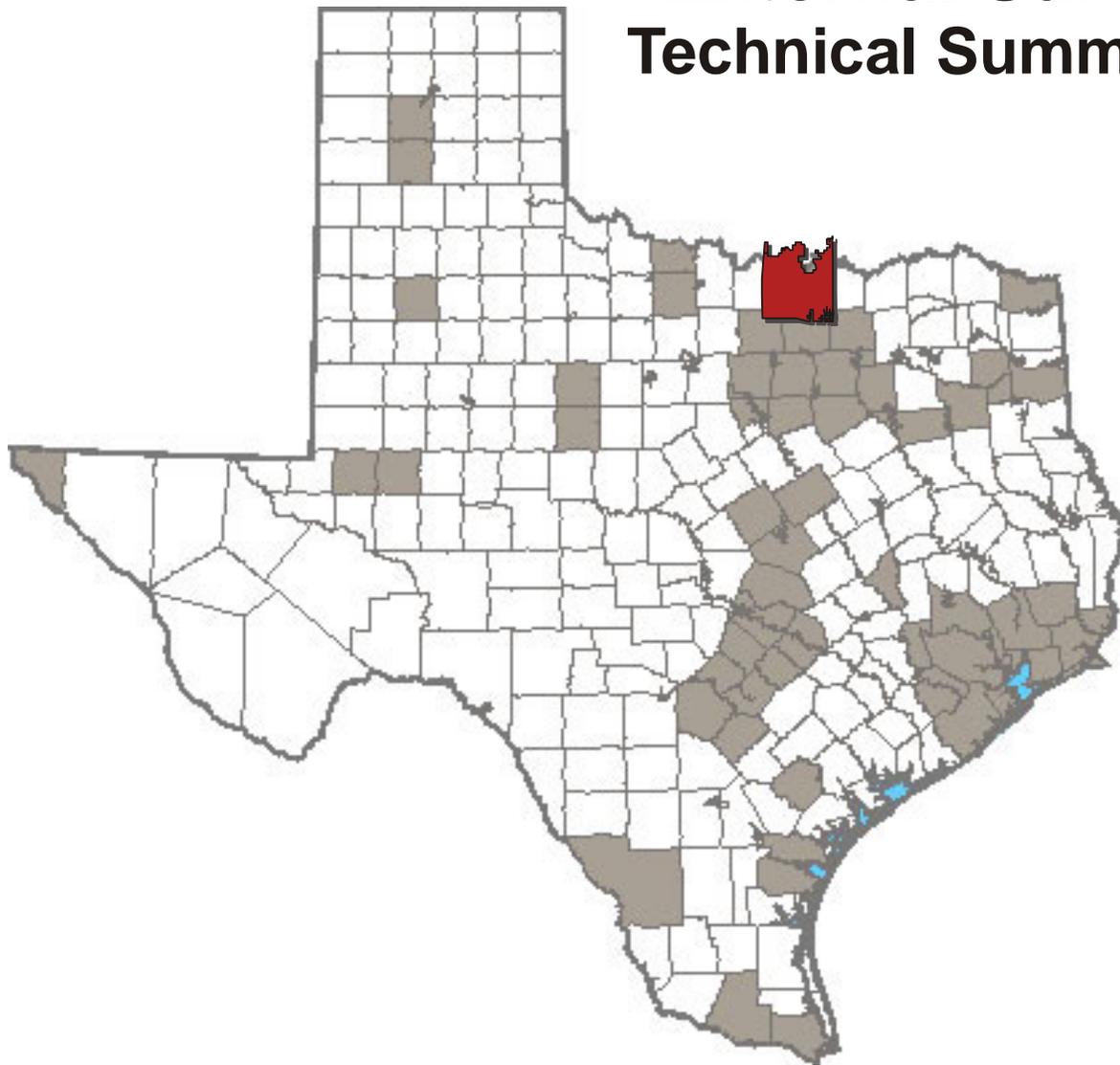


2005 Sherman-Denison External Survey Technical Summary



Prepared by the
Texas Transportation Institute
Revised December 2010

2005 Sherman-Denison External Survey

TECHNICAL SUMMARY

Texas Department of Transportation Travel Survey Program

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INTRODUCTION

In 2005, the Transportation Planning and Programming (TPP) Division of the Texas Department of Transportation (TxDOT) funded an external station travel survey in the Sherman-Denison metropolitan planning organization (MPO) area. The survey measured and identified travel patterns into, within, and out of the study area. This report presents a technical summary of the 2005 Sherman-Denison External Survey and documents the data collected and the analysis results for the study area.

EXTERNAL STATION SURVEY

An external station survey collects data through personal interviews to measure and identify travel patterns of vehicles and/or pedestrians entering and exiting a particular study area. Surveys are conducted during daylight hours for one day at each designated location. Additionally, 24-hour vehicle classification counts are performed on the same day as the survey at each location. These counts provide a basis for expanding the survey data to represent the average weekday movements into, out of, and through the study area. Data are also collected on the movements of the vehicle during the survey day prior to the time the vehicle is surveyed. These data are used to estimate the amount of travel occurring in the study area by persons that do not live in the study area.

STUDY AREA

The Sherman-Denison MPO study area covers Grayson County which is located in the northern Texas region. The county has a total land area of 934 square miles, and a population density of approximately 125 persons per square mile. According to the U.S. Census Bureau¹, the population of this county in 2005 was approximately 117,000 people. Figure 1 shows the location of the Sherman-Denison study area.

¹ <http://quickfacts.census.gov/qfd/states/48/48181.html>.

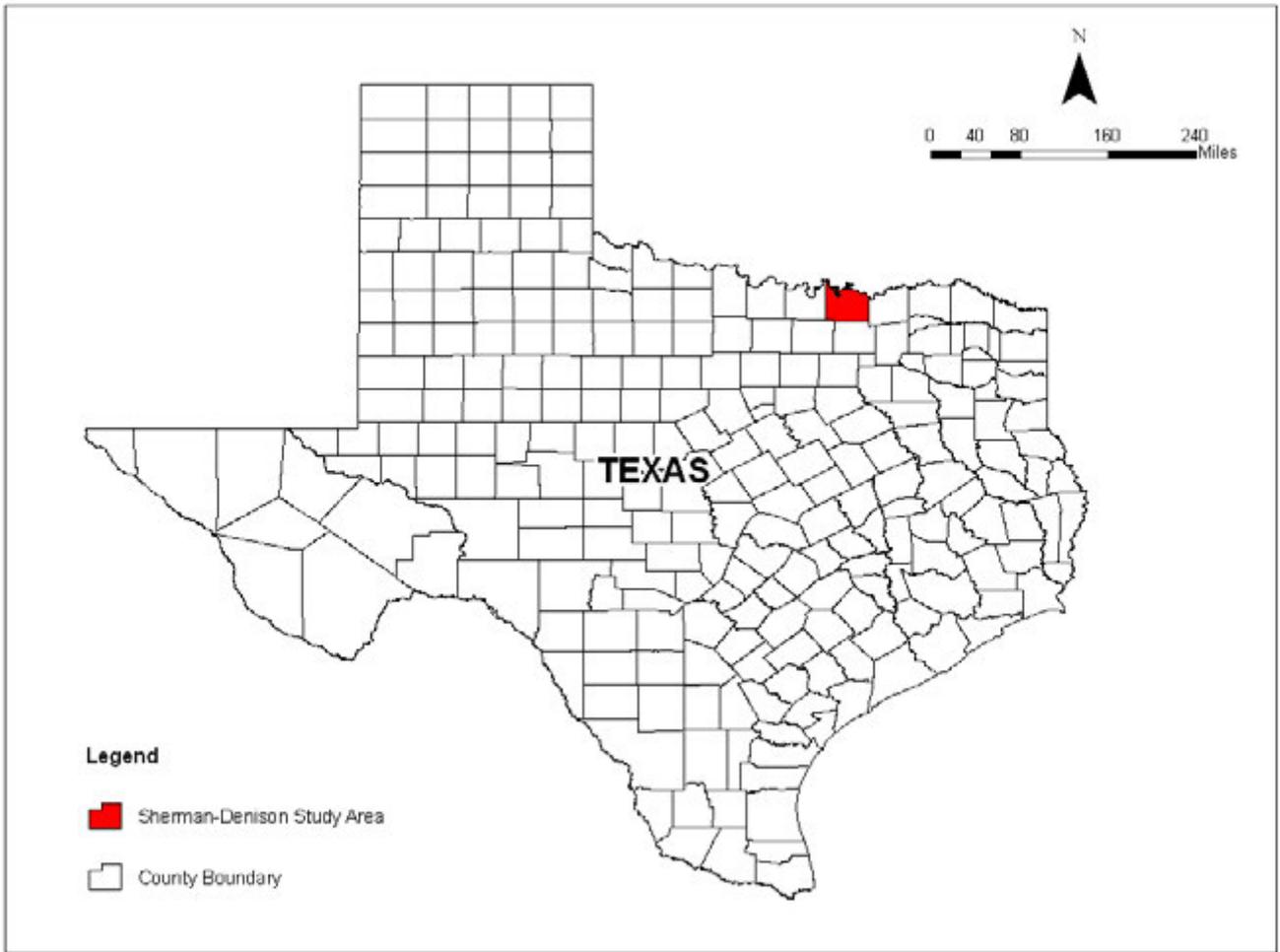


Figure 1. Sherman-Denison Study Area.

Figure 2 shows the location of the 20 external stations established for the Sherman-Denison study area. Ten external stations were selected for roadside surveys, eight were selected for vehicle classification counts only, and two were identified as high-volume sites. The high volume locations were US 75/69 North at the border of Grayson County and the Oklahoma state border (station number GR06) and US 75 North at the border of Grayson and Collin counties (station number GR17). Non-commercial vehicles on high-volume roadways were not surveyed but instead a license plate matching methodology was employed to provide information on the number of through and local trips. Commercial vehicles were surveyed at weigh stations using an intercept interview method. Additionally, commercial vehicles were included in the license plate matching data collection effort. More details on this methodology are provided later in the analysis.

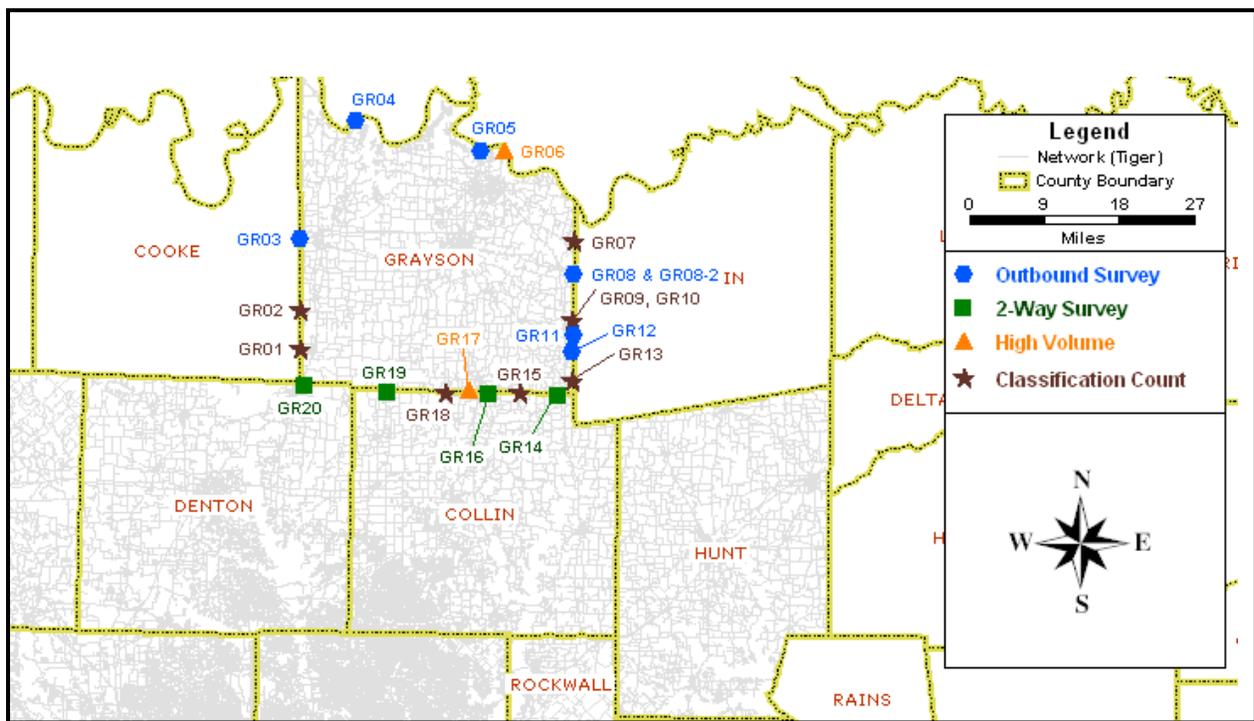


Figure 2. Sherman-Denison External Station Locations.

Table 1 identifies the external surveys, their general location, whether or not on-site surveys were conducted, and the 24-hour traffic count at the location in both the inbound and outbound direction. The location group indicated in Table 1 is used to aggregate data as a way to present external local and through trip information later in the summary.

Table 1. Sherman-Denison External Stations.

Station Number	Zone Number	Facility	Location	Surveyed	24-Hour Vehicle Count		Location Group
					Inbound	Outbound	
GR04	496	US 377 N	at TX/OK Border	Roadside	1,699	1,562	North
GR05	497	SH 91	at TX/OK Border	Roadside	1,775	1,709	
GR06	474	US 75/69 N	at TX/OK Border	High Volume	12,724	13,081	
GR07	476	FM 1753	at Fannin Co. Line	Count	568	589	East
GR08	479	US 82 E	at Fannin Co. Line	Roadside	3,436	3,534	
GR08-2	500	SH 56	at Fannin Co. Line	Roadside	1,437	1,311	
GR09	480	FM 898	at Fannin Co. Line	Count	273	279	
GR10	481	FM 151	at Fannin Co. Line	Count	233	271	
GR11	482	SH 11	at Fannin Co. Line	Count	834	743	
GR12	483	US 69 S	at Fannin Co. Line	Roadside	1,628	1,620	
GR13	484	FM 814	at Fannin Co. Line	Count	232	208	
GR14	485	SH 160	at Collin Co. Line	Roadside (2-way)	1,680	1,777	South
GR15	486	FM 3133	at Collin Co. Line	Count	337	330	
GR16	487	SH 5	at Collin Co. Line	Roadside (2-way)	1,555	1,503	
GR17	488	US 75 N	at Collin Co. Line	High Volume	16,164	15,735	
GR18	489	FM 3356	at Collin Co. Line	Count	232	225	
GR19	490	SH 289	at Collin Co. Line	Roadside (2-way)	2,196	2,203	
GR20	491	US 377	at Denton Co. Line	Roadside (2-way)	3,815	3,872	
GR01	492	FM 922	at Cooke Co. Line	Count	957	920	West
GR02	493	FM 902	at Cooke Co. Line	Count	1,079	1,092	
GR03	494	US 82 W	at Cooke Co. Line	Roadside	6,650	6,536	
Total					59,504	59,100	

SURVEY METHODOLOGY

Two methodologies were employed in conducting the survey. For roadways with low-to-moderate traffic volumes, a roadside intercept interview method was used. For external stations on high-volume roadways, commercial and non-commercial vehicles were surveyed

using a license plate match method. For purposes of this study, roadways with traffic volumes in excess of 20,000 vehicles per day were considered high volume.

For each external station surveyed using the roadside intercept interview method, traffic control plans were set up and vehicles in the outbound direction (i.e., leaving the study area) were directed into an area where trained survey personnel interviewed the drivers. Drivers of commercial and non-commercial vehicles were interviewed using different survey instruments and those forms are provided in Appendix A. The data file formats used to store the collected survey data are provided in Appendix B. Figure 3 shows a typical survey station at an external station.



Figure 3. Typical External Survey Station.

Two external stations in the Sherman-Denison study area could not be surveyed using the intercept interview method because traffic volumes were too high to safely stop traffic and interview motorists. In lieu of intercept surveys at these locations, a license plate match method

was used as a means to estimate the amount of non-commercial vehicles traveling through the study area on high-volume facilities. However, commercial vehicles were surveyed at the weigh stations located along the high-volume facilities. A license plate match was also performed at these locations.

DATA ANALYSIS

Data analysis for non-commercial and commercial vehicles is developed separately and presented in this section. Non-commercial vehicles are typically personal use passenger cars, trucks, vans, and motorcycles. Commercial vehicles are those used for commercial purposes and, in most cases, consist of heavy-duty trucks. The analysis is based on information obtained from completed interviews of drivers. In the Sherman-Denison area, the majority of vehicles surveyed (85 percent) were non-commercial. Table 2 presents the number of surveys for commercial and non-commercial vehicles by station, as well as the outbound traffic volume during the survey period. At the sites where surveys were conducted, 23 percent of the non-commercial vehicles and 10 percent of the commercial vehicles that traveled through the external stations (including the high-volume roadways) in the outbound direction were interviewed. This does not include the stations where no roadside intercept survey was performed.

During the review of the data, there were a number of drivers that indicated the location where they entered the study area was the same location at which they were being surveyed. Since the survey is conducted in the outbound direction, it was assumed that the motorists misinterpreted the definition of a trip, and subsequently did not provide information on where they may have stopped within the study area. As a result, those non-commercial and commercial vehicle surveys were dropped from the analysis.

Table 2. Number of Non-Commercial and Commercial Vehicle Surveys.

Station Number	Facility	Location	Non-Commercial		Commercial	
			Surveyed	Count*	Surveyed	Count*
496	US 377 N	at TX/OK Border	333	990	62	188
497	SH 91	at TX/OK Border	351	1,237	7	16
474	US 75/69	at TX/OK Border	N/A	N/A	80	2,180
479	US 82 E	at Fannin Co. Line	461	2,323	52	265
483	US 69 S	at Fannin Co. Line	326	981	59	189
485	SH 160	at Collin Co. Line	310	718	82	269
487	SH 5	at Collin Co. Line	289	883	13	39
488	US 75	at Collin Co. Line	N/A	N/A	36	2,049
490	SH 289	at Collin Co. Line	432	1,118	49	116
491	US 377	at Denton Co. Line	351	2,157	45	155
494	US 82 W	at Cooke Co. Line	333	3,871	82	616
500	SH 56	at Fannin Co. Line	307	915	31	33
Total			3,493	15,193	598	6,115

* Outbound volumes during approximate time of survey (8 a.m. to 7 p.m.).

Trip Types

There are two types of trips identified as part of an external survey — external-local trips and external-through trips. An external-local trip is a trip where either the origin or destination of the trip is in the study area and the other trip end is outside the study area. An external-through trip is a trip traveling through the study area without stopping. Table 3 presents the survey data for non-commercial and commercial vehicles in terms of trips identified as local or through movements. Approximately 85 percent of non-commercial vehicle trips were external-local trips while the remaining 15 percent were external-through trips. For commercial vehicles, nearly 46 percent of the trips were external-local and the other 54 percent were external-through trips.

Table 3. Survey Results by Trip Type (Non-Commercial and Commercial Vehicles).

Station Number	Facility	Non-Commercial Vehicles			Commercial Vehicles		
		Local	Through	Total	Local	Through	Total
496	US 377 N	223	110	333	24	38	62
497	SH 91	321	30	351	5	2	7
474	US 75/69	N/A	N/A	0	6	74	80
479	US 82 E	409	52	461	35	17	52
483	US 69 S	264	62	326	30	29	59
485	SH 160	249	61	310	32	50	82
487	SH 5	282	7	289	13	0	13
488	US 75	N/A	N/A	0	5	31	36
490	SH 289	399	33	432	23	26	49
491	US 377	250	101	351	27	18	45
494	US 82 W	276	57	333	49	33	82
500	SH 56	291	16	307	24	7	31
Total		2,964	529	3,493	273	325	598
Percent of total		84.86%	15.14%	100.00%	45.65%	54.35%	100.00%

* N/A – site not surveyed.

The second type of trip identified in the survey is a sub-category of external-local trips. These are reported as resident and non-resident trips. A resident is a survey respondent that reported they lived in the study area. A non-resident is a respondent that reported they lived outside of the study area. Table 4 presents the survey data by residents and non-residents as well as the number of internal trips made by the non-residents within the study area prior to being surveyed. An important element of the trips reported by non-residents is the number of trips made prior to being surveyed. Based on the information provided in the survey, these trips are evaluated to estimate the number of internal trips, trips where both the origin and destination are within the study area, made by non-residents. By measuring the number of non-residents that travel in and out of the study areas and the number of internal trips they make, an estimate of the total internal trips within each study area attributable to non-residents can be developed.

The residency questions were only asked of respondents in non-commercial vehicles. Table 4 indicates that nearly 54 percent of the non-commercial travel in and out of the Sherman-Denison study area is made by persons that do not live in the area. The average number of internal trips made by those individuals is 0.05 trips per vehicle. This value is lower than what might be expected, and brings into question the effectiveness of the survey in obtaining information about

internal trips made. It is recommended that a review of the survey instrument and surveying process be conducted to correct trip reporting problems relating to internal trips taken prior to exiting the study area.

Table 4. Survey Results by Residency (Non-Commercial Vehicles Only).

Station Number	Facility	Number of Surveys	Residents	Percent	Non-Residents	Percent	Internal Trips (non-residents)
496	US 377 N	333	194	58.26	139	41.74	13
497	SH 91	351	190	54.13	161	45.87	5
479	US 82 E	461	144	31.24	317	68.76	6
483	US 69 S	326	87	26.69	239	73.31	5
485	SH 160	310	150	48.39	160	51.61	2
487	SH 5	289	146	50.52	143	49.48	17
490	SH 289	432	284	65.74	148	34.26	10
491	US 377	351	159	45.30	192	54.70	7
494	US 82 W	333	141	42.34	192	57.66	14
500	SH 56	307	127	41.37	180	58.63	11
Total		3,493	1,622	46.44	1,871	53.56	90

Travel Purpose

To understand the reasons people travel, the survey included questions about the driver's purpose for being at the location where the trip began (i.e., trip origin) and the purpose for traveling to their destination. There were 17 different purposes included on the survey instrument for non-commercial vehicles and nine purposes on the commercial vehicle survey. Table 5 provides the trip purposes for each survey. For the purpose of presenting survey results, the trip purpose categories are combined into a fewer number to reflect the primary purposes of travel.

Table 5. Trip Purpose Categories.

Code	Non-Commercial Vehicle Trip Purpose	Code	Commercial Vehicle Trip Purpose
1	Home/Return Home	1	Base location/Return to Base location
2	Go/Return to Work	2	Delivery
3	Work Related	3	Pick Up
4	School	4	Maintenance
5	Vacation	5	Driver Needs (lunch, etc)
6	Visit Friends/Family	6	To Home
7	Eat Out	7	Buy Fuel
8	Shop	8	Other (specify)
9	Buy Gas	99	Unknown/Refused
10	Personal Business		
11	Pick Up/Drop Off Passenger		
12	Change Travel Mode		
13	Delivery		
14	Recreation		
15	Overnight stay/sleep		
16	Other (specify)		
99	Refused/Do Not Know		

For non-commercial vehicles, the trip purposes listed in Table 5 were combined into the following six categories:

<u>Category</u>	<u>Trip Purpose Codes (from Table 5)</u>
Home	1
Work	2 and 3
School	4
Personal	5, 6, 10, 11, 14, and 15
Shop	7, 8, and 9
Other	12, 13, 16, and 99

Figure 4 presents the distribution of surveyed non-commercial vehicles by reported trip purpose at the origin of the trip while Figure 5 shows the distribution at the destination of the trip. The information is provided for both residents and non-residents, as well as combined. In Figure 4, the distribution for the origin purpose shows that the largest percentage of trips for residents (51 percent) began at their home location, and the most common non-resident trip origin purpose (38 percent) was their work location.

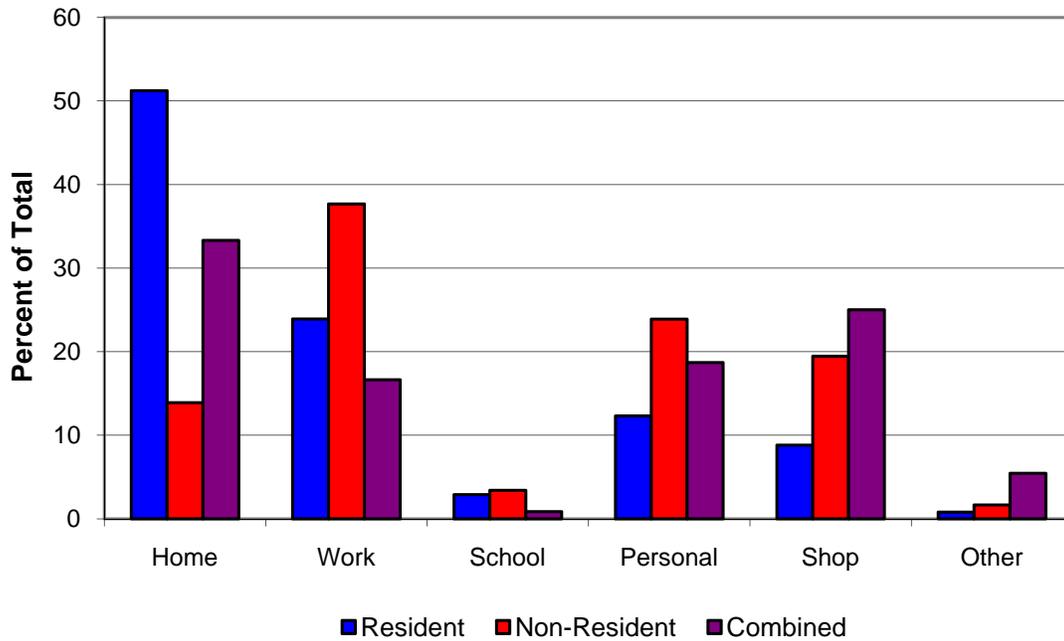


Figure 4. Trip Purpose at Origin for Non-Commercial Vehicles.

Figure 5 shows that the largest distribution of destination purposes for residents were to work (42 percent) and personal-related (32 percent) locations. The trip purpose at the destination for non-residents was primarily comprised of home (53 percent) and work (24 percent). Table 6 provides the results in tabular form.

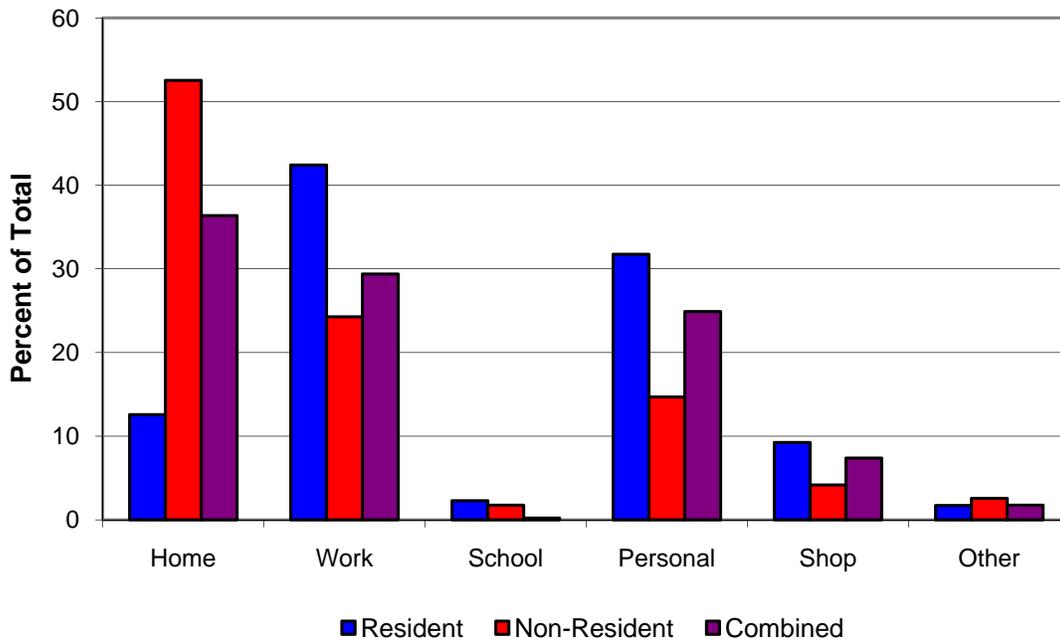


Figure 5. Trip Purpose at Destination for Non-Commercial Vehicles.

Table 6. Non-Commercial Vehicle Trip Purpose.

Trip Purpose	Origin			Destination		
	Resident	Non-Resident	Combined	Resident	Non-Resident	Combined
Home	51.23	13.90	31.23	12.58	52.54	33.98
Work	23.92	37.68	31.29	42.42	24.26	32.69
School	2.90	3.42	3.18	2.28	1.76	2.00
Personal	12.33	23.89	18.53	31.75	14.70	22.62
Shop	8.82	19.45	14.51	9.25	4.17	6.53
Other	0.80	1.66	1.26	1.72	2.57	2.18

The trip purposes normally used in travel demand modeling are home-based work (HBW), home-based non-work (HBNW), and non-home based (NHB). HBW trips are those that have one end of the trip at home and the other end of the trip at work. Trips that begin at home and end at work or those that begin at work and end at home are HBW. An HBNW trip is one where one end of the trip is at home and the other trip end is any location other than work. An NHB trip is a trip that does not begin or end at home. Figure 6 shows the distribution of trips by trip purpose, and Table 7 shows the data in tabular form. For residents, NHB trips were the most common, at 39 percent. HBNW trips for residents accounted for 36 percent. For non-residents, HBNW trips and NHB trips accounted for 39 percent and 36 percent, respectively.

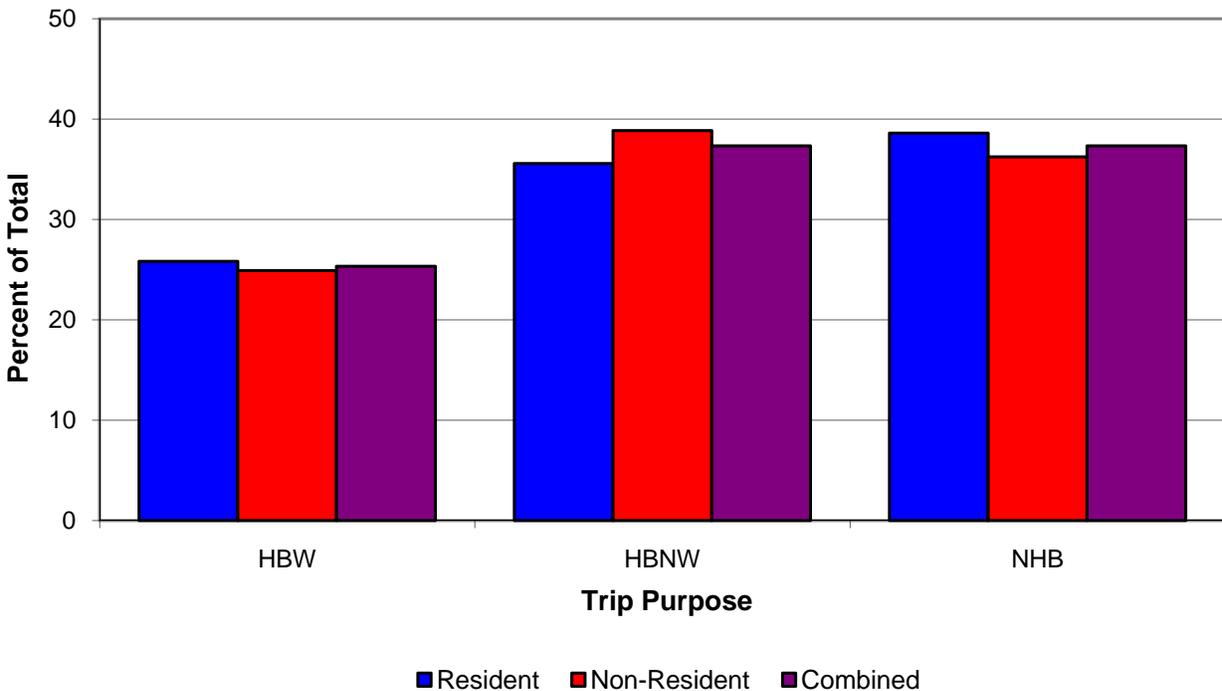


Figure 6. Distribution of Non-Commercial Vehicle Trips by Trip Purpose.

Table 7. Non-Commercial Vehicle Trip Purpose.

Trip Purpose	Resident		Non-Resident		Combined	
	Trips	Percent	Trips	Percent	Trips	Percent
HBW	419	25.83%	466	24.90%	885	25.34%
HBNW	577	35.57%	727	38.86%	1,304	37.33%
NHB	626	38.60%	678	36.24%	1,304	37.33%
Total	1,622	100.00%	1,871	100.00%	3,493	100.00%

For commercial vehicles, the trip purposes shown in Table 5 were combined into the following five categories:

<u>Category</u>	<u>Trip Purpose Codes</u>
Base Location	1
Delivery	2
Pick Up	3
Support Functions	4, 5, 6, and 7
Other	8 and 99

Figure 7 shows the distribution of commercial vehicle trips by reported trip purpose at the origin of the trip. Pick-up (36 percent) and delivery (33 percent) of cargo were the most common origin trip purposes, comprising 69 percent of the total commercial vehicle trips.

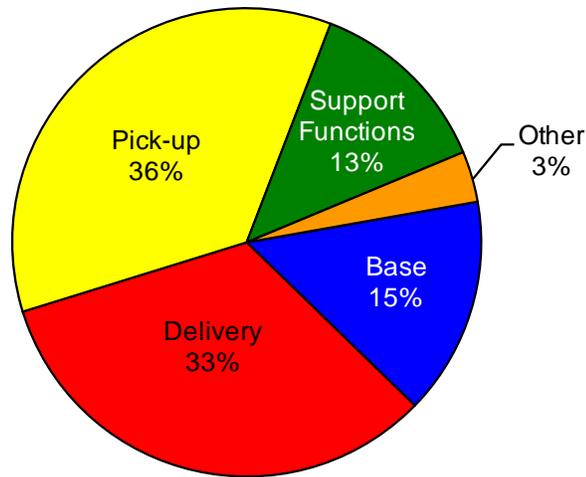


Figure 7. Trip Purpose at Origin for Commercial Vehicles.

The distribution for destination trip purpose, as shown in Figure 8, indicates that the majority of the surveyed vehicles, 62 percent, were destined for delivering cargo and another 17 percent were destined for picking up cargo.

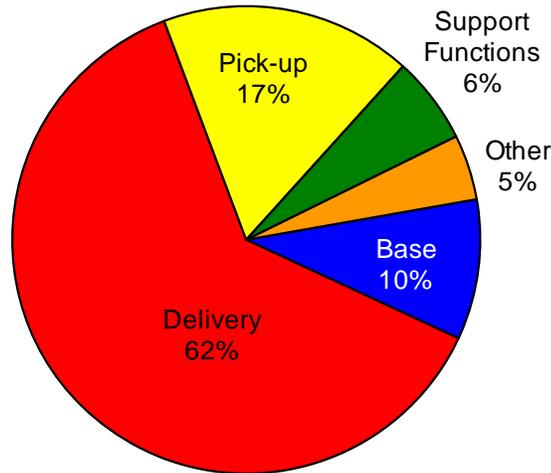


Figure 8. Trip Purpose at Destination for Commercial Vehicles.

In addition to obtaining information on the purpose of travel, drivers were asked to identify the type of place associated with the origin of the trip. Table 8 provides the results of the responses for both commercial and non-commercial vehicles, and Figure 9 shows the results in graphical form. For non-commercial vehicles, the largest percentage of respondents listed residential (43 percent) as the type of place at the origin, followed by retail/shopping/gas (16 percent) and office building (15 percent). For commercial vehicles, the majority of the respondents (51 percent) listed industrial/manufacturing as the type of place at the origin, followed by office building (21 percent).

Table 8. Type of Place at Trip Origin.

Type of Place	Non-Commercial Vehicles		Commercial Vehicles	
	Number	Percent	Number	Percent
Office Building	526	15.06%	125	20.90%
Retail/Shopping/Gas	549	15.72%	69	11.54%
Industrial/Manufacturing/ Warehouse	211	6.04%	307	51.34%
Medical	206	5.90%	3	0.50%
Educational	143	4.09%	0	0.00%
Government	74	2.12%	3	0.50%
Residential	1,507	43.14%	34	5.69%
Airport	30	0.86%	1	0.17%
Eating Establishment	73	2.09%	7	1.17%
Hotel/Motel	24	0.69%	5	0.84%
Other	150	4.29%	44	7.35%
Total	3,493	100.00%	598	100.00%

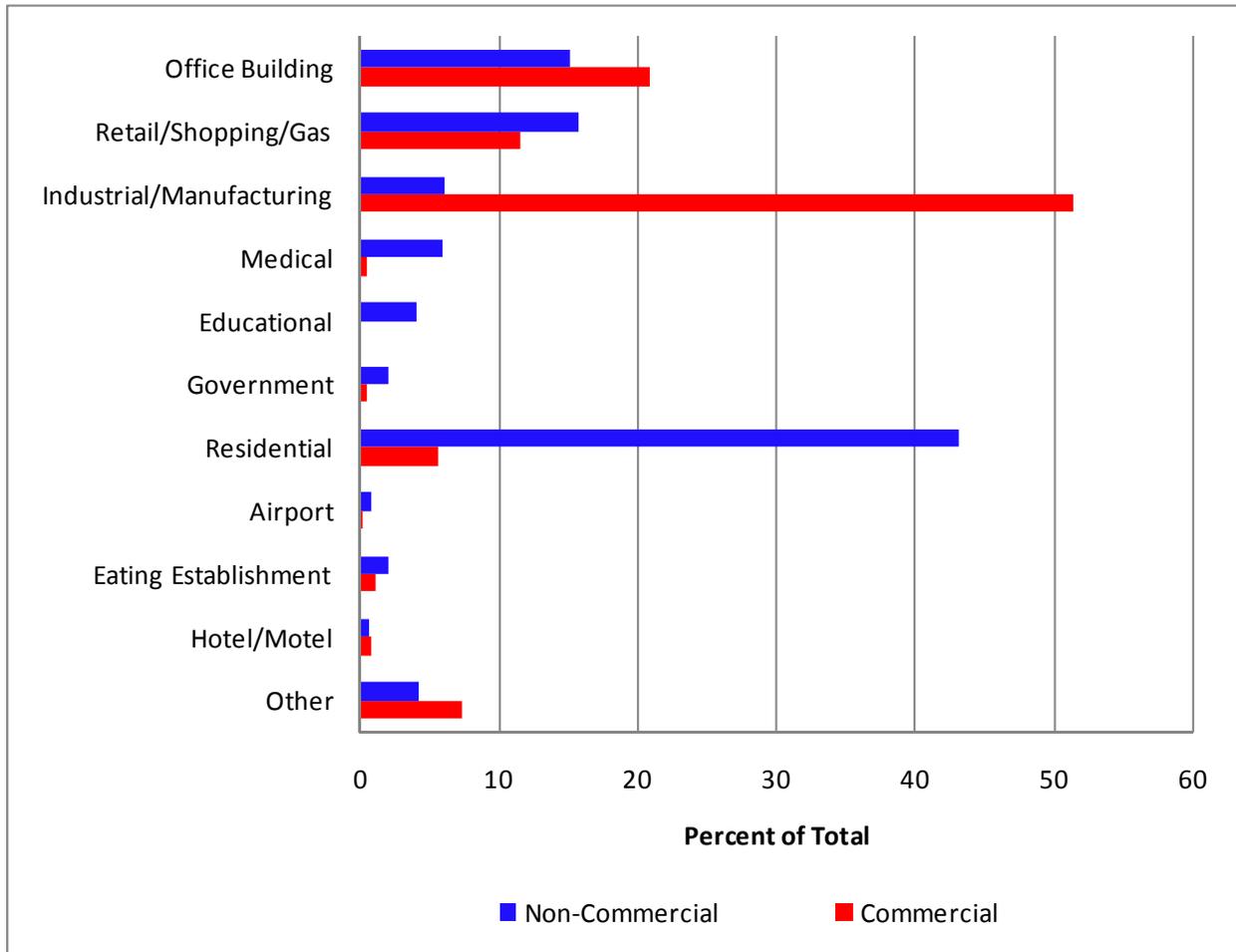


Figure 9. Type of Place at Trip Origin.

Time-of-Day

Vehicle classification counts were conducted at each external survey location on the same day as the survey. These counts were for a 24-hour period and they include data by time-of-day and by direction. This information is primarily used for expansion of the survey data, but is also of interest to examine the distribution of vehicles by time-of-day. Figures 10 and 11 provide the distribution of non-commercial and commercial vehicles by time-of-day for all of the external locations by inbound and outbound direction, respectively.

For inbound vehicles (Figure 10), the morning peak occurs at 7 a.m. and 8 a.m. for non-commercial vehicles, with an afternoon peak period between 5 p.m. and 6 p.m. For outbound vehicles (Figure 11), the morning peak period also occurs between 7 a.m. and 8 a.m. and the afternoon peak between 5 p.m. and 6 p.m. Commercial vehicles, however, maintained a consistent inbound and outbound volume from 9 a.m. to 3 p.m., and the volumes did not significantly reduce until the late night and early morning hours.

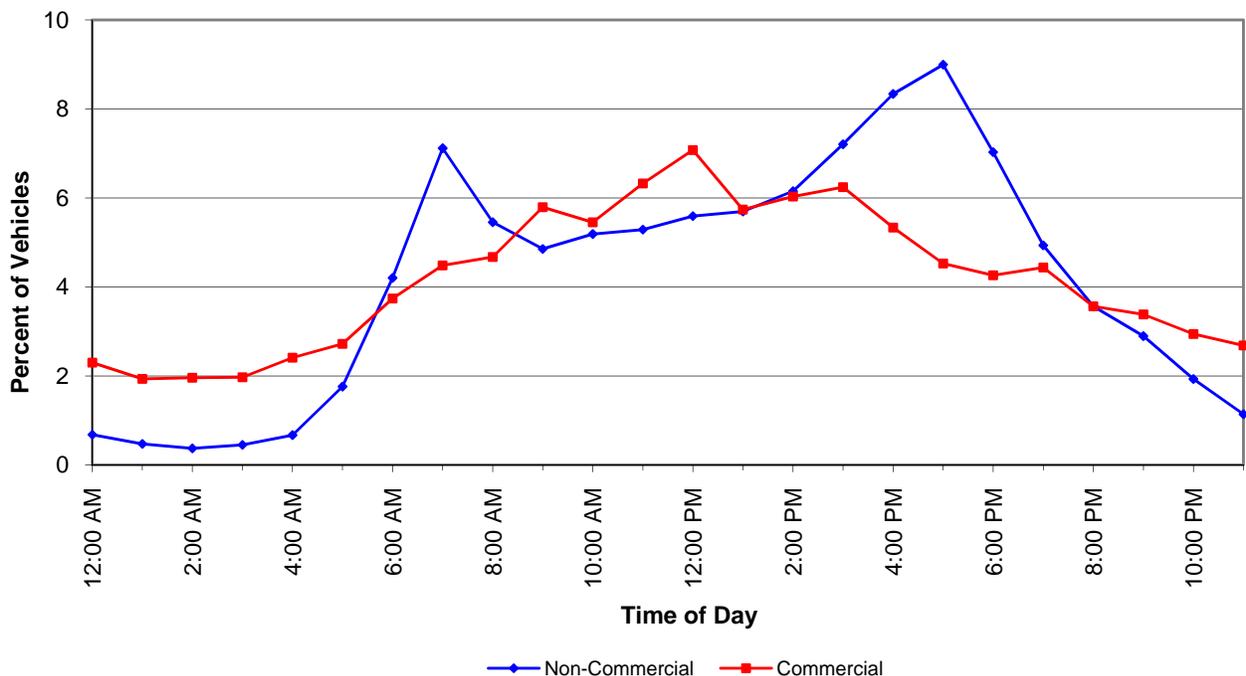


Figure 10. Distribution of Inbound Vehicles by Time-of-Day.

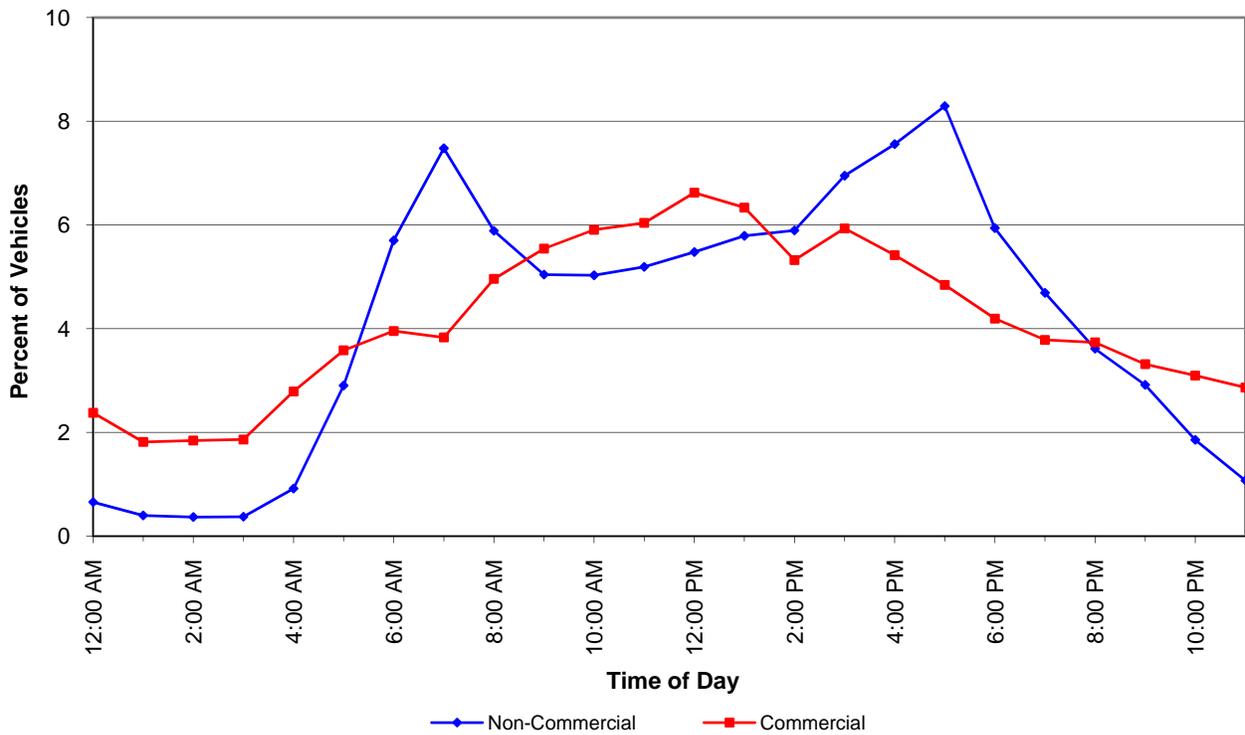


Figure 11. Distribution of Outbound Vehicles by Time-of-Day.

An additional analysis was performed comparing the number of surveys by time of day for both non-commercial and commercial survey types. In this analysis, the percent of vehicles surveyed in each hourly increment was determined for the time period in which the surveys were conducted. Figure 12 shows these results.

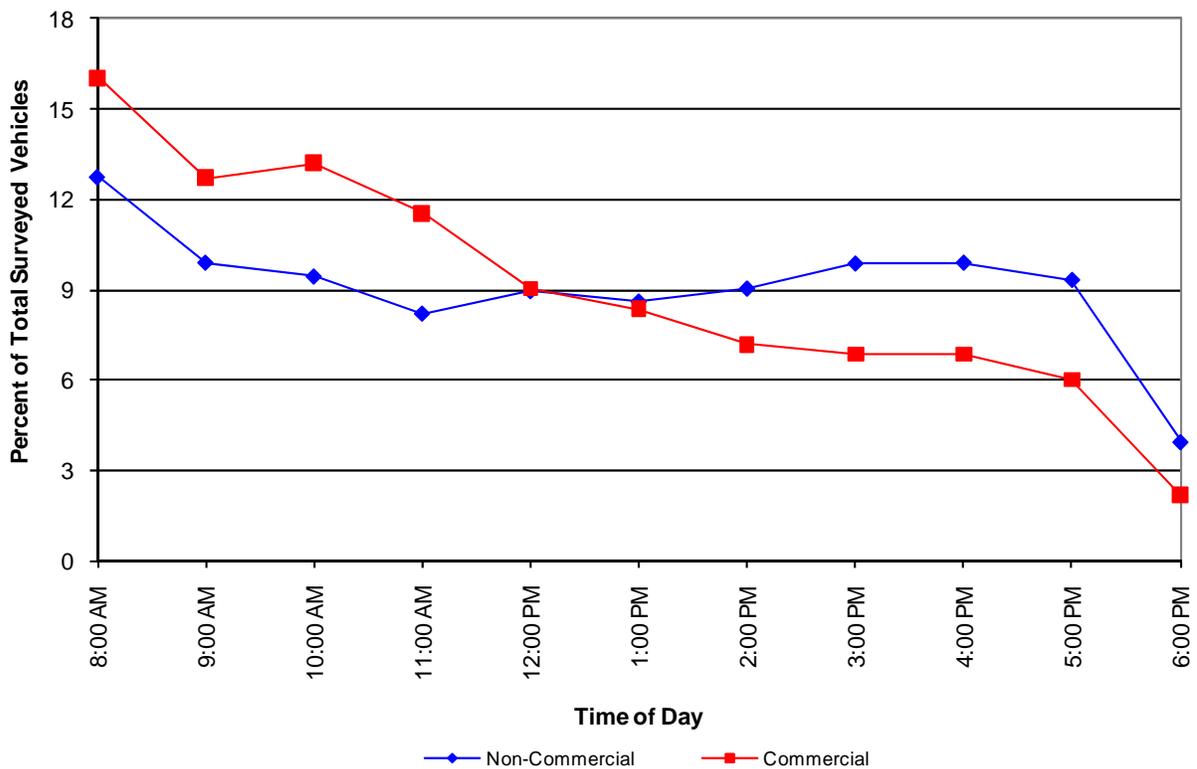


Figure 12. Distribution of Surveys by Time-of-Day.

For non-commercial vehicles, the number of surveys completed each hour was somewhat constant throughout the day, with a slight peak during the early morning hours. There was a different trend among commercial vehicles. While the percent of vehicles counted was consistent throughout the day, the number of completed surveys peaked in the early morning, and then declined throughout the remainder of the day.

Vehicle Characteristics

As part of the survey, interviewers collected data on the year, make, odometer readings, and model of each vehicle surveyed. This provides an indication of the distribution of vehicles traveling through the external stations by type, age, and condition (as implied by the number of miles on the vehicle). Figure 13 presents the percent distribution of non-commercial and commercial vehicles by age as reported in the surveys. The average age was 5.8 years for both non-commercial and commercial vehicles. The median vehicle year for non-commercial vehicles was 2001, and 2000 for commercial vehicles.

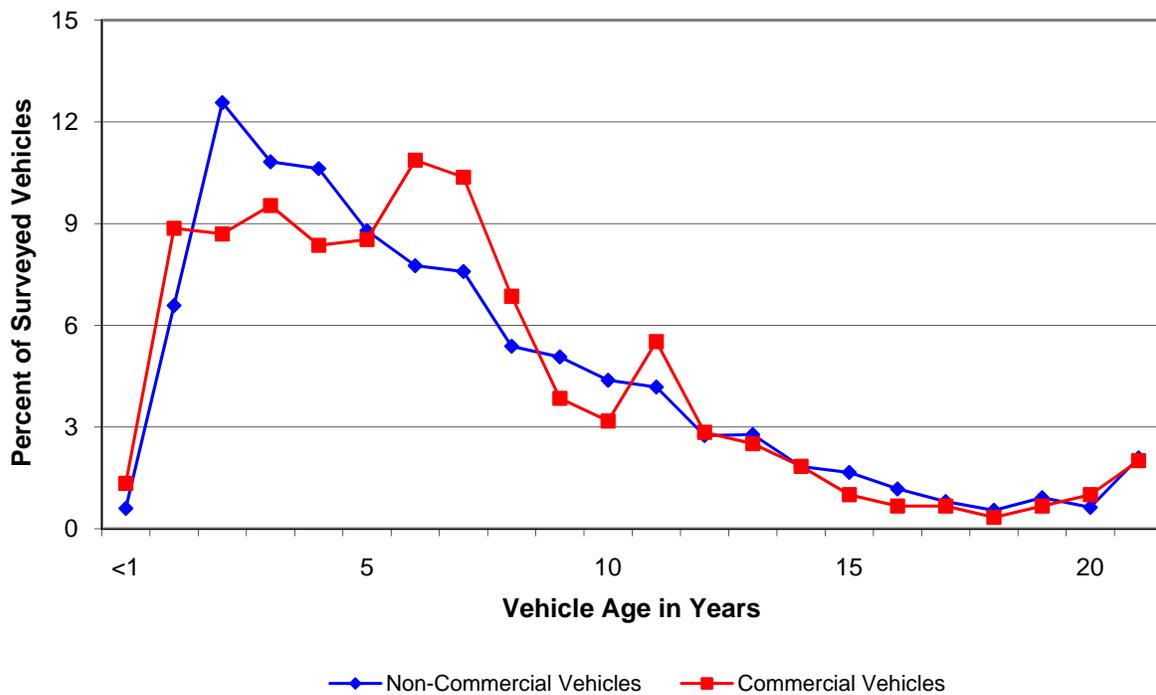


Figure 13. Distribution of Surveyed Vehicles by Age of Vehicle.

In Figure 14, the average odometer reading for non-commercial vehicles was 146,042 miles and 210,847 miles for commercial vehicles. Table 9 shows the detailed distribution by age.

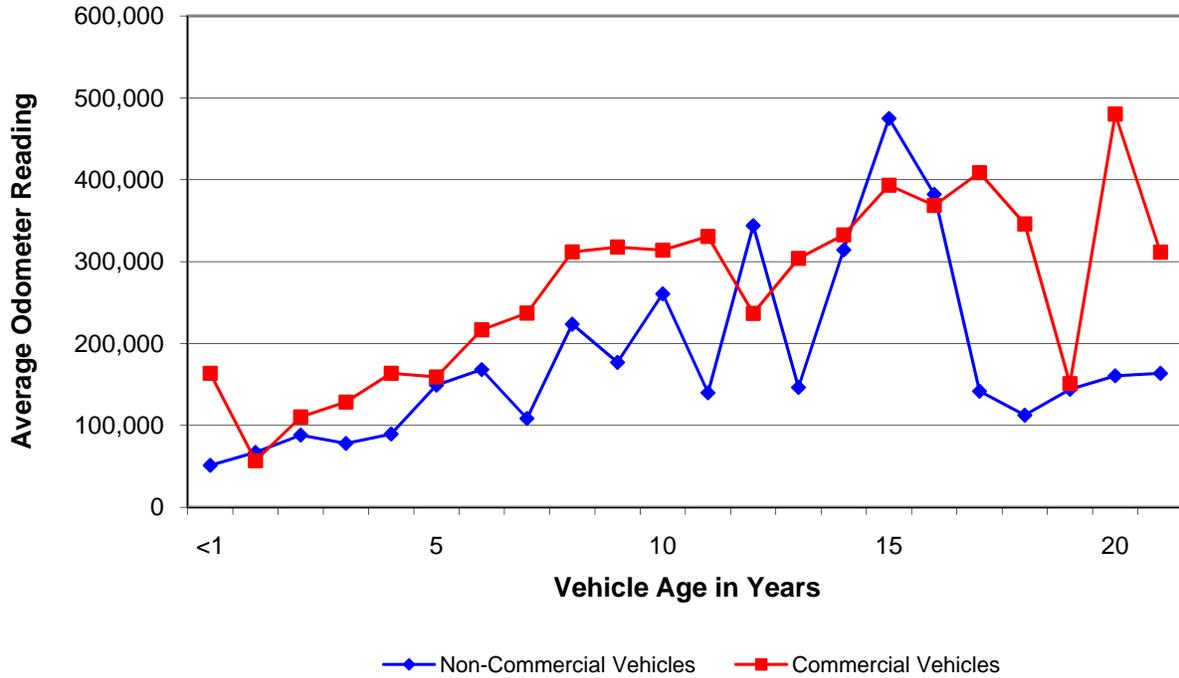


Figure 14. Average Odometer Readings for Vehicles by Age of Vehicle.

Table 9. Distribution of Surveyed Vehicles by Age and Average Odometer Readings.

Age	Non-Commercial Vehicles			Commercial Vehicles		
	Number of Vehicles	Percent of Total	Average Reported Odometer	Number of Vehicles	Percent of Total	Average Reported Odometer
<1	21	0.6	51,216	8	1.3	163,667
1	230	6.6	67,117	53	8.9	56,750
2	439	12.6	88,152	52	8.7	110,279
3	378	10.8	77,981	57	9.5	128,438
4	371	10.6	89,505	50	8.4	163,583
5	307	8.8	149,164	51	8.5	159,204
6	271	7.8	168,173	65	10.9	216,777
7	265	7.6	108,516	62	10.4	237,170
8	188	5.4	223,615	41	6.9	311,937
9	177	5.1	177,029	23	3.8	317,810
10	153	4.4	260,698	19	3.2	313,999
11	146	4.2	139,869	33	5.5	330,730
12	96	2.7	343,976	17	2.8	236,828
13	97	2.8	146,410	15	2.5	303,929
14	64	1.8	314,388	11	1.8	332,669
15	58	1.7	474,954	6	1.0	393,246
16	41	1.2	382,305	4	0.7	368,618
17	28	0.8	141,795	4	0.7	408,600
18	19	0.5	112,464	2	0.3	346,000
19	32	0.9	144,088	4	0.7	151,000
20	22	0.6	160,583	6	1.0	480,250
>20	73	2.1	163,614	12	2.0	311,583
Unknown	17	0.5	97,857	3	0.5	337,275
Total	3,493	100.0	146,042	598	100.0	210,847

Vehicle Occupancy

As vehicles were surveyed, one of the data items recorded was the class or type of vehicle and the number of persons in the vehicle. This information provides a means for estimating the number of persons traveling in and out of the Sherman-Denison study area. Table 10 presents the distribution of non-commercial and commercial vehicles by class and the average occupancy of each vehicle. A majority of the non-commercial vehicles (98 percent) were classified as passenger vehicles. Approximately 70 percent of commercial vehicles were semi/tractor-trailer combinations. The overall average occupancy for non-commercial vehicles was 1.39 persons/vehicle and 1.11 persons/vehicle for commercial vehicles.

Table 10. Distribution of Vehicles by Class and Average Occupancy.

Non-Commercial Vehicles	Observed Vehicles	Percent of Total	Average Occupancy	Commercial Vehicles	Observed Vehicles	Percent of Total	Average Occupancy
Passenger Vehicle	3,422	97.97	1.39	Single Unit 2-axle (6 wheels)	86	14.38	1.19
Bus	42	1.20	1.64	Single Unit 3-axle (10 wheels)	49	8.19	1.18
Taxi/Paid Limo	1	0.03	1.00	Single Unit 4-axle (14 wheels)	42	7.02	1.14
School Bus	1	0.03	2.00	Semi (tractor-trailer)	421	70.40	1.09
Commercial Vehicle (over 1 ton)	10	0.29	1.10	Other	0	0.00	—
Motorcycle	10	0.29	1.00				
Recreational Vehicle	7	0.20	2.29				
Other	0	0.00	—				
Total	3,493	100.00	1.39	Total	598	100.00	1.11

COMMERCIAL VEHICLE CARGO CHARACTERISTICS

Commercial vehicles represent a major component of travel into, out of, and through most study areas. Specific questions were included in the commercial vehicle survey to obtain information on the cargo being transported, the type of facility where it was picked up and dropped off, and how the cargo was transferred to the vehicle. Table 11 presents data on the number of commercial vehicles surveyed by external station, the number and percent of vehicles not transporting any cargo, and whether or not their cargo was from Mexico. In Table 11, approximately 17 percent of the vehicles reported not carrying any cargo. The remaining 83 percent were transporting cargo, of which 2 percent of those cargos were from or destined to Mexico.

Table 11. Commercial Vehicles with Cargo from Mexico.

Station Number	Facility	Surveyed Vehicles	Empty Vehicles	Percent Empty	Vehicles with Mexico Cargo	Vehicles without Mexico Cargo
496	US 377 N	62	27	43.55	1	34
497	SH 91	7	0	0.00	0	7
474	US 75/69	80	10	12.50	1	69
479	US 82 E	52	11	21.15	1	40
483	US 69 S	59	15	25.42	1	43
485	SH 160	82	2	2.44	4	76
487	SH 5	13	3	23.08	0	10
488	US 75	36	6	16.67	0	30
490	SH 289	49	4	8.16	2	43
491	US 377	45	4	8.89	0	41
494	US 82 W	82	15	18.29	0	67
500	SH 56	31	5	16.13	0	26
Total		598	102	17.06	10	486

Table 12 shows a detailed summary of cargo types being transported by surveyed commercial vehicles. The percent of vehicles reflected for cargo classes 1 through 21 represent the total percent for those vehicles that were transporting a cargo. The most frequently occurring types were metals and minerals (16 percent), food, health, and beauty products (11 percent), manufactured goods and equipment (10 percent), clay, concrete, glass, or stone (10 percent), miscellaneous shipments (10 percent), and farm products (9 percent). These items comprised approximately 66 percent of the total cargo types.

Table 12. Distribution of Commercial Vehicles by Type of Cargo.

Cargo Description		Number of Vehicles	Percent of Vehicles
1	Farm Products	44	8.87
2	Forest Products	39	7.86
3	Marine Products	3	0.60
4	Metals and Minerals	80	16.13
5	Food, Health, and Beauty Products	57	11.49
6	Tobacco Products	1	0.20
7	Textiles	16	3.23
8	Wood Products	17	3.43
9	Printer Matter	7	1.41
10	Chemical Products	16	3.23
11	Refined Petroleum or Coal Products	17	3.43
12	Rubber, Plastic, and Styrofoam Products	17	3.43
13	Clay, Concrete, Glass, or Stone	48	9.68
14	Manufactured Goods/Equipment	52	10.48
15	Wastes	4	0.81
16	Miscellaneous Shipments	48	9.68
17	Hazardous Materials	6	1.21
18	Transportation	11	2.22
19	Unclassified Cargo	3	0.60
20	Driver Refused to Answer	2	0.40
21	Unknown to Driver	8	1.61
Total Vehicles with Cargo		496	82.94
22	Empty	102	17.06
Grand Total		598	100.00

Figures 15 and 16 present the distribution of surveyed commercial vehicles by the type of transfer for their cargo at the origin (point of pick up), and at their destination (point of delivery). Truck-to-truck and warehouse-to-truck accounted for the majority of cargo transfers at both the origin and destination. Nearly 50 percent of the transfers were truck-to-truck and more than 30 percent were warehouse-to-truck. Approximately 5 percent of the transfers were pipeline-to-truck.

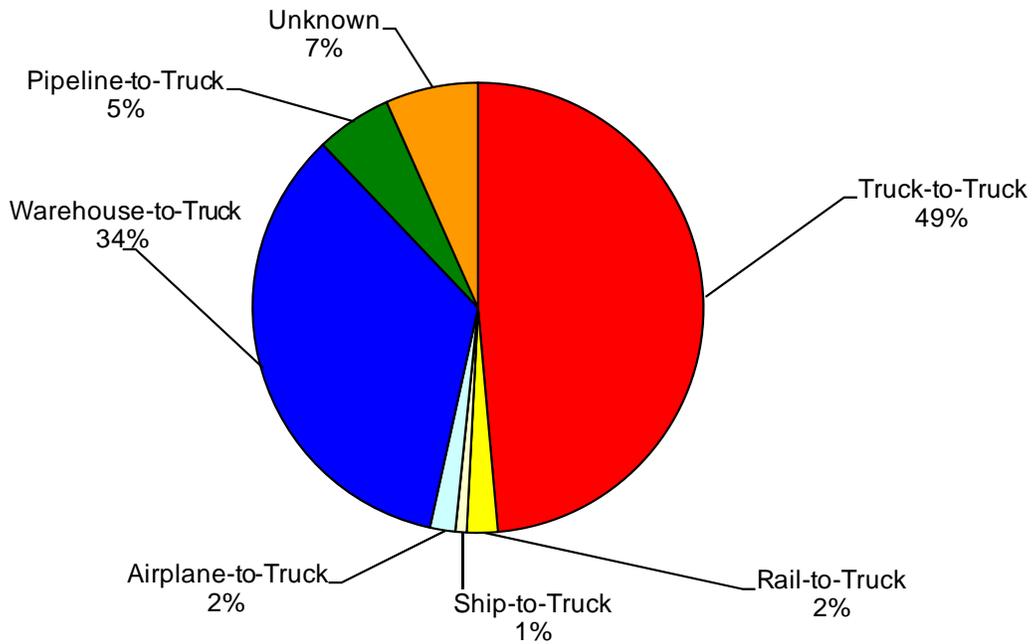


Figure 15. Cargo Transfer at Point of Pick-Up.

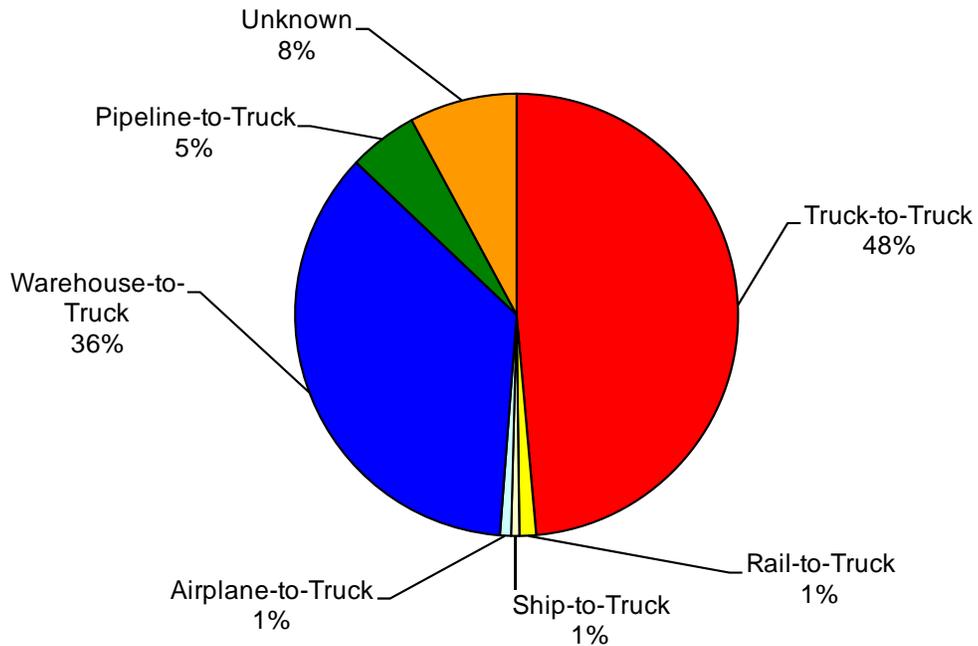


Figure 16. Cargo Transfer at Point of Drop-Off.

HIGH-VOLUME LICENSE PLATE MATCH SYSTEM

There were two locations in the Sherman-Denison area with traffic volumes that were too high to safely stop traffic and interview drivers. For these locations, a license plate match method was used to estimate the number of external-local and external-through trips. The license plate matching survey was conducted using high-speed digital cameras that recorded license plates of commercial and non-commercial vehicles entering and exiting the study area at each high-volume location. As previously mentioned, for the purpose of this study, any roadway that had more than 20,000 vehicles per day was considered high volume. The license plate information for all locations was gathered on the same day. After the plate information was recorded, it was processed through a computer program that determined the number of license plate matches between each license plate survey location. Table 13 shows the high-volume locations, the number of license plates recorded by direction, and the 24-hour traffic counts for these locations.

Table 13. High-Volume Locations.

Station Number	Facility	Location	License Plates Recorded		24-Hour Vehicle Count	
			Inbound	Outbound	Inbound	Outbound
474	US 75/69 N	at TX/OK Border	8,653	9,128	12,724	13,081
488	US 75 N	at Collin Co. Line	12,079	11,265	16,164	15,735

Only matches meeting specified criteria that occurred within acceptable time limits between each survey location were considered valid matches. One criterion for license plate data was that at least five of the six characters (in consecutive order) match for the plate to be considered valid. Additionally, travel time runs were made for the peak and off-peak periods to establish reasonable time limits for an external-through vehicle to travel between license plate survey stations. The travel times were then increased by 25 percent for both peak and off-peak periods to account for variation in travel speeds among motorists. Table 14 provides the travel times utilized for the analysis of license plate data.

Table 14. High-Volume Travel Times.

Movement		Travel Time	
From	To	Peak (h:mm)	Off-Peak (h:mm)
US 75/69 N (474)	US 75 N (488)	0:30	0:30
US 75 N (488)	US 75/69 N (474)	0:28	0:29

Using the travel time estimates provided in Table 14, the total number of license plates determined to be traveling between the high-volume locations was determined. Table 15 shows the results of this analysis.

Table 15. Results of License Plate Matching for High-Volume Locations.

Movement		Through Trips (expanded)	
From	To	Non-Commercial	Commercial
US 75/69 N (474)	US 75 N (488)	1,217	437
US 75 N (488)	US 75/69 N (474)	1,427	521

SURVEY DATA EXPANSION

The vehicle survey data were expanded based on the 24-hour directional vehicle classification counts conducted at each survey site on the day the site was surveyed. The assumption was made that the traffic in the non-surveyed direction was a mirror image of the traffic in the surveyed direction. For example, if 10 percent of the surveyed outbound traffic was through trips, it was assumed that 10 percent of the inbound traffic would be through trips. Additionally, it was assumed that the surveyed vehicles are a representative sample of the vehicles at each site for a 24-hour period.

Table 16 presents the expanded estimates of external-local and external-through trips for non-commercial and commercial vehicles by site as well as the estimates of trips by residents and visitors (non-residents). Note that estimates are included in Table 16 for the non-surveyed sites. Additionally, the number of residents and visitors for the non-surveyed sites was determined using the percentage of residents and visitors from a proximal surveyed site. For example, the percentage of residents determined from the survey for US 82 West (station number 494) was applied to the total number of trips for FM 902 (station number 493) which was a non-surveyed location.

The expanded survey data were used to develop zone-to-zone estimates of non-commercial and commercial vehicle trips based on the geocoded origins and destinations for the surveyed trips. Trips for the non-surveyed sites were distributed to the destination zones observed from the surveyed sites on a proportional basis. It is assumed that the surveyed sites are representative of the possible destination zones for the non-surveyed sites. Since the volume of vehicle trips at the non-surveyed sites is typically low, the amount of error that may be generated by that assumption is believed to be small. For the high-volume locations, a license plate match was used to identify and estimate the number of through trips made by non-commercial and commercial vehicles.

Table 16. Expanded Survey Results by Station.

Station Number	Facility	Non-Commercial Vehicles			Residents	Visitors	Commercial Vehicles		
		Local	Through	Total			Local	Through	Total
496	US 377 N	2,448	333	2,781	1,426	1,022	210	270	480
497	SH 91	3,311	120	3,431	1,792	1,519	46	7	53
474	US 75/69 N	15,526	3,004	18,530	7,204	8,322	6,040	1,235	7,275
476	FM 1753	638	0	638	199	439	299	220	519
479	US 82 E	5,719	567	6,286	1,786	3,933	519	165	684
480	FM 898	524	0	524	163	361	28	0	28
481	FM 151	501	0	501	134	367	3	0	3
482	SH 11	1,459	0	1,459	390	1,069	118	0	118
483	US 69 S	2,381	350	2,731	635	1,745	310	207	517
484	FM 814	416	10	426	202	215	14	0	14
485	SH 160	2,550	167	2,717	1,234	1,316	507	233	740
486	FM 3133	642	0	642	311	331	25	0	25
487	SH 5	2,884	44	2,928	1,457	1,427	130	0	130
488	US 75 N	21,047	3,030	24,077	9,766	11,281	6,617	1,205	7,822
489	FM 3356	446	0	446	293	153	11	0	11
490	SH 289	3,969	135	4,104	2,609	1,360	212	83	295
491	US 377	6,508	776	7,284	2,948	3,560	276	127	403
492	FM 922	1,351	420	1,771	612	739	101	5	106
493	FM 902	2,123	0	2,123	898	1,225	39	9	48
494	US 82 W	10,260	895	11,155	4,344	5,916	1,398	633	2,031
500	SH 56	2,628	50	2,678	1,087	1,541	49	21	70
Total		87,333	9,899	97,232	39,492	47,841	16,951	4,421	21,372

Figure 17 shows the estimates of external-local trip movements by direction and location group. The largest number of external-local trips occurred with the south group of external stations.

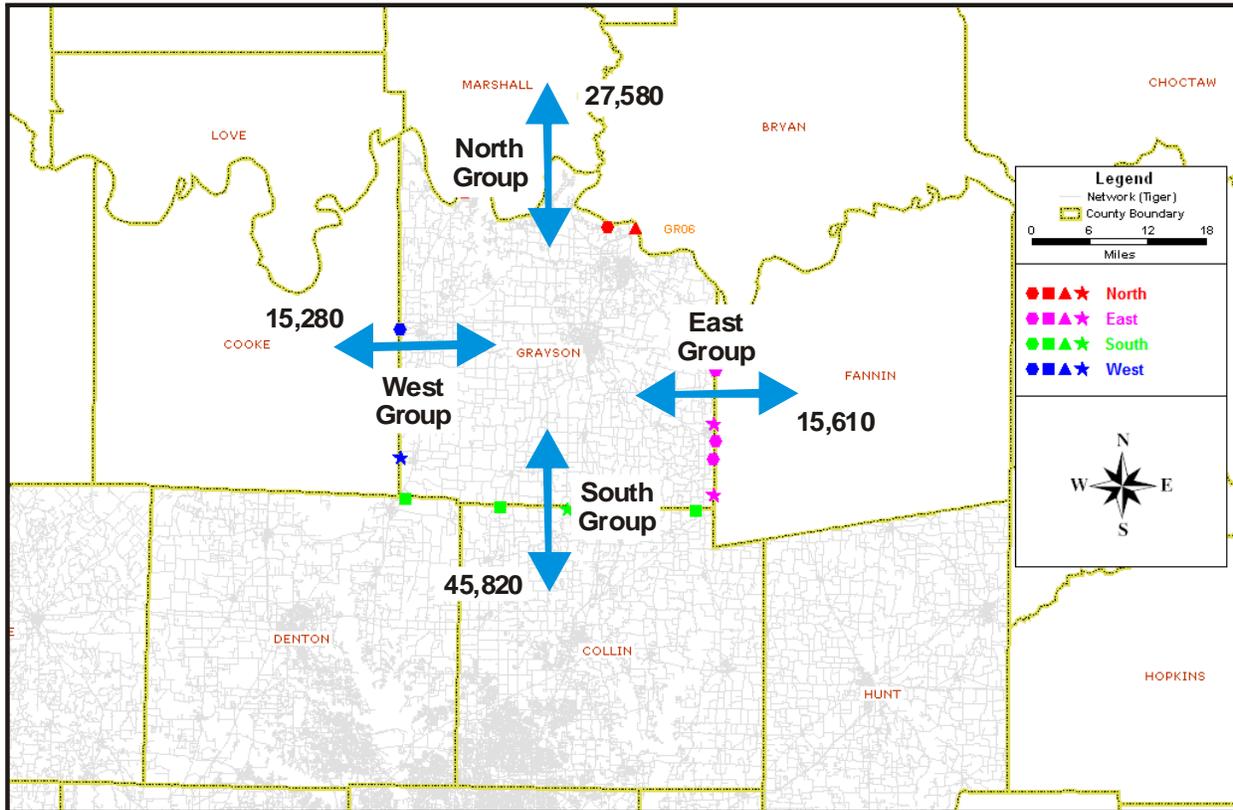


Figure 17. Estimates of External-Local Trip Movements by Location Group.

Figure 18 shows the estimates of external-through trip movements by direction and location group. For the study area, the most external-through movements were in the north-south and south-west pairs.

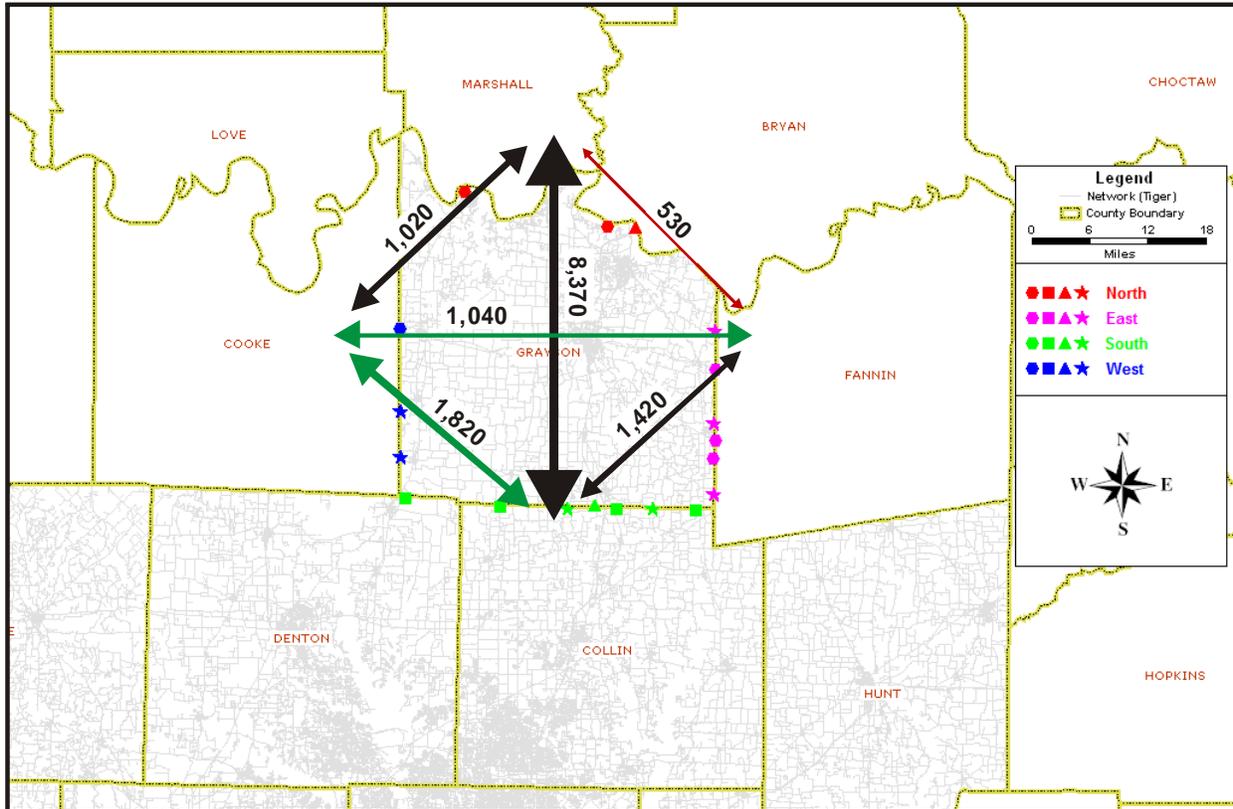


Figure 18. Estimates of External-Through Trip Movements by Location Group.

Table 17 shows the expanded external local and external through trips by station and location group for both commercial and non-commercial vehicles.

Table 17. Expanded Local and Through Trips by Station and Location Group.

Station Number	Facility	External Local	Percent	External Through	Percent	Total
496	US 377 N	2,658	9.64	603	12.14	3,261
497	SH 91	3,357	12.17	127	2.55	3,484
474	US 75/69 N	21,565	78.19	4,240	85.31	25,805
North Group		27,581	100.00	4,969	100.00	32,550
476	FM 1753	937	6.00	220	13.85	1,157
479	US 82 E	6,239	39.97	731	46.01	6,970
480	FM 898	552	3.54	0	0.00	552
481	FM 151	504	3.23	0	0.00	504
482	SH 11	1,577	10.10	0	0.00	1,577
483	US 69 S	2,691	17.24	557	35.07	3,248
484	FM 814	430	2.76	10	0.60	440
500	SH 56	2,677	17.15	71	4.47	2,748
East Group		15,606	100.00	1,590	100.00	17,196
485	SH 160	3,057	6.67	400	6.89	3,457
486	FM 3133	667	1.46	0	0.00	667
487	SH 5	3,014	6.58	44	0.76	3,058
488	US 75 N	27,664	60.37	4,235	73.02	31,899
489	FM 3356	457	1.00	0	0.00	457
490	SH 289	4,181	9.12	218	3.76	4,399
491	US 377	6,784	14.80	903	15.57	7,687
South Group		45,824	100.00	5,800	100.00	51,624
492	FM 922	1,453	9.51	424	21.63	1,877
493	FM 902	2,162	14.16	9	0.47	2,171
494	US 82 W	11,658	76.33	1,528	77.91	13,186
West Group		15,273	100.00	1,961	100.00	17,234
Grand Total		104,284	87.93	14,320	12.07	118,604

The final analysis performed involved ascertaining the vehicle miles of travel (VMT) for all external related trips. Using the expanded trip data and lengths provided in the transportation

network travel distance matrix, the total amount of VMT attributable to commercial and non-commercial trips was determined. Table 18 provides the results. The overall average trip length was 15.7 miles per trip.

Table 18. Summary of VMT.

Vehicle Type	Trip Type	Number of Trips	VMT	Average Trip Length
Non-Commercial	External Through	4,950	148,988	30.10
	External Local	87,331	1,235,609	14.15
Commercial	External Through	2,210	70,232	31.78
	External Local	16,952	298,091	17.58
Total		111,443	1,752,920	15.73

SURVEY SUMMARY

Approximately 118,600 vehicles enter and leave the Sherman-Denison study area daily, of which approximately 82 percent are non-commercial vehicles and the remaining 18 percent are commercial vehicles. Approximately 12 percent of the total vehicles make through trips. Based on the average vehicle occupancy observed in the survey, more than 135,000 persons are entering and leaving the study area daily by non-commercial vehicle and 23,700 persons are entering and leaving by commercial vehicle. The estimated number of non-residents (persons that do not live in the study area) by non-commercial vehicles that enter the study area daily is approximately 48,000. Based on the survey results, it is estimated that nearly 2,400 internal trips are made by non-residents on a daily basis.

For residents, 51 percent of non-commercial trip origins were leaving home and 32 percent of non-commercial trip destinations were personal-related. For non-residents, 14 percent of non-commercial trip origins and 53 percent of non-commercial trip destinations were to home. HBNW trips accounted for 37 percent of the non-commercial trips. The percentage of trips that were NHB and HBW were 37 percent and 25 percent, respectively.

Commercial vehicle drivers reported varied trip purposes at the origin and destination ends of their trip. Approximately 33 percent of the trip origin purposes were reported to be for delivery, and 35 percent for picking up cargo. Delivering cargo was the stated purpose for 62 percent of the destination trips, and 17 percent for picking up cargo. Leaving base operations accounted for 15 percent of the origin trips and 10 percent of the destination trips.

The percent distribution of non-commercial and commercial vehicles by time-of-day was similar between inbound and outbound directions for all the sites combined. The outbound volumes “mirrored” the inbound volumes, which is the expected result. The largest “spike” in the inbound direction occurred during the morning peak period (as people entered the study area to work, shop, etc.), and the spike for the outbound direction was in the afternoon peak period.

The median vehicle year for non-commercial vehicles was 2001 and for commercial vehicles it was 2000. The average vehicle age was 5.8 years for both non-commercial and commercial

vehicles. The average odometer reading for commercial vehicles was over 210,000 miles, compared to 146,000 miles for non-commercial vehicles. Average vehicle occupancy was 1.39 for non-commercial vehicles and 1.11 for commercial vehicles.

Commercial vehicles represented 18 percent of the vehicles traveling into and out of the study area daily. Based on the survey, approximately 17 percent of the commercial vehicles were not carrying any cargo. For those commercial vehicles transporting cargo, only 2 percent were carrying cargo originating from or destined to Mexico.

APPENDIX A

**DALLAS-FORT WORTH / SHERMAN-DENISON EXTERNAL STATION
NON-COMMERCIAL VEHICLE SURVEY - FORM A**
(Outbound Direction)

Station # _____ Survey Date _____
Station Name/Location _____ Interviewer _____

For each vehicle you collect	Vehicle 1	Vehicle 2	Vehicle 3
Time	_____ a.m. _____ p.m.	_____ a.m. _____ p.m.	_____ a.m. _____ p.m.
Number of people in vehicle			
Vehicle Type			

Vehicle Type options: 1) Passenger (car/truck/van) 2) Bus 3) Taxi/Paid Limo 4) School Bus
5) Commercial Vehicle (over 1 ton) 6) Motorcycle 7) Recreational Vehicle 8) Other (specify in block) 99) Refused/Unknown

QUESTIONS:	Vehicle 1	Vehicle 2	Vehicle 3
1. What year, make, and model is this vehicle? Gas (leaded, unleaded), diesel, propane or other fuel?	_____ Year _____ Make _____ Model Leaded <input type="checkbox"/> Unleaded <input type="checkbox"/> Diesel <input type="checkbox"/> Propane <input type="checkbox"/> Other <input type="checkbox"/> _____	_____ Year _____ Make _____ Model Leaded <input type="checkbox"/> Unleaded <input type="checkbox"/> Diesel <input type="checkbox"/> Propane <input type="checkbox"/> Other <input type="checkbox"/> _____	_____ Year _____ Make _____ Model Leaded <input type="checkbox"/> Unleaded <input type="checkbox"/> Diesel <input type="checkbox"/> Propane <input type="checkbox"/> Other <input type="checkbox"/> _____
2. What is the mileage on your odometer?			
3. What county do you live in? (If other, go to 4)	<input type="checkbox"/> Collin <input type="checkbox"/> Dallas <input type="checkbox"/> Denton <input type="checkbox"/> Ellis <input type="checkbox"/> Hood <input type="checkbox"/> Hunt <input type="checkbox"/> Johnson <input type="checkbox"/> Kaufman <input type="checkbox"/> Parker <input type="checkbox"/> Rockwall <input type="checkbox"/> Tarrant <input type="checkbox"/> Wise <input type="checkbox"/> Grayson <input type="checkbox"/> Other	<input type="checkbox"/> Collin <input type="checkbox"/> Dallas <input type="checkbox"/> Denton <input type="checkbox"/> Ellis <input type="checkbox"/> Hood <input type="checkbox"/> Hunt <input type="checkbox"/> Johnson <input type="checkbox"/> Kaufman <input type="checkbox"/> Parker <input type="checkbox"/> Rockwall <input type="checkbox"/> Tarrant <input type="checkbox"/> Wise <input type="checkbox"/> Grayson <input type="checkbox"/> Other	<input type="checkbox"/> Collin <input type="checkbox"/> Dallas <input type="checkbox"/> Denton <input type="checkbox"/> Ellis <input type="checkbox"/> Hood <input type="checkbox"/> Hunt <input type="checkbox"/> Johnson <input type="checkbox"/> Kaufman <input type="checkbox"/> Parker <input type="checkbox"/> Rockwall <input type="checkbox"/> Tarrant <input type="checkbox"/> Wise <input type="checkbox"/> Grayson <input type="checkbox"/> Other
3a. What city do you live in?	(go to 5)	(go to 5)	(go to 5)
4. What city and state to you live in?	_____ (city / state in US or Mexico) <input type="checkbox"/> Refused	_____ (city / state in US or Mexico) <input type="checkbox"/> Refused	_____ (city / state in US or Mexico) <input type="checkbox"/> Refused
4a. Did you stay overnight as part of your travel?	<input type="checkbox"/> Yes <input type="checkbox"/> Refused <input type="checkbox"/> No (go to 4d)	<input type="checkbox"/> Yes <input type="checkbox"/> Refused <input type="checkbox"/> No (go to 4d)	<input type="checkbox"/> Yes <input type="checkbox"/> Refused <input type="checkbox"/> No (go to 4d)
4b. Where did you stay?	_____ _____ (city / state in US or Mexico) <input type="checkbox"/> Refused	_____ _____ (city / state in US or Mexico) <input type="checkbox"/> Refused	_____ _____ (city / state in US or Mexico) <input type="checkbox"/> Refused
4c. How many nights have you stayed?			
4d. Did you enter Texas today?	<input type="checkbox"/> Yes <input type="checkbox"/> Refused <input type="checkbox"/> No (go to 5)	<input type="checkbox"/> Yes <input type="checkbox"/> Refused <input type="checkbox"/> No (go to 5)	<input type="checkbox"/> Yes <input type="checkbox"/> Refused <input type="checkbox"/> No (go to 5)

4e. Where outside of Texas did you travel from?	_____	_____	_____	
	(city / state in US or Mexico)	(city / state in US or Mexico)	(city / state in US or Mexico)	
4f. What road or highway did you use to enter Texas?	<input type="checkbox"/> Refused	<input type="checkbox"/> Refused	<input type="checkbox"/> Refused	
	_____	_____	_____	
5. Where was the <i>last</i> place you got into your vehicle (place/address or nearest intersection/city)	_____ a.m. _____ p.m.	_____ a.m. _____ p.m.	_____ a.m. _____ p.m.	
	5b. What type of place was that? (choose from type of place options)	_____	_____	
	5c. What was your purpose for being at your last location? (Choose from trip purpose options)	_____	_____	
	5d. Was that location in the study area? (see Question 3 for study area counties)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refused (Yes go to 6)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refused (Yes go to 6)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refused (Yes go to 6)
	5e. What road did you use to enter the study area? (see Question 3 for study area counties)	_____	_____	_____
	_____	_____	_____	

- Type of Place Options:**
- | | | |
|--------------------|--|---------------------------------------|
| 1) Office building | 2) Retail Shopping/Gas | 3) Industrial/Manufacturing/Warehouse |
| 4) Medical | 5) Educational (12 th grade or lower) | 6) Educational (college, trade, etc.) |
| 7) Government | 8) Residential | 9) Airport |
| 11) Hotel / Motel | 12) Other (specify) | 10) Eating Establishment |
| | | 99) Refused/Unknown |

- Trip Purpose Options:**
- | | | | |
|------------------------|-------------------------|--------------------------------|--------------------------|
| 1) Home/Return Home | 2) Go/Return to work | 3) Work-related | 4) School |
| 5) Vacation | 6) Visit Family/Friends | 7) Eat out | 8) Shop |
| 9) Buy gas | 10) Personal business | 11) Pick-up/Drop off Passenger | |
| 12) Change Travel Mode | 13) Delivery | 14) Recreation | 15) Overnight stay/sleep |
| 16) Other (specify) | 99) Unknown/Refused | | |

6. Where is your next destination? (place/address or nearest intersection/city)	_____	_____	_____
	_____	_____	_____
6a. What is your purpose for traveling to this destination? (Choose from trip purpose options)	_____	_____	_____
7. Are you going to a location out of Texas?	<input type="checkbox"/> Yes <input type="checkbox"/> Refused <input type="checkbox"/> No (go to 7d)	<input type="checkbox"/> Yes <input type="checkbox"/> Refused <input type="checkbox"/> No (go to 7d)	<input type="checkbox"/> Yes <input type="checkbox"/> Refused <input type="checkbox"/> No (go to 7d)
<i>If Yes:</i> 7a. What city and state are you going to?	_____	_____	_____
7b. What road / bridge will you use to leave Texas?	_____	_____	_____
7c. How many more days will you be in Texas?	_____	_____	_____
<i>If No</i> 7d. What city / county in Texas are you going to?	_____	_____	_____

To measure the amount of travel you made today, we need to know the number of places you have gone today. Would you please tell us:

8. Where did your first trip today begin? (city/county/landmark)			
9. Where did you go from there? (city/county/landmark)			
10. Where did you go next? (city/county/landmark)			
11. Where did you go next? (city/county/landmark)			
12. Where did you go next? (city/county/landmark)			
13. How many more places did you stop today?			

DALLAS-FORT WORTH / SHERMAN-DENISON EXTERNAL STATION
COMMERCIAL VEHICLE SURVEY - FORM B
(Outbound Direction)

Station # _____

Survey Date _____

Station Name/Location _____

Interviewer _____

For each vehicle you collect:

	Vehicle 1	Vehicle 2	Vehicle 3
1. Time	_____ a.m. _____ p.m.	_____ a.m. _____ p.m.	_____ a.m. _____ p.m.
2. Number of people in vehicle			
3. Vehicle Classification			
4. What is the cargo ? (choose from vehicle cargo codes)	<input type="checkbox"/> Empty (no cargo)		
4a. If empty, what was the last cargo you delivered?	(go to 12)		
4b. Is your load full or partial? * <i>determine 4a and 4b by observation</i> *	<input type="checkbox"/> Full <input type="checkbox"/> Partial		
4c. Is cargo being hauled using an multi-modal container/trailer or TEU?	<input type="checkbox"/> Yes <input type="checkbox"/> No (go to 5)		
<i>If Yes</i> 4d. Is the container a Reefer or Dry Box?	<input type="checkbox"/> Reefer <input type="checkbox"/> Dry Box		
5. Did your cargo come from or is it going to Mexico?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refused / Unknown	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refused / Unknown	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refused / Unknown
6. Where did you pick up your load? (place/address or nearest intersection and city)			
7. Was that location an inter-modal transfer or custom brokerage site?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refused / Unknown	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refused / Unknown	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refused / Unknown
8. How was your load transferred at that site (choose from transfer codes)?			
9. Where will you drop your cargo off? (place/address or nearest intersection and city)			
10. Is that location an inter-modal transfer or custom brokerage site?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refused / Unknown	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refused / Unknown	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refused / Unknown
11. How will the cargo be transferred at that site (choose from transfer codes)?			

Vehicle Classification Options: 1) Single Unit 2-axle (6 wheels) 2) Single Unit 3-axle (10 wheels) 3) Single Unit 4-axle (14 wheels)
4) Semi (all tractor-trailer combinations) 5) Other (specify) 99) Refused / Unknown

Cargo Transfer Options: 1) Truck-to/from-Truck 2) Rail-to/from-Truck 3) Ship-to/from-Truck 4) Airplane-to/from-Truck
5) Warehouse-to/from-Truck 6) Pipeline-to/from-Truck 99) Unknown / Refused

NOTE: All cargo transfer options are both ways (i.e., Truck-to-Warehouse should be coded same as Warehouse-to-Truck).

QUESTIONS:

<p>12. What is the year and gross weight rating of this vehicle ?</p> <p>Gas (leaded, unleaded), diesel, propane or other fuel?</p>	<p>_____</p> <p>Year</p> <hr/> <p>Gross Weight</p> <p>Leaded <input type="checkbox"/> Unleaded <input type="checkbox"/></p> <p>Diesel <input type="checkbox"/> Propane <input type="checkbox"/></p> <p>Other <input type="checkbox"/> _____</p>	<p>_____</p> <p>Year</p> <hr/> <p>Gross Weight</p> <p>Leaded <input type="checkbox"/> Unleaded <input type="checkbox"/></p> <p>Diesel <input type="checkbox"/> Propane <input type="checkbox"/></p> <p>Other <input type="checkbox"/> _____</p>	<p>_____</p> <p>Year</p> <hr/> <p>Gross Weight</p> <p>Leaded <input type="checkbox"/> Unleaded <input type="checkbox"/></p> <p>Diesel <input type="checkbox"/> Propane <input type="checkbox"/></p> <p>Other <input type="checkbox"/> _____</p>
<p>13. What is the mileage on your odometer?</p>			

<p>14. Where are you coming from? (city / state in US or Mexico)</p> <p>14a. Is that location in Texas?</p> <p>14b. (If not in Texas) Did you enter Texas today?</p> <p>14c. What road or highway did you use to enter Texas?</p> <p>14d. Did you stay overnight as part of your travel?</p> <p>14e. If yes, where did you stay? (city/county/state)</p> <p>14f. How many nights have you stayed?</p>			
<p>15. Where was the last place you got into your vehicle? (place/address or nearest intersection/city)</p> <p>15a. What time did you leave that place?</p> <p>15b. What type of place was this? (choose from type of place options).</p> <p>15c. What was your purpose for being at your last location?</p> <p>15d. Was that location in the study area?</p> <p>15e. What road did you use to enter the study area?</p>	<p>_____ a.m. _____ p.m.</p>	<p>_____ a.m. _____ p.m.</p>	<p>_____ a.m. _____ p.m.</p>
<p>16. Where is your next destination? (place/address or nearest intersection/city)</p> <p>16a. What is your purpose for traveling to this destination? (Choose from trip purpose options.)</p>			

17. Are you going to a location outside of Texas?	<input type="checkbox"/> Yes (Go to 17a) <input type="checkbox"/> No (go to 17d) <input type="checkbox"/> Refused	<input type="checkbox"/> Yes (Go to 17a) <input type="checkbox"/> No (go to 17d) <input type="checkbox"/> Refused	<input type="checkbox"/> Yes (Go to 17a) <input type="checkbox"/> No (go to 17d) <input type="checkbox"/> Refused
<i>If Yes</i>			
17a. What city and state are you going to?			
17b. What road or highway will you use to leave Texas?			
17c. How many more days will you be in Texas?			
<i>If No</i>			
17d. What city / county in Texas are you going to?			

- Type of Place Options:**
- | | | |
|--------------------|--|---------------------------------------|
| 1) Office building | 2) Retail Shopping/Gas | 3) Industrial/Manufacturing/Warehouse |
| 4) Medical | 5) Educational (12 th grade or lower) | 6) Educational (college, trade, etc.) |
| 7) Government | 8) Residential | 9) Airport |
| 11) Hotel/Motel | 12) Other (specify) | 10) Eating Establishment |
| | | 99) Refused/Unknown |

- Trip Purpose Options:**
- | | | |
|--|-------------------------------|-------------|
| 1) Base location/return to base location | 2) Delivery | 3) Pick-up |
| 4) Maintenance | 5) Driver needs (lunch, etc.) | 6) To Home |
| 8) Other (specify) | 99) Refused/Unknown | 7) Buy fuel |

To measure the amount of travel you made today, we need to know the places you have gone today. Would you please tell us:

18. Where did your first trip today begin? (city/county/landmark)			
19. Where did you go from there? (city/county/landmark)			
20. Where did you go next? (city/county/landmark)			
21. Where did you go next? (city/county/landmark)			
22. Where did you go next? (city/county/landmark)			
23. Where did you go next? (city/county/landmark)			
24. Where did you go next? (city/county/landmark)			
25. How many more places did you stop today?			

Vehicle Cargo Codes

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, etc.
5 – Food, Health, Beauty Products	Assorted food products, cosmetics, etc.
6 – Tobacco Products	Cigarettes, cigars, and chewing tobacco
7 – Textiles	Clothing, lines, 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, 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 such as machinery, appliances, 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, Heavy Equipment, etc.
19 – Unclassified Cargo (specify)	Cargo not falling within one of the above categories
20 – Driver Refused to Answer	Driver refused to answer
21 – Unknown to Driver	Unknown to driver
22 - Empty	Empty

APPENDIX B

Dallas-Fort Worth and Sherman-Denison External Station Non-Commercial Travel Survey Form A Data File Format

This file will contain the survey data collected using Form A in the Dallas-Fort Worth and Sherman-Denison External Station survey. The data should be in an ASCII data file.

Item	Begin	End	Type	Field Columns	
				Format	Description
1. Record Type	1	2	Alphanum LJ	A2	Code which indicates the type of record, here it should be A.
2. Month	3	4	Numeric RJ	I2	Month station is being surveyed.
3. Day	5	6	Numeric RJ	I2	Day of the month survey is being conducted.
4. Station Number	7	10	Alphanum LJ	A4	Site number of the station being surveyed as described in Attachment A.
5. Station	11	40	Alphanum. LJ	A30	Name of station/facility being surveyed.
6. Longitude	41	50	Numeric RJ	F10.6	Longitude of location being surveyed.
7. Latitude	51	60	Numeric RJ	F10.6	Latitude of location being surveyed.
8. Vehicle Number	61	61	Numeric RJ	I1	Vehicle number surveyed (column number on survey form).
9. Arrival Hour	62	63	Numeric RJ	I2	Hour vehicle arrived at location. Must be in military time.
10. Arrival Minute	64	65	Numeric RJ	I2	Minute vehicle arrived at location.
11. Occupancy	66	67	Numeric RJ	I2	Number of people in vehicle.
12. Vehicle Class.	68	69	Numeric RJ	I2	Code indicating the classification of the vehicle. See below for code descriptions.
13. Vehicle Class. Other	70	79	Alphanum. LJ	A10	If vehicle type is coded as other, this is the description of the vehicle type.
14. Year of Vehicle	80	83	Numeric RJ	I4	Year vehicle was manufactured. 9999 should be coded for unknown / refused.
15. Vehicle Make	84	113	Alphanum. LJ	A30	Make of vehicle.
16. Vehicle Model	114	143	Alphanum. LJ	A30	Model of vehicle.
17. Vehicle Fuel Type	144	145	Numeric RJ	I2	Type of fuel used by vehicle. 1 - Leaded Gas; 2 - Unleaded Gas; 3 - Diesel; 4 - Propane; 5 - Other.
18. Fuel Type Other	146	155	Alphanum. LJ	A10	If type of fuel is coded as "other", this is the description of the type of fuel. Otherwise it is blank.
19. Odometer	156	162	Numeric RJ	I7	Odometer mileage on vehicle. 9999999 should be coded for unknown / refused.
20. Residence Status	163	164	Numeric RJ	I2	Code indicating if person lives in the study area. 1 – Collin; 2 – Dallas; 3 – Denton; 4 – Ellis; 5 – Hood; 6 – Hunt; 7 – Johnson; 8 – Kaufmann; 9 – Parker; 10 – Rockwall; 11 – Tarrant; 12 – Wise; 13 – Grayson; 14– Other; 99 – Unknown / Refused.
21. Resident Home Location	165	194	Alphanum. LJ	A30	This field contains the city and state of their home. This field is blank if item 20 is coded as 14.
22. Home Location (Non-Resident)	195	224	Numeric RJ	A30	For persons not living in the study area, this field contains the city and state where they reside. This field is blank if item 20 is coded 1 through 13.
23. Stayed Overnight (Non-Resident)	225	226	Numeric RJ	I2	For persons not living in study area, this field contains code indicating if person stayed overnight in study area. 1 – Yes; 2 – No; 99 – Unknown / Refused. This field is blank if item 20 is coded 1 through 13.
24. Stay-over Location (Non-Resident)	227	256	Alphanum LJ	A30	For persons not living in study area who indicated they stayed overnight in item 23, this field contains the name and location of where they stayed. This field is blank if item 20 is coded 1 through 13 or if item 23 is coded as 2.
25. Number of Nights (Non-Resident)	257	258	Numeric RJ	I2	This field should contain the number of nights non-resident stayed overnight in the study area. This field is blank if item 20 is coded 1 through 13.
26. Enter Texas (Non-Resident)	259	260	Numeric RJ	I2	For persons not living in the study area, this field contains the code indicating if person entered Texas on the survey date. 1- Yes; 2 – No; 99 – Unknown / Refused. This field is blank if item 20 is coded 1 through 13.
27. Travel Origin (Non-Resident)	261	290	Alphanum. LJ	A30	For persons not living in the study area, this field contains the travel origin for persons who entered Texas on the survey day. This field is blank if item 20 is coded 1 through 13 or if item 26 is coded as 2.
28. Texas Entry Point (Non-Resident)	291	320	Alphanum. LJ	A30	For persons not living in the study area who entered Texas on the travel day, this field should state the name of the road or highway they used to enter Texas. This field is blank if item 20 is coded 1 through 13 or if item 26 is coded as 2.
29. Texas Entry Zone (Non-Resident)	321	325	Numeric RJ	I5	This field contains the external station zone number of the entry or exit point listed in item 28. This field is blank if item 20 is coded 1 through 13 or if item 26 is coded as 2. If this is a SAM zone number, column 321 should be coded with a 1.
30. Origin Field 1	326	355	Alphanum. LJ	A30	This is the address of the last place person got into their vehicle or the name of the nearest intersecting streets to that place.

Dallas-Fort Worth and Sherman-Denison External Station Travel Survey, Form A Format (continued)

<u>Item</u>	<u>Begin</u>	<u>End</u>	<u>Type</u>	<u>Field Columns</u>	
				<u>Format</u>	<u>Description</u>
31. Origin Field 2	356	385	Alphanum. LJ	A30	This is the second street name of the nearest intersecting streets to the last place person got into their vehicle or a continuation of the address in item 30.
32. Origin Longitude	386	395	Numeric RJ	F10.6	This is the longitude of the origin address. Unknown / Refused origins within the study area should be coded as 888.8888. Unknown external origins outside of the study area but within Texas should be coded as 666.6666. Unknown Mexico external origins should be coded as 777.7777. Unknown out-of-state external origins (non-Mexico) should be coded as 999.9999.
33. Origin Latitude	396	405	Numeric RJ	F10.6	This is the latitude of the origin address. Unknown / Refused origins within the study area should be coded as 888.8888. Unknown external origins outside of the study area but within Texas should be coded as 666.6666. Unknown Mexico external origins should be coded as 777.7777. Unknown out-of-state external origins (non-Mexico) should be coded as 999.9999.
34. Study Area ID	406	406	Numeric RJ	I1	Study area ID of the origin zone. Zones in the Dallas/Ft.Worth study area should be coded as a D. Zones in the Sherman-Denison study area should be coded with an S.
35. Origin Zone	407	411	Numeric RJ	I5	If the trip origin is within the study area, this is the zone number where the origin is located. Unknown / refused internal locations within the study area should be coded as 8888. If the trip began outside of the study area but within Texas, it should be coded using the statewide zone system (SAM) and preceded by the number 1 in column 407. Unknown / refused external locations within Texas should be coded as 16666. If the origin is in Mexico, this should be the zone number for the international border crossing used to enter Texas. Unknown / refused border crossings from Mexico should be coded as 7777. If the origin is outside of Texas (non-Mexico), this should be the SAM zone number for the highway used to enter the state. Unknown / refused external locations outside of Texas (non-Mexico) should be coded as 9999.
36. Departure Hour	412	413	Numeric RJ	I2	This is the hour the vehicle departed from the origin location. This should be in military time.
37. Departure Minute	414	415	Numeric RJ	I2	This is the minute the vehicle departed from the origin location.
38. Origin Type	416	417	Numeric RJ	I2	Code indicating the type of place from which the trip originated. See code definitions below.
39. Origin Type Other	418	437	Alphanum. LJ	A20	If the origin type is coded as "other", this is the description of the type of place. Otherwise it is blank.
40. Origin Purpose	438	439	Numeric RJ	I2	This is the driver's purpose for being at that location. See code definitions below.
41. Origin Purpose Other	440	459	Alphanum. LJ	A20	If the origin purpose is coded as "other", this is the description of the purpose. Otherwise it is blank.
42. Trip Indicator	460	461	Numeric RJ	I2	Code indicating if the origin address is within the study area. 1 - Yes, 2 - No, 99 - Unknown / Refused.
43. Entry Point	462	491	Alphanum. LJ	A30	If the trip origin is outside the study area (i.e., indicated by a 2 in item 42), this field should state the name of the external highway / bridge at which the vehicle entered the study area. This field is blank if item 42 is coded as 1.
44. Entry Zone	492	496	Numeric RJ	I5	If the trip origin is outside the study area (i.e., indicated by a 2 in item 42), this field contains the external station number of the entry point listed in item 43. Unknown should be coded as 99999. This field is blank if item 42 is coded as 1.
45. Destination Field 1	497	526	Alphanum. LJ	A30	This is the address of the destination for the person or the name of the nearest intersecting streets to that destination.
46. Destination Field 2	527	556	Alphanum. LJ	A30	This is the second street name of the nearest intersecting streets to the destination of the person or a continuation of the address in item 45.
47. Destination Longitude	557	566	Numeric RJ	F10.6	This is the longitude of the destination address. Unknown / Refused internal destinations should be coded as 888.8888. Unknown external destinations within Texas should be coded as 666.6666. Unknown Mexico external destinations should be coded as 777.7777. Unknown out-of-state external destinations (non-Mexico) should be coded as 999.9999.

Dallas-Fort Worth and Sherman-Denison External Station Travel Survey, Form A Format (continued)

<u>Item</u>	<u>Begin</u>	<u>End</u>	<u>Type</u>	<u>Field Columns</u>	
				<u>Format</u>	<u>Description</u>
48. Destination Latitude	567	576	Numeric RJ	F10.6	This is the latitude of the destination address. Unknown / Refused internal destinations should be coded as 888.8888. Unknown external destinations within Texas should be coded as 666.6666. Unknown Mexico external destinations should be coded as 777.7777. Unknown out-of-state external destinations (non-Mexico) should be coded as 999.9999.
49. Study Area ID	577	577	Alphanum	A1	Study area ID of the destination zone. Zones in the Dallas/Ft.Worth study area should be coded as a D. Zones in the Sherman-Denison study area should be coded with an S.
50. Destination Zone	578	582	Numeric RJ	I5	If the trip destination is within the study area, this is the zone number where the destination is located. Unknown / refused internal locations within the study area should be coded as 8888. If the trip ends outside of the study area but within Texas, it should be coded using the statewide zone system (SAM) and preceded by the number 1 in column 578. Unknown / refused external locations within Texas should be coded as 16666. If the destination is in Mexico, this should be the zone number for the international border crossing used to exit Texas. Unknown / refused border crossings to Mexico should be coded as 7777. If the destination is outside of Texas (non-Mexico), this should be the SAM zone number for the highway used to exit the state. Unknown / refused external locations outside of Texas (non-Mexico) should be coded as 9999.
51. Trip Purpose	583	584	Numeric RJ	I2	Code indicating purpose of trip to destination. See code definitions below.
52. Trip Purpose Other	585	604	Alphanum. LJ	A20	If trip purpose is coded as "other", this field should contain the description of that other trip purpose.
53. Destination Indicator	605	606	Numeric RJ	I2	Code indicating if the destination location is outside of Texas. 1 - Yes, 2 - No, 99 - Unknown / Refused.
54. Destination Location	607	656	Alphanum. LJ	A50	If person is traveling to a location outside of Texas (i.e., indicated by a 1 in item 53), this field should contain the city / state to which the person is traveling. This field is blank if item 53 is coded as 2.
55. Exit Location	657	706	Alphanum. LJ	A50	If person is traveling to a location outside of Texas (i.e., indicated by a 1 in item 53), this field should state the name of the road or highway where the vehicle will exit this state. This field is blank if item 53 is coded as 2.
56. Exit Zone	707	711	Numeric RJ	I5	If person is traveling to a location outside of Texas (i.e., indicated by a 1 in item 53), this field contains the external station zone number of the exit point listed in item 55. Unknown should be coded as 99999. This field is blank if item 53 is coded as 2.
57. Days Remaining	712	713	Numeric RJ	I2	If person is traveling to a location outside of Texas (i.e., indicated by a 1 in item 53), this field should contain the number of days the person will remain in this state. This field is blank if item 53 is coded as 2.
58. Destination Texas	714	763	Alphanum. LJ	A50	If person is traveling to a location within Texas (i.e., indicated by a 2 in item 53), this field should contain the city / county to which the person is traveling. This field is blank if item 53 is coded as 1.
59. Beginning Location	764	788	Alphanum. LJ	A25	Location where person's first trip began on day of survey. This can be a description or a zone number if location has been geocoded.
60. First Destination	789	813	Alphanum. LJ	A25	Location of first place person went.
61. Second Destination	814	838	Alphanum. LJ	A25	Location of second place person went.
62. Third Destination	839	863	Alphanum. LJ	A25	Location of third place person went.
63. Fourth Destination	864	888	Alphanum LJ	A25	Location of fourth place person went.
64. Additional Trips	889	892	Numeric RJ	I4	Number of additional trips/stops person made on day of survey up to the time they were surveyed.
65. Form	893	899	Numeric RJ	I7	Number of survey form where data was recorded.

Vehicle Classification Codes

- 1 – Passenger Vehicle (car/truck/van)
- 2 – Bus
- 3 – Taxi/Paid Limo
- 4 – School Bus
- 5 – Commercial Vehicle (Over 1 Ton)
- 6 – Motorcycle
- 7 – Recreational Vehicle
- 8 – Other
- 99 – Unknown/Refused

Trip Purpose Options

- 1 – Home/Return Home
- 2 – Go/Return to Work
- 3 – Work Related
- 4 – School
- 5 – Vacation
- 6 – Visit Friends/Family
- 7 – Eat Out
- 8 – Shop
- 9 – Buy Gas
- 10 – Personal Business
- 11 – Pick Up/Drop Off Passenger
- 12 – Change Travel Mode
- 13 – Delivery
- 14 – Recreation
- 15 – Overnight stay / sleep
- 16 – Other
- 99 – Refused/Do Not Know

Type of Place Options

- 1 – Office Building
- 2 – Retail/Shopping/Gas
- 3 – Industrial/Manufacturing/Warehouse
- 4 – Medical
- 5 – Educational (12th grade or lower)
- 6 – Educational (college, trade. Etc)
- 7 – Government
- 8 – Residential
- 9 – Airport
- 10 – Eating Establishment
- 11 – Hotel/Motel)
- 12 – Other (specify)
- 99 – Refused/Unknown

Dallas-Fort Worth and Sherman-Denison External Station Commercial Vehicle Survey Form B Data File Format

This file will contain the survey data collected using Form B in the Dallas-Fort Worth and Sherman-Denison External Station Commercial Vehicle survey. The data should be in an ASCII data file.

<u>Item</u>	<u>Begin</u>	<u>End</u>	<u>Type</u>	<u>Field Columns</u>	
				<u>Format</u>	<u>Description</u>
1. Record Type	1	2	Alphanumeric LJ	A2	Code which indicates the type of record, here it should be B.
2. Month	3	4	Numeric RJ	I2	Month station is being surveyed.
3. Day	5	6	Numeric RJ	I2	Day of the month station is being surveyed.
4. Station Number	7	10	Alphanumeric LJ	A4	Site number of the station being surveyed as described in Attachment A.
5. Station	11	40	Alphanumeric. LJ	A30	Name of station / facility being surveyed.
6. Longitude	41	50	Numeric RJ	F10.6	Longitude of location being surveyed.
7. Latitude	51	60	Numeric RJ	F10.6	Latitude of location being surveyed.
8. Truck Number	61	61	Numeric RJ	I1	Truck number surveyed (column number on survey form).
9. Arrival Hour	62	63	Numeric RJ	I2	Hour vehicle arrived at location. Must be in military time.
10. Arrival Minute	64	65	Numeric RJ	I2	Minute vehicle arrived at location.
11. Occupancy	66	67	Numeric RJ	I2	Number of people in vehicle.
12. Vehicle Class.	68	69	Numeric RJ	I2	Code indicating the classification of the vehicle. See below for code descriptions.
13. Vehicle Class. Other	70	79	Alphanumeric. LJ	A10	If vehicle classification is coded as "other", this is the description of the type of fuel. Otherwise it is blank.
14. Vehicle Cargo	80	81	Numeric RJ	I2	This is a code number indicating the type of cargo being carried by the vehicle. See code definitions.
15. Vehicle Cargo Other	82	111	Alphanumeric RJ	A30	If the cargo type in Item 14 is coded as 19 "Unclassified Cargo", this is the description of the Cargo. Otherwise it is blank.
16. Empty Cargo Indicator	112	112	Numeric RJ	I1	Code indicating if vehicle is empty and has no cargo. If vehicle cargo is empty this field should be coded as 1, otherwise it should be left blank
17. Last Cargo	113	114	Numeric RJ	I2	If cargo is empty indicated by a 1 in item 15, this is the code number indicating the type of cargo that was last delivered by the vehicle, prior to it being empty. See code definitions.
18. Last Cargo Other	115	144	Alphanumeric RJ	A30	If the last cargo type in Item 17 is coded as 19 "Unclassified Cargo", this is the description of the last cargo. Otherwise it is blank.
19. Load Capacity	145	146	Numeric RJ	I2	Code indicating if the vehicle is carrying a full or partial load. 1- Full, 2-Partial, 3 – Refused/Unknown.
20. Multimodal container	147	147	Numeric RJ	I1	Code indicating if cargo is being hauled by a multimodal container/trailer or a TEU. 1-Yes, 2-No.
21. Container type	148	148	Numeric RJ	I1	If item 20 is coded as 1, this field indicated the type of container is a reefer or a dry box. 1-reefer, 2-dry box, 3-neither. Field should be left blank if item 20 is not 1.
22. Mexico Cargo	149	150	Numeric RJ	I2	Code indicating if cargo came from or is going to Mexico. 1 – Yes; 2 – No; 99 – Unknown / Refused. This field is blank if item 14 is coded as 22.
23. Pick up Address	151	200	Alphanumeric. LJ	A50	Address of location where cargo was picked up. This field is blank if item 14 is coded as 22.
24. Pick up Intermodal	201	202	Numeric RJ	I2	Code indicating if location where cargo was picked up was an interpositional transfer or custom brokerage facility. 1 – Yes; 2 – No; 99 – Unknown / Refused. This field is blank if item 14 is coded as 22.
25. Cargo Transfer Type	203	205	Numeric RJ	I3	Code indicating how cargo was transferred. See below for code descriptions. This field is blank if item 14 is coded as 22.
26. Drop off Address	206	255	Alphanumeric. LJ	A50	Address of location where cargo will be dropped off. This field is blank if item 14 is coded as 22.
27. Drop off Intermodal	256	257	Numeric RJ	I2	Code indicating if location where cargo will be dropped off is an interpositional transfer or custom brokerage facility. 1 – Yes; 2 – No; 99 – Unknown / Refused. This field is blank if item 14 is coded as 22.
28. Cargo Transfer Type	258	260	Numeric RJ	I3	Code indicating how cargo will be transferred at drop off site. See below for code descriptions. This field is blank if item 14 is coded as 22.
29. Year of Vehicle	261	264	Numeric RJ	I4	Year vehicle was manufactured. 9999 should be coded for Unknown / Refused.
30. Gross Weight Rating	265	270	Numeric RJ	I6	Gross weight rating of the vehicle or of the truck/trailer combination.
31. Vehicle Fuel Type	271	272	Numeric RJ	I2	Type of fuel used by vehicle. 1 – Leaded Gas; 2 – Unleaded Gas; 3 – Diesel; 4 – Propane; 5 – Other.

<u>Item</u>	<u>Begin</u>	<u>End</u>	<u>Type</u>	<u>Field Columns</u>	
				<u>Format</u>	<u>Description</u>
32. Fuel Type Other	273	282	Alphanum. LJ	A10	If type of fuel is coded as "other", this is the description of the type of fuel. Otherwise it is blank.
33. Odometer	283	289	Numeric RJ	I7	Odometer mileage on the vehicle. Unknown or refused should be coded as 9999999.
34. General Origin	290	339	Alphanum LJ	A50	This is the city / state where the vehicle is coming from. City / State information is required for locations in Mexico.
35. Texas Origin	340	341	Numeric RJ	I2	Code indicating if the location listed in item 34 is located in Texas. 1 – Yes; 2 – No; 99 – Unknown / Refused.
36. Enter Texas	342	343	Numeric RJ	I2	If general origin was not in Texas (indicated by a 2 in item 35), this field contains the code indicating if the person entered / left Texas on the survey date. 1- Yes; 2 – No; 99 – Unknown / Refused. This field is blank if item 35 is coded as 1.
37. Entry Point	344	373	Alphanum. LJ	A30	If general origin was not in Texas, this field should state the name of the road or highway at which the person entered or exited Texas. This field is blank if item 35 is coded as 1 or item 36 is coded as 2.
38. Entry Zone	374	378	Numeric RJ	I5	This field contains the external station zone number of the entry or exit point listed in item 37. This field is blank if item 35 is coded as 1 or if item 36 is coded as 2.
39. Stayed Overnight	379	380	Numeric RJ	I2	This field contains the code indicating if person stayed overnight as part of his/her travel. 1 – Yes; 2 – No; 99 – Unknown / Refused.
40. Stay-Over Location	381	410	Alphanum LJ	A30	For persons who indicated they stayed overnight as part of travel (indicated by a 1 in item 39), this field contains the name and location of where they stayed overnight. This field is blank if item 39 is coded as 2.
41. Number of Nights	411	412	Numeric RJ	I2	If person stayed overnight (i.e., indicated by a 1 in item 39) this field should contain the number of nights the person stayed overnight. This field is blank if item 39 is coded as 2.
42. Origin Field 1	413	462	Alphanum. LJ	A50	This is the address of the last place person got into the vehicle or the first street name of the nearest intersecting streets to that location.
43. Origin Field 2	463	512	Alphanum. LJ	A50	This is the second street name of the nearest intersecting streets to the originating point or a continuation of the address in item 42.
44. Origin Longitude	513	522	Numeric RJ	F10.6	This is the longitude of the origin address. Unknown / Refused origins within the study area should be coded as 888.8888. Unknown external origins outside of the study area but within Texas should be coded as 666.6666. Unknown Mexico external origins should be coded as 777.7777. Unknown out-of-state external origins (non-Mexico) should be coded as 999.9999.
45. Origin Latitude	523	532	Numeric RJ	F10.6	This is the latitude of the origin address. Unknown / Refused origins within the study area should be coded as 888.8888. Unknown external origins outside of the study area but within Texas should be coded as 666.6666. Unknown Mexico external origins should be coded as 777.7777. Unknown out-of-state external origins (non-Mexico) should be coded as 999.9999.
46. Origin Zone Identifier	533	533	Alphanum	A1	This field identifies the MPO study in which the origin zone in item 47 is located. TAZ zones in the DFW/NCTGOG study area should be coded as 'D', zones in the Sherman–Denison MPO study area should be coded as 'S'.
47. Origin Zone	534	538	Numeric RJ	I5	If the trip origin is within the study area, this is the TAZ number where the origin is located. Unknown / refused locations within the study area should be coded as 8888. If the trip began outside of the study area but within Texas, it should be coded using the statewide zone system (SAM) and preceded by the number 1 in column 534. Unknown / refused external locations within Texas should be coded as 16666. If the origin is in Mexico, this should be the zone number for the international border crossing used to enter Texas. Unknown / refused border crossings from Mexico should be coded as 7777. If the origin is outside of Texas (non-Mexico), this should be the SAM zone number for the highway used to enter the state. Unknown / refused external locations outside of Texas (non-Mexico) should be coded as 9999.
48. Departure Hour	539	540	Numeric RJ	I2	This is the hour the vehicle departed from the location listed as "Origin". This should be in military time.
49. Departure Minute	541	542	Numeric RJ	I2	This is the minute the vehicle departed from the location listed as "Origin".
50. Origin Type	543	544	Numeric RJ	I2	Code indicating the type of place from which the trip originated. See code descriptions below.

Dallas-Fort Worth and Sherman-Denison External Station Commercial Vehicle Survey, Form B (continued)

<u>Item</u>	<u>Begin</u>	<u>End</u>	<u>Type</u>	<u>Field Columns</u>	
				<u>Format</u>	<u>Description</u>
51. Origin Type Other	545	564	Alphanum. LJ	A20	If the origin type in item 50 is coded as 'other', this is the description of the type of place. Otherwise it is blank.
52. Origin Purpose	565	566	Numeric RJ	I2	This is the driver's purpose for being at that location. See below for code descriptions.
53. Origin Purpose Other	567	586	Alphanum. LJ	A20	If trip purpose in item 52 is coded as 'other', this field should contain the description of that other trip purpose.
54. Trip Indicator	587	588	Numeric RJ	I2	Code indicating if trip origin is inside the study area. 1 – Yes; 2 – No; 99 – Unknown / Refused.
55. Origin Entry Point	589	618	Alphanum. LJ	A30	If the trip origin is outside the study area (i.e., indicated by a 2 in item 54), this field should state the name of the road or highway at which the vehicle entered the study area. This field is blank if item 54 is coded as 1.
56. Origin Entry Zone	619	623	Numeric RJ	I5	If the trip origin is outside the study area (i.e., indicated by a 2 in item 54), this field contains the external station number of the entry point listed in item 55. Unknown should be coded as 99999. This field is blank if item 54 is coded as 1.
57. Destination Field 1	624	673	Alphanum. LJ	A50	This is the address of the destination for the person or the first street name of the nearest intersecting streets to that location. (place / address or nearest intersection / city).
58. Destination Field 2	674	723	Alphanum. LJ	A50	This is the second street name of the nearest intersecting streets to the destination of the person or a continuation of the address in item 57
59. Destination Longitude	724	733	Numeric RJ	F10.6	This is the longitude of the destination address. Unknown / Refused internal destinations should be coded as 888.8888. Unknown external destinations within Texas should be coded as 666.6666. Unknown Mexico external destinations should be coded as 777.7777. Unknown out-of-state external destinations (non-Mexico) should be coded as 999.9999.
60. Destination Latitude	734	743	Numeric RJ	F10.6	This is the latitude of the destination address. Unknown / Refused internal destinations should be coded as 888.8888. Unknown external destinations within Texas should be coded as 666.6666. Unknown Mexico external destinations should be coded as 777.7777. Unknown out-of-state external destinations (non-Mexico) should be coded as 999.9999.
61. Destination Zone Identifier	744	744	Alphanum	A1	This field identifies the MPO study in which the destination zone in item 62 is located. TAZ zones in the DFW / NCTCOG study area should be coded as 'D', zones in the Sherman – Denison MPO study area should be coded as 'S'.
62. Destination Zone	745	749	Numeric RJ	I5	If the trip destination is within the study area, this is the TAZ number where the destination is located. Unknown / refused locations within the study area should be coded as 8888. If the trip ends outside of the study area but within Texas, it should be coded using the statewide zone system (SAM) and preceded by the number 1 in column 745. Unknown / refused external locations within Texas should be coded as 16666. If the destination is in Mexico, this should be the zone number for the international border crossing used to exit Texas. Unknown / refused border crossings to Mexico should be coded as 7777. If the destination is outside of Texas (non-Mexico), this should be the SAM zone number for the highway used to exit the state. Unknown / refused external locations outside of Texas (non-Mexico) should be coded as 9999.
63. Trip Purpose	750	751	Numeric RJ	I2	Code indicating purpose of trip to destination. See code definitions below.
64. Trip Purpose Other	752	771	Alphanum. LJ	A20	If trip purpose in item 63 is coded as "other", this field should contain the description of that other trip purpose.
65. Destination Indicator	772	773	Numeric RJ	I2	Code indicating if the destination location is outside of Texas. 1 - Yes, 2 – No, 99 – Unknown / Refused.
66. Destination Location	774	823	Alphanum. LJ	A50	If person is traveling to a location outside of Texas (i.e., indicated by a 1 in item 65), this field should contain the city / state to which the person is traveling. This field is blank if item 56 is coded as 2.
67. Exit Location	824	873	Alphanum. LJ	A50	If person is traveling to a location outside of Texas (i.e., indicated by a 1 in item 65), this field should state the name of the road or highway where the vehicle will exit Texas. This field is blank if item 65 is coded as 2.

<u>Item</u>	<u>Begin</u>	<u>End</u>	<u>Type</u>	<u>Field Columns</u>	
				<u>Format</u>	<u>Description</u>
68. Exit Zone	874	878	Numeric RJ	I5	This field contains the external station zone number of the exit point listed in item 67. Unknown should be coded as 99999. This field is blank if item 65 is coded as 2.
69. Days Remaining	879	880	Numeric RJ	I2	If person is traveling to a location outside of Texas (i.e., indicated by a 1 in item 65), this field should contain the number of days the person will remain in Texas. This field is blank if item 65 is coded as 2.
70. Destination Texas	881	930	Alphanum. LJ	A50	If person is traveling to a location <u>inside</u> Texas (i.e., indicated by a 2 in item 65), this field should contain the city / county in Texas to which the person is traveling. This field is blank if item 65 is coded as 1.
71. Beginning Location	931	980	Alphanum. LJ	A50	Location where person first trip began on day of survey. This can be a description or a zone number if location has been geocoded.
72. First Destination	981	1030	Alphanum. LJ	A50	Location of first place person went.
73. Second Destination	1031	1080	Alphanum. LJ	A50	Location of second place person went.
74. Third Destination	1081	1130	Alphanum. LJ	A50	Location of third place person went.
75. Fourth Destination	1131	1180	Alphanum. LJ	A50	Location of fourth place person went.
76. Fifth Destination	1181	1230	Alphanum. LJ	A50	Location of fifth place person went.
77. Sixth Destination	1231	1280	Alphanum. LJ	A50	Location of sixth place person went.
78. Additional Trips	1281	1284	Numeric RJ	I4	Number of additional trips/stops person made on day of survey up to the time they were surveyed.
79. Form	1285	1291	Numeric RJ	I7	Number of survey form where data was recorded.

Vehicle Classification Codes

- 1 - Single Unit 2-axle (6 wheels)
- 2 - Single Unit 3-axle (10 wheels)
- 3 - Single Unit 4-axle (14 wheels)
- 4 - Semi (all Tractor-Trailer Combinations)
- 5 - Other (specify)
- 99 - Unknown

Trip Purpose Options

- 1 - Base location/Return to Base location
- 2 - Delivery
- 3 - Pick Up
- 4 - Maintenance
- 5 - Driver Needs (lunch, etc)
- 6 - To Home
- 7 - Buy Fuel
- 8 - Other (specify)
- 99 - Refused/unknown

Cargo Transfer Codes

- 1 - Truck-to/from-Truck
- 2 - Rail-to/from-Truck
- 3 - Ship-to/from-Truck
- 4 - Airplane-to/from-Truck
- 5 - Warehouse-to/from-Truck
- 6 - Pipeline-to/from-Tuck
- 7 - Unknown
- 99 - Refused

Type of Place Options

- 1 - Office Building
- 2 - Retail/Shopping/Gas
- 3 - Industrial/Manufacturing/Warehouse
- 4 - Medical
- 5 - Educational (12th grade or lower)
- 6 - Educational (college, trade. Etc)
- 7 - Government
- 8 - Residential
- 9 - Airport
- 10. - Eating Establishment
- 11 - Hotel / Motel
- 11 - Other (specify)
- 99 - Refused/Unknown

Vehicle Cargo Codes

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/Equip.	Miscellaneous products, such as 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, Heavy Equipment, etc.
19	-	Unclassified Cargo (specify)	Cargo not falling within one of the above categories
20	-	Driver Refused to Answer	Driver refused to answer
21	-	Unknown to Driver	Unknown to driver
22	-	Empty	Empty (including empty shipping containers)

Dallas-Fort Worth and Sherman-Denison High Volume External Station ASCII Data File Format

This file will contain the data collected as part of the Dallas-Fort Worth and Sherman-Denison high volume external station survey. The data should be in an ASCII data file.

<u>Item</u>	<u>Begin</u>	<u>End</u>	<u>Type</u>	<u>Field Columns</u>	
				<u>Format</u>	<u>Description</u>
1. Record Type	1	2	Alphanumeric LJ	A2	Code which indicates the type of record, here it should be C.
2. Month	3	4	Numeric RJ	I2	Month station is being surveyed.
3. Day	5	6	Numeric RJ	I2	Day of the month station is being surveyed.
4. Station Number	7	10	Alphanumeric LJ	A4	Site number of the station being surveyed as described in Attachment A.
5. Station	11	40	Alphanumeric. LJ	A30	Name of station / facility being surveyed.
6. Longitude	41	50	Numeric RJ	I10	Longitude of location being surveyed.
7. Latitude	51	60	Numeric RJ	I10	Latitude of location being surveyed.
8. Direction	61	61	Numeric RJ	I1	Code indicating the direction of travel. 0 – North; 1 – Northeast; 2 – East; 3 – Southeast; 4 – South; 5 – Southwest; 6 – West; 7 – Northwest.
9. Dealer Plate	62	62	Numeric RJ	I1	Code indicating if vehicle has a dealer/temporary license plate. 1 – Yes; 2 – No.
10. State	63	64	Alphanumeric LJ	A2	This field contains the State shown on the vehicle license plate. The entry should be abbreviated using all capital letters. This field is left blank if item 9 is coded as 1.
11. License Number	65	74	Alphanumeric LJ	A10	This field contains the license plate number of the vehicle. Use all capital letters. For partial license plates, a unique symbol shall be used in the position that the letter/number could not be read. This field is left blank if item 9 is coded as 1.
12. Hour	75	76	Numeric RJ	I2	Hour that the vehicle was observed. Must be in military time.
13. Minute	77	78	Numeric RJ	I2	Minute that the vehicle was observed.