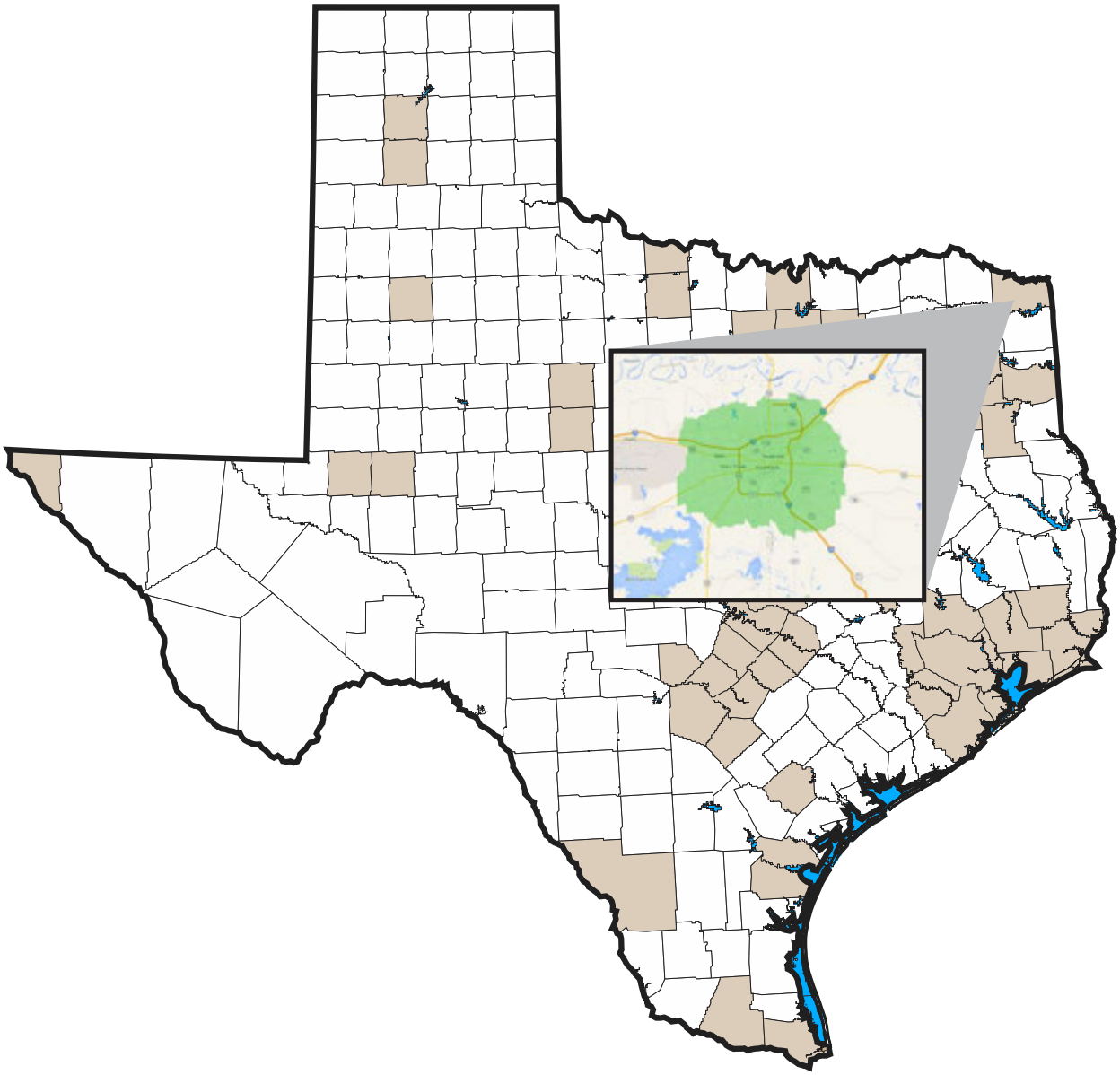
2013 Texarkana Commercial Vehicle Survey Technical Summary



Texas Department of Transportation

Prepared by the
Texas A&M Transportation Institute
August 2015

2013 Texarkana
Commercial Vehicle Survey

TECHNICAL SUMMARY

Texas Department of Transportation Travel Survey Program

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INTRODUCTION

In 2013, the Texas Department of Transportation (TxDOT) funded a commercial vehicle survey in the Texarkana area. The purpose of this survey was to provide data that would enable TxDOT to forecast total commercial vehicle travel demand within the Texarkana urban area. The study area is located in northeast Texas, as shown in Figure 1, and includes portions of Bowie County (TX) and Miller County (AR). The study area had a total population of approximately 66,300 people in 2010 (American Fact Finder).

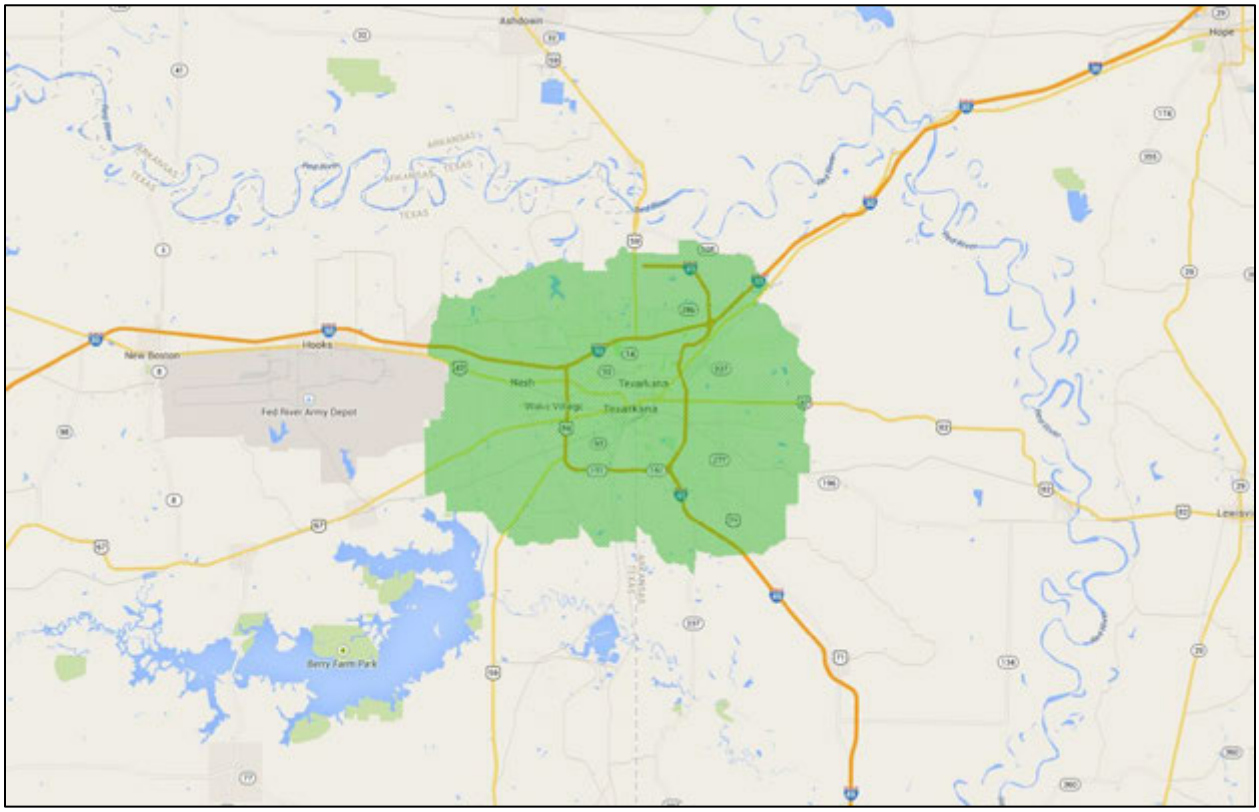

Figure 1. Texarkana Study Area.

This report presents a technical summary of the commercial vehicle travel survey conducted in 2013 in the Texarkana region and documents the data collected and the analysis of results for the study area. The forms used in the survey are included in the Appendix of this report.

SURVEY METHODOLOGY

The commercial vehicle surveys for the Texarkana study area were conducted during the period between August 2013 and March 2014. Alliance Transportation Group (ATG) was contracted by TxDOT to conduct the commercial vehicle surveys for the study area, with technical assistance from the Texas A&M Transportation Institute (TTI). Prior to these surveys, a pilot study was conducted, which consisted of 25 commercial vehicles. Pilot survey data are typically included with the primary survey results. No changes were made to the survey instruments between the pilot survey and the primary survey.

The survey sample was randomly selected from a listing of all business individuals, companies, and public agencies that own, operate, or lease commercial vehicles within the study area. This list was purchased from InfoUSA and provided to TTI for categorization and randomizing. Selected businesses were contacted and requested to participate in the survey. Those who agreed to participate were provided survey packets and instructions on how the survey forms should be filled out. The drivers of the commercial vehicles were asked to keep a 24-hour diary of the locations of all trips made by each vehicle.

As Table 1 shows, 2,968 businesses were contacted during the recruitment process. Contacts were tracked based on the following categories.

- Agreed to Participate – The company or individual operated qualifying vehicles making trips within the study area, agreed to participate, complete, and return the survey materials.
- Refused to Participate – The company or individual operated qualifying vehicles making trips within the study area but refused to participate in the survey.
- Ineligible Business – The company was no longer in business or did not have a working number.
- Backed Out – The company reversed decision to participate.

Table 1. Survey Participation Rates.

Category	Contact Calls	
	Number	Percent of Total
Agreed to Participate	194	6.5
Refused to Participate	198	6.7
Ineligible Business	2,528	85.2
Backed Out	48	1.6
Total	**2,968**	**100.0**

Source: Alliance Transportation Group.

A total of 143 companies participated in the Texarkana commercial vehicle survey, from which a total of 338 commercial vehicle surveys were obtained. Data editing and review processes were performed by TTI to ensure that the survey data collected were complete and followed the guidelines set forth in TxDOT's bid specification for the project. A data check program was also used to examine the accuracy of geocoding of locations and logic of survey responses. The majority of data errors were expected to be corrected prior to final data submittals by the contractor (ATG). However, it was not unusual to find errors during actual data processing and analysis. In this study, survey responses with irreconcilable data were not included in the survey analysis. Additionally, inconsistent trip records were dropped from the survey analysis.

During the review process, it was noted that some of the business locations included in the survey were located outside of the MPO area. Therefore, those businesses and their accompanying surveys were removed from the analysis. Additionally, 13 vehicles reported no trips on the survey day and therefore were removed from the analysis. The results presented in this technical summary are therefore based on data from 264 surveyed commercial vehicles.

SURVEY RESULTS

Vehicle Characteristics

This section presents the characteristics of registered trucks and surveyed commercial vehicles to provide an overview of the type and condition of commercial vehicles operating within the

Texarkana (TX) study area. Information on registered trucks includes the number of diesel-fueled, gasoline-fueled, and propane-fueled trucks by gross vehicle weight and by model year. Information on surveyed commercial vehicles includes the vehicle's make, model and year, odometer reading, gross vehicle weight, vehicle classification, and fuel use.

Registered Commercial Vehicles

Based on TxDOT's vehicle registration data, there were approximately 1,645 trucks registered in the Texarkana (TX) study area in 2014. Table 2 shows the distribution of registered diesel trucks and gasoline trucks by gross vehicle weight. Over 75 percent of all trucks registered in the Texarkana (TX) study area are diesel-fueled vehicles. Sixty-seven percent of all registered trucks had a gross vehicle weight of less than 10,000 pounds.

Table 2. Gross Vehicle Weight of Registered Trucks in Texarkana (TX) Study Area.

Gross Vehicle Weight	Diesel Trucks		Gasoline Trucks		Total	
	Number of Vehicles	% of Diesel Trucks	Number of Vehicles	% of Gasoline Trucks	Number of Vehicles	% of Total Trucks
< 10000	875	68.2	223	61.6	1,098	66.7
> 10000	142	11.1	66	18.2	208	12.6
> 14000	44	3.4	28	7.7	72	4.4
> 16000	43	3.4	7	1.9	50	3.0
> 19500	80	6.2	18	5.0	98	6.0
> 26000	24	1.8	9	2.5	33	2.0
> 33000	65	5.1	9	2.5	74	4.5
> 60000	10	0.8	2	0.6	12	0.7
Total	1,283	100.0	362	100.0	1,645	100.0

Source: TxDOT 2014.

Figure 2 shows the distribution of registered diesel trucks and gasoline trucks by model year. Registered gasoline trucks were older relative to the diesel trucks. Approximately 72 percent of the diesel trucks were less than 10 years old, compared to 56 percent of the gasoline trucks within that age range. Approximately 4 percent of the over 1,600 registered diesel trucks were 20 years or older, while ten percent of the registered gasoline trucks were 20 years or older.

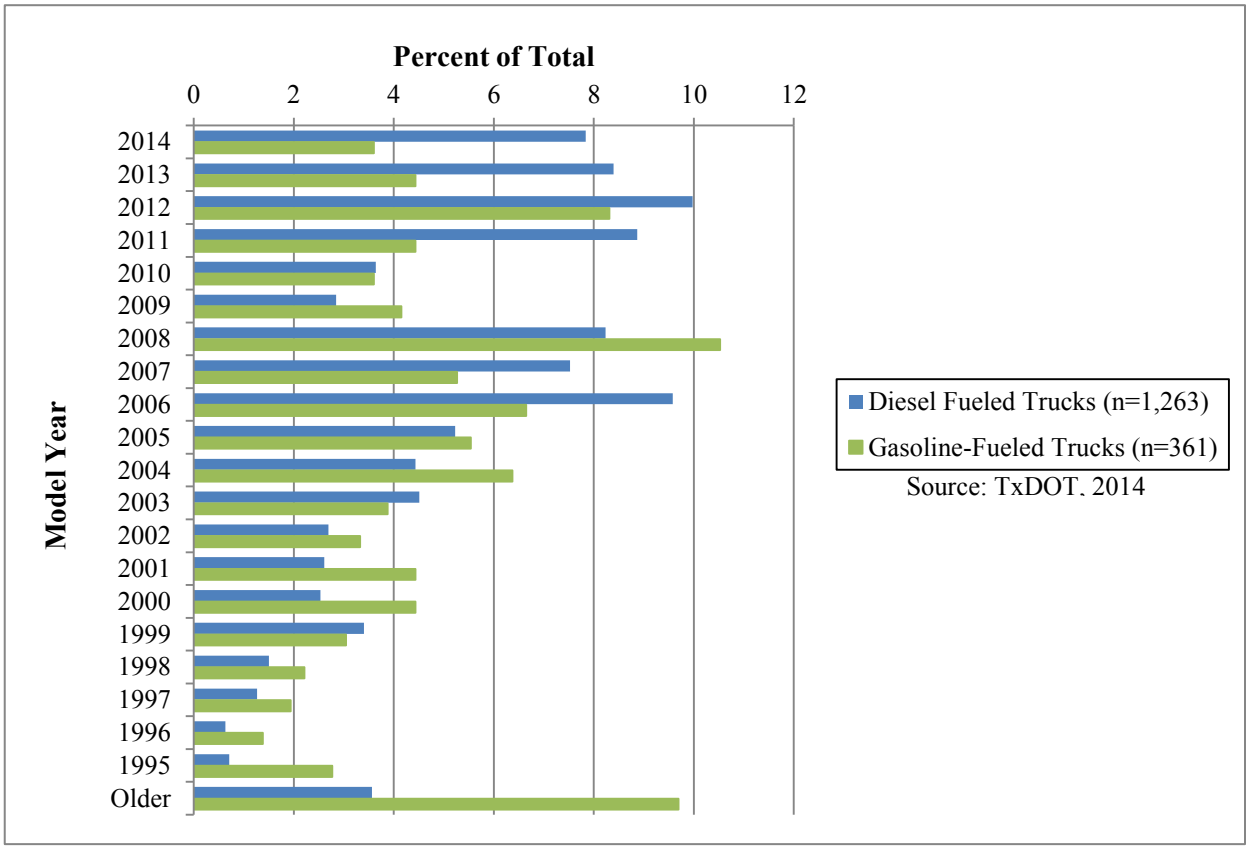

Figure 2. Model Year of Registered Trucks in the Texarkana (TX) Study Area.

Surveyed Commercial Vehicles

Commercial vehicles that participated in the Texarkana commercial vehicle survey were distinguished based on the nine classification types listed in Table 3. These were further categorized by commercial type as either major cargo/freight transport or local service vehicles, simply referred to in this report as cargo vehicles and service vehicles, respectively.

Cargo vehicles were defined as vehicles mainly used to transport cargo or freight, which were typically bulk goods, materials, and cargo in large quantities for wholesale distribution. Service vehicles were defined as vehicles mainly used to perform services such as those used by building contractors, plumbers, electricians, cable and telephone services/repairs, and delivery vans/vehicles used by local retailers. These also included company fleet vehicles or fleets and maintenance vehicles of public agencies such as TxDOT, city, county, or school districts.

Table 3 shows the distribution of surveyed vehicles by vehicle classification type and commercial type. Of the total 264 vehicles surveyed, 120 were cargo vehicles and 144 were service vehicles. Among cargo vehicles, approximately 35 percent were semi (tractor-trailers), another 22 percent were single unit 2-axle (6 wheel) trucks, and 17 percent were pick-up trucks. Among service vehicles, approximately 40 percent were pick-up trucks, 31 percent were vans, and 10 percent were passenger cars.

Table 3. Vehicle Classification Type of Surveyed Commercial Vehicles.

Vehicle Classification	Cargo Vehicles		Service Vehicles		Total Vehicles	
	Number of Vehicles	Percent of Cargo	Number of Vehicles	Percent of Service	Number of Vehicles	Percent of Total
Passenger Car	5	4.2	15	10.4	20	7.6
Pickup Truck	20	16.6	58	40.3	78	29.5
Van (passenger or mini)	8	6.7	44	30.6	52	19.6
Sport Utility Vehicle	0	0.0	11	7.6	11	4.2
Single Unit 2-axle (6 wheels)	27	22.5	13	9.0	40	15.2
Single Unit 3-axle (10 wheels)	16	13.3	1	0.7	17	6.4
Single Unit 4-axle (14 wheels)	2	1.7	0	0.0	2	0.8
Semi (tractor-trailer)	42	35.0	1	0.7	43	16.3
Other	0	0.0	1	0.7	1	0.4
Total	**120**	**100.0**	**144**	**100.0**	**264**	**100.0**

Figure 3 shows the distribution of surveyed vehicles by fuel type. Approximately 54 percent of the surveyed vehicles used diesel and 46 percent used unleaded gasoline. Among cargo vehicles, 75 percent used diesel and 25 percent used gasoline. Among service vehicles, 87 percent used gasoline and 13 percent used diesel. There was one service vehicle classified as a hybrid-fueled vehicle.

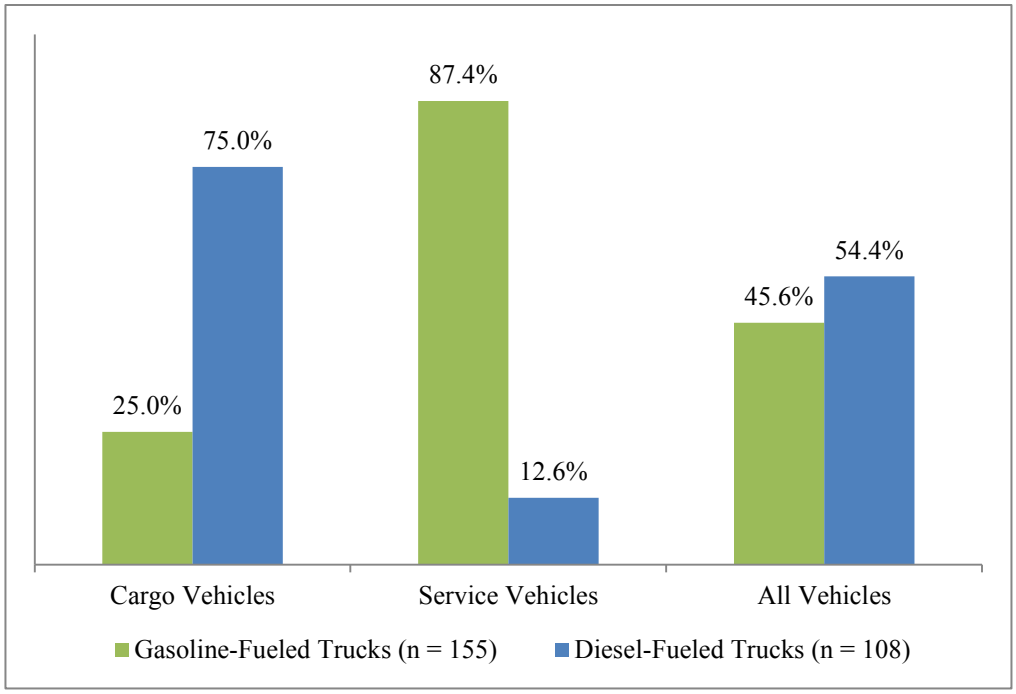

Figure 3. Type of Fuel Used by Surveyed Commercial Vehicles.

Table 4 shows the distribution of surveyed vehicles by gross vehicle weight. The survey included commercial vehicles with a gross vehicle weight of less than 10,000 pounds. Approximately 81 percent of the service vehicles belonged to this category, while approximately 58 percent of the cargo vehicles weighed more than 19,500 pounds.

Table 4. Gross Vehicle Weight.

Gross Vehicle Weight (lbs.)	Cargo		Service		Total	
	Number of Vehicles	% of Cargo Vehicles	Number of Vehicles	% of Service Vehicles	Number of Vehicles	% of Total Vehicles
< 10,000	38	31.6	116	80.5	154	58.3
> 10,000	6	5.0	5	3.5	11	4.2
> 14,000	2	1.7	2	1.4	4	1.5
> 16,000	5	4.2	4	2.7	9	3.4
> 19,500	11	9.2	2	1.4	13	4.9
> 26,000	9	7.5	2	1.4	11	4.2
> 33,000	19	15.8	5	3.5	24	9.1
> 60,000	30	25.0	8	5.6	38	14.4
Total	**120**	**100.0**	**144**	**100.0**	**264**	**100.0**

Figure 4 shows the distribution of surveyed vehicles by model year. Approximately 73 percent of cargo vehicles and 66 percent of the service vehicles were less than 10 years old. The average age for cargo vehicles was 6.9 years, while the average age for service vehicles was 7.6 years (assuming 2014 as the base year).

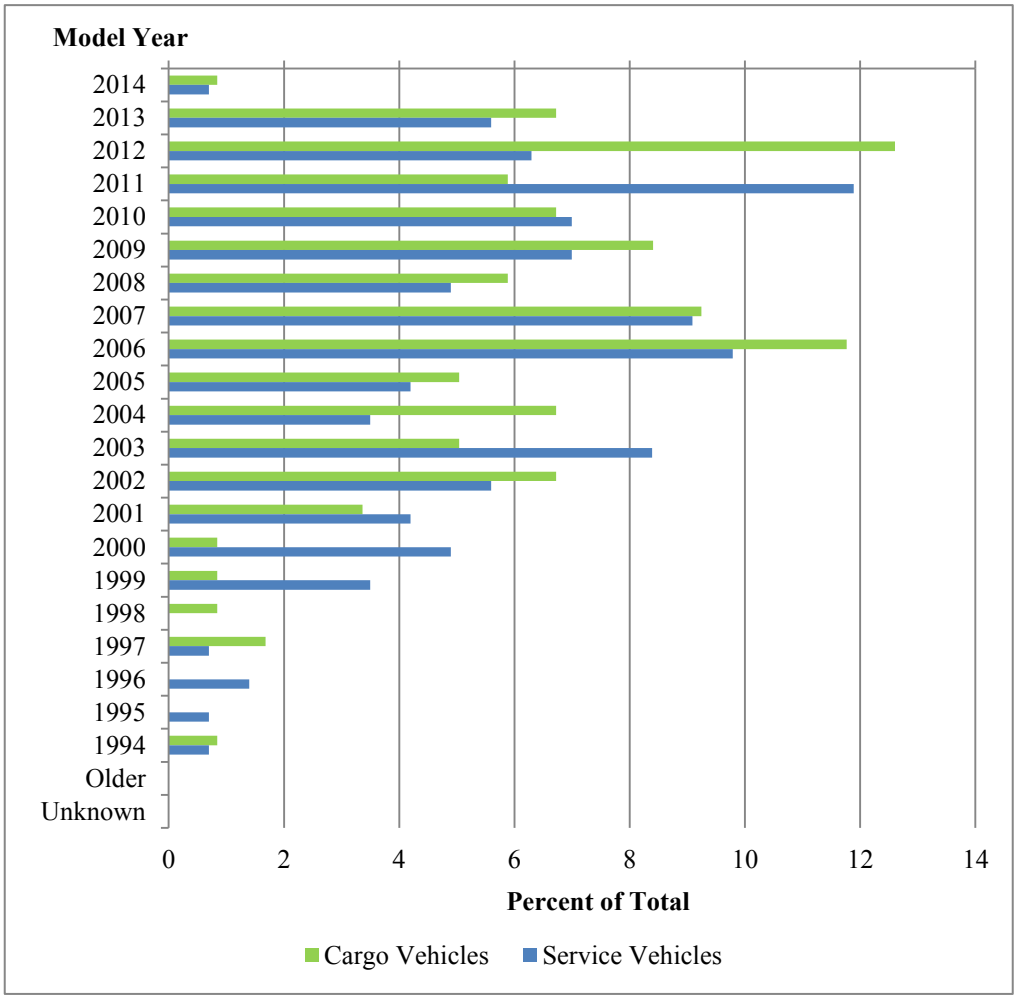

Figure 4. Vehicle Model Year.

Table 5 shows the average vehicle mileage by model year based on reported odometer readings from 340 surveyed vehicles at the beginning of their survey travel day. Cargo vehicles reported higher average odometer readings of over 237,000 miles compared to almost 137,000 miles for service vehicles. Two cargo vehicles and three service vehicles were excluded due to unknown odometer readings.

Table 5. Average of Reported Odometer Readings by Model Year.

Model Year	Cargo Vehicles		Service Vehicles		Total Vehicles	
	Number of Vehicles	Avg. Odometer Reading	Number of Vehicles	Avg. Odometer Reading	Number of Vehicles	Avg. Odometer Reading
2014	1	38,623	0	0	1	38,623
2013	8	94,573	8	19,130	16	56,852
2012	15	127,916	9	42,417	24	95,854
2011	7	197,714	17	59,934	24	100,120
2010	8	206,579	10	57,793	18	123,920
2009	10	220,839	10	151,280	20	186,059
2008	7	146,901	7	140,947	14	143,924
2007	11	384,051	13	81,723	24	220,290
2006	14	302,658	14	126,149	28	214,403
2005	6	283,066	6	133,926	12	208,496
2004	8	359,060	5	116,091	13	265,610
2003	6	274,150	12	100,408	18	158,322
2002	8	258,787	8	184,337	16	221,562
2001	4	309,509	6	534,869	10	444,725
2000	1	89,600	7	240,253	8	221,422
1999	1	53,609	5	134,684	6	121,172
1998	1	713,847	0	0	1	713,847
1997	2	107,750	0	0	2	107,750
1996	0	0	2	157,960	2	157,960
1995	0	0	1	2,121,720	1	2,121,720
1994	0	0	1	99,374	1	99,374
Older	0	0	0	0	0	0
Total	**118**	**237,675**	**141**	**136,940**	**259**	**182,835**

Trip Frequency

The surveyed vehicles generated a total of 1,475 trips, of which 925 were internal trips and 550 were external trips. Internal trips were defined as those trips made within the Texarkana area. These trips were further distinguished by travel within or between zones. Inter-zonal trips were those trips made from one zone to another, while intra-zonal trips were made within the same zone. External trips were those trips made outside of the study area.

Figure 5 shows the distribution of inter-zonal, intra-zonal, and external trips, while Table 6 provides the breakdown of these trips. Cargo vehicles generated 777 trips, of which approximately 50 percent were external trips, 47 percent were inter-zonal trips, and three percent were intra-zonal trips. Service vehicles generated 698 trips, of which 72 percent were inter-zonal trips, 23 percent were external trips, and five percent were intra-zonal trips.

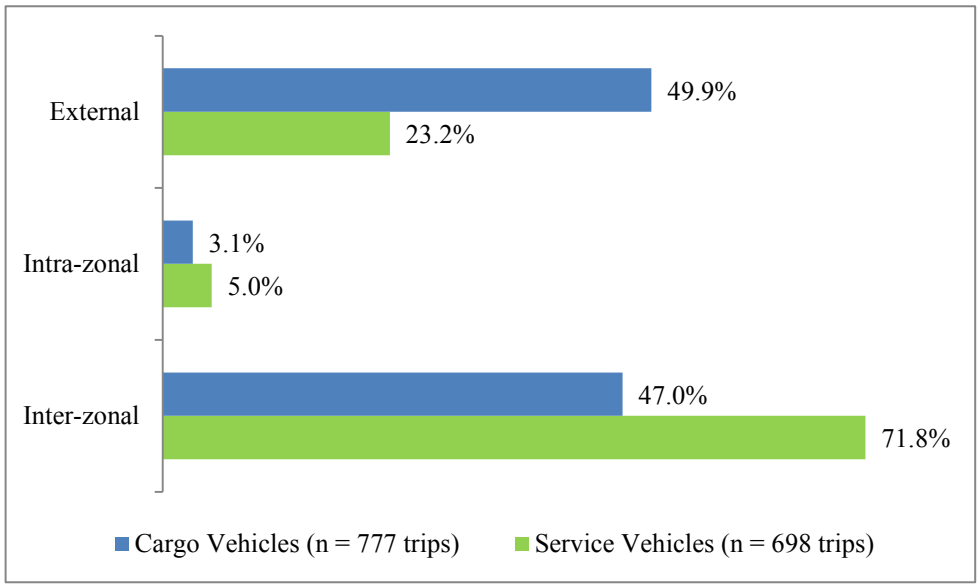

Figure 5. Inter-Zonal, Intra-Zonal, and External Trips.

Table 6. Total Internal and External Trips.

Vehicle Type	Cargo Vehicles		Service Vehicles		Total Vehicles	
Trip Type	**Number**	**% of Total**	**Number**	**% of Total**	**Number**	**% of Total**
Inter-zonal	365	47.0	501	71.8	866	58.7
Intra-zonal	24	3.1	35	5.0	59	4.0
Total Internal	**389**	**50.1**	**536**	**76.8**	**925**	**62.7**
External	388	49.9	162	23.2	550	37.3
Total	**777**	**100.0**	**698**	**100.0**	**1,475**	**100.0**

Figure 6 shows the distribution of total trips (internal and external trips), which varied from one trip to 28 trips per service vehicle and from one trip to 39 trips per cargo vehicle on the survey day. The average number of total trips per day was 6.5 trips for cargo vehicles and 4.8 trips for service vehicles.

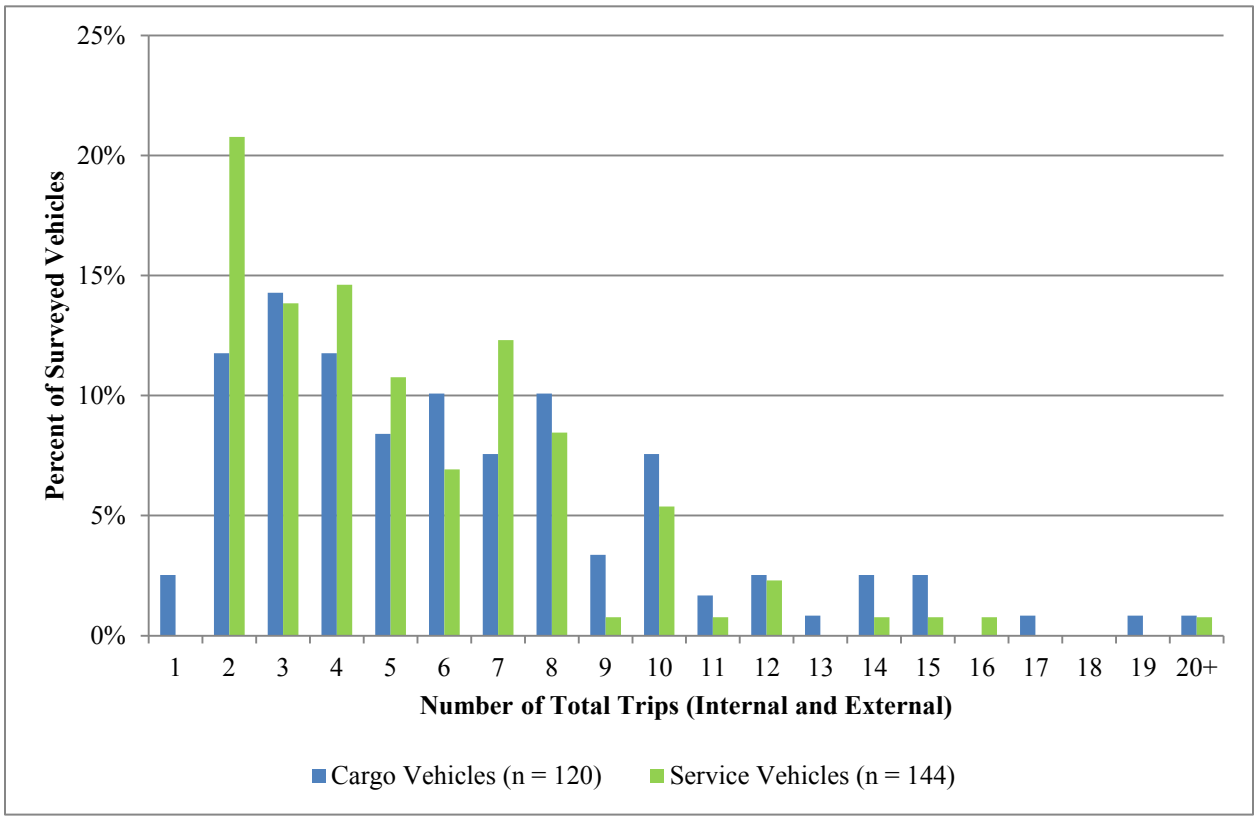

Figure 6. Total Trips per Vehicle.

Figure 7 shows the distribution of internal trips only by vehicle type. Approximately 36 percent of cargo vehicles and 13 percent of service vehicles made no internal trips on the survey day. Approximately 10 percent of cargo vehicles made only one internal trip; while five percent of service vehicles made only one internal trip. The average number of internal trips per day was 3.0 trips for cargo vehicles and 3.5 trips for service vehicles.

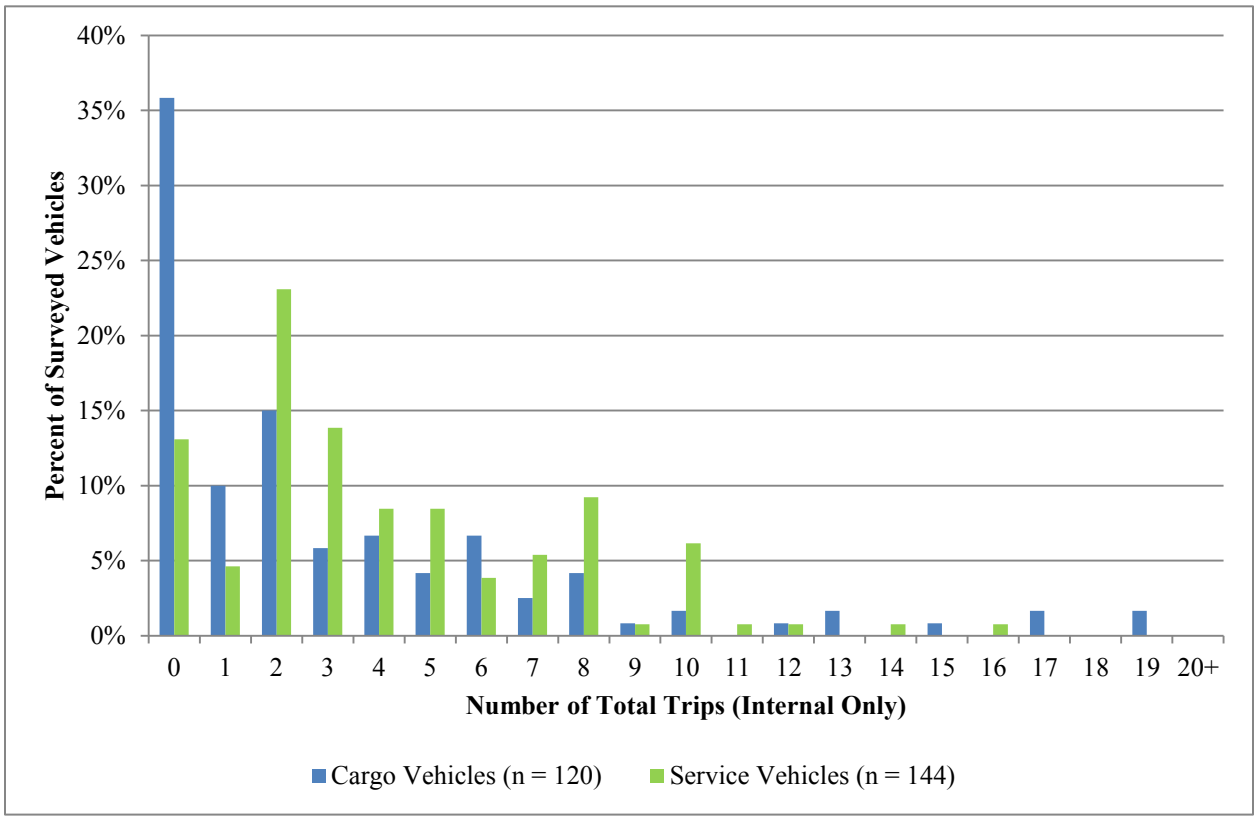

Figure 7. Total Internal Trips per Vehicle.

Trip Characteristics

Information on travel purpose and the type of land use activity where these trips occurred are important in estimating commercial vehicle trip patterns. The analysis of trips presented in this section is based solely on internal trips and does not include external trips.

Table 7 shows the distribution of internal trips by land use type at trip destinations. Approximately 32 percent of the trips made by cargo vehicles traveled to retail locations, followed by 16 percent to residential locations, and 12 percent to construction locations. For service vehicles, nearly 33 percent of the trips traveled to residential locations, followed by nearly 23 percent to office locations, and 19 percent to retail locations.

Table 7. Distribution of Internal Trips by Land Use Type at Trip Destinations.

Land Use	Cargo		Service	
	Number	Percent of Cargo	Number	Percent of Service
Office Building (Non-Government)	25	6.4	123	22.9
Retail/Shopping	124	31.9	103	19.2
Industrial/Manufacturing	31	8.0	19	3.5
Medical/Hospital	30	7.7	21	3.9
Education (< 12th Grade)	5	1.3	7	1.3
Education (College, Trade)	0	0.0	1	0.2
Government Office/Building	6	1.5	32	6.0
Residential	63	16.2	177	33.0
Airport	1	0.3	1	0.2
Intermodal Facility	0	0.0	0	0.0
Warehouse	27	6.9	7	1.3
Distribution Center	27	6.9	3	0.6
Construction Site	47	12.1	33	6.2
Other	0	0.0	6	1.1
Refused/Unknown	3	0.8	3	0.6
Total Trips	**389**	**100.0**	**536**	**100.0**

Table 8 shows the distribution of internal trips by trip purposes at trip destinations. Approximately 44 percent of the cargo vehicle internal trips were for delivery, 25 percent were base, and 13 percent were classified as "pick-up." For trips made by service vehicles, approximately 33 percent were classified as base, 32 percent were classified as service, and 12 percent were sales.

Table 8. Trip Purposes at Destination Locations.

Trip Purpose	Cargo		Service	
	Number	Percent of Cargo	Number	Percent of Service
Base	95	24.5	171	32.8
Maintenance	17	4.4	12	2.3
Driver Needs	11	2.8	60	11.5
Delivery	171	44.2	7	1.3
Pick-Up	51	13.2	6	1.1
Pick-Up and Delivery	5	1.3	0	0.0
Government	4	1.0	10	1.9
Service	25	6.5	169	32.4
Sales	2	0.5	62	11.9
Other	6	1.6	25	4.8
Unknown	0	0.0	0	0.0
Total Trips	**387**	**100.0**	**522**	**100.0**

Cargo Characteristics

Information on the type of cargo being delivered or picked up at each stop, the weight of cargo, and the type of land use where the cargo trip occurred was collected in the Texarkana commercial vehicle survey to examine the movement of commodities within and outside of the study area. The analyses presented in this section are for both internal and external trips made by surveyed cargo vehicles only, and do not include the trips made by service vehicles. The types of cargo in the survey were based on 23 classification types listed in Table 9.

The analysis of cargo trip data examined the types of cargo being transported at trip destinations, the trip purpose, the land use activity at each stop, and the estimated net weight of the cargo being picked up and/or delivered for each trip. Several inconsistencies were observed during the processing and analysis of cargo trip data. There were some trips with full or partial cargo loads that did not report cargo weights, but actually reported the type of cargo being transported. There were some trips that indicated a delivery trip purpose but did not report any cargo weights at drop-off.

Table 9. Cargo Classification Types.

Cargo Type	Cargo Descriptions
1. Farm Products	Livestock, fertilizer, dirt, landscaping, etc.
2. Forest Products	Trees, sod, etc.
3. Marine Products	Fresh fish, seafood, etc.
4. Metals and Minerals	Crude petroleum, natural gas, propane, metals, gypsum, ores, etc.
5. Food, Health, and Beauty Products	Assorted food products, cosmetics, etc.
6. Tobacco Products	Cigarettes, cigars, and chewing tobacco
7. Textiles	Clothing, linens, etc.
8. Wood Products	Lumber, paper, cardboard, wood pulp, etc.
9. Printed Matter	Newspapers, magazines, books, etc.
10. Chemical Products	Soaps, paints, household or industrial chemicals, etc.
11. Refined Petroleum or Coal Products	Gasoline, etc.
12. Rubber, Plastic, and Styrofoam Products	Finished products of rubber, plastic, or Styrofoam
13. Clay, Concrete, Glass, or Stone	Finished products of clay, concrete, glass, or stone
14. Manufactured Goods/Equipment	Miscellaneous products (machinery, appliances, furniture, etc.)
15. Wastes	Waste products including scrap and recyclable materials
16. Miscellaneous Shipments	U.S. mail, U.P.S., Federal Express, and other mixed cargo
17. Hazardous Materials	Hazardous chemicals and substances
18. Transportation	Automobiles and other transport vehicles
19. Empty	Empty (including empty shipping containers)
20. No Cargo Picked Up or Delivered	
96. Other	
98. Unknown	
99. Driver Refused to Answer	

Table 10 shows the distribution of trips by cargo type. Approximately 24 percent of the total cargo vehicle trips cited “no cargo picked up or delivered”, followed by 15 percent transporting food, health, and beauty products, and another 15 percent carrying manufactured goods.

Table 10. Distribution of Trips by Cargo Type at Destinations.

Cargo Type	Number of Trips	% of Total
Farm Products	11	1.4
Forest Products	1	0.1
Marine Products	0	0.0
Metals and Minerals	20	2.6
Food, Health, and Beauty Products	112	14.5
Tobacco Products	0	0.0
Textiles	6	0.8
Wood Products	77	10.0
Printed Matter	2	0.3
Chemical Products	1	0.1
Refined Petroleum or Coal Products	38	4.9
Rubber, Plastic, and Styrofoam Products	55	7.1
Clay, Concrete, Glass, or Stone	65	8.4
Manufactured Goods/Equipment	113	14.6
Wastes	12	1.6
Miscellaneous Shipments	35	4.5
Hazardous Materials	13	1.7
Transportation	8	1.0
No Cargo Picked Up or Delivered	183	23.7
Other	4	0.5
Unknown	9	1.2
Refused	0	0.0
Total Trips with Cargo	**765**	**99.0**
Empty	8	1.0
No Response	4	-
Total Cargo Vehicle Trips	**777**	**100.0**

The commodity grouping scheme used by TxDOT in its Texas Statewide Analysis Model (SAM) was used to simplify the cargo types into 10 commodity groups. The type of place option in the survey was categorized into seven land use categories. Table 11 shows the equivalency between SAM commodity groups and cargo classifications from the survey, while Table 12 shows the land use categories and their corresponding equivalents in the type of place options from the survey. Those items in italics did not have equivalents but were added or grouped together so as not to exclude any trips in the analysis.

Table 11. Equivalency between SAM Commodity Groups and Survey Classifications.

Commodity Group	Survey Cargo Classification
1. Agriculture	Farm Products, Forest Products, and Marine Products
2. Raw Materials	Metals and Minerals, Chemical Products, Refined Petroleum, or Coal Products
3. Food	Food, Health and Beauty Products, and Tobacco Products
4. Textiles	Textiles, Rubber, Plastic, and Styrofoam Products
5. Wood	Wood Products and Printed Matter
6. Building Materials	Clay, Concrete, Glass, or Stone Products
7. Machinery	Manufactured Goods/Equipment
8. Miscellaneous	Wastes, Miscellaneous Shipments
9. Secondary	Unclassified Cargo
10. Hazardous Materials	Hazardous Materials
--- *Transportation*	*Transportation*
--- *Empty*	*Empty*
--- *Unknown*	*Unknown to Driver, Driver Refused to Answer, Other*

Table 12. Equivalency between Land Use Category and Survey Type of Place.

Land Use Category	Type of Place
1. Office	Office Building
2. Retail	Retail/Shopping
3. Industrial	Industrial/Manufacturing
4. Medical	Medical/Hospital
5. Education	Educational (12th grade or less and college, trade, etc.)
6. Government	Government Office/Building
7. Residential	Residential
-- *Other*	*Airport, Inter-Modal Facility, Warehouse, Distribution Center, Construction Site, Other*
-- *Unknown*	*Land Use Category not Provided, Omitted, Driver Refused to Answer*

Table 13 shows the distribution of cargo trips by commodity group and land use type at trip destinations. Nearly 30 percent of the trips traveled to "other" land use types, which were mainly warehouses, distribution centers, and construction sites. By commodity group, approximately 26

percent of the trips were transporting unknown commodities, and about 15 percent were transporting food products. There was no response provided for 6 cargo trips.

Table 13. Cargo Trips by Commodity Group and Land Use Destinations.

Commodity Group	Land Use								Total Trips	% of Total
	Office	Retail	Ind'l	Med	Edu	Gov't	Res	Othr		
Agriculture	1	5	0	0	1	0	4	1	**12**	**1.6**
Raw Materials	2	26	18	0	0	0	1	12	**59**	**7.7**
Food	0	42	1	33	2	0	33	1	**112**	**14.5**
Textiles	0	38	8	1	0	1	0	13	**61**	**7.9**
Wood	2	16	3	1	2	0	12	43	**79**	**10.2**
Building Materials	2	0	23	0	0	0	2	38	**65**	**8.4**
Machinery	2	22	32	1	3	0	17	33	**110**	**14.3**
Miscellaneous	7	8	10	3	2	1	0	16	**47**	**6.1**
Hazardous	5	0	0	1	0	0	6	1	**13**	**1.7**
Transportation	1	1	0	0	0	0	4	2	**8**	**1.0**
Unknown	21	69	14	3	0	6	20	64	**197**	**25.6**
Empty	0	1	0	0	0	0	1	6	**8**	**1.0**
Total*	**43**	**228**	**109**	**43**	**10**	**8**	**100**	**230**	**771**	**100.0**
Percent of Total	**5.6**	**29.6**	**14.1**	**5.6**	**1.3**	**1.0**	**13.0**	**29.8**	**100.0**	**---**

* No data/response provided for six trips.

Figure 8 shows the distribution of trips at destination locations by trip purpose, while Table 14 shows a detailed summary of trips by commodity group and trip purpose. Approximately 47 percent of the total cargo vehicle trips were delivery and 21 percent were base related. Approximately three percent of the total cargo vehicle trips were driver needs.

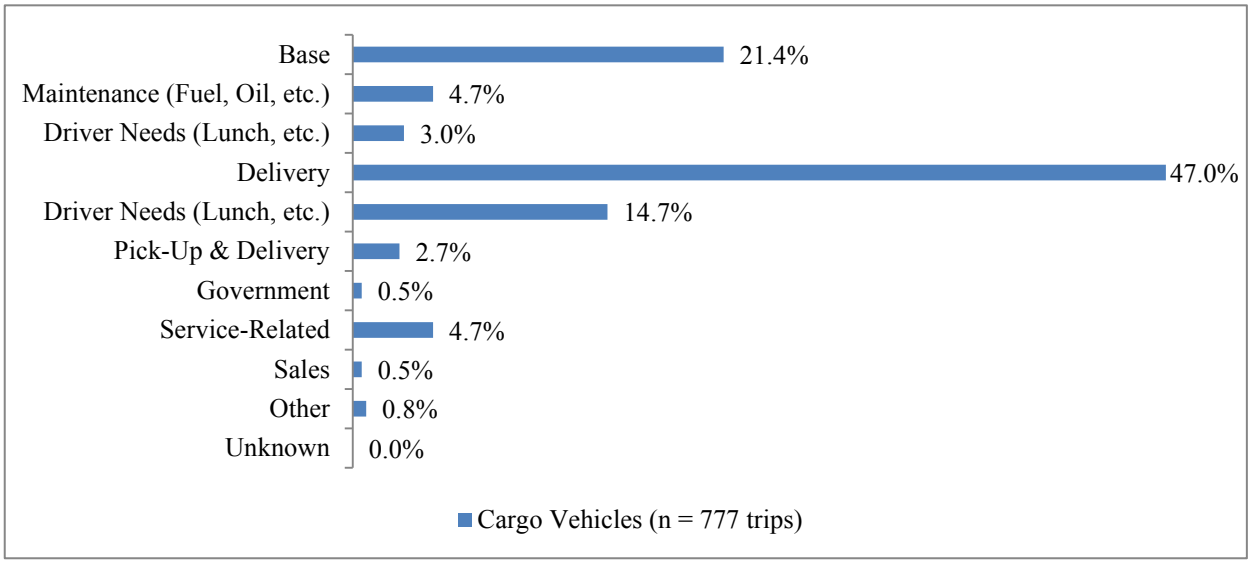

Figure 8. Cargo Trip Purposes at the Trip Destinations.

Table 14. Cargo Trips by Commodity Group and Trip Purpose at the Trip Destinations.

Commodity Group	Trip Purpose										Total Trips	% of Total
	Base	Maint	Driver Need	Deliv	Pick-Up	Pick-Up & Deliv	Govt	Srvc	Sales	Oth		
Agriculture	2	1	1	5	2	1	0	0	0	0	**12**	**1.6**
Raw Materials	10	0	0	41	7	1	0	0	0	0	**59**	**7.6**
Food	8	0	0	92	11	1	0	0	0	0	**112**	**14.5**
Textiles	7	1	0	39	9	4	1	0	0	0	**61**	**7.9**
Wood	19	3	2	42	11	1	0	1	0	0	**79**	**10.2**
Building Materials	1	0	0	34	26	1	3	0	0	0	**65**	**8.4**
Machinery	15	1	1	64	28	4	0	0	0	0	**113**	**14.6**
Miscellaneous	4	1	0	29	8	4	0	0	0	0	**46**	**5.9**
Hazardous	2	0	0	6	3	2	0	0	0	0	**13**	**1.7**
Transportation	0	0	2	1	2	0	0	3	0	0	**8**	**1.0**
Unknown	96	29	16	8	5	2	0	32	4	6	**198**	**25.6**
Empty	2	0	1	3	2	0	0	0	0	0	**8**	**1.0**
Total*	**166**	**36**	**23**	**364**	**114**	**21**	**4**	**36**	**4**	**6**	**774**	**100.0**
Percent of Total	**21.4**	**4.7**	**3.0**	**47.0**	**14.7**	**2.7**	**0.5**	**4.7**	**0.5**	**0.8**	**100.0**	**---**

*No data/response provided for three trips.

The analysis of cargo weights by cargo type provides information on the volume and type of commodities being moved from the time the surveyed cargo vehicle left its base location, began its trip, continued making trips until it reached its destination(s), and returned to its base location. The net cargo weight for each trip was estimated based on the cargo weight being picked-up

and/or being dropped-off, consistent with the reported trip purpose for each stop. There were several cases when cargo types were changed between trips (i.e., reported as empty cargo or food type), even if the same cargo was being transported either for delivery or pick-up. For example, in some cases the driver of the surveyed cargo vehicle reported a different trip purpose during a particular stop (i.e., driver needs - lunch, etc.), which indicated that no cargo was delivered and/or picked-up but the cargo remained in transit. In such cases, the cargo weight from the trip origin should be the net cargo weight at that particular stop or trip destination with its corresponding cargo type. If a delivery occurred during that particular stop, the cargo weight for that particular drop-off should be deducted from the current weight load, and if cargo was picked-up, the cargo weight should be added to the current weight load, thus resulting in an estimated net cargo weight for that particular trip.

Table 15 shows the distribution of average net cargo weight per trip by commodity group and land use type at destination locations and Table 16 shows the distribution by commodity group and trip purpose. Agricultural materials being transported to office sites had the highest average net cargo weight by commodity group and land use at the trip destination. There was only one trip recorded for this commodity and land use combination. Building materials being transported to pick-up and delivery locations had the highest average net cargo weight by commodity group and trip purpose at the trip destination.

Table 15. Average Net Cargo Weight by Commodity Group and Land Use at Trip Destinations.

Commodity Group	Land Use							
	Office	Retail	Ind'l	Med	Edu	Gov't	Res	Other
Agriculture	78,000	6,500	0	0	0	0	35,035	0
Raw Materials	483	5,611	1,857	0	0	0	1,483	5,240
Food	0	463	1,281	5	0	0	6	1
Textiles	0	125	3,182	400	0	2,500	0	3,060
Wood	2,550	175	15,000	45,000	600	0	1,414	3,521
Building Materials	38,970	0	0	0	0	0	36,002	32,678
Machinery	194	1,486	2,422	0	383	0	365	1,565
Miscellaneous	42	60	506	335	663	0	0	11,556
Hazardous	23	0	0	300	0	0	111	62
Transportation	0	0	0	0	0	0	219	0
Unknown	0	652	0	0	0	3,333	75	1,477

Table 16. Average Net Cargo Weight by Commodity Group and Trip Purpose at Trip Destinations.

Commodity Group	Trip Purpose						
	Base Location	Maintenance	Driver Needs	Delivery	Pick-Up	Pick-Up & Delivery	Service
Agriculture	0	0	0	43,628	0	32,500	0
Raw Materials	946	0	0	5,614	0	5,000	0
Food	4	0	0	229	0	10	0
Textiles	25	5,000	0	1,621	0	500	0
Wood	147	16,239	254	5,011	0	5,000	0
Building Materials	0	0	0	38,787	0	61,920	0
Machinery	200	0	0	2,568	0	570	0
Miscellaneous	0	0	0	6,361	0	2,150	0
Hazardous	0	0	0	161	0	88	0
Transportation	0	0	0	875	0	0	0
Unknown	0	1,552	0	9,815	0	34,053	0

Table 17 shows the distribution of cargo trips and net cargo weights at trip destinations by commodity group. Overall, the average net cargo weight (excluding trips with empty cargo) per trip was over 3,600 lbs. Of the classified commodity groups, building materials showed the highest average net cargo weight of over 21,400 lbs. per trip. Food was the most frequently transported of the known commodity groups, with average net cargo weights of nearly 200 lbs. per trip.

Table 17. Cargo Trips and Net Cargo Weight by Commodity Group at Trip Destinations.

Commodity Group	Total Cargo Trips	Total Net Cargo Weight (lbs.)	Number of Trips*	Average Net Cargo Weight (lbs.)*
Agriculture	12	250,640	12	20,887
Raw Materials	59	244,639	59	4,146
Food	112	21,102	112	188
Textiles	61	72,890	61	1,195
Wood	79	267,484	79	3,386
Building Materials	65	1,391,691	65	21,411
Machinery	110	169,567	110	1,542
Miscellaneous	47	193,066	47	4,108
Hazardous	13	1,141	13	88
Transportation	8	875	8	109
Unknown	197	161,063	197	818
Empty	8	15,000	0	0
No Response	**6**	**-**	**-**	**-**
Total	**777**	**2,789,158**	**763**	**3,656**

* Excluding trips with empty cargo.

Table 18 shows the number of trips and net cargo weights at trip destinations by land use type. "Other" land use sites showed the highest average net cargo weight of over 8,000 lbs. per trip, followed by office sites with an average net cargo weight of nearly 3,800 lbs. per trip.

Table 18. Cargo Trips and Net Cargo Weights by Land Use at Trip Destinations.

Land Use	Total Cargo Trips	Total Net Cargo Weight (lbs.)	Number of Trips*	Average Net Cargo Weight (lbs.)*
Office	43	162,803	43	3,786
Retail	228	283,595	227	1,244
Industrial	109	187,721	109	1,722
Medical	43	46,855	43	1,090
Education	10	3,673	10	367
Government	8	22,500	8	2,813
Residential	100	240,045	99	2,400
Other	230	1,841,966	224	8,009
No Response	**6**	**-**	**-**	**-**
Total	**777**	**2,789,158**	**763**	**3,656**

* Excluding trips with empty cargo.

Table 19 shows the distribution of cargo trips and net cargo weights by trip purpose. Pick-up and delivery trip purpose had the highest average net weight of over 8,800 lbs. per trip.

Table 19. Cargo Trips and Net Cargo Weights by Trip Purpose at Trip Destinations.

Trip Purpose	Total Cargo Trips	Total Net Cargo Weight (lbs.)	Number of Trips*	Average Net Cargo Weight (lbs.)*
Base	166	15,466	164	94
Maintenance	36	98,716	36	2,742
Driver Needs	23	508	22	23
Delivery	364	2,506,023	361	6,942
Pick-Up	114	0	112	0
Pick-Up & Delivery	21	185,588	21	8,838
Government	4	13,500	4	3,375
Service	36	0	36	0
Sales	4	0	4	0
Other	6	0	6	0
Unknown	0	0	0	0
No Response	**3**	**-**	**-**	**-**
Total	**777**	**2,819,801**	**766**	**3,681**

* Excluding trips with empty cargo.

Trip Length

Odometer readings at the beginning and end of the trip are useful in estimating travel distances for external and intra-zonal trips. The Texarkana commercial vehicle survey, however, only provided odometer mileage on each vehicle for the beginning of the trip and not for the end of the trip. Because this incomplete information makes odometer readings not particularly useful for trip length measurement in the analysis, network matrices available for the study area were used to estimate trip lengths. The network matrices provide travel distance and time estimates from one zone to all other zones in the Texarkana study area. Since each reported trip in the survey was coded with a traffic analysis zone (TAZ) number assigned to the study area, it was then possible to estimate the trip length based on the distance provided in the network matrix. Figure 9 shows the TAZ boundary and base locations of surveyed vehicles within the Texarkana study area, while Figure 10 shows the origin and destination locations of trips made by the surveyed vehicles. Any trip that had at least one trip outside of the Texarkana study area was considered an external trip.

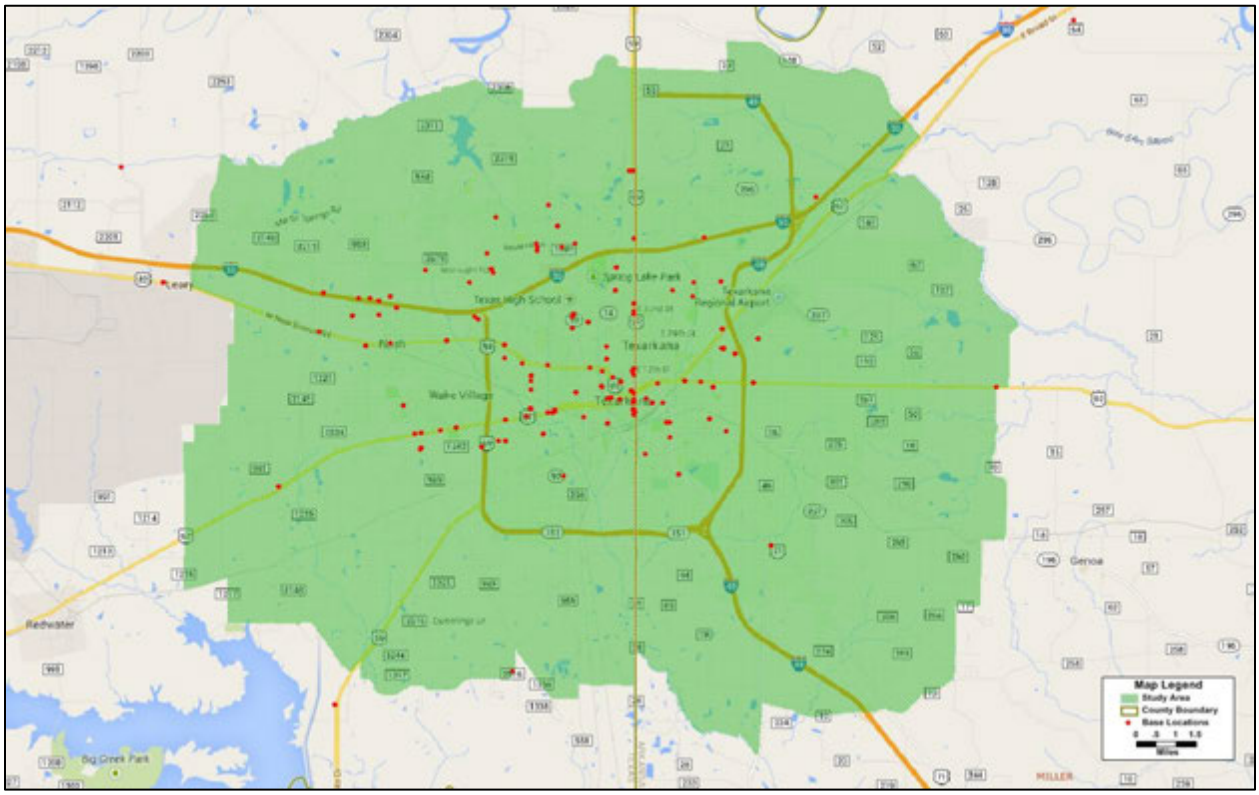

Figure 9. TAZ Boundary and Base Locations of Surveyed Commercial Vehicles.

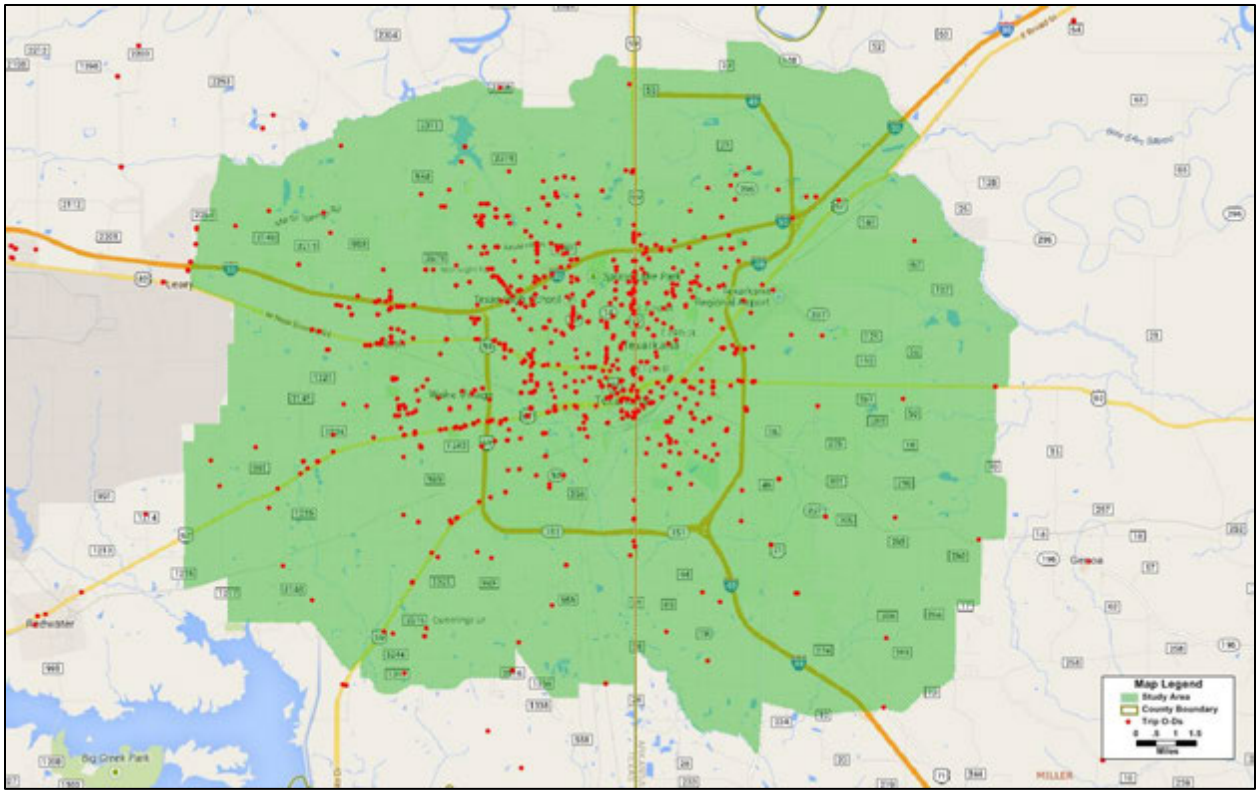

Figure 10. Trip Origins and Destinations of Surveyed Commercial Vehicles.

The results presented in this section pertain to trip length characteristics for 903 inter-zonal trips only. Table 20 shows the trip length frequency distribution (TLFD), grouped at five-mile intervals, while Figure 11 and Table 21 show the ungrouped TLFD. Approximately 67 percent of the cargo vehicles and 69 percent of the service vehicle trips had trip lengths of less than five miles. Additionally, 25 percent of the cargo vehicle trips and 29 percent of the service vehicles had trip lengths between six miles and 10 miles. The longest trip lengths reported by cargo and service vehicles were 16 miles and 13 miles, respectively.

Table 20. Trip Length Frequency Distribution (Grouped Interval).

Trip Length (miles)	Cargo		Service		All Vehicles	
	# of Trips	% of Total	# of Trips	% of Total	# of Trips	% of Total
Less than 5	236	67.2	382	69.2	618	68.4
6 to 10	89	25.4	161	29.2	250	27.7
11 to 15	25	7.1	9	1.6	34	3.8
16 to 20	1	0.3	0	0.0	1	0.1
21 to 25	0	0.0	0	0.0	0	0.0
26 to 30	0	0.0	0	0.0	0	0.0
31 to 35	0	0.0	0	0.0	0	0.0
More than 35	0	0.0	0	0.0	0	0.0
Total	**351**	**100.0**	**552**	**100.0**	**903**	**100.0**

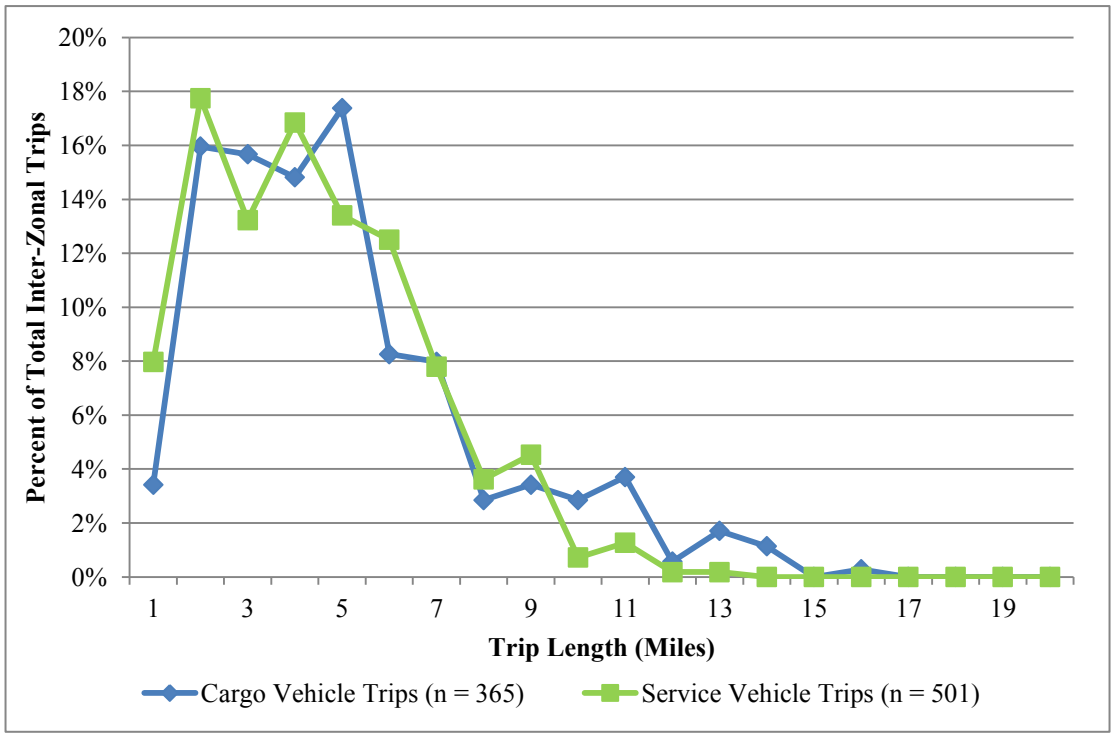

Figure 11. Surveyed Commercial Vehicle Trips TLFD.

Table 21. Trip Length Frequency Distribution (Ungrouped).

Trip Length (miles)	Cargo Vehicles		Service Vehicles		All Vehicles	
	# of Trips	% of Total	# of Trips	% of Total	# of Trips	% of Total
1	12	3.4	44	8.0	56	6.2
2	56	16.0	98	17.8	154	17.1
3	55	15.7	73	13.2	128	14.2
4	52	14.8	93	16.8	145	16.1
5	61	17.4	74	13.4	135	15.0
6	29	8.3	69	12.5	98	10.8
7	28	8.0	43	7.8	71	7.8
8	10	2.8	20	3.6	30	3.3
9	12	3.4	25	4.5	37	4.1
10	10	2.8	4	0.7	14	1.6
11	13	3.7	7	1.3	20	2.2
12	2	0.6	1	0.2	3	0.3
13	6	1.7	1	0.2	7	0.8
14	4	1.1	0	0.0	4	0.4
15	0	0.0	0	0.0	0	0.0
16	1	0.3	0	0.0	1	0.1
17	0	0.0	0	0.0	0	0.0
18	0	0.0	0	0.0	0	0.0
19	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
Total	**351**	**100.0**	**552**	**100.0**	**903**	**100.0**

Table 22 shows the average trip length to destinations by land use type for cargo and service vehicle trips. Overall, the average distance per trip traveled by the surveyed vehicles was 4.2 miles, with cargo vehicles and service vehicles averaging 4.6 miles and 3.9 miles, respectively. The most number of trips by cargo vehicles occurred at retail land use types, with an average trip length of 4.1 miles, followed by "other" sites with average trip length of 5.5 miles. For service vehicles, the highest frequency of trips occurred at residential land use types, with an average trip length of 3.8 miles. Over half (53 percent) of the trips made by service vehicles occurred at either retail or residential land use sites.

Table 22. Average Trip Length to Destinations by Land Use Type.

Land Use	Cargo			Service			All Vehicles		
	Number of Trips	Total Trip Length (miles)	Avg. Trip Length (miles)	Number of Trips	Total Trip Length (miles)	Avg. Trip Length (miles)	Number of Trips	Total Trip Length (miles)	Avg. Trip Length (miles)
Office	20	76	3.8	120	511	4.3	140	587	4.2
Retail	111	452	4.1	110	413	3.8	221	865	3.9
Industrial	24	132	5.5	19	69	3.6	43	201	4.7
Medical	30	85	2.8	22	54	2.5	52	139	2.7
Education	5	14	2.8	9	28	3.2	14	42	3.0
Government	6	32	5.3	34	133	3.9	40	165	4.1
Residential	57	271	4.8	183	696	3.8	240	967	4.0
Other	98	535	5.5	55	259	4.7	153	794	5.2
Total	**351**	**1,597**	**4.6**	**552**	**2,163**	**3.9**	**903**	**3,760**	**4.2**

Table 23 shows the average trip length to destinations by commodity group for trips made by cargo vehicles only. Approximately 30 percent of the trips cited the commodity group "unknown," with an average trip length of 4.1 miles per trip. The food commodity group was the next most frequently transported commodity group, with an average trip length of 3.5 miles per trip. The overall average trip length for cargo vehicles was 4.4 miles.

Table 23. Average Trip Length to Destinations by Commodity Group.

Commodity Group	Cargo Vehicles		
	Number of Trips	Total Trip Length (miles)	Average Trip Length (miles)
Agriculture	2	8	3.9
Raw Materials	5	20	3.9
Food	82	286	3.5
Textiles	31	158	5.1
Wood	39	234	6.0
Building Materials	26	79	3.0
Machinery	49	266	5.4
Miscellaneous	13	50	3.9
Hazardous	4	24	5.9
Transportation	4	19	4.7
Unknown	108	445	4.1
Empty	2	8	3.9
Total	**365**	**1,597**	**4.4**

Travel Time and Speed

The Texarkana commercial vehicle survey provided travel logs on the arrival and departure times for each trip made by the surveyed commercial vehicles. The travel logs can be compared with the network travel time matrix table available for the study area. However, some of the reported travel logs had missing departure or arrival times, which rendered them unreliable in generating accurate estimates. Hence, as has been done in the estimation of trip lengths, travel time estimates were generated from the network travel time matrix table available for the Texarkana study area, and travel speed estimates were derived from the estimated trip lengths.

Table 24 shows the travel time frequency distribution of inter-zonal trips, grouped at five-mile intervals, while Figure 12 and Table 25 show the ungrouped TLFD. Approximately 30 percent of the trips made by cargo vehicles were less than five minutes, 47 percent were between 6-and-10 minutes, and 15 percent were between 11-and-15 minutes. For service vehicles, approximately 35 percent of the trips were less than five minutes, 50 percent were between 6-and-10 minutes, and 13 percent were between 11-and-15 minutes. The longest duration of travel time for cargo vehicles was 23 minutes, while the longest travel duration for service vehicles was 19 minutes.

Table 24. Travel Time Frequency Distribution (Grouped Interval).

Travel Time (minutes)	Cargo		Service		All Vehicles	
	# of Trips	% of Total	# of Trips	% of Total	# of Trips	% of Total
Less than 5	104	29.6	191	34.6	295	32.7
6 to 10	166	47.3	275	49.8	441	48.8
11 to 15	54	15.4	73	13.2	127	14.1
16 to 20	24	6.8	13	2.4	37	4.1
21 to 25	3	0.9	0	0.0	3	0.3
More than 25	0	0.0	0	0.0	0	0.0
Total	**351**	**100.0**	**552**	**100.0**	**903**	**100.0**

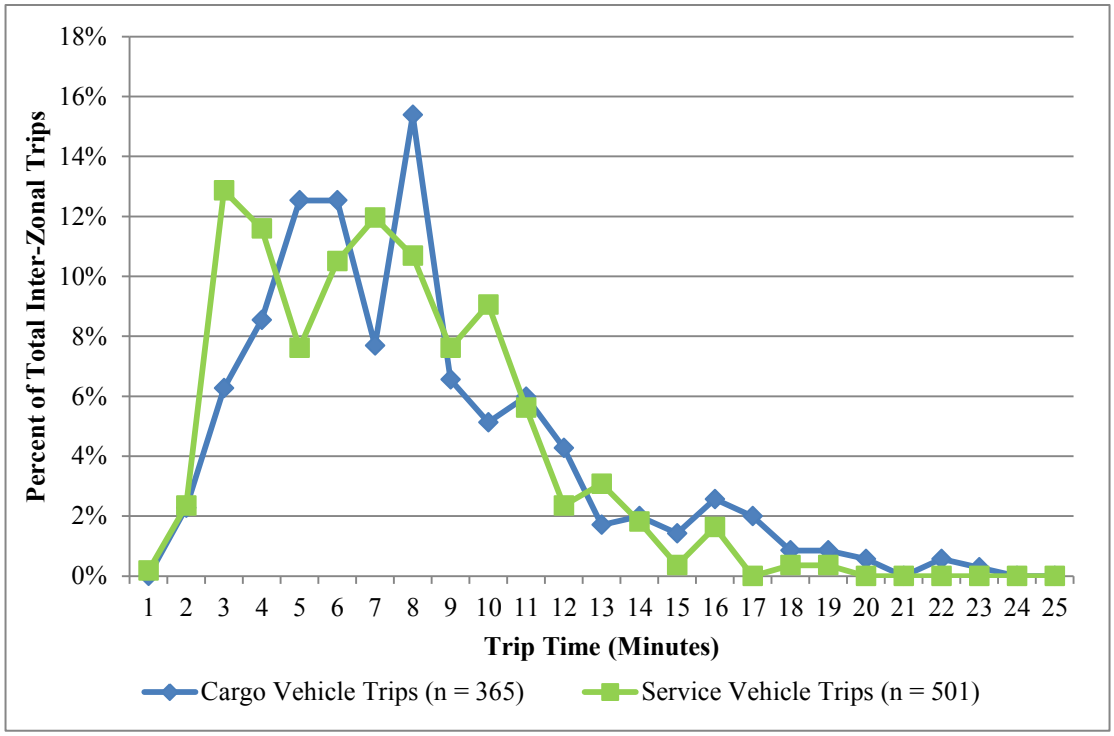

Figure 12. Surveyed Commercial Vehicle Trips Travel Time.

Table 25. Travel Time Frequency Distribution (Ungrouped).

Travel Time (minutes)	Cargo Vehicles		Service Vehicles		All Vehicles	
	# of Trips	% of Total	# of Trips	% of Total	# of Trips	% of Total
1	0	0.0	1	0.2	1	0.1
2	8	2.3	13	2.4	21	2.3
3	22	6.3	71	12.8	93	10.3
4	30	8.5	64	11.6	94	10.4
5	44	12.5	42	7.6	86	9.5
6	44	12.5	58	10.5	102	11.3
7	27	7.7	66	12.0	93	10.3
8	54	15.4	59	10.6	113	12.5
9	23	6.6	42	7.6	65	7.2
10	18	5.1	50	9.1	68	7.5
11	21	6.0	31	5.6	52	5.8
12	15	4.3	13	2.4	28	3.1
13	6	1.7	17	3.1	23	2.5
14	7	2.0	10	1.78	17	1.9
15	5	1.4	2	0.4	7	0.8
16	9	2.6	9	1.6	18	2.0
17	7	2.0	0	0.0	7	0.8
18	3	0.8	2	0.4	5	0.6
19	3	0.8	2	0.4	5	0.6
20	2	0.6	0	0.0	2	0.2
21	0	0.0	0	0.0	0	0.0
22	2	0.6	0	0.0	2	0.2
23	1	0.3	0	0.0	1	0.1
24	0	0.0	0	0.0	0	0.0
25	0	0.0	0	0.0	0	0.0
Total	**351**	**100.0**	**552**	**100.0**	**903**	**100.0**

Table 26 shows the average travel time and speed to destinations by land use for cargo and service vehicles. Overall, the average travel time for all surveyed vehicles was 7.0 minutes, with cargo vehicles averaging 7.6 minutes and service vehicles averaging 6.7 minutes. By land use types, trips made by cargo vehicles to government sites have the longest average travel duration of 9.6 minutes, with an average travel speed of 33.0 mph. For service vehicles, trips to "other" land use types had the highest average travel time of 8.0 minutes and an average travel speed of 35.2 mph.

Table 26. Average Travel Time and Speed to Destinations by Land Use Type.

Land Use	Cargo			Service			All Vehicles		
	Number of Trips	Avg. Travel Time (min)	Avg. Travel Speed (mph)	Number of Trips	Avg. Travel Time (min)	Avg. Travel Speed (mph)	Number of Trips	Avg. Travel Time (min)	Avg. Travel Speed (mph)
Office	20	6.3	36.2	120	7.0	36.3	140	6.9	36.3
Retail	111	6.8	36.1	110	6.3	35.7	221	6.5	35.9
Industrial	24	8.9	37.1	19	6.9	31.8	43	8.0	35.1
Medical	30	5.2	32.7	22	4.3	34.2	52	4.8	33.3
Education	5	5.5	31.0	9	5.4	34.9	14	5.4	33.5
Government	6	9.6	33.0	34	6.7	34.9	40	7.2	34.5
Residential	57	8.0	35.6	183	6.6	34.6	240	6.9	34.9
Other	98	8.9	36.8	55	8.0	35.2	153	8.6	36.2
Unknown	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
Total	**351**	**7.6**	**36.0**	**552**	**6.7**	**35.2**	**903**	**7.0**	**35.5**

Table 27 shows the average travel time and speed to destinations by commodity group for trips made by cargo vehicles only. Trips transporting wood products had the longest average trip duration of 9.3 minutes, with an average travel speed of 38.8 mph. Of the known commodity groups, food products had the highest number of trips, with an average travel time of 6.1 minutes and an average travel speed of 34.4 mph.

Table 27. Average Travel Time and Speed to Destinations by Commodity Group.

Commodity Group	Cargo Vehicles		
	Number of Trips	Average Travel Time (minutes)	Average Travel Speed (mph)
Agriculture	2	6.8	34.0
Raw Materials	5	6.7	35.0
Food	82	6.1	34.4
Textiles	31	8.3	36.8
Wood	39	9.3	38.8
Building Materials	26	5.1	35.3
Machinery	49	8.8	37.1
Miscellaneous	13	6.6	35.1
Hazardous	4	9.2	38.5
Transportation	4	7.7	36.2
Unknown	108	7.1	34.9
Empty	2	6.1	38.6
Total	**365**	**7.3**	**36.0**

Trip Tours

The analyses of trip tours show the amount of circuitous travel undertaken by commercial vehicles in the study area. Trip tours are defined as a combination (or chaining) of trips in which a vehicle leaves and returns to a common point, typically its base location. However, those cases where a vehicle did not report a base location (i.e., all of the reported trips were non-base) were considered on a case-by-case basis. In cases where the beginning and ending non-base zone were the same, a tour was considered to be made. In a handful of cases where only non-base trips were reported, the trip tour was determined to have an open start or end, with a trip tour occurring as well.

To accurately analyze trip tours, external trips had to be included in the analysis. This is done because it is possible for trip tours to begin within the study area, then travel outside the study area, and then end or return to the study area. Therefore, to exclude external trips in the analysis could result in not capturing those trips that occur outside the study area that occur within the trip tour.

There were 2,109 trips observed in the Texarkana commercial vehicle survey area. Each trip in the survey provided information on whether or not the origin of the trip was the vehicle's base location. This served as the basis for determining if the trip was a base trip or a non-base trip. A base trip was defined as when either trip ends (origin or destination) began or ended at the base location. If neither trip end was at the base location, then the trip was considered as a non-base trip. Such instances were treated separately from those vehicles with at least one trip involving a base, in determining whether the trip tour could be considered "all open," "completely closed," "before a closed tour," or "after a closed tour." Rather than simply labeling such trips as "all open," each case was considered individually. If the trips began or ended in the same zone number, the trips for this vehicle were classified as "completely closed." Similar logic was used in determining if a "trip before the tour" or a "trip after the tour" had occurred.

As Table 28 shows, approximately 54 percent of the total trips generated by cargo vehicles were base trips and 46 percent were non-base trips. For trips made by service vehicles, 56 percent were base trips and 44 percent were non-base trips.

Table 28. Base and Non-Base Trips.

Trip Type	Cargo Vehicles		Service Vehicles		All Vehicles	
	Number of Trips	Percent of Total	Number of Trips	Percent of Total	Number of Trips	Percent of Total
Base	417	53.7	391	56.0	808	54.8
Non-Base	360	46.3	307	44.0	667	45.2
Total	**777**	**100.0**	**698**	**100.0**	**1,475**	**100.0**

Table 29 shows the distribution of trip tours for cargo and service vehicles. There were 379 trip tours generated by 218 vehicles making at least one trip tour. Cargo vehicles made 205 tours and service vehicles produced 174 tours. The number of tours varied from 1-to-8 tours for cargo vehicles, and 1-to-6 tours for service vehicles. Approximately 60 percent of the cargo vehicles and 64 percent of the service vehicles (that made trip tours) made only one trip tour. For those cargo and service vehicles making only one trip tour, they averaged 5.4 trips and 4.1 trips within the tour, respectively. For all vehicles combined, the average number of tours per vehicle was 1.7 and the average number of trips per tour was 3.4.

Table 29. Trip Tours per Vehicle.

Cargo Vehicles				
Total Number of Trip Tours	**Number of Vehicles**	**Number of Tours**	**Number of Trips**	**Average Trips per Tour**
1	64	64	348	5.4
2	18	36	122	3.4
3	8	24	56	2.3
4	7	28	74	2.6
5	5	25	52	2.1
6	1	6	17	2.8
7	2	14	28	2.0
8	1	8	19	2.4
Cargo Total	**106**	**205**	**716**	**3.5**
Service Vehicles				
Total Number of Trip Tours	**Number of Vehicles**	**Number of Tours**	**Number of Trips**	**Average Trips per Tour**
1	72	72	296	4.1
2	29	58	177	3.1
3	5	15	36	2.4
4	2	8	18	2.3
5	3	15	31	2.1
6	1	6	12	2.0
Service Total	**112**	**174**	**570**	**3.3**
Grand Total	**218**	**379**	**1,286**	**3.4**

The analyses of trip tours also involved counting the number of non-base trips, external trips, inter-zonal trips, and intra-zonal trips within trip tours to determine the total amount and types of travel that occur during the course of the tour. There were 1,286 trips observed within the total 379 trip tours. For all vehicles, 456 were external trips (35 percent), 776 were inter-zonal trips (60 percent), and 54 were intra-zonal trips (5 percent). Table 30 shows the distribution of these trips for cargo and service vehicles.

Table 30. External, Inter-Zonal, and Intra-Zonal Trips within Trip Tours.

No. of Trip Tours	External		Inter-Zonal		Intra-Zonal		Total Trips	
	Cargo Vehicles	Service Vehicles	Cargo Vehicles	Service Vehicles	Cargo Vehicles	Service Vehicles	Cargo Vehicles	Service Vehicles
1	206	77	130	208	12	11	348	296
2	61	21	61	145	0	11	122	177
3	23	6	29	25	4	5	56	36
4	12	0	58	18	4	0	74	18
5	24	2	28	28	0	1	52	31
6	0	0	17	6	0	6	17	12
7	24	0	4	0	0	0	28	0
8	0	0	19	0	0	0	19	0
Total	**350**	**106**	**346**	**430**	**20**	**34**	**716**	**570**

Table 31 shows the number of non-base trips within trip tours separately since non-base trips are not mutually exclusive of the other trip types (i.e., a non-base trip may also be an inter-zonal or external trip).

Table 31. Non-Base Trips within Trip Tours.

No. of Trip Tours	Non-Base Trips within Trip Tours			Total Trips within Trip Tours					
	Cargo Vehicles	Service Vehicles	All Vehicles	Cargo Vehicles	Percent of Total	Service Vehicles	Percent of Total	All Vehicles	Percent of Total
1	220	150	370	348	48.6	296	51.9	644	50.1
2	50	64	114	122	17.0	177	31.1	299	23.2
3	10	8	18	56	7.8	36	6.3	92	7.2
4	20	2	22	74	10.3	18	3.2	92	7.2
5	2	2	4	52	7.3	31	5.4	83	6.4
6	5	1	6	17	2.4	12	2.1	29	2.3
7	0	0	0	28	3.9	0	0.0	28	2.2
8	3	0	3	19	2.7	0	0.0	19	1.4
Total	**310**	**227**	**537**	**716**	**100.0**	**570**	**100.0**	**1,286**	**100.0**

Figure 13 and Figure 14 show the percentage distribution of non-base trips, external trips, inter-zonal trips, and intra-zonal trips within trip tours for cargo vehicles and service vehicles, respectively.

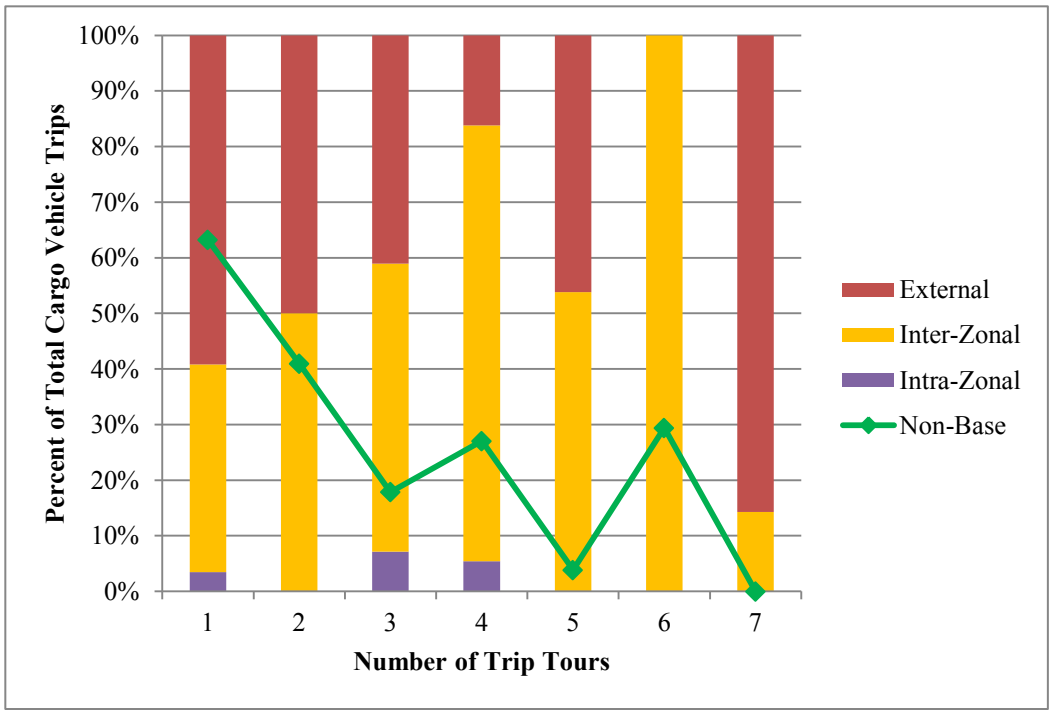

Figure 13. Cargo Vehicle Trips within Trip Tours by Trip Type.

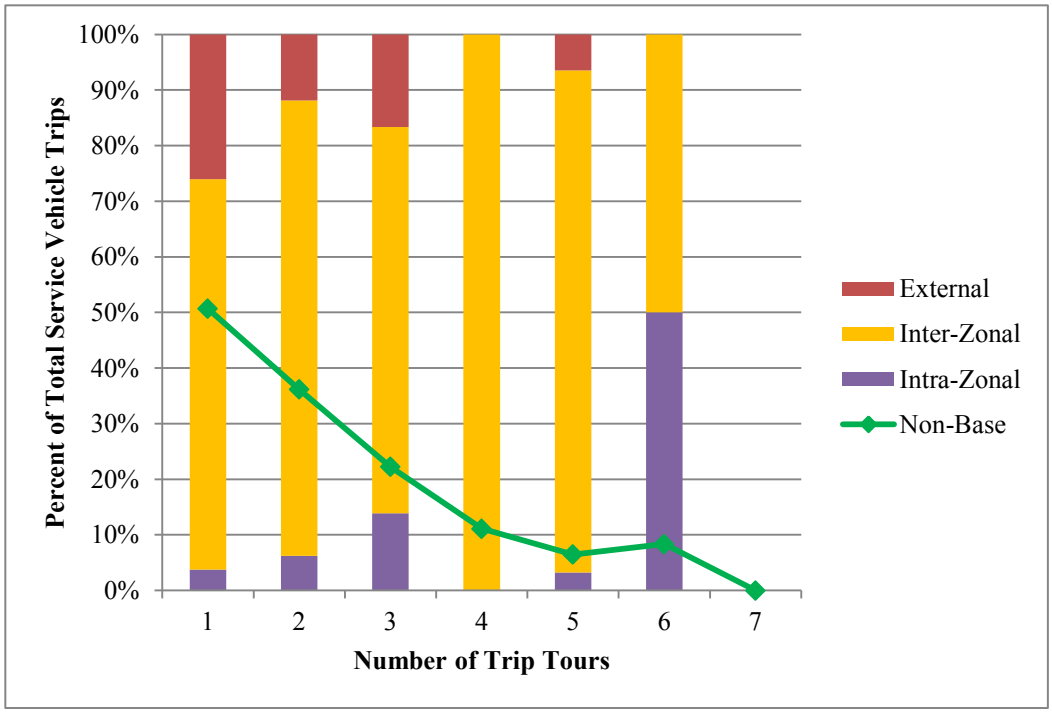

Figure 14. Service Vehicle Trips within Trip Tours by Trip Type.

The analyses of trip tours involved counting all the trips that began at the base location until the vehicle returned to its base location. Those trip chains that did not begin and/or end at their base location, as well as those that only went to the base one time on the survey day, were considered open tours (except in the case of all non-base trips). In the case of non-base trips, if the trips were determined to contain completely closed tours under the criteria described earlier, they were labeled as completely closed tours. Due to the number of trips that were made in open tours, a review of when these trips occurred was performed. Table 32 provides an overview of when trips that are not part of tours were made relative to trip tours. Slightly over 2 percent of the trips made in an open tour (that contained a tour) by cargo and service vehicles combined were before the first trip tour or after the last completed trip tour.

Table 32. Summary of Open Tour Trips.

Trip Type	Cargo		Service		All Vehicles	
	# of Trips	% of Total	# of Trips	% of Total	# of Trips	% of Total
Before Start of First Tour	1	0.1	10	1.4	11	0.7
After End of Last Tour	8	1.0	18	2.6	26	1.8
Only Open	49	6.3	97	13.9	146	9.9
Within Closed	717	92.6	573	82.1	1,290	87.6
Total*	**775**	**100.0**	**698**	**100.0**	**1,473**	**100.0**
No Tours	11	1.4	18	2.6	29	2.0

*Total does not include the "No Tours" category.

Survey Expansion

The expansion of commercial vehicle survey data is conducted in an indirect manner. In typical travel surveys, an estimate of the population being sampled is known and data are then expanded to represent that population. In the case of commercial vehicle surveys, the population of vehicles operating in the study area is unknown. Vehicle registration data are not considered a viable basis to estimate the number of commercial vehicles in the study area because other vehicles operating in the area may be registered in neighboring counties. However, in the Texarkana commercial vehicle survey analysis, information on registered trucks has been included to show how the survey data compare with existing vehicle registration data.

The methodology currently used to expand commercial vehicle survey data is based on vehicle miles of travel (VMT) estimates from the Highway Performance Monitoring System (HPMS), and vehicle classification counts by functional classification for the study area. In essence, an estimate of the commercial VMT is developed from the HPMS data and is then used to expand the VMT observed from sampled commercial vehicles. HPMS data contain annual average daily traffic (AADT) estimates of the total VMT by functionally-classified facilities such as freeways, arterials, collectors, and local roadways. Since AADT includes weekend traffic, a correction factor is applied to the data to obtain average weekday VMT by functional classification. Table 33 provides the adjusted 2013 HPMS VMT estimates for the Texarkana study area.

Table 33. 2013 HPMS Estimates of Weekday VMT in the Texarkana Study Area.

Functional Classification	Total Weekday VMT
Freeway	819,805
Arterial	1,161,316
Collector	371,412
Local	56,420
Total	**2,408,953**

The percentages of commercial and non-commercial vehicles by functional classification were determined by using vehicle classification counts for the Texarkana area obtained from TxDOT. The percentage of commercial vehicles for internal sites for each functional classification were combined with the corresponding percentage for external sites based on the percentage of regional VMT estimated as external travel.

Table 34 provides the internal, external, and weighted percentages of commercial and non-commercial vehicles by functional classification. The weighted percentages were applied to the HPMS estimated weekday VMT shown in Table 33 to estimate the total commercial and non-commercial VMT. Table 35 shows the estimated VMT for commercial and non-commercial vehicles.

Table 34. Percentage of Commercial and Non-Commercial Vehicles by Functional Classification.

Functional Classification	Percent of Commercial Vehicles			Percent of Non-Commercial Vehicles		
	Internal Sites (56%)	External Sites (44%)	Weighted Average	Internal Sites (56%)	External Sites (44%)	Weighted Average
Freeway	28	36	32	72	64	68
Arterial	7	23	14	93	77	86
Collector	3	26	13	97	74	87
Local	2	N/A	2	98	N/A	98

Table 35. Estimated VMT for Commercial and Non-Commercial Vehicles.

Functional Classification	Commercial VMT	Non-Commercial VMT	Total VMT
Freeway	259,313	560,492	819,805
Arterial	160,311	1,001,005	1,161,316
Collector	49,043	322,369	371,412
Local	1,128	55,292	56,420
Total	**469,795**	**1,939,158**	**2,408,953**

The total commercial VMT of 469,795 miles represents all commercial vehicles that traveled within the Texarkana study area. To properly expand the survey data and determine the total internal commercial vehicle trips generated in the study area, external VMT estimates had to be subtracted from the total commercial VMT. The external commercial VMT was estimated to be 165,147 miles. Therefore, the internal commercial VMT estimate was 304,648 miles.

The total internal VMT observed from the commercial vehicle survey was 3,633 miles, of which 1,679 miles were cargo VMT and 1,954 miles were service VMT. This estimate was based on 866 inter-zonal trips (365 cargo vehicle trips and 501 service vehicle trips), multiplied by the average trip length (4.6 miles for cargo and 3.9 miles for service vehicles). The total internal commercial VMT (304,648 miles) represented all commercial vehicles and is not distinguished by cargo or service vehicles. Based on the vehicle classification counts conducted in the study area, approximately 36 percent of the commercial vehicles belonged to Class 5 (two-axle, six-tire, single unit trailers) through Class 13 (seven or more axle multi-trailers) and were assumed as cargo transport vehicles. Approximately 64 percent of the commercial vehicles belonged to

Class 3 (pick-up, van, or two-axle, four-tire, single unit trailers) and Class 4 (buses) and were assumed as service vehicles. Therefore, to establish the VMT estimates by commercial cargo and service types, it was deemed reasonable to apply these percentages to the total internal commercial VMT. The resulting VMT estimates were 110,289 miles for cargo vehicles and 194,359 miles for service vehicles.

An expansion factor was developed based on the quotient between total internal VMT and observed internal VMT (from the survey) for each commercial vehicle type. The expansion factors (65.69 for cargo vehicles and 99.47 for service vehicles) were then multiplied by the observed number of inter-zonal trips to estimate the total vehicle trips. The resulting inter-zonal trip estimates were approximately 23,976 cargo vehicle trips and 49,836 service vehicle trips. Additionally, 5,058 intra-zonal trips (1,576 cargo trips and 3,482 service trips) were made, bringing the total number of internal commercial vehicle trips to 78,870. Based on the average number of inter-zonal trips per day of 3.04 trips for cargo vehicles and 3.48 trips for service vehicles, 23,725 commercial vehicles (8,401 cargo vehicles and 15,325 service vehicles) were estimated to be operating within the Texarkana study area on a daily basis. Table 36 provides a summary of key results from the Texarkana commercial vehicle survey and data expansion.

Table 36. Key Survey Results and Expanded Trip and VMT Data.

Indicator	Cargo Vehicles	Service Vehicles	All Vehicles
Sample Size	120	144	264
Total Inter-Zonal Trips	365	501	866
Total Intra-Zonal Trips	24	35	59
Total Internal Trips	389	536	925
Total External Trips	388	162	550
Total Internal and External Trips	777	698	1,475
Average Total Trips per Vehicle	6.5	4.8	5.6
Average Total Internal Trips per Vehicle*	3.2	3.7	3.5
Average Trip Length	4.6	3.9	4.2
Observed Internal VMT	1,679	1,954	3,633
Total Internal Commercial VMT	110,289	194,359	304,648
Survey Expansion Factor	65.69	99.47	83.86
Total Expanded Inter-Zonal Commercial Vehicle Trips	23,976	49,836	73,812
Total Expanded Intra-Zonal Commercial Vehicle Trips	1,576	3,482	5,058
Total Expanded Commercial Vehicle Trips	25,552	53,317	78,869
Number of Commercial Vehicles Operating on a Daily Basis	8,401	15,325	23,726
Attraction Rate to Households	--	--	0.558

*Based on internal trips of 264 surveyed commercial vehicles (120 cargo vehicles and 144 service vehicles).

One final calculation was the determination of the commercial vehicle attraction rate to households. In the survey, approximately 25 percent of the trips went to residential land use types. This percentage was applied to the total, expanded commercial vehicle trips within the study area to obtain an estimated 20,467 trips to residential locations. The residential trip estimate was divided by the estimated number of households in the Texarkana area (36,655) to obtain an attraction rate of 0.558.

SURVEY SUMMARY

This section provides a summary of vehicle and trip characteristics of 264 commercial vehicles that participated in the 2013 Texarkana commercial vehicle survey. Based on the results from the survey, significant differences as well as similarities on travel characteristics were observed between cargo vehicles and service vehicles.

The average vehicle age for cargo vehicles was 6.9 years compared to 7.6 years for service vehicles. The odometer readings reported by cargo vehicles indicated an average mileage of 237,000 miles, while service vehicles had a reported average mileage of 137,000 miles. In terms of fuel use, around 75 percent of cargo vehicles used diesel and 25 percent used unleaded gasoline, while 87 percent of service vehicles used unleaded gasoline and 13 percent used diesel.

The analyses of trip characteristics included an in-depth examination of trip frequency, trip type, average trip length, trip purpose, and land use activity at trip destinations by commercial vehicle type. Surveyed cargo vehicles made an average of 6.5 total trips per day, compared to 4.8 trips per day for service vehicles. Excluding the trips made outside of the study area (external trips), cargo vehicles produced 3.0 internal trips per day, with average travel distance of 4.6 miles, compared to service vehicles, which made 3.5 internal trips per day, with average trip length of 3.9 miles. The average travel time per trip for cargo vehicles was 7.6 minutes and for service vehicles the average travel time per trip was 6.7 minutes.

In terms of trip purpose at trip destinations, approximately 44 percent of the cargo vehicle trips were for delivery, 25 percent were base related, and 13 percent were classified as "pick-up." For trips made by service vehicles, approximately 33 percent were base related, 32 percent were service, and 12 percent were for sales.

In terms of land use activity, approximately 32 percent of the trips made by cargo vehicles traveled to retail locations, followed by 16 percent to residential locations, and 12 percent to construction locations. For service vehicles, nearly 33 percent of the trips traveled to residential locations, followed by 23 percent to office sites, and 19 percent to retail locations.

The analyses of cargo characteristics were exclusive to trips made by cargo vehicles only and involved examining the types of cargo/commodities being transported at trip destinations, the trip purposes, the land use activity at each stop, and the net weight of cargo being picked-up and/or dropped off for each trip. Overall, the average net cargo weight per trip was approximately 3,600 lbs. Building materials products showed the highest average net cargo weight of approximately 21,400 lbs. per trip, but the most frequently transported commodity was food products with an average net cargo weight of nearly 200 lbs. per trip. The land use category "other" showed the highest average net cargo weight of approximately 8,000 lbs. per trip. The

pick-up and delivery trip purpose had the highest average net cargo weight of over 8,800 lbs. per trip.

The analyses of trip tours involved examining the amount of circuitous travel performed by the commercial vehicles in the study area. It also involved counting the number of non-base trips, external trips, inter-zonal trips, and intra-zonal trips within trip tours to determine the total amount and types of travel that occur during the course of the tour. A total of 379 trip tours were generated by the surveyed vehicles, with cargo vehicles making 205 tours and service vehicles producing 174 tours. The number of trip tours per vehicle varied from one-to-eight tours for cargo vehicles and one-to-six tours for service vehicles. The average number of trips tours for all vehicles was 1.7 and the average number of trips per tour was 3.4. Trips made as part of trip tours accounted for 1,286 trips (716 trips by cargo vehicles and 570 trips by service vehicles). Within the trip tours, approximately 60 percent were inter-zonal trips, 5 percent were intra-zonal trips and the remaining 35 percent were external trips. Non-base trips (which were not mutually-exclusive of the other trip types) comprised approximately 45 percent of the trips within the tours.

Lastly, the expansion of commercial vehicle survey data were based on VMT estimates and vehicle classification counts for the Texarkana study area. The commercial VMT estimates represented all commercial vehicles and do not distinguish by cargo and service vehicle types. Therefore, the estimation of VMT and volume of cargo and service vehicles operating within the study area were mainly based on key findings from the survey, such as the total number of internal cargo and service vehicle trips, the average number of trips per cargo and service vehicle, and the average trip lengths per cargo and service vehicle. Based on these findings, approximately 23,700 commercial vehicles (8,400 cargo vehicles and 15,300 service vehicles) were estimated to be operating within the Texarkana study area on a daily basis.

APPENDIX

Record 20

COMMERCIAL TRAVEL SURVEY
PART 1: VEHICLE INFORMATION

(Please fill out this form, even if the information requested has been provided elsewhere.)

Official Use	Vehicle ID #: _____	NAICS Code: _____

Travel Day: _____ (Month / Day / Year)

Vehicle License Plate #: _____

Company or Name of Owner (name on registration):

_____

Company Address:

_____
(Street Address or Names of Nearest Intersecting Streets)

_____
City State Zip Code

Company - Type of Place (see options below): _____

Vehicle Info: Make: _____ Model: _____ Year: _____

Vehicle Type (Primary Use)
1) ☐ Cargo / Freight Transport Vehicle
2) ☐ Service Vehicle (vehicle used PRIMARILY for non-cargo transport purposes)
3) ☐ Cargo Delivery and Commercial Service Vehicle

Vehicle Fuel:
1) ☐ Unleaded Gas 2) ☐ Diesel 3) ☐ Propane 4) ☐ Natural Gas (LNG or CNG)
5) ☐ Electric 6) ☐ Gas/Electric 96) ☐ Other (specify) _____

What is the average Miles Per Gallon (MPG) of the vehicle? _____

Vehicle Classification:
1) ☐ Passenger Car
2) ☐ Pick-up
3) ☐ Van (Cargo or Minivan)
4) ☐ Sport Utility Vehicle (SUV)
5) ☐ Single Unit 2-axle (6 wheels)
6) ☐ Single Unit 3-axle (10 wheels)
7) ☐ Single Unit 4-axle (14 wheels)
8) ☐ Semi (all Tractor-Trailer combinations)
96) ☐ Other _____

Gross Vehicle Weight (including trailer): _____ pounds

Odometer Reading at beginning of travel day: _____ Total Number of Stops on travel day: _____

PLACE OPTIONS

(1) Office Building (Non-Government)
(2) Retail / Shopping
(3) Industrial / Manufacturing
(4) Medical / Hospital
(5) Education (12th grade or less)
(6) Education (college, trade, etc.)
(7) Government Office / Building
(8) Residential
(9) Airport
(10) Intermodal Facility
(11) Warehouse
(12) Distribution Center
(13) Construction Site
(96) Other (specify)

Record 21

COMMERCIAL TRAVEL SURVEY
PART 2: TRIP INFORMATION

Vehicle Plate #: _____

The place my travel began today was:

☐ Work / Base Location (Company address) ☐ Other Location (Please describe): _____

Type of Place (Specify Type of Place 1-13 or 96 using the Place options below): _____

_____ TRAVEL DATE: _____
(Street Address or Names of Nearest Intersecting Streets) Month / Day / Year

_____ DEPARTURE TIME: _____ am/pm
(City, State, Zip Code)

When you left the above location was your vehicle: ☐ Fully Loaded ☐ Partially Loaded ☐ Empty ☐ Not Applicable (Service Vehicle)

If loaded, what is the total weight in pounds of the cargo being transported? (Please provide an estimate if unsure of exact weight): _____ pounds

RECORD EVERY PLACE YOU GO, INCLUDING BRIEF STOPS

	Record the following information about each place. Location: Address including City, State, and Zip Code or Names of Nearest Intersecting Streets or Landmark	Is this the Work/Base Location for this vehicle?	What Type of Place is this? (See Place Options below)	What Time did you Arrive and Depart this location? (Record exact times)	What Activity are you doing at this location? (See Activity Options below)	If transporting cargo, what is the Cargo? (If HAZMAT also enter Placard #)	If transporting cargo, enter Cargo Weight (Pounds)
PLACE 1		☐ - Yes ☐ - No		Arrive: _____ am/pm Depart: _____ am/pm			_____ Delivered _____ Picked Up
PLACE 2		☐ - Yes ☐ - No		Arrive: _____ am/pm Depart: _____ am/pm			_____ Delivered _____ Picked Up
PLACE 3		☐ - Yes ☐ - No		Arrive: _____ am/pm Depart: _____ am/pm			_____ Delivered _____ Picked Up

PLACE OPTIONS		
(1) Office Building (Non Government)	**(6)** Education (college, trade, etc.)	**(11)** Warehouse
(2) Retail / Shopping	**(7)** Government Office / Building	**(12)** Distribution Center
(3) Industrial / Manufacturing	**(8)** Residential	**(13)** Construction Site
(4) Medical / Hospital	**(9)** Airport	**(96)** Other (specify)
(5) Education (12th grade or less)	**(10)** Intermodal Facility	

ACTIVITY OPTIONS		
(1) Base Location / Return to Base Location	**(4)** Deliver Cargo	**(7)** Government Related Service
(2) Vehicle Maintenance (fuel, oil, etc.)	**(5)** Pick up Cargo	**(8)** Installation / Maintenance / Repair Service
(3) Driver Needs (lunch, restroom, etc.)	**(6)** Deliver and Pick up Cargo	**(9)** Sales / Professional Service
		(10) Shopping for Business
		(96) Other Activity (specify)

Record 21

Commercial Travel Survey – Trip Information
(continued)

Vehicle Plate #: _____

	Record the following information about each place. Location: Address including City, State, and Zip Code or Names of Nearest Intersecting Streets or Landmark	Is this the Work/Base Location for this vehicle?	What Type of Place is this? (See Place Options below)	What Time did you Arrive and Depart this location? (Record exact times)	What Activity are you doing at this location? (See Activity Options below)	If transporting cargo, what is the Cargo? (If HAZMAT also enter Placard #)	If transporting cargo, enter Cargo Weight (Pounds)
PLACE 4		☐ - Yes ☐ - No		Arrive: _____ am/pm Depart: _____ am/pm			_____ Delivered _____ Picked Up
PLACE 5		☐ - Yes ☐ - No		Arrive: _____ am/pm Depart: _____ am/pm			_____ Delivered _____ Picked Up
PLACE 6		☐ - Yes ☐ - No		Arrive: _____ am/pm Depart: _____ am/pm			_____ Delivered _____ Picked Up
PLACE 7		☐ - Yes ☐ - No		Arrive: _____ am/pm Depart: _____ am/pm			_____ Delivered _____ Picked Up
PLACE 8		☐ - Yes ☐ - No		Arrive: _____ am/pm Depart: _____ am/pm			_____ Delivered _____ Picked Up
PLACE 9		☐ - Yes ☐ - No		Arrive: _____ am/pm Depart: _____ am/pm			_____ Delivered _____ Picked Up

PLACE OPTIONS		
(1) Office Building (Non Government)	**(6)** Education (college, trade, etc.)	**(11)** Warehouse
(2) Retail / Shopping	**(7)** Government Office / Building	**(12)** Distribution Center
(3) Industrial / Manufacturing	**(8)** Residential	**(13)** Construction Site
(4) Medical / Hospital	**(9)** Airport	**(96)** Other (specify)
(5) Education (12th grade or less)	**(10)** Intermodal Facility	

ACTIVITY OPTIONS		
(1) Base Location / Return to Base Location	**(4)** Deliver Cargo	**(7)** Government Related Service
(2) Vehicle Maintenance (fuel, oil, etc.)	**(5)** Pick up Cargo	**(8)** Installation / Maintenance / Repair Service
(3) Driver Needs (lunch, restroom, etc.)	**(6)** Deliver and Pick up Cargo	**(9)** Sales / Professional Service
		(10) Shopping for Business
		(96) Other Activity (specify)

Record 21

Commercial Travel Survey – Trip Information

(continued)

Vehicle Plate #: _____

	Record the following information about each place. Location: Address including City, State, and Zip Code or Names of Nearest Intersecting Streets or Landmark	Is this the Work/Base Location for this vehicle?	What Type of Place is this? (See Place Options below)	What Time did you Arrive and Depart this location? (Record exact times)	What Activity are you doing at this location? (See Activity Options below)	If transporting cargo, what is the Cargo? (If HAZMAT also enter Placard #)	If transporting cargo, enter Cargo Weight (Pounds)
PLACE 10		☐ - Yes ☐ - No		Arrive: _____ am/pm Depart: _____ am/pm			_____ Delivered _____ Picked Up
PLACE 11		☐ - Yes ☐ - No		Arrive: _____ am/pm Depart: _____ am/pm			_____ Delivered _____ Picked Up
PLACE 12		☐ - Yes ☐ - No		Arrive: _____ am/pm Depart: _____ am/pm			_____ Delivered _____ Picked Up
PLACE 13		☐ - Yes ☐ - No		Arrive: _____ am/pm Depart: _____ am/pm			_____ Delivered _____ Picked Up
PLACE 14		☐ - Yes ☐ - No		Arrive: _____ am/pm Depart: _____ am/pm			_____ Delivered _____ Picked Up

PLACE OPTIONS

(1) Office Building (Non Government)
(2) Retail / Shopping
(3) Industrial / Manufacturing
(4) Medical / Hospital
(5) Education (12th grade or less)
(6) Education (college, trade, etc.)
(7) Government Office / Building
(8) Residential
(9) Airport
(10) Intermodal Facility
(11) Warehouse
(12) Distribution Center
(13) Construction Site
(96) Other (specify)

ACTIVITY OPTIONS

(1) Base Location / Return to Base Location
(2) Vehicle Maintenance (fuel, oil, etc.)
(3) Driver Needs (lunch, restroom, etc.)
(4) Deliver Cargo
(5) Pick up Cargo
(6) Deliver and Pick up Cargo
(7) Government Related Service
(8) Installation / Maintenance / Repair Service
(9) Sales / Professional Service
(10) Shopping for Business
(96) Other Activity (specify)

Record 21

Commercial Travel Survey – Trip Information
(continued)

Vehicle Plate #: _____

	Record the following information about each place. Location: Address including City, State, and Zip Code or Names of Nearest Intersecting Streets or Landmark	Is this the Work/Base Location for this vehicle?	What Type of Place is this? (See Place Options below)	What Time did you Arrive and Depart this location? (Record exact times)	What Activity are you doing at this location? (See Activity Options below)	If transporting cargo, what is the Cargo? (If HAZMAT also enter Placard #)	If transporting cargo, enter Cargo Weight (Pounds)
PLACE 15		☐ - Yes ☐ - No		Arrive: _____ am/pm Depart: _____ am/pm			_____ Delivered _____ Picked Up
PLACE 16		☐ - Yes ☐ - No		Arrive: _____ am/pm Depart: _____ am/pm			_____ Delivered _____ Picked Up
PLACE 17		☐ - Yes ☐ - No		Arrive: _____ am/pm Depart: _____ am/pm			_____ Delivered _____ Picked Up
PLACE 18		☐ - Yes ☐ - No		Arrive: _____ am/pm Depart: _____ am/pm			_____ Delivered _____ Picked Up
PLACE 19		☐ - Yes ☐ - No		Arrive: _____ am/pm Depart: _____ am/pm			_____ Delivered _____ Picked Up

PLACE OPTIONS		
(1) Office Building (Non Government)	**(6)** Education (college, trade, etc.)	**(11)** Warehouse
(2) Retail / Shopping	**(7)** Government Office / Building	**(12)** Distribution Center
(3) Industrial / Manufacturing	**(8)** Residential	**(13)** Construction Site
(4) Medical / Hospital	**(9)** Airport	**(96)** Other (specify)
(5) Education (12th grade or less)	**(10)** Intermodal Facility	

ACTIVITY OPTIONS		
(1) Base Location / Return to Base Location	**(4)** Deliver Cargo	**(7)** Government Related Service
(2) Vehicle Maintenance (fuel, oil, etc.)	**(5)** Pick up Cargo	**(8)** Installation / Maintenance / Repair Service
(3) Driver Needs (lunch, restroom, etc.)	**(6)** Deliver and Pick up Cargo	**(9)** Sales / Professional Service
		(10) Shopping for Business
		(96) Other Activity (specify)