# 2006 Waco External Survey
## Technical Summary

**Waco** ★

# 2006 Waco External Survey

## TECHNICAL SUMMARY

**Texas Department of Transportation Travel Survey Program**

**Prepared by**

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**Acknowledgements**

**INTRODUCTION**

In 2006, the Transportation Planning and Programming (TPP) Division of the Texas Department of Transportation (TxDOT) funded an external station travel survey in the Waco Metropolitan Planning Organization (MPO) study area. This survey measured and identified travel patterns into, within, and out of the Waco metropolitan area, which is comprised of the entirety of McLennan County. This report presents a Technical Summary of the 2006 Waco External Station 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 survey location. These counts provide a basis for expanding the survey data to represent the average weekday movements into and out of the study area. Data are also collected on the movements of the vehicle during the survey day prior to the point at which the vehicle is surveyed. This data provides a basis for estimating the amount of travel occurring in the study area prior to the time of the survey.

**WACO STUDY AREA**

The study area, as shown in Figure 1, is in McLennan County, and it is located in central Texas. McLennan County has a land area of over 1,000 square miles and a population density of approximately 205 persons per square mile. The population center of the study area is the city of Waco, which according to the 2000 census had a population of approximately 114,000 persons. The boundary established for the Waco external survey was determined by the local MPO.
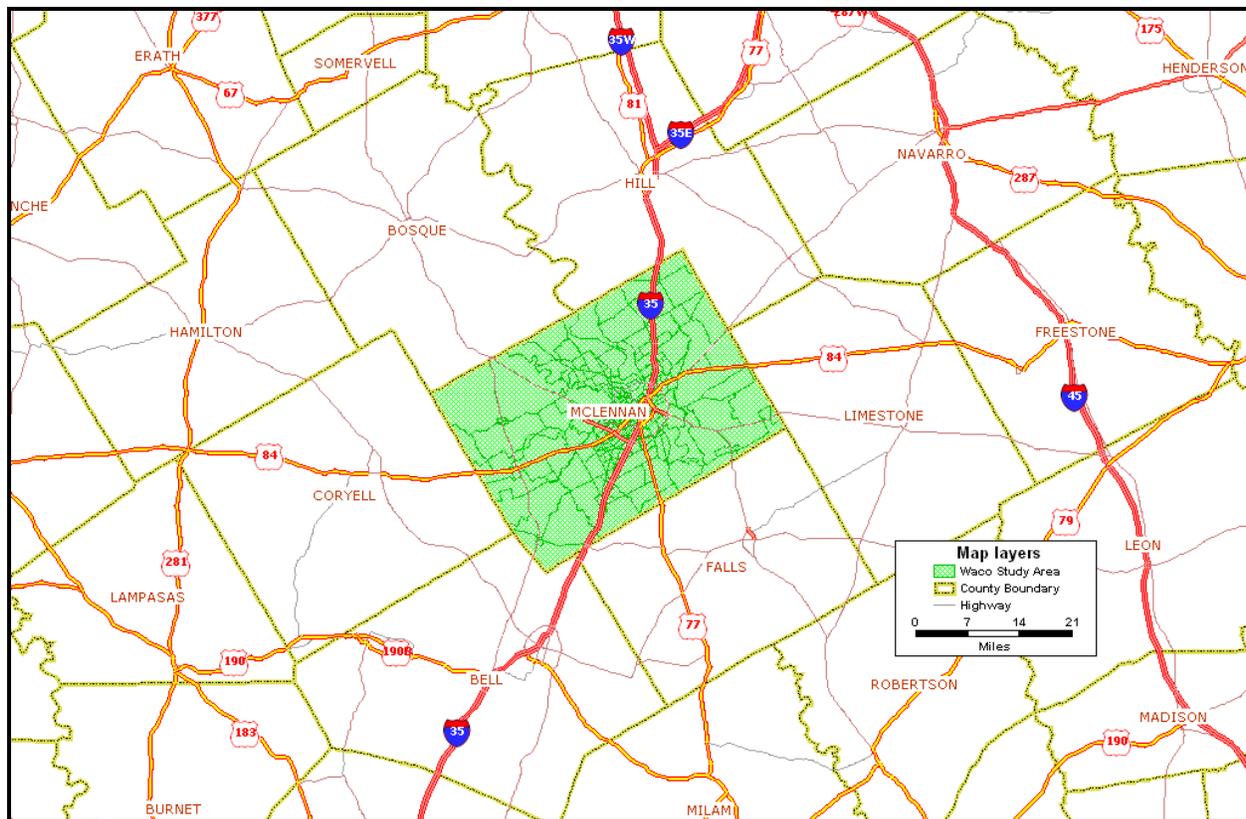
**Figure 1. Waco Study Area.**

## EXTERNAL STATIONS

There are 24 locations on the border of the Waco study area identified as external stations. These locations are transportation facilities that cross the study area boundary and represent where travelers may enter and exit the study area. Of these 24 locations, 15 were selected for travel surveys. One of the 15 survey locations bordered the Killeen/Temple study area, and as a result, this location was surveyed in both directions. Figure 2 shows the location of the external stations in Waco, and Table 1 identifies the external surveys, their general location, whether or not surveys were conducted, and the 24-hour traffic count at the location. Additionally, Table 1 groups the external station locations by direction. The location group aggregated data will be utilized to present external local and through trip information later in the summary.

**Figure 2. Waco External Station Locations.**

In addition to the 15 survey sites, two other locations were identified as high-volume sites. 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, rest areas, and truck stops 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.

**Table 1. Waco External Stations.**

| Station Number | Facility | Location | Surveyed | 24-Hour Vehicle Count | | Location Group |
|---|---|---|---|---|---|---|
| | | | | Inbound | Outbound | |
| 396 | FM 2114 | at Hill County line | Yes | 1,159 | 1,122 | Northwest |
| 398 | FM 308 | at Hill County line | Yes | 521 | 491 | |
| 399 | SH 31 | at Hill County line | Yes | 5,465 | 4,662 | |
| 400 | US 84 | at Limestone County line | Yes | 2,179 | 2,006 | |
| 401 | FM 342 | at Limestone County line | No | 115 | 110 | |
| 402 | SH 164 | at Limestone County line | No | 1,357 | 1,354 | |
| 403 | FM 2603 | at Falls County line | No | 181 | 167 | Northeast |
| 404 | SH 6 | at Falls County line | Yes | 5,682 | 6,968 | |
| 405 | FM 434 | at Falls County line | Yes | 256 | 349 | |
| 406 | US 77 | at Falls County line | Yes | 3,613 | 3,477 | |
| 407 | FM 2643 | at Falls County line | No | 222 | 197 | |
| 410 | IH 35 | at Falls County line | High Volume | 26,280 | 26,922 | |
| 411 | SH 317 | at Bell County line | Yes | 3,894 | 4,268 | Southeast |
| 412 | FM 107 | at Coryell County line | Yes | 466 | 556 | |
| 413 | FM 2671 | at Coryell County line | No | 240 | 240 | |
| 414 | US 84 | at Coryell County line | Yes | 3,015 | 2,915 | |
| 415 | FM 185 | at Coryell County line | No | 109 | 114 | |
| 416 | SH 317 | at Bosque County line | Yes | 841 | 895 | Southwest |
| 417 | SH 6 | at Bosque County line | Yes | 3,364 | 3,348 | |
| 418 | FM 1637 | at Bosque County line | Yes | 507 | 490 | |
| 419 | FM 2490 | at Bosque County line | Yes | 1,154 | 1,238 | |
| 420 | FM 933 | at Hill County line | Yes | 1,028 | 967 | |
| 421 | FM 2114 | at Hill County line | No | 226 | 237 | |
| 397 | IH 35 | at Hill County line | High Volume | 24,933 | 23,774 | |
| | | Total | | 86,807 | 86,867 | |

## SURVEY METHODOLOGY

Two methodologies were employed in the conduct of 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. Commercial vehicles were also surveyed at weigh stations, rest areas, and truck stops using an intercept interview method. For the purpose 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. Those declining were allowed to continue on their trip. Drivers of commercial and non-commercial vehicles were interviewed using different survey instruments and those forms are provided in the Appendix. Figure 3 shows a typical intercept interview survey at an external station.



**Figure 3. Typical External Survey Station.**

The intercept interview method was also used to conduct commercial vehicle surveys at weigh stations, rest areas, and truck stops located along high-volume facilities. The surveys were conducted by interviewing drivers of commercial vehicles when the driver stopped for gas, to eat, or other personal reasons. Since this method involved surveying the drivers off of the roadways, there was no traffic control required.

Two external stations in the Waco 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 two 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.

For a more detailed discussion and description of the survey methodology, see the report, *Waco MPO and CTCOG External Station Travel Survey*, prepared by Gram Traffic Counting, Inc., the vendor selected to conduct the survey.

## 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 motorists. In Waco, the majority of vehicles surveyed were non-commercial. Approximately 80 percent of the surveys were for non-commercial vehicles. The number of surveys for commercial and non-commercial vehicles by station as well as the outbound traffic volume during the survey period is provided in Table 2. Approximately 19 percent of non-commercial vehicles and 10 percent of commercial vehicles that traveled through the external stations during survey hours were interviewed.

Trip Types

There are two types of trips identified as part of an external survey; external-local trips and external-through trips. A local trip is one where either the origin or destination of the trip is in the study area and the other trip end is outside the study area. A through trip is one 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. Nearly 88 percent of non-commercial vehicle trips and nearly 58 percent of commercial vehicle trips were

local trips. Approximately 69 percent of the commercial vehicle through trips were made on the two high-volume external sites.

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

| Station Number | Facility | Location | Non-Commercial | | Commercial | |
|---|---|---|---|---|---|---|
| | | | Surveyed | Count* | Surveyed | Count* |
| 396 | FM 2114 | at Hill County line | 258 | 705 | 35 | 92 |
| 397^ | IH 35 | at Hill County line | N/A | N/A | 128 | 2,904 |
| 398 | FM 308 | at Hill County line | 212 | 270 | 20 | 82 |
| 399 | SH 31 | at Hill County line | 341 | 2,866 | 58 | 376 |
| 400 | US 84 | at Limestone County line | 313 | 1,157 | 64 | 200 |
| 404 | SH 6 | at Falls County line | 313 | 4,226 | 59 | 474 |
| 405 | FM 434 | at Falls County line | 105 | 218 | 12 | 24 |
| 406 | US 77 | at Falls County line | 333 | 2,139 | 62 | 284 |
| 410^ | IH 35 | at Falls County line | N/A | N/A | 241 | 3,817 |
| 411 | SH 317 | at Bell County line | 329 | 2,943 | 42 | 223 |
| 412 | FM 107 | at Coryell County line | 148 | 307 | 43 | 75 |
| 414 | US 84 | at Coryell County line | 347 | 1,837 | 56 | 177 |
| 416 | SH 317 | at Bosque County line | 220 | 539 | 39 | 109 |
| 417 | SH 6 | at Bosque County line | 333 | 2,001 | 66 | 459 |
| 418 | FM 1637 | at Bosque County line | 169 | 341 | 16 | 33 |
| 419 | FM 2490 | at Bosque County line | 330 | 661 | 23 | 110 |
| 420 | FM 933 | at Hill County line | 186 | 639 | 25 | 38 |
| Total | | | 3,937 | 20,849 | 989 | 9,477 |

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

^ High-volume location. Commercial Vehicle Surveys only.

**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 |
| 396 | FM 2114 | 243 | 15 | 258 | 28 | 7 | 35 |
| 397* | IH 35 | N/A | N/A | N/A | 42 | 86 | 128 |
| 398 | FM 308 | 199 | 13 | 212 | 16 | 4 | 20 |
| 399 | SH 31 | 259 | 82 | 341 | 33 | 25 | 58 |
| 400 | US 84 | 281 | 32 | 313 | 51 | 13 | 64 |
| 404 | SH 6 | 245 | 68 | 313 | 42 | 17 | 59 |
| 405 | FM 434 | 102 | 3 | 105 | 12 | 0 | 12 |
| 406 | US 77 | 273 | 60 | 333 | 46 | 16 | 62 |
| 410* | IH 35 | N/A | N/A | N/A | 40 | 201 | 241 |
| 411 | SH 317 | 300 | 29 | 329 | 37 | 5 | 42 |
| 412 | FM 107 | 94 | 54 | 148 | 29 | 14 | 43 |
| 414 | US 84 | 337 | 10 | 347 | 48 | 8 | 56 |
| 416 | SH 317 | 168 | 52 | 220 | 31 | 8 | 39 |
| 417 | SH 6 | 318 | 15 | 333 | 60 | 6 | 66 |
| 418 | FM 1637 | 167 | 2 | 169 | 16 | 0 | 16 |
| 419 | FM 2490 | 321 | 9 | 330 | 22 | 1 | 23 |
| 420 | FM 933 | 173 | 13 | 186 | 23 | 2 | 25 |
| Total | | 3,480 | 457 | 3,937 | 576 | 413 | 989 |

*High-volume location. Commercial vehicle surveys only.

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 resided in the Waco study area. A non-resident is a respondent that reported they lived outside of the Waco study area. Table 4 presents the survey data by residents and non-residents as well as the number of trips made by non-residents within the study area. 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 Waco and the number of internal trips they make, an estimate of the total internal trips within the study area attributable to non-residents can be developed.

**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) |
|---|---|---|---|---|---|---|---|
| 396 | FM 2114 | 258 | 109 | 42.25 | 149 | 57.75 | 25 |
| 398 | FM 308 | 212 | 56 | 26.42 | 156 | 73.58 | 77 |
| 399 | SH 31 | 341 | 64 | 18.77 | 277 | 81.23 | 6 |
| 400 | US 84 | 313 | 101 | 32.27 | 212 | 67.73 | 133 |
| 404 | SH 6 | 313 | 75 | 23.96 | 238 | 76.04 | 106 |
| 405 | FM 434 | 105 | 45 | 42.86 | 60 | 57.14 | 10 |
| 406 | US 77 | 333 | 108 | 32.43 | 225 | 67.57 | 11 |
| 411 | SH 317 | 329 | 206 | 62.61 | 123 | 37.39 | 61 |
| 412 | FM 107 | 148 | 68 | 45.95 | 80 | 54.05 | 3 |
| 414 | US 84 | 347 | 130 | 37.46 | 217 | 62.54 | 43 |
| 416 | SH 317 | 220 | 110 | 50.00 | 110 | 50.00 | 2 |
| 417 | SH 6 | 333 | 135 | 40.54 | 198 | 59.46 | 56 |
| 418 | FM 1637 | 169 | 74 | 43.79 | 95 | 56.21 | 13 |
| 419 | FM 2490 | 330 | 160 | 48.48 | 170 | 51.52 | 9 |
| 420 | FM 933 | 186 | 54 | 29.03 | 132 | 70.97 | 21 |
| Total | | 3,937 | 1,495 | 37.97 | 2,442 | 62.03 | 576 |

The residency questions were only asked of respondents in non-commercial vehicles. Table 4 illustrates that individuals who do not live in the study area make a sizeable proportion, 62 percent, of the non-commercial travel in and out of Waco. The average number of internal trips made by those individuals is 0.24 trips per vehicle.

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 18 different purposes included on the survey instrument for non-commercial vehicles and 10 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 | 9 | Unknown |
| 10 | Personal Business | 99 | Refused |
| 11 | Pick Up/Drop Off Passenger | | |
| 12 | Change Travel Mode | | |
| 13 | Delivery | | |
| 14 | Recreation | | |
| 15 | Overnight Stay | | |
| 16 | Other | | |
| 17 | Unknown | | |
| 99 | Refused/Do Not Know | | |

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

| Category | Trip Purpose Codes (from Table 5) |
|---|---|
| Home | 1 |
| Work | 2 and 3 |
| School | 4 |
| Personal | 5, 6, 10, 11, and 14 |
| Shop | 7, 8, and 9 |
| Other | 12, 13, 15, 16, 17, and 99 |

Figure 4 presents the distribution of non-commercial vehicles by reported trip purpose at the origin of the trip and Figure 5 shows the distribution at the destination of the trip. Additionally, Table 6 provides the data shown in Figures 4 and 5 in tabular form for comparative purposes.

The information is provided for residents, non-residents, and both groups combined. The distribution for the origin purpose shows that the largest percentage of trips for residents (58 percent) began at home, while the most common non-resident trip origin purpose (35 percent) was work. For both groups combined, the most common origin purposes were work (29 percent), home (27 percent), and personal (22 percent).
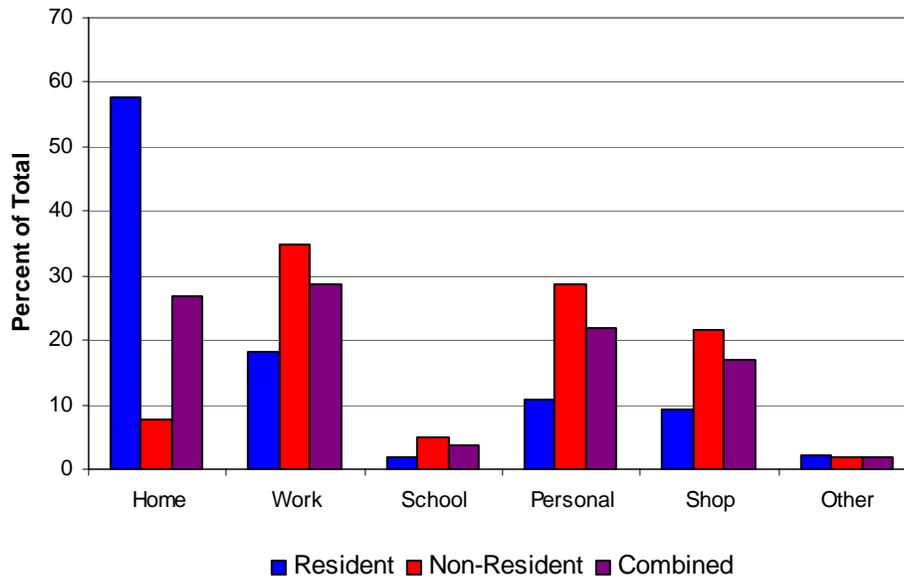


**Figure 4. Trip Purpose at Origin for Non-Commercial Vehicles.**

Figure 5 shows that the largest distribution of destination purpose for non-residents was home (70 percent). The trip purpose at the destination for residents was primarily comprised of personal (47 percent) and work (41 percent) trips. For both groups combined, home (46 percent), personal (28 percent), and work (23 percent) were the most common trip purposes.
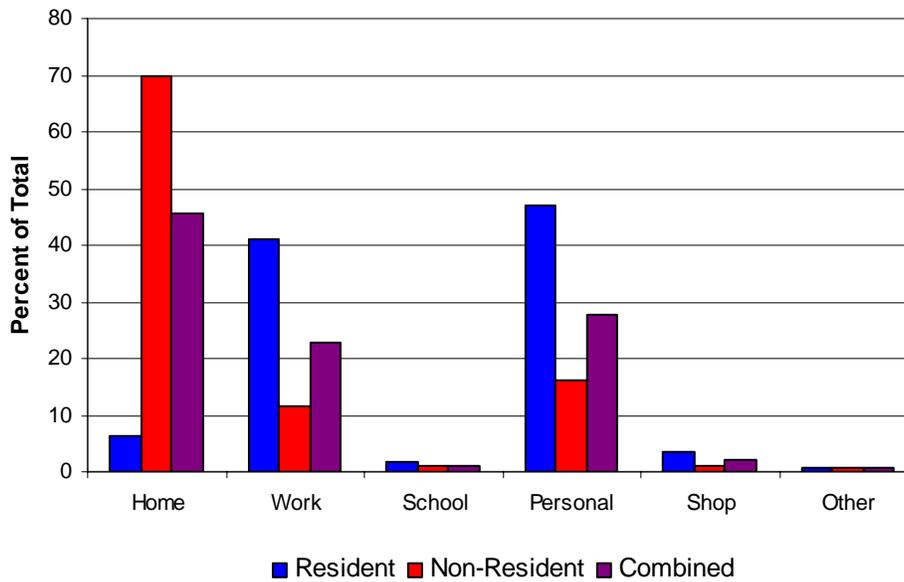
**Figure 5. Trip Purpose to Destination for Non-Commercial Vehicles**

**Table 6. Percent Distribution of Non-Commercial Vehicle Trip Purpose at Origin and Destination.**

| Trip Purpose | Origin | | | Destination | | |
|---|---|---|---|---|---|---|
| | Resident | Non-Resident | Combined | Resident | Non-Resident | Combined |
| Home | 57.79 | 7.86 | 26.82 | 6.15 | 69.79 | 45.62 |
| Work | 18.19 | 34.97 | 28.60 | 41.07 | 11.67 | 22.83 |
| School | 1.81 | 5.00 | 3.78 | 1.61 | 0.90 | 1.17 |
| Personal | 10.84 | 28.75 | 21.95 | 47.16 | 16.09 | 27.89 |
| Shop | 9.30 | 21.54 | 16.89 | 3.41 | 1.02 | 1.93 |
| Other | 2.07 | 1.88 | 1.96 | 0.60 | 0.53 | 0.56 |

A detailed analysis of specific subsets of the survey data was performed. Approximately 58 percent of the surveyed study area residents began their trip at home. Of that group of respondents, approximately 42 percent of those home-based trips had a destination purpose that was work or work-related. Since the survey was conducted in the outbound direction, this would indicate that a significant percentage of Waco study area residents work outside of the Waco study area.

Nearly 70 percent of the surveyed non-residents cited home as the trip purpose for traveling to their destination. Of that group of non-residents, nearly 39 percent of the trip origins were work or work-related trips and approximately 53 percent of the trip origins were for personal business or shopping purposes. Since roughly one-third of the non-resident trip origins are work or work-related, this indicates that the majority of non-residents traveling within the Waco study area are making trips for either non-work purposes or people are making personal or shopping trips after leaving work and prior to going home.

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. A HBNW trip is one that one end of the trip is at home and the other trip end is any location other than work. A NHB trip is a trip that does not begin or end at home. A distribution of trips by trip purpose for residents, non-residents, and both groups combined is provided in Figure 6. For residents, the trips were fairly equally distributed among the three trip purposes, with HBNW and NHB each having 37 percent and HBW having 26 percent. For non-residents, HBNW trips accounted for nearly half (48 percent) of the trips. HBNW trips were the most common trip purpose for residents and non-residents combined (44 percent).
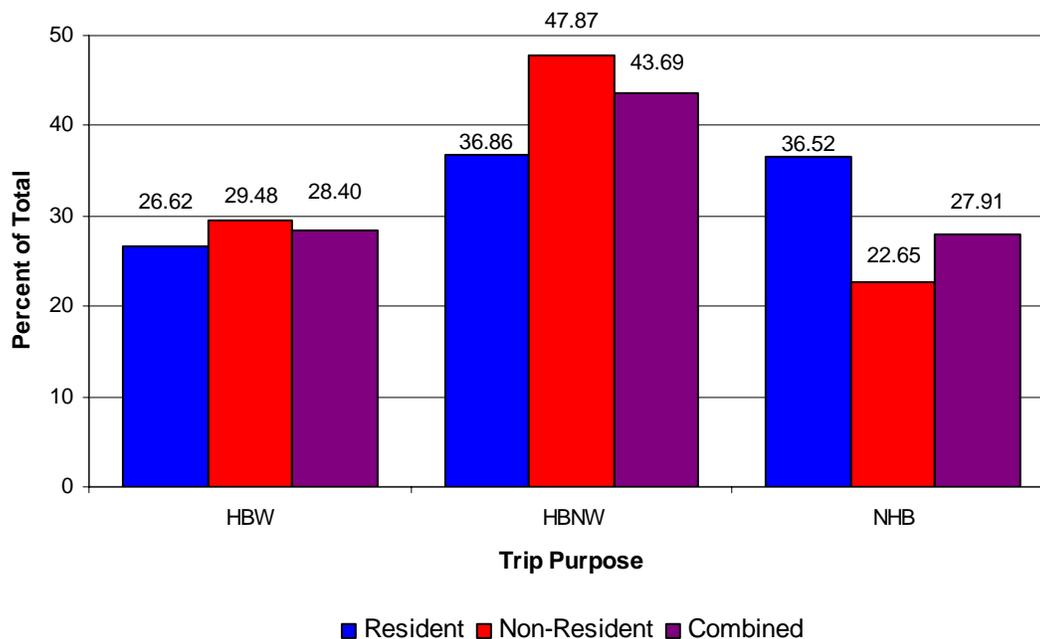
**Figure 6. Distribution of Non-Commercial Vehicle Trips by Trip Purpose.**

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

| Category | Trip Purpose Codes |
|---|---|
| Base Location | 1 |
| Delivery | 2 |
| Pick Up | 3 |
| Support Functions | 4, 5, 6, and 7 |
| Other | 8, 9, and 99 |

Figures 7 and 8 present the distribution of commercial vehicle trips by reported trip purpose at the origin and destination of the trip. At the origin, support functions was the most common origin trip purpose (31 percent). Pick-up (28 percent), base (20 percent), and delivery (19 percent) were the other most commonly cited trip purposes at the origin. The distribution for destination trip purpose shows that 41 percent of the trips were destined for delivering cargo and another 18 percent were destined for picking up cargo. Approximately 27 percent of the trip

destinations were for support functions and 8 percent of the destinations were for base operations.
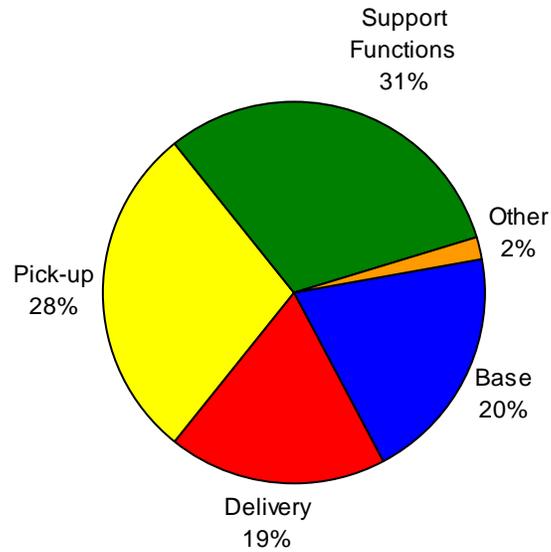


**Figure 7. Trip Purpose at Origin for Commercial Vehicles.**
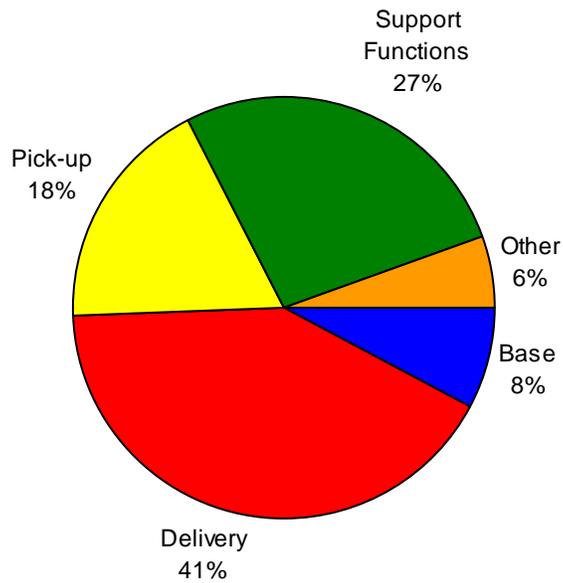


**Figure 8. Trip Purpose to Destination for Commercial Vehicles.**

In addition to obtaining information on the purpose of travel, questions were asked to identify the type of place associated with the origin of the trip. Table 7 provides the results of the responses provided for both commercial and non-commercial vehicles. For non-commercial vehicles, the largest percentage of respondents listed residential (40 percent) as the type of place at the origin. An additional 18 percent of the non-commercial vehicles cited retail/shopping/gas as the type of place. For commercial vehicles, over half of the respondents (52 percent) listed industrial/manufacturing as the type of place at the origin. Retail/shopping/gas and office building each had the next largest percentage of type of place at the origin for commercial vehicles at 16 percent.

**Table 7. Type of Place at Trip Origin.**

| Type of Place | Non-Commercial Vehicles | | Commercial Vehicles* | |
|---|---|---|---|---|
| | Number | Percent | Number | Percent |
| Office Building | 531 | 13.49 | 99 | 15.97 |
| Retail/Shopping/Gas | 713 | 18.11 | 97 | 15.65 |
| Industrial/Manufacturing | 441 | 11.20 | 322 | 51.94 |
| Medical | 225 | 5.72 | 3 | 0.48 |
| Educational | 200 | 5.08 | 3 | 0.48 |
| Government | 36 | 0.91 | 5 | 0.81 |
| Residential | 1,575 | 40.01 | 59 | 9.52 |
| Airport | 13 | 0.33 | 0 | 0.00 |
| Eating Establishment | 119 | 3.02 | 15 | 2.42 |
| Hotel/Motel | 33 | 0.84 | 8 | 1.29 |
| Other | 51 | 1.30 | 9 | 1.45 |
| Total | 3,937 | 100.00 | 620 | 100.00 |

 * Commercial Vehicles at High Volume locations were not asked this question

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 9 and 10 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 9), the morning peak occurs between 7:15 a.m. and 8:15 a.m. for non-commercial vehicles. There is an afternoon peak period for non-commercial vehicles between 4:30 p.m. and 5:30 p.m. While inbound commercial vehicle levels remain fairly constant from 8:00 a.m. to 5:00 p.m., the actual peak occurs at noon. For outbound traffic (Figure 10), the morning peak period for non-commercial vehicles is not as significant as the peak for the inbound direction, and it occurs between 7:30 a.m. and 8:00 a.m. The afternoon peak for non-commercial vehicles traveling outbound is larger and longer than the inbound afternoon peak. For outbound commercial vehicles, there appears to be no significant peak. The traffic levels remain fairly constant between 9 a.m. and 6 p.m.
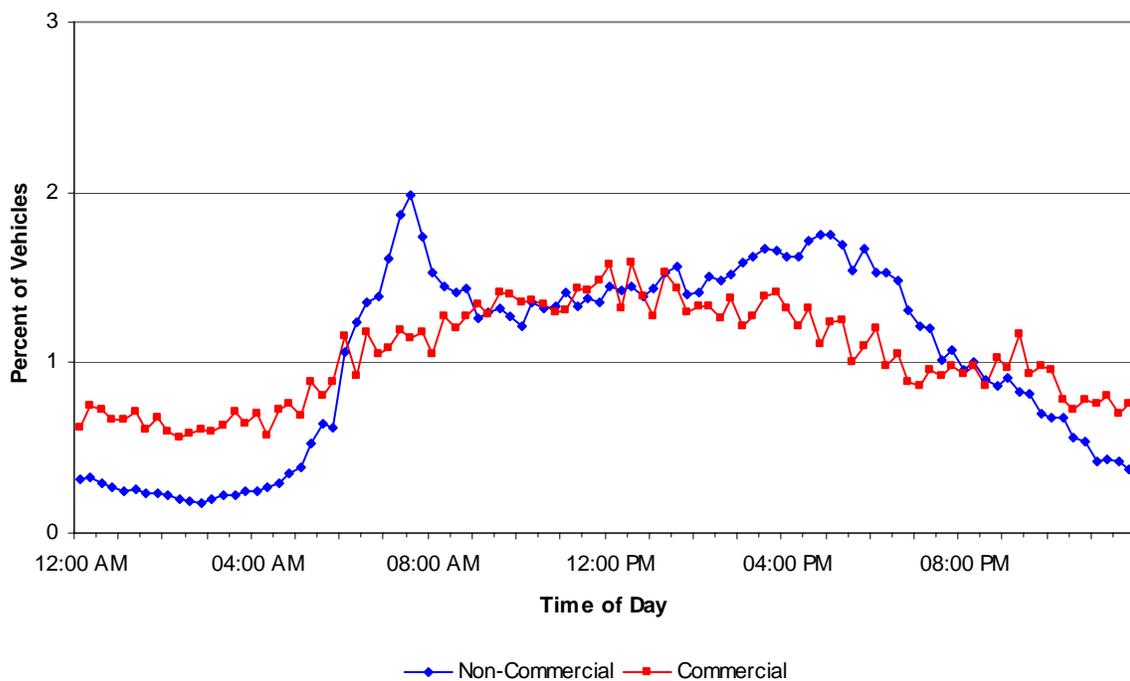


**Figure 9. Distribution of Inbound Vehicles by Time-of-Day.**
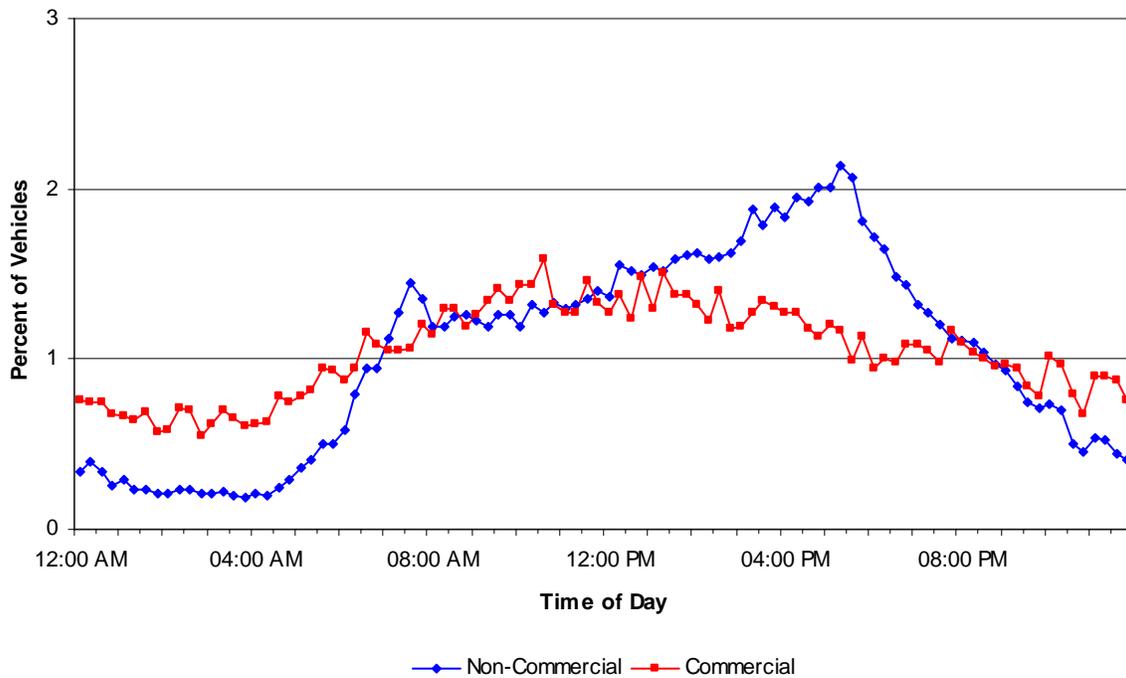
**Figure 10. Distribution of Outbound Vehicles by Time-of-Day.**

An additional analysis that compared the number of surveys and vehicle counts by time of day was conducted. In this analysis, the percent of vehicles surveyed and the percent of outbound vehicles counted were grouped in hourly increments during the time period in which the survey was conducted. The results for non-commercial vehicles are provided in Figure 11 and commercial vehicles are shown in Figure 12.

With the exception of the 9:00 a.m. to 10:00 a.m. hour, the percent of non-commercial surveys completed each hour increased gradually throughout the day. After 10:00 a.m. the counts for non-commercial vehicles gradually increased throughout the remainder of the morning and the afternoon. Approximately 19 percent of the non-commercial vehicles that were traveling out of the study area (at surveyed external stations) were successfully interviewed during survey hours.
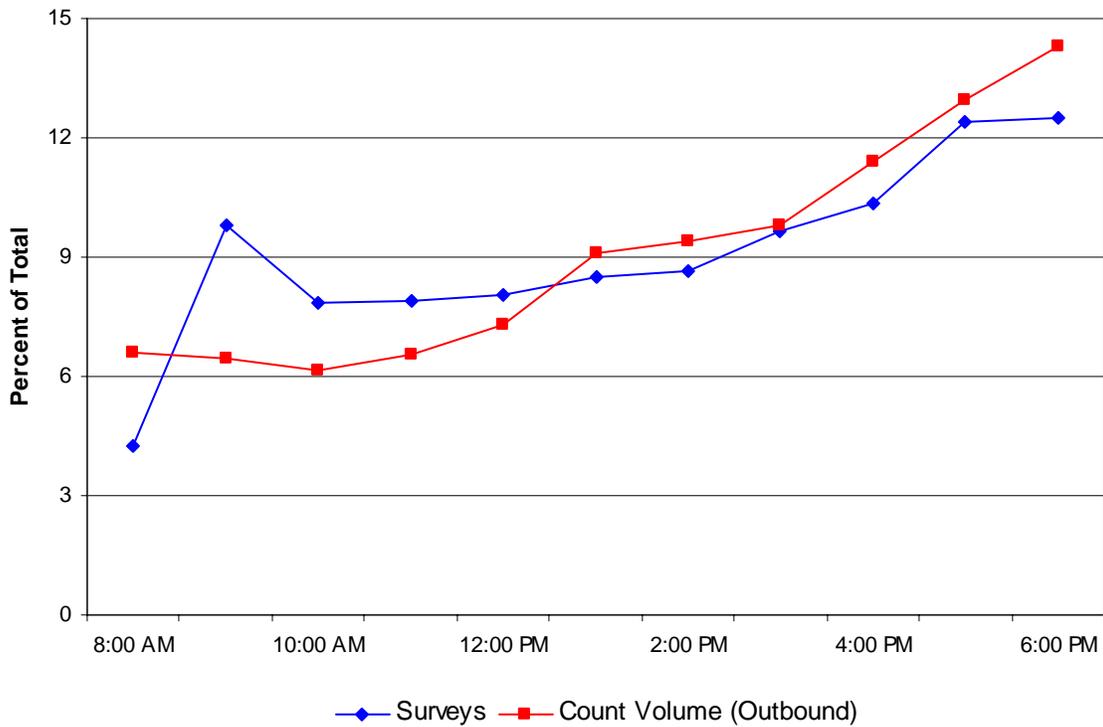
**Figure 11. Distribution of Non-Commercial Vehicles and Surveys by Time-of-Day.**

The trend among commercial vehicles was slightly different than the trend for non-commercial vehicles. The percent of vehicles counted was fairly constant throughout the day, while the percent of completed surveys peaked between 9:00 a.m. and 10:00 a.m. and then declined through the remainder of the day. Overall, 11 percent of the commercial vehicles that were counted during the survey period were interviewed.
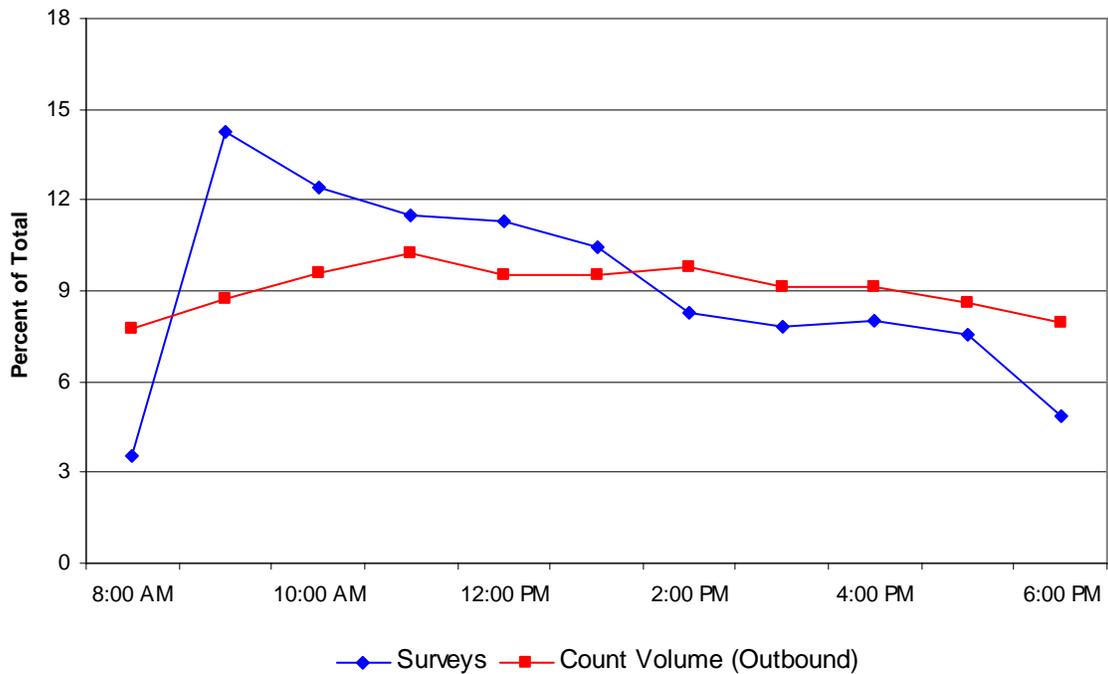
**Figure 12. Distribution of Commercial Vehicles and Surveys by Time-of-Day.**

A final comparison of the survey and count totals for the survey locations was conducted. In this analysis, the percent of counted vehicles that were surveyed per hour was determined for both non-commercial and commercial vehicles. This data was compared against the total count volumes for the survey period, and the results are provided in Figure 13. Generally, a larger percentage of non-commercial vehicles than commercial vehicles were surveyed throughout the course of the day. These trend lines compared against the total volumes illustrate that as the count volumes increase, the percentage of surveyed vehicles decrease. This is logical since the number of surveyors was constant during the survey period.
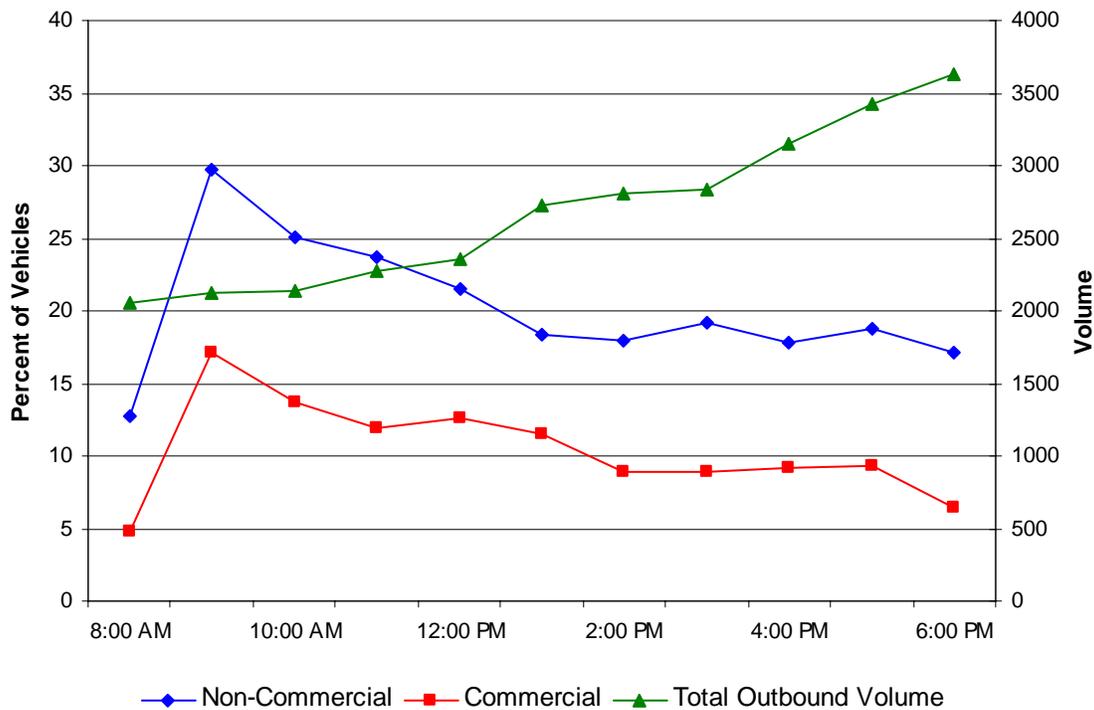
**Figure 13. Distribution of Counted Vehicles That Were Surveyed.**

<u>Vehicle Characteristics</u>

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 14 represents the percent distribution of non-commercial and commercial vehicles by age as reported in the surveys. The average age for surveyed vehicles was approximately 4.5 years for non-commercial vehicles and 4.2 years for commercial vehicles. The median vehicle model year was 2002 for both non-commercial and commercial vehicles.

Figure 15 presents the average odometer reading for non-commercial and commercial vehicles by age. This data shows the difference in mileage accumulation rates of commercial vehicles as compared to non-commercial vehicles. Unlike non-commercial vehicles, the data for commercial vehicles do not show smooth trends, especially for vehicles that are more than 10 years old. This is due in part to the total number of observations in the non-commercial and commercial surveys (3,937 and 989, respectively).
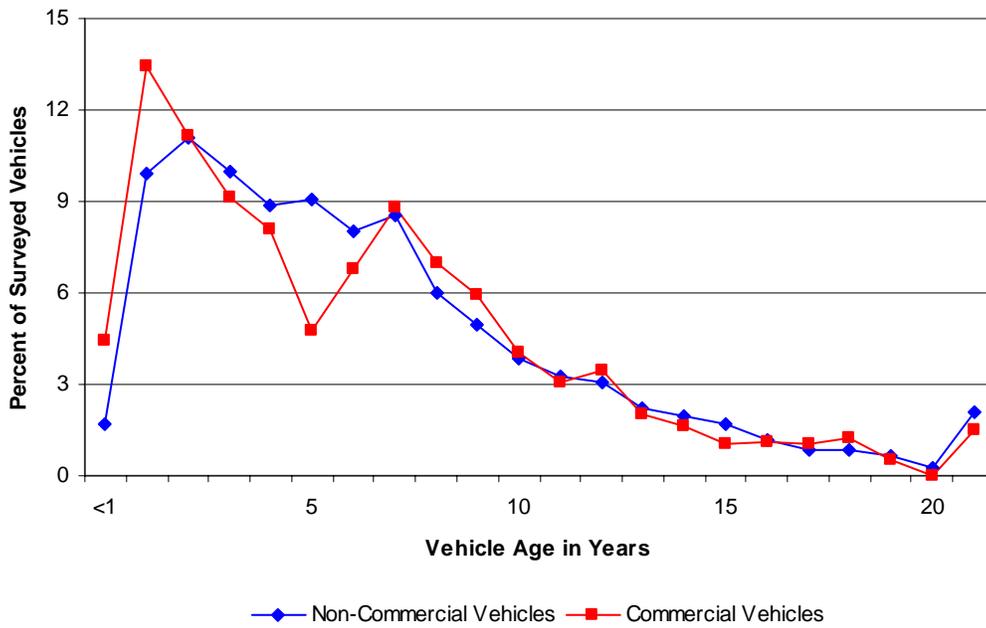
**Figure 14. Distribution of Surveyed Vehicles by Age of Vehicle.**
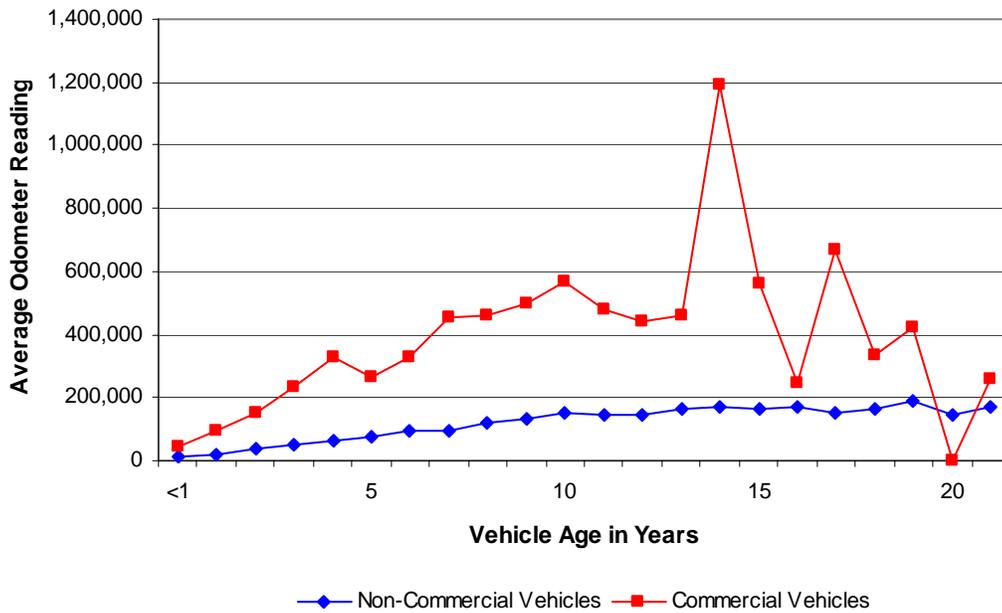


**Figure 15. Average Odometer Readings for Vehicles by Age of Vehicle.**

The average odometer reading for non-commercial vehicles was 87,788 and the average commercial vehicle odometer reading was 321,644. This information indicates that commercial vehicles accumulated mileage at nearly four times the rate of non-commercial vehicles. For more detailed information, Table 8 presents the numerical values for the non-commercial data plotted in Figures 13 and 14. Table 9 provides similar information for commercial vehicles.

**Table 8. Distribution of Non-Commercial Vehicles by Age and Average Odometer Reading.**

| Age | Number of Vehicles | Percent of Total | Cumulative Percent of Total | Average Reported Odometer Value |
|-----|-----|-----|-----|-----|
| <1 | 66 | 1.68 | 1.68 | 10,042 |
| 1 | 390 | 9.91 | 11.58 | 18,522 |
| 2 | 437 | 11.10 | 22.68 | 38,722 |
| 3 | 394 | 10.01 | 32.69 | 51,889 |
| 4 | 348 | 8.84 | 41.53 | 62,421 |
| 5 | 357 | 9.07 | 50.60 | 74,857 |
| 6 | 316 | 8.03 | 58.62 | 91,709 |
| 7 | 336 | 8.53 | 67.16 | 95,722 |
| 8 | 236 | 5.99 | 73.15 | 120,787 |
| 9 | 196 | 4.98 | 78.13 | 132,217 |
| 10 | 151 | 3.84 | 81.97 | 151,597 |
| 11 | 128 | 3.25 | 85.22 | 146,745 |
| 12 | 121 | 3.07 | 88.29 | 146,576 |
| 13 | 88 | 2.24 | 90.53 | 163,805 |
| 14 | 77 | 1.96 | 92.48 | 172,806 |
| 15 | 66 | 1.68 | 94.16 | 164,222 |
| 16 | 47 | 1.19 | 95.35 | 167,601 |
| 17 | 33 | 0.84 | 96.19 | 152,120 |
| 18 | 34 | 0.86 | 97.05 | 162,472 |
| 19 | 25 | 0.64 | 97.69 | 186,881 |
| 20 | 9 | 0.23 | 97.92 | 144,682 |
| >20 | 82 | 2.08 | 100.00 | 170,653 |
| Total | 3,937 | 100.00 | | |

**Table 9. Distribution of Commercial Vehicles by Age and Average Odometer Reading.**

| Age | Number of Vehicles | Percent of Total | Cumulative Percent of Total | Average Reported Odometer Value |
|---|---|---|---|---|
| <1 | 44 | 4.45 | 4.45 | 42,904 |
| 1 | 133 | 13.45 | 17.90 | 92,787 |
| 2 | 110 | 11.12 | 29.02 | 151,353 |
| 3 | 90 | 9.10 | 38.12 | 233,403 |
| 4 | 80 | 8.09 | 46.21 | 326,980 |
| 5 | 47 | 4.75 | 50.96 | 262,846 |
| 6 | 67 | 6.77 | 57.74 | 330,337 |
| 7 | 87 | 8.80 | 66.53 | 454,038 |
| 8 | 69 | 6.98 | 73.51 | 458,390 |
| 9 | 59 | 5.97 | 79.47 | 498,416 |
| 10 | 40 | 4.04 | 83.52 | 564,999 |
| 11 | 30 | 3.03 | 86.55 | 476,313 |
| 12 | 34 | 3.44 | 89.99 | 439,323 |
| 13 | 20 | 2.02 | 92.01 | 462,105 |
| 14 | 16 | 1.62 | 93.63 | 1,190,719 |
| 15 | 10 | 1.01 | 94.64 | 561,831 |
| 16 | 11 | 1.11 | 95.75 | 246,012 |
| 17 | 10 | 1.01 | 96.76 | 666,348 |
| 18 | 12 | 1.21 | 97.98 | 333,378 |
| 19 | 5 | 0.51 | 98.48 | 419,800 |
| 20 | 0 | 0.00 | 98.48 | 0 |
| >20 | 15 | 1.52 | 100.00 | 255,549 |
| Total | 989 | 100.00 | | |

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 into and out of the Waco study area. Table 10 presents the number of observed non-commercial and commercial vehicles by class and average occupancy. Nearly all of the non-commercial vehicles (99 percent) were classified as passenger vehicles. The majority of commercial vehicles (61 percent) were semi/tractor-trailer combinations. The overall average occupancy for non-commercial vehicles was 1.22 and 1.08 for commercial vehicles.

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

| Non-Commercial Vehicles | Observed Vehicles | Average Occupancy | Commercial Vehicles | Observed Vehicles | Average Occupancy |
|---|---|---|---|---|---|
| Passenger Vehicle | 3,879 | 1.22 | Single Unit 2-axle (6 wheels) | 131 | 1.15 |
| Bus | 0 | — | Single Unit 3-axle (10 wheels) | 23 | 1.22 |
| Taxi/Paid Limo | 0 | — | Single Unit 4-axle (14 wheels) | 17 | 1.06 |
| School Bus | 0 | — | Semi (tractor-trailer) | 600 | 1.04 |
| Commercial Vehicle (over 1 ton) | 3 | 1.00 | Other | 218 | 1.12 |
| Motorcycle | 47 | 1.08 | | | |
| Recreational Vehicle | 8 | 1.50 | | | |
| Other | 0 | — | | | |
| Total | 3,937 | 1.22 | Total | 989 | 1.08 |

## 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 about the type of commercial vehicle, the cargo being transported, the type of facility where it was picked up and dropped off, and how the cargo was transported to the vehicle. Table 11 presents data on the number and type 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.

Over one-third of the cargo transporting type vehicles (35 percent) reported not carrying any cargo. Of those vehicles transporting cargo, 92 percent of those cargos were not from or headed to Mexico. Only thirty-eight vehicles indicated that their cargo was from or destined to Mexico. Of those thirty-eight vehicles, thirty-six (95 percent) traversed the area on IH 35. Furthermore, of all the commercial vehicles surveyed at IH 35 survey locations, nearly 10 percent (36 of 369) had a cargo that was from or destined to Mexico.

For those vehicles carrying a cargo, approximately 4 percent reported picking their cargo up at an interposal transfer or custom brokerage facility and 4 percent indicated that they would be dropping their cargo off at the same type of facility. Interposal transfer or custom brokerage

facilities are sites where cargo may be transferred between several different modes (e.g. rail to truck, ship to truck, etc.).

**Table 11. Commercial Vehicles with Cargo from Mexico.**

| Station Number | Facility | Vehicles Surveyed | | | Empty Vehicles* | Percent Empty* | Vehicles with Mexico Cargo* | Vehicles without Mexico Cargo* |
|---|---|---|---|---|---|---|---|---|
| | | Cargo Transport | Service | Total | | | | |
| 396 | FM 2114 | 10 | 25 | 35 | 7 | 70.00 | 0 | 3 |
| 397 | IH 35 | 117 | 11 | 128 | 36 | 30.77 | 4 | 77 |
| 398 | FM 308 | 16 | 4 | 20 | 7 | 43.75 | 0 | 9 |
| 399 | SH 31 | 45 | 13 | 58 | 18 | 40.00 | 1 | 26 |
| 400 | US 84 | 25 | 39 | 64 | 9 | 36.00 | 0 | 16 |
| 404 | SH 6 | 40 | 19 | 59 | 12 | 30.00 | 0 | 28 |
| 405 | FM 434 | 6 | 6 | 12 | 3 | 50.00 | 0 | 3 |
| 406 | US 77 | 44 | 18 | 62 | 21 | 47.73 | 0 | 23 |
| 410 | IH 35 | 241 | 0 | 241 | 79 | 32.78 | 32 | 130 |
| 411 | SH 317 | 22 | 20 | 42 | 6 | 27.27 | 0 | 16 |
| 412 | FM 107 | 19 | 24 | 43 | 7 | 36.84 | 1 | 11 |
| 414 | US 84 | 32 | 24 | 56 | 14 | 43.75 | 0 | 18 |
| 416 | SH 317 | 30 | 9 | 39 | 6 | 20.00 | 0 | 24 |
| 417 | SH 6 | 42 | 24 | 66 | 19 | 45.24 | 0 | 23 |
| 418 | FM 1637 | 3 | 13 | 16 | 1 | 33.33 | 0 | 2 |
| 419 | FM 2490 | 8 | 15 | 23 | 1 | 12.50 | 0 | 7 |
| 420 | FM 933 | 14 | 11 | 25 | 7 | 50.00 | 0 | 7 |
| Total | | 714 | 275 | 989 | 253 | 35.43 | 38 | 423 |

\* Pertains to only Cargo Transport Vehicles.

A detailed summary of cargo types reported for commercial vehicles is provided in Table 12. Empty vehicles comprised 35 percent of those surveyed. For vehicles with identified cargo types, 21 percent reported their cargo as manufactured goods/equipment, 10 percent were reported as food, health, and beauty products, and 7 percent reported the cargo as farm products.

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

| | | Cargo Description | Number of Vehicles | Percent of Vehicles |
|---|---|---|---|---|
| 1 | — | Farm Products | 51 | 7.14 |
| 2 | — | Forest Products | 1 | 0.14 |
| 3 | — | Marine Products | 1 | 0.14 |
| 4 | — | Metals and Minerals | 37 | 5.18 |
| 5 | — | Food, Health, and Beauty Products | 70 | 9.80 |
| 6 | — | Tobacco Products | 0 | 0.00 |
| 7 | — | Textiles | 4 | 0.56 |
| 8 | — | Wood Products | 37 | 5.18 |
| 9 | — | Printer Matter | 0 | 0.00 |
| 10 | — | Chemical Products | 8 | 1.12 |
| 11 | — | Refined Petroleum or Coal Products | 8 | 1.12 |
| 12 | — | Rubber, Plastic, and Styrofoam Products | 12 | 1.68 |
| 13 | — | Clay, Concrete, Glass, or Stone | 42 | 5.88 |
| 14 | — | Manufactured Goods/Equipment | 151 | 21.15 |
| 15 | — | Wastes | 3 | 0.42 |
| 16 | — | Miscellaneous Shipments | 14 | 1.96 |
| 17 | — | Hazardous Materials | 1 | 0.14 |
| 18 | — | Transportation | 18 | 2.52 |
| 19 | — | Unclassified Cargo | 0 | 0.00 |
| 20 | — | Driver Refused to Answer | 1 | 0.14 |
| 21 | — | Unknown to Driver | 2 | 0.28 |
| 22 | — | Empty | 253 | 35.43 |
| | | Total | 714 | 100.00 |

Figures 16 and 17 present the distribution of surveyed commercial vehicles by the type of cargo transfer at the origin (point of pick-up) and at the destination (point of delivery). Warehouse-to-truck and truck-to-truck accounted for the majority of cargo transfers at both the origin and destination. At the origin, 73 percent of the transfers were warehouse-to-truck and 18 percent were truck-to-truck. At the destination, warehouse-to-truck (75 percent) and truck-to-truck (18 percent) transfers accounted for the majority of the transfers.
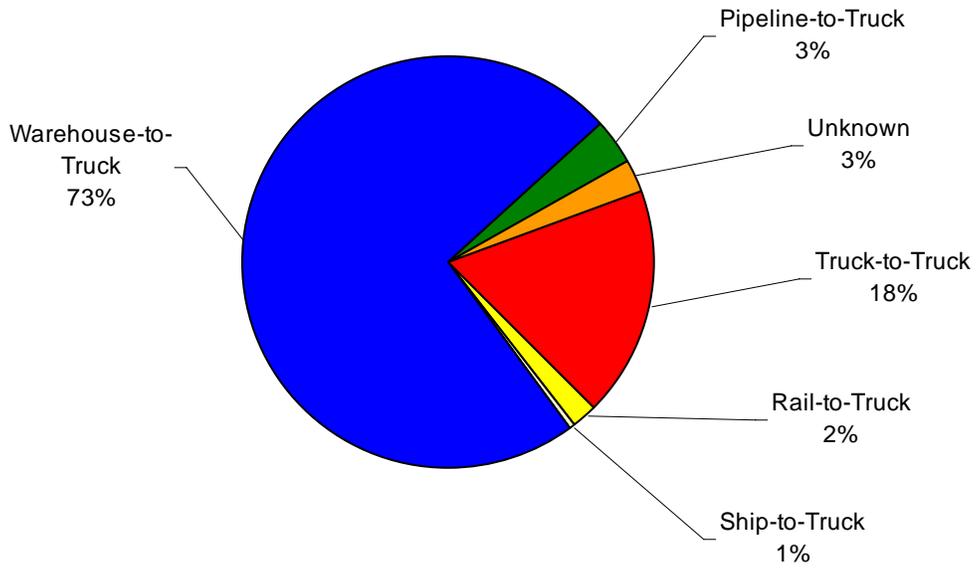
**Figure 16. Cargo Transfer at Point of Pick-Up.**
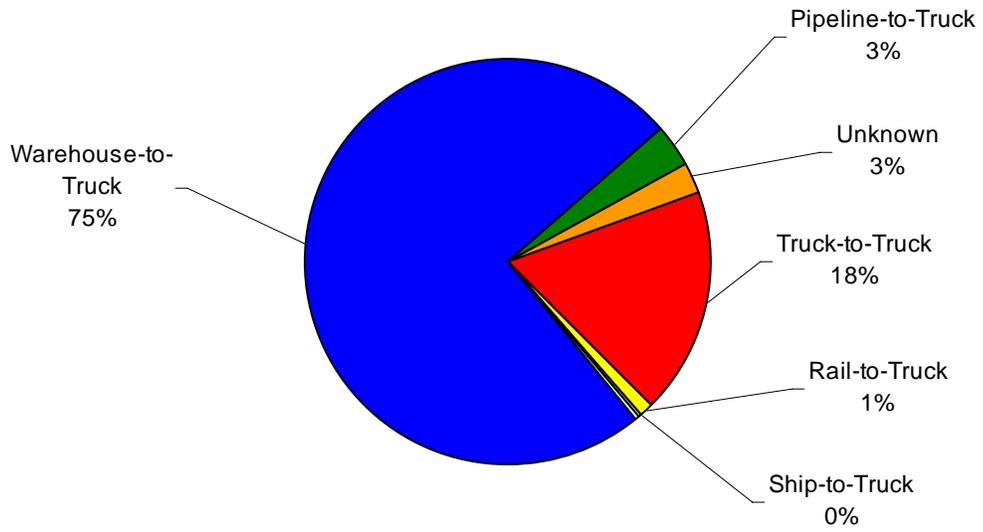


**Figure 17. Cargo Transfer at Point of Drop-Off.**

**HIGH VOLUME LICENSE PLATE MATCH SURVEYS**

Two locations in the Waco study area had traffic volumes that were too high to safely stop traffic and interview motorists. For these locations, a license plate match method was used as a means to estimate the number of external-local and external-through trips. The license plate matching survey was conducted using high-speed digital cameras which recorded license plates of commercial and non-commercial vehicles entering and exiting the study area at both high-volume locations. 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 both 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. The Waco high-volume locations, the number of license plates recorded, and the 24-hour traffic counts for these locations are provided in Table 13.

**Table 13. Waco High-Volume Locations.**

| Non-Commercial Vehicles | | | | | | |
|---|---|---|---|---|---|---|
| Station Number | Facility | Location | License Plates Recorded | | 24-Hour Vehicle Count | |
| | | | Inbound | Outbound | Inbound | Outbound |
| 397 | IH 35 | at Hill Co. line | 7,611 | 7,203 | 18,755 | 17,935 |
| 410 | IH 35 | at Falls Co. line | 8,538 | 9,793 | 20,819 | 19,854 |
| Commercial Vehicles | | | | | | |
| Station Number | Facility | Location | License Plates Recorded | | 24-Hour Vehicle Count | |
| | | | Inbound | Outbound | Inbound | Outbound |
| 397 | IH 35 | at Hill Co. line | 2,498 | 2,615 | 6,178 | 5,839 |
| 410 | IH 35 | at Falls Co. line | 2,373 | 2,291 | 5,461 | 7,068 |

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 and positional order) match in order for the plate to be considered valid. Additionally, travel time runs were made for the peak and off-peak periods in order to establish reasonable time limits for an external-through vehicle to travel between license plate survey stations. The travel times were then increased by 20 percent for

peak periods and 10 percent for 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 in Minutes | |
| --- | --- | --- |
| | Peak | Off-Peak |
| Northbound IH 35 (410) to IH 35 (397) | 41 | 52 |
| Southbound IH 35 (397) to IH 35 (410) | 49 | 39 |

\* Station numbers are shown in ( )

Using the travel time estimates provided in Table 14, the total number of license plate matches between the high-volume locations was ascertained. The results of this analysis for non-commercial and commercial vehicles are provided in Table 15. The table shows the location, the number of license plates recorded, the number of matches for each pair of sites, the inbound volume at the recording location, and the expanded number of through trips. The number of expanded through trips was determined by obtaining the percentage of recorded vehicles for a location that were matched at another location. This percentage was then multiplied by the total inbound volume for the recording location. For example, of the 7,611 inbound non-commercial vehicles recorded at IH 35 at the Hill County line, 2,670 (35.1 percent) were matched exiting the study area on IH 35 at the Falls County line. Therefore, the total inbound volume at the recording location (18,755 vehicles) multiplied by the percent matched (35.1 percent) equates to an estimated 6,583 through trips traveling on IH 35 from the Hill County line to the Falls County line.

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

| | | License Plates Recorded | | Expanded Total | |
|---|---|---|---|---|---|
| From Location | To Location | Recorded | Matches | Inbound Volume | Through Trips |
| IH 35 at Hill Co. line | IH 35 at Falls Co. line | 7,611 | 2,670 | 18,755 | 6,583 |
| IH 35 at Falls Co. line | IH 35 at Hill Co. line | 8,538 | 2,855 | 20,819 | 6,954 |
| **Commercial Vehicles** | | | | | |
| | | License Plates Recorded | | Expanded Match | |
| From Location | To Location | Recorded | Matches | Inbound Volume | Through Trips |
| IH 35 at Hill Co. line | IH 35 at Falls Co. line | 2,498 | 791 | 6,178 | 1,958 |
| IH 35 at Falls Co. line | IH 35 at Hill Co. line | 2,373 | 964 | 5,461 | 2,217 |

*(Note: "Non-Commercial Vehicles" heading spans the top of the first section.)*

## 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 is made that the traffic in the non-surveyed direction is a mirror image of the traffic in the surveyed direction. For example, if 10 percent of the surveyed outbound traffic was through trips, it is assumed that 10 percent of the inbound traffic will be through trips. It is also 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). It should be noted that estimates are included in Table 16 for the non-surveyed sites. For non-surveyed sites, it was assumed that all trips made were local trips. 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 as determined from the survey for FM 107 (station number 412) was applied to the total number of trips for FM 2671 (station number 413), which was a non-surveyed location.

**Table 16. Expanded Survey Results by Station.**

| Station Number | Facility | Non-Commercial Vehicles | | | Residents | Visitors | Commercial Vehicles | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Local | Through | Total | | | Local | Through | Total |
| 396 | FM 2114 | 2,014 | 58 | 2,072 | 851 | 1,163 | 184 | 25 | 209 |
| 397 | IH 35 | 21,557 | 15,133 | 36,690 | 5,174 | 16,383 | 6,915 | 5,102 | 12,017 |
| 398 | FM 308 | 833 | 24 | 857 | 220 | 613 | 135 | 20 | 155 |
| 399 | SH 31 | 7,710 | 1,015 | 8,725 | 1,447 | 6,263 | 1,077 | 325 | 1,402 |
| 400 | US 84 | 3,314 | 241 | 3,555 | 1,069 | 2,244 | 470 | 160 | 630 |
| 401 | FM 342 | 209 | 0 | 209 | 68 | 141 | 16 | 0 | 16 |
| 402 | SH 164 | 2,195 | 59 | 2,254 | 709 | 1,486 | 457 | 0 | 457 |
| 403 | FM 2603 | 309 | 0 | 309 | 74 | 235 | 39 | 0 | 39 |
| 404 | SH 6 | 9,671 | 1,442 | 11,113 | 2,317 | 7,354 | 890 | 647 | 1,537 |
| 405 | FM 434 | 532 | 9 | 541 | 228 | 304 | 64 | 0 | 64 |
| 406 | US 77 | 5,759 | 616 | 6,375 | 1,868 | 3,891 | 454 | 261 | 715 |
| 407 | FM 2643 | 390 | 0 | 390 | 126 | 264 | 29 | 0 | 29 |
| 410 | IH 35 | 25,982 | 14,691 | 40,673 | 6,236 | 19,746 | 7,775 | 4,754 | 12,529 |
| 411 | SH 317 | 7,037 | 603 | 7,640 | 4,406 | 2,631 | 485 | 37 | 522 |
| 412 | FM 107 | 579 | 217 | 796 | 266 | 313 | 160 | 66 | 226 |
| 413 | FM 2671 | 427 | 8 | 435 | 196 | 231 | 45 | 0 | 45 |
| 414 | US 84 | 4,838 | 288 | 5,126 | 1,813 | 3,025 | 628 | 176 | 804 |
| 415 | FM 185 | 188 | 8 | 196 | 94 | 94 | 27 | 0 | 27 |
| 416 | SH 317 | 1,011 | 399 | 1,410 | 506 | 506 | 286 | 40 | 326 |
| 417 | SH 6 | 5,105 | 295 | 5,400 | 2,070 | 3,036 | 1,119 | 193 | 1,312 |
| 418 | FM 1637 | 913 | 5 | 918 | 400 | 513 | 79 | 0 | 79 |
| 419 | FM 2490 | 2,172 | 30 | 2,202 | 1,053 | 1,119 | 184 | 6 | 190 |
| 420 | FM 933 | 1,709 | 97 | 1,806 | 496 | 1,213 | 172 | 17 | 189 |
| 421 | FM 2114 | 385 | 34 | 419 | 112 | 274 | 40 | 4 | 44 |
| Total | | 104,838 | 35,273 | 140,111 | 31,797 | 73,041 | 21,730 | 11,833 | 33,563 |

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 most likely 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.

Figure 18 shows the estimates of external-local trip movements by direction and location group. The Southeast group had the largest estimated number of external-local trip movements, with nearly 52,000 total daily trips. The Northwest group had the second highest estimated number of external-local trip movements with over 41,000 daily trips.
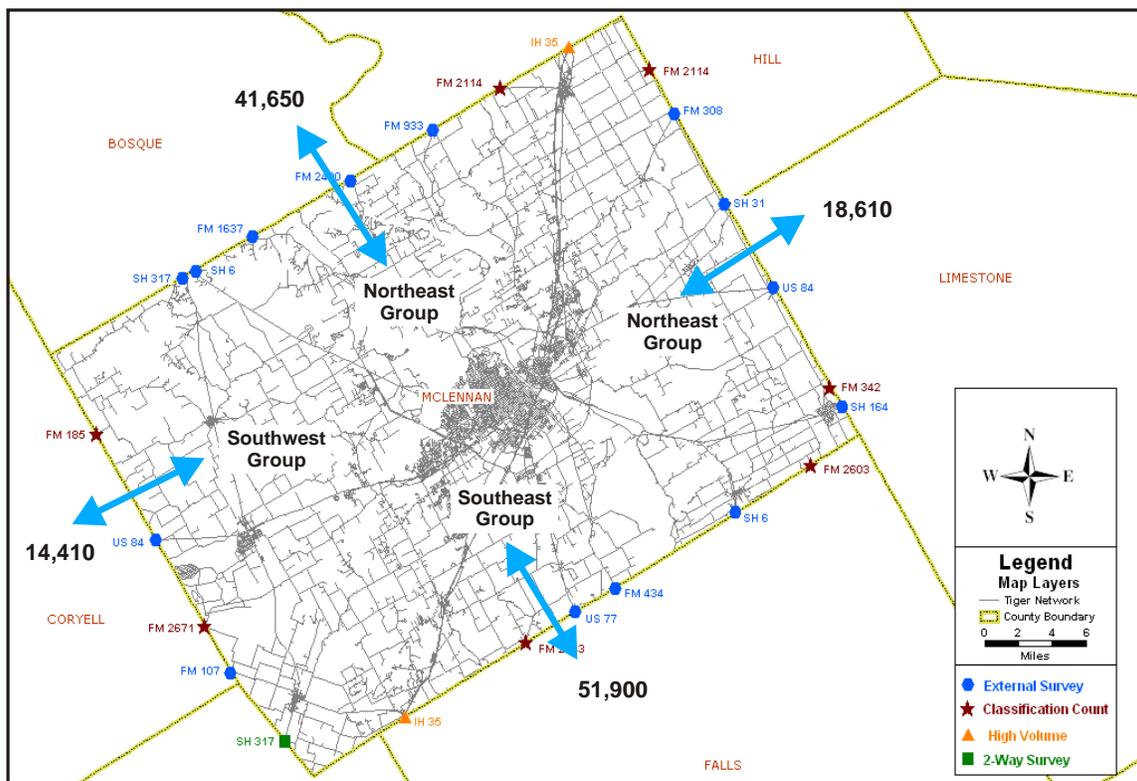


**Figure 18. Estimates of External-Local Trip Movements by Location Group.**

Figure 19 shows the estimates of external-through trip movements by direction and location group. The most common external-through movements were between the Northwest and Southeast groups. Over 41,000 external-through trips are estimated to be made on a daily basis between the Northwest and Southeast sides of the study area. This may be a little distorted due to the influence of through trips on IH 35. Northeast-Southeast external-through trips were the second most common movement.
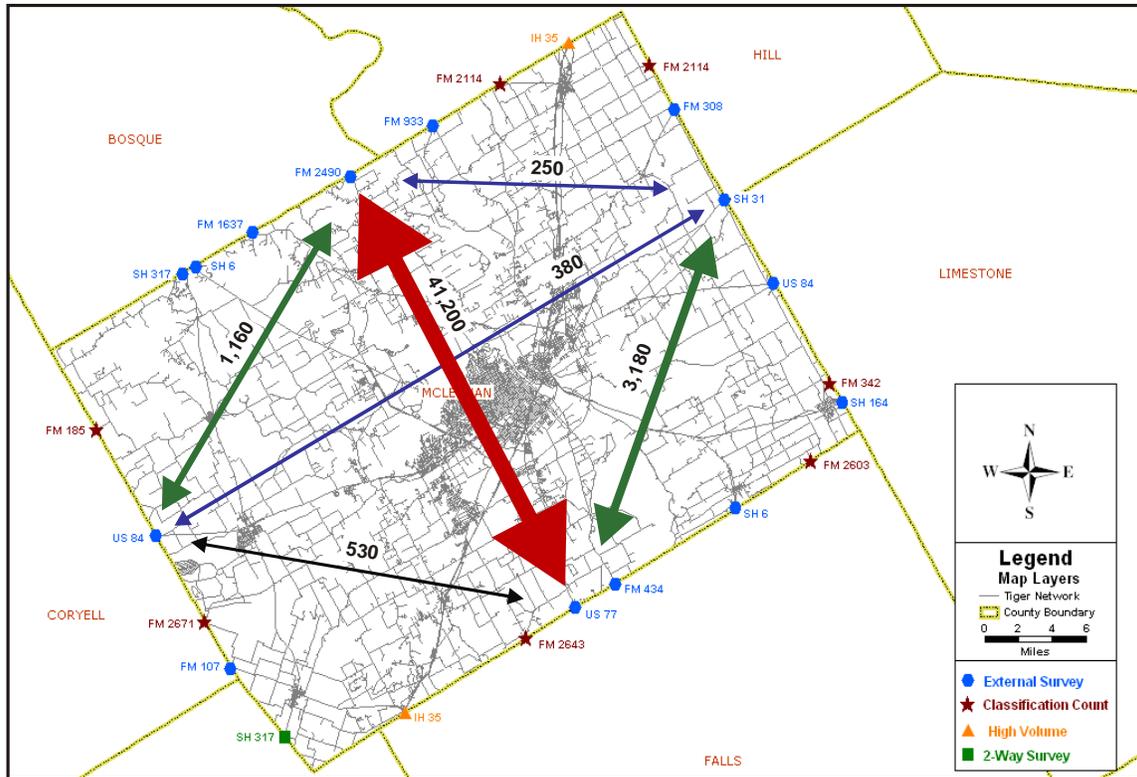
**Figure 19. Estimates of External-Through Trip Movements by Location Group.**

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. The results are provided in Table 17. The overall average trip length was 20.4 miles per trip.

**Table 17. Summary of VMT.**

| Vehicle Type | Trip Type | Number of Trips | VMT | Average Trip Length |
|---|---|---|---|---|
| Non-Commercial | External Thru | 17,637 | 677,500 | 38.4 |
| | External Local | 104,838 | 1,759,683 | 16.8 |
| Commercial | External Thru | 5,916 | 227,225 | 38.4 |
| | External Local | 21,730 | 396,876 | 18.3 |
| Total | | **150,121** | **3,061,284** | **20.4** |

**SURVEY SUMMARY**

Nearly 174,000 vehicles enter and leave the Waco study area daily. Nearly 19 percent are commercial vehicles. Approximately 27 percent of the nearly 174,000 vehicles make through trips. Approximately 55 percent of the non-commercial and commercial vehicles enter or leave the Waco study area via the two high-volume locations (IH 35 at Hill County and IH 35 at Falls County). Based on the average vehicle occupancy observed in the survey, an estimated 171,000 persons are entering and leaving the study area daily by non-commercial vehicle and nearly 36,000 persons are entering and leaving by commercial vehicle. The estimated number of non-residents (persons that do not live in the study area) in non-commercial vehicles that enter the study area daily is approximately 73,000. Non-residents account for approximately 17,800 internal trips within the study area.

Approximately 27 percent of non-commercial trip origins were leaving home and 46 percent of non-commercial trip destinations were returning to home. HBNW trips accounted for nearly 44 percent of the non-commercial trips. The percentage of trips that were NHB and HBW were both approximately 28 percent.

Commercial vehicle drivers reported varied trip purposes at the origin and destination ends of their trip. Approximately 31 percent of the trip origin purposes were reported as support functions. Picking up cargo accounted for 28 percent of trip origins. Delivering cargo was the stated purpose for 41 percent of the destination trips, while picking up cargo accounted for 18 percent of the destinations. Leaving/returning to base operations accounted for 20 percent of the commercial vehicle trip origins and 8 percent of the trip destinations.

For inbound vehicles, the morning peak occurs between 7:15 a.m. and 8:15 a.m. for non-commercial vehicles. There is an afternoon peak period for non-commercial vehicles between 4:30 p.m. and 5:30 p.m. While inbound commercial vehicle levels remain fairly constant from 8:00 a.m. to 5:00 p.m., the actual peak occurs at noon. For outbound traffic, the morning peak period for non-commercial vehicles is not as significant as the peak for the inbound direction, and it occurs between 7:30 a.m. and 8:00 a.m. The afternoon peak for non-commercial vehicles traveling outbound is larger and longer than the inbound afternoon peak. For outbound

commercial vehicles, there appears to be no significant peak. The traffic levels remain fairly constant between 9 a.m. and 6 p.m.

The median vehicle year for non-commercial and commercial vehicles was 2002. The average vehicle age for commercial vehicles was 4.2 years and for non-commercial vehicles it was 4.5 years. The average odometer reading for commercial vehicles was approximately four times higher than that for non-commercial vehicles. Average vehicle occupancy for non-commercial vehicles was 1.22, or nearly 15 percent greater than the 1.08 reported for commercial vehicles.

Commercial vehicles represent approximately 19 percent of the vehicles traveling into and out of the Waco study area on a daily basis. Over one-third (35 percent) of the commercial vehicles surveyed were carrying no cargo. Of those surveyed commercial vehicles that were carrying cargo, 92 percent were carrying cargo that is not from or destined to Mexico.

**APPENDIX**

Station # _____     Survey Date _____

Station Name/Location _____     Interviewer _____

| For each vehicle you collect | Vehicle 1 | Vehicle 2 | Vehicle 3 |
|---|---|---|---|
| Interview Begin Time<br>Interview End Time | _____a.m. _____p.m.<br>_____a.m. _____p.m. | _____a.m. _____p.m.<br>_____a.m. _____p.m. | _____a.m. _____p.m.<br>_____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)        9) Unknown        99) Refused

| QUESTIONS: | Vehicle 1 | Vehicle 2 | Vehicle 3 |
|---|---|---|---|
| 1.    What year, make, and model is this vehicle?<br><br><br>Unleaded gas, diesel, hybrid, propane or other fuel? | _____<br>Year<br>_____<br>Make<br>_____<br>Model<br>Unleaded ☐   Diesel ☐<br>Hybrid ☐   Propane ☐<br>Other ☐ _____ | _____<br>Year<br>_____<br>Make<br>_____<br>Model<br>Unleaded ☐   Diesel ☐<br>Hybrid ☐   Propane ☐<br>Other ☐ _____ | _____<br>Year<br>_____<br>Make<br>_____<br>Model<br>Unleaded ☐   Diesel ☐<br>Hybrid ☐   Propane ☐<br>Other ☐ _____ |
| 2.    What is the mileage on your odometer? | | | |
| 3.    What county do you live in?<br><br>  (If other, go to 4) | ☐ McLennan<br>☐ Bell<br>☐ Coryell<br>☐ Lampasas<br>☐ OTHER | ☐ McLennan<br>☐ Bell<br>☐ Coryell<br>☐ Lampasas<br>☐ OTHER | ☐ McLennan<br>☐ Bell<br>☐ Coryell<br>☐ Lampasas<br>☐ OTHER |
| 3a.    What city do you live in? | <br>(go to 5) | <br>(go to 5) | <br>(go to 5) |
| 4.    What city and state to you live in? | _____<br>(city/state in US or Mexico)<br>☐ Refused | _____<br>(city/state in US or Mexico)<br>☐ Refused | _____<br>(city/state in US or Mexico)<br>☐ Refused |
| 4a.    Did you stay overnight as part of your travel? | ☐ Yes        ☐ Refused<br>☐ No  (go to 4d) | ☐ Yes        ☐ Refused<br>☐ No  (go to 4d) | ☐ Yes        ☐ Refused<br>☐ No  (go to 4d) |
| 4b.    Where did you stay? | _____<br>(city/state in US or Mexico)<br>☐ Refused | _____<br>(city/state in US or Mexico)<br>☐ Refused | _____<br>(city/state in US or Mexico)<br>☐ Refused |
| 4c.    How many nights have you stayed? | ☐ Yes        ☐ Refused<br>☐ No  (go to 5) | ☐ Yes        ☐ Refused<br>☐ No  (go to 5) | ☐ Yes        ☐ Refused<br>☐ No  (go to 5) |

| | | | | |
|---|---|---|---|---|
| 4d. | Did you enter Texas today? | | | |
| 4e. | Where outside of Texas did you travel from? | _____<br>_____<br>(city/state in US or Mexico)<br>☐ Refused | _____<br>_____<br>(city/state in US or Mexico)<br>☐ Refused | _____<br>_____<br>(city/state in US or Mexico)<br>☐ Refused |
| 4f. | What road or highway did you use to enter Texas? | | | |
| 5. | Where was the *last* place you got into your vehicle (place/address or nearest intersection/city) | | | |
| 5a. | What time did you leave that place? | ____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) | ☐ Yes ☐ No ☐ Refused<br>(Yes go to 6) | ☐ Yes ☐ No ☐ Refused<br>(Yes go to 6) | ☐ Yes ☐ No ☐ Refused<br>(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 (12th grade or lower)  **6)** Educational (college, trade, etc.)
**7)** Government  **8)** Residential  **9)** Airport  **10)** Eating Establishment
**11)** Hotel / Motel  **12)** Other (specify)  **13)** Unknown  **99)** Refused

**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)  **17)** Unknown  **99)** 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? | ☐ Yes  ☐ Refused<br>☐ No (go to 7d) | ☐ Yes  ☐ Refused<br>☐ No (go to 7d) | ☐ Yes  ☐ Refused<br>☐ No (go to 7d) |
| *If Yes:* | | | | |
| 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? | | | |
| *If No:* | | | | |
| 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? | | | |

**WACO AND KILLEEN/TEMPLE 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.    Interview Begin Time<br><br>       Interview  End Time | _____a.m. _____p.m.<br>_____a.m. _____p.m. | _____a.m. _____p.m<br>_____a.m. _____p.m. | _____a.m. _____p.m.<br>_____a.m. _____p.m. |
| 2.    Number of people in vehicle | | | |
| 3.    Vehicle Classification | | | |
| 4.    Vehicle Type | ☐ Cargo Transport<br>☐ Service (go to 13) | ☐ Cargo Transport<br>☐ Service (go to 13) | ☐ Cargo Transport<br>☐ Service (go to 13) |
| 5.    Record the hazardous material placard (if applicable) | | | |
| 6.    What is the cargo ? (choose from vehicle cargo codes)<br>       6a.    If empty, what was the last cargo you delivered? | _____<br>☐ Empty (no cargo)<br><br>(go to 13) | _____<br>☐ Empty (no cargo)<br><br>(go to 13) | _____<br>☐ Empty (no cargo)<br><br>(go to 13) |
|       6b.    What is the weight of your cargo? | (lbs) | (lbs) | (lbs) |
|       6c.    Is cargo being hauled using an multi-modal container/trailer or TEU? | ☐ Yes<br>☐ No (go to 7) | ☐ Yes<br>☐ No (go to 7) | ☐ Yes<br>☐ No (go to 7) |
| *If Yes:*<br>      6d.    Is the container a Reefer or Dry Box? | ☐ Reefer<br>☐ Dry Box | ☐ Reefer<br>☐ Dry Box | ☐ Reefer<br>☐ Dry Box |
| 7.    Did your cargo come from or is it going to Mexico? | ☐ Yes        ☐ No<br>☐ Refused / Unknown | ☐ Yes        ☐ No<br>☐ Refused / Unknown | ☐ Yes        ☐ No<br>☐ Refused / Unknown |
| 8.    Where did you pick up your load?<br>(place/address or nearest intersection and city) | | | |
| 9.    Was that location an inter-modal transfer or custom brokerage site? | ☐ Yes        ☐ No<br>☐ Refused / Unknown | ☐ Yes        ☐ No<br>☐ Refused / Unknown | ☐ Yes        ☐ No<br>☐ Refused / Unknown |
| 10.  How was your load transferred at that site (choose from transfer codes)? | | | |
| 11.  Where will you drop your cargo off?<br>(place/address or nearest intersection and city) | | | |
| 12.  Is that location an inter-modal transfer or custom brokerage site? | ☐ Yes        ☐ No<br>☐ Refused / Unknown | ☐ Yes        ☐ No<br>☐ Refused  / Unknown | ☐ Yes        ☐ No<br>☐ Refused / Unknown |
| 13.  How will the cargo be transferred at that site (choose from transfer codes)? | | | |

**Vehicle Classification Options:**

| | | |
|---|---|---|
| 1) Passenger Car | 2) Pickup Truck | 3) Van (full or mini) |
| 4.) Sport Utility Vehicle SUV | 5.) Passenger Vehicle with trailer | 6.) Single Unit 2-axle (6 wheels) |
| 7.) Single Unit 2-axle (6 wheels) with trailer | 8.) Single Unit 3-axle (10 wheels) | 9.) Single Unit 4-axle (14 wheels) |
| 10) Semi (all tractor-trailer combinations) | 11) Other (specify) | 12) Unknown |
| 99) Refused | | |

**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 | 7. Unknown | 99) Refused |

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

| 14. What is the year and gross weight rating of this vehicle?<br><br>Gas (leaded, unleaded), diesel, propane or other fuel? | _____<br>Year<br><br>_____<br>Gross Weight<br>Unleaded ☐  Diesel ☐<br>Hybrid ☐  Propane ☐<br>Other ☐ _____ | _____<br>Year<br><br>_____<br>Gross Weight<br>Unleaded ☐  Diesel ☐<br>Hybrid ☐  Propane ☐<br>Other ☐ _____ | _____<br>Year<br><br>_____<br>Gross Weight<br>Unleaded ☐  Diesel ☐<br>Hybrid ☐  Propane ☐<br>Other ☐ _____ |
|---|---|---|---|
| 15. What is the mileage on your odometer? | | | |
| 16. Where are you coming from?<br>(city / state in US or Mexico) | | | |
|    16a. Is that location in Texas? | ☐ Yes (go to 16d)<br>☐ No | ☐ Yes (go to 16d)<br>☐ No | ☐ Yes ( go to 16d)<br>☐ No |
|    16b. (*If not in Texas*) Did you enter Texas today? | ☐ Yes<br>☐ No (go to 16d) | ☐ Yes<br>☐ No (go to 16d) | ☐ Yes<br>☐ No (go to 16d) |
|    16c. What road or highway did you use to enter Texas? | | | |
|    16d. Did you stay overnight as part of your travel? | ☐ Yes<br>☐ No (go to 17) | ☐ Yes<br>☐ No (go to 17) | ☐ Yes<br>☐ No (go to 17) |
|    16e. If yes, where did you stay?<br>(city/county/state) | | | |
|    16f. How many nights have you stayed? | | | |
| 17. Where was the last place you got into your vehicle? (place/address or nearest intersection/city) | | | |
|    17a. What time did you leave that place? | _____a.m. _____p.m. | _____a.m. _____p.m. | _____a.m. _____p.m. |
|    17b. What type of place was this?<br>(choose from type of place options) | | | |
|    17c. What was your purpose for being at your last location? | | | |
|    17d. Was that location in the study area? | ☐ Yes (Go to 18)<br>☐ No<br>☐ Refused | ☐ Yes (Go to 18)<br>☐ No<br>☐ Refused | ☐ Yes (Go to 18)<br>☐ No<br>☐ Refused |
|    17e. What road did you use to enter the study area? | | | |
| 18. Where is your next destination?<br>(place/address or nearest intersection/city) | | | |
|    18a. What is your purpose for traveling to this destination? (Choose from trip purpose options) | | | |
| 19. Are you going to a location outside of Texas? | ☐ Yes (Go to 19a)<br>☐ No (go to 19d)<br>☐ Refused | ☐ Yes (Go to 19a)<br>☐ No (go to 19d)<br>☐ Refused | ☐ Yes (Go to 19a)<br>☐ No (go to 19d)<br>☐ Refused |
| *If Yes:*<br>   19a. What city and state are you going to? | | | |

| | | | |
|---|---|---|---|
| 19b. What road or highway will you use to leave Texas? | | | |
| 19c. How many more days will you be in Texas? | | | |
| *If No:* | | | |
| 19d. 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 (12th grade or lower)   **6)** Educational (college, trade, etc.)
**7)** Government   **8)** Residential   **9)** Airport   **10)** Eating Establishment
**11)** Hotel/Motel   **12)** Other (specify)   **13)** Unknown   **99)** Refused

**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)   9) Unknown   99) Refused

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

| | | | |
|---|---|---|---|
| 20. Where did your first trip today begin? (city/county/landmark) | | | |
| 21. Where did you go from there? (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. Where did you go next? (city/county/landmark) | | | |
| 26. Where did you go next? (city/county/landmark) | | | |
| 27. 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 |

**WACO AND KILLEEN/TEMPLE EXTERNAL STATION**
**HIGH VOLUME COMMERCIAL VEHICLE SURVEY     FORM  E**

Station # _____

Survey Date _____

Station Name/Location

_____

Interviewer _____

| For each vehicle you collect: | Vehicle 1 | Vehicle 2 | Vehicle 3 |
|---|---|---|---|
| 1.  Interview BEGIN Time | _____a.m. _____p.m. | _____a.m. _____p.m. | _____a.m. _____p.m. |
| 2.  Interview END Time | _____a.m. _____p.m. | _____a.m. _____p.m. | _____a.m. _____p.m. |
| 3.  What direction are you headed? | | | |
| 4.  Number of people in vehicle | | | |
| 5.  Vehicle Classification (Use Codes shown below) | | | |
| 6.  Vehicle Type | Cargo Transport Service (Go to 17) | Cargo Transport Service (Go to 17) | Cargo Transport Service (Go to 17) |
| 7.  Record the hazardous material placard (if applicable) | | | |
| 8.  What is the cargo ? (choose from vehicle cargo codes) | _____ Empty (no cargo) | _____ Empty (no cargo) | _____ Empty (no cargo) |
| 8a.  If empty, what was the last cargo you delivered? | _____ (go to 18) | _____ (go to 18) | _____ (go to 18) |
| 8b.  What is the weight of your cargo? | (lbs) | (lbs) | (lbs) |
| D*etermine 8c and 8d by observation *<br>8c.  Is cargo being hauled using an multi-modal container/trailer or TEU? | Yes<br>No | Yes<br>No | Yes<br>No |
| *If Yes:*<br>8d.  Is the container a Reefer or Dry Box? | Reefer<br>Dry Box | Reefer<br>Dry Box | Reefer<br>Dry Box |
| 9.  What city, state, and country was the point of origin for your cargo? | | | |
| 10.  Did your cargo come from or is it going to Mexico? | Yes       No<br>Refused / Unknown | Yes       No<br>Refused / Unknown | Yes       No<br>Refused / Unknown |
| 11.  Where did you pick up your load? (place/address or nearest intersection and city) | | | |
| If in Mexico ask:<br>11a.  What international bridge was used to enter Texas? | | | |
| If not in Texas ask:<br>11b.  What road or highway were you on when you entered Texas? | | | |
| 12.  Was that location an inter-modal transfer or custom brokerage site? | Yes       No<br>Refused / Unknown | Yes       No<br>Refused / Unknown | Yes       No<br>Refused / Unknown |
| 13.  How was your load transferred at that site (choose from transfer codes)? | | | |
| 14.  Where will you drop your cargo off? (place/address or nearest intersection and city) | | | |
| 15.  Is that location an inter-modal transfer or custom brokerage site? | Yes       No<br>Refused / Unknown | Yes       No<br>Refused  / Unknown | Yes       No<br>Refused / Unknown |

**Vehicle Classification Options:**

| | | |
|---|---|---|
| 1) Passenger car | 2) Pickup Truck | 3) Van (full or mini) |
| 4.) Sport Utility Vehicle SUV | 5.) Passenger Vehicle with trailer | 6.) Single Unit 2-axle (6 wheels) |
| 7.) Single Unit 2-axle (6 wheels) with trailer | 8.) Single Unit 3-axle (10 wheels) | 9.) Single Unit 4-axle (14 wheels) |
| 10) Semi (all tractor-trailer combinations) | 11) 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 | 7) Unknown | 99) Refused |

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

| | | | |
|---|---|---|---|
| 16. How will the cargo be transferred at that site (choose from transfer codes)? | | | |
| 17. What city, state, and country is the final destination for your cargo? | | | |
| 18. What is the year and gross weight rating of this vehicle?<br><br>Unleaded gas, diesel, hybrid, propane or other fuel? | Year<br>Gross Weight<br>☐ Unleaded ☐ Diesel<br>☐ Hybrid ☐ Propane<br>☐ Other | Year<br>Gross Weight<br>☐ Unleaded ☐ Diesel<br>☐ Hybrid ☐ Propane<br>☐ Other | Year<br>Gross Weight<br>☐ Unleaded ☐ Diesel<br>☐ Hybrid ☐ Propane<br>☐ Other |
| 19. What is the mileage on your odometer? | | | |
| 20. Where are you coming from? (city/state in US or Mexico) | | | |
| 20a. Is that location in Texas? | Yes (go to 20d)<br>No | Yes (go to 20d)<br>No | Yes ( go to 20d)<br>No |
| 20b. (*If not in Texas*) Did you enter Texas today? | Yes<br>No (go to 20d) | Yes<br>No (go to 20d) | Yes<br>No (go to 20d) |
| 20c. What road or highway did you use to enter Texas? | | | |
| 20d. Did you stay overnight as part of your travel? | Yes<br>No (go to 21) | Yes<br>No (go to 21) | Yes<br>No (go to 21) |
| 20e. If yes, where did you stay? (city/county/state) | | | |
| 20f. How many nights have you stayed? | | | |
| 21. Where was the last place you got into your vehicle? (place/address or nearest intersection/city) | | | |
| 21a. What time did you leave that place? | _____a.m. _____p.m. | _____a.m. _____p.m. | _____a.m. _____p.m. |
| 21b. What was your purpose for being at your last location? (Choose from trip purpose options) | | | |

| 22. Where is your next destination? (place/address or nearest intersection/city) | | | |
|---|---|---|---|
| 22a. What is your purpose for traveling to this destination? (Choose from trip purpose options) | | | |

**Trip Purpose Options:**

1) Base location/return to base location    2) Delivery    3) Pick-up
4) Delivery and Pick-up    5) Maintenance    6) Driver needs (lunch, etc.)    7) To Home
8) Buy fuel    9) Other (specify)    10) Unknown    99) Refused

**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