# Truck Parking Profile

## WEST VIRGINIA STATE FREIGHT PLAN

November 2023

*Tech Memo*

# West Virginia State Freight Plan

## *Truck Parking Profile*

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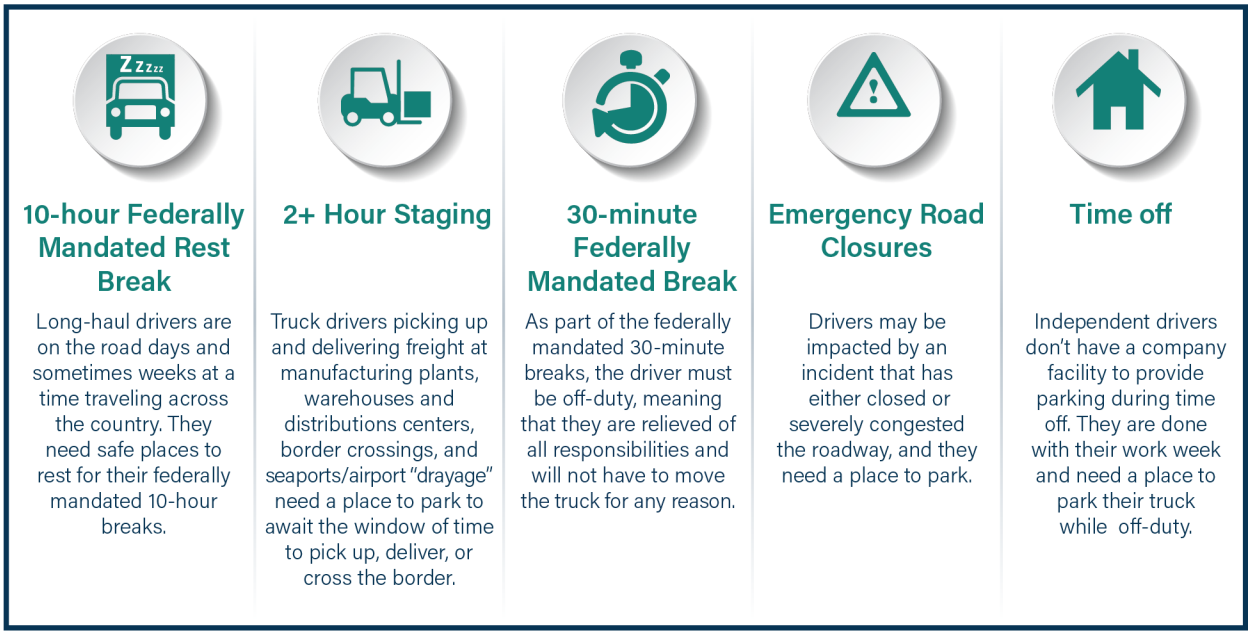
# 1.0 OVERVIEW

Truck freight movement is an essential element of West Virginia economic vitality completing millions of daily deliveries shipped by a network of highways, railways, waterways, ports, airports, and pipelines. The State's economy also relies on truck drivers and their ability to safely and efficiently complete deliveries. The West Virginia Department of Transportation (WVDOT) is working towards a more efficient and higher-capacity freight system. An adequate supply of truck parking is critical to achieving that goal. To that end, the WVDOT decided to undertake a statewide assessment of truck parking needs.

## 1.1 Why Truck Drivers Need to Park

Truck drivers need to park for different reasons and there are unique challenges for various types of parking needs (see Figure 1.1). Drivers must adhere to Federal and State hours of service (HOS) regulations that place specific time limits on driving and rest intervals. Drivers almost always need to park and wait for delivery windows at shippers and receivers, and sometimes are impacted by unexpected road closures or congestion. Finally, truck drivers are essential workers, who need to take personal breaks for rest and safety.

**Figure 1.1 Reasons Truck Drivers Park**




Commercial Motor Vehicle (CMV) labor regulations are under the purview of the U.S. Federal Motor Carrier Safety Administration (FMCSA). FMCSA propagates rules to increase safety on the road. For CMVs, the mandatory HOS regulations have the greatest impact on truck parking. The most recent HOS regulations, updated in September 2020, are outlined below in Table 1.1.

**Table 1.1 Summary of Hours-of-Service Rules for Property-Carrying Drivers**

| Regulation | Description |
|---|---|
| 11-Hour Driving Limit | May drive a maximum of 11 hours after 10 consecutive hours off duty. |
| 14-Hour Limit | May not drive beyond the 14th consecutive hour after coming on duty, following 10 consecutive hours off duty. Off-duty time does not extend the 14-hour period. |
| 30-Minute Driving Break | Drivers must take a 30-minute break when they have driven for a period of 8 cumulative hours without at least a 30-minute interruption. The break may be satisfied by any nondriving period of 30 consecutive minutes (i.e., on-duty not driving, off duty, sleeper berth, or any combination of these taken consecutively). |
| 60/70-Hour Limit | May not drive after 60/70 hours on duty in 7/8 consecutive days. A driver may restart a 7/8-consecutive-day period after taking 34 or more consecutive hours off duty. |
| Sleeper Berth Provision | Drivers may split their required 10-hour off-duty period, as long as one off-duty period (whether in or out of the sleeper berth) is at least 2 hours long and the other involves at least 7 consecutive hours spent in the sleeper berth. All sleeper berth pairings must add up to at least 10 hours. When used together, neither period counts against the maximum 14-hour driving window. |
| Adverse Driving Conditions | Drivers are allowed to extend the 11-hour maximum driving limit and 14-hour driving window by up to 2 hours when adverse driving conditions are encountered. |
| Short-Haul Exception | A driver is exempt from the requirements of §395.8 and §395.11 if: the driver operates within a 150 air-mile radius of the normal work reporting location, and the driver does not exceed a maximum duty period of 14 hours. Drivers using the short-haul exception in §395.1(e)(1) must report and return to the normal work reporting location within 14 consecutive hours and stay within a 150 air-mile radius of the work reporting location. |

*Source: https://www.fmcsa.dot.gov/regulations/hours-service/summary-hours-service-regulations, September 29, 2020.*

HOS regulations are strongly enforced by State agencies, and penalties can be high. To avoid these steep fines, drivers are under pressure to find parking as quickly and efficiently as possible to avoid violating HOS regulations while trying to make pick-ups/deliveries as efficiently as possible.

To increase compliance with HOS regulations, most CMV drivers are required to track their HOS with an electronic logging device (ELD). An ELD monitors a vehicle's engine to capture data on whether the engine is running, whether the vehicle is moving, miles driven, and duration of engine operation (engine hours). This approach to HOS monitoring replaced a paper version, which provided drivers with some leeway in finding parking within the HOS limits. With the full implementation of the ELD mandate in December 2019, time and location are now tracked much more precisely. This allows for closer enforcement of existing HOS regulations, which makes finding parking within allowable time limits even more critical.

# 2.0 TRUCK PARKING INVENTORY

Truck parking facilities are essential for truck movements across West Virginia's highways. Truck drivers require places to take mandatory breaks during the day and overnight, refuel their vehicles, and coordinate delivery windows with their destination. Inadequate truck parking supplies forces these drivers to make difficult choices that compromise their and other roadway users' safety—such as driving outside of their scheduled hours, possibly in an overtired state, or parking in undesignated areas that could be unsafe for the driver or create roadway hazards.

## 2.1 Methodology

Data on the location and capacity of truck parking facilities was gathered from previous WVDOT inventory initiatives, the Jason Law surveys of the State, third-party websites (e.g., TruckStopGuide.com, Trucker Path), company websites (e.g., Pilot, Flying J, etc.), and from examining current aerial maps. The inventory of truck parking facilities covers both public and commercial facilities. Public facilities include travel plazas, rest areas, and welcome centers which are owned by WVDOT and located adjacent to State highways and Federal Interstates. These public facilities offer different levels of amenities for drivers. Travel Plazas are located on the West Virginia Turnpike portion of I-77 and offer the highest level of service, including Wi-Fi, restaurants, gift shops, and fueling stations. Welcome Centers are located on major roads at State border crossings and have large buildings staffed by the West Virginia tourism department with Wi-Fi and comfortable restrooms but few other amenities of interest to truckers. Rest areas have the lowest level of amenities, usually only restrooms, but are located along major roads often in rural areas.

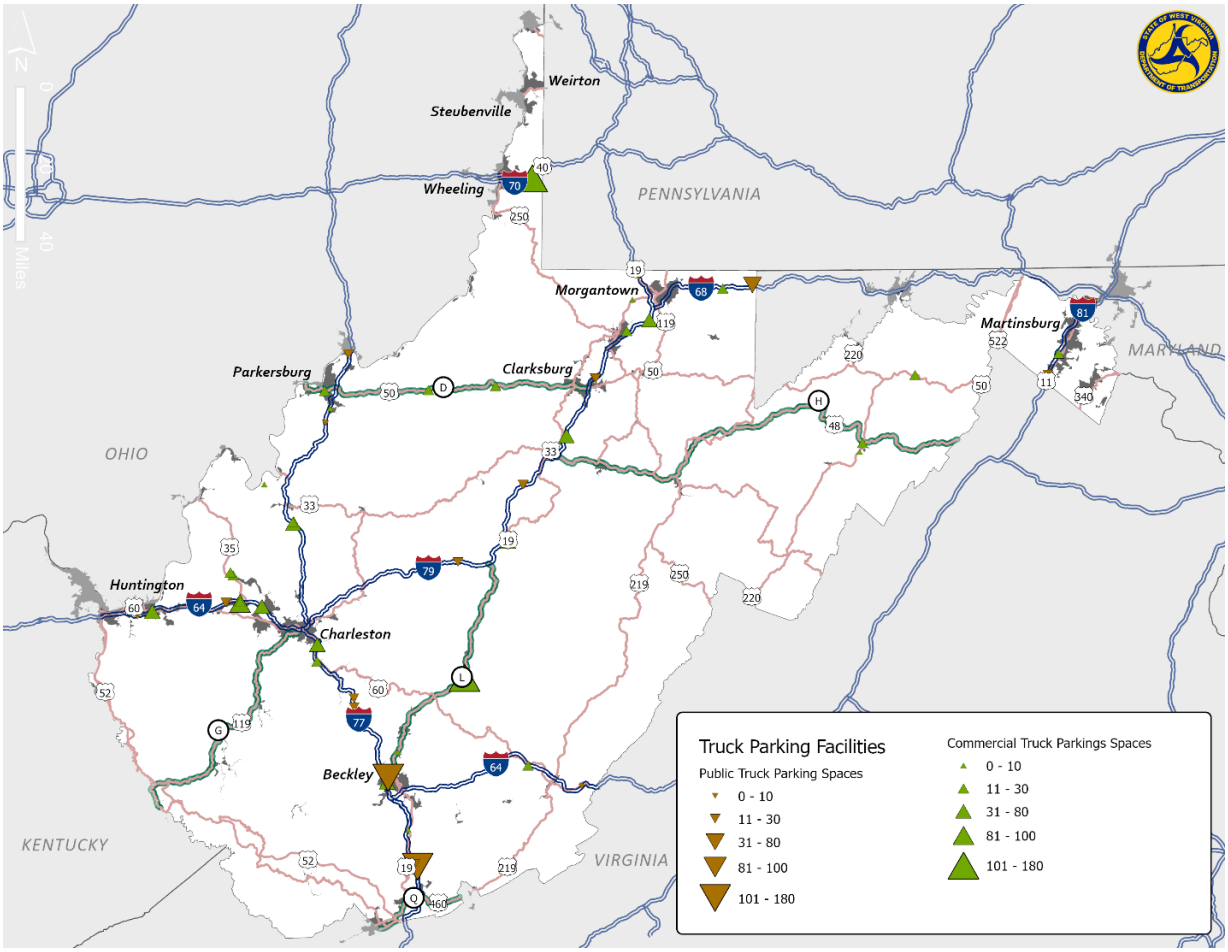
Most commercial vehicle weigh stations in West Virginia have parking spaces for trucks, although they are dedicated for conducting inspections and other weigh station business, and not intended for general truck parking needs. Importantly, in cases where public facilities were collocated, but separated by a median barrier (e.g., an eastbound facility and a separate westbound facility directly across the highway), each facility was counted separately as part of the analysis. Commercial truck parking facilities are private businesses that typically provide fuel, and often offer food, showers, and other services for truck drivers.

Information on the capacity (i.e., number of spaces) of truck parking facilities reported from the various data sources was not always consistent. Sources from official reporting such as company websites or public data were used when available. In cases where firsthand data was unavailable, information on capacity from third-party sources such as mobile applications were collected and compared to aerial imagery to estimate the number of spaces available. Using this methodology, every public facility—regardless of capacity—and any private facility with at least 10 parking spaces were included as part of the State's truck parking inventory.

## 2.2 Inventory

In total, there are 60 truck parking facilities—public and commercial—included in the inventory analysis. These facilities provide approximately 1,860 truck parking spaces in West Virginia. Figure 2.1 displays truck parking locations across the State.

### Figure 2.1 Truck Parking Inventory in West Virginia




*Source: West Virginia Department of Transportation, 2022.*

Table 2.1 groups truck parking facilities by six typologies which describe the level of amenities usually present at the facility for truck drivers. Public facilities are based on WWVDOT's naming conventions. Rest areas and welcome centers both provide parking, restrooms, and potentially vending machines. Travel plazas provide amenities typical of a gas station by partnering with commercial entities who provide food and fuel for drivers.

Commercial facilities include truck stops which provide full-service amenities such as specialized fueling stations, maintenance facilities, showers, food, etc. Gas stations typically provide fuel, food, and restrooms, but not the other amenities offered at full-service truck stops. Other commercial facilities are any facility that does not provide fuel but allow drivers to park overnight. These include restaurants, retail establishments, and commercial parking lots.

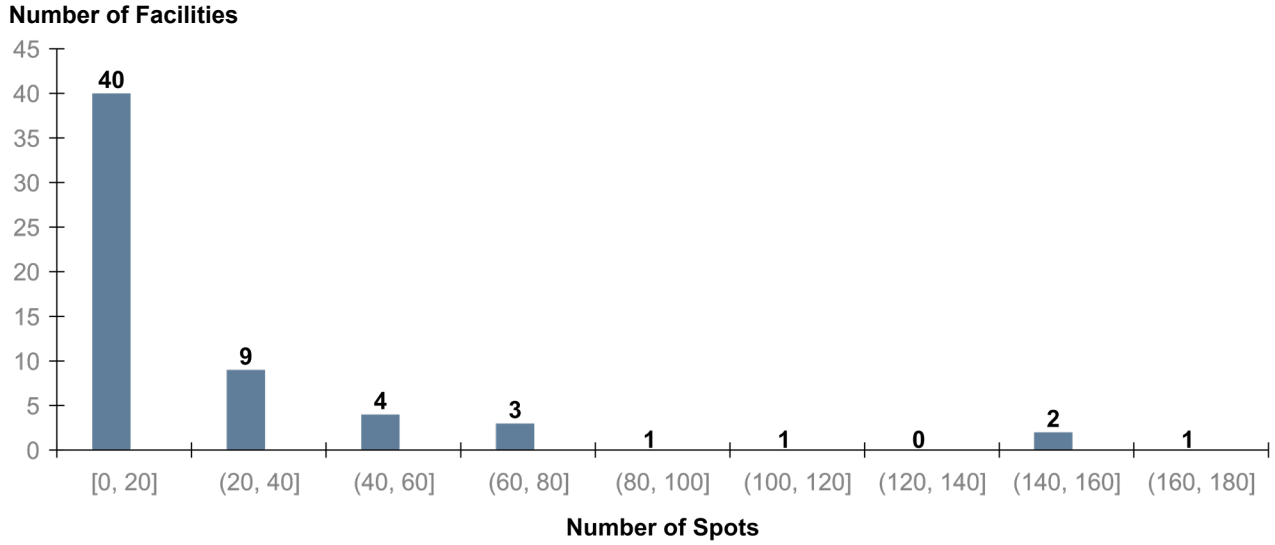
Commercial facilities make up 66 percent of the total truck parking capacity in West Virginia. As shown in Table 2.1, the nine full-amenity truck stops in the State account for 755 spots or 41 percent of the State's capacity. However, the typical truck parking facility in West Virginia provides 10–20 spots. As shown in Figure 2.2, 40 facilities (or 67 percent of all facilities in the State) have 20 or less spots.

### Table 2.1 Truck Parking Typologies

| | Type of Facilities | Number of Facilities | Parking Capacity |
|---|---|---|---|
| Public | Travel Plaza | 2 (3%) | 137 (7%) |
| | Welcome Center | 9 (15%) | 283 (15%) |
| | Rest Area | 13 (22%) | 216 (12%) |
| Commercial | Truck Stop | 9 (15%) | 755 (41%) |
| | Gas Station | 22 (37%) | 414 (22%) |
| | Other Commercial Facilities | 5 (8%) | 55 (3%) |
| **Total** | | 60 | 1,860 |

*Source: West Virginia Department of Transportation, 2022.*

### Figure 2.2 Distribution of Truck Parking Capacity




*Source: West Virginia Department of Transportation, 2022.*

Table 2.2 shows the total number of private and commercial parking spaces by type of roadway. When analyzing parking facilities at the intersection of two major roadways the higher classification roadway was given precedent (e.g., Interstates > U.S. Highways > State Routes). 16 facilities were located at intersections, accounting for 523 parking spots in West Virginia. 82 percent of West Virginia trucking capacity (or 1,524 spots) are along Interstate corridors or interchanges of Interstates and other major facilities. About 35 percent of the State's truck parking capacity is publicly provided via travel plazas, rest areas, and welcome centers. All the State's public facilities are located adjacent to Interstates or interchanges between Interstates and other major facilities. The majority of commercially provided truck parking capacity also is proximate to Interstates. About 72 percent (873 spaces in total) of commercial truck parking spaces are along Interstates.

### Table 2.2 Truck Parking Capacity by Roadway Type

| Roadway Type | Public | Commercial | Total |
|---|---|---|---|
| Interstate | 651 | 873 | 1,524 |
| U.S. Highway | 0 | 303 | 303 |
| State Route | 0 | 33 | 33 |
| **Total** | 651 | 1,209 | 1,860 |

*Source: West Virginia Department of Transportation, 2022.*

Table 2.3 provides details on truck parking capacity at the corridor level. For example, the I-77 corridor contains the largest share of both public and commercial truck parking capacity. Nearly 56 percent of public spaces and nearly 21 percent of commercial spaces are located along I-77. It is followed by I-79 and I-64 in terms of total capacity. These three corridors alone account for 64 percent of the State's total truck parking capacity.

### Table 2.3 Total Truck Parking Facilities by Corridor

| Corridor | Number of Public Facilities | Number of Public Parking Spaces | Number of Commercial Facilities | Number of Commercial Parking Spaces | Total Parking Spaces |
|---|---|---|---|---|---|
| I-77 | 8 (24%) | 367 (56%) | 7 (20%) | 253 (21%) | 620 (33%) |
| I-79 | 10 (30%) | 126 (19%) | 6 (17%) | 252 (21%) | 378 (20%) |
| I-64 | 6 (18%) | 60 (9%) | 4 (11%) | 150 (12%) | 210 (11%) |
| US-19 | 2 (6%) | 0 | 5 (14%) | 195 (16%) | 195 (10%) |
| I-70 | 1 (3%) | 0 | 1 (3%) | 170 (14%) | 170 (9%) |
| I-81 | 1 (3%) | 54 (8%) | 1 (3%) | 28 (2%) | 82 (4%) |
| US-50 | 1 (3%) | 0 | 4 (11%) | 76 (6%) | 76 (4%) |
| I-68 | 1 (3%) | 44 (7%) | 1 (3%) | 20 (2%) | 64 (3%) |
| Rt-817 | 0 | 0 | 2 (6%) | 33 (3%) | 33 (2%) |
| US-220 | 2 (6%) | 0 | 2 (6%) | 22 (2%) | 22 (1%) |
| US-340 | 0 | 0 | 1 (3%) | 10 (1%) | 10 (1%) |
| **Total** | **33 (100%)** | **651 (100%)** | **35 (100%)** | **1209 (100%)** | **1860 (100%)** |

*Source: West Virginia Department of Transportation, 2022.*

Table 2.4 shows the number of parking facilities and truck parking spaces by WVDOT district. The State is divided into 10 transportation districts, which are each comprised of multiple counties. The results in Table 2.4 indicate that districts generally have a comparable number of public facilities—between 10 to 20 percent—but with a few outliers. Districts 1 and 10 have the largest truck parking supply. Together, they account for about 36 percent of all truck parking spaces. Four of the State's six Interstates traverse District 1, which likely contributes to the prevalence of commercial facilities. District 10 is traversed by two Interstates—I-77 and I-64. Notably, I-77 provides access to the Charlotte, NC metropolitan area which likely contributes to the prevalence of truck parking capacity along this corridor. Districts 2 and 8 have notably small shares of the State's overall truck parking capacity. District 8 has no capacity, while District 2 has only 57 spaces which is

3 percent of the State's overall truck parking capacity. Both Districts 2 and 8 are heavily forested and mountainous and also contain multiple wildlife management areas, State parks, national forests, and other environmentally sensitive areas. This limits the suitability of much of these districts for truck parking facilities.

**Table 2.4 Total Number of Truck Parking Facilities and Spaces**

| Corridor | Number of Public Facilities | Number of Public Parking Spaces | Number of Commercial Facilities | Number of Commercial Parking Spaces | Total Parking Spaces |
|---|---|---|---|---|---|
| 1 | 6 (18%) | 80 (12%) | 8 (23%) | 268 (22%) | 348 (19%) |
| 2 | 1 (3%) | 20 (3%) | 1 (3%) | 37 (3%) | 57 (3%) |
| 3 | 5 (15%) | 43 (7%) | 6 (17%) | 136 (11%) | 179 (10%) |
| 4 | 7 (21%) | 107 (16%) | 5 (14%) | 135 (11%) | 242 (13%) |
| 5 | 3 (9%) | 54 (8%) | 5 (14%) | 78 (6%) | 132 (7%) |
| 6 | 1 (3%) | 0 (0%) | 1 (3%) | 170 (14%) | 170 (9%) |
| 7 | 4 (12%) | 72 (11%) | 3 (9%) | 146 (12%) | 218 (12%) |
| 8 | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) |
| 9 | 2 (6%) | 8 (1%) | 4 (11%) | 197 (16%) | 205 (11%) |
| 10 | 4 (12%) | 276 (42%) | 2 (6%) | 42 (3%) | 318 (17%) |
| **Total** | **33 (100%)** | **660 (100%)** | **35 (100%)** | **1209 (100%)** | **1869 (100%)** |

*Source: West Virginia Department of Transportation, 2022.*

# 3.0 STAKEHOLDER ENGAGEMENT

The project team engaged in a series of interviews, workshops, and digital surveys with local officials from WVDOT and regional Government officials from metropolitan planning organizations (MPO) and intergovernmental councils to gain a better understanding of truck parking needs and issues across the State. The goal of these strategies is to leverage local expertise and context to better understand this analysis.

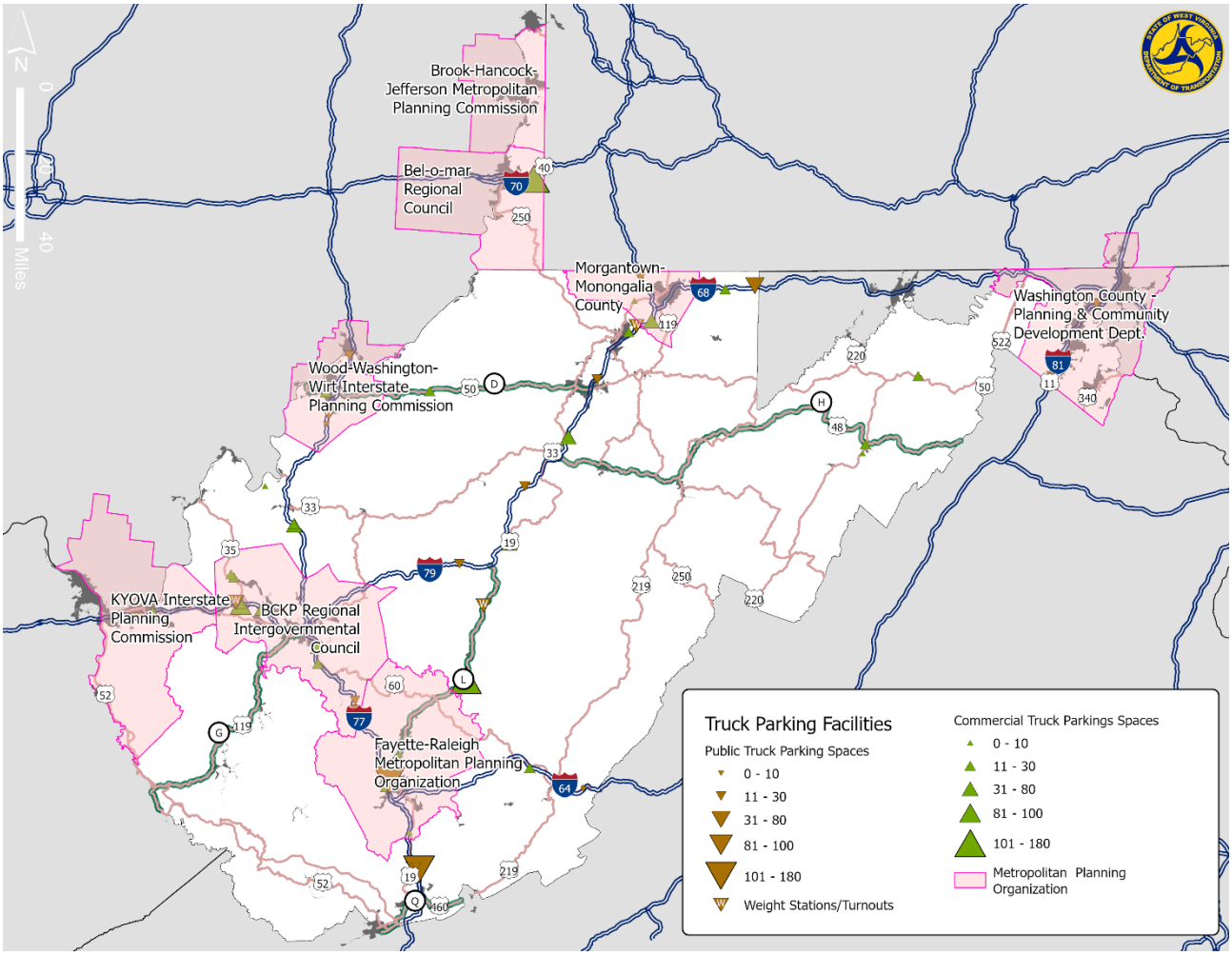
## 3.1 Stakeholder Survey

In April of 2023, an online survey was distributed to stakeholders in West Virginia that included a few questions regarding truck parking. The survey response pool was not large enough to make definite conclusions about parking issues in the State, but increasing truck traffic, truck mobility, truck parking, and maintenance of highway infrastructure were all mentioned by stakeholders as major issues facing the State. When asked where truck parking was a major issue survey respondents said both major roads—Interstates and highways—as well as minor back roads had deficient truck parking capacity.

## 3.2 Regional Government Interviews

Officials from all eight regional governments in West Virginia were interviewed to understand the particular truck parking needs in their area. Figure 3.1 shows a map of the location of these MPOs. Six of these regional entities noted truck parking issues, which are discussed in detail below. In general, stakeholders noted specific locations where truck parking capacity was not able to handle the demand causing congestion and undesignated parking issues. Locations tended to be near the larger urbanized areas in the State.

**Figure 3.1 Regional Government Stakeholders**




*Source: West Virginia Department of Transportation, 2022.*

## *BCKP Regional Intergovernmental Council*

The interview noted that major commercial facilities outside of Charleston were full and causing congestion and undesignated parking issues.

- The Travel Centers of America facility in Teays Valley and the Pilot Travel Center facility in Nitro are typically very congested. These facilities are along I-64 northwest of Charleston.
- Undesignated parking often occurs along I-79 near the town of Mink Shoals (northeast of Charleston).

## *Morgantown-Monongalia County*

The regional Government noted issues with undesignated parking, with truckers ignoring and removing signage that prohibited parking in certain areas.

- The interviewer noted interchange 152 of I-79 where trucks can be found within 1/2 mile of the interchange utilizing wide shoulders available; Goshen Road near I-79 and the Pilot Travel Center which is always full; 4H Camp Road near Walmart; and US-119 at the interchange with I-68.

- The State has placed a 'No Overnight Parking' sign on the road in several of these areas. Some signs put in place to indicate that truck parking was illegal were removed by truckers.

### *KYOVA Interstate Planning Commission*

The interviewees noted that truck parking was an issue across the region. The commission borders Kentucky to west I-64 traverses the MPO connecting Kentucky, both within the MPO, and Charleston which is just east of the commission's jurisdiction.

- I-64 and US-52 do not have enough truck parking capacity. Trucks park along the shoulder across these major roadways.

- Exit 1 of I-64 was noted as a particularly problematic area near the Kentucky border.

### *Washington County – Planning and Community Development Department*

The Department oversees the portion of West Virginia between Pennsylvania and Maryland, traversed by I-81. The largest urban development in the area is Hagerstown. The interviewee noted several areas along I-81 where truck parking is inadequate leading to overflowing onto entrance and exit ramps.

- Public parking locations: West Virginia Welcome Center near the border to Pennsylvania, an old weigh station no longer in service, and the Inwood Welcome Center bordering Maryland.

- Smaller commercial facilities near Exits 16 and 8 along I-81. Walmart stores near these two exits fill up with spillover trucks as well.

### *Brook-Hancock Jefferson Metropolitan Planning Commission*

The jurisdiction of the commission does not include as many major roadways as other regional stakeholders. However, the interviewee noted locations where undesignated parking tends to occur. Weirton is the major urban area between Ohio and Pennsylvania along the Ohio River and traversed by US-22. Industrial businesses in the area are prominent which creates truck parking demand and is inhibited by overspill trucks in certain undesignated areas.

- Main Street (a primarily industrial and somewhat isolated street) in Weirton was cited as a location where between 30 and 50 trucks park at night.

- Truck traffic stems from Cleveland Cliffs (a steel manufacturer) and oil and gas industry businesses in the area. Trucks congregate on Main Street in Weirton an isolated roadway. Nearly 30–50 trucks park here nightly, with no major facilities to park on US-22 or Route 2. Forum Energy and Bidell Compression (other industrial businesses) want these trucks removed as the area becomes active again with increasing industrial activity.

### *Bel-O-Mar Regional Council*

The council is just south of Brook-Hancock Jefferson MPC, also sitting between Ohio and Pennsylvania with I-70/I-470 crossing the jurisdiction. The major urban area is Wheeling and Bethlehem along the Ohio river. The MPO conducted an internal survey by advertising at trucks stops in the area and found that there was insufficient truck parking in the region with trucks overflowing onto entry and exit ramps along major roadways.

## 3.3 Truck Parking Workshops

Three truck parking workshops were held in April and May of 2023 with an average of 33 attendants per session and a total of 52 unique participants. Participants included representatives from the federal government—FHWA and Federal Motor Carrier Safety Administration (FMSCA), WVDOT, MPO and local government, peer agencies, and private organizations involved in the transportation industry. The workshops consisted of presentations of information in this analysis as well as presentations from peer agencies, trucker advocacy organizations, and local experts. Facilitated conversations and live polling were conducted to identify truck parking needs and solutions.

While discussion during the workshop was broad, the simplest and most overwhelming comment from participants was the lack of truck parking spaces in the State. Safety and funding issues also were discussed as well as information and education issues. When discussing solutions, participants seemed most interested in seeing added capacity by public entities above other options. For instance, when asked to rank potential interventions to truck parking issues, participants answered:

1. Increase spaces at existing facilities.
2. Develop new public rest areas.
3. Use nontraditional facilities and locations.
4. More education
5. Develop new private facilities.
6. Enhance design or amenities at existing facilities.

DOT and MPO representatives both noted that a lack of funding were the main challenges for their agency. Funding for truck parking issues is often provided through Federal Formula Funding (HSIP, NHPP, STBG, etc.) Stakeholders noted that a variety of policy (zoning and design standards) and planning efforts have been used to tackle truck parking issues with many MPOs noting they had done internal truck parking investigations. Safety for drivers at truck parking locations and information/education issues also were discussed. There is an industry-wide issue with newer drivers causing issues, especially drivers from other States who are not as familiar with certain local conditions. This highlights the importance of efforts like these workshops that bring together peer agencies from different States to discuss problems and strategies.

At the end of the sessions, respondents were asked if the workshop was effective and helpful for their jobs and all respondents answered yes. These results are promising and point towards a larger statewide cross-jurisdictional effort to improve truck parking conditions.

# 4.0 TRUCK PARKING DEMAND AND SAFETY

This section assesses the current supply and demand for truck parking in West Virginia and identify truck parking needs. It estimates the demand for parking across the State at designated locations identified in the inventory analysis above. To understand the need for truck parking, this section also estimates the gap between available capacity and unmet demand. Using truck global positioning system (GPS) data, the American Transportation Research Institute (ATRI) estimated the demand for truck parking at 47 of the 60 sites identified in the inventory section above. Demand for truck parking was estimated at all public sites as well as major private sites, but smaller and more isolated private sites that were not frequented by drivers based on evidence from Trucker Path were not included in the demand estimates.

## 4.1 Data Collection and Processing

The ATRI dataset captures GPS coordinates of trucks, generally Federal Highway Administration (FHWA) Class 8 and higher, across the country. This source provides a highly detailed picture of where trucks are stopping within West Virginia and can be manipulated to provide information about stop length, location, travel time, and travel direction before and after a stop. While ATRI provides an accurate and rich dataset, it is important to note that it is a sample of trucks and does not represent all trucks traveling through West Virginia. For that reason, it is necessary to develop an estimate of the percentage of trucks captured by the ATRI GPS data for West Virginia.

The percentage of trucks captured is important because it was used to develop an expansion factor for the GPS data. Expansion factors are used to scale a sample of observations up to an estimate for the entire population. In this case, an expansion factor would be applied to the sample of observations of parked trucks so that it is representative of the total population of trucks. For example, if the average percent capture is 25 percent, it indicates an expansion factor of 4 should be applied to the data. In this scenario, if ATRI data indicates 20 trucks in their database parked at a particular location, it is estimated that approximately 80 trucks, or four times the number of trucks in ATRI's database, likely parked there.

To develop an expansion factor for the ATRI GPS data in West Virginia, classification counts collected by WVDOT at 10 permanent classification count stations throughout the State were compared to ATRI GPS truck counts at those same locations and during the same time periods. As shown in Table 4.1, in total 16 candidate expansion factors were developed by varying the subset of selected permanent count stations included in the analysis (i.e., all stations, Interstate stations, stations with 1,000 or more daily trucks, or outlier stations with very few ATRI observations), the FHWA vehicle classification (i.e., FHWA Class 8+ or FHWA Class 9+, and the statistic on which the expansion factor was based (i.e., average or median). The final selected expansion factor was the one calculated using the median value for FHWA Class 9+ vehicles at selected permanent count stations with 1,000 or more daily trucks.

**Table 4.1 Candidate ATRI Truck GPS Expansion Factor**

| Expansion Factor | FHWA Class 8 or Higher | FHWA Class 9 or Higher |
|---|---|---|
| All Selected Permanent Count Stations | Expansion Factor from Average Value versus Expansion Factor from Median Value | Expansion Factor from Average Value versus Expansion Factor from Median Value |
| Selected Interstate Permanent Count Stations | Expansion Factor from Average Value versus Expansion Factor from Median Value | Expansion Factor from Average Value versus Expansion Factor from Median Value |
| Selected Permanent Count Stations with 1,000 or More Daily Trucks | Expansion Factor from Average Value versus Expansion Factor from Median Value | Expansion Factor from Average Value versus Expansion Factor from Median Value |
| Selected Permanent Count Stations with Sparse GPS Observations Omitted | Expansion Factor from Average Value versus Expansion Factor from Median Value | Expansion Factor from Average Value versus Expansion Factor from Median Value |

*Source: Cambridge Systematics.*

## 4.2 Truck Parking Demand at Designated Facilities

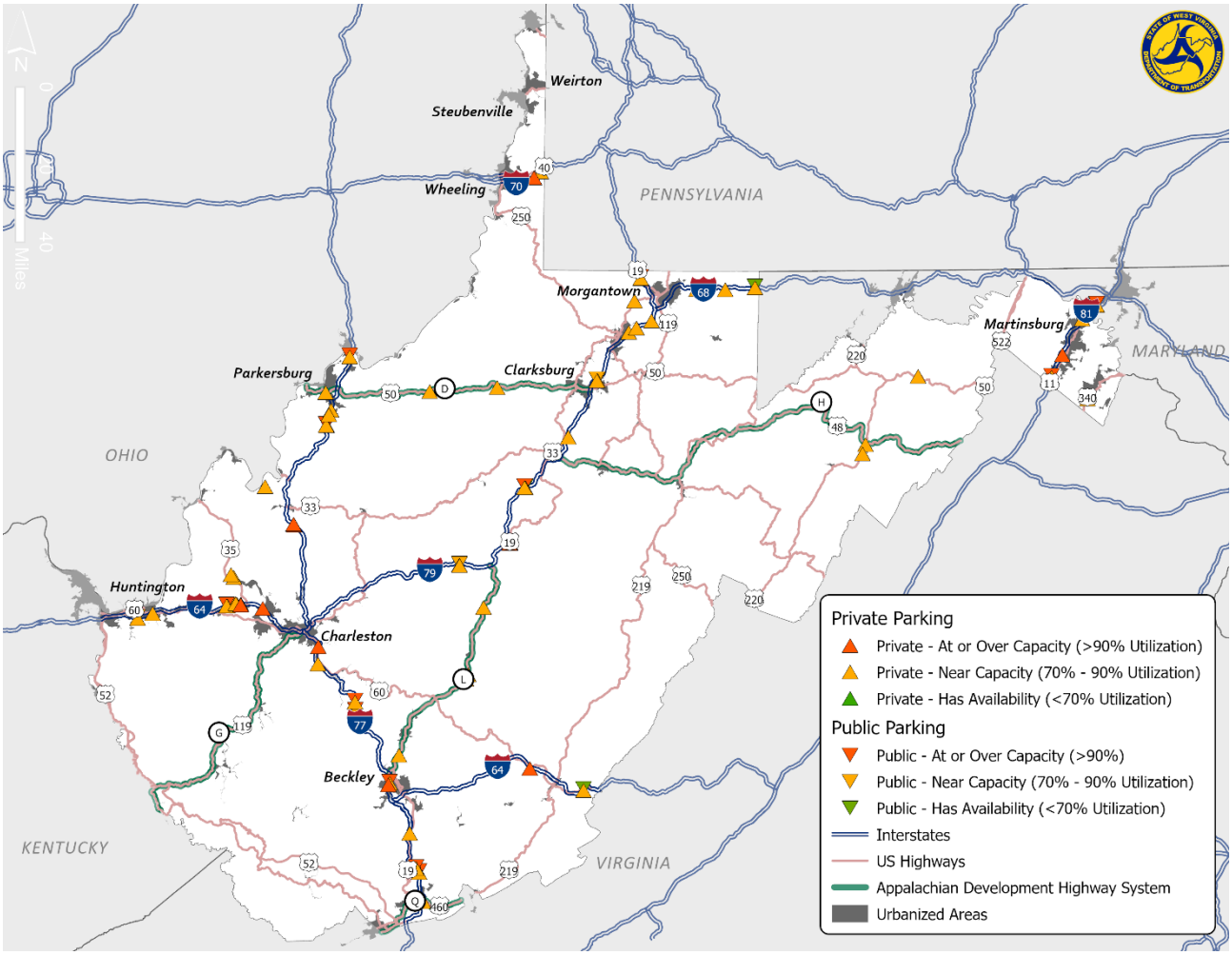
Parking demand at designated locations estimated for typical peak-hour truck parking (1 a.m.–2 a.m.) is shown in Figure 4.1 and Table 4.2 and provides details on parking demand by type of facility (public or commercial). The Federal Motor Carrier Safety Administration HOS Regulations require truck drivers to take a 10-hour break after 11 hours of driving. This break usually occurs overnight. Drivers fill up commercial facilities which are preferred for their amenities starting in the evening and then public facilities when no more spots are available. By 1 a.m. most trucks stopping overnight are parked and a reasonable estimate of the peak demand can be made. Of the 47 sites with demand data, 34 percent of the locations have availability during peak hours, 15 percent are near capacity, and 51 percent are at or over capacity (see Table 4.2). Note that "Has Availability" is defined as anything under 70 percent utilization. Over 65 percent of the State's public sites are near, at, or over capacity. These results indicate that, in general, demand exceeds capacity at the statewide level. This is discussed in greater detail in the following paragraphs.

**Table 4.2 Truck Parking Demand by Facility Type**

| Ownership | Has Availability (<70% Utilization) | Near Capacity (70%–89% Utilization) | At or Over Capacity (>90% Utilization) | Total |
|---|---|---|---|---|
| Public | 4 (9%) | 5 (11%) | 14 (30%) | 23 (49%) |
| Commercial | 12 (26%) | 2 (4%) | 10 (21%) | 24 (51%) |
| **Total** | 16 (34%) | 7 (15%) | 24 (51%) | 47 (100%) |

*Source: ATRI; Cambridge Systematics analysis.*

**Figure 4.1 Peak-Hour Utilization of Designated Truck Parking Facilities in West Virginia**




*Source:* *Truck GPS data from ATRI. Mapping by Cambridge Systematics.*

*Note:* *Facilities built near or after the initial analysis of available parking inventory may not be displayed here. At least one location along I-81 has been noted a Rutter's facility with 18 truck parking stalls.*

Statewide, West Virginia seems to have a nearly perfectly balanced truck parking supply and demand with a statewide peak utilization of approximately 99 percent, but the distribution is unfortunately uneven. Table 4.3 shows the truck parking demand by WVDOT district and the characteristics of the truck parking inventory in each district was discussed in Section 2.2. Districts 1 and 10, the two districts with the largest truck parking supply, are both significantly over capacity. These districts are traversed by many of WV's Interstates and provide access to major metropolitan areas. Several other districts are over capacity, including Districts 3, 5, and 6 (which has only a single parking facility), with District 5 having the highest peak utilization rate. District 5 is traversed by I-81 with most facilities being at or near capacity. Stakeholder interviews revealed that undesignated truck parking is a major issue along the I-81 corridor with truckers using Walmart parking lots frequently. Districts 2, 4, and 9 have an overabundance of truck parking supply. District 9 is rural to some degree, but Districts 2 and 4 have urban areas and major corridors. Possibly, these districts are located along the borders of West Virginia so drivers move though the district before needing to stop, but if drivers could be encouraged to stop in underutilized regions the overall truck parking supply could become more efficient.

### Table 4.3 Demand at Designated Locations by WVDOT District

| District | Number of Locations | Number of Spaces | Peak-Hour Demand | Peak Utilization (Peak Demand/Supply) |
|---|---|---|---|---|
| 1 | 10 | 323 | 408 | 126% |
| 2 | 2 | 57 | 31 | 54% |
| 3 | 6 | 164 | 168 | 102% |
| 4 | 8 | 233 | 148 | 64% |
| 5 | 5 | 100 | 147 | 147% |
| 6 | 1 | 170 | 180 | 106% |
| 7 | 7 | 218 | 197 | 90% |
| 8 | 0 | – | – | – |
| 9 | 4 | 195 | 95 | 49% |
| 10 | 4 | 301 | 375 | 125% |
| **Total** | 47 | 1,761 | 1,749 | 99% |

*Source: ATRI; Cambridge Systematics analysis.*

Table 4.4 shows that demand at designated locations differ only slightly between urban and rural areas. Rural areas are overutilized compared to urban ones at the peak hour. Rural private facilities are much harder to operate and staff meaning there is simply less spaces available in a largely rural State.

### Table 4.4 Demand at Designated Locations by Area

| Area | Number of Locations | Number of Spaces | Peak-Hour Demand | Peak Utilization (Demand/Supply) |
|---|---|---|---|---|
| Rural | 14 | 562 | 613 | 109% |
| Urban | 33 | 1,199 | 1,136 | 95% |
| **Total** | 47 | 1,761 | 1,749 | 99% |

*Source: ATRI; Cambridge Systematics analysis.*

Table 4.5 summarizes the parking information for roadways in West Virginia. Most truck parking is along federal Interstates, nearly 86 percent of all supply and 95 percent of peak-hour demand. Of the interstates, I-77 (by far the corridor with the highest capacity and demand), I-70, and I-81 are all over utilized, and I-64 and I-79 are near full utilization at peak hours. I-68 is the only interstate with more capacity than is needed, with a 55 percent peak utilization. The non-interstate routes listed (US-19, US-50, and Rt-817) are less than half-filled at peak utilization. In general, length is not the distinguishing characteristics for which routes are the most utilized. West Virginia has two extremely short segments of I-70 and I-81 that are nonetheless important corridors for travel especially I-81. The other intestates within West Virginia intersect at near Charleston or Beckley. In general, east-west corridors are less critical in terms of overall supply and utilization than north-south routes.

**Table 4.5 Demand along Major Roadways**

| Area | Number of Locations | Number of Spaces | Peak-Hour Demand | Peak Utilization (Demand/Supply) |
|---|---|---|---|---|
| I-64 | 8 | 210 | 193 | 92% |
| I-77 | 14 | 613 | 796 | 130% |
| I-79 | 12 | 368 | 307 | 83% |
| I-68 | 2 | 64 | 35 | 55% |
| I-70 | 1 | 170 | 180 | 106% |
| I-81 | 4 | 82 | 146 | 178% |
| US-19 | 2 | 175 | 76 | 43% |
| US-50 | 3 | 61 | 12 | 20% |
| Rt-817 | 1 | 18 | 4 | 22% |
| **Total** | **47** | **1,761** | **1,749** | **99%** |

*Source: ATRI; Cambridge Systematics analysis.*

## 4.3 Undesignated Truck Parking

Undesignated parking is truck parking outside of a dedicated truck parking facilities often occurring on the shoulders of local roads and highways, entrance/exit ramps, vacant and large commercial parking lots at big box stores, or on the margins of designated truck parking areas. Undesignated parking introduces safety and security risks for drivers and the traveling public. Trucks parked on shoulders and ramps can reduce visibility, damage pavement, and result in crashes. Crashes involving a parked truck will be discussed in Section 4.4.

The requirement for drivers to use ELDs, instead of paper logs, also has led to stricter adherence to HOS regulations. Drivers previously had a small margin of error in trip planning while reporting drive time in 15-minute intervals on paper logs. Today, ELDs log the driver's activity continuously. There are exceptions for adverse driving conditions or certain personal travel, but generally drivers are now held to a higher standard in time management. Drivers must weigh the risks and benefits of stopping before their hours are used when seeing an available space, continuing to the next rest area in hopes of reaching an available space, or stopping along the roadway on a shoulder or ramp in the event no parking is found in time.

## 4.4 Safety and Other Truck Parking Challenges

This section presents the results of an analysis of historical crash data involving trucks. The purpose of the analysis was to look for possible safety implications related to truck parking. Using data on crashes involving parked trucks, the analysis results provide insight into the consequences of undesignated parking and indicate areas where it is least safe for undesignated parking.

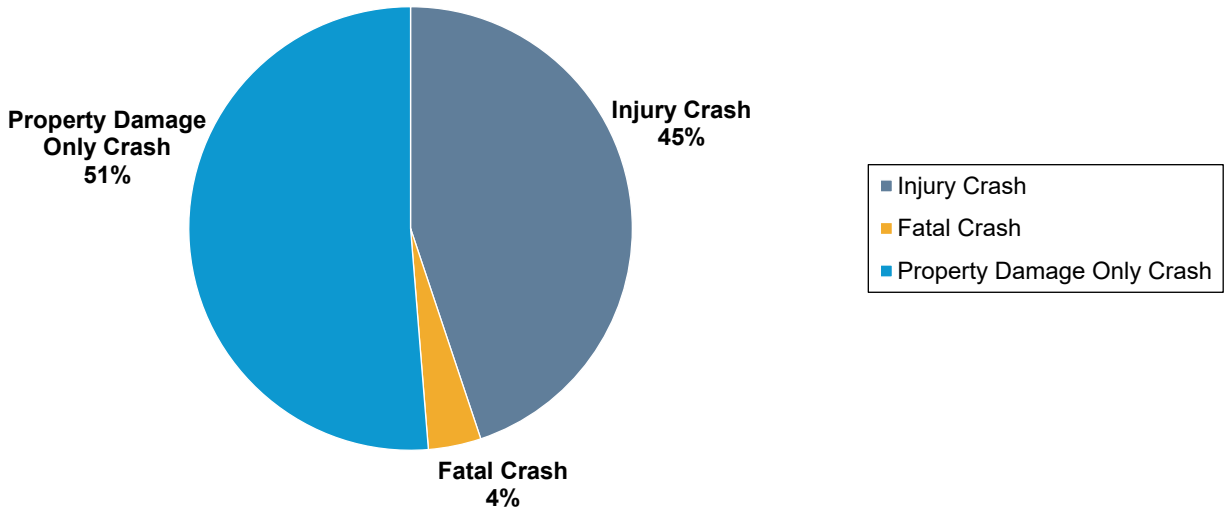
A FMCSA study found driver fatigue to be an associated risk factor in 13 percent of large truck involved crashes between April 2001 and December 2003.[1] Subsequent studies determined the risk for crashes or safety critical events (i.e., hard stops, evasive maneuvers, etc.) increases with driving time and/or a

[1] Federal Motor Carrier Safety Administration. Large Truck Crash Causation Study – Analysis Brief. July 2007. Online at: https://www.fmcsa.dot.gov/safety/research-and-analysis/large-truck-crash-causation-study-analysis-brief.

combination of driving time and work hours, suggesting that fatigue is a factor.[2,3] A 2009 study found that rest areas are a countermeasure to crashes (both fatigue- and non-fatigue-related) as crash rates were observed to decrease immediately downstream of a rest area while increasing further downstream with greater distance from the rest area.[4] With the increase in truck traffic nationwide and the continued lack of truck parking capacity, this issue is still likely a serious concern.

The remainder of this section of the report investigates crashes involving undesignated parked trucks on West Virginia roadways. The analysis was conducted using data from WVDOT's crash database for the 2017 to 2021 period. In the State there were 518 fatal and serious injury crashes involving trucks in the State. For this analysis, only those crashes involving undesignated parked trucks are being considered. Trucks are considered as parked in an undesignated location if they are on the roadway shoulder, entrance/exit ramp, median, or other roadside location. In total, there were 78 crashes involving parked trucks between 2017–2021. The results in Figure 4.2 show about 4 percent of these crashes resulted in a fatality, and about half resulted in some type of injury.

**Figure 4.2 Undesignated Parked Truck-Involved Crashes by Severity, 2017–2021**




*Source: WVDOT; Cambridge Systematics analysis.*

As shown in Figure 4.3, over half of undesignated parked truck-involved crashes occurred during daylight hours. This would imply that dark lighting is not a contributing factor to these crashes. Figure 4.4 summarizes the manner of collision for undesignated parked truck-involved crashes. About one-third of crashes were reported as single-vehicle crashes. Rear end and sideswipe same direction were the next most prevalent collision types accounting for 20 and 16 total crashes, respectively.

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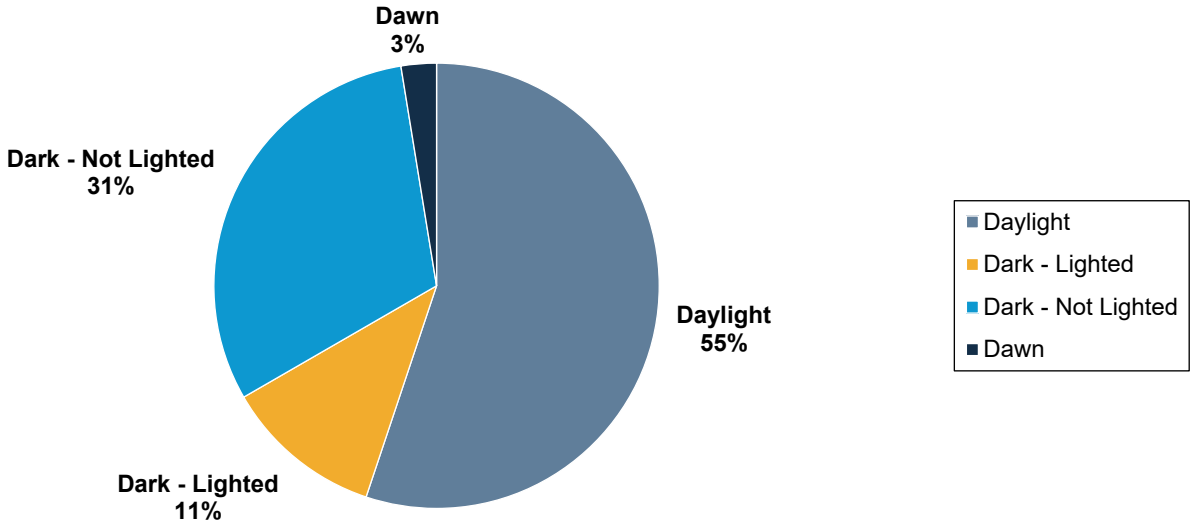
[2] Jovanis, P. et al. "Hours of Service and Driver Fatigue: Driver Characteristics Research." (2011) https://rosap.ntl.bts.gov/view/dot/70.

[3] Blanco, M. et al. "The Impact of Driving, Non-driving Work, and Rest Breaks on Driving Performance in Commercial Vehicle Operations" (2011), https://vtechworks.lib.vt.edu/handle/10919/55114.

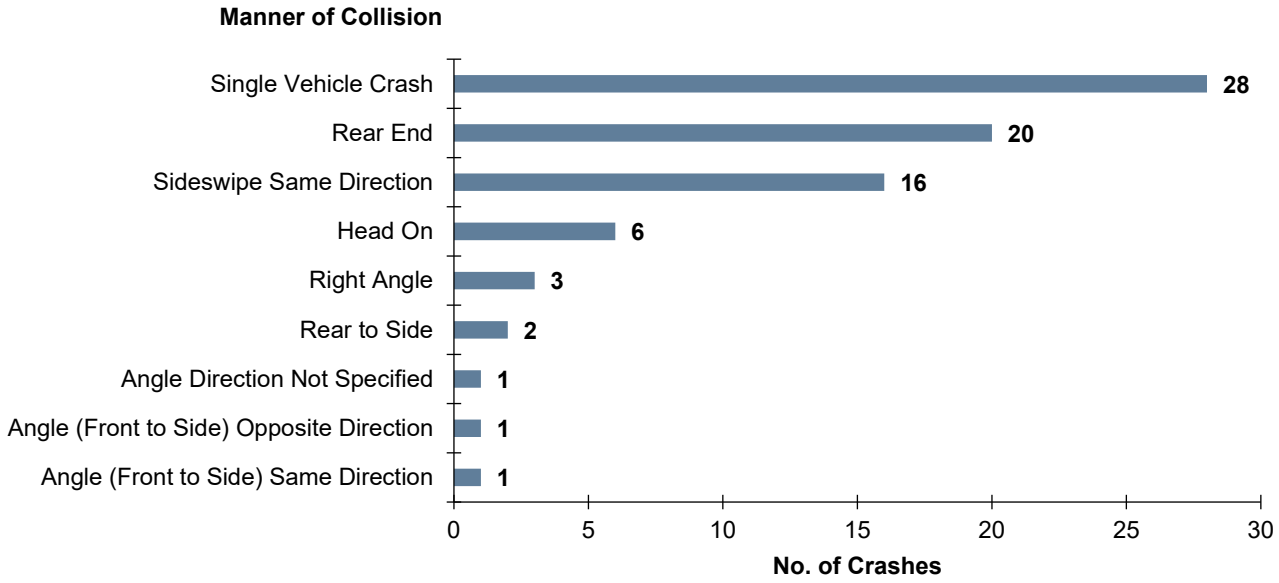
[4] Banerjee, I., et al. "Rest Areas – Reducing Accidents Involving Driver Fatigue" University of California Berkeley Traffic Safety Center and California Department of Transportation, May 2009. https://dot.ca.gov/-/media/dot-media/programs/research-innovation-system-information/documents/final-reports/ca09-1092-finalreport-a11y.pdf.

**Figure 4.3 Undesignated Parked Truck-Involved Crashes by Lighting Conditions, 2017–2021**




*Source: WVDOT; Cambridge Systematics analysis.*

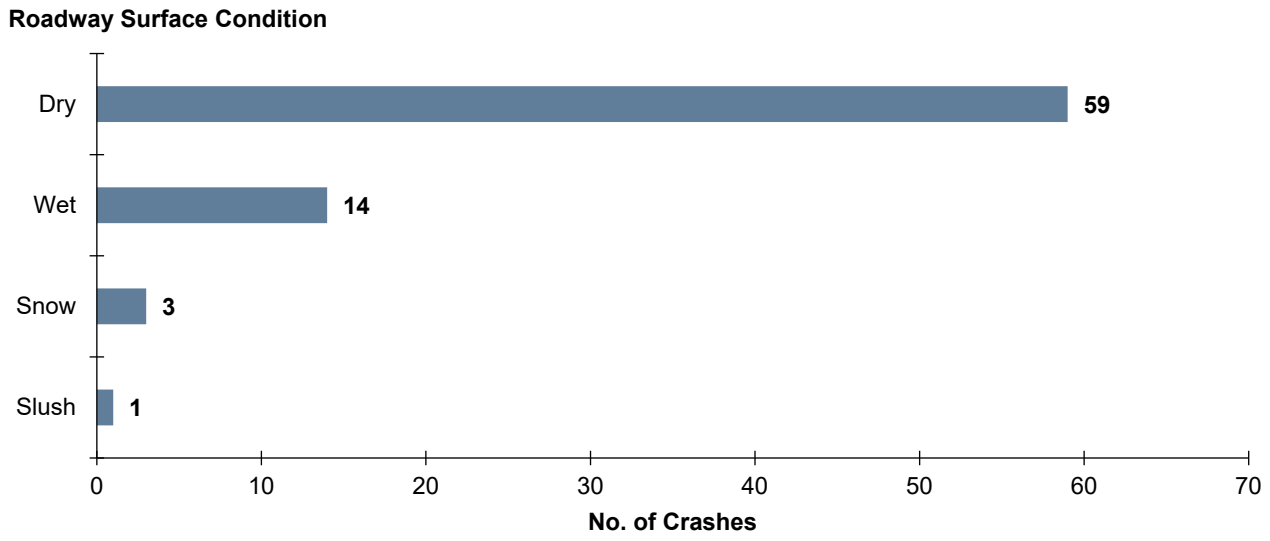
**Figure 4.4 Undesignated Parked Truck-Involved Crashes by Manner of Collision, 2017–2021**




*Source: WVDOT; Cambridge Systematics analysis.*

Figure 4.5 summarizes roadway surface conditions at the time of the crashes. It shows that 59 of the 78 total crashes (over 75 percent) occurred when roadway surface conditions were dry. This implies that roadway surface condition was generally not a contributing factor to undesignated parked truck-involved crashes.

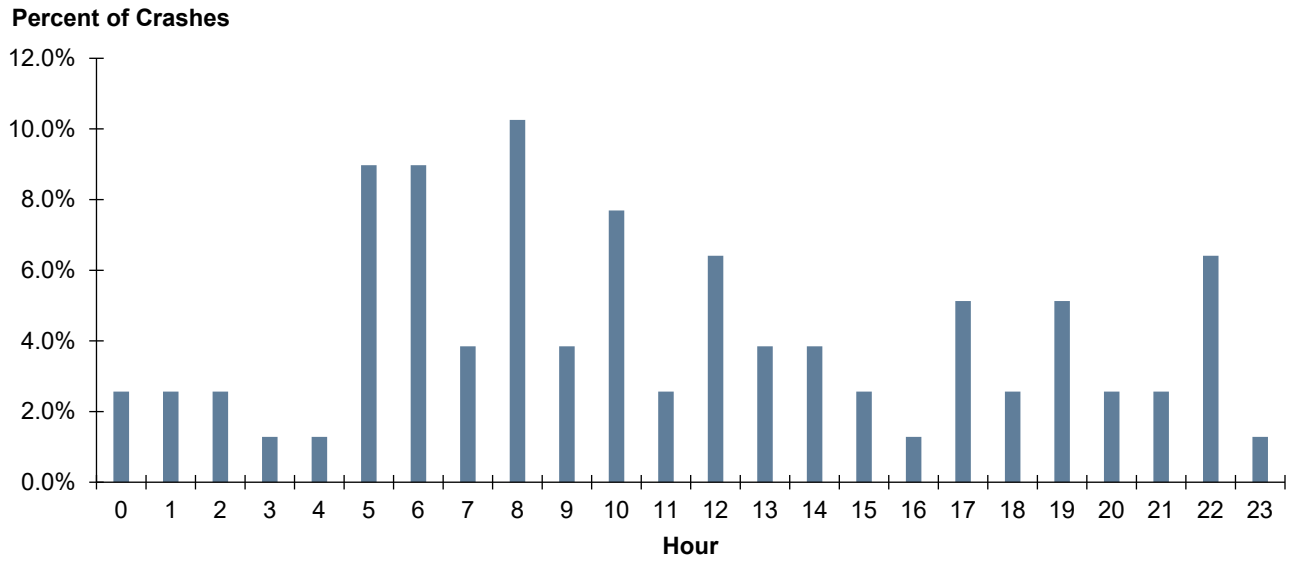
### Figure 4.5 Undesignated Parked Truck-Involved Crashes by Roadway Surface Conditions, 2017–2021




*Source: WVDOT; Cambridge Systematics analysis.*

As shown in Figure 4.6, crashes involving undesignated parked trucks generally occurred during typical business hours when trucking activity would be highest, 6 a.m. to 7 p.m. About 68 percent of undesignated parked truck-involved crashes took place during this timeframe. Interestingly, there are spikes in crashes during the 5 a.m. and 10 p.m. hours. The sharp increase in undesignated parked truck-involved crashes during the 5 a.m. hour may be a result of commuters beginning to enter the roadway network. It is unclear why the spike in crashes during the 10 p.m. hour occurs. This may correspond to a time of day where drivers begin to settle for undesignated parking locations if authorized locations are unavailable.

### Figure 4.6 Undesignated Parked Truck-Involved Crashes by Time of Day, 2017–2021




*Source: WVDOT; Cambridge Systematics analysis.*