used as a training ground for local law enforcement agencies. Handling and storage of packages may require additional employee training to ensure that the employees properly lift, handle, store, transport, and deliver packages.
- Processing and paperwork—How will the transit agency handle paperwork associated with packages? How will the introduction of additional steps to operator routine (i.e., scanning package for tracking) impact performance and passenger service? Public transit agencies expressed concern about the cost of procuring and implementing additional technology to process packages. A private-sector partner indicated that it uses a smartphone-enabled system for package scanning, which eliminates the need for scanners. There are several smartphone-enabled systems available for package scanning, which eliminates the need for scanners and reduces the cost of procuring and implementing additional hardware and technology.
- Insurance—Does the transit agency’s insurance cover the additional risk/liability associated with package delivery service? Agencies should contact their insurance agent to discuss specific details about their fleet and service types to ensure coverage. The private-sector partner indicated that very few packages are damaged during transit, but insurance to cover any damaged items is often prorated throughout each carrier involved in the delivery.
- Pricing—Pricing for package delivery service could be determined using per-mile fees, flat fees according to delivery zones, weight-based fees, market-based fees, or in accordance with private-sector fee tables and policies. Furthermore, fees could be split into two categories:
 - Local—packages that originate and terminate within the transit agency’s service area.
 - Last-mile—packages that are transferred from a private carrier to be delivered within a transit agency’s service area.
- Regulations and legal considerations—There are numerous laws and regulations, both at the state and federal levels, associated with commercial package delivery. Most of these regulations revolve around operator registration, driver licensing, and safety standards. Adding package delivery to a passenger service may require adjustments to operational and procedural practices, for both the operating agency and driver performing the movement. Package delivery service is not included in current FTA guidance on incidental use; however, two examples may have regulatory similarities: charter service

and meals-on-wheels. Existing legislation does not specifically mention package delivery, but it governs non-mission-specific activities and may be similar to future package delivery service guidance/regulations.

- Service opportunities—Participants identified several types of package delivery services: last-mile, drop, same day, and back up. Rural package delivery does not have to be exclusively door-to-door services. Several agencies pointed out that retailers and/or individuals often prefer to pick up packages rather than have them delivered, and residents in extremely rural areas may not be willing to pay more for home delivery. A private-sector partner suggested that not all public agencies have to offer all types of service; they can offer only those applicable to their community and customer base.
- Driver requirements and needs—In Texas, three classes of commercial driver’s licenses (CDLs) exist, each defined by the vehicle weight characteristics or the number of passengers transported. Transit agencies that perform package delivery will need to ensure that transit operators’ CDLs are adequate for the addition of package delivery service. Driver retention is a major issue in many regions, so several public agencies were concerned about adding additional responsibilities without increasing wages. Some suggested that adding “additional duties as assigned” to the existing job descriptions could alleviate any issues with package delivery. Others suggested offering drivers a commission for packages delivered. Furthermore, additional training may be needed for drivers to learn how to properly lift packages to prevent injuries.
- Security—Maintaining a secure environment for both passengers and packages is an important consideration when implementing a package delivery program. Many public agencies expressed concerns related to potential drug trafficking, especially near borders and on routes to major cities. The private-sector partners indicated that a visual package inspection is performed on each package prior to loading it on their vehicles. Basic package security training can be provided to public transit drivers, and transit terminals can be used as a training ground for local law enforcement agencies.

Conclusions from the Workshops

Transit agencies and private package carriers that attended workshops are equally interested in this concept and perceive similar benefits:

- Additional reach and market share.
- Increased ridership.
- Increased revenue.
- Opportunities to collaborate on service provision beyond package delivery.

There is not a one-size-fits-all way to implement package delivery in rural areas. The type of package delivery service (direct to the door, central pickup locations, pass-through packages, etc.) is dependent upon local/regional markets and the size/capacity of the local partner. The diversity of potential markets is substantial.

Although package delivery offers the potential for additional revenue for rural transit agencies, it is a secondary benefit. Package delivery can offer rural transit agencies the opportunity to provide an additional service to their customers beyond the agency’s service area and improve rural residents’ accessibility to goods and services. It can also provide additional service points

from private carriers. Support from state and federal agencies is key to ensuring successful programs. Funding partners (FTA, TxDOT, MPOs, and others) will need to be educated about this concept to ensure that such programs are executed in the same way throughout Texas.

STRATEGY FOR IMPLEMENTING LAST-MILE PACKAGE DELIVERY SERVICE VIA RURAL TRANSIT

This section documents considerations for implementing last-mile package delivery service via rural transit agencies. Initiation of rural, transit-based last-mile package delivery service requires transit agencies to implement non-standard policies and procedures and to coordinate with new and diverse service partners. Considerations include potential goals, objectives, and performance measures associated with implementing package delivery service, insurance and liability considerations, partners in a potential agreement to operate the service, agreements to manage the service/partnership, and training and operations requirements.

GOALS, OBJECTIVES, AND PERFORMANCE MEASURES

Goals, objectives, and performance measures establish upfront expectations and guide future decision-making. The project team worked with pilot participants to develop the following goals, objectives, and performance measures:

- **Goals:**
 - Provide additional services to customers.
 - Increase non-program transit revenues.
 - Facilitate expansion of intercity bus passenger service in rural areas.
 - Test the concept of last-mile package delivery in the market.
 - Gather management/training/operation information to inform future package service expansion.
 - Contribute to economic development within the transit agencies service area.
- **Objectives:**
 - Coordinate with private sector package delivery partners, such as intercity bus companies, to introduce package delivery service options.
 - Operate package delivery service under a fee-for-service model.
 - Document service impacts, staff training requirements, and lessons learned at regular intervals to improve service and facilitate goal achievement.
 - Document opportunities, challenges, and performance for monthly summary/documentation.
 - Provide access to affordable shipping services for local businesses and residents and foster opportunities for local service providers to partner to deliver packages.
- **Performance Measures:**
 - Packages and shipments per day.
 - Revenue from package service per month.
 - Revenue miles and hours completed with package on-board.
 - Portion of passenger capacity used for package service compared to total passenger capacity for vehicles that provided package service.
 - Non-passenger miles and hours that result from package service.
 - Operating cost associated with package services.
 - Staff time required per week for package services.
 - Transit referrals/conversions.

- Package size.
- Customer feedback.

INSURANCE AND LIABILITY

Potential risks associated with package delivery service include customer and employee injuries and lost, stolen, or damaged packages. Most transit agencies are part of TML. According to TML staff, package delivery service is not included in the pool's liability coverage but a transit agency's decision to implement package delivery service would not affect existing liability coverage. Transit agencies should contact insurance agents that specialize in courier and package service to discuss specific details about their fleet and service types to determine coverage availability.

The liability associated with lost, damaged, or stolen packages broadens a transit agency's risk exposure. For example, the maximum insurable value for packages that travel via GPX is \$1,000, so risk exposure is still low. Additionally, in the case of the pilots, GPX is responsible for handling all customer service issues related to lost or damaged packages and partner transit agencies is not required to handle such matters after referring customers to GPX.

SERVICE PARTNERS

Implementing last-mile package delivery service operated by rural transit agencies requires coordination and agreement between the transit agency and a private package delivery company.

Rural Transit Agencies

All rural transit agencies in Texas have the potential to implement package delivery service. Because of market variability and demand differentials, some rural transit agencies may be better suited to implement service than others. Demand trends and statewide goals, demographics, agency-specific conditions, and private sector insight are helpful for rural transit agencies to self-assess to determine whether the transit agency has potential to succeed with package delivery service.

When selecting participants for the pilot package delivery service, researchers worked with TxDOT's Public Transportation Division staff to review each interested agency according to the following criteria:

- *TxDOT freight plan goals*—Implementation of package delivery service in rural areas may help satisfy statewide planning goals and objectives. When considering service, rural transit agencies should review the Texas Freight Mobility Plan's goals to determine the potential statewide contributions such service may achieve. The 2016 Freight Mobility Plan goals included three that are specifically relevant to package delivery via rural transit: multimodal connectivity, customer service, and economic competitiveness.
- *Population and service area*—Each rural transit agency in Texas serves a unique portion of the state's population and operates in distinct geographic conditions. Each agency's service area and population should be analyzed to determine the potential for supporting a package delivery service. Variables for analysis include, at minimum: residential

density, current economic activity and business diversity, projected growth, and regional connectivity/opportunity.

- *Special features identified by the agency*—Rural transit agencies may possess unique qualities that could contribute to package delivery service (e.g., unique facilities/vehicles, a specific market for package service, an advertising or marketing department). The existence and impact of each unique quality that a transit agency can contribute to package delivery service should be assessed.
- *Private partner analysis*—The private package delivery partner should assess the rural transit agency’s service area to document existing business in the area, perception of the new opportunities this partnership could create, and other findings as relevant.

Private Package Delivery Companies

Private package delivery companies are integral to implementing rural, transit-based package delivery service. These companies provide connectivity to package origins and destinations beyond a rural transit agency’s service area.

Due to service models that are similar to rural transit agencies and service areas that overlap with rural transit, intercity bus companies that offer package delivery service are the most likely type of private package delivery company to partner with rural transit agencies to provide rural package delivery. For example, Greyhound’s bus-based, package delivery service, GPX. Smaller intercity bus companies also offer package delivery services and typically operate with interlining agreements to transfer passengers and packages to other carriers and facilitate through-trips.

Beyond providing similar services and operating in similar areas, intercity bus companies and rural transit agencies may be able to benefit financially by partnering. The Federal Section 5311 funding program includes funding for passenger service coordination between transit agencies and intercity bus companies; package service coordination further increases the chances that rural transit agencies and private intercity bus companies might coordinate passenger service, enabling the service providers to earn federal funding.

Other potential partners include UPS, FedEx, LSO, and other independent courier services. In the future, as technology enables diverse business-models and consumers continue to demand rapid service, it is likely that other companies and business models will enter the package delivery market. For example, Amazon.com contracts with private drivers to deliver packages in some key markets on the same day the order is placed (59). Additionally, Amazon.com is launching an in-house freight service, with a planned fleet of 40 cargo jets, to more quickly and reliably deliver packages to customers (60).

Service Agreement Structure

Service agreements for package delivery service document expectations and requirements for transit agencies and private partners. Such agreements will include information about the amount of reimbursement that a transit agency may receive for conducting package delivery activities and limitations to the size, weight, and quantity of packages to be shipped via transit vehicles, customer service protocols, operating guidance, and additional supporting materials. Appendix A

presents a copy of the agreement that governs one of the pilot package delivery services, between SWART and GPX.

Training

As with all changes to current transit service, the addition of package delivery service requires staff training to ensure the transit agency can provide service as planned. For package delivery service, transit agencies need to train staff and drivers about the processes involved in selling service and tracking packages, package restrictions, and proper package handling and security (both to prevent theft and shifting during transport). Training is likely to require two to four hours of staff time and trainers should complete this task prior to service launch. In the future, new employees tasked with any aspect of package delivery service should receive training immediately. Appendix B presents training materials developed by SWART and GPX to train SWART's staff and drivers in the use of GPX ShipTrack software.

Infrastructure Requirements

Maintaining a secure environment for both passengers and packages is an important consideration when implementing a package delivery program. Serving passengers is the primary mission of a transit agency; package delivery service should not impact the needs and safety of passengers. Passenger access to and from transit vehicles and facilities must be considered when combining passenger and package services. Packages may need to be stored in secure locations at transit stations or other designated facilities (in a locked room, or other similar secure environment), secured while in transit, and secured at the final destination. Handling and storage of packages may require additional employee training to ensure that the employees properly lift, handle, store, transport, and deliver packages.

Scheduling/Routing/Planning

Transit agencies must schedule package delivery service to avoid negatively affecting passenger service. A transit agency's dispatching department can work with a private partner's dispatch center to coordinate package deliveries with existing scheduled trips. Under the current pilot package delivery service, when selling service, GPX offers pickup and delivery windows (instead of guaranteed times) so that scheduling is flexible and package delivery can be worked in to existing passenger service. GPX's central dispatch center will work with package recipients to arrange a time-window for either delivery to the customer's address or for pickup at SWART's facility and coordinate with SWART's dispatch staff to schedule a vehicle to deliver the package or to ensure that the facility will be open and available for the customer to pick up the package.

POTENTIAL SERVICE MODELS AND EXAMPLE SERVICE PRICES

This section discusses the potential service models that a transit agent may adopt to provide package delivery services and presents example pricing for package delivery services. The service models used to provide package delivery service will vary depending on the transit agency's capacity for adding an additional service, the market for package delivery services, and the availability of facility space that is available to house the service. While transit agencies may partner with any package delivery provider (UPS, FedEx, GPX, and others), according to

previous research and stated interest from intercity bus, it is likely that transit agencies will experience the fewest challenges partnering with intercity bus package delivery providers such as GPX.

Intercity bus operators have a long history with package delivery. GPX dominates the package delivery segment of the intercity bus industry; regional operators offer package delivery service within their service areas and transfer packages to GPX and other service providers to complete package delivery routes through interlining agreements. GPX and regional intercity bus operators participate as NBTA members and provide connecting service under interlining agreements that allow passengers and packages to travel throughout the country by transferring between NBTA member bus operators. NBTA is responsible for establishing and managing these agreements. Part of NBTA's role is to function as a clearinghouse for revenue generated by selling tickets and providing package express services. The organization distributes revenue generated from ticket sales and package delivery fees according to the percent of service provided by each member bus operator involved in each transaction. As of 2012, NBTA distributed between its members \$180 million worth of revenue from transactions for passenger and package delivery service.

This section describes the three main service models that a transit agency might implement to provide package delivery service (options are modifiable to suit the agency and do not represent all options). This section also outlines which transit agencies and markets each service model is appropriate for and documents the benefits and challenges associated with each option to identify the considerations that a transit agency should assess when deciding which service model is right for the agency and the community. *Note: This section assumes that a transit agency will provide package delivery service in coordination with an intercity bus partner. Service models specific to coordination with companies such as UPS or FedEx may vary from these models.*

Interlining Carrier without Local Delivery

The simplest service model for providing package delivery service is for a transit agency to act as an intermediary package carrier as part of its agreement to provide interlining services to an intercity bus partner (as outlined above). Under this model, the transit agency (when picking up transfer passengers) would accept packages to transport as well. The packages transferred to the transit agency's vehicle are transferred again from the transit vehicle back to the intercity bus company's vehicle at a later transfer point. This type of service allows for packages to take the most direct route possible; for example, the alternative to transferring a package to a transit vehicle might require a longer overall trip for the package (because it has to go on the intercity bus's defined route instead of being able to take a shortcut via transit) and result in service that takes longer. This model does not allow customers to pick up or drop off packages. Additionally, this model does not require the transit agency to store packages or to accept payments for shipments. Interlining service is provided in exchange for mileage reimbursements directly from NBTA on behalf of the transit agency's intercity bus partner. Table 10 outlines what types of transit agencies might pursue the interlining carrier without local delivery service model and the benefits and challenges associated with the model.

Table 10. Interlining Carrier without Local Delivery Specifics.

Who's it for?	<ul style="list-style-type: none"> • Small agencies with limited staff time. • Agencies without secure package storage space. • Agencies that want to avoid handling package delivery fees and processing associated paperwork.
Benefits	<ul style="list-style-type: none"> • Additional revenue generation from existing service. • Simple and fast implementation. • Does not require interaction with additional customers or separate customer service staff.
Challenges	<ul style="list-style-type: none"> • Potential to increase dwell time. • Additional driver responsibility.

Pickup/Dropoff Facility

Acting as a pickup/dropoff location allows transit agencies to provide additional service options for package delivery and increases the market potential of the agency's package delivery service because of the higher level of service that customers receive. Under this service model, transit agencies will continue to provide interlining service for packages and providing space for packages to be stored. Stored packages include those that are dropped off by customers (with labels printed by the customer and paid for online) and packages that have arrived and are awaiting customer pickup. This service model requires a transit employee to retrieve packages for customers to pick up. The package delivery partner will typically have direct access to the package storage area so that the transit agency is not required to assist with access or be available to transfer packages. Table 11 outlines what types of transit agencies might pursue the pickup/dropoff service model and the benefits and challenges associated with the model.

Table 11. Pickup/Dropoff Facility Specifics.

Who's it for?	<ul style="list-style-type: none"> • Agencies that have available storage space. • Agencies that have greater service demand. • Agencies that can commit staff time to accept/retrieve customer packages.
Benefits	<ul style="list-style-type: none"> • Potential for additional market-share. • Opportunities for staff/customer interaction and outreach.
Challenges	<ul style="list-style-type: none"> • Providing a dedicated space for package storage. • Pickup/dropoff service requires additional staff time.

Complete Service

Transit agencies may decide to adopt a service model that offers complete service to customers. This model includes everything discussed in the previous service model sections, as well as sales of package delivery services and door-to-door pickup/delivery. Appendix A presents a complete description of this service model, according to GPX.

Table 12 outlines what types of transit agencies might pursue the complete service model and the benefits and challenges associated with the model.

Table 12. Complete Service Specifics.

Who's it for?	<ul style="list-style-type: none"> • Agencies with customer service centers (to facilitate sale of service). • Agencies with excess facility space that can be converted to customer service use. • Agencies with high-demand for package delivery service.
Benefits	<ul style="list-style-type: none"> • Highest potential revenue generation because of the additional level of service offered. • Greatest opportunity to expand access for the community.
Challenges	<ul style="list-style-type: none"> • Requires additional staff time and training to ensure package delivery fees are handled appropriately. • Requires coordination of courier drivers (or third-party contractors) to execute door-to-door services.

Service Pricing

If a transit agency operates package delivery service in coordination with a private package delivery company, the private partner will determine service pricing. However, the transit agency may also choose to develop separate local/regional package service that operates with a separate price schedule. Pricing will vary by market and be determined by numerous market-specific factors, such as demand, local cost of living, services required, and other variables.

PILOT PROJECT

To determine the viability of the best practices and potential policies developed determined from the information gathered from the state-of-the-practice scan, the questionnaire, knowledge of existing package delivery services and the strategy for implementation and operation, researchers coordinated with two rural Texas transit operators to implement a pilot package delivery service.

Researchers solicited transit agencies to participate in a pilot package delivery service in collaboration with GPX. Eight rural transit agencies responded stating interest in participating, and SWART and Concho Valley were selected to join the pilot because of each agency's unique service area and potential to generate meaningful lessons for the pilot. Researchers worked to facilitate coordination between SWART, Concho Valley, and GPX to establish a service plan and implement package service. This section documents the outcomes and lessons learned from this pilot service.

This chapter documents the pilot project timeline, goals, objectives, and performance measures developed for the pilot process, lessons learned, and an analysis of strengths, challenges, opportunities, and threats.

PILOT PROJECT TIMELINE

The following sections describe the chronological order of the pilot project process.

September 2016

In September 2016, researchers worked with the private-sector package delivery partner to establish minimum requirements for pilot partners, including documentation of the private partner's preferred markets. Additionally, the private partner reviewed the guidebook and provided feedback. Also in September, researchers completed a pilot participant recruitment questionnaire to be distributed to rural transit agencies.

October 2016

In October 2016, researchers distributed a questionnaire to all rural transit operators in Texas seeking interest in pilot participation. In response to the questionnaire, eight rural transit operators stated that they were interested in participating in the pilot, provided information about how the agency would benefit from the opportunity, and described the transit agency's unique characteristics that would contribute to the success of the pilot. Also in October, researchers developed a series of quantitative selection criteria to objectively determine which transit operators will participate in the pilot, and began the process of reviewing and selecting participating transit operators. Finally, in October, researchers presented a list of interested operators to the director of TxDOT's PTN for review and comment. Based on the meeting with PTN, researchers determined that the pilot launch should be postponed until after January 1, 2017, to afford more in-depth review by the project sponsor/PTN and the project team.

The eight rural transit operators that that expressed interest in participating in the package delivery pilot are listed below and presented on a map in Figure 20:

- Brazos Transit District.
- Colorado Valley Transit District.
- Concho Valley.
- Fort Bend County Public Transportation Department.
- Lower Rio Grande Valley Development Council–Valley Metro.
- REAL, Inc.
- SWART District.
- SPARTAN Public Transit.

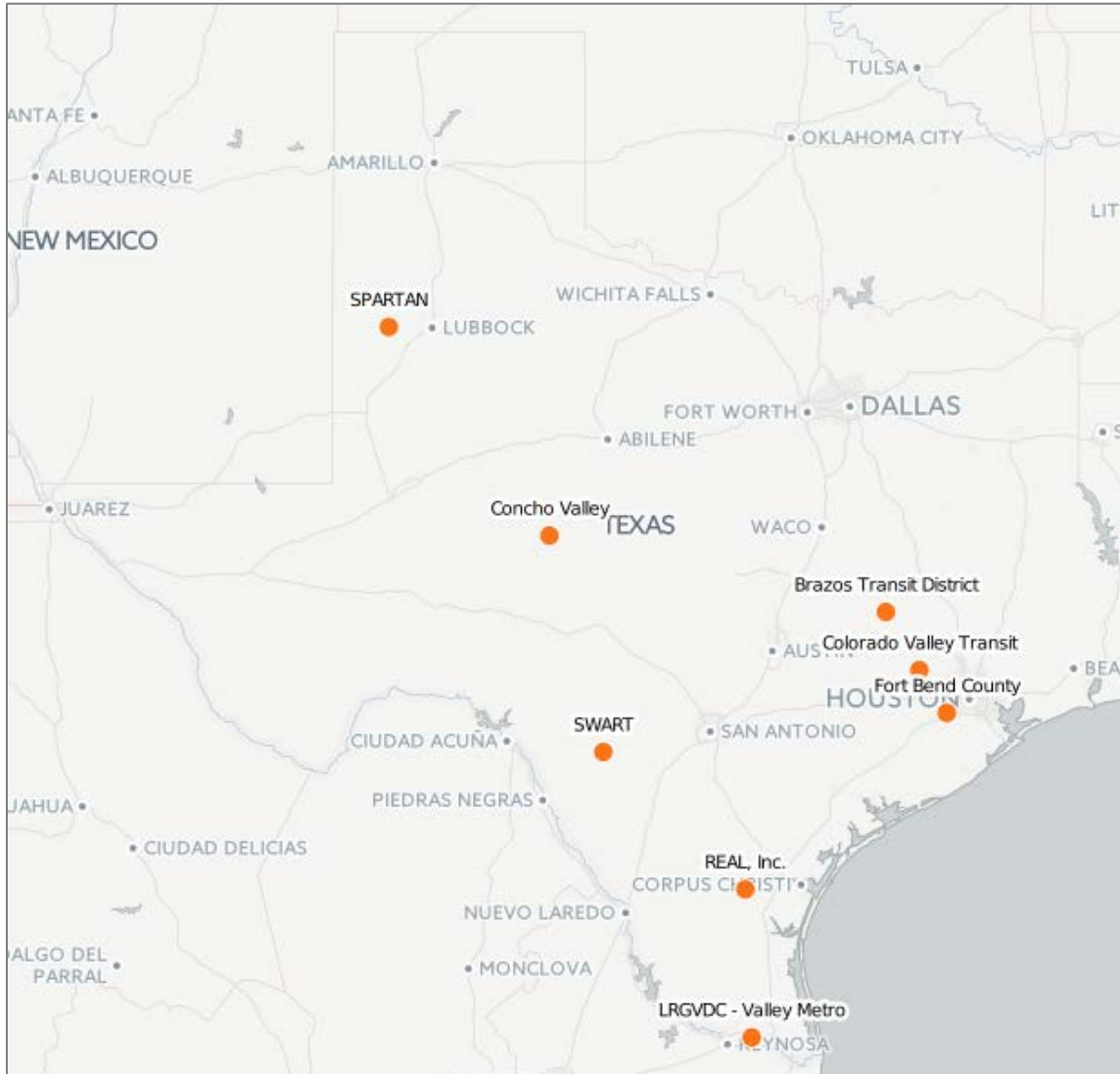


Figure 20. Rural Transit Operators Interested in Pilot Participation.

November 2016

In November 2016, researchers met with the pilot’s private partner to review the list of transit operators that are interested in participating in the pilot and discuss the strategy for moving forward. Additionally, the project supervisor and some project team members met with PTN to

discuss the list of interested agencies in detail, review strategies for making final pilot project selections, and discuss how to work with FTA to ensure that the pilot concepts that are developed in coordination with pilot participants (both the transit agency and the private partner) are in line with FTA guidance.

Researchers selected two rural transit agencies in Texas (SWART and Concho Valley) to implement a pilot last-mile package delivery service in coordination with GPX. According to this experience, the process of implementing such service takes approximately three months. In this time, the service agreement is negotiated and finalized, service protocols are developed, and staffs receive training. This following sections present information in order of occurrence during the implementation process—for example, a transit agency should identify service partners before a service agreement is established.

January–March 2017

Researchers worked with the private package delivery company (GPX) and each transit agency to initiate the process of establishing package delivery service beginning in January 2017. During February and March, the pilot participants worked closely with GPX to plan service, negotiate operating agreements, and implement training (including package handling, processing of packages, and documentation of transactions/performance) for transit agency staff.

April 2017

In April 2017, SWART launched its package delivery service and began working with GPX to market the service through signage, handouts distributed by transit operators, and a targeted marketing campaign that included direct calls to possible clients (conducted by GPS marketing staff). Figure 21 presents a screen capture showing available service from SWART.

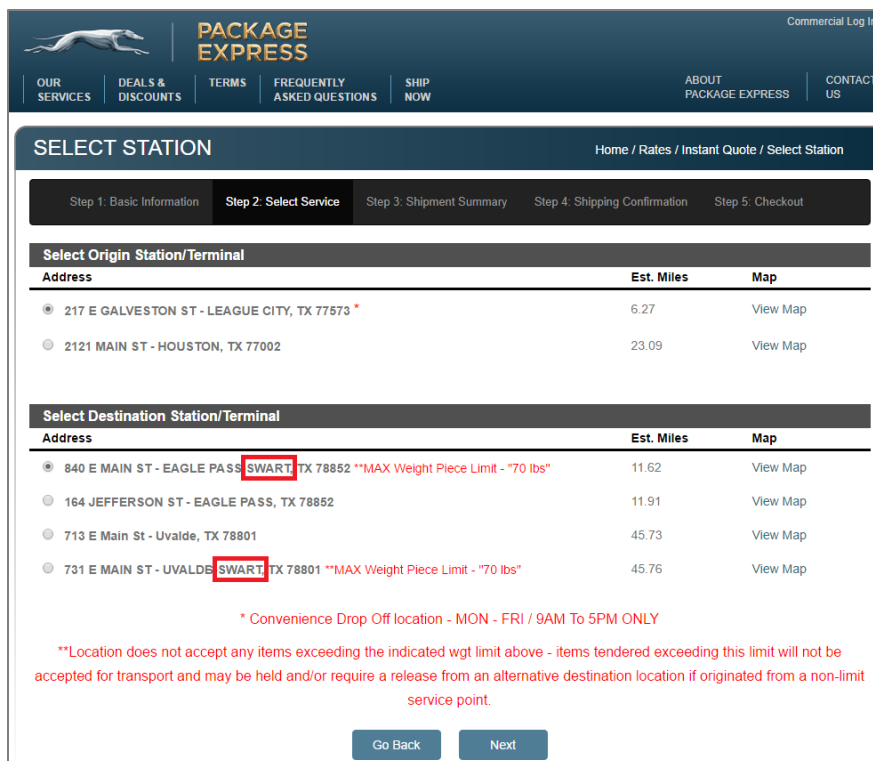


Figure 21. SWART Package Service Availability.

The process of launching the Concho Valley pilot package delivery service required additional negotiation and planning to account for existing conditions and to ensure that service was complimentary to GPX’s existing relationships in the region. The Concho Valley pilot was supposed to begin operating in May, but the transit agency’s staff met with a TML insurance representative and learned that TML could not insure package delivery service under existing liability coverage or as an addendum. To avoid possible liability issues, Concho Valley opted to delay service initiation until the staff could identify a solution for liability insurance.

GOALS, OBJECTIVES, AND PERFORMANCE

Goals, objectives, and performance measures establish upfront expectations and guide future decision-making. Researchers worked with pilot participants to develop goals, objectives, and performance measures to guide the implementation and operation of the pilot package delivery service.

Status—Goals and Objectives

Table 13 and Table 14 present the status of the goals and objectives (respectively) as well as a discussion of the effort/outcomes associated with each. The pilots completed 50 percent of the goals and 60 percent of the objectives during the performance period—January 1, 2017, through May 31, 2017.

Table 13. Status of Pilot Goals as of May 31, 2017.

Goals	Status as of May 31, 2017		Discussion
Provide additional services to customers.	Complete		The pilots added to the service portfolios of the rural transit agencies, providing a new service to the transit agency's customers.
Increase non-program transit revenues.	Initiated		The pilots did not receive service requests during the pilot period. During the performance period, the pilots could not increase non-program transit revenues.
Facilitate expansion of intercity bus passenger service in rural areas.	Initiated		Greyhound is interested in working with pilot participants and other transit agencies to increase service where appropriate, citing rekindled interest from the pilot project as the catalyst for such conversations.
Test the concept of last-mile package delivery in the market.	Complete		Two pilot package delivery services were initiated. SWART reached full service implementation and will offer package delivery service until the end of the project, at least (service began on April 1, 2017).
Gather management/training/operation information to inform future package service expansion.	Complete		Researchers worked with the pilot participants to document requirements for managing, training, and operating transit-based package delivery service.
Contribute to economic development within the transit agencies service area.	Initiated		The pilots did not receive service requests during the pilot period. During the performance period, the pilots could not contribute to economic development.
Total	3		
Complete	3	50%	
Initiated	3	50%	

Table 14. Status of Pilot Objective as of May 31, 2017.

Objectives	Status as of May 31, 2017		Discussion
Coordinate with private sector package delivery partners, such as intercity bus companies, to introduce package delivery service options.	Complete		Researchers worked with GPX and two rural transit agencies to initiated pilot package delivery service in two markets in Texas. Service, operated by SWART in coordination with GPX, launched in April 2017.
Operate package delivery service under a fee-for-service model.	Complete		SWART offered service, beginning in April 2017, to customers throughout the transit agency's service area.
Document service impacts, staff training requirements, and lessons learned at regular intervals to improve service and facilitate goal achievement.	Initiated		The pilots did not service requests during the pilot period. During the performance period, the pilots could not document service impacts, training requirement, or lessons learned.
Document opportunities, challenges, and performance for monthly summary/ documentation.	Initiated		The pilots did not service requests during the pilot period. During the performance period, the pilots could not document opportunities, challenges, or monthly performance.
Provide access to affordable shipping services for local businesses and residents and foster opportunities for local service providers to partner to deliver packages.	Complete		SWART offered service, beginning in April 2017, to customers throughout the transit agency's service area.
Total	5		
Complete	3	60%	
Initiated	2	40%	

Performance Outcomes

Working with pilot participants, researchers developed a series of performance metrics, as follows:

- Number of packages and shipments per day.
- Revenue from package service per month.
- Revenue miles and hours completed with package on-board.
- Portion of passenger capacity used for package service compared to total passenger capacity for vehicles that provided package service.
- Non-passenger miles and hours that result from package service.
- Operating cost associated with package services.
- Staff time required per week for package services.
- Transit referrals/conversions.
- Package size.
- Customer feedback.

During the pilot period, the pilot participants had access to an online tool to document these performance statistics. Because neither participant received a request for package delivery service during the performance period and there was no performance to track, the pilot participants did not need to use the tool. For reference, the following link provides access to a test version of the performance tracking tool: <http://sgiz.mobi/s3/Last-Mile-Package-Delivery-Monthly-Reporting/>. This tool provided a destination for pilot participants to submit narrative responses to nine feedback prompts (presented in the following list) and submit performance tracking spreadsheets (example presented in Figure 22):

Performance Tracking Response Prompts

1. Please provide any necessary documentation/discussion related to your tracking spreadsheet.
2. Benefits and challenges.
3. Service impacts.
4. Staff training and feedback.
5. Opportunities and performance.
6. Requests for additional passenger service as a result of package service.
7. Package size/weight including thoughts/lessons on storage in the vehicle, securing packages, passenger comfort/capacity/safety.
8. Customer feedback.
9. Lessons learned and changes for next month.

		May											
Daily Metrics	Day	1-May	2-May	3-May	4-May	5-May	6-May	27-May	28-May	29-May	30-May	31-May	Total
	Packages (total)												0.00
	Shipments (total)												0.00
	Package Service												
	Revenue miles												0.00
	Revenue hours												0.00
	Non-revenue miles												0.00
	Non-revenue hours												0.00
	All Service												
	Revenue miles												0.00
	Revenue hours												0.00
	Non-revenue miles												0.00
	Non-revenue hours												0.00
	Monthly Metrics	Revenue from package service											
Operating Cost													
Package Service													
Total													
Staff Time (hours)													
Package Service													
Total													
Transit Referrals													
Largest package (LxWxH in inches)													
Largest package (pounds/ounces)													

Figure 22. Data Reporting Spreadsheet.

LESSONS LEARNED

Throughout the performance period, researchers discussed the status of the pilots and documented the ongoing lessons learned from both the transit agency and GPX perspectives. Finally, researchers met with each pilot participant to discuss project outcomes and lessons learned. This section outlines the lesson learned from the pilot package delivery service implementation according to three broad themes—communication/education, marketing, and operations.

Communication/Education

Package delivery service is logistically challenging for companies that are dedicated to such service. Adding this type of service to a transit agency’s existing operations introduces an additional level of challenge. As such, communication and education are key to a successful transit-based package delivery service. Communication/education lessons include:

- Communication between the transit agency and the private package delivery company should be thorough and frequent to plan and coordinate service and handle day-to-day operational challenges.

- Developing a shared understanding of what each party's roles and responsibilities are beyond package delivery service is key to eliminating confusion or miscommunication during service implementation. Some considerations include:
 - The mission of each service partner.
 - Terminology that is unique to each industry (rural transit and package delivery).
 - Limitations of the partners as related to package service.
- Peer mentors are invaluable for transit agencies that are new to a service type, including package delivery. For example, pilot participants relied on information from peer transit agencies in Texas with similar experience to gain understanding of how to incorporate the logistics of package service within their current service portfolios.

Marketing

New service options benefit from marketing. GPX and SWART worked together to market the package service to customers via multiple media including handouts and signage provided by GPX, direct-call marketing by GPX sales members, and direct-to-customer information provided by drivers and SWART customer service staff. Additionally, SWART staff attended meetings with local business stakeholders to share information about the new service. Despite the significant marketing push, SWART did not receive requests for package service during the performance period. Marketing lessons include:

- Marketing is a key component of a new service and something that must be approached according to the needs of the area. For example, SWART customers and stakeholders like to meet the person providing the service and get a face-to-face understanding of who is behind the scenes.
- Teaching customers about how to purchase service and what service is available is an ongoing requirement. According to SWART, some potential customers lack knowledge/experience related to online purchasing of package delivery service. Instead, SWART has learned that customers want to work with a person and purchase service directly. Without this option, often the customers opt out of a specific service.
- A visible service presence can positively affect marketing outcomes. According to SWART's experience, people recognize that intercity bus service carries packages. Due to Greyhound's current location in SWART's service area (outside of town near the freeway), customers do not regularly see Greyhound and do not know the company is operating in the area. Therefore, the customers do not pursue package delivery service.

Operations

New services often require time to grow and attract customers. Additionally, new service requires insurance to operate. Operations lesson include:

- Due to the uncommon nature of package delivery service, from the perspective of traditional transit-focused insurers, insurance coverage for this type of service should be identified ahead of other operational variables.
- The pilot period was not long enough to allow the new package delivery service to become established and to attract customers. The outcomes are likely to be different

given additional time. For example, SWART has learned from prior experience that new service in that area can take one to two years to become established.

STRENGTHS, CHALLENGES, OPPORTUNITIES, AND THREATS ANALYSIS

Analyzing the SCOT associated with an undertaking provides a quick understanding of the project's successes and areas of needed improvement. SCOT outcomes present factors that are internal to a project or organization as strengths and challenges. Internal factors may include human and physical resources, budget, practices, and/or previous experience. External factors are labeled as opportunities and threats and may include elements out of direct control, market conditions, demographics, funding, environment, and/or legislation/policy. Categorizing factors as internal and external helps to direct the analysis (e.g., "Is this positive outcome a result of internal or external forces?") and allows strategic use of the findings (e.g., "In the future, this project needs to hire staff with more directly related skills").

Table 15 documents the factors identified as either strengths, challenges, opportunities, or threats, and Figure 23 displays the balance of strengths and opportunities compared to challenges and threats. Strengths and opportunities, together, represent positive contributions or outcomes. Challenges and threats represent future considerations.

Table 15. SCOT Analysis – Pilot Package Delivery Service.

		Internal			
Positive Contributions/Outcomes	<p><u>S</u>trengths</p> <p>Low cost of entry</p> <ul style="list-style-type: none"> • Service uses existing transit vehicles, drivers, and dispatchers. • Technology requirements are limited to desktop computers and, optionally, tablets. <p>Service diversity</p> <ul style="list-style-type: none"> • Package delivery service provides customers with additional connections to their home regions, the state, and nation. • Transit agencies gain experience operating innovative service and thinking outside the box, which could contribute to future transit service innovation. 	<p><u>C</u>hallenges</p> <p>Low demand for service</p> <ul style="list-style-type: none"> • During the performance period, the pilots did not receive requests for service. Without demand, the service cannot be successful. <p>Insurance requirements</p> <ul style="list-style-type: none"> • Liability insurance that covers package delivery activities is required for transit agencies to accept the additional risk associated with a new service. During the performance period, the transit agencies were unable to obtain adequate insurance. 			Future Considerations
	<p><u>O</u>pportunities</p> <p>Economic development</p> <ul style="list-style-type: none"> • Package service has the potential to facilitate low-cost shipping for local businesses and generate demand for secondary service-sector businesses such as couriers. <p>Buy-in from TxDOT and stakeholders</p> <ul style="list-style-type: none"> • TxDOT and stakeholders throughout Texas signaled support for this type of service during workshops and through the project period. 	<p><u>T</u>hreats</p> <p>Appearance of limited profitability</p> <ul style="list-style-type: none"> • Because the pilots did not receive service requests, it could appear as though the service concept may not be profitable. Given a longer performance period, it is likely that demand and profitability would increase. 			
		External			

Strengths & Opportunities

Challenges & Threats

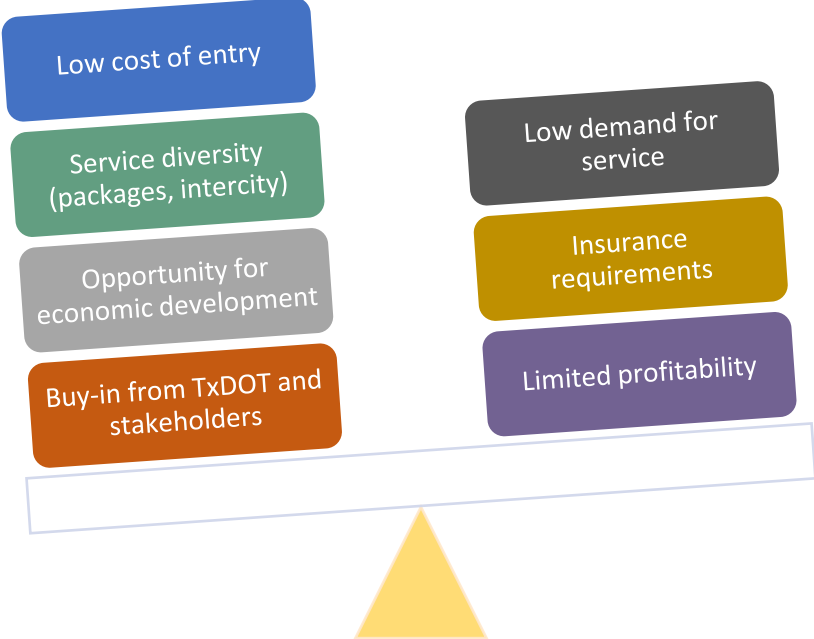


Figure 23. Balance of SCOT Findings.

GUIDEBOOK

This research effort resulted in a guidebook designed to inform rural transit operators of how to implement a package delivery service using information and input gathered from the state-of-the-practice scan, the fact-finding questionnaire, and stakeholder workshops. The guidebook summarizes the fiscal, coordination, and transportation impacts of rural transit package delivery service and provides elements for consideration in developing and implementing package delivery service using rural transit services.

The guidebook includes the following sections, outlined in more detail below:

- Review of the state of the practice.
- Opportunities for services and markets.
- Challenges associated with service provision.
- Potential service models and example service pricing.
- Documentation of pilot package delivery service outcomes and lessons learned.
- Appendices.

The guidebook provides public transit agencies in rural Texas communities with the information necessary to implement a package delivery service in coordination with a private package delivery partner. The following section briefly describes each chapter in the Guidebook. The full guidebook is available here: <http://tti.tamu.edu/documents/0-6891-P3.pdf>.

Chapter 1 introduces the guidebook, describes its purpose, describes the opportunity to provide package delivery via rural transit, and documents findings from previous phases of research. Users learn more about coordinating package delivery service between private package delivery providers and rural public transit operators. This research project will develop an understanding of opportunities to address current gaps in existing package delivery service by coordinating the network of intercity bus carriers and rural transit agencies in Texas.

Chapter 2 reviews the current package delivery industry and describes the needs that rural transit agencies might be able to fill by providing service. This chapter reviews the state of the practice of package delivery, including the challenges associated with package delivery in rural areas and the increased costs to deliver packages, and describes existing examples of rural package delivery partnerships.

Chapter 3 outlines the opportunities for service provision in more detail and highlights specific market segments for rural transit agencies to pursue. This chapter describes the impact the growing e-commerce industry has on package volume, service span of rural transit agency, community connections needed for a successful package delivery program, and potential markets for rural transit package delivery services.

Chapter 4 documents the challenges that may arise when implementing rural transit package delivery services. This chapter describes the challenges faced by rural transit agencies that provide or facilitate package delivery service. These agencies may be challenged by regulations, operational requirements, fiscal constraints, public and agency perception, marketing, transit service commitments, and service area size. In Texas, the size of rural transit agencies range

from compact areas like El Paso County and South Padre Island to the expansive area covered by West Texas Opportunities and Brazos Transit District. Rural transit agencies operate in all counties with the exception of Newton and Chambers Counties in southeast Texas.

Chapter 5 provides examples of possible service models and documents current package delivery pricing models used by other entities. This chapter discusses the potential service models that a transit agency may adopt to provide package delivery services and presents example pricing for package delivery services.

Chapter 6 documents the outcomes and lessons learned generated by two pilot package delivery services implemented using guidance from previous chapters.

PROJECT SUMMARY

Texas' network of rural transit agencies and intercity bus carriers may effectively bridge the last-mile gap in package shipping from the freight drop point to the final destination by providing last-mile package delivery services in exchange for a service fee. This research project investigated current gaps in existing package delivery service through several tasks over the course of two years.

Researchers established a baseline understanding of package delivery services in the United States and provided a better understanding of the opportunity for rural transit agencies to participate in freight delivery as a last-mile solution through a scan of the historic and current state of the practice. Information gathered from stakeholders through a fact-finding questionnaire revealed the motivating factors, keys to successful delivery programs, and the perceived benefits and challenges associated with such programs. Researchers facilitated a series of stakeholder workshops to capture rural transit agency and private intercity bus carrier perspectives on using public transit to facilitate last-mile package delivery in rural areas. The research resulted in a guidebook to aid TxDOT and its partners and stakeholders in how to best identify and implement these mobility programs.

There is not a one-size-fits-all way to implement package delivery in rural areas. The type of package delivery service (direct to the door, central pickup locations, pass-through packages, etc.) is dependent upon local/regional markets and the size/capacity of the local partner. The diversity of potential markets is substantial.

To implement last-mile package delivery service via rural transit, transit agencies should implement goals, objectives, and performance measures to guide decisions. After establishing expectations, a transit agency should identify a private partner, establish a formal agreement to coordinate service, and ensure the agency is protected from liability. After implementing a service agreement, transit agencies should train staff in the new service procedures, identify space to store/secure packages, and implement a process for scheduling package service.

When transit agencies implement last-mile package delivery service in partnership with private package delivery companies the transit agencies have the chance to increase revenues while providing additional services for the local community. In the same agreements, private package delivery partners receive increased exposure in new/underserved markets and have the opportunity to increase package delivery revenue. If such partnerships are between a rural transit agency and an intercity bus operator that provides package delivery service, both partners have the opportunity to increase ridership by offering transfers for passenger service customers.

Transit agencies should also consider the opportunities and challenges that exist when implementing a package delivery service. For example, the low cost of entry with a private package carrier, the service diversity potential, the opportunity for economic development and potential buy-in from stakeholders present transit agencies with many potential strengths and opportunities when adding a package delivery program to their existing service. However, possible low demand for service, insurance requirements, and potentially limited profitability may pose challenges to transit agencies.

Although package delivery offers the potential for additional revenue for rural transit agencies, it is a secondary benefit. Package delivery can offer rural transit agencies the opportunity to provide an additional service to their customers beyond the agency’s service area and improve rural residents’ accessibility to goods and services. It can also provide additional service points for customers to access private carriers. Support from state and federal agencies is key to ensuring successful programs. Funding partners (FTA, TxDOT, MPOs, and others) may need to develop an understanding of this concept to ensure that such programs are executed in the same way throughout Texas.

Based on the research outcomes and challenges associated with the pilot package delivery service, researchers developed a series of potential future research and technical assistance opportunities. Table 16 presents these potential opportunities.

Table 16. Future Opportunities.

Market Analysis and Feasibility	Promote in-depth market research in areas throughout Texas to document potential for transit-based package delivery service and coordination between transit agencies and intercity bus providers.
Document Insurance Availability, Requirements, and Risk Profiles	Review the options to insure transit-based package delivery service, the requirements set forth by insurers and legislation, and produce risk profiles that identify the perceived risk of different example service types.
Technical Assistance for an Alternative Service Working Group	Coordinate and facilitate a working group to enable information sharing between transit agencies in Texas that are implementing alternative service types (including but not limited to package delivery).

APPENDIX A. RURAL TRANSIT DISTRICT POLL

Appendix A contains the questions used in the rural transit district poll.

Poll—Transit Package/Freight Delivery for Match \$s

Thank you for taking 2–4 minutes out of your day to take our poll!

Please note that Question 1 is required, all others are optional.

Have a question?

Contact Jonathan Brooks at Texas A&M Transportation Institute at j-brooks@tti.tamu.edu or (713) 613-9206.

[All respondents]

1) **Does [Agency] have any experience with delivery services, such as meals-on-wheels, package delivery, freight haul (past or present)? ***

Yes

No

Unsure

[Hidden unless #1 “yes”]

2) **Check which types of delivery services [Agency] is involved in, or was in the past?**

Select all that apply.

Meals-on-wheels

Package delivery

Freight haul

Other (please describe): _____

[Hidden unless #2 “package delivery” or “freight haul”]

3) **Please briefly describe the nature of [Agency]'s involvement in package delivery/freight haul:**

[Hidden unless #2 “package delivery” or “freight haul”]

4) **What motivated [Agency] to get involved in package delivery/freight haul?**

[Hidden unless #2 “package delivery” or “freight haul” or “meals-on-wheels”]

5) **About how much revenue do the following generate for [Agency] each year, if applicable?**

Meals-on-wheels: _____

Package delivery: _____

Freight haul: _____

[Hidden unless #2 “package delivery” or “freight haul”]

6) **In [Agency]'s experience, what are keys to success for package delivery/freight haul coordination?**

[Hidden unless #1 “no” or “unsure”]

7) **Has [Agency] ever considered, or been approached about, generating local match revenue by delivering packages or freight?**

- Yes
- No
- Unsure

[Hidden unless #1 “no” or “unsure” and #7 “yes”]

8) **Any particular reason(s) the idea/conversation did not result in [Agency] participating the delivery service?**

[Hidden unless #1 “no” or “unsure”]

Consider the idea for a moment: imagine [Agency] coordinates package/freight delivery and passenger trips/routes remain at their existing high-level of customer service.

9) **What minimum level of revenue would make the endeavor interesting and worthwhile to [Agency]?**

- About \$5,000 each year
- About \$10,000 each year
- About \$25,000 each year
- About \$50,000 or more each year

[All respondents]

10) We will hold four workshops around Texas later this spring. Workshops will be about package delivery partnerships between private companies and rural transit districts.

Is [Agency] interested in participating?

- Yes
- No
- Unsure

[All respondents]

11) **Please share any final insight or comments about rural transit involvement in package/freight delivery:**

Thank You!

Thank you for completing the poll on behalf of [Agency]. Findings will be documented in a technical memo and shared during the workshops later this spring.

APPENDIX B. SUPPLEMENTAL MATERIALS

Appendix B contains supplemental information provided at each workshop, the presentation delivered at the workshops, the SCOT analysis worksheet, and the information form that agencies were asked to complete if interested in participating in the pilot program.

WORKSHOP SUPPORTING INFORMATION

Workshop facilitators provided participants with supporting information on FTA programs, rules, and reporting requirements; intercity bus package express; rural transit; and rural transit in Texas. The following sections describe the information presented.

FTA Programs, Rules, and Reporting Requirements

TxDOT is the authorized agency for administering assistance through Title 49 USC Section 5311 other than urbanized area transit funding programs. FTA is responsible for national implementation of these funding programs and provides program guidance in the circulars, which describe the intent of the programs and explain funding requirements.

FTA defines the Section 5311 program goals in Circular 9040.1G to support public transportation in rural areas with populations less than 50,000, where many residents often rely on public transit to reach their destinations (6I). Title 49 USC Section 5311(f) requires the state to spend not less than 15 percent of the annual 5311 funding to develop and support intercity bus transportation, unless the governor certifies to the U.S. Secretary of Transportation that the intercity bus service needs of the state are being met.

Section 5311(f) Intercity Bus Program

Rural transit agencies and intercity bus carriers may have opportunities to coordinate service and leverage funding through the Section 5311(f) Intercity Bus Program. Section 5311(f) Intercity Bus Program supports the connection between rural areas and larger regional or national systems of intercity bus service. TxDOT sets aside 15 percent of its annual Section 5311 program funding for intercity bus purposes. The Section 5311(f) intercity bus program goals include the following (6I):

- Implement meaningful scheduled transport connections between rural and urban areas with the national intercity transportation network.
- Support operating services to meet the intercity travel needs of residents in rural and small urban areas.
- Sustain the infrastructure of the state's intercity bus network through capital investments in facilities, vehicles, equipment, planning, and marketing.

Intercity Bus Definition

Connection to the national network of intercity bus service is an important goal of Section 5311(f), and services funded must make meaningful connections wherever feasible. Intercity bus projects may include package express service, if it is incidental to passenger transportation. The definition of intercity bus does not include commuter service (service designed primarily to

provide daily work trips within the local commuting area). Commuter service is excluded because it is considered a local public transportation service, eligible for assistance under Section 5311 but not counting toward the required percentage for Section 5311(f). Intercity service is not limited by the size of the vehicle used or by the identity of the carrier. Service that provides extensive circulation within a region is not considered intercity service. Similarly, service that only incidentally stops at an intercity bus facility among other destinations within the city at either end of a route that covers a long distance, without regard to scheduled connections, is eligible for Section 5311 assistance as public transportation but is not an intercity feeder service.

Intercity bus service can be defined as “regularly scheduled bus service for the general public that operates with limited stops over fixed routes connecting two or more urban areas not in close proximity, that has the capacity for transporting baggage carried by passengers, and that makes meaningful connections with scheduled intercity bus service to more distant points, if such service is available.” See FTA Circular 9040.1F for more information. The key components of intercity bus include scheduled general public bus service that:

- Operates with limited stops over fixed routes connecting two or more urban areas not in close proximity.
- Has the capacity to carry passenger baggage.
- Makes meaningful connections with scheduled intercity bus service to points outside the service area.

Feeder service to intercity bus is eligible; however, commuter service is excluded.

Participation of Private Companies Encouraged

FTA encourages the participation of private companies that provide public transportation to the maximum extent feasible in this and other FTA programs. Among the various types of projects in which private intercity bus operators may wish to participate are improvements to existing intercity terminal facilities for rural passengers; modifications to transit facilities to facilitate shared use by intercity bus, intercity rail, and rural transit operators; operating assistance to support specific intercity route segments; and applications of intelligent transportation system technology for coordinated information and scheduling.

In-Kind Match Opportunity

Section 5311(g)(3)(D) notes that in the case of an intercity bus project that includes both feeder service and an unsubsidized segment of intercity bus service to which the feeder service connects, the local match “may be derived from the costs of a private operator for the unsubsidized segment of intercity bus service as an in-kind match for the operating costs of connecting rural intercity bus feeder service funded under 5311(f).” The unsubsidized private operator costs can be used as the local match only “if the private operator agrees in writing to the use of the costs of the private operator for the unsubsidized segment of intercity bus service as an in-kind match.”

FTA 5010.D Grant Management: Incidental Use and Joint Development

The purpose of Section 5311 assistance is the provision of public transportation services, and FTA encourages maximum feasible coordination with other rural transportation services. FTA policy and the Federal Interagency Coordinating Council on Access and Mobility policy on vehicle resource sharing allow vehicles to be used for purposes other than those specified in the original award on an incidental basis.

A rural transit provider may use a Section 5311 vehicle for non-passenger transportation on an occasional or regular basis, such as package delivery, if this incidental use does not result in a reduction of service quality or availability of public transportation service. The incidental use policy does not preclude the recipient's use of Section 5311 assistance to support the transportation of passengers by a private provider that is not primarily engaged in passenger transportation. For example, a recipient may use Section 5311 funds to support a contract mail carrier that incidentally provides intercity passenger transportation if the carrier has appropriate regulatory authority to carry passengers. Section 5311 funds may only be used to subsidize the passenger transportation services of the mail carrier.

A rural transit provider may design its Section 5311 funded services to maximize use by members of the general public who are transportation disadvantaged. Transportation-disadvantaged people include seniors, people with disabilities, and low-income individuals. Transit service providers receiving assistance under Section 5310 or Section 5311 may coordinate and assist in providing meal delivery service for homebound people on a regular basis if the meal delivery services do not conflict with the provision of transit services or result in a reduction of service to transit passengers. FTA expects that the nutrition program will pay the operating costs attributable to meal delivery. Section 5311 capital assistance may not be used to purchase vehicles used solely for meal delivery or to purchase specialized equipment such as racks or heating or refrigeration units related to meal delivery.

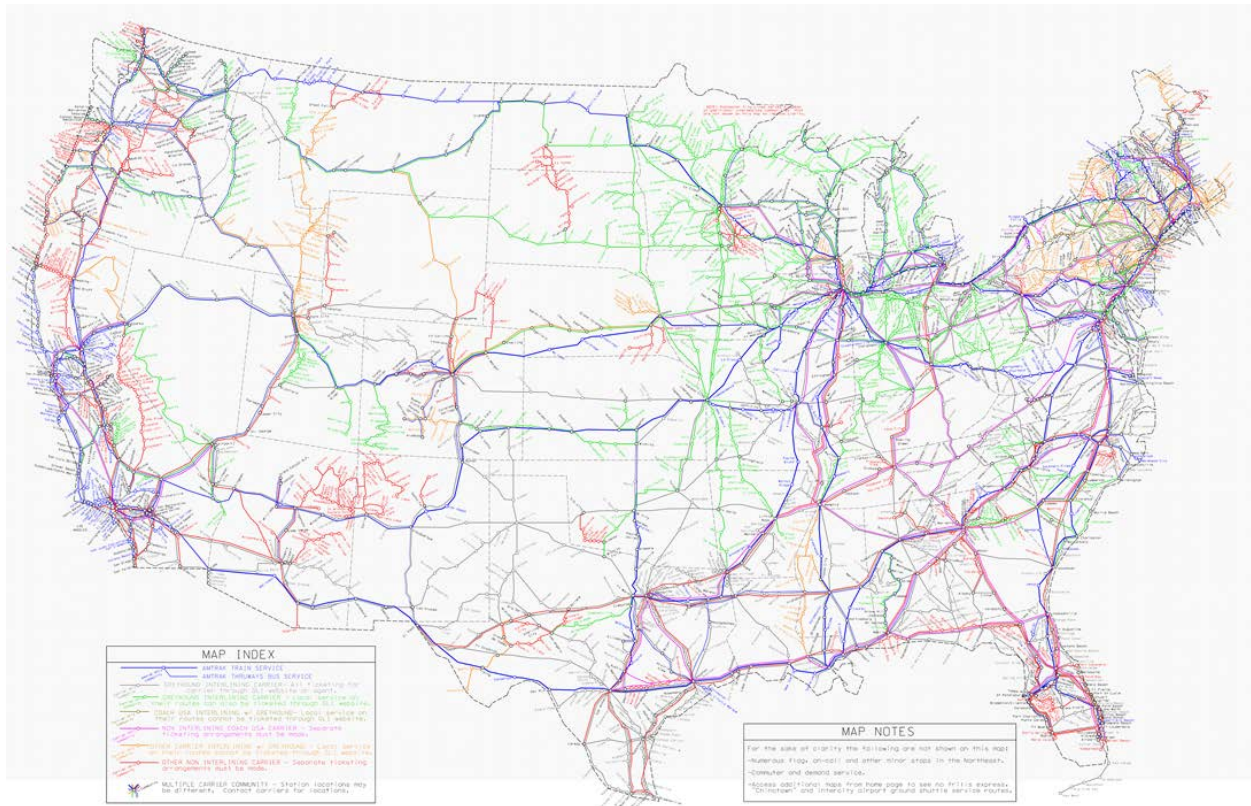
FTA National Transit Database

Congress established the NTD to be the nation's primary source for information and statistics on the transit systems of the United States. Statute requires that recipients or beneficiaries of grants from FTA under the Urbanized Area Formula Program (Section 5307) or Other Than Urbanized Area (Rural) Formula Program (Section 5311) submit data to the NTD. Each year, NTD performance data are used to apportion over \$5 billion of FTA funds to transit agencies in urbanized areas. FTA submits annual NTD reports to Congress summarizing transit service and safety data.

Revenues collected from package delivery are considered "other transportation revenue" and are defined as revenues from non-public transportation revenue. Reporters do not report non-operating data (hours, miles, passengers related to non-public transportation activities), but do report operating and expense data when the vehicle is in public transportation revenue service. Revenue service is when providing public transportation and is available to carry passengers. Packages cannot be counted as a passenger trip.

Intercity Bus Package Express Overview

Since the 1940s, package express has been an integral part of intercity bus service. Intercity bus carriers could guarantee same-day service to many locations due to the frequency of routes. Today, although there are fewer routes, the system still exists. Intercity bus carriers added 100 new routes in 2014 with some funding from the 5311(f) Intercity Bus Program. This expansion led to a 2.1 percent increase in daily schedule operation. This service increase helped serve rural areas and increased the availability of routes for package delivery in more places in the United States. Figure 24 illustrates the intercity bus and rail network in the United States.



Source: (62)

Figure 24. Bus and Rail Network in the United States.

New technology for package delivery on intercity bus carriers is expanding. Motorcoaches are tracked by GPS, and bus-side scanning is becoming more common. Scanning and tracking packages at bus stations is also available. Software linking each piece and partner of the package delivery process is available and widely used. Often, this software is provided to partner agencies through NBTA and interline agreements. These interline agreements allow a passenger to ride multiple bus lines but only purchase one ticket. The same can be applied to package delivery when proper partnerships are in place.

Rural Transit Overview

Rural public transportation in Texas is provided by RTDs created according to Texas Transportation Code Chapter 458. An RTD is a subdivision of the state that provides and

coordinates rural public transportation in its territory. The earliest RTDs began operations in 1980. As Figure 25 illustrates, in April 2016, there were 37 RTDs.

Texas is the largest federally funded rural transit program in the country. Texas collaborates with 37 RTDs to provide an integrated, seamless network of critical mobility services supported with essential fleet, operating, maintenance, and passenger facility investments.

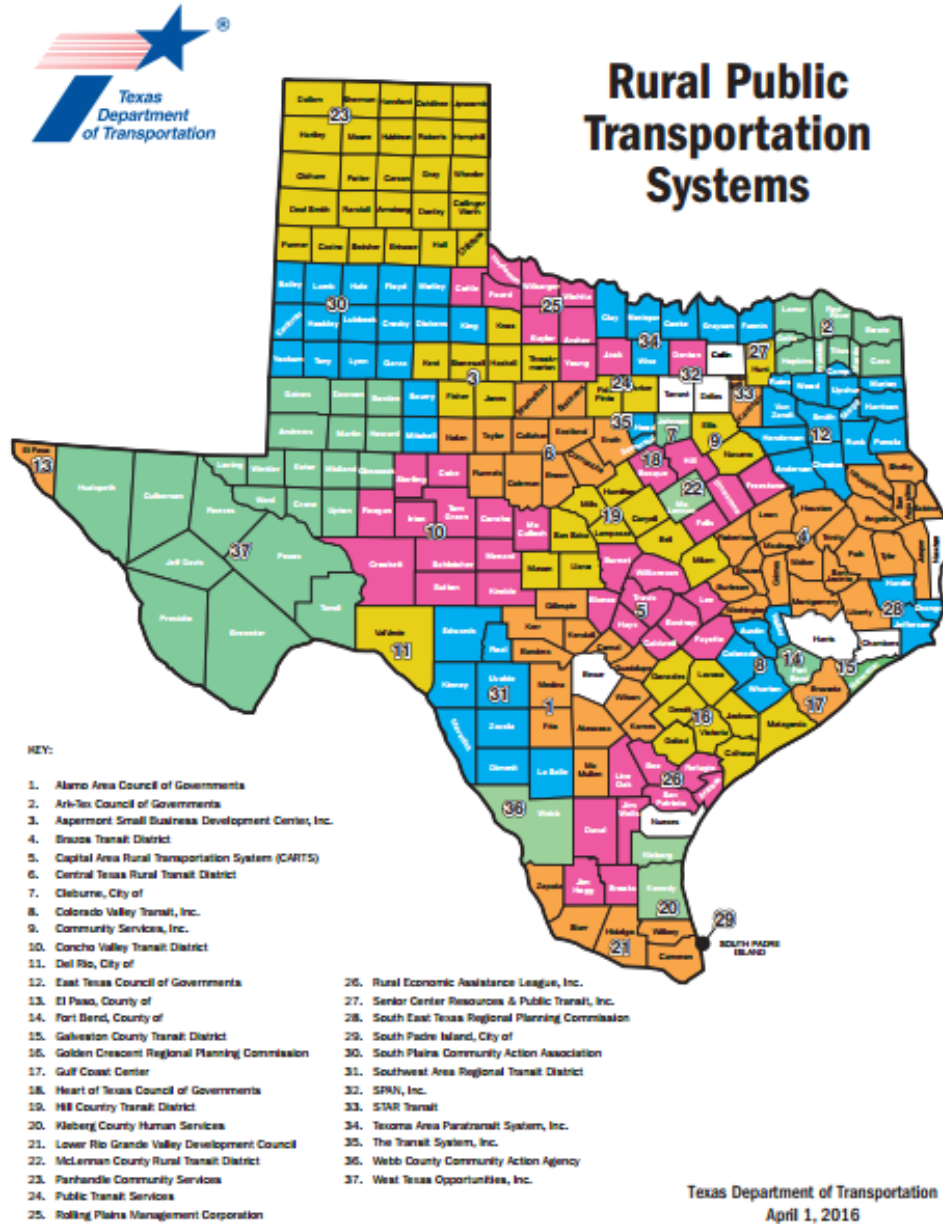


Figure 25. Map of RTDs in Texas.

Rural Texas

Texas has the largest rural population in the United States:

- 5,766,741 in 2000.
- 6,197,604 in 2010.

Texas's rural population increased 7.5 percent from 2000 to 2010. This population growth takes into account that urbanized land area increased 32 percent and urbanized population increased 26 percent. The average population density in RTDs was 24 persons per square mile in 2010—indicating very low-density, dispersed populations.

Rural transit in Texas will become even more important by 2035, according to demographic trends. The State Demographer's Office generated projections that indicate the following among statewide trends:

- Aging. As the Baby Boomers continue aging and longevity increases, the percentage of the population that is age 65 or over is expected to grow nearly 300 percent over the next 30 years. This growth will likely also lead to a large increase in the numbers of people with physical or cognitive conditions that preclude them from driving.
- Rural retirement. Projections indicate that as people retire, they are expected to leave the large urban centers and settle in the rural areas of the state.
- Rural population and density. Although the total rural population in Texas is increasing because counties near metropolitan areas and along the border are growing rapidly, the percentage of the state's population residing in rural areas is expected to decrease over time. In counties in West Texas, the Panhandle, and some counties south of San Antonio, population is declining, and migration of seniors is not expected to increase the density of population in rural areas.

Texas Rural Transit

RTDs operate various transportation services. Detailed profiles of Texas's transit districts can be found at <http://tti.tamu.edu/group/transit-mobility/resources/profiles/>. Public transportation agencies have an obligation to coordinate services with the development of regional service plans. Texas regional service plans can be found at the Regional Service Planning website: www.regionalserviceplanning.org.

In 2015, RTDs in Texas spent \$108 million to provide 36.4 million vehicle miles of service using a fleet of 1,800 vehicles to carry 6.1 million passengers in rural service. This vast, coordinated infrastructure of service and facilities provides a basic mobility network that supports and creates ladders of opportunity for many diverse trip purposes: 23 percent travel for work, 12 percent travel for education/training, 24 percent travel for shopping/personal business, 36 percent travel for health care, and 5 percent travel for other purposes.

Funding

RTDs receive federal Section 5311 non-urbanized area (rural) transit program formula funding for support of public transportation in rural areas with a population of less than 50,000. In addition to federal funding, RTDs receive state and local funds for rural transit including contract funds and county and municipal government funds. In Texas, the state distributes Section 5311 funds in the following manner and order:

- Intercity bus allocation—unless the intercity bus service needs are being adequately met, TxDOT will allocate not less than 15 percent of the annual Section 5311 federal apportionment for the development and support of intercity bus transportation.
- Administration—TxDOT may use up to 15 percent of the annual federal apportionment to defray expenses incurred for administration.
- Needs and performance formula allocation (Texas Transit Funding Formula)—an amount not to exceed \$20,104,352 after administration and intercity bus amounts are distributed is allocated based on needs and performance.
- Discretionary allocation—if the amount of the Section 5311 federal apportionments exceeds the \$20,104,352 maximum amount, a part of that excess not to exceed 10 percent will be available to the commission for award at any time during the fiscal year on a pro rata basis, competitively, or a combination of both. Consideration for the award of these additional discretionary funds may include, but is not limited to, coordination and technical support activities, compensation for unforeseen funding anomalies, assistance with eliminating waste and ensuring efficiency, maximum coverage in the provision of public transportation services, adjustments for reduction in purchasing power, and reductions in air pollution.
- Vehicle revenue mile formula allocation—any amount of the annual Section 5311 federal apportionment that is not otherwise allocated will be allocated to non-urbanized areas based on the proportion of vehicle revenue miles for that non-urbanized area to the total vehicle revenue miles for all non-urbanized areas.
- Adjustments to allocation—adjustments are determined in the case of a change due to a transit district's service area or declaration of a previously designated urbanized area as non-urbanized.
- Application and contract—new subrecipients may receive funds by completing and complying with all application requirements, rules, and regulations applicable to the Section 5311 program.
- Each state must spend no less than 15 percent of its apportionment for the development and support of intercity bus transportation, unless the state certifies, after consultation with affected intercity bus service providers, that the intercity bus service needs of the state are being adequately met. FTA also encourages consultation with other stakeholders, such as communities affected by the loss of intercity service.

A state may use not more than 15 percent of its apportioned Section 5311 funds, including funds apportioned under Section 5340 but not the Rural Transit Assistance Program allocation, to administer the Section 5311 program and to provide technical assistance to subrecipients. The federal share for capital assistance is 80 percent and the federal share for operating assistance is 50 percent of net operating expenses. Net operating expenses are those expenses

that remain after a transit provider subtracts operating revenues from eligible operating expenses. States may further define what constitutes operating revenues, but at a minimum, operating revenues must include farebox revenues. Some projects—to meet the requirements of the Americans with Disabilities Act, the Clean Air Act, or bicycle access projects—may be funded at 90 percent federal contribution. State or local funding sources may provide the local share.

Transit Service

RTDs typically operate majority demand-response (DR) service and some fixed-route (FR) service depending on transportation markets. DR services operate door-to-door service. FR services run along a pre-established route and stop at pre-established stops pursuant to a published schedule. In rural settings, these fixed-route services are often commuter or express services and may require that customers drive/ride to a fixed stop each morning to catch a non-stop ride to their work location. In some cases, drivers are allowed to deviate from the route slightly to pick up or drop off passengers, a practice often termed flex routing.

Along with diversity of service type, rural districts vary significantly in other respects. The geographic extent of districts ranges from compact areas like El Paso County and South Padre Island to the expansive area covered by West Texas Opportunities to the west and Brazos Transit District to the east. RTDs operate in all counties with the exception of Newton and Chambers Counties in southeast Texas (see Figure 25).

A number of Texas RTDs connect with intercity bus carriers. Texas RTDs that have interlining agreements with intercity bus carriers include CARTS, Texarkana Council of Governments, The Hop (Killeen/ Temple area), and SWART. Many intercity bus companies do not operate routes through the most rural areas of Texas. The connections that RTDs provide will become even more critical for providing access to rural communities.

Vehicle Types

The majority of transit vehicles that serve rural areas can be classified as minibuses. Texas transit agencies that receive both rural transit funding and urban transit funding operate a mix of rural and urban transit service with about 1200 vehicles in 2015. The fleet mix of the rural/urban transit districts that receive rural and urban transit funding includes the following:

- 61 percent of vehicles are classified as minibuses.
- 21 percent are standard buses.
- 12 percent are sedans/minivans.
- 5 percent are 15-passenger vans.
- 1 percent are specialty vehicles such as trolleys (see Figure 26).

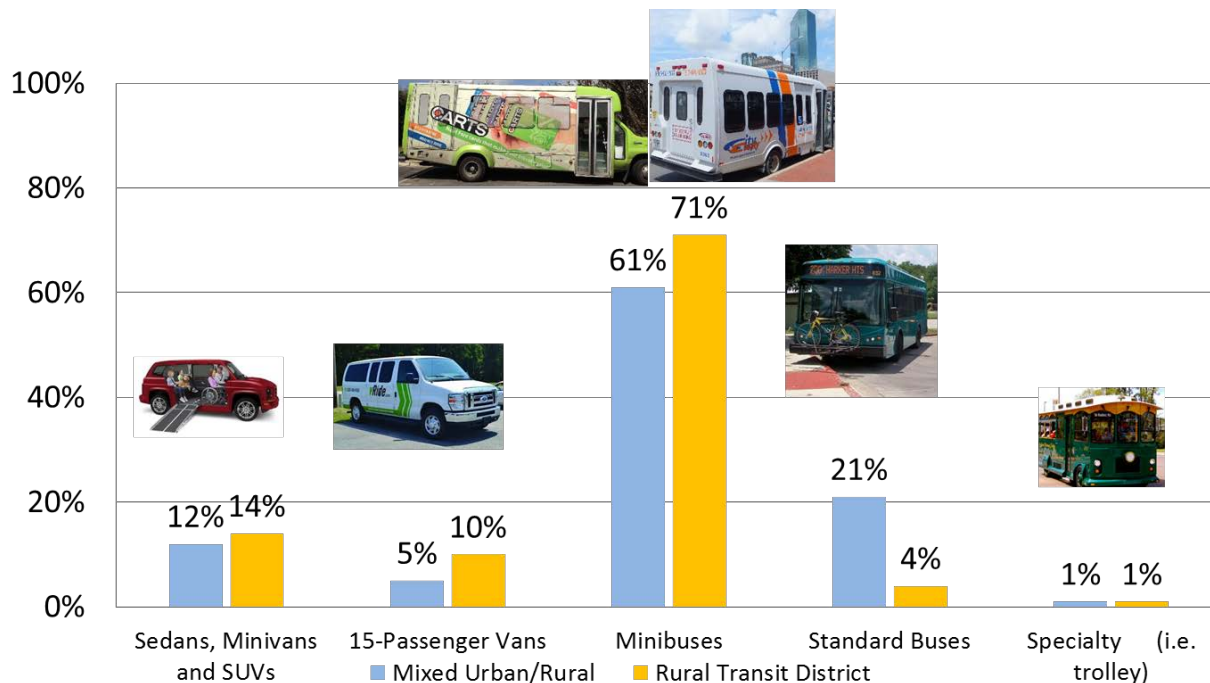


Figure 26. Rural Transit Vehicle Types.

The following fleet type descriptions are provided by fleet category and are consistent with the NTD descriptions:

- Sedan, minivans, and sports utility vehicles (SUVs):
 - An **automobile** is a passenger car up to and including station wagons in size.
 - Typical **minivans** are Dodge Caravans or Honda Odysseys. A minivan is a light-duty vehicle having a typical seating capacity of up to seven passengers plus a driver. A minivan is smaller, lower, and more streamlined than a full-sized van, but it is typically taller and has a higher floor than a passenger car. Minivans normally cannot accommodate standing passengers.
 - An **SUV** is a high-performance four-wheel drive car built on a truck chassis. It is a passenger vehicle that combines the towing capacity of a pickup truck with the passenger-carrying space of a minivan or station wagon. Most SUVs are designed with a roughly square cross-section, an engine compartment, a combined passenger and cargo compartment, and no dedicated trunk. Most mid-size and full-size SUVs have three rows of seats with a cargo area directly behind the last row of seats. Compact SUVs and mini SUVs may have five or fewer seats.
- Passenger vans—Typical **vans** are Ford E-Series or Dodge Ram vans. A van is an enclosed vehicle having a typical seating capacity of eight to 18 passengers and a driver. A van is typically taller and with a higher floor than a passenger car, such as a hatchback or station wagon. Vans normally cannot accommodate standing passengers.
- Minibuses—A cutaway transit vehicle is built on a van or truck chassis by a second stage manufacturer. The chassis is purchased by the body builder, a framework is built for the body, and then the body is finished for a complete vehicle. For example, a truck chassis may be used as the base for a small transit bus.

- Standard buses:
 - A **bus** is a rubber-tired passenger vehicle powered by diesel, gasoline, battery or alternative fuel engines contained within the vehicle. Vehicles in this category do not include school buses or cutaways.
 - A **school bus** is a passenger vehicle that is designed to carry more than 10 passengers in addition to the driver. School buses are used primarily for transporting pre-primary, primary, or secondary school students either to school from home or from school to home.
- Specialty vehicles:
 - **Ferryboats** are vessels for carrying passengers or vehicles over a body of water. The vessels are generally steam- or diesel-powered conventional ferry vessels. They may also be hovercraft, hydrofoil, and other high-speed vessels.
 - **Trolley bus** is an electric rubber-tired passenger vehicle, manually steered. Vehicles are propelled by a motor drawing current through overhead wires via trolleys, from a central power source not onboard the vehicle.
- Fleet types not in rural transit service:
 - An **over-the-road bus** is a bus characterized by an elevated passenger deck located over a baggage compartment.
 - **Articulated buses** are extra-long (54 ft to 60 ft) buses with two connected passenger compartments. The rear body section is connected to the main body by a joint mechanism that allows the vehicles to bend when in operation for sharp turns and curves and yet have a continuous interior.

Span of Service

RTDs’ average span of service is from about 5:30 a.m. to 7:15 p.m. (see Table 17). A little over 50 percent of RTDs operate service on Saturdays, and about 10 to 15 percent operate service on Sundays. For specific RTDs’ hours, see Transit Profiles at <http://tti.tamu.edu/group/transit-mobility/resources/profiles/>.

Table 17. Rural Transit Average Span of Service.

	Mon–Fri, Service Begins	Mon–Fri, Service Ends	% with Saturday Service	% with Sunday Service
Mixed Urban/Rural	5:30 AM	7:23 PM	56%	11%
RTD	5:46 AM	7:05 PM	52%	14%

Of Texas’s 254 counties, only one county (Newton County) does not have rural transit service. A little over 50 percent of rural transit agencies operate service on Saturdays, and about 10 to 15 percent operate on Sundays, on average. For specific rural transit agencies, see Transit Profiles: <http://tti.tamu.edu/group/transit-mobility/resources/profiles/>.

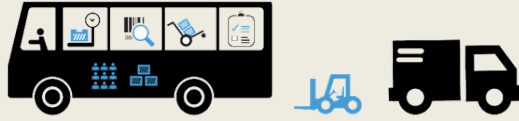
Rural transit agencies serve the general public and provide an important mobility option to transportation-disadvantaged people (such as senior citizens and people with disabilities) via

demand-response or flexible-route services. Transit vehicles visit local residential areas often to transport riders. Transit centers typically have professional staff on duty for transit customer services and have the potential to serve as a package pickup and/or dropoff center if the transit staff receives proper training.

Extending the Reach of Intercity Bus Carrier Package Delivery Services

Intercity bus carriers advertise the ability to transport packages as part of their regularly scheduled passenger services. Often with operations located at intermodal terminals that consist of rural transit providers, the opportunity exists for intercity bus operators to partner with rural providers to deliver packages to their final destination. These final destinations are at commercial businesses and individual customers. The commercial businesses are viewed by intercity bus operators as good customers because they generally ship goods regularly and do not require on-demand delivery services. Largely in relation to individual customers, the growth in e-commerce has expanded the need to offer on-demand delivery services. Texas rural transit districts are partnering with intercity bus operators to offer on-demand deliveries via both transit buses and other agency vehicles, such as maintenance vans.

WORKSHOP PRESENTATION



Last Mile Package Delivery *Stakeholder Workshop*

<<Date>>

<<Location>>



This workshop has been developed by the Texas A&M Transportation Institute (TTI) for the Texas Department of Transportation (TxDOT). The workshop and workshop materials have been developed as part of TxDOT Research Project 0-6891: Using Public Transportation to Facilitate Last Mile Package Delivery.





Agenda

- **Welcome and Introductions**
- **Why are we here?**
 - Background and Purpose
- **Overview**
 - Intercity Bus Package Express Overview
 - Rural Transit Overview
 - Section 5311(f) ICB Program
 - FTA Incidental Use and Reporting Considerations

Break

- **Stakeholder Perspective Brainstorm**
- **SCOT Analysis**

Networking Lunch

- **Facilitated Discussion**
 - Service Opportunities, Demand, Markets, Operation Considerations
- **Results Discussion**
- **Next Steps**



Welcome and Introductions

Texas A&M Transportation Institute:

- *Suzie Edrington*
- *Zachary Elgart*
- *Kristi Miller*

On Your Mark Transportation:

- *Mark Szyperski*



Participants:

- **Name, agency, transit types, fleet, service area, other**





Project Background

- Rural transit links Texas' rural residents with destinations and services
- E-commerce continues to grow and provides rural convenience
- Private sector rural package delivery is costly
high mileage, low frequency
- Rural transit could provide a last mile connection
Package delivery companies → Transit agency → Rural residents



Project Purpose

- Participants will:
 - ✓ Learn about opportunities for coordination
 - ✓ Identify resources for last mile delivery
 - ✓ Identify opportunities for local match
- Researchers will:
 - ✓ Gain insight into opportunities and challenges
 - ✓ Learn about real-world experience
 - ✓ Document best-practices and concerns
(Handbook)





Intercity Bus Package Express Overview



Intercity Bus Package Express - History

- Since the 1940's, package express has been an integral part of intercity bus service
- Considered the "UPS" of its day
- Forget "Guarantee Overnight" when you can "Guarantee Same Day!"





Intercity Bus Package Express - Today

- Fewer routes, but, the system still exists and is in growth mode
- 100 new routes added in 2014
 - 2.1% increase in daily scheduled operation
 - 5311(f) Intercity Bus Program funds assisted in this growth and helped serve rural areas
- New service increases the availability of routes for package express in more parts of the US
- “Same Day Service” still available in many areas

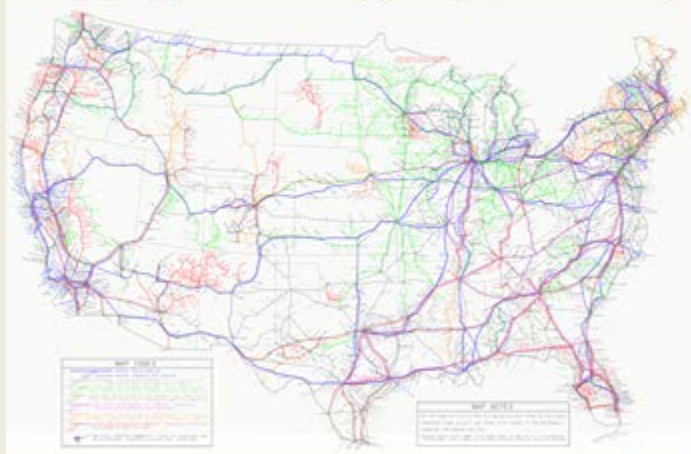


Intercity Bus Package Express - Today





Intercity Bus Package Express - Today



Intercity Bus Package Express - Technology

- Catching up
- Bus-side scanning is becoming more common
- Scanning and tracking packages at bus stations is available
- Motorcoaches are tracked by GPS
- The software to have each piece of the system “talk” to the others is in place





Intercity Bus Package Express - NBTA

- National Bus Traffic Association (NBTA)
- Existed since 1930s
- Allows a passenger to ride multiple bus lines via “interline” agreements
 - A passenger buys a ticket that is accepted on each company included in the interline agreement
- NBTA handles tariff exchange
- Transit systems, especially those that regularly connect with ICB, are welcome and encouraged to join NBTA

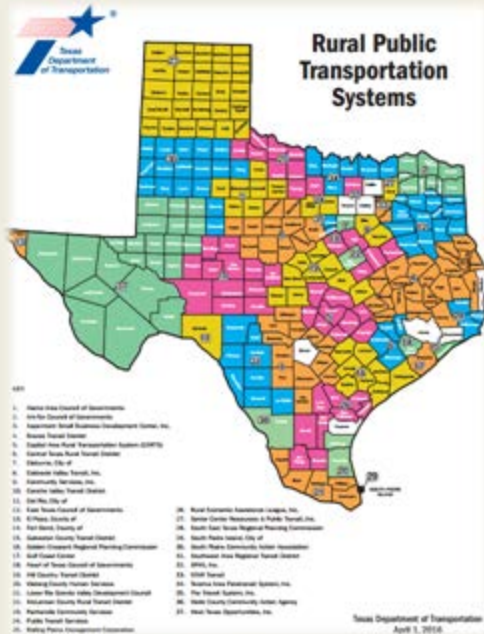


ICB Package Delivery Examples





Rural Public Transit Overview



Fiscal Year 2015

Over 1,800 vehicles

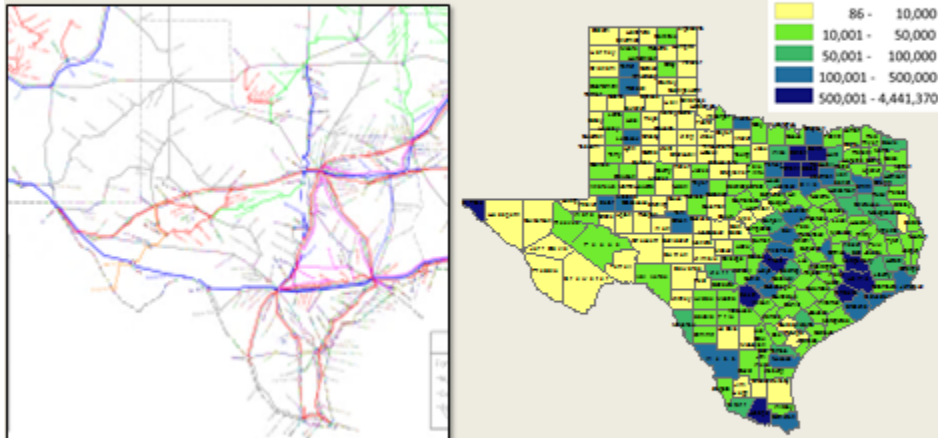
\$108 million expenditures

36.4 million vehicle miles

6.1 million passenger trips



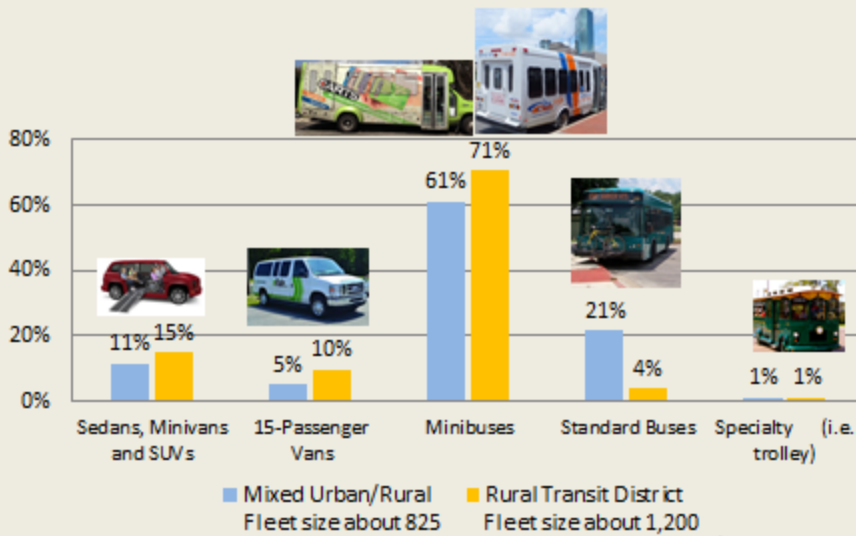
ICB Network & Rural Population



Sources: American InterCity Bus Riders Association and Texas State Data Center



Rural Transit Fleet Mix



Rural Transit Span of Service

	Mon-Fri, Service Begins	Mon-Fri, Service Ends	% with Saturday Service	% with Sunday Service
Mixed Urban/Rural	5:30 AM	7:23 PM	56%	11%
Rural Transit District	5:46 AM	7:05 PM	52%	14%



SECTION 5311(f) INTERCITY BUS PROGRAM



Section 5311(f) ICB Objectives

1. **Support the connection** between rural areas and larger regional or national system of intercity bus service
2. **Support services** to meet the intercity travel needs of residents in rural areas
3. **Support the infrastructure** of the intercity bus network through planning and marketing assistance and capital investment in facilities



FTA Section 5311(f) Intercity Bus

Intercity Bus Definition

- Scheduled general public bus service that operates with limited stops over fixed routes connecting two or more urban areas not in close proximity
- Has the capacity to carry passenger baggage
- **Makes meaningful connections with scheduled ICB** service to points outside the service area
- Feeder service to ICB is eligible, however commuter service is excluded





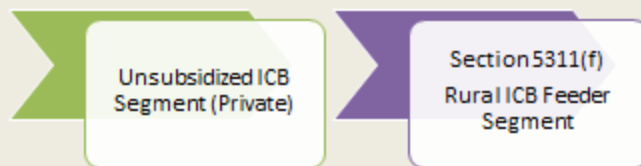
ICB USED AS IN-KIND MATCH FOR SECTION 5311(F)



1

In-Kind Match for Section 5311(f)
FTA Circular 9040.1G VIII

- ICB route that includes **both feeder service segment** and an **unsubsidized segment of ICB**
- Private operator must agree in writing



1

FTA: INCIDENTAL USE



Incidental Use and Joint Development. Policy FTA C 5010.D Grant Management

Incidental Use and Joint Development.

- FTA's policy is to permit grantees maximum flexibility in determining the best and most cost-effective use of FTA-funded property.
- FTA encourages incidental uses and joint development of real property that can raise additional revenues for the transit system or, at a reasonable cost, enhance system ridership.
- FTA approval is required for both joint development and for incidental uses of real property and must be compatible with the original purposes of the grant.



Incidental Use and Joint Development. Requirements FTA C 5010.D Grant Management

- Incidental use will be permitted if:
 - (a) The incidental use does not interfere with the grantee’s project or public transportation operations;
 - (b) The grantee fully recaptures all costs related to the incidental use from the non-transit public entity or private entity, including all applicable excise taxes on fuel for fueling facilities and wear and tear to capital improvements;
 - (c) The grantee uses revenues received from the incidental use for capital and/or operating expenses that were or will be incurred to provide the public transportation; and
 - (d) Private entities pay all applicable excise taxes on fuel.



GeekWire Photo Illustration/Image via Shutterstock.

FTA: REPORTING REQUIREMENTS



National Transit Database and State Transit Reporting

- Report **revenues from “Other Transportation Revenue” that are applied to public transit service** “Other Transportation Revenues” - transit services that are not public transportation [may include school bus service, charter service, and freight service]
- **Do not report operating data (hours, miles passengers) or expense data related to non-public transportation activities.** Report operating and expense data when the vehicle is in revenue service. Revenue service is when providing public transportation and is available to carry passengers.



National Transit Database and State Transit Reporting

- Package Delivery/Meal Delivery Programs (e.g., Meals on Wheels) **cannot conflict with public transit services, nor result in a reduction of service to transit passengers**
- Packages/meals cannot be counted as a passenger trip
- Package delivery must be incidental to providing public transportation services.





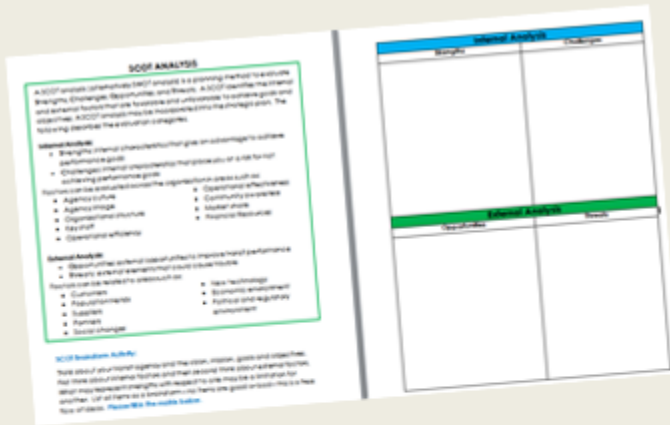
Stakeholder Objective Brainstorm



Stakeholder Perspectives on Objectives

- Private Intercity Bus Carriers
- Public Transit Agencies
- Customers of Package Delivery
- Federal Transit Administration
- TxDOT Public Transportation Division





STRENGTHS, CHALLENGES, OPPORTUNITIES, AND THREATS



37

SCOT - Internal and External Analysis

- **Strengths:** *internal* characteristics that give an advantage to achieve performance goals
- **Challenges:** *internal* characteristics that place you at a risk for not achieving performance goals
- **Opportunities:** *external* opportunities to improve transit performance
- **Threats:** *external* elements that could cause trouble





SCOT Analysis

Strengths

Challenges

Opportunities

Threats

- Consider the discussion we just had
- From your agency/company perspective write down the Strengths, Challenges, Opportunities, and Threats of packaged delivery
- We will review this perspective, and whether it may have changed, later



Facilitated Discussion

- Table facilitators take notes for group discussion after final round
- Participants take notes/compile thoughts in participant notebook
- TTI will compile participant notes for a workshop summary report to distribute to participant





Facilitated Discussion - TOPICS



Service Opportunities

- Last Mile Delivery and Package Drop



Demand

- Revenue Potential, Incentives to Increase Market (Commission), Economic Development



Markets

- Same day delivery
- Parts, food, medical, tools, printed materials, courier



Operations Considerations

- Package Security, Driver Requirements, Technology, Safety



Results Discussion





Next Steps

- **Results from Workshops**
 - TTI will compile findings for summary report
- **Develop handbook**
 - TTI is developing a handbook for transit agencies that wish to conduct package delivery
- **Pilot Program**
 - Using the handbook, TTI will work with a transit agency and an intercity bus/package delivery company to facilitate a pilot last mile package delivery partnership
- **Stakeholder Interest**
 - Are you interested in pilot participation?
 - ***Please complete and submit the form***



Thank you!

For questions or comments, please contact:

Kristi Miller, TTI

K-miller@ttimail.tamu.edu

972-994-2203



SCOT ANALYSIS WORKSHEET



Internal Analysis	
Strengths	Challenges
External Analysis	
Opportunities	Threats

AGENCY INFORMATION FORM



Agency/Company Interest Form

Agency Name: _____

Workshop Participant Name: _____

Is your agency interested in participating in the pilot package delivery service?

Yes!

Why? _____

Who should we contact at your agency to discuss the pilot?

Name: _____

Phone/Email: _____

No.

Why not? _____

Did you find the workshop useful and informative? Why or why not?

Questions, Comments, Additional Feedback?

APPENDIX C. EXAMPLE PACKAGE DELIVERY SERVICE AGREEMENT

Appendix C contains an example package delivery service agreement Greyhound provides to partner agencies.

Greyhound Package Express
Service Center Program



PACKAGE EXPRESS

Standard Operating Procedure

Greyhound has been in business for over 100 years. During that time we have provided package delivery service for large companies such as NCR, Clinique, American Red Cross and many more. With the growing shift to e-commerce, some consumers are seeking additional avenues to ship their packages. This includes the option to conveniently drop-off and pickup their packages locally instead of scheduling a pickup at their residence or business.

To help fill this void, Greyhound Package Express has developed the Service Center Program.

A Greyhound Package Express Service Center is a professionally-staffed location that provides shipping drop-off and pickup services to the general public. In the case of SWART, they will provide counter drop-off and pickup at their Uvalde and Eagle Pass location as well as pickup and delivery service to the customers' address within their service area.

The Greyhound Service Center's will be offered via our web quote capability and by our reseller partner (Dabent Holding / Busfreighter) website as a convenience drop-off location (CDL). Busfreighter has the below language on their website's FAQ's to help the customer know they are using a Service Center location.

What is a Convenience Drop-Off location (CDL)?

A convenience drop-off location (CDL) is separate from the intercity bus network of stations and agencies. CDL's accept shipments Monday through Friday from 9am to 5pm only...Holiday drop-offs are currently not available. The CDL accepts and holds shipments until a Greyhound assigned courier delivers them to the designated Bus Station. Once delivered to the station, Greyhound personnel weigh, measure and process the shipment. Please note that a CDL does not determine shipment suitability in most cases and acceptance by the CDL does not imply or ensure acceptance by Greyhound Package Express. Please email or call us if you have a question regarding item suitability.

Busfreighter or the Greyhound Package Express call center (depending on which took the order) will notify the Service Center location of an impending shipment and monitor until shipment is either picked up by SWART, dropped at or picked up from the Service Center location or delivered to the customer's door. Sample emails are below.

Busfreighter email notification to Service Center:

Hi All,

GPX order # 598834 - 4 pieces at 200 pounds. Estimated dimensions 18 x 18 x 24 (1) and 36 x 18 x 24 (3).

Tomorrow 6/3/2016 - Customer (Mathews Jacob) has selected your location to drop-off this Greyhound Package Express shipment. Customer has selected a drop-off time between 1p.m.-5p.m.

Please email back shipment count once accepted and confirm when shipment has been dropped off at Chicago GPX @ 630 W Harrison, Chicago, IL 60607

Thank you,

*Kenny
Busfreighter.com*

Greyhound Customer Service email notification template to Service Center:

Hello Greyhound Service Center,

GPX order # (insert Order #) - X pieces at XXX pounds. Estimated dimensions (insert in groups and number of each, i.e. 18 x 18 x 24 (1) and 36 x 18 x 24 (3)).

Tomorrow (insert date) - Customer (insert shipper name) has selected your location to drop-off this Greyhound Package Express shipment.

Please email back actual shipment piece count once accepted and confirm via email when the shipment has been tendered to a courier with the courier name as well as the date and time.

If you have any questions please reply to this email or call us at 866-744-7479.

Thank you,

Greyhound Package Express

A special email address has been set up for all notifications and communication. That email address is mbx-gpxservicecenter@greyhound.com.

ORIGIN SHIPMENTS FROM THE CUSTOMERS' ADDRESS

When an order is placed via web quote by a customer for pickup from their address within the SWART service area, Greyhound Package Express' central dispatch center will arrange a time-window for pickup with the customer and then notify SWART's dispatch (contact information below) with specifics. The specifics will include:

- Customer Name
- Customer Contact Information
- Online Order Number
- Pickup Address
- Pickup Date and Time Window
- Number of Pieces
- Estimated Weight & Dimensions of Packages
- Service Level Expectation

The SWART driver should ensure each package is properly labeled with a Greyhound Package Express online label (see below). If not labeled, the driver should contact their dispatch for instructions. (Labels could be added at the dispatch center before transferring to Greyhound Package Express)

NOTE: Should the label not be attached, the Service Center should contact Greyhound Customer Service at 866-744-7479 to obtain labels. An additional fee of \$1.00 for the shipment will be paid for the printing of missing labels.



Also below is a tracking sheet that will be provided to the Service Center to assist.

Service Center Location	Date Shipment Tendered	GPX Online Order #	Expected Piece Count	Actual Piece Count	Date Sent to Greyhound	Driver Name
SWART_Eagle Pass						
SWART_Eagle Pass						
SWART_Eagle Pass						
SWART_Eagle Pass						
SWART_Eagle Pass						

Once the packages are picked up from the customer's location, the driver will use Greyhound's tracking application (ShipTrack) to record the pickup.

SWART will then arrange to drop the package(s) off at either the Greyhound bus station at the STRIPES in Uvalde or Eagle Pass or the Greyhound station in San Antonio (addresses below) depending on schedule and shipment specifics.

- Standard shipments containing three pieces or less should be tendered to the STRIPES locations
- Standard shipments containing more than three pieces should be tendered to the Greyhound Package Express counter in San Antonio, TX.
- If several shipments are collected on the same day, they can be tendered to the Greyhound Package Express counter in San Antonio, TX at the same time. Notification to Greyhound's central dispatch must be made before doing this.
- Priority shipments should be tendered to the STRIPES location for the next available schedule unless SWART has prearranged schedules going to San Antonio that will fulfill the customer's need. (Greyhound Package Express' central dispatch should be called to assist with this decision). Contact information below.

The expectation for standard shipments is they are dropped off at Greyhound within two business days of acceptance from the customer.

At each change in custody of the shipment, tracking events should be captured using Greyhound's tracking application (ShipTrack).

- At drop-off at SWART for holding until sent to Greyhound Package Express
- At drop-off to Greyhound at STRIPES or San Antonio
- At any transfer between SWART drivers

Once a shipment has been tendered to Greyhound, SWART dispatch should notify the Greyhound Package Express via email with the date and time of the drop-off. The email address to notify them is mbx-gpxservicecenter@greyhound.com.

ORIGIN SHIPMENTS DROPPED OFF AT SWART LOCATION

When an order is placed via web quote by a customer for drop-off at a SWART location, Greyhound Package Express or Busfreighter will notify SWART's dispatch (contact information below) with specifics. The specifics will include:

- Customer Name
- Customer Contact Information
- Online Order Number
- Drop-Off Date and Time Window
- Number of Pieces
- Estimated Weight & Dimensions of Packages
- Service Level Expectation

SWART should ensure each package is properly labeled with a Greyhound Package Express online label (see below) upon drop-off. If not labeled, they should contact Greyhound Customer Service at 866-744-7479 to obtain labels. An additional fee of \$1.00 for the shipment will be paid for the printing of missing labels.



Also below is a tracking sheet that will be provided to the Service Center to assist.

Service Center Location	Date Shipment Tendered	GPX Online Order #	Expected Piece Count	Actual Piece Count	Date Sent to Greyhound	Driver Name
SWART_Eagle Pass						
SWART_Eagle Pass						
SWART_Eagle Pass						
SWART_Eagle Pass						
SWART_Eagle Pass						
SWART_Eagle Pass						

Once the packages are dropped off, SWART will use Greyhound's tracking application (ShipTrack) to record the acceptance of the shipment.

SWART will then arrange to drop the package(s) off at either the Greyhound bus station at the STRIPES in Uvalde or Eagle Pass or the Greyhound station in San Antonio (addresses below) depending on schedule and shipment specifics.

- Standard shipments containing three pieces or less should be tendered to the STRIPES locations
- Standard shipments containing more than three pieces should be tendered to the Greyhound Package Express counter in San Antonio, TX.

- If several shipments are collected on the same day, they can be tendered to the Greyhound Package Express counter in San Antonio, TX at the same time. Notification to Greyhound's central dispatch must be made before doing this.
- Priority shipments should be tendered to the STRIPES location for the next available schedule unless SWART has prearranged schedules going to San Antonio that will fulfill the customer's need. (Greyhound Package Express' central dispatch should be called to assist with this decision). Contact information below.

The expectation for standard shipments is they are dropped off at Greyhound within two business days of acceptance from the customer.

At each change in custody of the shipment, tracking events should be captured using Greyhound's tracking application (ShipTrack).

- At drop-off at SWART by the customer
- At drop-off to Greyhound at STRIPES or San Antonio
- At any transfer between SWART drivers

Once a shipment has been tendered to Greyhound, SWART dispatch should notify the Greyhound Package Express via email with the date and time of the drop-off. The email address to notify them is mbx-gpxservicecenter@greyhound.com.

DESTINATION SHIPMENTS TO BE DELIVERED TO THE CUSTOMERS' ADDRESS

All shipments that are scheduled for destination handling at the SWART service centers will be routed to the San Antonio Greyhound location and tendered to SWART from that location. Once the entire shipment is on hand in San Antonio, the Greyhound Package Express central dispatch will work to arrange transfer to SWART as well as arrange any customer contact needed. The expectation is pickups at San Antonio Greyhound will only happen when a drop-off is also being performed.

When an order is transferred to SWART for delivery to a customer (to their address) within the SWART service area, Greyhound Package Express' central dispatch center will arrange a time-window for delivery with the customer and then notify SWART's dispatch (contact information below) with specifics. The specifics will include:

- Customer Name
- Customer Contact Information
- Busbill Number
- Delivery Address
- Delivery Date and Time Window
- Number of Pieces
- Weight & Dimensions of Packages

Each package will now have a busbill (for piece one) and / or a Package ID (piece 2 – 99) attached (see below). The SWART driver should record pickup at San Antonio once they take control of the shipment. Packages may be held at SWART dispatch while waiting for final delivery.



Once the package delivery is arranged, SWART will then arrange to drop-off the package(s).

At each change in custody of the shipment, tracking events should be captured using Greyhound's tracking application (ShipTrack).

- At drop-off at SWART for holding until sent to customer's address
- At drop-off to customer
- At any transfer between SWART drivers

Once a shipment has been delivered, SWART dispatch should notify the Greyhound Package Express via email with the date and time of the delivery. The email address to notify them is mbx-gpxservicecenter@greyhound.com.

DESTINATION SHIPMENTS TO BE PICKED UP BY THE CUSTOMER AT SWART LOCATION

All shipments that are scheduled for destination handling at the SWART service centers will be routed to the San Antonio Greyhound location and tendered to SWART from that location. Once the entire shipment is on hand in San Antonio, the Greyhound Package Express central dispatch will work to arrange transfer to SWART as well as arrange any customer contact needed. The expectation is pickups at San Antonio Greyhound will only happen when a drop-off is also being performed.

When an order is transferred to SWART for pickup at SWART by the customer, Greyhound Package Express central dispatch will notify SWART's dispatch with specifics. The specifics will include:

- Customer Name
- Customer Contact Information
- Busbill Number
- Expected Pickup Date
- Number of Pieces
- Weight & Dimensions of Packages

Each package will now have a busbill (for piece one) and / or a Package ID (piece 2 – 99) attached (see below). The SWART driver should record pickup at San Antonio once they take control of the shipment.



At each change in custody of the shipment, tracking events should be captured using Greyhound's tracking application (ShipTrack).

- At drop-off at SWART for holding until sent to customer's pickup

- At pickup by the customer
- At any transfer between SWART drivers

Once a shipment has been picked up by the customer, SWART dispatch should notify the Greyhound Package Express via email with the date and time of the pickup. The email address to notify them is mbx-gpxservicecenter@greyhound.com.

KEY CONTACT INFORMATION FOR SHIPMENT MANAGEMENT

SWART DISPATCH – UVALDE, TX

830-278-4155

swartuvgh@rideswart.org

SWART DISPATCH – EAGLE PASS, TX

830-757-2892

swartepgh@rideswart.org

Carlos Mallen

Operations Manager

830-757-2892 Ext 3201

830-900-9918 cell

cmallen@paseoswart.org

GREYHOUND – UVALDE, TX (STRIPES)

2815 Hwy 90 West

Uvalde, Texas 78801

Main: [\(830\) 278-3458](tel:8302783458)

Package Express: [\(830\) 278-3458](tel:8302783458)

GREYHOUND – EAGLE PASS, TX (STRIPES)

2093 N Veterans Blvd

Eagle Pass, TX 78852

Main: [\(830\) 773-0941](tel:8307730941)

Package Express: [\(830\) 773-0941](tel:8307730941)

GREYHOUND – SAN ANTONIO, TX

500 N St Marys St

San Antonio, Texas 78205

Main: [\(210\) 270-5868](tel:2102705868)

Package Express: [\(210\) 270-5815](tel:2102705815)

Greyhound Package Express Central Dispatch

greyhound.express@greyhound.com

866-744-7479 (24/7)

Greyhound Package Express Supervisor – San Antonio, TX

Rudy Lerma

Rodolfo.LermaJr@greyhound.com

Office: [\(210\) 270-5815](tel:210.270.5815)

Cell: [\(210\) 248-4529](tel:210.248.4529)

Greyhound Package Express Regional Customer Experience Manager – Central Region

Michael Euins

Michael.euins@greyhound.com

Office: [\(214\) 849-0421](tel:214.849.0421)

Cell: [\(214\) 334-5943](tel:214.334.5943)

Greyhound Package Express Director

Chuck Sweet

charles.sweet@greyhound.com

Office: [\(214\) 849-8640](tel:214.849.8640)

Cell: [\(214\) 893-8526](tel:214.893.8526)

Busfreighter Customer Service

Email: sales@busfreighter.com

Phone: (214) 227.9792

Phone Office Hours:

Monday - Friday: 7:00am - 8:00pm (Central Time Zone)

Saturday: 12:00pm - 5:00pm (Central Time Zone)



APPENDIX D. EXAMPLE TRAINING DOCUMENTS

Appendix D contains example training documents Greyhound provides to partner agencies to use their ShipTrack system.

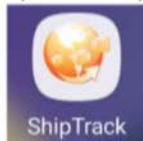
ShipTrack Web-based Interface

Web User Interface Instructions

- ShipTrack has created a portal for viewing, creating, and uploading tracking events via the web. To use it please visit <https://greyhound.shiptrackapp.com>
- This web-based interface will be useful to agents that do not have a Honeywell Mobile Scanner or agents that have a Honeywell Mobile Scanner that is not working properly at the moment.
- You will need a Report Admin login and password. If you do not have one it is very easy to get one. Please email greyhound.xpresstrackCA@greyhound.ca or call 1-800-440-5688. (NOTE: Your mobile device login will not work for the web-based interface)
- NOTE: ALWAYS scan busbills and package IDs when possible. If you do not have a barcode reader, contact the ITS help desk to check availability. (Note: A barcode reader is not a Honeywell Mobile Scanner.)

Barcode Reader	Honeywell Mobile Scanner
	

- When you manually type in busbill numbers there is room for human error.
- When entering numbers manually into the system please make sure you are entering the correct carrier number. (examples below)
- You can also use your smart phone if you want but you don't have to. You can download the



ShipTrack app from your app store. Turn on your GPS so we know what city you are in. The username and password is the same as the username and password for your Honeywell device. If you do not have a username and password you can email greyhound.express@greyhound.com.

Rule 1: For busbill created in TRIPS

These are busbills that start with a 307 or higher or were reprinted from GPX POS via TRIPS. When using the ShipTrack application, if you have to type in the busbill number manually, always type a 0 before the carrier number (i.e. 00013071234567, 00493071234567). See example below. (0 + Carrier Number + Ten Digit busbill number)

STD PFD 21MAR16 12:12P ** LABEL **
Schd: GLI 7326
Pos: 1 of 1 CEMPAIGN, IL
FROM: GETTYSBURG, PA MISS-DRAKONAD
RCV: SERILA HARVEY
CEMPAIGN, IL 61820
Phone: 000-000-0000
Standard
Agency Phone: (217)352-4150 WWW.SHIPGETTYSBURG.COM

GLI 3079509213
Manual Wght: 10.0
Tariff Wght: 10.0
PO/Ref #:

This barcode actually reads 00013079509213

Rule 2: For older manual busbills

If the busbill starts with 169 or lower that means it is an older manual busbill. When using the ShipTrack application always type GLI before the busbill number (i.e. GLI1691234567 or GLI1671234567). See example below.

GLI 169 601 596 0

This barcode reads GLI1696015960

Rule 3: For newer manual busbills

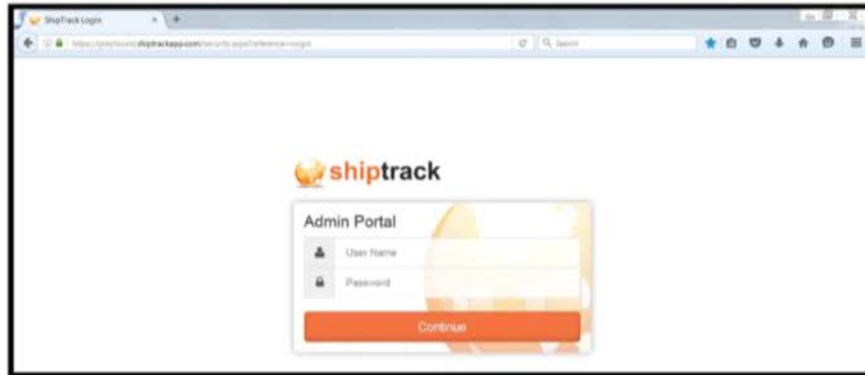
If the busbill starts with 170 or greater that means it is a newer manual busbill. When using the ShipTrack application always type 0001 before the busbill number (i.e. 00011701234567 or 00011721234567). See example below.

00011700288172

This barcode actually reads 00011700288172

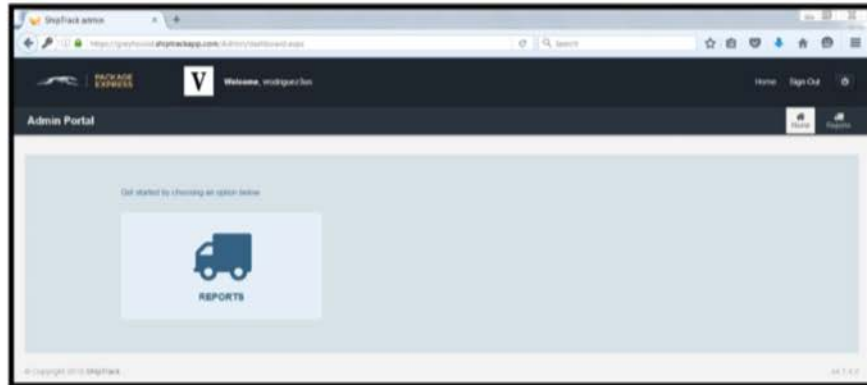
Step 1

Using your favorite internet browser go to <https://greyhound.shiptrackapp.com>. Type in your User Name and Password and click "Continue".



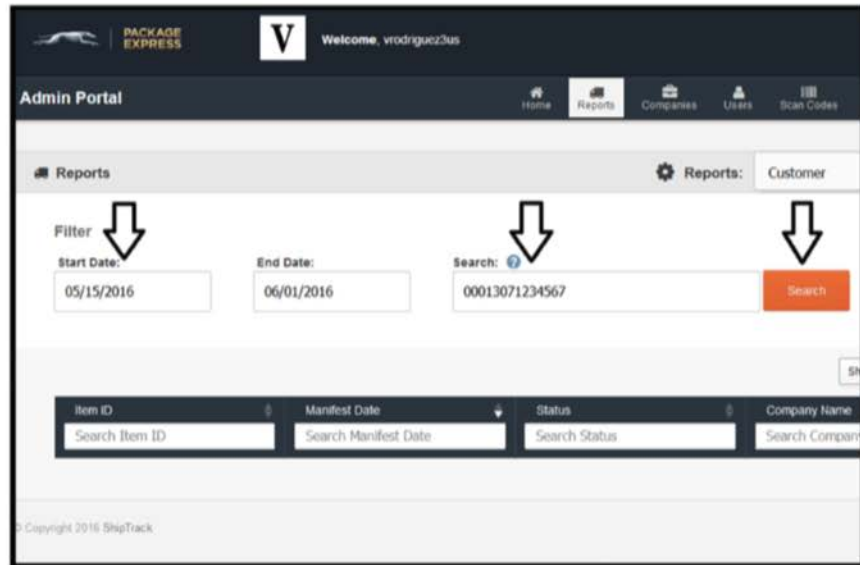
Step 2

The following portal will open. Click on the **REPORTS** icon.



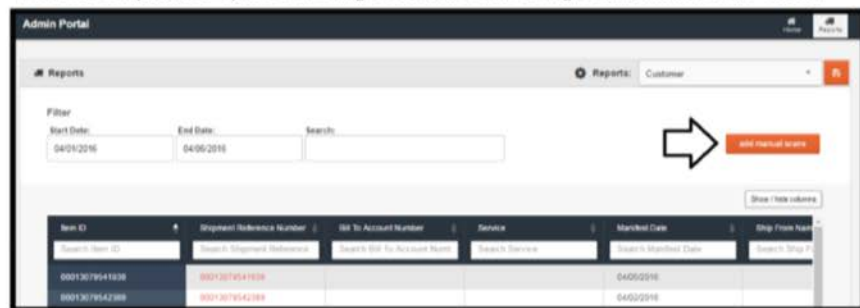
Step 3

The Report Management screen will open. If you want to create a shipment first make sure someone else has not created the shipment already. In the filter, back up the start date a week or two and then type in the busbill number in the search field. Click "Search". If no results show up you can continue to the next step. Also, continue to the next step if you are just uploading a tracking event.



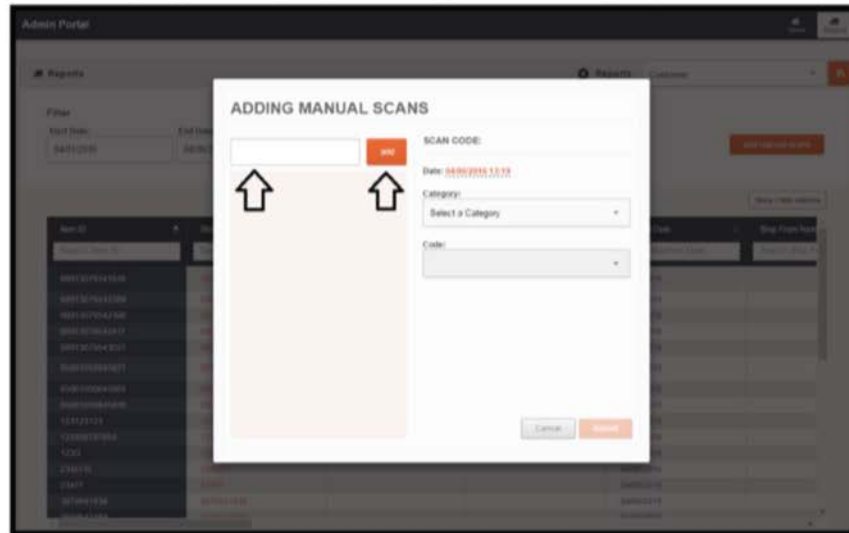
Step 4

To create a shipment or upload a tracking event click on the orange "add manual scans" button.



Step 5

The “**Adding Manual Scans**” window will open. For a single piece shipment type in the busbill number (following the above mentioned rules) and click the “**add**” button. For a multiple piece shipment type in the appropriate package ID’s after the busbill number. Be sure to click the “**add**” button after typing each number to add the package to the “Items List”. Reminder: A single piece shipment does NOT require a package ID label, only a busbill label. ONLY package (2) through (99) will require a package ID label. (Example of a Package ID#: A1234567B)



Note

When creating a shipment for the first time you must type in the busbill number first. After you type in the busbill number you can add package IDs if you have multiple pieces. If you try to type in a package ID first you will get a warning message. Below is a picture of what it looks like.



ADDING MANUAL SCANS

SCAN CODE:

Date: 04/08/2016 18:49

Category:

Code:

 Please scan the waybill first. 

This will remind you that when creating a shipment for the first time, you have to type in the busbill number first.

Step 6

Next, you **must** select a scan category and a scan code to continue. Click "**Submit**" after you have selected a scan category and a scan code. In the picture below we created a (2) piece shipment.

ADDING MANUAL SCANS

GLI1691234567
A1234567B
GLI1691234567

SCAN CODE:

Date: 09/20/2016 09:57

Category:

Code:

You are done. The shipment is now in the system and the tracking detail can be viewed at www.shipgreyhound.com. Below is a picture of what it will look like.

The screenshot displays the ShipTrack interface for a shipment with reference number GLJ1691234567. The top navigation bar includes 'Shipment', 'Pickup', 'Transit', and 'Delivered' tabs. The main content area features a table of items, a map of the Dallas, Texas area, and several utility sections.

Item	Time	Location	Activity
1	Friday April 8, 2016 11:03:42 PM GMT	Dallas, Texas	
2	Friday April 8, 2016 11:03:43 PM GMT	Dallas, Texas	Shipment Accepted

ShipTrack Item Barcodes	Last Scan Status
A12345678	Loaded Outbound
GLJ1691234567	Shipment Accepted

Need Help?
Contact us for more details about your shipment!
800-729-6029 [click here](#)

Email Notification
Send an e-mail to yourself, the recipient or others indicating the status of your shipment.
your@email.com
 Transit Delivered (Send POD)

Note

When using the "Adding Manual Scans" window, if the shipment is already in the ShipTrack system, meaning that someone created the shipment before you, the system will pull up all the packages in that shipment. The number that you typed in will be displayed in **BOLD** and the ones that you have not typed in will be grayed out. Below is an example.

ADDING MANUAL SCANS

SCAN CODE:

Date: 04/08/2016 18:08

Category: Terminal Package Scans

Code: Loaded Outbound

GLI1691234567 **BOLD**

A1234567B **Grayed Out**

GLI1691234567

If you try to continue without typing in all of the reference numbers that are grayed out you will get a warning message. Below is a picture of what it looks like.

ADDING MANUAL SCANS

SCAN CODE: [input type="text"]

Date: 2020/12/14 15:55

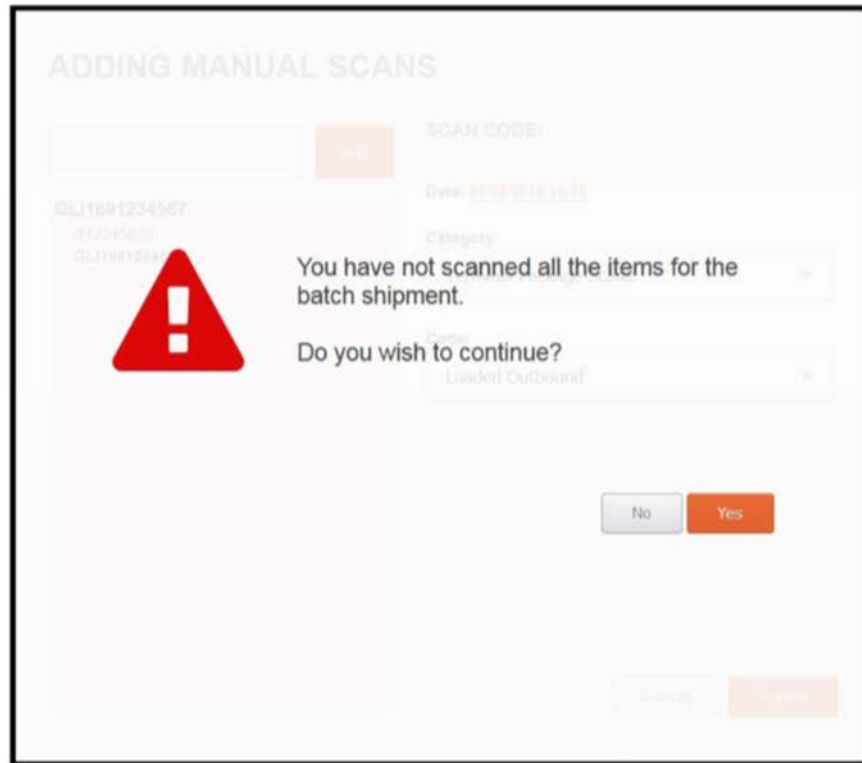
Category: [dropdown menu]

Do you wish to continue?

Loaded Outbound [dropdown menu]

No Yes

Cancel Confirm

A screenshot of a web application interface titled "ADDING MANUAL SCANS". The interface includes a "SCAN CODE" input field, a "Date" field showing "2020/12/14 15:55", and a "Category" dropdown menu. A prominent red warning triangle with a white exclamation mark is overlaid on the screen. To the right of the warning, the text reads: "You have not scanned all the items for the batch shipment. Do you wish to continue?". Below this text is another dropdown menu labeled "Loaded Outbound". At the bottom of the warning area, there are two buttons: "No" (grey) and "Yes" (orange). At the very bottom of the interface, there are two more buttons: "Cancel" (grey) and "Confirm" (orange).

If you have not received all of the packages in the shipment you have no choice but to click "Yes". If you have received all the packages but you forgot to type them in click "No" to go back and type in all the reference numbers.

These are all the steps needed to create shipments and upload tracking events via the new web interface.

Tracking Event Definitions

Below is a list of our tracking events followed by the situation when they are used.

P&D PICK-UP

- Driver Picked Up From Customer – Courier picked up the shipment at the customer's door.
- Driver Picked Up at Terminal – Courier picked up the shipment at the agency or terminal.

P&D DROP-OFF

- Driver Dropped Off at Terminal – Courier dropped off the shipment at the origin agency or terminal.
- Delivered to Customer – Courier delivered to the customer's door.

Counter PU or Drop-Off

- Shipment Created at Counter – Used as the very first tracking event in order to create the shipment in ShipTrack.
- Shipment Picked Up by Customer – Used to show the shipment was picked up by customer at the destination agency or terminal.

Terminal Package Scans

- Loaded Outbound – Used to mark the shipment as loaded outbound.
- Unloaded Inbound – Used to mark the shipment as unloaded at a transfer agency or terminal.
- Shipment at Final Destination – Used to show the shipment arrived at the final Greyhound destination. (Ready for pick up or ready for delivery)

Shipment Exceptions

- Re-routed – Used to show the shipment was re-routed.
- Short Shipment – Used to show that some pieces have not arrived.
- Accepted at \$0 Release Value – Used to show that the shipper was notified about the \$0.00 declared value and that they are still willing to shipment their item(s).

Note

The tracking events that employees see in ShipTrack and the ones that customers see on shippgreyhound.com are not the same. ShipTrack allows an internal and a public display of each tracking event. The tracking events that are listed when adding them are meant to make sense to employees and those on shippgreyhound.com are worded to make sense to the customer. Below is a chart of the differences.

What Employees See and What Customers See

Category	Scan Code in App, ShipTrack User Interface or Scanner	Public Name on ShipGreyhound
P&D Pick-Up	Driver Picked Up From Customer	Picked Up From Customer
P&D Pick-Up	Driver Picked Up at Terminal	Out For Delivery
P&D DROP-OFF	Driver Dropped Off at Terminal	Arrived at Sort Center
P&D DROP-OFF	Delivered to Customer	Delivered to Customer
Counter PU or Drop-Off	Shipment Created at Counter	Shipment Accepted
Counter PU or Drop-Off	Shipment Picked Up by Customer	Released to Recipient
Terminal Package Scans	Loaded Outbound	Loaded Outbound
Terminal Package Scans	Unloaded Inbound	At Sort Center
Terminal Package Scans	Shipment at Final Destination	At Final Sort Center
Shipment Exceptions	Re-routed	Re-routed
Shipment Exceptions	Short Shipment	Does not display on web
Shipment Exceptions	Accepted at \$0 Release Value	Does not display on web

The chart on the next page is used when creating TRIPS POS busbills in ShipTrack.

Here is a list of the most common carriers and their carrier number.

ONLY for TRIPS busbills that start with 308 or higher (not manual busbills)

Company Code	Company #	Company Name	Company Code	Company #	Company Name
ACD	072	ACADEMY LINES, INC.	GLP	129	GREYHOUND/PETER PAN POOL
ADT	104	ADIRONDACK TRAILWAYS	VGP	039	GREYHOUND/VALLEY TRANSIT
ADP	024	ADIRONDACK TRAILWAYS POOL	IT	053	INDIAN TRAILS
IBU	109	ALL ABOARD AMERICA	JL	504	JEFFERSON PARTNERS L.P.
AAA	214	ALL ABOARD AMERICAN	KCO	208	KINCAID COACH LINES, INC.
AMB	830	AMERICAN BUS LINES INC	LFL	241	LAKE FRONT LINES
ACL	488	AMERICAN COACH LINES INC	LAB	212	LAMERS BUS LINE, INC.
ABL	372	AMERICAN TRAILWAYS, INC.	LTA	828	LAND TO AIR EXPRESS
AWC	466	ARROW COACH	FMT	219	MARTZ TRAILWAYS
AWXP	497	ARROW EXPRESS	MRT	468	MILLER TRAILWAYS
BGC	083	BADGER COACHES, INC.	NWL	026	NORTHWESTERN TRAILWAYS, INC
BSB	856	Barons Bus Line	OTB	704	OLYMPIA TRAILS BUS CO., INC.
BBL	200	BEAVER BUS LINES	PRB	046	PEORIA-ROCKFORD BUS CO
BIH	728	BIEBER HBG	PPB	244	PETER PAN BUS LINES
BI	127	BIEBER, CARL R. TOURWAYS, INC	PPP	013	PETER PAN BUS LINES POOL
BHL	128	BLACK HILLS STAGE LINES, INC.	PUT	396	POCATELLO URBAN TRANSIT
BZ	074	BONANZA BUS LINES, INC.	RSL	078	REEDY STAGE LINES
BTW	134	BURLINGTON TRAILWAYS	RRS	262	RIMROCK TRAILWAYS
COP	015	CAPITAL COLONIAL TRW POOL	SLE	462	SALT LAKE EXPRESS
CPB	574	CAPITOL TRAILWAYS OF PENNA	SES	049	SOUTHEASTERN STAGES, INC.
BTA	141	CASCADE TRAILWAYS	SHT	289	SUSQUEHANNA TRAILWAYS
CCI	150	CONCHO COACHES, INC.	TNC	283	TRANSCOR INC
DEA	023	DELTA BUS LINES INC.	VTC	317	VALLEY TRANSIT CO., INC.

REFERENCES

- 1 Texas Department of Transportation. *Texas Freight Mobility Plan. Final Report*. January 2016. Available at: <ftp.dot.state.tx.us/pub/txdot/move-texas-freight/studies/freight-mobility/plan.pdf>.
- 2 Mid-Continent Railway Museum (n.d.). *The Express Companies*. Mid-Continent Railways Museum, North Freedom, Wisconsin. http://www.midcontinent.org/rollingstock/dictionary/express_companies.htm. Accessed October 15, 2015.
- 3 United States Postal Service (2015). *Rural Free Delivery*. In Publication 100 – The United States Postal Service – An American History 1775-2006. USPS. http://about.usps.com/publications/pub100/pub100_020.htm. Accessed 09/14/2015.
- 4 Smithsonian National Postal Museum (n.d.). *Precious Packages – America’s Parcel Post Service*. Smithsonian Institution, Washington, D.C. <http://postalmuseum.si.edu/exhibits/current/customers-and-communities/reaching-rural-america/parcel-post-service.html>. Accessed 10/15/2015.
- 5 United States Postal Service (2012). *Parcel Post*. In Publication 100 – The United States Postal Service – An American History 1775-2006. USPS. https://about.usps.com/publications/pub100/pub100_024.htm. Accessed 10/15/15.
- 6 UPS (n.d.). *History: 1907–1929*. United Parcel Service. <http://www.ups.com/content/us/en/about/history/1929.html>. Accessed 10/15/15.
- 7 Lancaster Dispatcher (2014). *History of the Railway Express Agency*. National Railway History Society, Lancaster Chapter, Inc. Lancaster Dispatcher, Volume 45, Number 7. http://www.nrhs1.org/images/e-Dispatcher_July_2014.pdf. Accessed October 23, 2015.
- 8 UPS (n.d.). *History: 1981–1990*. United Parcel Service. <http://www.ups.com/content/corp/about/history/1990.html?WT.svl=SubNav>. Accessed 10/15/15.
- 9 FedEx (n.d.). *Connecting People and Possibilities: The History of FedEx*. FedEx, 1995–2015. <http://about.van.fedex.com/our-story/history-timeline/history/>. Accessed 10/15/15/
- 10 Lone Star Overnight (n.d.). *Lone Star Overnight*. <https://www.lso.com/>. Accessed October 15, 2015.
- 11 Lone Star Overnight (n.d.). *Lone Star Overnight LSO Maps*. <https://www.lso.com/servicearea.aspx>. Accessed October 15, 2015.
- 12 Lone Star Overnight (2015). *LSO 2015 Service Guide*. Lone Star Overnight. Austin, TX. <http://www.lso.com/LSOserviceguide.pdf>. Accessed October 15, 2015.

- 13 Lone Star Overnight (n.d.) LOS Omniship. <https://www.lso.com/omniship.aspx>. Accessed October 15, 2015.
- 14 OnTrac. (2015). *Shipping rates*. <https://www.ontrac.com/quickrates.asp>. Accessed October 16, 2015.
- 15 OnTrac. (2015). *Service Area*. <https://www.ontrac.com/servicesAreas.asp>. Accessed October 16, 2015.
- 16 OnTrac Messenger (2015). *OnTrac Messenger Services*. <http://www.ontracmessenger.com/messenger.aspx>. Accessed October 16, 2015.
- 17 OnTrac Messenger (2015). <http://www.ontracmessenger.com/area.aspx>. Accessed October 16, 2015.
- 18 LaserShip (n.d.). *LaserShip – About*. <http://www.lasership.com/>. Accessed October 20, 2015.
- 19 Eastern Connection (n.d.). *Eastern Connection – About*. <http://www.easternconnection.com/>. Accessed October 20, 2015.
- 20 Eastern Connection (n.d.) *Eastern Connection – Service Area/Guide*. <http://www.easternconnection.com/index.cfm/page/Service-Area-Guide/pid/10908>. Accessed October 20, 2015.
- 21 United Delivery Service (n.d.). *United Delivery Service – About Us*. <https://www.uniteddeliveryservice.com/about-us/>. Accessed October 23, 2015.
- 22 United Delivery Service (n.d.). *United Delivery Service – Locations*. <https://www.uniteddeliveryservice.com/locations/>. Accessed October 23, 2015.
- 23 Golden State Overnight Delivery Service (n.d.). *GSO – About*. <https://www.gso.com/default>. Accessed October 15, 2015.
- 24 GSO. (2015). *Service Areas*. <https://www.gso.com/services/serviceareas>. Accessed October 15, 2015.
- 25 SpeeDee Delivery (2012). *SpeeDee Delivery Service – About*. <http://www.speedeedelivery.com/index.html>. Accessed October 15, 2015.
- 26 SpeeDee Delivery (2012). *SpeeDee Delviery Service – Service Area/Service Maps*. <http://www.speedeedelivery.com/areas.html>. Accessed October 15, 2015.
- 27 U.S. Cargo (n.d.). *US Cargo – About*. <http://www.us-cargo.com/index.shtml>. Accessed October 15, 2015.
- 28 Greyhound (n.d.). *Greyhound Package Express – Our Services*. <http://www.shipgreyhound.com/e/pages/OurServices.aspx>. Accessed October 23, 2015.

- 29 Greyhound (n.d.). *Greyhound – Package Express*.
<http://www.shipgreyhound.com/e/pages/Home.aspx>. Accessed October 23, 2015.
- 30 Amazon (2015). *Same Day Delivery*. <http://www.amazon.com/b?node=8729023011>.
Accessed October 15, 2015.
- 31 Amazon (2015). *PrimeNow*. http://www.amazon.com/b/ref=pn_surl_lp/?node=10481056011.
Accessed October 23, 2015.
- 32 Amazon (2015). *Amazon Flex*. <https://flex.amazon.com/>. Accessed October 15, 2015.
- 33 Amazon (2015). *Amazon Locker*. <http://www.amazon.com/b?ie=UTF8&node=6442600011>.
Accessed October 15, 2015.
- 34 United States Postal Service. “A decade of facts and figures.” *About*. Website. Available at
<https://about.usps.com/who-we-are/postal-facts/decade-of-facts-and-figures.htm>.
Accessed on October 7, 2015.
- 35 FedEx. *FedEx Statistical Books*. Online. Available at <http://investors.fedex.com/financial-information/statistical-books/default.aspx>. Accessed on October 7, 2015.
- 36 United Parcel Service. *2014 Annual Report*. Online. Accessed at
<http://www.investors.ups.com/phoenix.zhtml?c=62900&p=irol-reportsannual>. Accessed
on October 7, 2015.
- 37 eMarketer. (n.d.). Number of digital shoppers in the United States from 2010 to 2018 (in millions). In Statista - The Statistics Portal. Retrieved October 16, 2015, from
<http://www.statista.com/statistics/183755/number-of-us-internet-shoppers-since-2009/>.
- 38 Amazon. (n.d.). Net revenue of Amazon from 1st quarter 2007 to 2nd quarter 2015 (in billion U.S. dollars). In Statista - The Statistics Portal. Retrieved October 16, 2015, from
<http://www.statista.com/statistics/273963/quarterly-revenue-of-amazoncom/>.
- 39 US Census Bureau. (n.d.). B2C e-commerce volume in the United States from 2006 to 2013 (in billion U.S. dollars). In Statista - The Statistics Portal. Retrieved October 16, 2015, from
<http://www.statista.com/statistics/239372/us-b2c-e-commerce-volume-since-2006/>.
- 40 Colliers International. *From First Mile to Last Mile: Global Industrial & Logistical Trends*. October 2015. Online. Available at
http://www.supplychain247.com/paper/from_first_mile_to_last_mile_global_industrial_logistics_trends#register. Accessed on October 20, 2015.
- 41 SJ Consulting Group, Inc. *Report on Measuring the Benefits of Rural Postal Service for the Postal Regulatory Commission*. August 2011. Online. Available at
http://www.prc.gov/sites/default/files/archived/Rural_Service_Report.pdf. Accessed on October 7, 2015.

- 42 Thurber, Kathleen, "Concho Coaches works to provide service of old in changing transportation world." *Midland Reporter-Telegram*. Wednesday, January 12, 2011. Online. Available at http://www.mrt.com/business/oil/article_392e80d2-842d-5b19-8127-d0ed96ce6f96.html. Accessed on October 19, 2015.
- 43 Higgins, Laura, Jeff Warner, Curtis Morgan, and Philip Dunham. *Examining Long-Distance Express Buses as an Extension of and Feeder to Passenger Rail Systems*. UTCM 10-44-53, University Transportation Center for Mobility, Texas A&M Transportation Institute, College Station, TX, March 2011.
- 44 Belsky, Gary, "100 Years on a Dirty Dog: The History of Greyhound." *Mental_floss*. December 19, 2013. Online. Available at <http://mentalfloss.com/article/54273/100-years-dirty-dog-history-greyhound>. Accessed on October 28, 2015.
- 45 Greyhound, "Historical Timeline." *Greyhound corporate website*. Online. Available at <https://www.greyhound.com/en/about/historicaltimeline.aspx>. Accessed on October 28, 2015.
- 46 Box on a Bus (2015). *Box on a Bus Company Website*. Available at: <http://www.boxonabus.com/>. Accessed October 23, 2015.
- 47 Bus Freighter (2015). *Bus Freight Company Website*. Available at: <http://www.busfreighter.com/>. Accessed October 23, 2015.
- 48 1-800 Courier (2015). *1-800 Courier Company Website*. Available at: <http://www.1-800courier.com/package-express.asp>. Accessed October 23, 2015.
- 49 Weber, Erik, Ethan Arpi, and Aileen Carrigan. From Here To There: A Creative Guide to Making Public Transport the Way to Go. World Resources Institute Ross Center . n.d. Available at: <http://www.wrirosscities.org/sites/default/files/From-Here-to-There-EMBARQ.pdf>
- 50 Hess, Daniel Baldwin, and Alex Bitterman. Branding and selling public transit in North America: An analysis of recent messages and methods. *Research in Transportation Business & Management*, Volume 18, March 2016. Available at: <http://www.sciencedirect.com/science/article/pii/S221053951600002X>.
- 51 Texas Department of Public Safety (DPS), Commercial Vehicle Enforcement. *A Texas Motor Carrier's Guide to Highway Safety*. MCS-9, Revised August 2013. Available at <https://www.txdps.state.tx.us/InternetForms/Forms/MCS-9.pdf>. Accessed on October 13, 2015.
- 52 Texas Department of Motor Vehicles (TxDMV). "TxDMV Number," Requirements tab. Accessed at <http://www.txdmv.gov/motor-carriers/txdmv-number?tab=requirements>. Accessed on October 13, 2015.

- 53 Whistler, Deborah. "New broker law impacts carriers who forward freight." *Fleet Owner*. September 27, 2013. Accessed at <http://fleetowner.com/regulations/new-broker-law-impacts-carriers-who-forward-freight>. Accessed on October 14, 2015.
- 54 Texas Department of Transportation (TxDOT). *Texas Freight Mobility Plan*. Draft., September 28, 2015. Online. Available at www.MoveTexasFreight.com. Accessed on October 5, 2015.
- 55 Stevens, Laura. "Fuel Prices Fall, but FedEx and UPS Boost Surcharges." *The Wall Street Journal*. October 5, 2015. Online. Available at <http://www.wsj.com/articles/fuel-prices-fall-but-fedex-and-ups-boost-surcharges-1444088938>. Accessed on October 7, 2015.
- 56 Bishop, T. Exclusive: Hands-on with Amazon Locker, now working. <http://www.geekwire.com/2011/exclusive-handson-amazon-locker-running/>. Accessed Jun. 18, 2015.
- 57 United States Postal Service, Office of Inspector General. *U.S. Postal Service Parcel Delivery Lockers, Management Advisory*. Report Number DR-MA-13-002, May 6, 2013. Online. Available at <https://www.uspsig.gov/sites/default/files/document-library-files/2015/dr-ma-13-002.pdf>. Accessed on October 13, 2015.
- 58 Sasso, Michael. "UPS Asks People to Pick Up Packages Themselves." *Bloomberg*. September 30, 2015. Online. Available at <http://www.bloomberg.com/news/articles/2015-09-30/ups-solution-to-no-one-at-home-fetch-the-package-yourself>. Accessed on October 5, 2015.
- 59 Saito, M. 2016. *Exclusive: Amazon expanding deliveries by its 'on-demand' drivers*. Accessed April 10, 2017. <http://www.reuters.com/article/us-amazon-com-logistics-flex-idUSKCN0VR000>.
- 60 Boyle, A. 2016. *First Amazon Prime airplane debuts in Seattle after secret night flight*. Accessed April 10, 2017. <http://www.geekwire.com/2016/amazon-prime-airplane-seafair/>.
- 61 Federal Transit Administration (2014). FTA C 9040.1G Circular—Formula grants for rural areas: Program guidance and application instructions. Retrieved July 7, 2016, from [https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/FTA_Circular_9040_1Gwith_index_-_Final_Revised_-_vm_10-15-14\(1\).pdf](https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/FTA_Circular_9040_1Gwith_index_-_Final_Revised_-_vm_10-15-14(1).pdf).
- 62 American Intercity Busriders Association (2016). Maps. Retrieved July 7, 2016, from <http://www.kfhgroup.com/aibra/maps.htm>.

