Truck Parking Inventory and Utilization
Appendixes

WA 3 Task 2.3/2.4/2.7

Final 1: February 28, 2020
Appendix A: FHWA Methodology Details

This section provides an overview of the inputs and calculations used to derive truck parking demand in Texas utilizing the FHWA approach. As described in the report, this information provides a baseline for truck parking demand at the corridor level but has a number of limitations. Information generated from this approach will be used to cross-check data provided by the American Transportation Research Institute (ATRI) that is the main source of analysis used in this study.

This approach is based on three related studies:

- Virginia DOT—Virginia Truck Parking Study (2015). Referenced as “Virginia DOT.”

The Pennsylvania STAC and Virginia DOT models are based on the original FHWA approach but update some of the variables based on changes in FMCSA hours of service (HOS) regulations since 2002.

The model used to calculate truck parking demand requires 5 key user inputs. These inputs were all included in the original FHWA study:

- Truck AADT (AADTT) or Commercial AADT (AADTT).
- Corridor Length (L).
- Corridor Speed Limit or Average Speed (S).
- Percent of Trucks making short-haul trips.
- Percent of Trucks making long-haul trips.

The core equation for estimating truck parking demand (D) is shown below.

\[ D = THT \times P_{avg} \]

Where:

- \( D \) = Truck parking demand
- \( THT \) = Truck hours traveled
- \( P_{avg} \) = Average truck parking duration

Truck Hours Traveled (THT) is calculated based on:
\[ THT = \text{AADTT} \times (L/S) \]

Where:

- THT = Truck hours traveled
- AADTT = Annual average daily truck traffic
- L = Corridor length (in miles)
- S = Average speed

The more time trucks require to traverse a corridor \((L/S)\) and the more trucks in the corridor \((\text{AADTT})\), the higher the probability that they will need to stop at some point during that trip.

The average truck parking duration \((P_{\text{avg}})\) was expanded in the original FHWA study to include a number of additional parameters including:

- Hours of Service limitations (updated by the Pennsylvania STAC and Virginia DOT studies).
- Variation in truck parking characteristics for long-haul and short-haul trips. Short-haul trips can be made within a single day under hours-of-service regulations in place in 2002.
- Ratio of short-haul trips to long-haul trips. Truck parking duration is used as a surrogate. Based on observations and estimates of the percent of trucks that are parked for less than three hours (short-haul) versus those parked for more than three hours (long-haul), the original FHWA study used a 36% short-haul to 64% long-haul split for urban segments (defined as within 200 miles of a city with a population of 200,000 or more) and a 7% short-haul to 93% long-haul split for rural segments. The Pennsylvania STAC model used a 79% short-haul to 21% long-haul split while Virginia DOT used a 65% short-haul to 35% long-haul split.
- Time required for loading/unloading, staging, and other activities that occur while the driver is “on-duty” but off the roadway network.
- Demand for truck parking at public vs. private rest areas. This study does not differentiate between the types of parking available.
- Peak parking factors for long-haul and short-haul trucks. This determines the percent of daily truck parking demand that occurs during peak hours. Pennsylvania STAC and Virginia DOT both used 3 A.M to 4 a.m. as the peak truck parking hour. This study uses the same periods as the peak truck parking hour.

These parameters are further discussed in the sections below.
Short-Term Truck Parking Demand
To calculate short-term truck parking demand, the following steps were used for each corridor:

1. **Calculate AADTT.** TxDOT publishes roadway inventory data, including annual average truck counts each year. This study used 2018 data and combined the reported single- and combination-unit truck counts into an overall AADTT. Since this analysis focused on statewide Interstate corridors, the AADTT from urban areas (defined as within an MPO boundary) were not included in the overall corridor average to avoid skewing the average volume across the entire corridor.

2. **Calculate buffer AADTT.** The average AADTT value was multiplied by a 15% “buffer” to account for variances in the average daily truck traffic. This approach was used in the original FHWA study but not in the Pennsylvania STAC and Virginia DOT studies.

For the short-term truck parking demand calculation, the total daily truck volume is used instead of the short-haul percent because both short-haul and long-haul trucks need to stop for short periods of time (bathroom, fuel, etc.).

3. **Calculate segment length (L).** Obtained from GIS segment lengths for entire corridor.

4. **Calculate speed (S).** The average speed in a corridor can vary significantly based on time of year, time of day, traffic volumes, weather conditions, geography, and location (urban/rural) and speeds for commercial vehicles can be different than those for automobiles. For this analysis, statewide average speed of 65 miles per hour was used across all corridors.¹

Using equation 2, multiplying the buffer AADTT by the corridor length divided by corridor speed produces a truck-hours-traveled for the corridor.

5. **Calculate truck hours parked.** Using a truck parking/operating ratio of 5 minutes parked to 55 minutes of travel per hour, taken from the original FHWA study, the truck-hours-traveled is multiplied by 0.083.

6. **Calculate daily short-term truck stops.** All three studies used a value of 0.367 hours (22 minutes per hour) for the median short-term truck parking duration. This means that a driver would theoretically make a short-term truck parking stop once every 4 hours for 22 minutes. The total truck hours parked is multiplied by 0.367.

¹ This is consistent with the national average speed used by the National Highway Traffic Safety Administration “FMVSS No. 140. Speed Limiting Devices” (August 2016). Online at: https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/speed-limiter-pria-082016.pdf
7. **Calculate peak truck parking demand (short-haul).** The utilization rate for trucks parked for less than 3 hours during the peak period of truck parking demand (between 3 a.m. and 4 a.m.) was estimated as 2.11% in the Pennsylvania STAC model. This value was used in the Virginia DOT model as well. Multiplying the daily truck stops by this value produces a peak truck parking demand for short-haul trips. This is the maximum demand for short-term truck parking in each corridor.

**Long-Term Truck Parking Demand**

To calculate long-term truck parking demand, the following steps were used for each segment:

1. **Calculate AADTT.** This study uses published TxDOT AADTT from 2018 highway inventory datasets. Since this analysis focused on statewide Interstate corridors, the AADTT from urban areas (defined as within an MPO boundary) were not included in the overall corridor average to avoid skewing the average volume across the entire corridor. However, only some trips in each corridor will require trucks to stop for long periods of rest. The average AADTT was multiplied by the percent of trucks making long-haul trips. For this analysis, since urban area AADTT was not utilized, the assumption was that 93% of trucks are making long-haul trips, consistent with the original FHWA study assumption for rural areas.

2. **Calculate buffer AADTT.** The AADTT provided in step 1 was then multiplied by a 15% “buffer” to account for variances in the average daily truck traffic. This approach was used in the original FHWA study but not in the Pennsylvania STAC and Virginia DOT studies.

3. **Calculate segment length (L).** Obtained from GIS segment lengths for the entire corridor.

4. **Calculate speed (S).** The average speed in a corridor can vary significantly based on time of year, time of day, traffic volumes, weather conditions, geography, and location (urban/rural) and speeds for commercial vehicles can be different than those for automobiles. For this analysis, statewide average speed of 65 miles per hour was used across all corridors.

Using equation 2, multiplying the buffer AADTT by the corridor length divided by corridor speed produces a truck-hours-traveled for each segment.

To derive long-term truck parking activity, a number of additional factors were considered. All three studies use a similar approach, though the Pennsylvania STAC and Virginia DOT approaches are updated to account for changes in FMCSA HOS restrictions since the 2002 FHWA study. Exhibit 1 is taken from the Pennsylvania STAC model.
### Exhibit 1: Long-Haul Truck Parking Demand—HOS Related Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Derivation/Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>$F_D$</td>
<td>Driving hours permitted in a daily on-duty window</td>
<td>11 out of 14, or 0.786 (FMCSA Regulations)</td>
</tr>
<tr>
<td>$OD_B$</td>
<td>Maximum on-duty hours permitted 8 over consecutive days</td>
<td>70 (FMCSA)</td>
</tr>
<tr>
<td>$DR_B$</td>
<td>Maximum driving hours permitted over 8 consecutive days</td>
<td>$55 \times (OD_B \times F_D)$</td>
</tr>
<tr>
<td>$H_T$</td>
<td>Total hours in 8-day period</td>
<td>$192 \times (24 \times 8)$</td>
</tr>
<tr>
<td>$H_H$</td>
<td>Avg. hours at home (off-duty and away from truck) for long-haul truckers in 8-day period</td>
<td>42 (2002 FHWA Study)</td>
</tr>
<tr>
<td>$H_R$</td>
<td>Average hours with truck (on-duty or off-duty) for long-haul truckers in 8-day period</td>
<td>$150 \times (H_T - H_H)$</td>
</tr>
<tr>
<td>$D%$</td>
<td>Fraction of time on the road (on-duty and driving) for long-haul truckers in 8-day period</td>
<td>$0.367 \times (DR_B / H_R)$</td>
</tr>
<tr>
<td>$P%$</td>
<td>Fraction of time long-haul truckers must be off-duty and/or parked under FMCSA regulations</td>
<td>$0.633 \times (1 - D%)$</td>
</tr>
<tr>
<td>$P$</td>
<td>Parking Ratio (hours parked for FMCSA regulations for every hour driving)</td>
<td>$1.725 \times (P% / D%)$</td>
</tr>
</tbody>
</table>

Source: Pennsylvania STAC. Truck Parking in Pennsylvania.

5. **Calculate truck hours parked.** This is found by multiplying the truck hours traveled by the parking ratio.

6. **Calculate daily long-term truck parking stops.** All three studies adopted a median long-term parking value of 435 minutes or 7.25 hours. This represents the estimated typical parking duration for trucks that park for extended periods of time to meet FMCSA requirements. The value is calculated by multiplying the truck hours parked by 7.25 hours.

7. **Calculate the peak truck parking demand (long-haul).** Similar to the peak truck parking demand (short-haul), the daily truck parking stops is multiplied by a utilization rate for trucks parked for more than 3 hours during the peak period of truck parking demand (between 3 a.m. and 4 a.m.). A value of 45.33% was used in Pennsylvania STAC and Virginia DOT models. Multiplying the Daily Truck Stops by this value produces a peak truck parking demand for long-haul trips.
Finally, to calculate total truck parking demand, the peak truck parking demand for short-haul and long-haul trips are summed.

One final note is that the FHWA methodology included a differentiation between public and private truck parking facilities and the desirability of each option. However, trying to differentiate between demand for a public truck parking space and demand for a private truck parking space with the level of specificity available in the model is of limited use. Although surveys indicate truck drivers prefer private truck parking facilities with amenities such as showers, food, and fuel, they will use any safe truck parking location they can find when necessary. Neither the Pennsylvania STAC nor the Virginia DOT models used this variable and this study also declined to make the distinction.
Appendix B: Procedures for Preparing Location Based Data for Analysis

The goal of this task was to process raw GPS point data provided by the American Transportation Research Institute (ATRI) into usable stop information. Knowing the location of a truck at regular points throughout the day gives a great deal of information about its travel (including stops). For example, a GPS unit may return a report at a series of mileposts on a highway, then multiple reports are recorded at the same location over an hour or two, then the points begin moving down the highway again. The location of the stop, the length of stop, and the relative direction of travel before and after can all be discerned from this information.

However, the wide range of possible activities and situations that influence where a truck is and what it is doing at any given moment can make interpreting each set of points complex. For example, traffic may cause multiple points to be in the same place though the truck has not made a stop. When stops are short or movements are very slow, the GPS traces of stops vs. non-stops start to become more similar. The process of discerning these must keep the true stops while filtering out everything else. It must also maintain consistency in its definition of stops and non-stops across all trucks.

Another challenge is handling the massive amount of data involved when looking at a state-wide, near-population-scale data set of trucks. Algorithms which are computationally intensive or poorly programmed can become prohibitively time-consuming.

To tackle these issues, the team developed a series of sophisticated heuristics to iteratively check every data point and analyze patterns of time, distance, and location. The team also used a combination of Spark, Python, and R to efficiently process the data through a series of steps.

1.1 Raw Data

The raw truck GPS data from four periods during different seasons of the year (shown in Exhibit 2) was purchased from ATRI for this truck parking analysis. These periods included at least two of each day of the week, accounting for weekday variations. Seasonal effects were captured by analyzing different months of the year.

Exhibit 2: ATRI Raw Data Periods

<table>
<thead>
<tr>
<th></th>
<th>February</th>
<th>May</th>
<th>July</th>
<th>October</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start Date</td>
<td>02/01/2018</td>
<td>05/01/2018</td>
<td>07/16/2018</td>
<td>10/16/2018</td>
</tr>
<tr>
<td>End Date</td>
<td>02/15/2018</td>
<td>05/15/2018</td>
<td>07/30/2018</td>
<td>10/31/2018</td>
</tr>
<tr>
<td>Number of Truck (Thousands)</td>
<td>168</td>
<td>161</td>
<td>229</td>
<td>165</td>
</tr>
<tr>
<td>Number of Points (Millions)</td>
<td>385</td>
<td>407</td>
<td>415</td>
<td>380</td>
</tr>
</tbody>
</table>

Trucks appear in the data any period in which they were inside the state of Texas. For each period, ATRI provided GPS traces for every truck that operated in Texas at any time. If any of these trucks recorded points in other states, these were included, but without an exact location. The devices recorded data at regular intervals as frequent as 60 seconds apart, but could be as long as 15 minutes. Typically no data was recorded when a truck was shut off – at which time the truck would not move either. As it would report the same location before and after shut down, our process marks the whole period as part of a stop.

Exhibit 3 shows the points from a single example truck, reported over a period of 15 days in October when it was moving or stopped. This truck was clearly in many places around Dallas, Laredo, and especially Houston. The truck may have stopped, stopped multiple times, or passed through any of these. The time stamp (not shown) indicates that the first point is recorded on the state border by Texarkana on the 3rd day of the period, when the truck entered Texas. It proceeded to the Dallas area and onto Laredo, though it does not appear to have crossed the border. For the rest of the study period was within the state. At one time the truck is turned off and stored for a weekend at a facility in Houston. Mapping all 1,950 points illustrates the amount of information as well as the need for the process described here. In this form, there is little useful information about truck parking.
This study is focused on identifying locations where trucks park rather than fully understanding travel patterns of individual vehicles. In order to determine this in a state where many facilities are located close to roadways and other businesses, a high level of accuracy and precision is necessary. These two terms are often used interchangeably, but they are important concepts when using location data of any type. Exhibit 4 provides an illustration of the definition applied for this study.

For truck parking, the points must be precise enough to distinguish between those inside a lot and those in another nearby facility. This is especially true when identifying overflow from legal parking areas into illegal spaces. Imprecise data, like in target c) below, would produce a scattershot of stops in and around a lot. Rules which draw a border tightly around the space would erroneously miss many points. Points from trucks not in the facility of interest may land within the facility. Inaccurate reporting, as in b) and d), could bias the data by putting shifting points in a particular direction, resulting in similar issues to imprecision.
Raw GPS data from ATRI is fortunately accurate and precise. It is, in fact, so precise that none of the points in Exhibit 5 fall more than a few feet from pavement. This map contains records of 847 stops over the data collection period. While there are too many to clearly see each point even with a sample, they form an outline of the places where trucks go.

Given there are so many points and they are not far to the side of the road, it is safe to assume that their place along the length of the roadway or ramp is very close also. This
allows us to differentiate trucks on the ramp versus those in the rest stop. This drastically increases the amount of information about individual facilities and how they are used.

1.2 Methodology

1.2.1 Rules and Heuristics

A stop was defined most generally as an occurrence in which a truck was in one place for at least 15 minutes. This amount of time is long enough to discount stops due to traffic congestion or construction but short enough to capture drivers stopping to obtain food or meet the 30 minute break requirement. Trucks stopped at a location may move short distances within the facility or report slightly different locations due to satellite positions, so the stop ended only when it traveled a certain distance based on the moving average of the pings of the stop. Pings which were identified as waypoints – reports from a truck moving on the highway – were marked and filtered out. This was based on the speed and the frequency of reporting. Unreasonable speeds indicated that points were given and erroneous location or time. They were compared to the adjacent points and points most likely to be incorrect were filtered out.

Even with some allowance for movement within a facility, two stops would occasionally be produced just far enough apart to technically be marked as separate. Consecutive “stops” meeting very specific distance and time criteria were allowed one more chance to merge at the end.

At the conclusion of stop-making, categories were imposed:

- **Overnight** – Stop which starts before 3 am and ends after 3 am, with minimum duration of 4 hours (and max 48 hours).
- **Long-haul** – A stop between 2 trips of at least 3 hours travel time each.
- **Staging** – A stop with duration between 1 and 4 hours, following a trip of at least 1 hour and followed by a trip of less than 2 hours.
- **Local** – A stop of less than 2 hour stop duration and between 2 trips of up to 1 hour travel time each.

1.2.2 Data Handling and Pre-Processing

The datasets from the 4 periods (see Exhibit 2) were received and handled separately, but using the same process. The programming language Spark (implemented in Python) was used first as it is designed specifically to handle large datasets. Spark read and combined all the data – inside and outside of the state of Texas – for each period. After filtering out unused out of state points, assigning new truck ids, sorting and doing some other formatting changes, data were exported into a series of smaller files, each containing mutually exclusive sets of trucks. The smaller files could be more easily managed in R and run independently.
The next step occurred in R and prepared the data for the main processing steps. Some minor cleaning was done to preclude unnecessary or erroneous calculations. Additionally, initial calculations were done and the format of the data object set to save time in the next steps. Lastly, the (only slightly processed) data were summarized to show basic characteristics or unusual trends.

1.2.3 Analysis

Setting up the processing steps required understanding the initial state of the data and the new state after each step. This generally consisted of checking overall changes like statistics describing what was dropped or kept. Maps of truck points showed how a random sample or a specifically targeted set of individual trucks’ points were treated. Diagnostic runs allow for close examination of what was passing through each filter to become a “stop” by:

- Comparing results vs raw data;
- Comparing results vs previous step’s results;
- Analysis of trip-stop patterns; and
- Checking of unusual rates of stopping, lengths of time, speeds, etc.

The result was a series of filters that dropped records, grouping algorithms that clustered multiple records together, and calculations which analyzed their status, along with the carefully honed parameters which controlled them. Each step was closely monitored to address the following questions:

- Was anything filtered out or changed that should have remained?
- Was anything retained that should have been dropped or changed?
- If yes for 1 or 2, is this the step to take care of it or is there a later step that will?

When the answer for question 3 was “yes”, changes were made and tested until a desired result was reached. Not every pause in a truck’s movement is a stop and not every stop consists of many reports at exactly the same location. Consequently, the heuristic approach requires repeatedly taking different perspectives of each trace while carrying along the information inferred in previous steps. As the process progressed, the number of data points decreased and the changes became more limited and precise. Early steps allowed a lot of non-“stops” through to avoid taking out the real ones. For many trucks the later stages had no impact on their attributes because their stops were already identified.

1.3 Special Cases and Errors

1.3.1 Trucks Traveling Outside of Texas

Many trucks which recorded travel in Texas also visited other states. In these cases, the information from the time and location (zone) where it entered or left the other state was
kept along with its stop within Texas. That is, the data used followed the truck as it traveled through Texas and when it left the state kept a single record stating the first zone in Arkansas (or LA, NM, OK). Conversely, a truck that was elsewhere and entered Texas has a single record stating the New Mexico (or LA, AR, OK) zone it had reported prior to the point inside Texas.

Data on these trips made it clear that there were no stops or trips inside Texas before the entry point, after the exit point, or between exit and entry points. This produced trip-stop patterns such as: Truck left location A in Plano at 2 PM to location B in Mesquite, TX where it stopped for 45 minutes at 2:30. It then drove for at least 2 hours and 30 minutes, reporting a location in or around Shreveport, LA at 5:45. The program effectively interpreted this as: *I do not know what it was doing and it is not relevant to this study.* Data on travel outside Texas was dropped as being outside the scope of this study.

An issue occurred in the data that disrupted this process. Some trucks that almost certainly left the state were not reporting, leaving the appearance that they had either inexplicably stopped reporting near the border only to show up again at another border crossing, or more problematically that they were stopped on the border. The latter could be misinterpreted as a stop if the following criteria were met: 1) the truck entered and exited on the same road, 2) the pre-exit point and post-entrance points – temporally consecutive in the database – are close together, and 3) no outside locations were reported.

This data error was corrected in post-processing after analysis of the problem. Fortunately the points had several characteristics which could be used for identification. First, they were predominately very long “stops”. Second, they were in the right-of-way. Third, most occurred within a mile or even a few hundred feet of the border. Fourth, they consisted of very few pings – often only 2. (Stops, especially those in which the truck was not turned off, could record many pings in the stop location.) “Stops” within a mile of the border, in the right-of-way, were dropped unless the duration was less than an hour. To catch those reported further into the state, a 10 mile buffer was used and stops within this buffer were dropped only if they had a duration over 10.5 hours (to account for trucks stopping to fulfil a 10-hour break).

This process is shown in Exhibit 6 (before filtering) and Exhibit 7 (after filtering). Truck parking in the lot near the border remain as do many on other roads. A few erroneous points may remain or genuine stops disappear, but overall this was effective.
Exhibit 6: Truck Parking on Interstate 10 at the Louisiana Border
Before Filter


Exhibit 7: Truck Parking on Interstate 10 at the Louisiana Border
After Filter


1.3.2 Blackouts

One additional special case occurred when an unexplained disruption to location information occurred. Often, gaps in data started and ended in the same location suggesting that the truck was simply turned off. A small number of trucks experienced a disruption which started after a report in one place and ended up with another in a clearly different place. These were noted and not considered stops. The very limited set of trucks which had several of these were considered to be malfunctioning and dropped from the analysis.

1.4 Results

The output from this process is a set of all stops by all trucks in each period. Exhibit 8 shows a summary of points, stops, and trucks. ATRI trucks made almost 175,000 stops of at least 15 minutes every day. The number of trucks given is the sum of unique trucks in each period – a truck that appears in the February and July data will be counted twice in this total.
The average number of stops per truck is around 16, but this includes trucks which only spent a short time in Texas as well as those which traveled the whole 15 days without leaving. The 25% of trucks with the most stops in the first half of February averaged almost 50 stops and a few at the very top. A small percentage (~2%) but still significant number of frequently stopping trucks made at least 100 stops in the February period.

**Exhibit 8: Summary of Stop Processing Results**

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Average Per Truck*</th>
<th>Average Per Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw Data Points</td>
<td>1,587,668,148</td>
<td>2,195</td>
<td>26,027,347</td>
</tr>
<tr>
<td>Processed Stops</td>
<td>10,590,349</td>
<td>15.9</td>
<td>173,612</td>
</tr>
</tbody>
</table>


*Trucks are counted once for each period in which they appear.

A key element to understanding truck parking is the duration of the stop and the travel pattern. In Exhibit 9, the stops are broken out by their length. Nearly 60% of the stops were less than an hour. The next largest segment were trucks stopping between 1 and 4 hours. Since this data includes trucks stopped for any purpose at any location in the dataset, the high number of stops of short magnitude is not surprising. The proportions of stops by length did not vary from one season to the next.

**Exhibit 9: Stops by Duration**

![Pie chart showing stop duration distribution](chart.png)


### 1.4.1 Examples of Individual Trucks

Below are some examples of the truck data before and after being processed into stops. The stops are the critical input to the truck parking analysis using ATRI data described in the associated technical memos for this project. Exhibit 10 shows a truck that started traveling
from the Texarkana border through Dallas, San Antonio, Austin, Nuevo Laredo then back to Dallas, although only a handful of (in-state) stops were made until it reached the greater Houston region.

**Exhibit 10: Example Truck 1 – Truck Stop Locations Before and After Processing**

![Map showing truck stop locations](image)


The inset view in Exhibit 11 shows the activity even further. Both Dallas stops occurred at the same private facility, one of which was over 12 hours. In the Houston region there were many stops less than 1 hour in which it went to locations outside the beltway. All of its extended and overnight truck parking occurred at a facility owned by a freight company rather than public or private truck parking locations.
**Exhibit 11: Example Truck 1 – Inset of Raw (Red) and Stop Data (Blue)**


The truck mapped in Exhibit 12 did more intercity travel, returning multiple times to Dallas. As a result it had fewer stops. It made several trips between Dallas and the Abilene area, and a few elsewhere. It parked several times at privately owned truck parking properties like an 11 hour stop at a Love’s West of Abilene. The recording frequency varied significantly, resulting in the sparse trace on I-10. On the highway the frequency was often 1 point every 15 minutes, and while moving it never fell below this.

**Exhibit 12: Example Truck 2 – Truck Stop Locations Before and After Stop Processing**

The last example, Exhibit 13, shows a another truck which makes a few unique trips in and out of Texas. It also sat for several days at a shipping facility outside of Brownsville. While it made several long stops, these were not at an authorized public or private truck parking facilities. This truck is somewhat unusual because its combination of travel pattern and consistent reporting, even when stopped, produced only 17 stops from almost 5,000 points.

Exhibit 13: Example Truck 3 – Truck Stop Locations Before and After Stop Processing