

3.0 COMMERCIAL TRUCK PARKING SUPPLY

3.1 INTRODUCTION

This section contains an inventory of the number of public rest areas and commercial truck stops that could be used to comply with Federal hours-of-service rules. A survey of public rest areas was completed to develop an inventory of public rest area spaces. A proprietary database developed by Interstate America served as the primary basis for determining the number of spaces available at commercial truck stops and travel plazas. The inventory includes Interstate highways and the non-Interstate portions of the NHS with daily truck volumes greater than or equal to 1,000.^a A total of 39,963 Interstate and 21,702 non-Interstate miles were included in the inventory.

3.2 PUBLIC REST AREA PARKING FACILITIES

A survey that included 49 States (excluding Hawaii) was conducted to gather information on truck parking capacity at public rest areas and other public facilities.^b The following list describes the key findings from this analysis:

- The survey identified 31,249 spaces at 1,771 public facilities.
- Nationwide, about 10 percent of the total available parking spaces are at public facilities, with a low of 1 percent and a high of 39 percent within individual States. In 35 of the 49 States, parking spaces at public facilities amount to between 5 percent and 15 percent of the total.
- Some States restrict parking at public rest areas. For example, 27 States limit the length of time that a truck can park at some public rest areas.
- Some States augment the parking available for commercial vehicles at public rest areas by allowing parking at other facilities. For example, 11 States permit trucks to park for extended rest at some weigh stations.
- A total of 288,995 parking spaces (7.2 spaces per road-mile) were identified on Interstate highways, and 10 percent of these parking spaces were at public facilities. A total of 26,855 parking spaces (1.2 spaces per road-mile) were identified on non-Interstate highways, and 10 percent of these parking spaces were at public facilities.

- A 1996 survey of parking spaces at public rest areas documented a complete inventory for 33 States for a total of 16,334 spaces at 907 facilities.⁽⁵⁾ In the inventory completed for this study, 16,101 spaces were noted at 1,090 facilities for the same 33 States. This indicates a slight decrease of about 1 percent in the supply of parking spaces at public rest areas during this period.
- Eleven States reported plans to expand truck parking at public facilities by 1,609 spaces over the next 5 years, which implies an estimated growth of 5.1 percent over a 5-year period.

Detailed results on the number of public parking facilities and spaces for each State are listed in the first three columns of [Table 2](#).

3.3 COMMERCIAL TRUCK STOP AND TRAVEL PLAZA PARKING FACILITIES

Commercial truck stops and travel plazas are designed to provide drivers an opportunity to fulfill many non-rest related activities while public rest areas provide the driver with only minimal services. Commercial truck stop operators provide a number of services to trucks and typically provide extended parking to encourage drivers to use these services. In other words, commercial truck stop and travel plaza operators do not provide extended-stay parking as a primary service but only to encourage purchases of fuel, food, and other services. Truck stop operators do not generally charge for parking and provide parking only to attract business.

The primary data source for the inventory of parking spaces at commercial truck stops and travel plazas was the Truck Stops Database developed by Interstate America. The Federal Highway Administration, for purposes of this study, obtained a license for the use of the 1999 database, which includes every known facility in the United States and Canada. The Truck Stops Database, which is updated annually, contains information describing the number of commercial vehicle parking spaces available at each facility as well as information about the amenities available (e.g., type of fuel available, type of food available). The following list describes the key findings from this analysis:

- The analysis identified 284,601 spaces at 3,382 commercial facilities.
- Nationwide, about 90 percent of the total available parking spaces are at commercial facilities, with a low of 61 percent and a high of 99 percent within individual States. In 35 of the 49 States, parking spaces at commercial facilities amount to between 85 percent and 95 percent of the total.
- A total of 288,995 parking spaces (7.2 spaces per road-mile) were identified on

Interstate highways, and 90 percent of these parking spaces were at commercial facilities. A total of 26,855 parking spaces (1.2 spaces per road-mile) were identified on non-Interstate highways, and 89 percent of these parking spaces were at commercial facilities.

- The National Association of Truck Stop Operators (NATSO) Foundation reports an estimated annual growth rate of 6.5 percent for the number of parking spaces available at commercial truck stops and travel plazas.^c

Detailed results on the number of commercial truck stop and travel plaza parking facilities and spaces for each State are listed in [Table 2](#).

3.4 DRIVER'S ASSESSMENT OF PARKING FACILITY QUALITY

Because the number of available parking spaces is only part of the parking picture, respondents were asked to report how frequently truck parking spaces have certain usability characteristics. Drivers rated how frequently available parking is convenient to the highway, has the features they need, has time limits that allow enough time for their needs, has enough room for them to maneuver their trucks in and out, and is used only by trucks. Respondents gave mixed ratings for all these usability characteristics ([Table 3](#)). For each of these usability characteristics, *sometimes* [encountered] was the most frequently reported driver response. The usability characteristic that was most often encountered by respondents (i.e., most often given ratings of frequently or almost always) was *available parking has the features I need*, marked by 51 percent of respondents. Thirty-nine percent of respondents indicated that available parking is *frequently* or *almost always* convenient to the highway.

Table 2. Commercial truck parking inventory along Interstate and other NHS routes carrying more than 1,000 trucks per day

State	Public rest areas			Truck stops and travel plazas			Total
	Number of facilities	Number of spaces	Percent of total	Number of facilities	Number of spaces	Percent of total	Number of spaces
Alabama	27	712	9%	99	6,902	91%	7,614
Alaska ¹	N/A	457	100%	N/A	N/A	N/A	457
Arizona	38	559	6%	58	8,140	94%	8,699

Arkansas	21	343	4%	108	7,519	96%	7,862
California	88	1,106	13%	122	7,496	87%	8,602
Colorado	31	167	6%	57	2,710	94%	2,877
Connecticut	20	361	23%	12	1,243	77%	1,604
Delaware	1	70	18%	8	324	82%	394
Florida	69	1,709	19%	85	7,339	81%	9,048
Georgia	31	1,162	9%	122	11,475	91%	12,637
Idaho	30	245	11%	25	1,967	89%	2,212
Illinois	54	1,267	12%	122	9,602	88%	10,869
Indiana	52	2,430	14%	119	14,529	86%	16,959
Iowa	38	804	13%	65	5,209	87%	6,013
Kansas	29	455	9%	55	4,383	91%	4,838
Kentucky	44	991	12%	76	7,186	88%	8,177
Louisiana	15	221	2%	115	9,159	98%	9,380
Maine	11	113	8%	16	1,248	92%	1,361
Maryland	11	295	11%	14	2,290	89%	2,585
Massachusetts	17	140	7%	20	1,916	93%	2,056
Michigan	75	1,570	20%	90	6,147	80%	7,717
Minnesota	40	536	11%	58	4,503	89%	5,039
Mississippi	43	428	6%	98	7,003	94%	7,431
Missouri	35	618	5%	140	12,272	95%	12,890
Montana	43	392	11%	39	3,085	89%	3,477
Nebraska	22	263	8%	46	2,835	92%	3,098
Nevada	36	260	5%	31	4,979	95%	5,239
New Hampshire	6	86	11%	13	697	89%	783
New Jersey	19	667	15%	34	3,730	85%	4,397
New Mexico	11	78	1%	49	6,322	99%	6,400
New York	36	1,257	15%	97	6,970	85%	8,227
North Carolina	37	642	8%	102	7,323	92%	7,965
North Dakota	30	260	11%	25	2,039	89%	2,299
Ohio	98	1,402	11%	135	11,474	89%	12,876
Oklahoma	63	767	7%	129	9,632	93%	10,399

Oregon	40	602	10%	52	5,702	90%	6,304
Pennsylvania	65	1,298	8%	134	14,502	92%	15,800
Rhode Island	5	267	39%	3	420	61%	687
South Carolina	49	816	9%	96	8,515	91%	9,331
South Dakota	21	371	22%	30	1,331	78%	1,702
Tennessee	30	767	11%	89	6,419	89%	7,186
Texas	105	654	3%	284	23,525	97%	24,179
Utah	24	238	9%	43	2,488	91%	2,726
Vermont	41	178	28%	63	449	72%	627
Virginia	39	820	10%	13	7,445	90%	8,265
Washington	29	455	15%	39	2,663	85%	3,118
West Virginia	21	506	23%	21	1,717	77%	2,223
Wisconsin	23	652	10%	80	5,971	90%	6,623
Wyoming	58	792	17%	51	3,806	83%	4,598
Total	1,771	31,249	10%	3,382	284,601	90%	315,850

¹ An inventory of private parking spaces was not performed for Alaska.

Table 3. Driver-reported usability characteristics in truck parking

Usability characteristic	Percent of respondents reporting [*]				
	Almost always	Frequently	Sometimes	Rarely	Almost never
Parking is convenient to highway	9%	30%	41%	12%	7%
Facility has features needed	15%	36%	38%	7%	3%
Parking time limits allow enough time	15%	22%	30%	18%	15%
Parking allows enough room to drive in and out	8%	24%	48%	15%	6%
Truck spaces used only by trucks	9%	25%	34%	20%	12%

Note: The bold-faced percentages highlight the most frequently reported response for each usability characteristic.

*Due to rounding, percentages may not sum to 100.

To help clarify drivers' parking preferences, the survey asked drivers to identify how important various parking facility features are to them when they park their trucks. Drivers rated various features on a scale from 1 to 5 (*almost always important* to *almost never important*). [Table 4](#) shows the features evaluated, along with the mean, median and modal ratings they received. Features rated as most important were generally the ones that address basic needs. Food, fuel, restrooms, telephones, showers, convenience to highway, and well-lighted parking lots all received modal ratings of *almost always important*. In fact, between 70 percent and 85 percent of the sample rated these features as *frequently important* or *almost always important*. Interestingly, drivers appear to value well-lighted parking lots more than they value security presence. Seventy-five percent of respondents rated "well-lighted parking lots" as *frequently important* or *almost always important*, while only 60 percent gave the same ratings to "security presence." The majority of drivers rated features such as entertainment facilities, Internet connections, and availability of travel information as less important.

Table 4. Driver-rated importance of features when parking

Important features	Mean	Median	Mode
Restrooms	1.4	1.0	1
Convenient to highway	1.6	1.0	1
Showers	1.7	1.0	1
Well-lighted parking lot	1.9	1.0	1
Public phones	1.9	1.0	1
Restaurant	1.9	1.0	1
Fuel	2.0	1.0	1
Security presence	2.3	2.0	1
Repair facilities	2.6	3.0	1
Prepaid fuel cards accepted	2.9	3.0	1
Vending machines	3.4	3.0	5
Entertainment facilities	3.4	3.0	5

Travel information available	3.6	4.0	5
Internet connections	4.0	5.0	5

Note: Respondents rated the features on a scale from 1 to 5 ("almost always important" to "almost never important").

Almost 400 respondents provided written comments on the parking facility features they consider important. The single most frequently mentioned feature was *big parking spaces that allow trucks to maneuver in and out* (written by 45 drivers). Drivers indicated that they look for quiet parking facilities where they are not likely to be disturbed by police officers or solicitors. They value clean facilities where the personnel are friendly. Drivers also commented that they prefer parking facilities that allow access to shopping areas with grocery or department stores. Finally, drivers commented that laundry facilities add to the appeal of a parking facility.

Ratings given by short-haul drivers reflected the fact that they value parking facility features differently than long-haul drivers. Specifically, long-haul drivers most often rated features such as showers, fuel, and well-lighted parking lots as *almost always important*, while short-haul drivers most often rated these same features as only *frequently important*. Female respondents provided different ratings than their male counterparts on some features. Eighty percent of women rated security presence as *frequently important* or *almost always important*, while just under 60 percent of men gave the same ratings to security presence. Additionally, 92 percent of women rated "well-lighted parking lots" as *frequently important* or *almost always important*, while about three-quarters of men did the same.

In addition to inquiring about the features that are important to drivers, the survey also asked which type of parking facilities (public versus commercial) they prefer for parking. Because parking facility preference likely depends on the purpose of the stop, various common "reasons for parking" were identified to give context to their facility preferences. Generally when drivers showed a preference, they indicated a preference for commercial truck stops over public rest areas ([Table 5](#)). Public rest areas were preferred to commercial truck stops only when drivers stop for a quick (less than 2-hour) nap. For extended rest (more than 2 hours), performing minor truck maintenance, and eating a meal, drivers overwhelmingly preferred truck stops to rest areas, with between 79 percent and 91 percent of drivers indicating a preference for truck stops and less than 6 percent indicating a preference for rest areas. Most respondents marked *no preference* for stops

made to use vending machines, get travel information, use public telephones, and use the restroom. However, among those drivers who did show a facility preference when making these types of stops, more drivers indicated a preference for truck stops. For all the parking reasons listed, short-haul driver preferences were the same as long-haul driver preferences.

Table 5. Drivers' parking facility preferences by purpose of stop

Reason for parking	Percent of respondents reporting*		
	Rest area	No preference	Truck stop
Take a quick nap (\leq 2 hours)	45%	36%	19%
Take an extended rest ($>$ 2 hours)	6%	16%	79%
Use vending machines	28%	58%	14%
Get travel information	9%	51%	40%
Use public phones	14%	49%	37%
Perform minor maintenance on truck	2%	19%	79%
Use the restroom	25%	45%	30%
Eat a meal	1%	8%	91%

Note: The bold-faced percentages highlight the most frequently reported response for each parking reason.

*Due to rounding, percentages may not sum to 100.

In the same survey, drivers were asked where they parked their trucks to sleep during their most recent trips. The results are summarized in [Table 6](#).

Table 6. Facility most recently used for sleep

Facility	Respondents reporting (%)*
Home	9%
Truck stop	54%
Public rest area	8%
Ramp	4%
Loading dock	10%
Other	11%
No response	4%

*Because of rounding, percentages do not sum to 100.

A significant proportion (54 percent) reported using a commercial truck stop or travel plaza. Interestingly, 10 percent reported parking at a loading dock, company terminal, or other facility to sleep. In addition, 11 percent reported parking at other facilities, such as shopping plazas and hotels or motels. These facilities, therefore, appear to represent a significant proportion of the parking supply used by drivers to comply with Federal hours-of-service rules. The results of this survey support the idea that drivers prefer to use commercial truck stops and travel plazas for extended rest. Clearly, however, a proportion of drivers also use public rest areas for this purpose.

3.5 INTERCHANGEABILITY OF PUBLIC REST AREA AND COMMERCIAL TRUCK STOP AND TRAVEL PLAZA PARKING

An important factor in determining whether there is a sufficient supply of truck parking spaces involves the concept of interchangeability of spaces at public rest areas and commercial truck stops and travel plazas. That is to say, can a surplus of parking spaces at commercial truck stops and travel plazas compensate for a shortfall in available public rest area parking? Since most truck drivers utilize public rest areas and commercial truck stops and travel plazas for resting, it is logical to conclude that a driver can rest equally well while parked at a public rest area or at a commercial truck stop or travel plaza and, therefore, these spaces are interchangeable. This view is challenged, however, by the results of the national survey of driver needs and preferences, by the findings of field observational studies, and by the imbalance identified within the supply and demand ratios between public and commercial parking spaces.

National Truck Parking Needs and Preferences Survey

Drivers' responses to the Truck Parking Needs and Preferences Survey conducted as part of this study demonstrated definite preferences and priorities when it comes to choosing where they will park. These preferences are offered as evidence of the limited interchangeability or substitutability between public rest areas and commercial truck stops or travel plazas.

- When drivers park for quick naps (less than 2 hours), they prefer to park in public rest areas (45 percent of the drivers preferred a public rest area, 19 percent preferred commercial truck stops, and 36 percent expressed no preference between public rest areas and commercial truck stops). For more lengthy activities (greater than 2 hours), such as eating a meal, resting for the night, or repairing a truck, drivers would choose truck stops where possible (79 percent of the drivers preferred a truck stop, 6 percent preferred rest areas, and 16 percent expressed no preference between rest areas and truck stops).

- To help clarify drivers' parking preferences, the survey asked drivers to identify how important various parking facility features are to them when they park their trucks. Restrooms, convenience to a highway, showers, well-lighted parking lots, and public telephones were the top features selected from a list of 14 features that drivers rated as most important. Three of the five features address drivers' basic needs, while the other two clearly address drivers' preferences. Drivers were also given the opportunity to write comments on the parking features they considered most important. The single most frequently mentioned feature was big parking spaces that allow trucks to maneuver in and out.
- The survey also provided the respondents with the opportunity to speculate about why truck drivers sometimes park on entrance or exit ramps and highway shoulders. The most commonly reported reasons were that no nearby parking facility was available, no empty spaces were available at nearby truck stops or rest areas, nearby parking spaces have time limits that are too short, empty parking spaces nearby were blocked by others vehicles, the ramp/shoulder is convenient for getting back on the road, interruptions by strangers (e.g., drug dealers, prostitutes) was less likely, it is hard to drive around congested parking lots, and better lighting exists on ramp(s)/shoulder(s) than in lot(s).

Field Observational Studies

In addition to the driver self-report data cited above, more objective evidence to support the notion of limited interchangeability between public rest areas and commercial truck stops and travel plazas can be found from the results of observational field surveys conducted both for this study and by a number of other States.

- Commercial vehicle parking field surveys were conducted as part of the demand model development effort for this study. The purpose of these observational studies was to record trucks parked during the peak hour in public rest areas, commercial truck stops, pull-out areas, interchange ramps, mainline and cross street shoulders, fueling stations, fast food restaurants, hotels, etc. The studies were conducted along two segments of I-81 in Virginia, on seven segments of Georgia interstate highways and six segments of Pennsylvania interstate highways. These segments were selected as representing the typical range, from low to high, of truck parking supply and demand. Although all of the rest areas were full or overflowing, some of the commercial truck stops had spaces available, as did most of the fast-food restaurants, fueling stations, and shopping centers along the segments, suggesting that drivers do differentiate between parking at public rest areas and other commercial parking areas.
- The University of Tennessee conducted nighttime observational studies at all public rest areas in Tennessee for each day of the week.⁽¹⁰⁾ Availability of space in commercial truck stops and travel plazas near interchanges was also examined. The results of the

occupancy studies showed that the rest areas were overflowing with trucks at night, as evidenced by trucks parked along the shoulders of highway exit and entrance ramps as well as on interchange ramps. While the rest areas were overflowing, approximately 30 percent of the private truck parking spaces were not occupied, and the unoccupied private parking spaces outnumbered the trucks parked along the highways by nearly three times. To understand why some truck drivers park along the highway when there are available private parking spaces, in-depth interviews were held with drivers. Opinions of the drivers interviewed were quite consistent. The findings were that commercial truck stops and public rest areas are not substitutes for each other because they meet different needs.

- The State of Iowa completed field observations of truck parking on Interstate highways in 1999.⁽¹¹⁾ This study divided the Interstates in Iowa into six segments. Parking at public rest areas was observed to be above capacity for almost every segment and almost every day during the observation period, and trucks were observed parking on the shoulder at exit and entrance ramps. On the other hand, parking at commercial truck stops and travel plazas was observed to be above capacity for only a single segment, and then for only two of the 7 days during the observation period. This suggests that drivers do differentiate between parking at public rest areas and other commercial parking areas.
- In 1999, the Baltimore Metropolitan Council sponsored a study of truck parking in the Baltimore area that concluded that, even though there was a sufficient supply of parking spaces available to truck drivers, trucks were often parked illegally along the highways at night.⁽¹²⁾ These observations suggest that truck drivers do differentiate between parking spaces by choosing to park at illegal spaces along the highway rather than legally at other locations.
- The FHWA supported a study in 1996⁽⁵⁾ that included observations of truck parking along a stretch of I-81 between Radford, Virginia, and Knoxville, Tennessee. These observations indicated that public rest areas tended to reach capacity before commercial truck stops, and that large numbers of trucks parked on shoulders and ramps of rest areas, even when parking was available at a public rest area. These findings suggest that truck drivers differentiate between parking at public rest areas and other commercial parking facilities.

Public-Private Supply/Demand Imbalance

As stated earlier in this report, the national driver survey was also used to develop an estimate of public and private parking demand to reflect preferences for public versus private parking. As part of the survey, drivers were asked for each of seven activities whether they preferred to stop at a public rest area or at a commercial truck stop for that activity. The relative preference

for each type of parking space was estimated by taking an average of the preferences for each activity, rating each preference by the relative frequency of that type of activity and the duration of that activity. The proportions of total parking demand for public rest area and commercial truck stop spaces were estimated as 0.23 and 0.77, respectively. However, when looking at the supply of available parking, on average, approximately 90 percent of the total available parking spaces are at commercial facilities, and 10 percent of the available parking spaces are at public facilities. This imbalance in supply (90/10) and demand (77/23) between the commercial and public sectors, respectively, is further evidence on the limits of interchangeability in the drivers' eyes.

In summary, while it may be argued that, since truck drivers could rest equally well at public rest areas and commercial truck stops and travel plazas, parking spaces at these two different types of rest stops are interchangeable. In other words, truck stop parking can be substituted for rest area parking, even if the private parking is not as convenient. On the other hand, empirical evidence provided through both driver surveys and observations of parking behavior indicate that parking at these locations is not interchangeable; more likely, the evidence suggests that there is some interchangeability and this interchangeability is limited due to preferences expressed by drivers for one type of space over another. In reality, a system of parking exists in this country that consists of public rest areas, commercial truck stops and travel plazas, weigh stations, and various commercial establishments (motels, fast food restaurants, etc.). As a system, a certain synergy applies such that substitution occurs among the available types of spaces. However, it is not a complete substitutability. The interchangeability of one type of parking space for another is limited or governed by an array of drivers' preferences (e.g., purpose of the stop, amenities available, parking convenience, etc.), and it is these preferences that influence a driver's decision as to where to park.

3.6 SUMMARY AND CONCLUSIONS

The primary purpose of this section was to describe the inventory of truck parking spaces at public rest areas and at commercial truck stops and travel plazas that will serve in Section 4.0 as part of the basis for identifying shortages in truck parking spaces on the NHS. Evaluation of this inventory did indicate the following:

- Public rest areas account for 10 percent of truck parking spaces, and commercial truck stops and travel plazas account for 90 percent. Consequently, changes that result in greater use of existing private parking spaces may be a cost-effective way to address shortages in supply.
- Expected growth of truck parking spaces at public rest areas is expected to be small (5.1 percent over the next 5 years), while growth in the private sector is estimated at 6.5 percent annually.

In addition to the inventory of parking spaces, this section also described survey results indicating the features that truck drivers value at a parking facility and, in this context, described interchangeability of parking spaces at public rest areas and commercial truck stops and travel plazas for meeting parking demand. The evidence indicated that truck drivers valued public rest areas primarily for ease of access and convenience and valued truck stops for their amenities. This differentiation suggested that, although the two types of parking spaces considered in this study are interchangeable in theory, in practice, some drivers preferentially choose one type of parking space over another.

[a] Some States provided data for highway segments with daily truck volumes less than 1,000, in which case these highway segments are included in the analysis. For example, no highways with daily truck volumes greater than 1,000 exist in Alaska, and Alaska provided data for those highway segments that had a high daily truck volume relative to other highways in Alaska.

[b] These public facilities includes public rest areas, welcome centers, turnpike travel plazas, weigh stations, and truck-only parking lots.

[c] An evaluation of the Truck Stops Database for the years 1997 to 2000 indicated an average growth rate of 6.5 percent for these years. The NATSO Foundation expects this rate of growth to continue.

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