Truck Parking Demand in Dedicated and Unauthorized Locations
Memo
WA 3 Task 2.5/2.7
Final 1: Mach 4, 2020
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v
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<th>Acronyms</th>
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<td>AADTT</td>
<td>Annual Average Daily Truck Traffic</td>
</tr>
<tr>
<td>ATRI</td>
<td>American Transportation Research Institute</td>
</tr>
<tr>
<td>CMV</td>
<td>Commercial Motor Vehicle</td>
</tr>
<tr>
<td>DOT</td>
<td>Department of Transportation</td>
</tr>
<tr>
<td>DPS</td>
<td>Department of Public Safety</td>
</tr>
<tr>
<td>ELD</td>
<td>Electronic Logging Device</td>
</tr>
<tr>
<td>FHWA</td>
<td>Federal Highway Administration</td>
</tr>
<tr>
<td>GIS</td>
<td>Geographic Information System</td>
</tr>
<tr>
<td>GPS</td>
<td>Global Positioning System</td>
</tr>
<tr>
<td>HOS</td>
<td>Hours-of-Service</td>
</tr>
<tr>
<td>MAP-21</td>
<td>Moving Ahead for Progress in the 21st Century (Act)</td>
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<tr>
<td>NAFTA</td>
<td>North American Free Trade Agreement</td>
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<td>NHS</td>
<td>National Highway System</td>
</tr>
<tr>
<td>ROW</td>
<td>Right-of-Way</td>
</tr>
<tr>
<td>SH</td>
<td>State Highway</td>
</tr>
<tr>
<td>TFMP</td>
<td>Texas Freight Mobility Plan</td>
</tr>
<tr>
<td>THFN</td>
<td>Texas Highway Freight Network</td>
</tr>
<tr>
<td>TTI</td>
<td>Texas Transportation Institute</td>
</tr>
<tr>
<td>TxDOT</td>
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1.0 Introduction
The safe and efficient movement of freight depends on adequate and strategically located truck parking. Hours-of-service (HOS) regulations require drivers to rest at defined intervals, causing them to search for parking before their allowable drive time expires or while staging for their pick-up and delivery slots. The scarcer truck parking is, the sooner drivers must begin searching for parking, resulting in lost productivity and higher shipping costs. Truck parking shortages also can lead to parking in unauthorized locations and result in a safety hazard for both the driver and the motoring public. Assessing the current condition of truck parking was identified in the Texas Freight Mobility Plan 2018 (TFMP) as an immediate need and a comprehensive examination and plan for truck parking was one of the short-term policy recommendations.

1.1 Study Purpose and Tasks
The purpose of this study is to conduct a statewide truck parking evaluation that will assess the current supply and demand for truck parking in Texas, identify truck parking needs, recommend solutions, and develop solutions to address existing and future parking gaps and needs. The study will develop actionable strategies to meet truck parking needs across the state, promote partnerships with the private sector, enhance safety, reduce congestion, and improve efficiency on the Texas Highway Freight Network (shown in Exhibit 1).

The various tasks within this study are shown in Exhibit 2. This memo contains information for Task 2.5 (Truck Parking Demand in Dedicated and Non-Dedicated or Unauthorized Locations) and Task 2.7 (Truck Parking Utilization and Demand).

_Parked trucks at a rest area outside of San Antonio, Texas_
Source: Cambridge Systematics (2019).
Exhibit 1: Texas Highway Freight Network

Source: TxDOT
Exhibit 2: Truck Parking Study Tasks

This inventory and utilization of authorized locations is the foundation on which the analysis and technical reports will be built. To frame where this report fits in the broader study, the technical assessments and reports included in the study are summarized below with topics addressed in this memo noted with an asterisk (*).

- **Truck Parking Inventory and Utilization of Authorized Locations (Tasks 2.3 and 2.4)**—An inventory and the attributes of all known and authorized truck parking locations across the State will be collected from a variety of sources. The utilization of authorized sites by time of day, day of week, and for what purpose also will be shown.

- **Truck Parking Demand in Dedicated and Unauthorized Locations: the Impacts of Parking Deficiencies (Task 2.5, subject of this memo)**—Building on the utilization analysis in the prior step, a more in-depth assessment of demand for truck parking will be conducted to identify common areas, patterns, and reasons for unauthorized parking. This section also includes information for Task 2.7 regarding an examination of unpredictable incidents and events and their impact on truck parking demand.

- **Crash Data Analysis Related to Trucks on Highways and Ramps (Task 2.6)**—Truck involved crash statistics for the latest five-year history will be analyzed to document and map the highest crash locations and overlay those crash statistics with the truck parking inventory and demand analysis.
• **Truck Parking Demand (Task 2.7, subject of this memo)**—Expanding the truck parking demand analysis in Task 2.5, this task estimates the demand for truck parking in key corridors and regions in Texas, identifies areas or locations where parking is not sufficient to meet current demand, and examines the impacts of weather closures on truck parking.

• **Freight Forecast and Impact on Truck Parking (Task 2.8)**—Future freight volumes will be forecasted to estimate future truck parking demand.

• **Truck Parking Impacts on Safety (Task 2.9)**—Building on the Crash Data Analysis (Task 2.6) an assessment will be conducted of how strategic truck parking improvements—such as increased capacity, improved technology, or physical changes to existing truck parking facilities—can provide safer operations for truck drivers, passenger vehicles, and communities.

• **Summarize Truck Parking Needs (Task 2.10)**—Utilizing the information gathered in previous tasks, truck parking needs and issues will be summarized by type of concern (e.g., staging, short-term, long-term, and , overnight parking).

• **Recommendations (Task 2.12)**—A range of short, medium, and long term policies, programs, and projects to address Texas’ current and future truck parking needs will be presented, along with an assessment of estimated costs, potential funding sources, and an analysis of key factors influencing, and affected by completing the recommendations.

• **Actionable Steps for Recommended Solutions (Task 2.13)**—A set of actionable steps for each recommended solution will be developed, describing the sequence of activities which must occur for the concept to be fully realized.

1.2 **Definitions**

There are a number of terms used when discussing truck parking, often describing very similar concepts and sometimes used interchangeably. For purposes of this study, the following terms and definitions apply:

• **Authorized Location**—Specific site where truck parking is explicitly allowed.

• **Inventory**—Number of truck parking spaces at a location.

• **Capacity**—Number of truck parking spaces in a given geographic area (district, statewide, corridor, etc.).

• **Demand**—How many trucks would park at a location or geographic area if there was sufficient space.

• **Utilization**—How many trucks are parked at a location or in a geographic area at a given time.

• **Raw Utilization**—The number of trucks in the American Transportation Research Institute (ATRI)’s database parked at a location or within a defined geographic area at a given time compared to the inventory or capacity available within the same defined area.
- **Expanded Utilization**—An estimate of the full number of trucks at a location or within a defined geographic area derived by “expanding” the number of trucks in ATRI’s database. Not every truck on the road is included in ATRI’s GPS database; therefore, the number of parked trucks captured in the database and recorded at any given location is only a portion of the total number of parked trucks. The ratio of ATRI truck volumes to TxDOT truck volumes at locations around the State is needed to “expand” the ATRI count and thereby approximate the actual number of parked trucks.

- **Percent Capacity**—The number of trucks parked at a location or in a geographic area at a given time compared to the inventory or capacity. This number, expressed as a ratio or percent shows if a location or area has a shortage or surplus of truck parking spaces.

- **Shortage in Truck Parking**—The inventory or capacity of truck parking at a location or in a geographic area, less the number of trucks parked there at a given time.

- **Urban**—Located within a U.S. Census designated urbanized area.

### 1.3 Organization of the Report

The remainder of this report is organized into the following sections:

- Section 2 explains the methodology used to develop expansion factors for the raw ATRI GPS data.

- Section 3 provides an overview of trucks parked outside of authorized locations, including on the highway shoulders and ramps, at closed or inactive rest areas, at weight/safety inspection sites, and on local roads in urban areas.

- Section 4 examines emergency closures of the highway system and their impact on the demand for truck parking.

- Section 5 provides expanded truck parking estimates and compares those estimates to inventory and capacity to determine the truck parking shortage or surplus at the location, district, and corridor level and discusses stakeholders impacted by truck parking shortages.

- Section 6 reviews and compares truck rest areas designs.

- Section 7 identifies next steps to be examined in future technical memos.

- Appendix A contains a profile for each of Texas’ 25 districts.

- Appendix B contains a profile for each of the 177 publicly owned truck parking locations.

- Appendix C provides details on estimating unauthorized truck parking along streets in the remainder of the State.

- Appendix D includes a list of sites not included in the utilization analysis as well as “opportunity sites” that will be examined in more detail in the recommendations memo.
2.0 Developing Expansion Factors for ATRI Raw GPS Data

This section describes the methodology used to develop expansion factors for the raw ATRI GPS data. Summaries of demand at the district, location, and corridor level are described in Section 5.0. In addition, district summaries are provided in Appendix A and public location summaries are provided in Appendix B.

2.1 Expanding Raw American Transportation Research Institute (ATRI) Data

ATRI's GPS data does not cover every truck utilizing parking in Texas. Nationwide, ATRI's raw data sample is between 800,000 and 1,000,000 vehicles. In order to more accurately determine utilization, an expansion factor is needed to extrapolate the ATRI parked vehicle counts to an estimate of the full population of parked trucks in the State.

To calculate expansion factors, ATRI truck counts were compared to annual average daily truck traffic (AADTT) for FHWA Class 8 or higher trucks (see Exhibit 3) at 19 TxDOT count stations throughout the State. These locations are shown in Exhibit 4 and Exhibit 5 contains more detailed information about the location of each counter. Class 8 and higher trucks represent the vast majority (more than 90 percent) of trucks in ATRI's database.

ATRI counted the number of vehicles in their database at these locations on the days referenced below. The number of trucks at these count locations were then summed up for each day in the data sample, and the daily totals compared to TxDOT totals to calculate the percent of ATRI's coverage at that site for that day. Finally, expansion factors were calculated by dividing the TxDOT AADTT figures by the corresponding ATRI AADTT figure. The dates used for the comparison were the same as used in the utilization analysis:


These dates were chosen to cover any seasonal swings and avoid major holidays which can skew travel patterns.

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1 30 locations were initially identified, 11 did not have data available during the ATRI sample periods. Count stations classified data based on vehicle length or vehicle type. For length, TxDOT identifies vehicles of 35 feet or longer as FHWA Classes 8-13. For vehicle type, "Single Trailer Trucks" and "Multi Trailer Trucks" categories were used.
### Exhibit 3: FHWA Vehicle Classifications

<table>
<thead>
<tr>
<th>Class</th>
<th>Description</th>
<th>Class 7: Four or more axle, single unit</th>
<th>Class 8: Four or less axle, single trailer</th>
<th>Class 9: 5-Axle tractor semitrailer</th>
<th>Class 10: Six or more axle, single trailer</th>
<th>Class 11: Five or less axle, multi trailer</th>
<th>Class 12: Six axle, multi-trailer</th>
<th>Class 13: Seven or more axle, multi-trailer</th>
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<tbody>
<tr>
<td>Class 1</td>
<td>Motorcycles</td>
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<td>Class 2</td>
<td>Passenger cars</td>
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<td>Four tire, single unit</td>
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<td>Class 5</td>
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<td>Class 6</td>
<td>Three axle, single unit</td>
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Source: FHWA.
Exhibit 4: TxDOT Count Location Used to Develop Expansion Factors

### Exhibit 5: TxDOT Counter Data Locations

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<tr>
<th>Counter Number</th>
<th>Highway</th>
<th>Community</th>
<th>County</th>
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<th>ATRI Trucks Captured</th>
<th>Days With Data</th>
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<td>IH0020</td>
<td>Gordon</td>
<td>Palo Pinto</td>
<td>N</td>
<td>27.9%</td>
<td>16</td>
</tr>
<tr>
<td>S342</td>
<td>IH0035W</td>
<td>Alvarado</td>
<td>Johnson</td>
<td>N</td>
<td>28.5%</td>
<td>36</td>
</tr>
<tr>
<td>S388</td>
<td>IH0020</td>
<td>–</td>
<td>Gregg</td>
<td>N</td>
<td>40.2%</td>
<td>61</td>
</tr>
</tbody>
</table>
The percent of total trucks captured was averaged statewide, and then averaged for sites within large urbanized area (Austin, Dallas-Fort Worth, El Paso, Houston, San Antonio) and those not in the large urbanized areas.² By dividing 100 percent by these averages, expansion factors are developed. Preliminary expansion factors are shown in Exhibit 6 below.

### Exhibit 6: Preliminary Expansion Factors

<table>
<thead>
<tr>
<th>Location</th>
<th>ATRI % of Trucks Captured Over 61 Days</th>
<th>Preliminary Expansion Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Large Urbanized Areas</td>
<td>27.07%</td>
<td>3.69</td>
</tr>
<tr>
<td>Rural Areas</td>
<td>35.40%</td>
<td>2.83</td>
</tr>
<tr>
<td>Statewide Average (used for unauthorized truck parking in TxDOT right of way)</td>
<td>32.57%</td>
<td>3.07</td>
</tr>
</tbody>
</table>

Source: Cambridge Systematics (2019).

### 2.2 ATRI Data Post-Processing

#### 2.2.1 Field Reviews and Online Utilization

The initial output using the above expansion factors produced results that did not align with field observations in a number of locations. For example, the project team visited and spoke with employees at a number of private truck parking locations along I-10 in the El Paso District and on I-10 and U.S. 59 near Houston during outreach activities. In most cases, private location employees indicated a higher level of use than what the initial data reports returned.

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² As identified in the 2010 U.S. Census.
The project team also called a number of truck parking establishments on I-20 and I-30 that were initially identified as being close to or overcapacity. Exhibit 7 provides a partial list of locations contacted (where a response was received) and utilization information obtained.

**Exhibit 7: Truck Parking Utilization—Field Reviews**

<table>
<thead>
<tr>
<th>Truck Stop Name</th>
<th>Corridor</th>
<th>Address</th>
<th>Does the Location Ever Reach Capacity?</th>
<th>What Time of Day?</th>
<th>What Day of Week?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petro #301</td>
<td>I-10</td>
<td>1295 Horizon Blvd, El Paso</td>
<td>Yes</td>
<td>Every night</td>
<td>Weekdays</td>
</tr>
<tr>
<td>Love’s #214</td>
<td>I-10</td>
<td>1300 Horizon Blvd, El Paso</td>
<td>Yes</td>
<td>Every night</td>
<td>Weekdays</td>
</tr>
<tr>
<td>Flying J #728</td>
<td>I-10</td>
<td>1301 Horizon Blvd, El Paso</td>
<td>Yes</td>
<td>Every night</td>
<td>Every day</td>
</tr>
<tr>
<td>Shell/Fast Trak Travel Center</td>
<td>I-10</td>
<td>1790 Fabens Rd, Fabens</td>
<td>Yes</td>
<td>Most evenings</td>
<td>Friday, Saturday, Wednesday</td>
</tr>
<tr>
<td>Pilot</td>
<td>U.S. 59</td>
<td>525 S 1st St, Beasley</td>
<td>Nearly</td>
<td>Most evenings</td>
<td>Weekdays</td>
</tr>
<tr>
<td>Chevron 786 Truck Stop</td>
<td>U.S. 59</td>
<td>7122 U.S.-59, Beasley</td>
<td>Nearly</td>
<td>Most evenings</td>
<td>Weekdays</td>
</tr>
<tr>
<td>Love’s #617</td>
<td>U.S. 59</td>
<td>350 E Walnut St, Hungerford</td>
<td>Yes</td>
<td>Most evenings</td>
<td>Weekdays</td>
</tr>
<tr>
<td>TA #231</td>
<td>U.S. 59</td>
<td>U.S. 59, 802 E York St, Ganado</td>
<td>75 of 90 spaces</td>
<td>Most evenings</td>
<td>Weekdays</td>
</tr>
<tr>
<td>TA #153</td>
<td>I-35</td>
<td>1010 Beltway Pkwy, Laredo</td>
<td>Yes</td>
<td>Evening</td>
<td>Every day</td>
</tr>
<tr>
<td>Flying J #730</td>
<td>I-35</td>
<td>1011 Beltway Pkwy, Laredo</td>
<td>Yes</td>
<td>Evening</td>
<td>Every day</td>
</tr>
<tr>
<td>Pilot #377</td>
<td>I-35</td>
<td>1101 Uniroyal Dr, Laredo</td>
<td>Yes</td>
<td>Evening</td>
<td>Every day</td>
</tr>
<tr>
<td>Trucker’s Paradise</td>
<td>I-610</td>
<td>9221 Wallisville Rd, Houston</td>
<td>Yes</td>
<td>Evening</td>
<td>Every day</td>
</tr>
<tr>
<td>Truck Stop Name</td>
<td>Corridor</td>
<td>Address</td>
<td>Does the Location Ever Reach Capacity?</td>
<td>What Time of Day?</td>
<td>What Day of Week?</td>
</tr>
<tr>
<td>------------------------------</td>
<td>----------</td>
<td>--------------------------------</td>
<td>----------------------------------------</td>
<td>-------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Love’s #315</td>
<td>I-610</td>
<td>3940 N McCarty St, Houston</td>
<td>Yes</td>
<td>Always</td>
<td>Every day</td>
</tr>
<tr>
<td>Pilot #375</td>
<td>I-610</td>
<td>4440 N McCarty St, Houston</td>
<td>Yes</td>
<td>Always</td>
<td>Every day</td>
</tr>
<tr>
<td>Flying J #1025</td>
<td>I-10</td>
<td>102 Sheldon Rd, Channelview</td>
<td>Yes</td>
<td>Evening</td>
<td>Every day</td>
</tr>
<tr>
<td>Flying J #725</td>
<td>I-10</td>
<td>1876 East Fwy, Baytown</td>
<td>80%</td>
<td>Always</td>
<td>Every day</td>
</tr>
<tr>
<td>TA #017</td>
<td>I-10</td>
<td>6800 Thompson Rd, Baytown</td>
<td>80%</td>
<td>Always</td>
<td>Every day</td>
</tr>
<tr>
<td>Love’s #401</td>
<td>I-10</td>
<td>1703, I-10, Baytown</td>
<td>Yes</td>
<td>Evening</td>
<td>Every day</td>
</tr>
<tr>
<td>Gateway Travel Plaza—PTP stop</td>
<td>I-20</td>
<td>I-20 Exit 587, Kilgore</td>
<td>Yes</td>
<td>Every night</td>
<td>Every day</td>
</tr>
<tr>
<td>Circle K #6340</td>
<td>I-20</td>
<td>2198 N Trade Days Blvd, Canton</td>
<td>Yes</td>
<td>Nights</td>
<td>Random</td>
</tr>
<tr>
<td>Dukes Travel Plaza</td>
<td>I-20</td>
<td>30176 Hwy 64, Canton</td>
<td>Yes</td>
<td>Random</td>
<td>Random</td>
</tr>
<tr>
<td>Valero #4532</td>
<td>I-20</td>
<td>17030 TX 34, Terrell</td>
<td>Yes</td>
<td>Evenings</td>
<td>Every day</td>
</tr>
<tr>
<td>Flying J Travel Center</td>
<td>I-20</td>
<td>7425 Bonnie View Rd, Dallas</td>
<td>Yes</td>
<td>Evenings</td>
<td>Every day</td>
</tr>
<tr>
<td>Love’s Leary-Texarkana</td>
<td>I-30</td>
<td>451 Leary Rd, Leary</td>
<td>Yes</td>
<td>Varies</td>
<td>Weekdays</td>
</tr>
<tr>
<td>Truck Stop Name</td>
<td>Corridor</td>
<td>Address</td>
<td>Does the Location Ever Reach Capacity?</td>
<td>What Time of Day?</td>
<td>What Day of Week?</td>
</tr>
<tr>
<td>-----------------------</td>
<td>----------</td>
<td>-----------------------------------</td>
<td>----------------------------------------</td>
<td>-------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Sunshine Travel Plaza</td>
<td>I-30</td>
<td>803 Main Street, Hooks</td>
<td>Yes</td>
<td>Night</td>
<td>Every day</td>
</tr>
<tr>
<td>7Star Travel Center</td>
<td>I-30</td>
<td>1600 W Shannon Road, Sulphur Springs</td>
<td>Yes</td>
<td>Every night</td>
<td>Every day</td>
</tr>
<tr>
<td>Pilot Travel Center #157</td>
<td>I-30</td>
<td>1200 South Hillcrest, Sulphur Springs</td>
<td>Yes</td>
<td>5 or 6 p.m.</td>
<td>Every day</td>
</tr>
<tr>
<td>Pilot Travel Center #367</td>
<td>I-30</td>
<td>2725 FM 1903, Caddo Mills</td>
<td>Yes</td>
<td>Evenings</td>
<td>Every day</td>
</tr>
<tr>
<td>TA Rockwall #49</td>
<td>I-30</td>
<td>2105 S Goliad St, Rockwall</td>
<td>Yes</td>
<td>Evenings</td>
<td>Every day</td>
</tr>
</tbody>
</table>

Source: Cambridge Systematics (2019).

The team also examined utilization using the TruckerPath application at a select set of locations in the Odessa District during the week of August 12th, 2019. The application was checked in both the morning and evening for sites including a Love’s in Odessa and Midland, a Pilot/FlyingJ in Odessa, Midland, and Monahans, a FlyingJ in Odessa and Midland, and a Stripes/Sunoco in Midland and Monahans (shown in Exhibit 8). Utilization based on crowdsourced information was mixed, with most of the locations indicating they were full or that “some” spaces were available at most times with some scattered instances of “Lots of Spaces.” These data indicate that utilization is higher than shown by ATRI data, although spaces are available in some locations at some times, including during the overnight peak.
2.2.2 Analysis and Modifications

At the statewide level, there are a number of potential explanations for the above results. First, a private location which reports being “full every night” may not actually be filling up. This is one of the concerns with crowdsourced data or visual counts—“full” may have different meanings to different people and it becomes more problematic to accurately judge utilization at locations with larger inventories. Second, the raw ATRI data were collected over a 61-day period, including 16 weekend days when demand for truck parking is typically much lower. For example, at site S342 on I-35 south of Fort Worth, February average TxDOT counts were approximately 6,720 trucks on weekdays and 2,830 trucks on weekends. ATRI counts were approximately 1,900 trucks on weekdays and 985 trucks on weekends. Third, the initial data counted trucks parked at a location for part of an hour as a fraction. In theory, 2 trucks parked at a location for 30 minutes each would each count as half a truck, for a total of one. While this approach makes sense if one truck leaves as the other arrives, if both trucks arrive at the same time there is a demand for 2 spaces instead of 1.

To address these issues, two key changes were made in the demand methodology. First, the demand methodology changed to count trucks as being parked at a location if they were there for any amount of time during the hour rather than counting as a fraction of a truck depending on the length of time parked.

Second, demand was altered to be based on 45 weekdays. Because a weekday for truck parking necessarily includes weeknights, the 5 weekdays for purposes of this study run from Sunday evening through Friday afternoon. Sunday evenings are the start of the week, and Friday evenings are considered the start of the weekend. In some areas, such as Laredo, truck parking demand is very high Sunday evenings because the next day is the start of the
work week—drivers arrive on Sunday in order to make a weekday (Monday morning) delivery or pickup in Laredo. Therefore, in the data sample the following rules were applied:

- Start parking on weekday, stop parking on weekday—keep.
  - For example: a driver arriving at a truck stop Tuesday evening and departing Wednesday morning is considered a weekday stop.

- Start parking on weekend, stop parking on weekday—keep.
  - For example: a driver arriving at a truck stop Sunday evening and departing Monday morning is considered a weekday stop, as described above.

- Start parking on weekend, stop parking on weekend—remove.
  - For example: a driver arriving at a truck stop Saturday evening and departing Sunday morning is considered a weekend stop.

- Start parking on weekday, stop parking on weekend—remove.
  - For example: a driver arriving at a truck stop Friday evening and departing Saturday morning is considered a weekend stop.

The expansion factors were modified to only include weekday counts.

Note that none of the publicly owned truck parking locations are located within the five largest urbanized areas in the state (Austin, Dallas-Fort Worth, El Paso, Houston, San Antonio).³

Finally, the Odessa District initially had the greatest estimated surplus of truck parking spaces—an outcome that does not match input from various stakeholders and field reviews. Many of the trucks operating in the Odessa District are part of small, independent companies hauling oil-related products in the region and not involved in Interstate commerce, therefore they may not be included in ATRI’s data sampling. Most of these vehicles’ stops may not appear at all within ATRI’s raw sample, and therefore will not be part of the expanded average counts. The percent of trucks captured by ATRI’s data at the S251 TxDOT counter located on I-20 east of Odessa District was lower than the statewide average used to initially calculate expansion factors and is likely higher than what would be captured on U.S. or state highways in the region. The S521 TxDOT counter did not have data from all lanes of travel and so was unable to provide information to develop the expansion factor. This means that the statewide expansion factor used is approximately half what a region-specific expansion factor should be for the Permian Basin, and the total number of trucks parked in the region should be higher than estimated.

For this reason, a higher expansion factor of six, or twice that of the statewide expansion factor, is applied to trucks parked in counties within the Permian Basin in the Odessa, San

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³ As identified in the 2010 U.S. Census.
Angelo, and Lubbock districts, as shown in Exhibit 9 below. This brings utilization in those regions in line with observed results. Counties in the area include:

- Andrews
- Borden
- Crane
- Crockett
- Ector
- Glasscock
- Howard
- Irion
- Loving
- Martin
- Midland
- Pecos
- Reagan
- Reeves
- Scurry
- Upton
- Ward
- Winkler

Additional work in the Permian Basin is underway as part of the Permian Basin Regional Freight Plan to supplement existing count data with information from additional sources to better understand the truck parking concerns in the region.4

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4 This work is scheduled to be completed in 2020.
Exhibit 9: Permian Basin Counties with Higher Expansion Factors

Permian Basin Counties with Higher Expansion Factor

Source: TxDOT.
Exhibit 10 shows the modified, final expansion factors used throughout this analysis, based on 45 weekday counts and where truck parking during any part of an hour counted for being parked at that hour. This factor was then applied to the raw data and totals were divided by 45 days instead of the original 61 days.

**Exhibit 10: Final Expansion Factors**

<table>
<thead>
<tr>
<th>Location</th>
<th>ATRI % of Trucks Captured Over 45 Week Days</th>
<th>Expansion Factor</th>
<th>All Parking Locations Using This Factor</th>
<th>Publicly Owned Parking Locations Using This Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Large Urbanized Areas#</td>
<td>26.60%</td>
<td>3.76</td>
<td>79</td>
<td>0</td>
</tr>
<tr>
<td>Rural Areas</td>
<td>35.10%</td>
<td>2.85</td>
<td>349</td>
<td>159</td>
</tr>
<tr>
<td>Permian Basin</td>
<td>-</td>
<td>6.00</td>
<td>34</td>
<td>18</td>
</tr>
<tr>
<td>Statewide Average (used for unauthorized parking in TxDOT right of way)</td>
<td>32.26%</td>
<td>3.10</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

Source: Cambridge Systematics (2019).

# Austin, Dallas-Fort Worth, El Paso, Houston, San Antonio

Finally, it is important to note that all of the data presented in the following sections are based on averages of expanded data. The analysis uses demand at a peak hour (1–2 a.m.). This is the time when the highest number of locations had their peak demand using the average number of trucks parked over the 45 week day sample. Individual locations may have peak demand at other hours of the day (shown in Exhibit 11), and demand within the 45-day period can vary. This approach also provides a consistent “real-world” comparison examining utilization at a specific time rather than choosing the highest utilization time at every location and summing the results. Using a single peak hour allows for a statewide summary of surplus or shortage of truck parking spaces.
Exhibit 11: Number of Locations by Hour of Highest Demand at Authorized Locations (Expanded Data)

3.0 Truck Parking in Unauthorized Locations

This section provides information about trucks parked in unauthorized locations, including on highway shoulders and ramps, in inactive or closed rest areas, in truck size/weight enforcement sites, and in urban areas on street shoulders.

3.1 Key Findings and Observations

Below are some key findings and observations that will be presented in the remainder of this section.

- Based on raw ATRI GPS data, there were approximately 254,000 trucks stopped statewide in TxDOT right of way during the sample period, or more than 16,400 total on an average weekday night. I-20 in Odessa District, I-30 in Atlanta District, and I-10 in the El Paso District are the three corridors with the highest number of trucks parked in TxDOT right of way (more than 300 on an average weekday in each). Corridors with the highest number of trucks parked in the right of way all are part of the Texas Highway Freight Network (THFN).

- Approximately 77 percent of unauthorized truck parking within TxDOT right of way lasts for less than 1 hour. Stops of more than 8 hours appear relatively evenly distributed across the highway network, with noticeable clusters near urban areas.

- Highway ramps and shoulders near existing truck parking locations are used for parking, often because the authorized parking spaces are all occupied. The data also indicates that closed or inactive TxDOT safety rest areas and picnic areas are also used for truck parking.

- Based on Texas Department of Public Safety (DPS) input, trucks also are parking at weigh stations throughout the State when the sites are not active, even though many of the locations have signs prohibiting truck parking or have gates across the entrance ramps.

- Based on 4 case studies in areas with a mix of residential and commercial/industrial activity, approximately 4 percent of vehicles parked in locations other than authorized truck parking locations or TxDOT right of way are parked on a local road shoulder.

3.2 Trucks Parked on Highway Shoulder/Ramps

Trucks parked on the highway shoulder or ramps are a critical concern for TxDOT. These trucks pose safety hazards for other drivers and cause infrastructure damage to portions of the highway that were not designed to support heavy loads. During the 2013–2017 period, the TxDOT Crash Records Information System database documents 2,315 crashes involving parked trucks resulting in 138 fatalities (in 117 crashes) and 997 injuries (in 657 crashes). Approximately 83 percent of crashes involving parked trucks that resulted in fatalities occurred on roads with speed limits of 55 mph and greater, indicating that fatalities are occurring mainly on high-speed corridors and not in crowded urban areas.
Based on expanded ATRI data, approximately 77 percent of the stops are for less than 1 hour and another 15 percent are less than 4 hours. These time buckets likely represent trucks meeting their 30 minute rest requirements or trucks staging near a business while waiting for an appointment window. Only 2 percent of all truck stops last over 14 hours. Exhibit 12 shows the breakdown by hours stopped for trucks parked on TxDOT right of way.5

*Exhibit 12: Length of Stops—TxDOT Right of Way (Expanded Data)*

Exhibit 13 shows the average number of trucks parked within TxDOT right of way during weekdays by corridor using expanded data. The interstate corridors in general have the highest number of trucks parked, including Interstates 10, 20, and 40 in the western half of Texas, Interstates 35 and 10 leading to San Antonio, and many of the interstates that surround Dallas and Houston. Exhibit 14 shows the same data as a heat map, indicating where the largest concentrations of unauthorized truck parking on TxDOT right of way are occurring. Note that lack of color on the heat map does not mean that there are no trucks parked in the right of way, only that the concentration is not as high as in other areas. Not surprisingly, urban centers and the areas immediately outside them exhibit the highest levels of this type of parking. Truck parking for staging needs or while waiting for congestion to clear may be a contributing factor. In other areas, it is likely that some of the authorized truck parking locations are full. Examples of specific locations are shown in the following pages.

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5 Right of way was determined using TxDOT “On System” highway data which includes a width field. This was increased by 5% and applied to the system.
Exhibit 13: Trucks Parked on Highway Shoulders/Ramps (Expanded Data)

Exhibit 14: TxDOT Right of Way – Truck Parking Heat Map (Expanded Data)

Parking in TxDOT Right of Way
Heat Map

Exhibit 15 is a tabular version of Exhibit 13 that shows the top 10 corridors within TxDOT districts with the most trucks parked in TxDOT right of way as well as the top corridor in each district (if it already was not included in the top 10). I-20 in the Odessa District has the highest number of trucks parked in TxDOT right of way with an average of approximately 540 trucks parked on a weekday night. However, most of those trucks are only parked for a few hours at most. I-10 in Odessa District and I-35 in the San Antonio district have the highest number of trucks parked for over 14 hours.

**Exhibit 15: Top Unauthorized Truck Parking Corridors—Average Weekday Trucks Parked (Expanded Data)**

<table>
<thead>
<tr>
<th>Highway Corridor</th>
<th>District</th>
<th>Parked 15 Min.–1 Hour</th>
<th>Parked 1–4 Hours</th>
<th>Parked 4–8 Hours</th>
<th>Parked 8–14 Hours</th>
<th>Parked 14+ Hours</th>
<th>Total Parked</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top 10 Corridors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I-20</td>
<td>Odessa</td>
<td>412</td>
<td>82</td>
<td>15</td>
<td>23</td>
<td>9</td>
<td>540</td>
</tr>
<tr>
<td>I-30</td>
<td>Atlanta</td>
<td>210</td>
<td>66</td>
<td>14</td>
<td>55</td>
<td>1</td>
<td>346</td>
</tr>
<tr>
<td>I-10</td>
<td>El Paso</td>
<td>250</td>
<td>50</td>
<td>9</td>
<td>17</td>
<td>1</td>
<td>327</td>
</tr>
<tr>
<td>I-35</td>
<td>Austin</td>
<td>239</td>
<td>64</td>
<td>7</td>
<td>10</td>
<td>1</td>
<td>322</td>
</tr>
<tr>
<td>I-35</td>
<td>Waco</td>
<td>231</td>
<td>57</td>
<td>6</td>
<td>12</td>
<td>2</td>
<td>308</td>
</tr>
<tr>
<td>I-20</td>
<td>Abilene</td>
<td>216</td>
<td>50</td>
<td>9</td>
<td>11</td>
<td>2</td>
<td>288</td>
</tr>
<tr>
<td>I-35</td>
<td>San Antonio</td>
<td>191</td>
<td>47</td>
<td>7</td>
<td>10</td>
<td>8</td>
<td>264</td>
</tr>
<tr>
<td>I-10</td>
<td>Beaumont</td>
<td>148</td>
<td>31</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>189</td>
</tr>
<tr>
<td>I-35E</td>
<td>Dallas</td>
<td>141</td>
<td>30</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>185</td>
</tr>
<tr>
<td>I-30</td>
<td>Paris</td>
<td>118</td>
<td>25</td>
<td>6</td>
<td>23</td>
<td>2</td>
<td>174</td>
</tr>
<tr>
<td>Top Corridors in Remaining TxDOT Districts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I-40</td>
<td>Amarillo</td>
<td>91</td>
<td>20</td>
<td>2</td>
<td>7</td>
<td>3</td>
<td>124</td>
</tr>
<tr>
<td>US 87</td>
<td>Brownwood</td>
<td>28</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>34</td>
</tr>
<tr>
<td>I-45</td>
<td>Bryan</td>
<td>114</td>
<td>29</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>151</td>
</tr>
<tr>
<td>US 287</td>
<td>Childress</td>
<td>37</td>
<td>12</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>54</td>
</tr>
<tr>
<td>I-37</td>
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<td>53</td>
<td>10</td>
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<td>6</td>
<td>73</td>
</tr>
<tr>
<td>I-20</td>
<td>Fort Worth</td>
<td>103</td>
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<td>131</td>
</tr>
<tr>
<td>I-10</td>
<td>Houston</td>
<td>124</td>
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<tr>
<td>I-35</td>
<td>Laredo</td>
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<td>25</td>
<td>6</td>
<td>3</td>
<td>2</td>
<td>147</td>
</tr>
<tr>
<td>US 84</td>
<td>Lubbock</td>
<td>46</td>
<td>8</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>59</td>
</tr>
<tr>
<td>Highway Corridor</td>
<td>District</td>
<td>Parked 15 Min.–1 Hour</td>
<td>Parked 1–4 Hours</td>
<td>Parked 4–8 Hours</td>
<td>Parked 8–14 Hours</td>
<td>Parked 14+ Hours</td>
<td>Total Parked</td>
</tr>
<tr>
<td>-----------------</td>
<td>------------</td>
<td>-----------------------</td>
<td>------------------</td>
<td>------------------</td>
<td>------------------</td>
<td>------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>US 59</td>
<td>Lufkin</td>
<td>88</td>
<td>15</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>109</td>
</tr>
<tr>
<td>US 281</td>
<td>Pharr</td>
<td>73</td>
<td>11</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>89</td>
</tr>
<tr>
<td>I-10</td>
<td>San Angelo</td>
<td>57</td>
<td>12</td>
<td>4</td>
<td>6</td>
<td>7</td>
<td>87</td>
</tr>
<tr>
<td>I-20</td>
<td>Tyler</td>
<td>108</td>
<td>35</td>
<td>2</td>
<td>6</td>
<td>1</td>
<td>152</td>
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<tr>
<td>US 82</td>
<td>Wichita Falls</td>
<td>49</td>
<td>10</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>62</td>
</tr>
<tr>
<td>I-10</td>
<td>Yoakum</td>
<td>61</td>
<td>14</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>81</td>
</tr>
</tbody>
</table>


### 3.2.1 Long Stops on the Highway Right of Way

Locations along the TxDOT right of way with numerous stops of 8 hours or longer represent about 6 percent of the total stops occurring on the right of way and are a particular concern. These long stops pose risks to both the traveling public and drivers as they often occur overnight. Drivers generally prefer to park in authorized areas, especially those with amenities, for these longer stops. Hence, clusters of unauthorized truck parking for longer than 8 hours may indicate locations or corridors with a shortage of parking spaces.

Stops of at least 8 hours during the 45 weekdays are shown statewide in Exhibit 16. Long stops on the highway are distributed throughout the State, with the greatest concentration in metro areas and on the interstates—areas with the largest volume of trucks. Outside of these clusters, the distribution across the remaining Texas Highway Freight Network (and the Interstate system in particular) is relatively even.
Exhibit 16: Trucks Parked 8+ Hours on Highway Shoulders/Ramps (Expanded Data)

Trucks Parked 8+ Hours on Highway Shoulders/Ramps (Expanded Data)

3.2.2 Trucks Parked in Right of Way - Examples
The following set of Exhibits show examples of trucks parked on TxDOT right of way throughout the State. These examples are illustrative of the types of challenges the State faces in tackling the truck parking issue. The district profiles in Appendix A each contain a heat map showing trucks parked on TxDOT right of way.

Exhibit 17 shows that the area around the Culberson County Rest Area on I-10. I-10 in the El Paso District has the highest number of truck parking events in TxDOT right of way. The actual rest area is on the left side of the image, outlined in blue. The center cluster of dots appear around a pull-off area which is signed as a “weigh station” but is not equipped with any permanent infrastructure, indicating that it is used for mobile inspections rather than staffed on a regular basis. As discussed further in Section 2.4, enforcement sites that are infrequently used can be hotspots for unauthorized truck parking activity. The right-most cluster is around Exit 146 on Interstate 10. There is a significant concentration of parked trucks in these two locations, which suggests that Culberson County Rest Area does not have enough truck parking to satisfy peak-hour demand. Initial utilization data supports the conclusion that this rest area is slightly overcapacity during weekday early morning hours.
Exhibit 17: Trucks Parked on Highway Shoulder/Ramp – Near Culberson County Rest Area (I-10)

Other examples can be found throughout the State where trucks are clustered on highway shoulders or ramps. Exhibit 18 shows U.S. 59 Business and U.S. 79 north of Carthage, TX (Panola County). This image shows a large number of trucks parking on the shoulders of U.S. 59, both northbound and southbound, as well as a number of trucks parked on both the east-bound and west-bound on-ramps to U.S. 79. The average length of stop for all trucks is slightly more than two hours, however, of the approximately 300 stops shown in Exhibit 18, 73 percent are stopped for less than an hour. Of the 38 stops lasting 8 to 14 hours, the majority are located on the northbound shoulder of U.S. 59.

There is a privately owned truck parking facility in the northwest corner of this intersection with approximately 30 spaces and additional amenities including food and fuel. Trucks parked within that facility are not shown in this map as they are in an authorized parking area. Initial utilization data shows that this location does not reach capacity at any point during the day. The large number of trucks parked in the vicinity of the site indicates that there may be a significant peak-hour demand that is not accounted for in the data or that trucks are choosing to park in an unauthorized area even with truck parking available nearby.
Exhibit 18: Trucks Parked on Highway Shoulder/Ramp – Near Carthage (U.S. 59/79)

Exhibit 19 shows a similar situation on the east side of Amarillo. Of the approximately 60 stopped trucks shown in this image, all but eight stayed for less than one hour. There are two privately owned authorized truck parking locations shown (Love’s on the left, TA on the right) with a combined capacity of nearly 300 spaces. Initial utilization information indicates that both stops are at or near capacity overnight but are not at capacity during the day when shorter stops are more common. Roadside truck parking may indicate that some drivers prefer to stop roadside for short breaks, especially when the site is full (and thus time is lost looking for a space) or when ingress/egress is difficult due to site design or the high number of vehicles moving within the location. Additionally, when drivers are required to back in to a space they may find it faster, and perceive it to be safer, to just pull off on the shoulder.

Finally, Exhibit 20 shows the Shell Travel Center off of Exit 49 on Interstate 10 near Fabens in western Texas. The points clustered to the northwest of this location (the grey polygon) are all less than one hour long except one. This, plus the proximity to additional stores on that side of the road, may indicate trucks parking near the shoulders for access to the stores on that side. There also are clusters of points on the entrance ramps going in both directions. Approximately 10 percent of these stops are greater than one hour in duration. Initial utilization data indicates that this location is at or overcapacity for most of the day.
Exhibit 19: Trucks Parked on Highway Shoulder/Ramp - Near Amarillo (I-40)

Trucks Parked on Highway Shoulder/Ramp - Near Amarillo (I-40)

Exhibit 20: Trucks Parked on Highway Shoulder/Ramp - Near Fabens (I-10)

3.2.3 Parking on Highway Shoulder/Ramps and Congestion

As described in the Truck Parking Inventory and Utilization Report prepared for this study, ATRI identifies locations where congestion is having the largest impact on truck-borne freight. The 2019 report of the 100 top truck bottlenecks in the nation contains 13 locations in Texas (the most of any state):

- #13: I-10 at I-45 in Houston.
- #16: I-45 at I-30 in Dallas.
- #22: I-35 in Austin.
- #24: I-45 at I-610 (North) in Houston.
- #27: I-10 at I-610 (West) in Houston.
- #42: U.S. 75 at I-635 in Dallas.
- #57: I-10 at I-610 (East) in Houston.
- #61: I-610 at U.S. 290 in Houston.
- #69: I-35W at I-30 in Fort Worth.
- #79: I-610 at I-69/U.S. 59 (West) in Houston.
- #89: I-45 at I-610 (South) in Houston.
- #100: I-10 at I-69/U.S. 59 in Houston.

Exhibit 21 plots the location of these top bottlenecks in relation to trucks parked within TxDOT right of way. Every one of these top bottleneck areas are on a highway with a large number of trucks parked on the TxDOT right of way. However, these two facts may be more coincidental than correlated. As noted in the prior memo, the Texas Transportation Institute’s (TTI) “100 Most Congested Roadways in Texas” list of top truck delay locations also contains many of these same locations.

Drivers interviewed for this study indicate that congestion and travel time unreliability increase the need for them to be as close to their delivery or pick-up location as possible to avoid the risk of being late due to congestion. This might lead to the increased roadside truck parking often observed in and around major freight generating centers, such as industrial parks. Some drivers also indicated a preference for parking on freeway ramps or frontage roads, when authorized truck parking is not available, as close to urban centers as possible, rather than risking not being able to find a reasonable place to park inside the urban center. Therefore, unauthorized truck parking outside of an urban area may be more closely linked to the lack of authorized truck parking than to congestion, while congestion may be a factor for unauthorized parking inside an urban area.
Exhibit 21: ATRI Top Congested Areas & TxDOT Right of Way Truck Parking Heat Map (Expanded Data)

ATRI Top Congested Areas & TxDOT ROW Truck Parking Heat Map

Heat Map

3.3 Trucks Parked Near Inactive or Closed Rest Areas

In early 2019, TxDOT created an updated inventory of publicly owned truck parking locations to comply with a request from FHWA as part of Jason’s Law. In that list, 20 locations were identified as either inactive or closed. These sites are shown in Exhibit 22 and data for each location is summarized in Exhibit 23. Stops within each facility and on TxDOT right of way within one-half mile of the locations are shown based on the ATRI raw GPS data collected over 61 days. It is important to note that many of these facilities are “pairs” located across from each other on opposite sides of the highway. Stops located in the vicinity of one location are often shown at both.

This analysis looked in more detail at these locations to determine if trucks are still utilizing the ramps or highway shoulder nearby (or the location itself) to park. This may indicate a latent demand for truck parking in the area and may indicate sites that could be targeted for conversion to truck-only parking facilities.

Truck parking near NHS Facility 46 and 48 on I-30 near Saltillo (Paris District) had the highest number of unauthorized stops within one-half mile. This rest area was active for most of 2018, only closing after two new rest areas near Cumby, TX were completed in October 2018. Anecdotal evidence from drivers and an examination of the raw ATRI GPS data indicated it was commonly at or overcapacity, which is consistent with the high number of truck parking events within the nearby right of way. NHS Facility 50 and 51 on I-35E in Forreston (Dallas District) had the second highest number of unauthorized stops within a one-half mile.

Using the expansion factor developed in Section 4, the daily average number of trucks stopped at each location ranges from approximately less than one at NHS Facilities 2, 7, 9, and 13 to nearly 29 at NHS Facility 46/48. However, the closure of Facility 46/48 in late 2018 has likely decreased the number of trucks parking adjacent since associated amenities are no longer available at this location. The busiest locations other than NHS Facility 46/48 saw approximately 9 trucks parked per day, a number surpassed by 134 of the 149 publicly owned locations (average is 69 trucks per day amongst all publicly owned locations).

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6 Because the site was an authorized location for most of 2018, stops within the (now) inactive site were not included in this analysis. For all other locations analyzed in this section, stops within the inactive site in addition to any on the right of way within one-half mile were included.
Exhibit 22: Publicly Owned Inactive or Closed Rest Areas (with Utilization Data)

Publicly Owned Inactive or Closed Rest Areas (with Utilization Data)

Source: TxDOT.
### Exhibit 23: Trucks Parking at or within One-half Mile of Closed or Inactive Rest Areas (Raw ATRI GPS Data—61 Days)

<table>
<thead>
<tr>
<th>Rest Area</th>
<th>Latitude, Longitude</th>
<th>Status</th>
<th>Highway</th>
<th>Municipal-ity</th>
<th>TxDOT District</th>
<th>Total Number of Trucks Stopped</th>
<th>Stops 15 Min.-1 Hour</th>
<th>Stops 1-4 Hours</th>
<th>Stops 4-8 Hours</th>
<th>Stops 8-14 Hours</th>
<th>Stops &gt;14 Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHS Rest Stop or Truck Facility 10/22/23</td>
<td>29.484368, -98.233823</td>
<td>Inactive</td>
<td>I-10</td>
<td>Universal City</td>
<td>San Antonio</td>
<td>22</td>
<td>13</td>
<td>5</td>
<td>1</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>NHS Rest Stop or Truck Facility 14/27</td>
<td>30.130572, -93.903731</td>
<td>Inactive</td>
<td>I-10</td>
<td>Gratis</td>
<td>Beaumont</td>
<td>88</td>
<td>62</td>
<td>5</td>
<td>3</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td>NHS Rest Stop or Truck Facility 32/40</td>
<td>32.6324, -98.0704</td>
<td>Rest area has been shutdown</td>
<td>I-20</td>
<td>Brazos</td>
<td>Fort Worth</td>
<td>549</td>
<td>35</td>
<td>10</td>
<td>0</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>NHS Rest Stop or Truck Facility 33/43</td>
<td>32.483832, -94.525246</td>
<td>Inactive</td>
<td>I-20</td>
<td>Hallsville</td>
<td>Atlanta</td>
<td>22</td>
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<td>1</td>
<td>4</td>
</tr>
<tr>
<td>NHS Rest Stop or Truck Facility 46/48</td>
<td>33.1646, -95.2862</td>
<td>Rest area has been shutdown</td>
<td>I-30</td>
<td>Saltillo</td>
<td>Paris</td>
<td>413</td>
<td>334</td>
<td>44</td>
<td>13</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Rest Area</td>
<td>Latitude, Longitude</td>
<td>Status</td>
<td>Highway</td>
<td>Municipality</td>
<td>TxDOT District</td>
<td>Total Number of Trucks Stopped</td>
<td>Stops 15 Min.-1 Hour</td>
<td>Stops 1-4 Hours</td>
<td>Stops 4-8 Hours</td>
<td>Stops 8-14 Hours</td>
<td>Stops &gt;14 Hours</td>
</tr>
<tr>
<td>---------------------------------</td>
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<td>--------</td>
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<td>----------------</td>
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</tr>
<tr>
<td>NHS Rest Stop or Truck Facility 47/49</td>
<td>33.40181, -94.575921</td>
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<td>I-30</td>
<td>Bassett</td>
<td>Atlanta</td>
<td>7</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>NHS Rest Stop or Truck Facility 50/51</td>
<td>32.281873, -96.868002</td>
<td>Inactive</td>
<td>I-35E</td>
<td>Forreston</td>
<td>Dallas</td>
<td>93</td>
<td>62</td>
<td>11</td>
<td>2</td>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td>NHS Rest Stop or Truck Facility 53/56</td>
<td>29.633052, -98.224363</td>
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<td>I-35</td>
<td>Comal</td>
<td>San Antonio</td>
<td>23</td>
<td>14</td>
<td>3</td>
<td>0</td>
<td>4</td>
<td>2</td>
</tr>
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<td>NHS Rest Stop or Truck Facility 58</td>
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<td>I-35W</td>
<td>Burleson</td>
<td>Fort Worth</td>
<td>15</td>
<td>12</td>
<td>1</td>
<td>0</td>
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<td>0</td>
</tr>
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<td>NHS Rest Stop or Truck Facility 59</td>
<td>32.497175, -97.289514</td>
<td>Inactive</td>
<td>I-35W</td>
<td>Burleson</td>
<td>Fort Worth</td>
<td>24</td>
<td>20</td>
<td>2</td>
<td>0</td>
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<td>0</td>
</tr>
<tr>
<td>NHS Rest Stop or Truck Facility 82</td>
<td>28.171942, -97.390878</td>
<td>Inactive</td>
<td>U.S. 77</td>
<td>Bonnie View</td>
<td>Corpus Christi</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Exhibit 24 shows the percent of trucks by amount of time parked within \( \frac{1}{2} \) mile of these closed or inactive sites. Approximately 74 percent of the stops in these locations were for less than one hour, higher than the percent of stops in this category statewide for authorized truck parking locations (64 percent) or at publicly owned authorized locations (67 percent).

**Exhibit 24: ATRI Trucks Parked In/Near Closed Rest Areas**

![Pie chart showing distribution of stops by duration](image)


This analysis indicates that trucks are still using space near these closed or inactive facilities (either the ramps or in some cases within the site itself) to park. In districts or corridors with a shortage in truck parking, these areas could be potential opportunities to add additional capacity.

Exhibit 25 through Exhibit 35 provide aerial imagery of each location (or set of locations) and show the total number of trucks in ATRI’s dataset over the 61-day period that were parked within one-half mile on TxDOT right of way or within the location based on the amount of time the truck was stopped (number of stops in parentheses).
Exhibit 25: Truck Parking Near Inactive or Closed Rest Areas
(Facility 10, 22, 23)

Exhibit 26: Truck Parking Near Inactive or Closed Rest Areas (Facility 14, 27)

Exhibit 27: Truck Parking Near Inactive or Closed Rest Areas (Facility 32, 40)

Exhibit 28: Truck Parking Near Inactive or Closed Rest Areas (Facility 33, 43)

Exhibit 29: Truck Parking Near Inactive or Closed Rest Areas (Facility 46, 48)

Source: ATRI, Analysis by Cambridge Systematics (2019). Note that this location was an authorized truck parking location until shortly after the opening of a new rest area near Cumby in October 2018. Stops shown in the Exhibit were located outside of the (now closed) rest area.
Exhibit 30: Truck Parking Near Inactive or Closed Rest Areas (Facility 47, 49)

Exhibit 31: Truck Parking Near Inactive or Closed Rest Areas (Facility 50, 51)

Exhibit 32: Truck Parking Near Inactive or Closed Rest Areas (Facility 53, 56)

Exhibit 33: Truck Parking Near Inactive or Closed Rest Areas (Facility 58)

Fort Worth District

Truck Parking Near Inactive or Closed Rest Areas (Facility 58)

Exhibit 34: Truck Parking Near Inactive or Closed Rest Areas (Facility 59)

Exhibit 35: Truck Parking Near Inactive or Closed Rest Areas (Facility 82)

In addition to these locations, the Itasca Picnic Area on I-35 (Waco District) and the Panhandle Picnic Area on I-40 (Amarillo District) were closed at the end of 2018 after the data collection period for this project, and the Fayette County Picnic Area on I-10 (Yoakum District) and Fayette County Picnic Area on SH 71 (Yoakum District) were approved for closure in June 2019 due to facility deterioration and misuse. While the Panhandle Picnic Area had available capacity, utilization data from Itasca and Fayette County show that these locations were heavily used, with Fayette County Picnic Area seeing 100% or higher utilization during peak hours based on available data.

In the Wichita Falls District, the Wichita County Rest Area on US 287 will be replaced with a new rest area (under construction) and the Sunset Picnic Area on US 81 is planned to be replaced with a new rest area. A new rest area for Nolan County on I-20 (Abilene District) is in the design phase.

Additional input from TxDOT districts identified several additional locations that have been closed in the past decade that were not part of the original Jason’s Law submission. Utilization data for these locations was not obtained and the physical state of the locations varies greatly, but these sites could be considered during the recommendations phase of this study for investment, particularly if TxDOT still control the right of way and they are located in a high need corridor. A map of these sites are shown in Exhibit 36 and a table with additional details is provided in Appendix D.
Exhibit 36: Additional Closed or Closing Publicly Owned Truck Parking Locations

Source: TxDOT District input.
3.4 Trucks Parked Near Inspection Locations

The Texas Department of Public Safety (DPS) operates a number of inspection facilities around the State to enforce commercial motor vehicle (CMV) size, weight, and safety regulations (shown in Exhibit 37). DPS does not allow trucks to park at these facilities unless they are conducting business at the site or are required to stop due to enforcement action. Many of the locations have signs indicating that truck parking is not allowed, and some sites have gates across the entrance ramp to keep vehicles out while the site is not operating. However, discussions with DPS indicate that trucks are still utilizing some locations during off-hours for parking, especially those that are staffed infrequently. In some cases, vehicles have damaged the gates placed across entrance ramps.

Information obtained from DPS field staff concerning unauthorized truck parking at weigh stations is noted below. Note that this is not an exhaustive list of all DPS facilities in the state that may an issue as responses were not received from every area of the state.

- Winnie Weigh Station on I-10 (Chambers County) had a gate blocking access to the site when it was closed. However, the gate is no longer closed by DPS due to multiple incidents of it being damaged by trucks attempting to park in the site.7 DPS notes that the Chambers County Safety Rest Area (approximately 5 miles west) consistently has spaces available. However, utilization data shows the site is near capacity on an average night.

- The Mt. Pleasant Weigh Station on I-30 (Titus County) also has had the gates that block the entrance ramp damaged multiple times. This site is typically open Monday–Friday, 40 hours a week.

- The Tyler Weigh Station on I-20 (Smith County) is open approximately twice a week for eight hours a day and was noted as a systemic location where DPS see trucks parked when the site is not open.

- The New Waverly Weigh Station on I-45 (Walker County) is open approximately 40 hours per week. DPS staff note that the site is often used for truck parking when not open.

- The Andrews County (SH176/FM181) and Midland County (SH 349/FM1787) weigh stations commonly have trucks parked in them. Both are part-time facilities, so drivers often choose to utilize the space and risk getting a ticket if the site is opened while they are there. If parked in the area during non-operating hours, the DPS typically does not intervene and there is no gate or other physical barrier stopping use of the site. These sites are in rural areas with limited options for drivers, and the sites also may be serving as group parking areas for oil field workers. DPS noted that they commonly see trucks and cars parked for extended periods of time. These sites do not have any amenities, so there may be issues with trash and human waste.

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7 The approach to this site has a sign indicating that trucks must enter when lights are flashing, and the entrance ramp has a sign saying “CMV Station.” Mt. Pleasant Weigh Station has similar signage on the approach.
▪ The Hutchins weigh station on I-45 NB (Dallas County) is located near Exit 272. The site operates approximately 2–3 days per month during daylight hours. There is a Love’s Travel Center in the northeast corner of the interchange with more than 100 spaces and the location is near the Union Pacific Dallas Intermodal Terminal. However, both utilization data and input from officers indicate that this location is consistently at or overcapacity. Trucks appear to be using the weigh station and the ramps leading to/from Fulghum Road to park, with approximately half of the stops lasting more than one hour.

▪ Kaufman County Weigh Stations on I-20 just west of Exit 512 near Terrell also is open approximately 2–3 days a month during daylight hours.

Exhibit 38 through Exhibit 42 below show the total number of trucks in ATRI’s dataset over the 61-day period that were parked at a selection of the locations noted by DPS as problem areas. It is important to note that some of the stops shown, especially those of shorter durations, may be associated with enforcement activity. Trucks that stop at these sites to be weighed or to present credentials or other paperwork to officers are parked legally. In some locations, trucks placed out of service may remain at the facility (note this is not the case at every location). These trucks cannot easily be filtered from the data. However, all of the images show some activity occurring on ramps or adjacent highway shoulders which is unlikely to be enforcement related.

Truck parking at these locations may indicate a need for additional capacity in the region, although some unauthorized parking may be due to driver choice to stop at a weigh station and risk enforcement action even though authorized parking options are available nearby. This may point to a need for better information about nearby truck parking availability paired with increased enforcement.
Exhibit 37: Texas Department of Public Safety Truck Inspection Locations

Texas Department of Public Safety Truck Inspection Locations

Source: Texas DPS. Note, the location on I-35 north of Laredo (near the Unitec Industrial Park) currently is not active. Note, this is a sampling of Texas DPS locations with truck parking issues and may not be exhaustive.
Exhibit 38: Truck Parking At/Near Winnie Weigh Station (I-10)

Truck Parking At/Near Winnie Weigh Station (I-10)

Exhibit 39: Truck Parking At/Near Mt. Pleasant Weigh Station (I-30)

Truck Parking At/Near Mt. Pleasant Weigh Station (I-30)

Exhibit 40: Truck Parking At/Near Tyler Weigh Station (I-20)

Truck Parking At/Near Tyler Weigh Station (I-20)

Exhibit 41: Truck Parking At/Near New Waverly Weigh Station (I-45)

Truck Parking At/Near New Waverly Weigh Station (I-45)

Trucks Parked on Highway Shoulder/Ramp
Length of Stop
- Parked 15 Min. - 1 Hour
- Parked 1+ Hour

Exhibit 42: Truck Parking At/Near Hutchins Weigh Station (I-45)

3.5 **Trucks Parked in Other Unauthorized Areas**

This section provides the methodology and results from four case studies used to identify trucks parked in unauthorized areas, specifically roadside in mixed residential and commercial/industrial areas. Additional details on this approach are provided in Appendix C.

### 3.5.1 Truck Parking along Streets

The ATRI raw GPS data indicates the volume and location of stopped trucks, but determining whether or not they are parked where they should be, especially in urban areas, is difficult to ascertain. Authorized truck parking locations are delineated for this study and capture data on stopped trucks within those zones, but outside of the authorized parking zones and the TxDOT highway right of way, trucks could be legitimately parked at a shipper, receiver, company yard, or other location. Delineating the universe of possible locations across the State where drivers may legitimately stop and/or park their trucks would be difficult and time consuming. In addition, in some industrial zoned areas truck parking along roadway shoulders or in vacant lots may be explicitly permitted or implicitly allowed.

#### 3.5.1.1 Methodology

For purposes of this exercise, unauthorized truck parking is defined as parking on streets. Stakeholders have indicated that trucks park (for short-term staging or cueing) on roadway shoulders most frequently in areas with a concentration of shippers and receivers, which may spill over onto nearby residential streets. Therefore, using information gleaned from heat maps, stakeholder input, and aerial imagery, 4 industrial/commercial areas of between approximately 2–3 square miles were selected that have a high concentration of parked trucks and are adjacent to residential neighborhoods. These areas are:

- Galena Park (Harris County).
- Northwest Odessa (Ector County).
- Lancaster (Dallas County).
- Laredo (Webb County).

Exhibit 43 shows the sample area in Laredo. GIS polygons were drawn around these adjacent industrial and residential areas to capture the total number of all trucks stopped in ATRI’s database during the 61-day period data were collected. Aerial imagery was used to visually identify and count the number of trucks parked on roadways and shoulders within the delineated industrial and residential areas. Trucks stopped in business parking lots or driveways were not counted—these were assumed to be parked for a legitimate purpose and in an acceptable location. Trucks parked in vacant lots were similarly not counted due to the inability to determine if truck parking may be allowed by a property owner. When in doubt regarding whether a location was authorized or not, trucks were considered to be parked in an authorized location.
Exhibit 43: Urban Area Truck Parking Methodology – Laredo (Webb County) – Street Parking in Industrial/Commercial and Residential Areas

3.5.1.2 Results
Based on the estimates of truck parking in the 4 sample areas combined, as shown in Exhibit 44, an average of approximately 1 percent of all stopped trucks within the sample area are parked on roadway shoulders or streets in residential areas, and approximately 3.5 percent of all stopped trucks are parked on roadway shoulders in industrial areas. Thus, trucks parked along roadway shoulders, assumed to be unauthorized parking, in residential and industrial locations combined ranges from 0.9—7.6 percent of all parked trucks, or an average of 4 percent.

Section 4 of this memo, which uses the expanded ATRI data to identify areas with a need for additional truck parking, provides estimates of unauthorized parking on streets by including 4 percent of trucks that are in the database but parked outside of authorized areas or TxDOT right of way. Although this percent appears to be a small number at first glance, based on ATRI data it means that nearly 8 million truck parking events occur in these unauthorized locations over the course of a year across the State. Due to limitations with the ATRI data, this number is likely low, especially in urban areas where there are more local delivery trucks active that may not be part of ATRI’s data.

Exhibit 44: Combined Sample Areas—Unauthorized Truck Parking Counts and Percentages

<table>
<thead>
<tr>
<th></th>
<th>All Parked Trucks</th>
<th>Trucks Parked in Unauthorized Locations</th>
<th>% Unauthorized Parking within Each Zone</th>
<th>% Unauthorized Parking in Combined Zones</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential Zone</td>
<td>1,923</td>
<td>493</td>
<td>25.6%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Industrial/Commercial Zone</td>
<td>75,266</td>
<td>2,680</td>
<td>3.6%</td>
<td>3.5%</td>
</tr>
<tr>
<td>Combined Zones</td>
<td>77,189</td>
<td>3,173</td>
<td>4.1%</td>
<td>4.1%</td>
</tr>
</tbody>
</table>

Source: Analysis by Cambridge Systematics (2019).

Individual communities will need to determine the extent and locations of unauthorized truck parking affecting the quality of life of their residents, and the quality of life of the truck drivers who deliver the goods they rely on. As noted previously, allowing truck parking in vacant lots or roadway shoulders in commercial or industrial areas might be acceptable in some areas and not in others. However, unauthorized truck parking in and adjacent to residential areas is almost universally unacceptable to local communities.
4.0 Emergency Truck Parking

Incidents or uncommon events can be a common contributor to unauthorized truck parking, particularly if a full road closure is required and a truck needs a place to stop while the incident clears. This is especially true for trucks if there are few, if any, authorized locations to park near the incident and the truck parking inventory is reaching capacity during normal conditions.

Road closure data were collected for the interstate highway, U.S. highway, and state highway network to evaluate the potential impact of road closures on truck parking throughout the State. The data were used to identify corridors where there is a high frequency of long-term road closures, combined with high truck volumes, significant truck parking demand, little or no truck parking near the corridor, and limited or no alternate routes. This combination of factors creates a significant challenge for truck drivers during an unexpected road closure.

4.1 Key Findings and Observations

Below are some key findings and observations that will be presented in the remainder of this section.

- There were more than 38,250 road closures in Texas between March 2017 and December 2018.
- Flooding was the main contributing factor to road closures that lasted greater than 10 hours. These longer closures have the greatest disruption to travel patterns and potential demand for truck parking.
- The top 5 corridors with closures include I-27/U.S. 87 between Midland and Amarillo, I-35 between Laredo and San Antonio, SH 73/87 between Winnie and Orange, U.S. 281 between Brownsville to Rancho Alegre, and U.S. 59 between Victoria and Rosenberg. These 5 segments had 61 closures lasting a total of 395 days during the period analyzed. 31 of those closures lasted longer than 24 hours.
- All routes have nearby alternatives, limiting the impact of any single road closure on the system as a whole.

4.2 Analysis

There were over 38,250 closures statewide during the study period, from March 2017 to December 2018. This includes full and partial road closures ranging in duration from a couple of hours to more than a year. The data were narrowed down to identify the top 5 highway corridors with the most road closures. This included only locations where there was a full road closure lasting more than 10 hours and a detour was required, with a total of 61 closures identified. Exhibit 45 through Exhibit 50 shows the top 5 corridors and Exhibit 51 summarizes the road closure data and other important criteria by corridor. Key observations regarding the 5 corridors are described below. Note that truck parking utilization data are based on data collected during the four two-week periods discussed in Section 2 of this report and therefore may or may not coincide with the dates of any specific closure event.
- **I-27/U.S. 87 (between U.S. 60 and SH-250).** I-27/U.S. 87 runs north-south and connects the agricultural regions in the Texas Panhandle. It is part of the ports-to-plains corridor. The segment of I-27 between U.S. 60 and SH-250, connecting Amarillo to Midland, had 9 road closures during the study period, with the majority of closures occurring near Plainview and U.S. 70. Damage to the highway closed the road for 293 days. The maximum non-urban AADTT on this segment of I-27 is relatively low with 2,673 trucks per day. There also are 39 truck parking facilities within 20 miles of the segment, with a total of 2,076 spaces. The total utilization rate for the truck parking facilities is 83 percent, the 2nd highest of the corridors analyzed. U.S. 385 (part of the THFN) parallels I-27 approximately 30 miles to the west, and SH 207 parallels I-27 approximately 25 miles to the east with multiple east-west roads providing connections between the routes. Both roads provide reasonable alternative routes through the region. Road closures along this segment of I-27/U.S. 87 are likely to affect long-term truck parking needs due to the already high parking utilization rate near this highway segment, especially in the southern portion of the corridor located in the Permian Basin.

- **I-35 (between U.S. 83 and SH-1604).** I-35, a critical north-south trade corridor through the central United States, passes through several large metro areas in Texas. The segment of I-35 between U.S. 83 and SH 1604 (E Charles William Anderson Loop), connects Laredo, near the Mexican border, with San Antonio and had 10 closures during the study period. The road closures were fairly dispersed along the segment. The closures lasted a total of 18 days, with flooding as the primary cause. The maximum AADTT on this segment of I-35 is 10,956 trucks per day. There are 25 truck parking facilities located within 20 miles of this highway segment, with a total of 1,780 spaces. The total utilization rate for the truck parking facilities is 92 percent. The combination of U.S. 83, U.S. 85, and U.S. 90 provide a reasonable alternative route if needed. While an alternative route is available, the truck parking demand within 20 miles of this highway segment already exceeds capacity and road closures along this segment would exacerbate the long-term truck parking demand.

- **SH 73 and SH 87 (between I-10).** SH 73 is a highway beginning in Winnie, approximately 60 miles east of Houston, traveling through Port Arthur, and terminating near Orange. SH 73 joins SH 87 in Orange. This stretch of highway had 13 road closures during the study period. Most of the closures occurred near either the south end of the route or near Port Arthur. The closures lasted a total of 26 days, with flooding requiring the most closure days. The maximum AADTT on this segment of SH 73 and SH 87 is approximately 3,071 trucks per day, with much of the traffic likely due to trucking activity near Port Arthur. There are 11 truck parking facilities within 20 miles of the segment, with a total of 891

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8 Maximum AADTT from outside of urban areas was used as this better represents long-haul trucks impacted by route closures.
spaces almost entirely located along I-10. The total utilization rate for the truck parking facilities is 73 percent. I-10 provides an alternate route for trucks traveling through the region, and U.S. 96 provides a link from I-10 to Port Arthur although the distance traveled increases significantly. While alternative routes are available, road closures along this segment of SH 73 and SH 87 are likely to affect long-term truck parking needs due to the high volume of trucks generated by the Port and associated industries, the relative number of truck parking facilities near this highway segment, and the already high truck parking utilization rate.\(^9\)

- **U.S. 281 (Mexican border to SH 141).** U.S. 281 is a major north-south highway connecting Mexico to Canada. Within Texas, U.S. 281 begins in Brownsville, near the Mexican border, travels through central Texas and terminates at the Oklahoma state line. The segment of U.S. 281 between Pharr and SH 141 approximately 12 miles south of Rancho Alegre, had 13 closures during the study period. Most of the closures occurred near Pharr, with a few closures also occurring at the northern end of the segment. The closures lasted a total of 29 days, with flooding requiring the most closure days. The maximum AADTT on this segment of U.S. 281 is relatively high with 5,232 trucks per day. There are 17 truck parking facilities within 20 miles of the segment, with a total of 834 spaces. The total utilization rate for the truck parking facilities is 39 percent. However, with most of the closures occurring near Pharr, the greatest demand for truck parking is in and around Pharr which has 12 truck parking facilities with an average utilization rate below 50 percent. I-69/U.S. 77, parallels U.S. 281 approximately 15–20 miles to the east, providing a reasonable alternative route and the low utilization rate at existing facilities indicates there is some capacity to accept additional trucks during closures.

Note that stakeholder outreach indicates that many of the trucks traveling in this region may be running between locations on opposite sides of the U.S. – Mexico border. These trucks likely have a lower demand for parking in rest areas or truck stops since much of their time will be spent parked at warehouses or businesses. The lack of a busy Interstate corridor through the area (compared to I-35 in Laredo or I-10 in El Paso) may also contribute to the lower utilization rates seen in the region as ATRI data typically contains more over-the-road traffic that is likely to utilize Interstate corridors than local short-haul trucks. Finally, many of the truck parking locations in the Pharr region, especially along U.S. 281 north of Pharr have inventories of more than 100 spaces. These sites may be heavily used but due to the large capacity may not appear to have high utilization rates during the peak hour. For example, a location with 100 trucks parked but 150 spaces is busy, but will only have an utilization rate of 67%.

- **U.S. 59 (between U.S. 87 and SH 36).** U.S. 59 is a major north-south highway beginning in Laredo, near the Mexican border, running through eastern Texas, and terminating near Texarkana. U.S. 59 is cosigned with various highways throughout its length.

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\(^9\) Note that this route was also heavily impacted during Tropical Storm Imelda in September, 2019.
including I-69, a major transcontinental corridor from Mexico to Canada. The segment of U.S. 59, between U.S. 87 near Victoria to SH 36 near Rosenberg, had 16 closures during the study period. Most of the closures occurred on the portion of the route approaching Rosenberg. The closures lasted a total of 25 days. Accidents and flooding represented nearly half the closure types, with the reason for the remaining closures not specified. The maximum AADTT on this segment of U.S. 59 is approximately 6,635 trucks per day. There are 16 truck parking facilities located within 20 miles of this highway segment, with a total of 813 spaces. The total utilization rate for the truck parking facilities is 65 percent. The combination of U.S. 77A, I-10, and SH 36 provide an indirect, alternative route. While an alternative route is available, road closures along this segment of U.S. 59 are likely to affect long-term truck parking needs due to the high volume of trucks and high parking utilization rate near this highway segment.
Exhibit 45: Top Five Corridors with the Most Frequent Road Closures (2017-2018)

Source: Analysis by Cambridge Systematics (2019).
Exhibit 46: I-27 Route Closures

I-27 Route Closures

Duration (Days)
- <1
- 1-2
- 2-3
- 3-4
- >4
- Closure Route

Source: Analysis by Cambridge Systematics (2019).
Exhibit 47: I-35 Route Closures

I-35 Route Closures

- Duration (Days):
  - <1
  - 1-2
  - 2-3
  - 3-4
  - >4

Source: Analysis by Cambridge Systematics (2019).
Exhibit 48: SH 73 and SH 87 Route Closures

SH 73 and SH 87 Route Closures

Duration (Days)
- <1
- 1-2
- 2-3
- 3-4
- > 4
- Closure Route

Source: Analysis by Cambridge Systematics (2019).

Prepared by Cambridge Systematics.
Data for planning purposes only.
October 30, 2019
Exhibit 49: US 281 Route Closures

Source: Analysis by Cambridge Systematics (2019).
Exhibit 50: US 59 Route Closures

The map illustrates the duration of route closures on US 59 based on the analysis by Cambridge Systematics (2019).

**Duration (Days)**
- <1
- 1-2
- 2-3
- 3-4
- > 4
- Closure Route

Source: Analysis by Cambridge Systematics (2019).
### Exhibit 51: Road Closure Data by Corridor

<table>
<thead>
<tr>
<th>Corridor</th>
<th>Total Closures</th>
<th>Total Duration (Days)</th>
<th>Type</th>
<th>Number</th>
<th>Duration</th>
<th>Highest AADTT on Route (outside urban areas)</th>
<th>Alternate Route?</th>
<th>Truck Parking within 20 Miles of Corridor</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-27/U.S. 87 (U.S. 60 to SH 250)</td>
<td>9</td>
<td>297</td>
<td>Closed</td>
<td>1</td>
<td>1</td>
<td>2,673</td>
<td>I-385</td>
<td>39, 2,076, 83%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Damage</td>
<td>4</td>
<td>293</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ice/Snow</td>
<td>4</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I-35 (U.S. 83 to SH-1604)</td>
<td>10</td>
<td>18</td>
<td>Accident</td>
<td>1</td>
<td>1</td>
<td>10,956</td>
<td>SH-83, SH-85, SH-90</td>
<td>25, 1,780, 91%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Closed</td>
<td>2</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Flood</td>
<td>7</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SH-73 and SH-87 (between I-10)</td>
<td>13</td>
<td>26</td>
<td>Closed</td>
<td>2</td>
<td>4</td>
<td>3,071</td>
<td>I-10, SH-124</td>
<td>11, 891, 73%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Flood</td>
<td>11</td>
<td>21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U.S. 281 (Border to SH-141)</td>
<td>13</td>
<td>29</td>
<td>Closed</td>
<td>6</td>
<td>6</td>
<td>5,232</td>
<td>I-69</td>
<td>17, 834, 39%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Flood</td>
<td>5</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Other</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U.S. 59 (U.S. 87 to SH-36)</td>
<td>16</td>
<td>25</td>
<td>Accident</td>
<td>3</td>
<td>2</td>
<td>6,635</td>
<td>U.S. 77A, I-10, SH-36</td>
<td>16, 813, 65%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Closed</td>
<td>9</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Flood</td>
<td>4</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Analysis by Cambridge Systematics (2019).
5.0 Expanded Data and Shortage/Surplus of Truck Parking

This section identifies and quantifies areas where truck parking demand exceeds inventory or capacity based on an “expanded” dataset using the ATRI raw GPS data as a base. Summaries of demand at the district, location, and corridor level are described below. Note that the utilization analysis focused on private locations with 10 or more truck parking spaces and public locations with an inventory of five or more spaces. Publicly owned locations with less than five spaces are discussed as part of the inventory and are listed in the district profiles in Appendix A but are not included in district or statewide capacity counts in this section and utilization at those locations were not examined. In addition, a number of privately owned facilities that opened during 2018 or early 2019 are not included in the utilization analysis because they were not open during all times when demand data was captured (leading to lower than expected utilization rates) or operate substantially differently than the other truck parking locations in the sample. These sites include:

- Love’s in Donna, Lufkin, Sonora, and Sulphur Springs;
- Pilots in Falfurrias, Hempstead, Kermit, Monahans, Odessa, Orla; and
- Two long-term storage facilities (Hutto Truck Parking in Hutto and Park My Truck 24/7 in Fort Worth).

5.1 Key Findings and Observations

Below are some key findings and observations, summarized in Exhibit 52, that will be presented in the remainder of this section.

Exhibit 52: Texas Truck Parking Summary Statistics

<table>
<thead>
<tr>
<th>TOTAL UTILIZATION AT PEAK HOUR AT:</th>
<th>Major national truck stops</th>
<th>All other privately owned truck stops</th>
<th>Total of all privately owned truck stops</th>
<th>Publicly owned safety rest areas/travel information centers</th>
<th>Publicly owned picnic areas/pull-offs</th>
<th>Total of all publicly owned locations</th>
</tr>
</thead>
<tbody>
<tr>
<td>105 percent</td>
<td></td>
<td>92 percent</td>
<td>67 percent</td>
<td>86 percent</td>
<td>60 percent</td>
<td>78 percent</td>
</tr>
</tbody>
</table>

The peak hour for truck parking based on demand at authorized parking locations is 1-2 a.m. Meaning that in a 24-hour period, the period of highest demand at the most number of authorized sites was between the hours of 1:00 a.m. and 2:00 a.m.

Approximately 198 of the 639 authorized locations where location utilization information was collected are at or overcapacity during the peak hour (1–2 a.m.). Of the remainder, 39 additional locations are at or overcapacity during some other hour of the day and an additional 61 locations are at least 80 percent utilized (near capacity) at the peak hour. These 298 locations represent the most utilized sites in the state.

There are 150 locations from the “Big 3” (Love’s, Pilot/FlyingJ, TA-Petro) with approximately 16,200 spaces in the utilization data. Total peak hour utilization across all locations is 105 percent. At the peak hour, the remaining 312 privately owned locations have a total utilization rate of 67 percent, the State’s 85 rest areas or travel information centers have a peak hour utilization rate of 86 percent, and the 92 picnic areas or pull-offs have an utilization rate of 60 percent.

I-20, I-30, I-35, and I-45 have peak hour utilization rates above 100 percent. The eight Interstate corridors examined in this study have a peak hour average utilization rate of 99 percent for all locations within 1 mile of the corridor.

Based on the peak hour demand for truck parking at authorized locations, within TxDOT right of way, and street parking off the TxDOT network (estimated at 4 percent of all other parked trucks), 15 of the 25 TxDOT districts are overcapacity with five more districts with a surplus of less than 100 spaces. In total, there is a net shortage of approximately 5,475 spaces at the peak hour in Texas. A net shortage of approximately 3,685 spaces.\(^\text{10}\)

5.2 Statewide Shortage

Across the State, especially in and around urban centers and major freight corridors, authorized truck parking locations are at or overcapacity most weekday nights, and many for most of the day. At the peak hour within and immediately surrounding authorized truck parking locations only, there is a demand for approximately 24,560 parking spaces. Trucks parked in the TxDOT right of way at the peak hour adds another 2,110 spaces to the demand at the peak hour. Finally, there are approximately 5,920 trucks parked in unauthorized locations on local roads bringing the total demand for truck parking statewide to approximately 32,600 with a statewide inventory of approximately 27,121 spaces. In total approximately 5,475 trucks are in need of authorized parking spaces on an average weekday night—located where they are needed and with desired amenities. This last part is critical. As discussed further in the following sections, the net number of truck parking spaces can be a deceiving as additional supply in one area cannot be assumed to meet

\(^{10}\) Note that this calculation is at the District level so specific locations, corridors, or sub-areas may be overcapacity even if the District as a whole is not.
excess demand in another. Using gross shortage instead of net, the State has a deficit of approximately 11,600 truck parking spaces at the peak hour.

Exhibit 53 shows the 237 locations that are at/overcapacity at some point during the day. The majority (198 locations) are at/overcapacity during the peak hour, and many of those are full for 20 or more hours each day (78 locations).

These locations are key areas of concern, with the greatest concentrations occurring in the Texas Triangle between Houston, San Antonio, and Dallas/Fort Worth, the east side of Houston, and east of the Dallas District along I-20 and I-30. Most of these locations are on Interstates, but U.S. 287 and the future I-69 corridor also are corridors with significant truck parking concerns.

The following sections take a closer look at the shortage by district, publicly owned and privately owned location, and key Interstate corridor.
Exhibit 53: Truck Parking Locations with High Utilization

Source: ATRI, Analysis by Cambridge Systematics (2019). Note that additional study is underway to better estimate demand from local operators involved in the oil and gas industry in the Permian Basin.
5.3 Truck Parking Shortage or Surplus in TxDOT Districts

There are many ways to examine truck parking data that can yield vastly different information and conclusions. This section outlines two main approaches, first looking at the net shortage or surplus of spaces in the State. This approach sums all shortages and surpluses in a district, regardless of where a location is. While this provides an overall picture, it can skew the conversation by making it appear there are more spaces available even if those spaces are located in an area of low demand, and therefore less helpful to industry. The second approach looks at gross shortage which removes location surpluses from the estimates to identify a “worse case” where additional supply at one location cannot fulfill demand at another location.

Based on the net approach, 9 of Texas’ 25 districts have a greater demand for truck parking than available inventory from trucks parked at authorized locations and trucks parked in TxDOT right of way. The Dallas District has the largest shortage with a deficit of more than 800 spaces, double the Odessa District which has the second highest shortage at 400 spaces. Of the districts with a surplus, that surplus is less than 100 spaces in Abilene, Bryan, San Angelo, Lufkin, Brownwood, Fort Worth, and Wichita Falls districts. Since demand is estimated using averages based on a statewide peak hour rather than the peak hour at each individual location, the surplus capacity in those districts should be considered minimal. Therefore, 16 of the 25 districts are overcapacity or nearly overcapacity. However, as shown in Exhibit 53, the need for truck parking spaces is not evenly distributed across each district, just as it is not across the State.

Exhibit 54 and Exhibit 55 summarize the net shortage or surplus of truck parking by district. Note that these numbers do not include an estimate of trucks parked in unauthorized locations on local streets which greatly increases the overall demand, especially in urban areas.

The Corpus Christi, Beaumont, Amarillo, and Pharr Districts have surpluses based on authorized locations and TxDOT right of way truck parking of more than 200 spaces. These areas lack large urban areas which are a key driver of staging parking for trucks and the 4 percent “other” truck parking estimated described in Section 5.4.

In the Pharr District, stakeholder outreach indicates that trucks operating across the U.S. border are often making “turns” between warehouses on either side of the border. These drivers mostly park mostly at associated businesses in the U.S., thus creating a high truck volume but a lower demand for truck parking at rest areas or truck stops than over-the-road drivers. These types of trucks are also less likely to be included in ATRI’s data and so may be missing from the overall dataset.
Exhibit 54: Net Truck Parking by District – Authorized Locations and TxDOT Right of Way

Source: ATRI, Analysis by Cambridge Systematics (2019). Note that additional study is underway to better estimate demand from local operators involved in the oil and gas industry in the Permian Basin.
**Exhibit 55: Truck Parking Net Shortage/Surplus at Authorized Locations and TxDOT Right of Way by District**

<table>
<thead>
<tr>
<th>District</th>
<th>Total Truck Parking Spaces</th>
<th>Peak Hour Weekday Demand at Authorized Locations</th>
<th>Peak Hour Weekday Demand within TxDOT Right of Way</th>
<th>Peak Hour Shortage or Surplus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dallas</td>
<td>2,384</td>
<td>2,993</td>
<td>208</td>
<td>-816</td>
</tr>
<tr>
<td>Odessa</td>
<td>1,953</td>
<td>2,135</td>
<td>219</td>
<td>-400</td>
</tr>
<tr>
<td>El Paso</td>
<td>1,285</td>
<td>1,428</td>
<td>62</td>
<td>-205</td>
</tr>
<tr>
<td>Waco</td>
<td>1,405</td>
<td>1,489</td>
<td>91</td>
<td>-175</td>
</tr>
<tr>
<td>Paris</td>
<td>593</td>
<td>665</td>
<td>78</td>
<td>-149</td>
</tr>
<tr>
<td>Tyler</td>
<td>659</td>
<td>704</td>
<td>81</td>
<td>-126</td>
</tr>
<tr>
<td>Atlanta</td>
<td>635</td>
<td>593</td>
<td>138</td>
<td>-96</td>
</tr>
<tr>
<td>Austin</td>
<td>362</td>
<td>336</td>
<td>78</td>
<td>-52</td>
</tr>
<tr>
<td>San Antonio</td>
<td>2,178</td>
<td>2,090</td>
<td>123</td>
<td>-35</td>
</tr>
<tr>
<td>Abilene</td>
<td>1,011</td>
<td>923</td>
<td>74</td>
<td>14</td>
</tr>
<tr>
<td>San Angelo</td>
<td>484</td>
<td>396</td>
<td>58</td>
<td>30</td>
</tr>
<tr>
<td>Bryan</td>
<td>748</td>
<td>672</td>
<td>44</td>
<td>32</td>
</tr>
<tr>
<td>Lufkin</td>
<td>352</td>
<td>259</td>
<td>32</td>
<td>61</td>
</tr>
<tr>
<td>Brownwood</td>
<td>306</td>
<td>201</td>
<td>30</td>
<td>75</td>
</tr>
<tr>
<td>Fort Worth</td>
<td>1,263</td>
<td>1,059</td>
<td>110</td>
<td>94</td>
</tr>
<tr>
<td>Wichita Falls</td>
<td>497</td>
<td>365</td>
<td>33</td>
<td>99</td>
</tr>
<tr>
<td>Childress</td>
<td>420</td>
<td>277</td>
<td>17</td>
<td>125</td>
</tr>
<tr>
<td>Houston</td>
<td>3,142</td>
<td>2,833</td>
<td>39</td>
<td>156</td>
</tr>
<tr>
<td>Lubbock</td>
<td>526</td>
<td>318</td>
<td>40</td>
<td>169</td>
</tr>
<tr>
<td>Laredo</td>
<td>1,435</td>
<td>1,219</td>
<td>47</td>
<td>176</td>
</tr>
<tr>
<td>Yoakum</td>
<td>922</td>
<td>698</td>
<td>154</td>
<td>177</td>
</tr>
<tr>
<td>Corpus Christi</td>
<td>901</td>
<td>499</td>
<td>172</td>
<td>230</td>
</tr>
<tr>
<td>Beaumont</td>
<td>1,323</td>
<td>991</td>
<td>54</td>
<td>279</td>
</tr>
<tr>
<td>Amarillo</td>
<td>1,600</td>
<td>1,150</td>
<td>94</td>
<td>356</td>
</tr>
<tr>
<td>Pharr</td>
<td>737</td>
<td>291</td>
<td>37</td>
<td>409</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>27,121</strong></td>
<td><strong>24,564</strong></td>
<td><strong>2,110</strong></td>
<td><strong>26,675</strong></td>
</tr>
</tbody>
</table>

Source: ATRI. Analysis by Cambridge Systematics (2019). Note that additional study is underway to better estimate demand from local operators involved in the oil and gas industry in the Permian Basin.
5.4 Truck Parking Shortage Including Other Unauthorized Areas

Data in the exhibits above do not include an estimate of demand based on the unauthorized truck parking in other areas presented in Section 3.5 above.\textsuperscript{11} That analysis estimated that approximately 4 percent of trucks parked outside of authorized locations and outside of the TxDOT right of way are likely parked on street shoulders, edges of roads, or other areas. Much of this activity is likely associated with staging parking, so it is highest in urban areas.

Including this estimate of unauthorized truck parking, the average number of trucks parked between 1–2 a.m. on weekdays adds to the demand by approximately 11 additional spaces needed in the Childress District to more than 1,180 additional spaces in the Dallas District. This information is shown in Exhibit 56 below.

Adding these trucks to the demand identified above produces a different view of the truck parking shortage, shown in Exhibit 57 on the following page. Abilene, Bryan, Fort Worth, Houston, Laredo, and San Angelo districts flip from having a truck parking surplus to a shortage. Surpluses in Brownwood, Lubbock, Lufkin, Wichita Falls, and Yoakum, districts are all less than 100.

Based on this collection of information, the areas of largest truck parking concerns at the district level appear to be in the eastern half of the State, particularly in the Texas Triangle between San Antonio, Houston, and Dallas-Fort Worth along Interstates I-35, I-45, and I-10, as well as El Paso District.

Exhibit 56: Unauthorized Truck Parking Demand (Peak Hour) by District


\textsuperscript{11} The 4\% estimate of trucks parked on street shoulders, outside of authorized locations and outside of the TxDOT right of way, was developed to help frame the magnitude of the lack of truck parking within the state, but is not precise enough to be included with other more accurate data and estimates. More precise estimates will require local data and input, and will vary by location.
Exhibit 57: Net Truck Parking by District – Authorized Locations and All Unauthorized

Net Truck Parking by District - Authorized Locations & All Unauthorized

Source: ATRI, Analysis by Cambridge Systematics (2019). Note that additional study is underway to better estimate demand from local operators involved in the oil and gas industry in the Permian Basin.
District level utilization by category using these net values are shown in the District Profiles. Exhibit 58 below shows an example from the Beaumont District. These profiles show that across nearly every district, there are a number of locations that are filling up during the peak hour even if the district as a whole shows a surplus of spaces. In the Beaumont District, the nine busiest privately operated locations actually have a small shortage of spaces and two of the three rest areas/travel information centers are more than 75 percent full.12 This pattern is also observable in the corridor analysis in Section 5.8 where certain corridors (I-35, I-40, and I-45) are above 100 percent utilization even though some locations along those corridors have available capacity.

Exhibit 58: District Utilization by Location Type – Beaumont District Example

<table>
<thead>
<tr>
<th>Location Type</th>
<th>Number of Locations</th>
<th>Number of Spaces</th>
<th>Number of Parked Trucks</th>
<th>Shortage / Surplus of Spaces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Truck Stops</td>
<td>17</td>
<td>1,236</td>
<td>938</td>
<td>298</td>
</tr>
<tr>
<td>Rest Areas/Travel Information Center</td>
<td>2</td>
<td>61</td>
<td>28</td>
<td>33</td>
</tr>
<tr>
<td>Picnic Area/Pullouts</td>
<td>1</td>
<td>26</td>
<td>24</td>
<td>2</td>
</tr>
<tr>
<td>Unauthorized in TxDOT Right of Way</td>
<td>-</td>
<td>-</td>
<td>54</td>
<td>-</td>
</tr>
<tr>
<td>Unauthorized Elsewhere</td>
<td>-</td>
<td>-</td>
<td>124</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>20</strong></td>
<td><strong>1,323</strong></td>
<td><strong>1,168</strong></td>
<td><strong>155</strong></td>
</tr>
</tbody>
</table>

Weekday average of modeled data at 1 A.M. (Statewide Peak Hour)

Number of Locations With High Or Medium Capacity Needs *  
10

Number of Locations With Low Capacity Needs *  
10

*Capacity Need: High = > 80% Utilization at Peak Hour | Medium = 30%-80% Utilization at Peak Hour | Low = < 30% Utilization at Peak Hour


5.5 **Gross Truck Parking Shortage**

Because demand is not evenly distributed geographically throughout the State, and/or the amenities desired by drivers vary by location, some locations are overcapacity and others may be nearly empty. Therefore, one final way to look at the district shortage is to not reduce the deficit at one location by the surplus at another. For example, if there were only 2 locations in a district, one with a shortage of 50 spaces and one with a surplus of 50 spaces, the district would not show a shortage or surplus of authorized truck parking. However, if the 2 locations are 50 miles apart, the surplus of truck parking at one location is of limited benefit to drivers facing a shortage at the other location. Therefore, the gross

---

12 The Orange Travel Information Center is the exception with a utilization rate below 30 percent.
District truck parking shortage is calculated by totaling up the deficit from locations that have a deficit of truck parking spaces during the peak hour, and adding to that the number of trucks parked in TxDOT right of way and the estimated number of trucks parked in unauthorized locations on local roads.

This analysis takes a worst-case approach by assuming that a surplus of truck parking in one location cannot meet excess demand in another and so is not used in the district summaries or following analysis. Using this approach, there is a gross shortage of more than 11,600 spaces statewide during the peak hour. This data is presented in Exhibit 59 and Exhibit 60. This approach makes a large difference in results where demand is concentrated in specific locations and a truck parking space in the wrong location does not necessarily help solve a parking shortage in another location.

**Exhibit 59: Gross Truck Parking Shortage by District (Excluding Surplus at Authorized Locations)**

<table>
<thead>
<tr>
<th>District</th>
<th>Sum of Peak Hour Shortage at Authorized Locations with a Shortage</th>
<th>Peak Hour Average Demand—TxDOT Right of Way</th>
<th>Peak Hour Other Unauthorized Parking Demand</th>
<th>Gross Peak Hour Shortage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dallas</td>
<td>754</td>
<td>208</td>
<td>1,184</td>
<td>-2,145</td>
</tr>
<tr>
<td>Houston</td>
<td>406</td>
<td>154</td>
<td>1,124</td>
<td>-1,684</td>
</tr>
<tr>
<td>Odessa</td>
<td>491</td>
<td>219</td>
<td>488</td>
<td>-1,197</td>
</tr>
<tr>
<td>San Antonio</td>
<td>293</td>
<td>123</td>
<td>431</td>
<td>-847</td>
</tr>
<tr>
<td>Fort Worth</td>
<td>114</td>
<td>110</td>
<td>477</td>
<td>-701</td>
</tr>
<tr>
<td>El Paso</td>
<td>289</td>
<td>62</td>
<td>240</td>
<td>-591</td>
</tr>
<tr>
<td>Waco</td>
<td>206</td>
<td>91</td>
<td>161</td>
<td>-459</td>
</tr>
<tr>
<td>Tyler</td>
<td>157</td>
<td>81</td>
<td>145</td>
<td>-383</td>
</tr>
<tr>
<td>Laredo</td>
<td>35</td>
<td>40</td>
<td>305</td>
<td>-380</td>
</tr>
<tr>
<td>Paris</td>
<td>152</td>
<td>78</td>
<td>71</td>
<td>-301</td>
</tr>
<tr>
<td>Abilene</td>
<td>135</td>
<td>74</td>
<td>86</td>
<td>-294</td>
</tr>
<tr>
<td>Corpus Christi</td>
<td>5</td>
<td>172</td>
<td>109</td>
<td>-285</td>
</tr>
<tr>
<td>Austin</td>
<td>65</td>
<td>78</td>
<td>139</td>
<td>-281</td>
</tr>
<tr>
<td>Atlanta</td>
<td>76</td>
<td>138</td>
<td>66</td>
<td>-281</td>
</tr>
<tr>
<td>Amarillo</td>
<td>31</td>
<td>94</td>
<td>123</td>
<td>-248</td>
</tr>
<tr>
<td>Yoakum</td>
<td>84</td>
<td>47</td>
<td>93</td>
<td>-224</td>
</tr>
<tr>
<td>Beaumont</td>
<td>44</td>
<td>54</td>
<td>124</td>
<td>-222</td>
</tr>
<tr>
<td>Pharr</td>
<td>0</td>
<td>37</td>
<td>157</td>
<td>-193</td>
</tr>
<tr>
<td>Bryan</td>
<td>66</td>
<td>44</td>
<td>71</td>
<td>-182</td>
</tr>
<tr>
<td>District</td>
<td>Sum of Peak Hour Shortage at Authorized Locations with a Shortage</td>
<td>Peak Hour Average Demand—TxDOT Right of Way</td>
<td>Peak Hour Other Unauthorized Parking Demand</td>
<td>Gross Peak Hour Shortage</td>
</tr>
<tr>
<td>---------------</td>
<td>---------------------------------------------------------------</td>
<td>--------------------------------------------</td>
<td>---------------------------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Lubbock</td>
<td>24</td>
<td>39</td>
<td>118</td>
<td>-181</td>
</tr>
<tr>
<td>San Angelo</td>
<td>57</td>
<td>58</td>
<td>58</td>
<td>-173</td>
</tr>
<tr>
<td>Lufkin</td>
<td>37</td>
<td>32</td>
<td>59</td>
<td>-128</td>
</tr>
<tr>
<td>Wichita Falls</td>
<td>30</td>
<td>33</td>
<td>61</td>
<td>-124</td>
</tr>
<tr>
<td>Brownwood</td>
<td>10</td>
<td>30</td>
<td>20</td>
<td>-60</td>
</tr>
<tr>
<td>Childress</td>
<td>15</td>
<td>17</td>
<td>11</td>
<td>-44</td>
</tr>
<tr>
<td>Total</td>
<td>3,578</td>
<td>2,110</td>
<td>5,920</td>
<td>-11,609</td>
</tr>
</tbody>
</table>

Exhibit 60: Gross Truck Parking by District – Authorized Locations and All Unauthorized

5.6 *Truck Parking Shortage or Surplus at Publicly Owned Truck Parking Locations*

Of Texas’ 177 publicly owned truck parking locations included in the utilization analysis, 57 (32 percent) are at or overcapacity on average for at least 1 hour of the day and 40 of the 57 are at or overcapacity between 1–2 a.m. which is the peak hour for the State. The majority of these top locations follow a similar pattern, reaching capacity at some point between approximately 5 p.m. and 8 p.m., staying full overnight, then having some available inventory beginning around 7 a.m. Six locations are full throughout the entire day:

- Howard County Rest Area (I-20 EB) – Abilene District
- Ward County Rest Area (I-20 EB and WB) – Odessa District
- Midland County Picnic Area (I-20 EB) – Odessa District
- Bell County Rest Area (I-35 NB and SB) – Waco District.

Eleven additional locations are at or overcapacity for at least half of the day:

- Midland County Picnic Area (I-20 WB) – Odessa District
- Smith County Picnic Area (I-20 WB) – Tyler District
- Pecos East Rest Area (I-20 EB and WB) – Odessa District
- Leon County Picnic Area (I-45 NB and SB) – Bryan District
- Van Zandt County Rest Area (I-20 WB) – Tyler District
- Gainesville Travel Information Center (I-35 SB) – Wichita Falls District
- Reeves County Picnic Area (I-20 EB) – Odessa District
- Crockett County Truck Pull-off (I-10 WB) – San Angelo District
- Sutton County Rest Area (I-10 EB) – San Angelo District

Rest areas which typically include restroom facilities are much more heavily utilized than picnic areas or pull-offs which often just have benches and possibly trash receptacles. Of the 85 rest areas or travel information centers in the state, 33 are at or overcapacity for at least one hour on average, with a total peak hour utilization rate of 86 percent–close to the privately owned location average of 92 percent. The State’s 92 picnic areas and pull-offs where utilization data was obtained had an average utilization rate of approximately 60 percent and only 24 locations were at or overcapacity for at least one hour on average. Overall, the utilization rate across all publicly owned locations is approximately 78 percent at the peak hour. That rate rises to 91 percent if utilization is determined separately at each location based on the hour of highest demand within each site, indicating that some public locations are seeing higher rates of use during other hours of the day.
The most common reason for shortages and surpluses has to do with the location, layout, and amenities offered at the truck parking facility. If it is located where many truck drivers need to park, it will typically fill up. If not, it won’t. In urban and suburban areas, generally the closer a facility is to shippers and receivers and other freight generators, the greater the utilization. The popularity of truck parking facilities in rural areas is harder to predict, and more than likely is a function of when a driver needs a break to comply with HOS requirements, and therefore truck parking demand may be more evenly dispersed across rural corridors.

However, it is not uncommon to find a completely full truck stop, with a partially full competing truck stop across the street. Likewise, it is common for a public rest area to have excess capacity, while two miles down the road a private truck stop parking area is completely full and trucks are spilling out onto adjacent roads and ramps. Through numerous interviews and surveys conducted for this and other studies, drivers have overwhelmingly indicated their preference for parking at full service truck stops where they have access to fuel, food, restrooms, showers, laundry, truck repair, etc. In addition, most drivers have fuel cards with national chains that earn the driver points which can be used towards purchases, incentivizing them to park at those truck stops.

As indicated previously, the average utilization rate in Texas of the “Big 3” national truck stop chains is 105%, in large part because they are strategically located where the owners can expect a return on their investment, and because they offer the amenities drivers needs as explained above. One other consideration for their success may be the well-designed layout of their facilities which enable convenient ingress and egress and flow through the property. Trucks parking along the streets have been observed adjacent to truck stops (not the “Big 3”) with ample available parking at a lot that does not have striping or a clear traffic flow, and which may only be partially paved. It is assumed that in these instances drivers feels safer parking on the street for short breaks, and not have to negotiate parking in an undefined lot.

In addition to location and the amenities and rewards offered to drivers, in many instances the discrepancy between truck parking utilization at nearby lots is due to lack of information. A driver may not be aware that two miles down the road is a clean rest area with available truck parking. However, in some instances they may be aware and yet still choose to park on the street next to their favorite truck stop. In a case like this, where nearby truck parking is available and parking on the street is a community nuisance or safety concern, greater enforcement might be needed.

Exhibit 61 shows utilization of Texas’ publicly owned locations along with the shortage or surplus of total truck parking by district.

A location profile for each of the 177 locations, including graphs showing utilization by hour, aerial images showing where trucks are actually parked, and data on the duration of stops are provided in Appendix B.
Exhibit 61: Publicly Owned Truck Parking Utilization and District Shortage/Surplus

Source: ATRI, Analysis by Cambridge Systematics (2019). Note that additional study is underway to better estimate demand from local operators involved in the oil and gas industry in the Permian Basin.
5.7 **Truck Parking Shortage or Surplus at Privately Owned Truck Parking Locations**

Of the 467 identified privately owned truck parking locations in Texas with utilization data, 180 are at or overcapacity for at least 1 hour each day, 158 of them during the peak hour. Similar to the publicly owned locations, the busiest periods are the overnight hours although a large number of locations (72) are at or overcapacity for 20 or more hours of the day, indicating sustained demand beyond the overnight peak. These 72 locations are distributed between 20 of Texas’ 25 districts as shown in Exhibit 62 with the largest concentration in Dallas District.\(^\text{13}\)

**Exhibit 62: Distribution of Privately Owned Locations At/Overcapacity for 20 or More Hours**

![Graph showing distribution of privately owned locations at/overcapacity for 20 or more hours.]


The largest shortage at any location is a Love’s in El Paso just south of the border with New Mexico (shown in Exhibit 63) with an estimated utilization of approximately 248 percent (shortage of approximately 134 spaces with an inventory of 91) at the peak hour. A Flying J and Pilot at the same exit also are overcapacity at the peak hour. However, the Anthony Texas Travel Center located less than 2 miles south is consistently below 50 percent utilization and often well below that (see Exhibit 64).

The second largest overall shortage is TA New Braunfels on I-35 between San Antonio and Austin (shown in Exhibit 65) with a shortage of approximately 130 spaces at the peak hour (approximately 160 percent utilization).

This does not mean that there are 100 or more trucks parked at these locations between 1–2 a.m. than what the location can accommodate but instead that the demand for truck

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\(^{13}\) Abilene, Corpus Christi, Odessa, and San Angelo do not have a privately owned location that is overcapacity for at least 20 hours.
parking is very high. Some trucks may be at the location and parked along curbs or in unstriped areas. Others may be parking at other authorized locations nearby or potentially parking on TxDOT or local road right of way or in other unauthorized areas. Others may be trucks parked for part of the hour but leaving in time to accommodate another arriving truck.

Exhibit 66 shows peak hour utilization at privately owned truck parking locations statewide with the shortage or surplus of total truck parking by district in the background. The Dallas-Fort Worth region (especially Dallas District and areas east) has the largest concentration of locations at or overcapacity, but privately owned locations with a shortage exist across all 25 districts. Total utilization across all privately owned locations is approximately 92 percent.

Heat maps showing this information for individual districts are included in the district profiles in Appendix A.

Finally, as mentioned above, discussions with stakeholders indicate that location, design, and amenities influence where a driver chooses to park, especially in a corridor with available options. Private truck stop operators understand these needs and must locate their facilities in areas where they can make a return on investment. The “Big 3” truck stop operators in the U.S.—Love’s, Pilot/FlyingJ, and TA-Petro—have 150 locations with approximately 16,201 spaces in Texas (70 percent of the private capacity) where utilization data was obtained. Across these locations, the total utilization rate at the peak hour is approximately 105 percent, well above the total for the entire set of privately owned locations (approximately 92 percent). These facilities typically have excellent amenities including showers, food options, wireless internet, and laundry, often have rewards programs or fuel cards active with specific fleets, and some allow specific companies (typically those with large fleets) to reserve spaces, guaranteeing a driver a safe place to park.
Exhibit 63: Loves (El Paso, I-10)—Example Location Utilization

Exhibit 64: Anthony Texas Traveler Information Center (El Paso, I-10)—Example Location Utilization

Exhibit 65: TA (New Braunfels, I-35)—Example Location Utilization

Exhibit 66: Privately Owned Truck Parking Utilization and District Shortage/Surplus

Source: ATRI, Analysis by Cambridge Systematics (2019). Note that additional study is underway to better estimate demand from local operators involved in the oil and gas industry in the Permian Basin.
5.8 Truck Parking Shortage or Surplus on Texas’ Interstate Corridors

Looking at utilization along a specific corridor is another way to identify high-need locations. The utilization of authorized truck parking locations within 1 mile of Texas’ main Interstate corridors is summarized in Exhibit 67 below. The total utilization rate across all of the locations in the identified corridors is approximately 99 percent and there are an additional 676 trucks parked during the peak hour on highway shoulders and ramps on an average evening. Use on I-20, I-30, I-35, and I-45 all exceed the existing inventory during the peak hour. The following sections provide an overview of truck parking utilization along each corridor. The needs analysis will further refine this information at a county/route level and help identify if specific sections of a given corridor are seeing higher demand.

Exhibit 67: Truck Parking Utilization by Interstate Corridor

<table>
<thead>
<tr>
<th>Interstate Corridor</th>
<th>Number of Truck Parking Locations</th>
<th>Total Truck Parking Spaces</th>
<th>Average Weekday Peak Hour Demand</th>
<th>Total Corridor Utilization</th>
<th>Number of Locations At/Overcapacity at Peak Hour (1–2 a.m.)</th>
<th>Average Weekday Trucks Parked in Highway Right of Way at Peak Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-10</td>
<td>112</td>
<td>5,772</td>
<td>5,521</td>
<td>96%</td>
<td>40</td>
<td>117</td>
</tr>
<tr>
<td>I-20</td>
<td>91</td>
<td>4,599</td>
<td>4,718</td>
<td>103%</td>
<td>43</td>
<td>165</td>
</tr>
<tr>
<td>I-27</td>
<td>15</td>
<td>636</td>
<td>490</td>
<td>77%</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>I-30</td>
<td>19</td>
<td>826</td>
<td>1,059</td>
<td>128%</td>
<td>14</td>
<td>126</td>
</tr>
<tr>
<td>I-35</td>
<td>67</td>
<td>4,573</td>
<td>4,892</td>
<td>107%</td>
<td>35</td>
<td>185</td>
</tr>
<tr>
<td>I-37</td>
<td>18</td>
<td>492</td>
<td>289</td>
<td>59%</td>
<td>0</td>
<td>30</td>
</tr>
<tr>
<td>I-40</td>
<td>23</td>
<td>1,309</td>
<td>976</td>
<td>75%</td>
<td>3</td>
<td>21</td>
</tr>
<tr>
<td>I-45</td>
<td>30</td>
<td>1,538</td>
<td>1,555</td>
<td>101%</td>
<td>19</td>
<td>50</td>
</tr>
<tr>
<td>Total</td>
<td>375</td>
<td>19,745</td>
<td>19,500</td>
<td>99%</td>
<td>142</td>
<td>702</td>
</tr>
</tbody>
</table>


Key observations regarding each corridor are noted below, followed by maps of each in Exhibit 68 through Exhibit 75. Note that the maps show locations more than 1 mile from the specified corridor faded for reference. Only locations included in the utilization analysis are shown in the maps.

- **I-10** is a major freight corridor from the Ports of Los Angeles and Long Beach to Florida. It passes through Texas connecting 3 major urban areas (Houston, San Antonio, and El Paso) and makes up the south leg of the Texas Triangle. Approximately one-third of the locations within 1 mile of the corridor are at or overcapacity on an average night during the peak hour (1–2 a.m.) and the total utilization within authorized sites is approximately
96 percent. There are approximately 120 additional trucks parked on I-10 shoulders and ramps on an average night. There are few observable patterns within the corridor for which locations are filling up at night with some locations overcapacity while others in close proximity are not reaching capacity (see Exhibit 63 and associated text for an example from El Paso).

- **I-20** connects the Dallas-Fort Worth metropolitan area to the energy sector and natural resources of West Texas. The utilization rate across the entire corridor is approximately 103 percent driven by demand in the Permian Basin and east of Ft. Worth, and there is a demand for nearly 165 additional spaces based on trucks parked on I-20 ramps and shoulders between 1–2 a.m. Approximately half of the locations in the corridor are at or overcapacity on an average night, 13 of which are publicly owned locations. The eastern portion of the corridor near Dallas and to the Louisiana border has a higher number of locations with high utilization rates. In addition, as further data on trucks supporting drilling activity is collected and analyzed in the Permian Basin region, the utilization of these locations may also rise.

- **I-27** connects the agricultural regions in the Texas Panhandle, and is part of the ports-to-plains corridor. It has the third lowest total utilization rate and the fewest trucks parked on shoulders or ramps even though it had the lowest number of total spaces within 1 mile of the corridor. A Love’s in Lubbock and Taylor Petroleum in Plainview are the only 2 locations with a shortage but both appear to be full at most hours of the day.

- **I-30** connects the Dallas-Fort Worth metropolitan area to Texarkana, and north and east to Memphis and Chicago. It has the highest utilization rate of any corridor at 128 percent and 14 of the 19 locations are at or overcapacity on an average weeknight during the peak hour. Approximately 125 additional trucks park on the highway shoulder or ramps on an average night. Note that the Hopkins County Rest Area appears underutilized in the map but was only completed in October 2018, so there was limited ATRI GPS data available for the location. Field reviews suggest use of the rest area is higher than data indicate and a closed rest area nearby, near Saltillo, was heavily utilized prior to closing. This corridor has the lowest number of truck parking spaces per truck miles traveled, and the lowest number of spaces per AADTT.

- **I-35** is a major NAFTA trade corridor from Mexico to Canada, a critical north-south trucking corridor through the central United States that passes through several large metro areas in Texas (Laredo, San Antonio, Austin, and Dallas-Fort Worth). The corridor has the second highest utilization rate (107 percent) and the highest number of trucks parked on shoulders/ramps during the peak hour on an average day (185). More than half of the locations in the corridor are at or near capacity on an average night during the peak hour and high activity is found throughout the entire corridor.

- **I-37** is a relatively short corridor connecting San Antonio and Corpus Christi. It has the lowest corridor utilization rate and no locations that are at or overcapacity.
- **I-40**, like I-10 to the south, is a major east to west coast trucking route, passing through Amarillo and the Texas Panhandle. It has the second lowest average utilization rate of approximately 75 percent among its 23 locations and the second-lowest number of trucks parked in the highway right of way. The corridor has the highest number of truck parking spaces per 100,000 truck-miles traveled.

- **I-45** makes up the eastern leg of the Texas Triangle, connecting Port of Houston to the Dallas-Fort Worth metropolitan area. It has the fourth highest utilization rate (101 percent) and 19 of the 30 locations are at or overcapacity during the peak hour.
Exhibit 68a: Authorized Truck Parking Locations: Inventory and Utilization on I-10 Corridor (West to East)

Exhibit 68b: Authorized Truck Parking Locations: Inventory and Utilization on I-10 Corridor (West to East)

Exhibit 68c: Authorized Truck Parking Locations: Inventory and Utilization on I-10 Corridor (West to East)

Exhibit 68d: Authorized Truck Parking Locations: Inventory and Utilization on I-10 Corridor (West to East)

Exhibit 69a: Authorized Truck Parking Locations: Inventory and Utilization on I-20 Corridor (West to East)

Authorized Truck Parking Locations: Inventory and Utilization On I-20

Source: ATRI. Analysis by Cambridge Systematics (2019). Note that additional study is underway to better estimate demand from local operators involved in the oil and gas industry in the Permian Basin.
Exhibit 69b: Authorized Truck Parking Locations: Inventory and Utilization on I-20 Corridor (West to East)

Authorized Truck Parking Locations: Inventory and Utilization On I-20

Source: ATRI. Analysis by Cambridge Systematics (2019). Note that additional study is underway to better estimate demand from local operators involved in the oil and gas industry in the Permian Basin.
Exhibit 69c: Authorized Truck Parking Locations: Inventory and Utilization on I-20 Corridor (West to East)

Source: ATRI. Analysis by Cambridge Systematics (2019). Note that additional study is underway to better estimate demand from local operators involved in the oil and gas industry in the Permian Basin.
Exhibit 70: Authorized Truck Parking Locations: Inventory and Utilization on I-27 Corridor

Exhibit 71: Authorized Truck Parking Locations: Inventory and Utilization on I-30 Corridor

Authorized Truck Parking Locations: Inventory and Utilization On I-30

Exhibit 72a: Authorized Truck Parking Locations: Inventory and Utilization on I-35 Corridor (North to South)

Exhibit 72b: Authorized Truck Parking Locations: Inventory and Utilization on I-35 Corridor (North to South)

Exhibit 72c: Authorized Truck Parking Locations: Inventory and Utilization on I-35 Corridor (North to South)

Exhibit 73: Authorized Truck Parking Locations: Inventory and Utilization on I-37 Corridor

Exhibit 74: Authorized Truck Parking Locations: Inventory and Utilization on I-40 Corridor

Exhibit 75a: Authorized Truck Parking Locations: Inventory and Utilization on I-45 Corridor (North to South)

Exhibit 75b: Authorized Truck Parking Locations: Inventory and Utilization on I-45 Corridor (North to South)

5.9 Stakeholders Affected by Truck Parking Shortages

Below is a summary of stakeholders affected by shortages in truck parking, how they are affected, and how they benefit from adequate parking.

5.9.1 Truck Drivers and the Trucking Industry

The prevalent compensation structure in the industry—being paid per mile—impacts driver wages when truck parking issues prevent a driver from maximizing revenue-earning miles driven. ATRI collected detailed travel diary data from drivers which showed that drivers lose an average of 56 minutes a day of revenue and compensation-earning drive time. This lost productivity equates to $4,600 in lost wages, over 10 percent of the average truck driver’s annual wages.

Of greater importance to drivers than lost wages is their personal safety. The story of Jason Rivenburg, recorded by FHWA, has driven significant safety improvements:

“On March 4, 2009, Jason stopped for a delivery in Virginia and then headed toward a delivery destination in South Carolina. While only 12 miles from the delivery location, he needed to find parking to rest through the night as his arrival location was not yet open to receive deliveries. Jason did not have a safe place to park. Jason had learned from truckers familiar with the area that a nearby abandoned gas station was a safe location to park and proceeded to park there for the night. Tragically, he was attacked and murdered at this location while he slept with his killer taking both his life and just $7.00 that he had in his wallet.

“Since his death, Jason’s wife, Hope Rivenburg, has worked diligently to bring attention to the national truck parking shortage problem. Her efforts, along with those of countless family members, friends, and representatives from the trucking industry, helped to push forth legislation to focus national attention on the issue. After several versions of the Jason’s Law legislative language were brought to Congress, the legislative language described above was incorporated into MAP-21.”

In addition to acts of violence, parking outside of authorized truck parking locations increases the risk of being struck by a moving vehicle. As noted in the Truck Parking Crash Analysis report for this study, during the 2013–2017 period, there were 2,315 crashes in Texas involving parked trucks resulting in 138 fatalities (in 117 crashes) and 997 injuries (in 657 crashes). All of those crashes occurred outside of authorized truck parking locations.

Drivers must take a number of precautionary measures to protect cargo, among which is parking in secure locations. While cargo can be, and often is stolen at authorized locations,

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15 “Jason’s Law Truck Parking Survey Results and Comparative Analysis.”
the most common location is at a store parking lot or unsecured empty lot where a trailer is parked for the weekend, awaiting a Monday delivery.\footnote{16}

5.9.2 Shippers and Receivers
The rates carriers charge and the service they provide is increasingly tied to the way they are treated by their customers. A recent survey conducted by Zipline Logistics “showed that 77 percent carriers are much more selective in the shippers and receivers that they are willing to load in/out of since the [ELD] Mandate and that 80 percent of carriers state that there are now facilities they will absolutely not load out of.... All have a reputation of long load and unload times.”\footnote{17}

One company interviewed for this study stated that they have stopped serving some of their customers because of the long wait times and no staging allowed on-site or parking available nearby while they wait. All drivers and companies voiced similar frustrations with the lack of staging. The issue is so prevalent that a recent startup, Dock411, is offering an app that allows drivers to rate shippers and receivers.

Several of those interviewed for this study independently held up Hershey's as an example of a carrier-friendly company that is punctual and provides on-site truck parking and a comfortable lounge for drivers when they do have to wait. Companies like Hershey's will likely receive better service and rates from carriers.

5.9.3 Local Communities
Lack of truck parking near residential neighborhoods sometimes leads to roadside truck parking that frustrates local residents. In response, local entities often post “No Truck Parking” signs which only causes trucks to relocate to another street since they have no other option.

For the same reason providing truck parking makes financial sense for shippers and receivers, local communities also may benefit from lower shipping rates and a healthier economic environment by creating common and secure staging lots in industrial centers that can service many shippers and receivers. A common staging lot would replace the need for shippers and receivers to provide on-site truck parking, thereby enabling them to maximize warehousing space on their lot, and make the industrial park an attractive location for establishing freight-dependent businesses.

5.9.4 Traveling Public
Providing adequate truck parking, and thus removing trucks parked on the sides of roads, especially high-speed highways, improves the safety for all drivers on the road. As noted in the Truck Parking Crash Analysis report for this study, crashes with parked trucks resulted in

higher severity than crashes with trucks in general. This finding is expected due to the higher speed differential between a moving and a stationary vehicle compared to 2 vehicles moving in the same direction. Additionally, the significant weight of a truck can result in greater damage to the vehicle in motion compared to potential damage if 2 light vehicles collided. More than 70 percent of crashes involving parked trucks occurred in urbanized areas. However, more than half of fatal parked-truck crashes occurred in rural areas—mostly on roads with a speed limit of 55 mph or greater.
6.0 Safety Rest Area Design Comparison (SRA)

A design comparison of a representative older safety rest area, one newer safety rest area, and one out-of-state rest area was performed in order to identify the potential to modify or upgrade public rest areas in Texas to better accommodate trucks. The amenities of these representative rest areas also were compared.

6.1 Methodology

When choosing the representative rest areas, it was important that all of them be located on similar roadways and therefore subject to similar use by trucks. It was decided that only rest areas located along an interstate highway would be considered.

The Medina County SRA was chosen as the older rest area representative. This rest area was chosen because it is located on an Interstate (I-35), was constructed in 1979, and serves as a good representation of rest areas constructed during the 70s and early 80s as it is smaller in size and has only parallel truck parking. The Bell County SRA located just outside Salado was chosen as the newer rest area representative. This rest area was chosen because it is located on an Interstate (I-35), was constructed in 2007, and serves as a good representation of rest areas constructed during the 2000s as it is larger in size and has angled truck parking. Additionally, this rest area was selected because it is routinely highly utilized as indicated from both ATRI data and physical observation. The Hart County SRA located along I-65 near Horse Cave, Kentucky, was chosen as the representative out-of-state rest area, because it was noted by truckers during interviews as being a particularly well-designed rest area with easy ingress, egress, and overall maneuverability.

The plan sets for both the Bell County SRA’s and the Hart County SRA’s were obtained from TxDOT and the Kentucky Cabinet of Transportation, respectively. These plan sets were reviewed for specific design criteria and the specs were entered into a comparison matrix. Unfortunately, the plan set for the Medina County SRA, or any rest area built in that time period, was not available. Therefore, Google Earth satellite imagery was used to get estimates for design features. Google Earth aerial imagery also was used to count the number of public rest areas with parallel only truck parking within Texas.

Amenities were examined by looking at aerial images of the rest areas, photos in Google reviews of the rest areas, and online information listed on the TxDOT website.

6.2 Results

The results of the design comparison are presented in Exhibit 76, and aerial images of each of the rest areas can be found in Section 6.3.

The Hart County SRA in Kentucky have about 200 spaces, far more truck parking spots than either of the two Texas rest areas that were analyzed, however the Bell County SRA’s (NB and SB) have more right of way associated with them than the Kentucky rest areas. This is due to the presence of frontage roads that run behind the Bell County SRA’s, which require additional right of way, as well as 4 detention ponds in the northbound direction.
Both the Bell County and Kentucky SRA’s have angled truck parking that are separated from the passenger vehicle parking, while the Medina County rest areas utilize parallel truck parking which is located adjacent to passenger vehicle parking. Parallel truck parking can be dangerous because anytime a truck has to reverse it creates sight and safety issues. Furthermore, parallel truck parking is often not an efficient use of space as trucks who parked earlier may leave gaps in between trucks that cannot simply be pulled into, resulting in unused space. The truck parking at the Medina County SRA is also located directly adjacent to the passenger vehicle parking which can create conflict points between trucks and passenger vehicles.

There are 28 SRA’s and 71 picnic/pull-off areas in Texas that only offer parallel parking for trucks, as determined from aerial imagery. The total utilization rate at these locations is approximately 66 percent compared to the 78 locations with some or all angled truck parking which have a total utilization rate of 85 percent. Since locations with angled truck parking typically are at newer rest areas or travel information centers with larger inventories and amenities such as restrooms or wireless internet, the higher use of these locations cannot be linked directly to the design of truck parking, though it may be a factor. Examining just public locations with a surplus of truck parking at the peak hour, a similar pattern emerges with 47 percent utilization at locations with just parallel truck parking and 57 percent at locations with angled truck parking.

The Medina County acceleration and deceleration lane lengths also are shorter than the Bell County or Kentucky SRA’s. This can cause issues for trucks which require longer distances to slow down and speed up.

In summary, older SRA’s in Texas tend to provide only parallel parking for trucks or a mix of both angled and parallel truck parking and tend to be smaller ranging from about 5 to 18 truck parking spaces. The newer SRA’s in Texas are larger and contain angled truck parking that is generally separated from passenger vehicle parking. These locations typically contain anywhere from 25 to 60 truck parking spots. The Kentucky rest area is much larger than the SRA’s in Texas, containing more truck parking spots. However, the right of way requirements are smaller than some of the SRA’s in Texas due to a lack of frontage roads in Kentucky.

6.2.1 Amenities
The amenities provided at the 3 rest areas are listed in Exhibit 77. The amenities offered at the three facilities are fairly similar and include, restrooms, vending machines, picnic areas, handicap access, drinking water, and lighting. All three rest areas provide green space which can be used to walk a dog. The Bell County rest area also offers a playground for children and a storm shelter.
## Exhibit 76: Rest Area Design Comparison

<table>
<thead>
<tr>
<th>Design Criteria</th>
<th>Medina County Safety Rest Area I-35 NB</th>
<th>Medina County Safety Rest Area I-35 SB</th>
<th>Bell County Safety Rest Area I-35 NB</th>
<th>Bell County Safety Rest Area I-35 SB</th>
<th>Bell County Safety Rest Area (Kentucky) I-65 NB</th>
<th>Hart County Safety Rest Area (Kentucky) I-65 SB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right of Way</td>
<td>~390,000 sq. ft</td>
<td>~395,000 sq. ft</td>
<td>~2,200,000 sq. ft</td>
<td>~2,350,000 sq. ft</td>
<td>~1,210,000 sq. ft</td>
<td>~1,460,000 sq. ft</td>
</tr>
<tr>
<td>Frontage road</td>
<td>Two-way frontage road located behind rest area</td>
<td>Two-way, one-way frontage road located behind rest area</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Length of deceleration ramp</td>
<td>Data Unavailable</td>
<td>Data Unavailable</td>
<td>1,500 feet</td>
<td>1,149 feet</td>
<td>763.94 feet</td>
<td>763.94 feet</td>
</tr>
<tr>
<td>Length of acceleration ramp</td>
<td>Data Unavailable</td>
<td>Data Unavailable</td>
<td>Not enough info</td>
<td>Not enough info</td>
<td>Data Unavailable</td>
<td>Data Unavailable</td>
</tr>
<tr>
<td>Width of deceleration ramp</td>
<td>15 feet</td>
<td>15 feet</td>
<td>14 feet</td>
<td>14 feet</td>
<td>15 feet</td>
<td>15 feet</td>
</tr>
<tr>
<td>Length of acceleration ramp</td>
<td>Data Unavailable</td>
<td>Data Unavailable</td>
<td>739 feet</td>
<td>1,537 feet</td>
<td>763.94 feet</td>
<td>763.94 feet</td>
</tr>
<tr>
<td>Right of way</td>
<td>Data Unavailable</td>
<td>Data Unavailable</td>
<td>793 feet</td>
<td>1537 feet</td>
<td>763.94 feet</td>
<td>763.94 feet</td>
</tr>
<tr>
<td>Angle of deceleration ramp</td>
<td>Data Unavailable</td>
<td>Data Unavailable</td>
<td>14 feet</td>
<td>14 feet</td>
<td>15 feet</td>
<td>15 feet</td>
</tr>
<tr>
<td>Vertical grade of deceleration ramp</td>
<td>Data Unavailable</td>
<td>Data Unavailable</td>
<td>Data Unavailable</td>
<td>Data Unavailable</td>
<td>Data Unavailable</td>
<td>Data Unavailable</td>
</tr>
<tr>
<td>Center aisle</td>
<td>Data Unavailable</td>
<td>Data Unavailable</td>
<td>Data Unavailable</td>
<td>Data Unavailable</td>
<td>Data Unavailable</td>
<td>Data Unavailable</td>
</tr>
<tr>
<td>Outer aisle</td>
<td>N/A</td>
<td>N/A</td>
<td>59 feet (Frontage Road side)</td>
<td>59 feet (Frontage Road side)</td>
<td>40 feet</td>
<td>40 feet</td>
</tr>
</tbody>
</table>

1. For the length of deceleration and acceleration ramps, the distance was measured using Google Maps for both the Bell County and the Kentucky rest areas.
2. For the length of truck parking spaces for the Kentucky rest area, the distance was measured using the scale from the plans and it correlated with the one obtained using Google Maps distance measuring tool.
3. The width of truck parking spaces for the Kentucky rest area was estimated using Google Maps.
4. The width of deceleration and acceleration ramps for the Bell County rest area was estimated using Google Maps.
5. The right of way was estimated using Google Earth.
### Exhibit 77: List of Amenities by Safety Rest Area

<table>
<thead>
<tr>
<th>Medina County Safety Rest Area</th>
<th>Medina County Safety Rest Area I-35 SB</th>
<th>Bell County Safety Rest Area I-35 NB</th>
<th>Bell County Safety Rest Area I-35 SB</th>
<th>Hart County Safety Rest Area (Kentucky) I-65 NB</th>
<th>Hart County Safety Rest Area (Kentucky) I-65 SB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open 24 hours</td>
<td>Open 24 hours</td>
<td>Open 24 hours</td>
<td>Open 24 hours</td>
<td>Open 24 hours</td>
<td>Open 24 hours</td>
</tr>
<tr>
<td>Men's and Women's Restrooms</td>
<td>Men's and Women's Restrooms</td>
<td>2 sets of Men's and Women's Restrooms</td>
<td>2 sets of Men's and Women's Restrooms</td>
<td>Men's and Women's Restrooms</td>
<td>Men's and Women's Restrooms</td>
</tr>
<tr>
<td>Drinking Water</td>
<td>Drinking Water</td>
<td>Drinking Water</td>
<td>Drinking Water</td>
<td>Drinking Water</td>
<td>Drinking Water</td>
</tr>
<tr>
<td>N/A</td>
<td>N/A</td>
<td>Family/Assisted Restroom</td>
<td>Family/Assisted Restroom</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>N/A</td>
<td>N/A</td>
<td>Group Picnic Facility</td>
<td>Group Picnic Facility</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Picnic Tables</td>
<td>Picnic Tables</td>
<td>Picnic Tables</td>
<td>Picnic Tables</td>
<td>Picnic Tables</td>
<td>Picnic Tables</td>
</tr>
<tr>
<td>N/A</td>
<td>N/A</td>
<td>Playground</td>
<td>Playground</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Vending Machines</td>
<td>Vending Machines</td>
<td>Vending Machines</td>
<td>Vending Machines</td>
<td>Vending Machines</td>
<td>Vending Machines</td>
</tr>
<tr>
<td>Trash Cans</td>
<td>Trash Cans</td>
<td>Trash Cans</td>
<td>Trash Cans</td>
<td>Trash Cans</td>
<td>Trash Cans</td>
</tr>
<tr>
<td>Lighting</td>
<td>Lighting</td>
<td>Lighting</td>
<td>Lighting</td>
<td>Lighting</td>
<td>Lighting</td>
</tr>
<tr>
<td>Dog walking area</td>
<td>Dog walking area</td>
<td>Dog walking area</td>
<td>Dog walking area</td>
<td>Dog walking area</td>
<td>Dog walking area</td>
</tr>
<tr>
<td>WiFi</td>
<td>WiFi</td>
<td>WiFi</td>
<td>WiFi</td>
<td>No WiFi</td>
<td>No WiFi</td>
</tr>
</tbody>
</table>

Source: Google photos, TxDOT Safety Rest Area Map.
6.3 Safety Rest Area Aerial Imagery
Exhibit 78 through Exhibit 82 provide aerial images of the rest area sites compared in this analysis.

*Exhibit 78: Medina County Safety Rest Area Northbound*

Source: Google Earth. Area in red shows truck parking spaces.
Exhibit 79: Medina County Rest Area Southbound

Source: Google Earth. Area in red shows truck parking spaces.
Exhibit 80: Bell County Rest Area Northbound

Source: Google Earth. Area in red shows truck parking spaces.
Exhibit 81: Bell County Rest Area Southbound

Source: Google Earth. Area in red shows truck parking spaces.
Exhibit 82: Hart County Rest Area (Kentucky) Northbound and Southbound

Source: Google Earth. Area in red shows truck parking spaces.
7.0 Next Steps

The next technical memo will accomplish three key goals associated with Tasks 2.8, 2.10, and 2.12. First, it will develop a model to forecast the future demand for truck parking (Task 2.8). Second, it will summarize the existing and anticipated future truck parking needs and consider them in relation to safety concerns and key freight generators in the State such as border crossings, intermodal facilities, and industrial/commercial centers (Task 2.10). Third, it will present a “toolbox” of potential solutions TxDOT could pursue to address truck parking issues in the State (Task 2.12). This final goal will be supplemented by a second round of stakeholder workshops. This approach will provide a holistic view of truck parking issues in Texas.

The following memo (Task 2.13) will include additional details on selected truck parking solutions that can be deployed in Texas and provide information on the sequence of activities which must occur for the concept to be fully realized.