SDDOT REST AREA & TRUCK PULLOUT

TRUCK PARKING ANALYSIS

Final Report

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1. INTRODUCTION AND PROJECT DESCRIPTION

Truck parking demand throughout South Dakota has been increasing due to general freight traffic growth and implementation of regulations that require monitoring of truck traffic to ensure that drivers are complying with Hours of Service (HOS) rules.

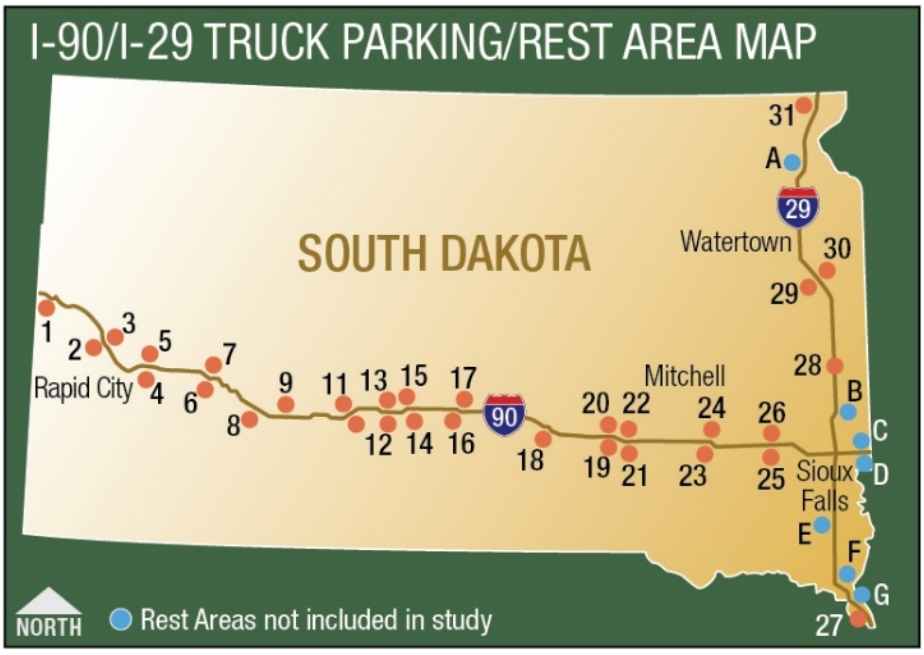
Accordingly, the South Dakota Department of Transportation (SDDOT) continues to monitor truck parking needs along its interstate system to ensure that available infrastructure adequately meets current and future needs. This analysis provides the data to support decisions regarding strategic investment in parking areas maintained by the SDDOT along Interstate 90 (I-90) and Interstate 29 (I-29)—both rest areas and truck pullouts.

The analysis builds on two previous studies: the I-90/I-29 Rest Areas Truck Parking Study completed in 2013 and a truck parking analysis of select rest areas completed in 2016. This report summarizes the truck parking data collection and demand analyses for 30 locations on the I-90 and I-29 corridors.

The analysis documents the existing and projected truck parking demand to determine if truck parking capacity improvements are required to meet existing and/or future demand. The following sections detail the existing (2018) and future (2045) parking conditions. **Appendix A** includes the Methods and Assumptions document for this project.

2. EXISTING (2018) CONDITIONS

This study designated 31 specific truck parking, truck pullout, and rest area locations for analysis (shown in orange on the map). However, due to construction at 2 – Tilford Truck Parking EB at the time of data collection, the analysis includes 30 locations. The locations shown in blue on the map represent other truck parking, truck pullout, and rest area locations along I-90 and I-29 that were not included in this analysis. These facilities were not included due to existing plans for reconstruction or roadway construction in the area.



Brief descriptions of the access and parking conditions at each site are provided below. **Figure 2-1** through **Figure 2-31** show aerials of each rest area evaluated in this study. The following sections describe current characteristics and observations at each location.

In general, all rest areas are accessed directly from the interstate (except the Ward, Wilmot, and Homestead rest areas) and provide separate parking areas for trucks and passenger vehicles. The following locations are those that provide separate designated truck parking spaces:

- **1 – Spearfish (I-90 Eastbound):** The truck parking area provides 25 angled head-in parking spaces that direct trucks toward a shared vehicle lane when exiting the rest area.
- **2 – Tilford Truck Parking (I-90 Eastbound) – UNDER CONSTRUCTION AT THE TIME OF DATA COLLECTION:** The truck parking area was originally included for analysis in this effort. However, construction during summer 2018 precluded data collection and evaluation of this location.
- **3 – Tilford Truck Parking (I-90 Westbound):** The truck parking area includes spaces for nine trucks provided in three rows of in-line, parallel parking with space for three trucks per row. These parking spaces are parallel to I-90 and approximately perpendicular to the passenger parking. The current parking layout presents challenges accessing spaces depending on the occupancy and placement of parked trucks.
- **6 – Wasta (I-90 Eastbound):** The rest area is accessed directly from I-90 and has a unique two-way traffic flow design. Entering vehicles curve back against the highway directional flow to park. To exit, vehicles proceed to a cul-de-sac to turn around at the west end of the rest area before proceeding back through the rest area to the exit ramp. The parking area consists of a paved area with designated passenger vehicle and truck parking spaces. The truck parking area provides seven angled head-in parking spaces. Trucks also parallel park along the southern edge of the rest area.
- **7 – Wasta (I-90 Westbound):** The truck parking area provides seven angled head-in parking spaces; trucks pull to the south side of the parking area before parking head-in facing the rest area. Trucks also parallel park along the southern edge of the rest area. Discussions with SDDOT staff indicated that this location is frequently observed to be at capacity.
- **10 – Belvidere (I-90 Eastbound):** The truck parking includes 12 parallel parking spaces; 8 spaces in the middle and 4 spaces along the northern edge of the rest area. The current parking design presents challenges to accessing available spaces depending on the occupancy and where trucks choose to park.
- **11 – Belvidere (I-90 Westbound):** The truck parking includes 12 parallel parking spaces; 8 spaces in the middle and 4 spaces along the northern edge of the rest area. The current parking design presents challenges accessing spaces depending on the occupancy and where trucks choose to park. When demand exceeds capacity, trucks parallel park over the passenger parking spaces and stage along the curb adjacent to the entry ramp.
- **16 – Presho (I-90 Eastbound):** The truck parking area includes 16 head-in angled parking spaces.
- **17 – Presho (I-90 Westbound):** The truck parking area includes 13 head-in angled parking spaces. When truck parking is at capacity, trucks parallel park over the passenger parking area and diagonally along the west end of the rest area.
- **18 – Chamberlain (I-90 Eastbound/Westbound):** The rest area serves I-90 eastbound and westbound directions via a grade-separated interchange. The rest area provides separate

designated parking for trucks, passenger vehicles, and campers/vehicles with trailers. Before entering the parking, signs direct trucks/campers to the left and passenger vehicles to the right. Although there are 16 designated truck parking spaces, trucks were also observed parking in the spaces for campers. When demand exceeds capacity, trucks also park over the westernmost passenger car parking area.

- **21 – White Lake (I-90 Eastbound):** The truck parking area includes nine head-in angled parking spaces.
- **22 – White Lake (I-90 Westbound):** The truck parking area includes nine head-in angled parking spaces. When demand exceeds capacity, trucks parallel park within the passenger parking spaces, stage along the curb adjacent to the entry ramp, and parallel park along the southern edge of the rest area.
- **25 – Salem (I-90 Eastbound):** The truck parking area includes 16 angled head-in parking spaces.
- **26 – Salem (I-90 Westbound):** The rest area includes 16 angled head-in designated truck parking spaces with separate passenger vehicle parking spaces.
- **28 – Ward (I-29 Northbound/Southbound):** This rest area serves I-29 northbound and southbound directions with separate circulation for passenger vehicles and trucks. Access to the rest area is provided off County Highway B / 223rd Street on the east side of I-29. Truck and passenger vehicles are split before reaching the respective parking areas; passenger vehicle parking is provided on the interior of the circular rest area, with parallel truck parking on the perimeter. This rest area has no designated striped parking areas. Based on observed parking behavior, it has been estimated that the Ward rest area truck parking can accommodate 16 trucks.
- **29 – Hidewood Truck Parking (I-29 Northbound):** The rest area is accessed directly from northbound I-29. Upon exiting, truck and passenger vehicles are directed to separate parking areas. The truck and passenger vehicle traffic streams merge before re-entering northbound I-29. The Hidewood truck parking areas were recently resurfaced and the designated truck parking area has been assumed to retain eight designated truck parking spaces based on the striping shown in the plans provided by SDDOT. (Note: Aerial imagery shown on **Figure 2-29** was taken before the resurfacing project.)
- **30 – Hidewood Truck Parking (I-29 Southbound):** The rest area is accessed directly from southbound I-29. Upon exiting, truck and passenger vehicles are directed to separate parking areas. The truck and passenger vehicle traffic streams merge before re-entering southbound I-29. The recently resurfaced parking area has been assumed to retain eight designated truck parking spaces, consistent with the plans provided by SDDOT (Note: Aerial imagery shown on **Figure 2-30** was taken before the resurfacing project.)
- **31 – Glacial Lakes (I-29 Southbound):** The truck parking area includes 10 angled head-in parking spaces that direct trucks toward a shared vehicle lane when exiting the rest area.

The truck pullout and scenic pullout locations observed do not provide designated parking for trucks. The truck pullout locations are accessed directly from the interstate and include slip ramp lanes with parallel parking areas that are used by trucks and passenger vehicles. The slip ramp lanes generally range from 1,000 to 2,200 feet in length (from estimated gore point to gore point). The *SDDOT Road Design Manual* criteria specifies 705 and 1,960 feet of deceleration and acceleration length for the stop condition under a design speed of 80 miles per hour (mph). The length of the existing ramps can

generally accommodate a 65-mph design speed to stop condition scenario with 50 to 200 feet of space for vehicles to park.

The following locations are those that do not provide separate designated truck parking spaces:

- **4 – Box Elder Pullout (I-90 Eastbound)**: The truck pullout includes a parallel parking area that can accommodate an estimated two trucks.
- **5 – Box Elder Pullout (I-90 Westbound)**: The truck pullout includes a parallel parking area that can accommodate an estimated two trucks. Trucks/vehicle caravans transporting wind turbine blades were observed using this location. Due to the oversized nature of these trucks, each truck carrying a turbine was counted as occupying the space equivalent to that of two average-sized trucks. The caravans of trucks were observed to include several support vehicles (non-trucks) that required a significant area to park and stage.
- **8 – Cactus Flats Scenic Pullout (I-90 Eastbound):**[1] The scenic pullout is accessed directly from I-90. When entering the scenic pullout, there are traffic splits to access parallel parking on the south edge of the pullout and angled parking in the middle of the pullout. There is currently no striping to designate spot locations.
- **9 – Cactus Flats Scenic Pullout (I-90 Westbound):**[2] The scenic pullout is accessed directly from I-90 with the scenic pullout itself being set back from mainline I-90. Combined passenger vehicle and truck parallel parking is provided on a semi-circular parking area.
- **12 – Okaton Truck Pullout (I-90 Eastbound):** The truck pullout provides parallel parking for trucks with a median in the middle of the parking area. Trucks were observed parking along the edges of the pullout and along the median. There are no designated truck parking spaces, and passenger vehicles were also observed using the pullout.
- **13 – Okaton Truck Pullout (I-90 Westbound):** The truck pullout provides parallel parking for trucks. Trucks were observed parking along the edges of the pullout and along the median. There are no designated truck parking spaces, and passenger vehicles were also observed using the pullout.
- **14 – Murdo Truck Pullout (I-90 Eastbound):** The truck pullout provides a parallel parking area for trucks. Passenger cars were also observed parking along the pullout area.
- **15 – Murdo Truck Pullout (I-90 Westbound):** The truck pullout provides a parallel parking area for trucks. Passenger cars were also observed parking along the pullout area.
- **19 – White Lake Truck Pullout (I-90 Eastbound):** The truck pullout provides a parallel parking area for trucks.
- **20 – White Lake Truck Pullout (I-90 Westbound):** The truck pullout provides a parallel parking area for trucks. Passenger cars were also observed parking along the pullout area.
- **23 – Mitchell Truck Pullout (I-90 Eastbound):** The truck pullout provides a parallel parking area for trucks.

[1] **NOTE:** The scenic pullouts are heavily used by passenger vehicles, in addition to a modest number of trucks observed parking at the location. These locations lack designated striped spaces for passenger vehicles and trucks. Occasionally, the unstructured nature of the parking area resulted in little space to accommodate truck parking.

[2] **NOTE:** The scenic pullouts are heavily used by passenger vehicles, in addition to a modest number of trucks observed parking at the location. These locations lack designated striped spaces for passenger vehicles and trucks. Occasionally, the unstructured nature of the parking area resulted in little space to accommodate truck parking.

- **24 – Mitchell Truck Pullout (I-90 Westbound):** The truck pullout provides a parallel parking area for trucks. Passenger cars were also observed parking along the pullout area.
- **27 – Jefferson Truck Pullout (I-29 Southbound):** The truck pullout provides a parallel parking area for trucks. Passenger cars were also observed parking along the pullout area near the entry and exit ramps.

As previously noted, there are seven other truck parking, truck pullout, and rest area locations along I-90 and I-29 that were not included in this analysis. These facilities were not included due to existing plans for reconstruction or roadway construction in the area:

- **A – Wilmot Information Center (I-29 Northbound/Southbound):** Access to the rest area is provided via SD State Highway 15 (SD 15), on the east side of I-29, serving both the northbound and southbound directions of I-29. The rest area has a two-way access off SD 15 that splits to a one-way loop around the rest area with separate parking for trucks and passenger vehicles. The truck parking area provides nine head-in parking spaces. The truck and passenger vehicle traffic streams merge before exiting the rest area.
- **B – Dell Rapids Truck Pullout (I-29 Southbound):** The truck pullout provides a parallel parking area for trucks.
- **C – Valley Springs Port of Entry and Information Center (I-90 Westbound):** The rest area includes a weigh station area that is separate from the passenger vehicle parking area. The weigh station area is striped with seven truck parking spaces. The truck and passenger vehicle traffic streams merge before re-entering westbound I-90.
- **D – Valley Springs (Beaver Creek) Traveler Information Center (I-90 Eastbound):** The rest area includes 21 angled head-in truck parking spaces in a designated area separate from the passenger vehicle parking area. The truck and passenger vehicle traffic streams merge before re-entering eastbound I-90.
- **E – Beresford Truck Pullout (I-29 Southbound):** The truck pullout provides a parallel parking area for trucks.
- **F – Homestead (Vermillion) Information Center (I-29 Northbound/Southbound):** The rest area access is located off SD State Highway 50 (SD 50), east of I-29, and serves I-29 northbound and southbound directions. The access road circles the rest area in a counterclockwise direction. Separate passenger vehicle and truck parking is provided. The truck parking area provides 21 angled head-in parking spaces; trucks pull to the east side of the parking area before parking head-in facing the rest area.
- **G –– Jefferson Truck Parking and Weigh Station (I-29 Northbound):** The northbound Jefferson truck parking and weigh station is accessed off I-29. When exiting, the onsite circulation directs truckers clockwise around the area with options to access the weigh station, parking, and the inspection area. For the parking, there are two sets of angled truck parking providing a total of 19 spaces.

2.1 Data Collection

Video cameras were placed at each rest area on June 26, 2018, to record the occupancy in truck-only parking spots over a single 24-hour period. Cameras were positioned at strategic locations at each rest area to capture entering/exiting trucks and to provide a view of all truck parking spots.

2.1.1 Truck Occupancy Counts

Parked trucks were counted in 5-minute increments by reviewing the video footage. Occupancy was recorded in truck-only spaces; demand calculations included trucks parked in non-designated locations. Passenger vehicles, campers, vehicles pulling trailers, etc., parked in truck spaces were recorded in the occupancy counts to reflect the associated reduction in available capacity for truck parking demand.

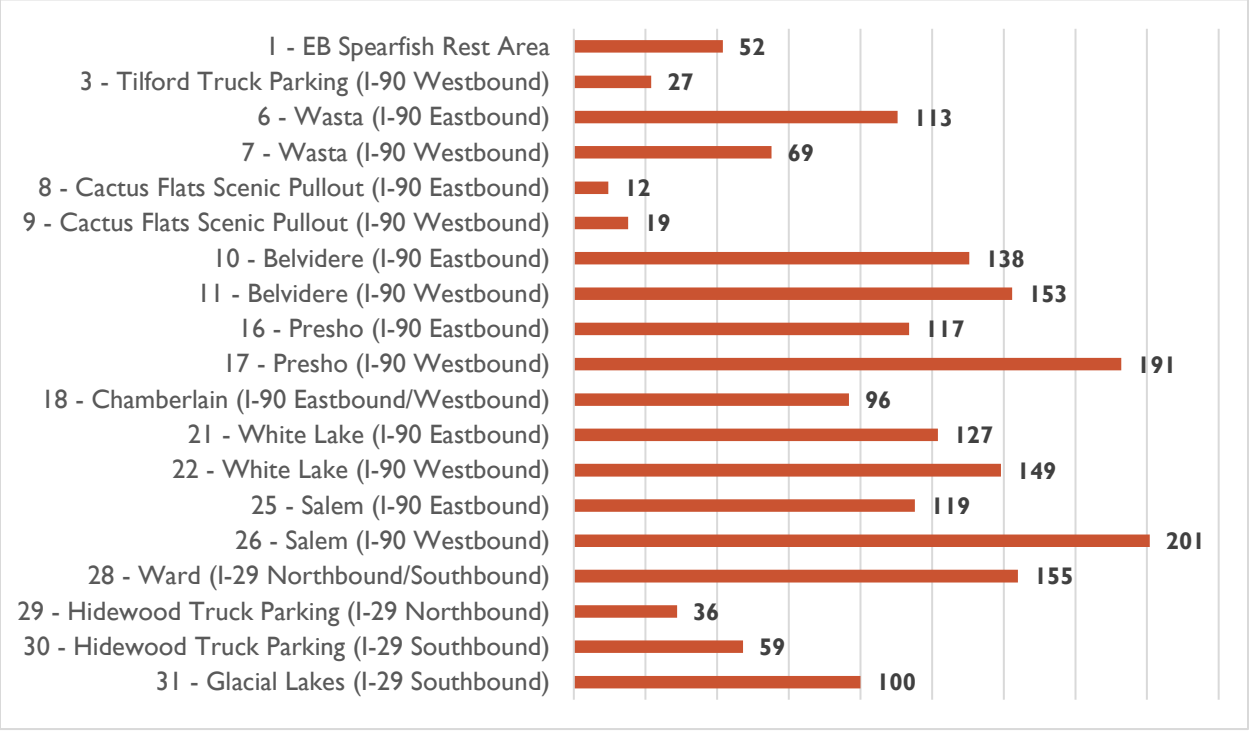
The 24-hour truck parking use at rest area facilities and pullout facilities was recorded on June 26, 2018, at the previously noted locations, except 2 - Tilford Truck Parking EB, 29 – Hidewood Truck Parking NB, and 30 – Hidewood Truck Parking SB. These three locations were under construction at the time of initial data collection. Following the completion of the construction at the Hidewood locations, SDDOT staff conducted supplemental video data collection and provided occupancy profiles.

2.2 Truck Parking Analysis

After compiling the truck parking data at each location, several analyses were performed to evaluate the overall use of each location.

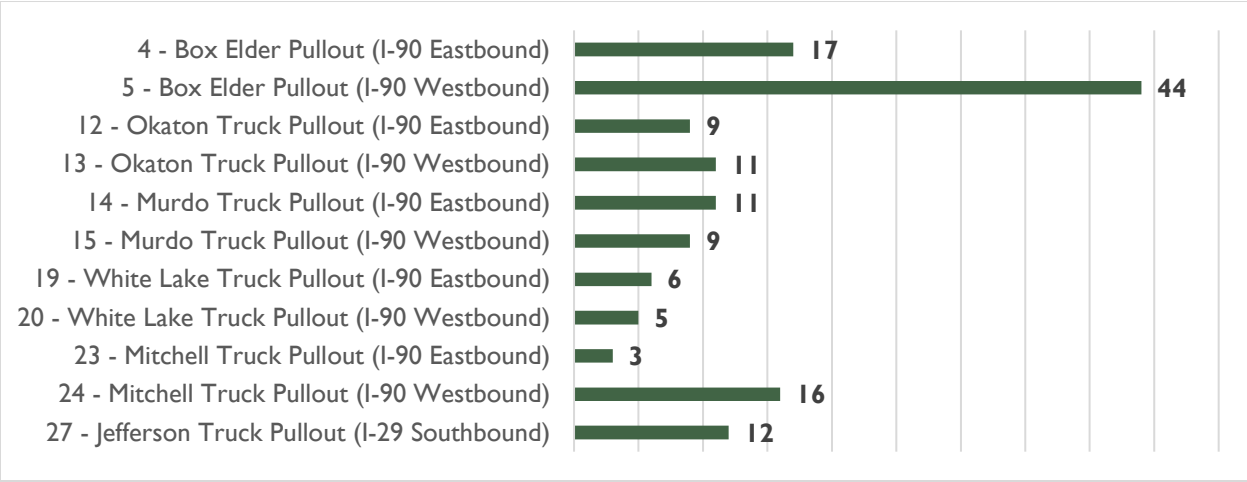
Chart 2-1 summarizes the 24-hour cumulative total number of observed parked trucks and vehicles parked in designated truck parking spaces for rest areas.

Chart 2-1. 24-hour Truck Parking Totals – Rest Areas



The truck pullouts do not have designated truck parking spaces; however, there is a limited amount of space available for truck parking at each location. For these locations, the total number of parked vehicles has been reported **(Chart 2-2**).

Chart 2-2. 24-hour Truck Parking Totals – Truck Pullouts



It is important to recall that Location 5 – Box Elder Pullout (I-90 Westbound) was observed to be a popular staging area for caravans of trucks moving wind turbine blades. The turbine transport trucks are oversized and were counted as occupying the space of two average trucks. These trucks were also accompanied by several support vehicles included in the total parking count.

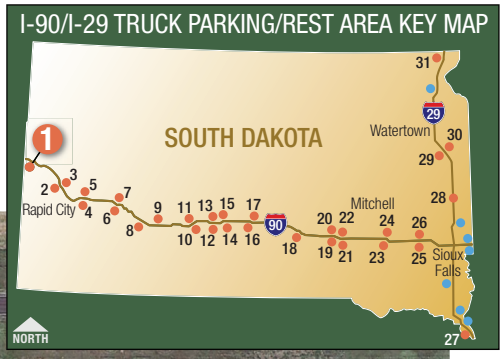
2.2.1 Average Truck Parking Occupancy

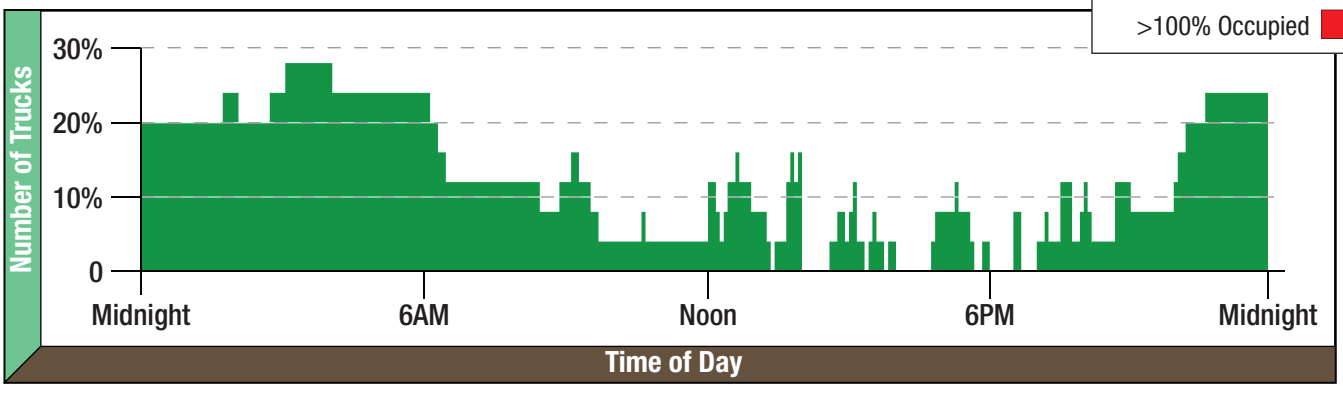
For the rest areas, where there is a defined truck parking capacity, existing 2018 demand has been reported as a percentage of the available capacity. For truck pullout locations, where there are no designated or marked truck parking spaces (as noted in **Table 2-1** with the N/A designation under the column heading *Truck Spaces Provided*), demand has been reflected as the total number of observed parked trucks.

Table 2-1 also shows the average daytime (7:00 AM to 7:00 PM) and nighttime (7:00 PM to 7:00 AM) parking demand. The average truck parking occupancy at each facility was evaluated in 5-minute intervals to determine the adequacy of the existing parking supply. The analysis also evaluated the average hourly demand (**Figure 2-1** through **Figure 2-31**).

Table 2-1. 2018 Average Hourly Daytime and Nighttime Truck Parking Occupancy

	Facility	Truck Spaces Provided	Daytime Hours	Nighttime Hours
1	Spearfish Rest Area (I-90 Eastbound)	25	6%	18%
3	Tilford Truck Parking (I-90 Westbound)	9	6%	23%
4	Box Elder Pullout (I-90 Eastbound)	N/A	0.2	0.2
5	Box Elder Pullout (I-90 Westbound)	N/A	7.3	7.1
6	Wasta (I-90 Eastbound)	7	52%	103%
7	Wasta (I-90 Westbound)	7	54%	78%
8	Cactus Flats Scenic Pullout (I-90 Eastbound)	N/A	0.3	1.6
9	Cactus Flats Scenic Pullout (I-90 Westbound)	N/A	1.2	0.9
10	Belvidere (I-90 Eastbound)	12	29%	51%
11	Belvidere (I-90 Westbound)	12	35%	78%
12	Okaton Truck Pullout (I-90 Eastbound)	N/A	0.2	0.1
13	Okaton Truck Pullout (I-90 Westbound)	N/A	0.1	0.2
14	Murdo Truck Pullout (I-90 Eastbound)	N/A	0.4	1.2
15	Murdo Truck Pullout (I-90 Westbound)	N/A	0.1	0.1
16	Presho (I-90 Eastbound)	16	28%	48%
17	Presho (I-90 Westbound)	13	47%	82%
18	Chamberlain (I-90 Eastbound/Westbound)	16	43%	100%
19	White Lake Truck Pullout (I-90 Eastbound)	N/A	0.0	0.0
20	White Lake Truck Pullout (I-90 Westbound)	N/A	0.1	0.5
21	White Lake (I-90 Eastbound)	9	36%	60%
22	White Lake (I-90 Westbound)	9	55%	75%
23	Mitchell Truck Pullout (I-90 Eastbound)	N/A	0.4	1.1
24	Mitchell Truck Pullout (I-90 Westbound)	N/A	1.1	0.7
25	Salem (I-90 Eastbound)	16	21%	38%
26	Salem (I-90 Westbound)	16	50%	71%
27	Jefferson Truck Pullout (I-29 Southbound)	N/A	0.1	0.3
28	Ward (I-29 Northbound/Southbound)	16	39%	104%
29	Hidewood Truck Parking (I-29 Northbound)	8	17%	33%
30	Hidewood Truck Parking (I-29 Southbound)	8	21%	36%
31	Glacial Lakes (I-29 Southbound)	10	24%	45%





LEGEND

- 0 - 59% Occupied
- 60 - 89% Occupied
- 90 - 100% Occupied
- >100% Occupied

FELSBURG HOLT & ULLEVIG

NORTH

NOTE: Drawing Not to Scale

FIGURE 2-1

2018 Weekday Recorded Truck Parking Demand
I - I-90 EB Spearfish Rest Area

SDDOT I-90/I-29 Rest Area Truck Parking 18-225 11/6/18

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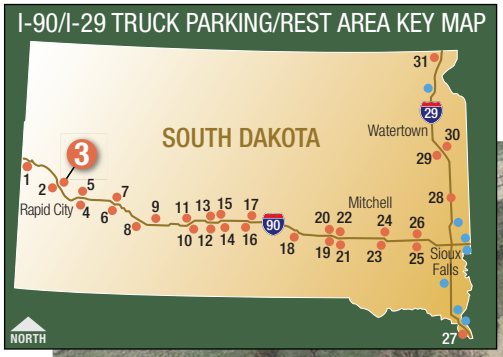
NORTH

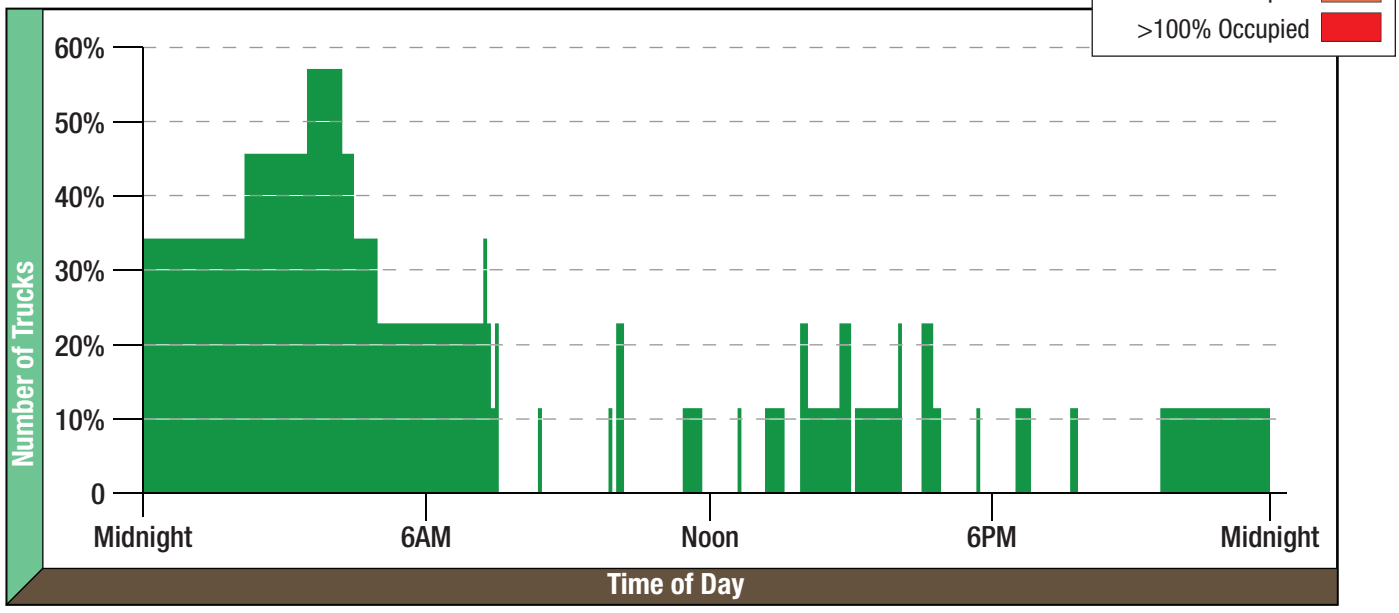
NOTE: Drawing Not to Scale

FIGURE 2-2

2018 Weekday Recorded Truck Parking Demand
2 - I-90 EB Tilford Rest Area

SDDOT I-90/I-29 Rest Area Truck Parking 18-225 11/6/18





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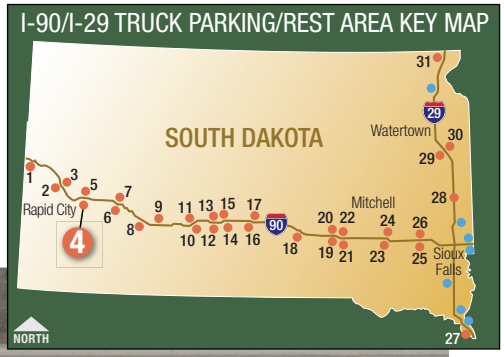
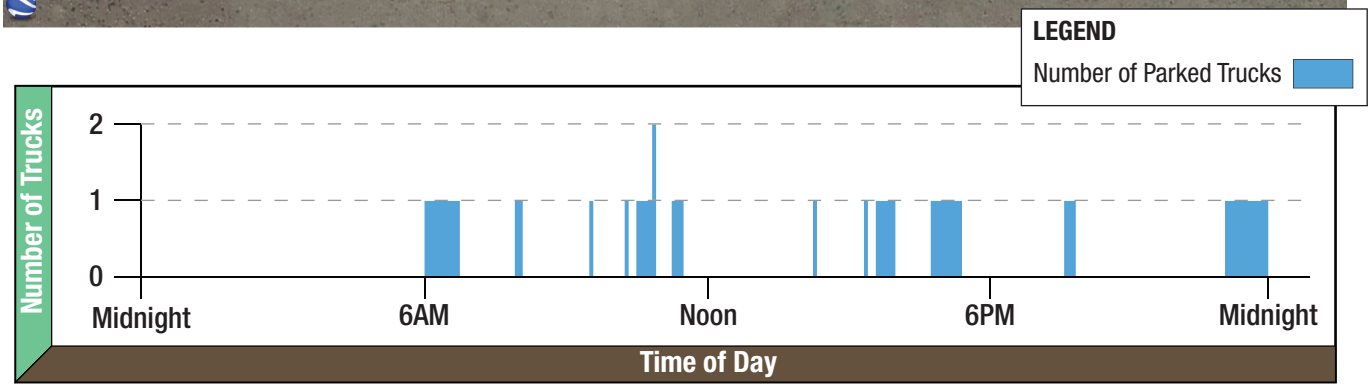
NOTE: Drawing Not to Scale

FIGURE 2-3

2018 Weekday Recorded Truck Parking Demand
3 - I-90 WB Tilford Rest Area

SDDOT I-90/I-29 Rest Area Truck Parking 18-225 11/6/18





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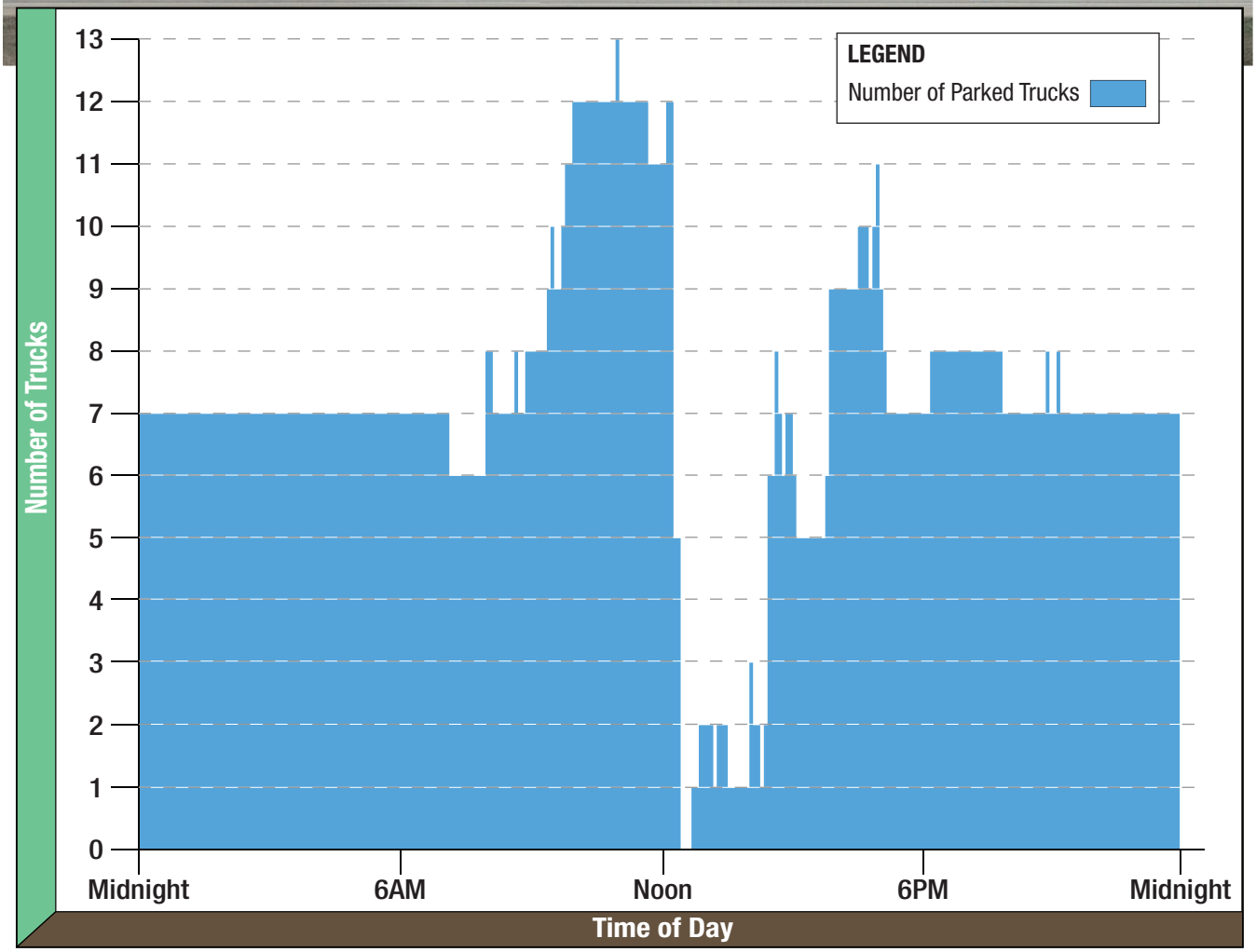
NORTH
NOTE: Drawing Not to Scale

FIGURE 2-4

2018 Weekday Recorded Truck Parking Demand
4 - I-90 EB Box Elder Pullout

SDDOT I-90/I-29 Rest Area Truck Parking 18-225 11/6/18



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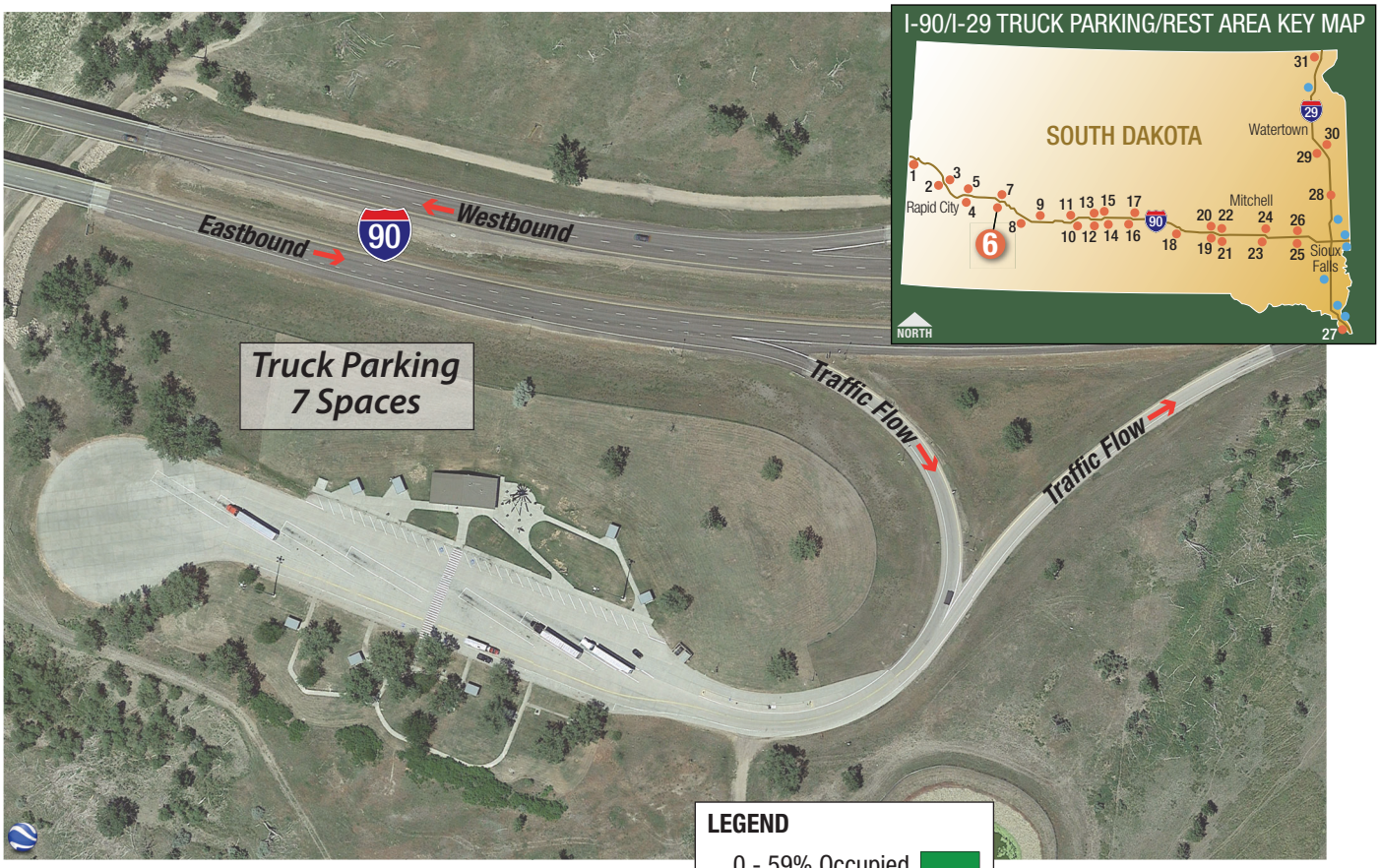
NORTH
NOTE: Drawing Not to Scale

FIGURE 2-5

2018 Weekday Recorded Truck Parking Demand
5 - I-90 WB Box Elder Pullout

SDDOT I-90/I-29 Rest Area Truck Parking 18-225 11/6/18

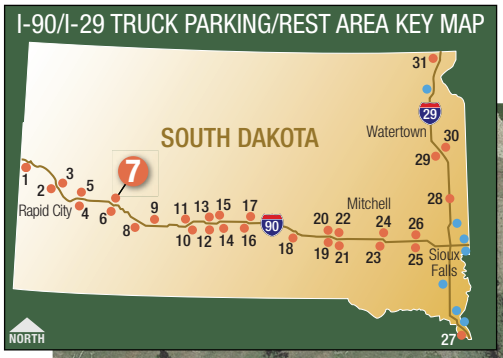


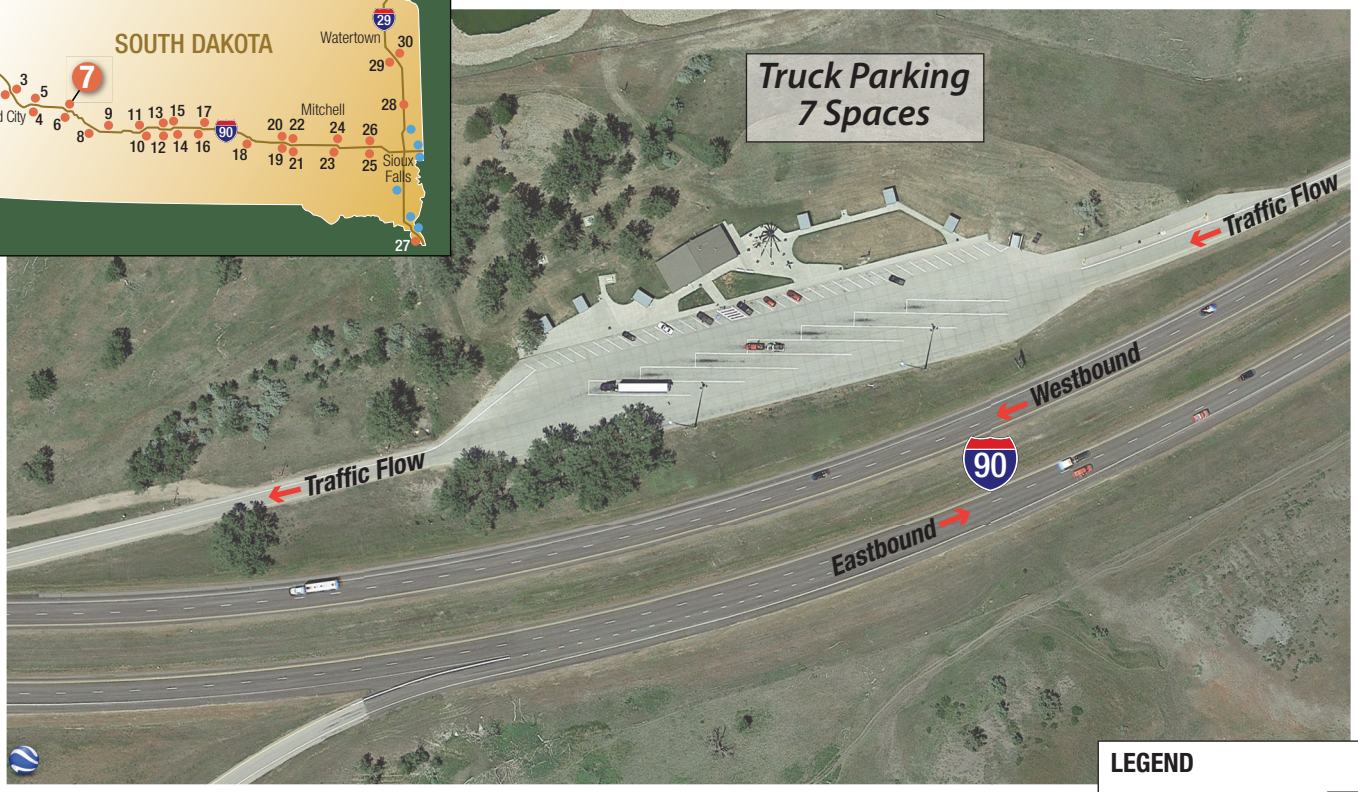
NORTH
NOTE: Drawing Not to Scale

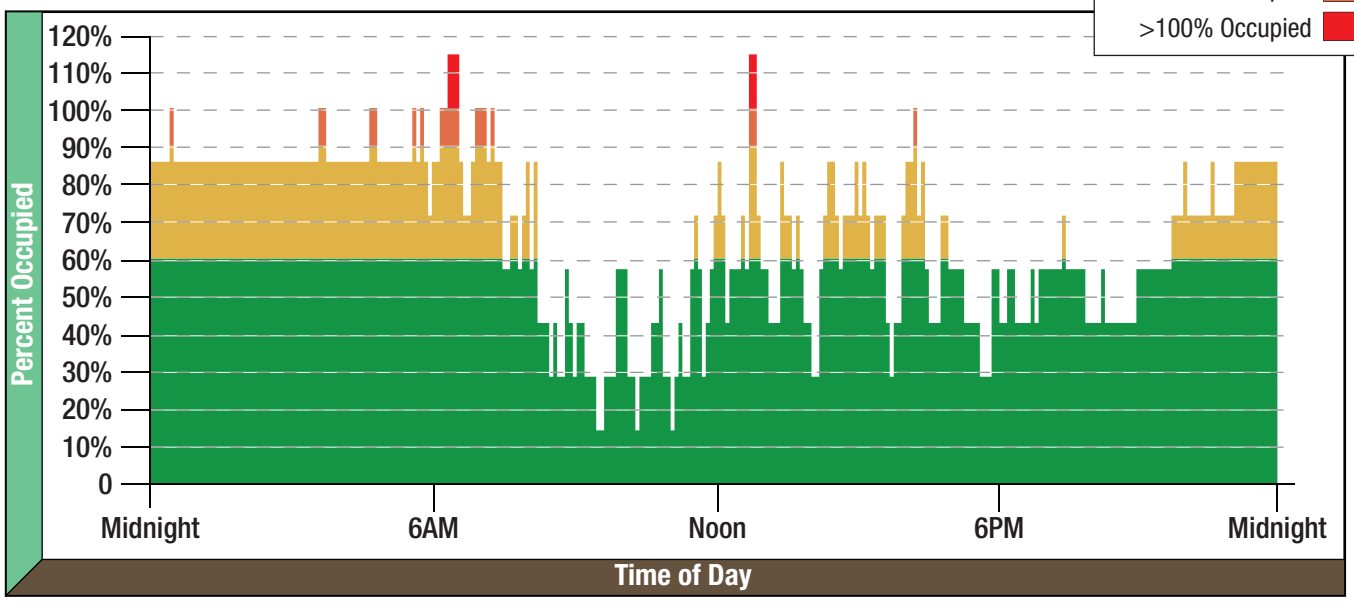
FIGURE 2-6

2018 Weekday Recorded Truck Parking Demand
6 - I-90 EB Wasta Rest Area

SDDOT I-90/I-29 Rest Area Truck Parking 18-225 11/6/18







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NORTH

NOTE: Drawing Not to Scale

FIGURE 2-7

2018 Weekday Recorded Truck Parking Demand
7 - I-90 WB Wasta Rest Area

SDDOT I-90/I-29 Rest Area Truck Parking 18-225 11/6/18

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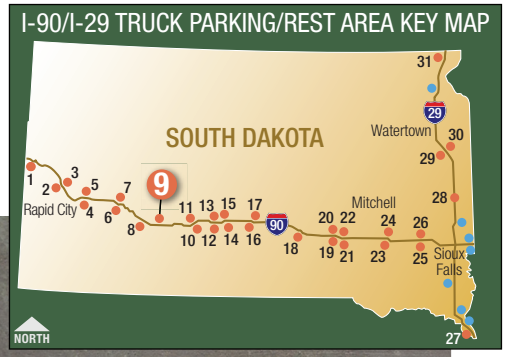
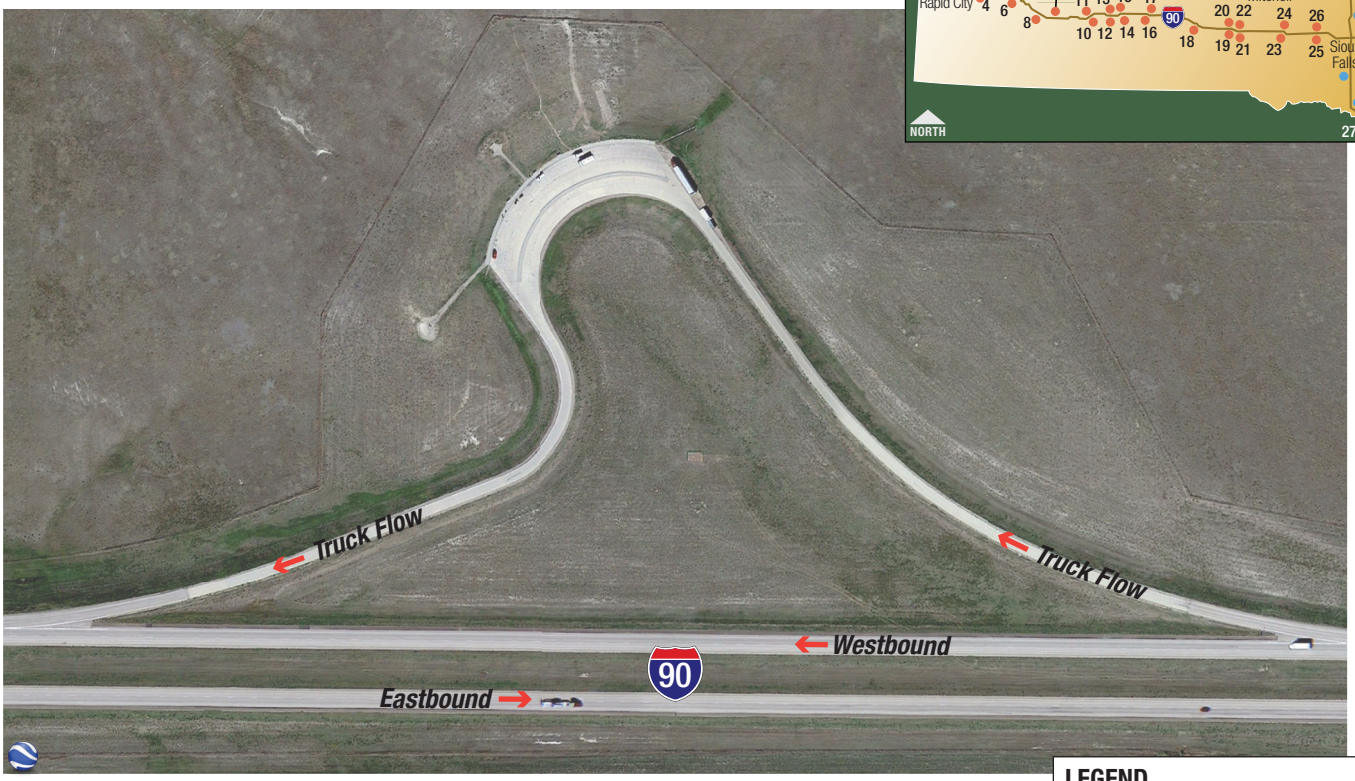
NOTE: Drawing Not to Scale

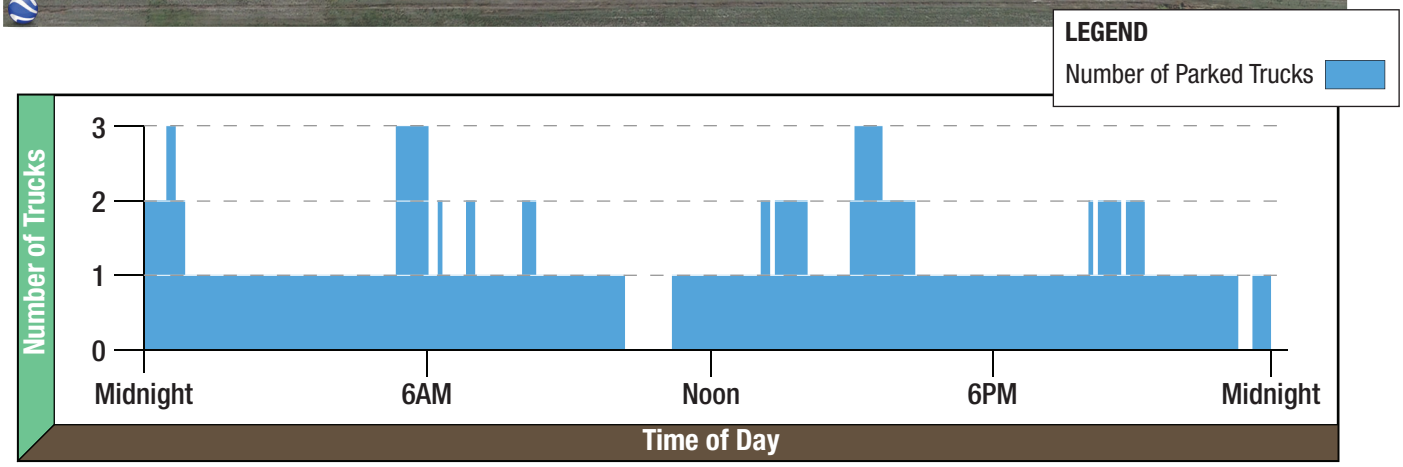
FIGURE 2-8

2018 Weekday Recorded Truck Parking Demand
8 - I-90 EB Cactus Flats Scenic Pullout

SDDOT I-90/I-29 Rest Area Truck Parking 18-225 11/6/18







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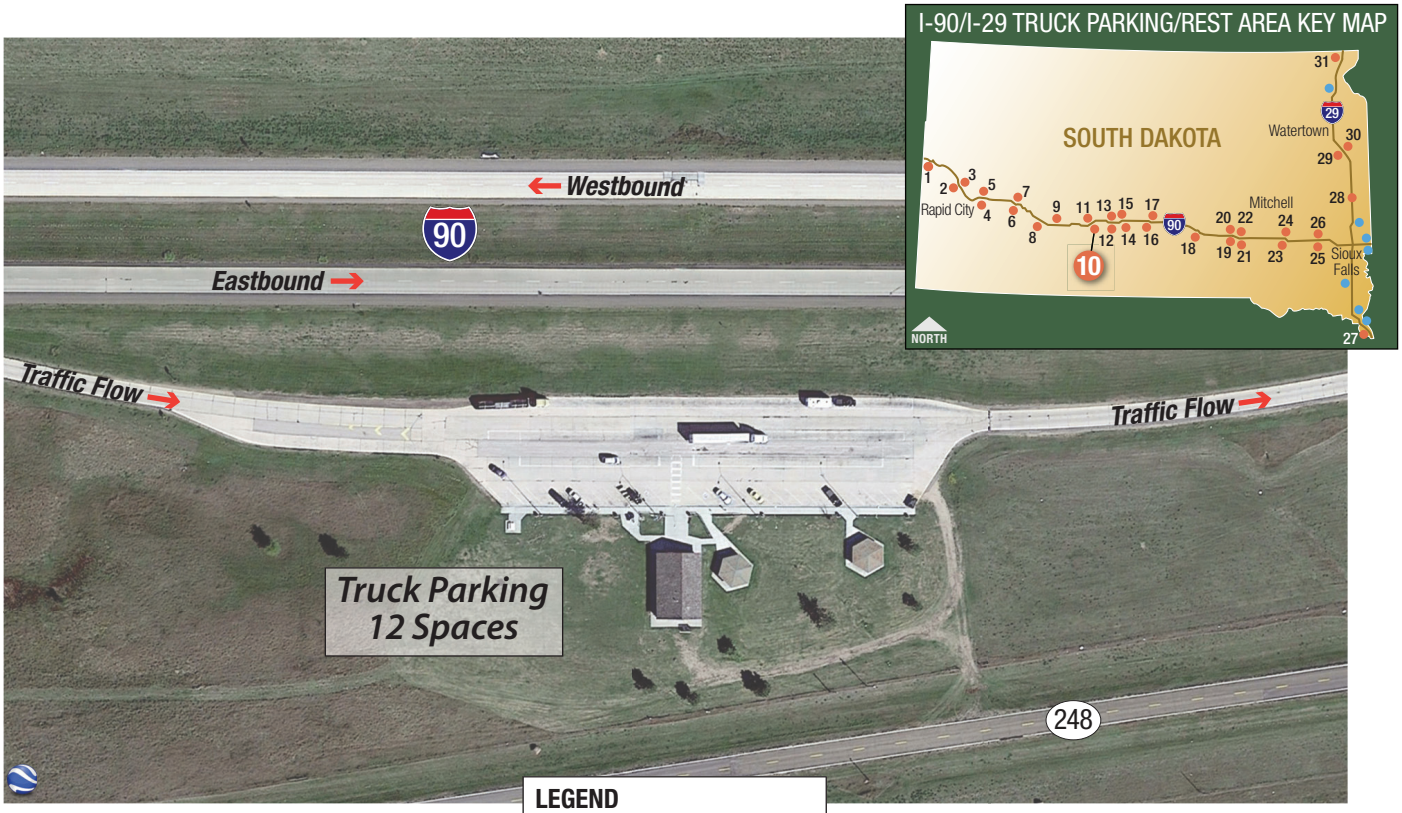
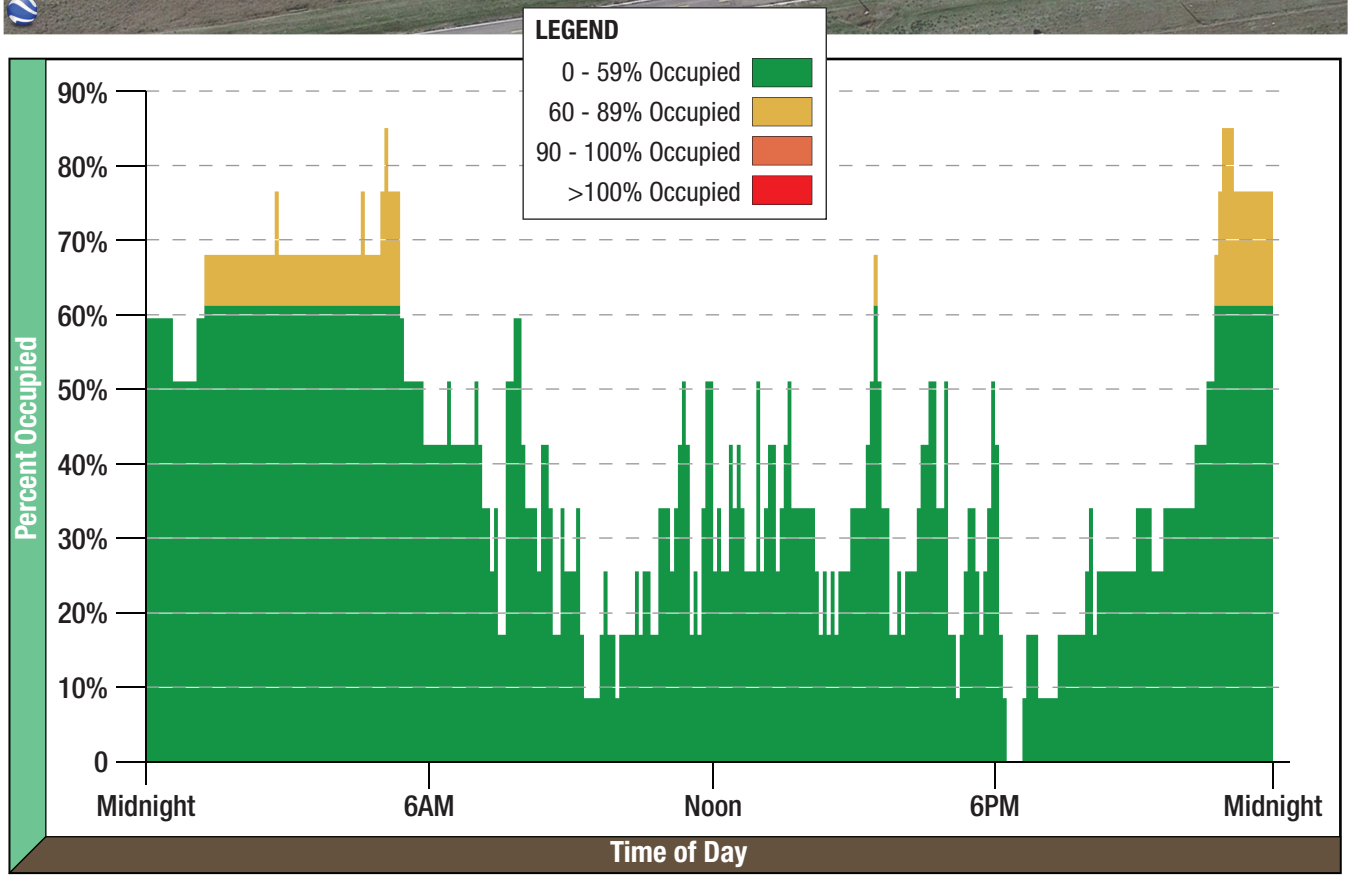
NORTH

NOTE: Drawing Not to Scale

FIGURE 2-9

2018 Weekday Recorded Truck Parking Demand
9 - I-90 WB Cactus Flats Scenic Pullout





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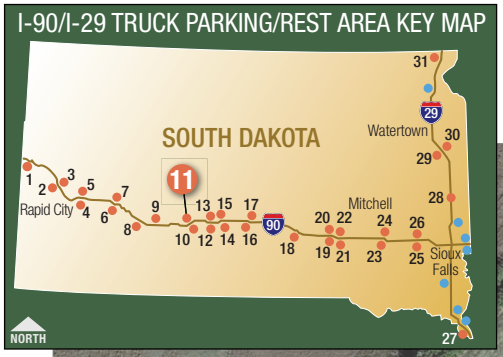
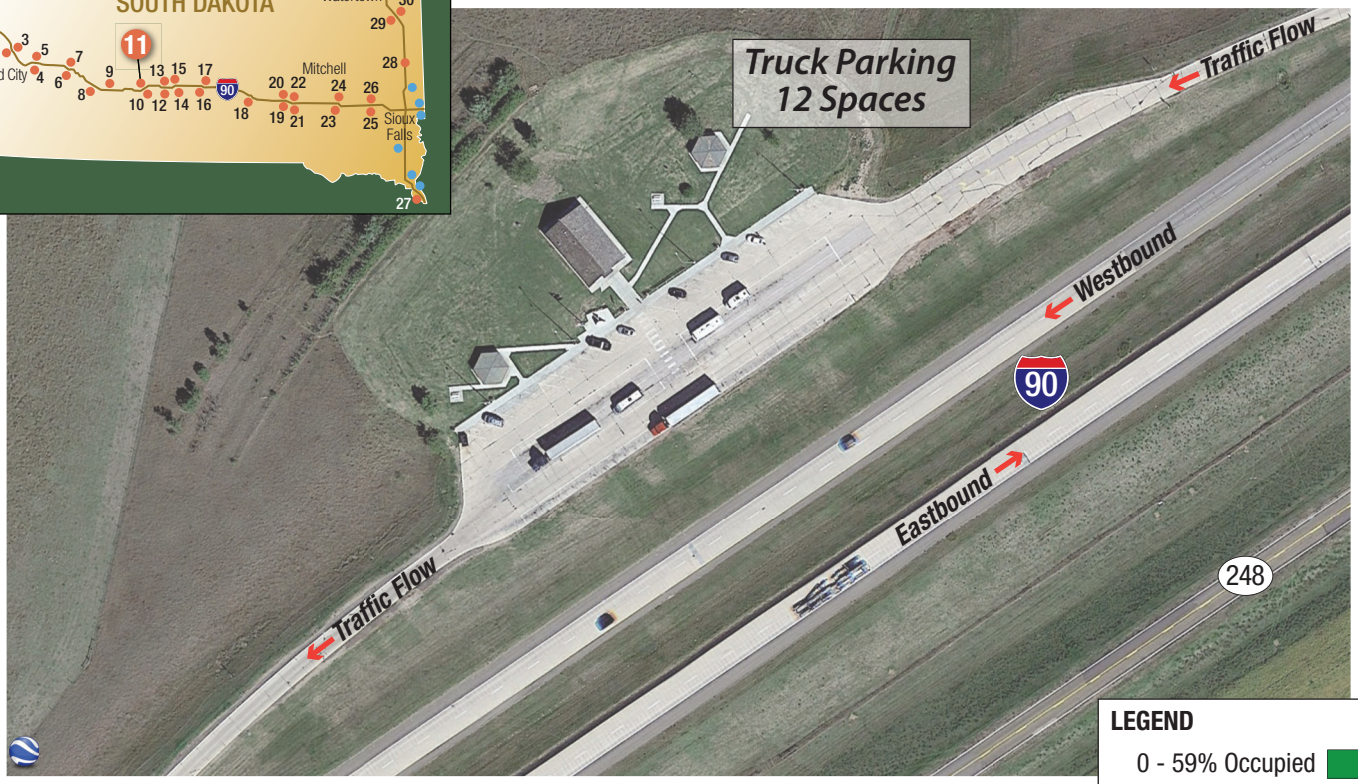
NOTE: Drawing Not to Scale

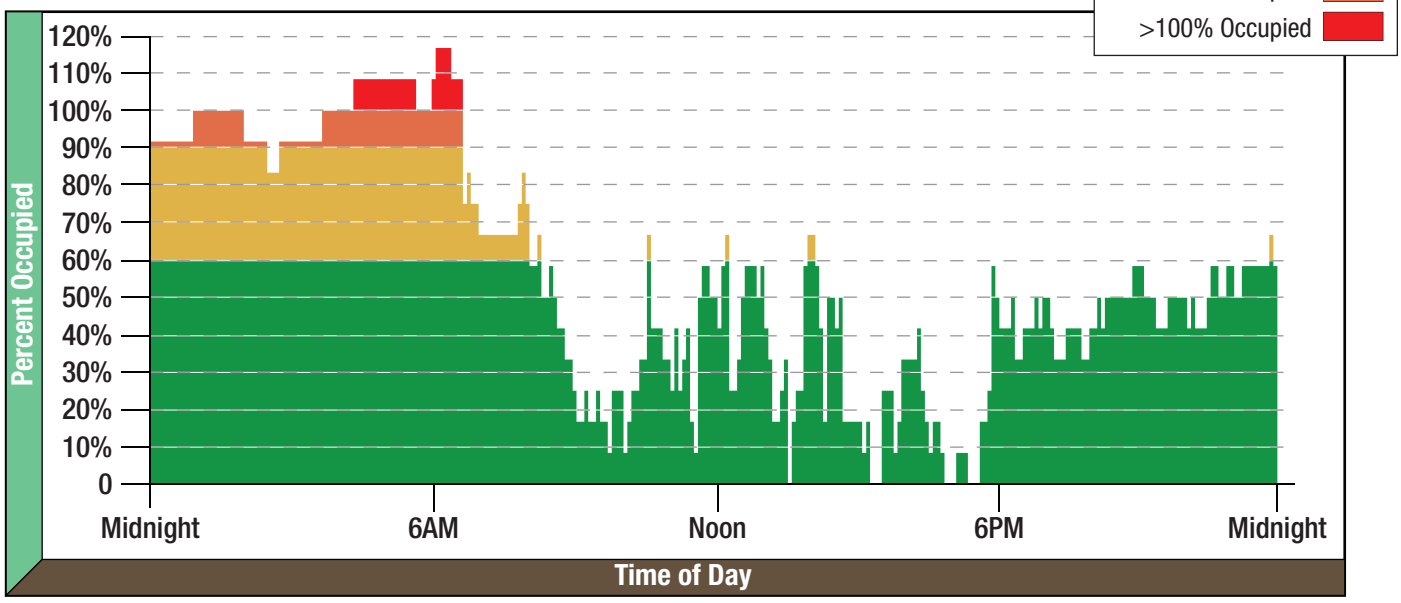
FIGURE 2-10

2018 Weekday Recorded Truck Parking Demand
10 - I-90 EB Belvidere Rest Area

SDDOT I-90/I-29 Rest Area Truck Parking 18-225 11/6/18







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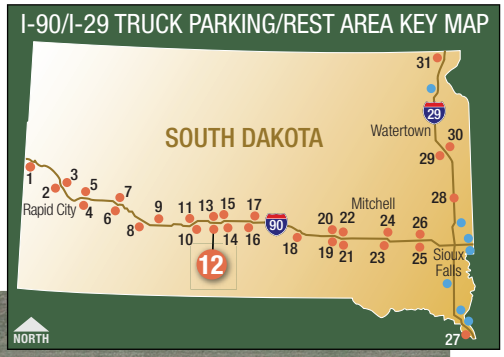
NORTH

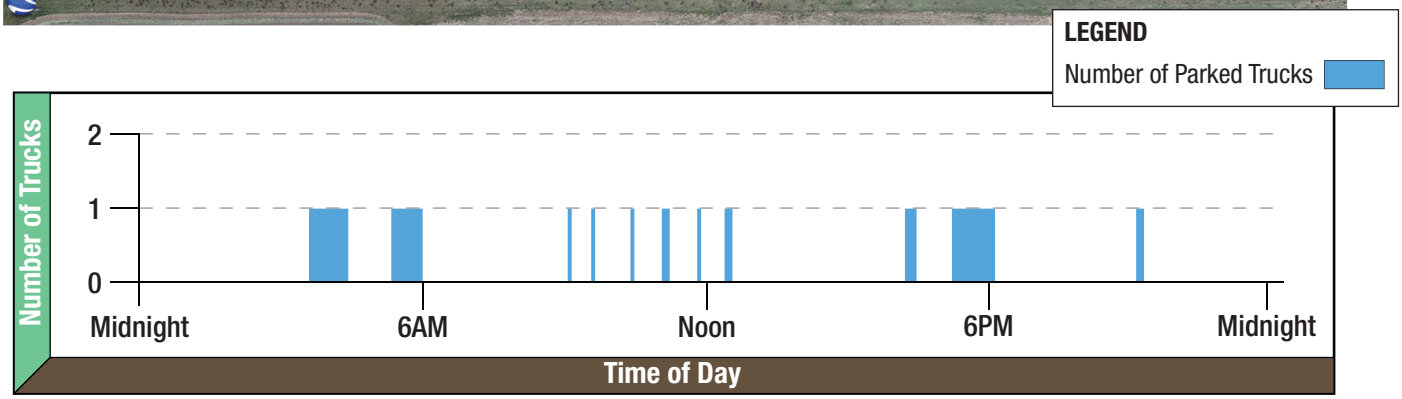
NOTE: Drawing Not to Scale

FIGURE 2-11

2018 Weekday Recorded Truck Parking Demand
11 - I-90 WB Belvidere Rest Area

SDDOT I-90/I-29 Rest Area Truck Parking 18-225 11/6/18



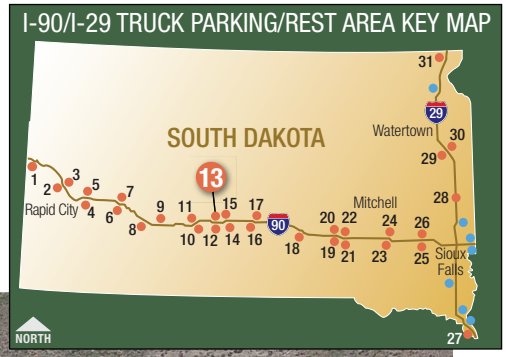


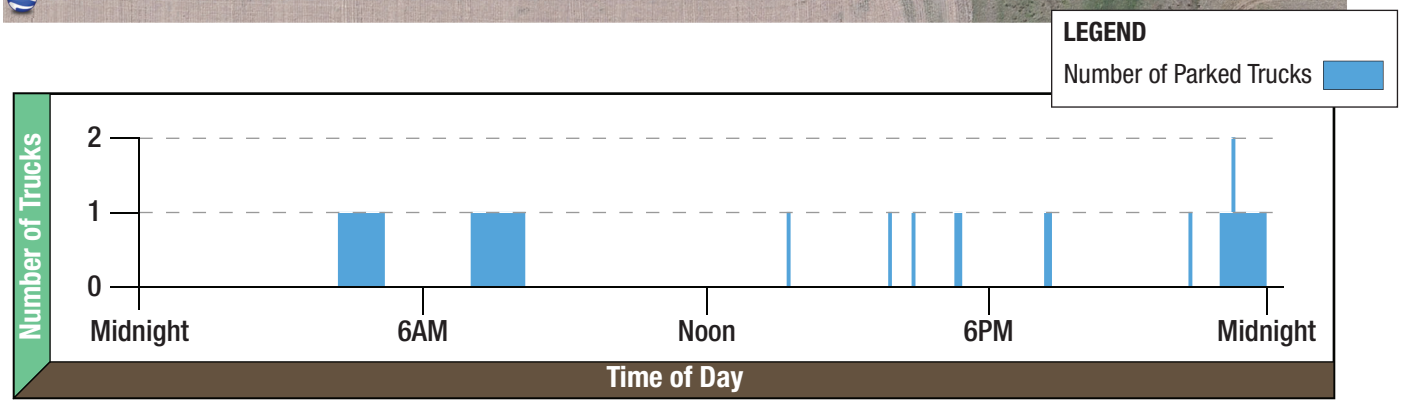
NORTH
NOTE: Drawing Not to Scale

FIGURE 2-12

2018 Weekday Recorded Truck Parking Demand
12 - I-90 EB Okaton Pullout

SDDOT I-90/I-29 Rest Area Truck Parking 18-225 11/6/18





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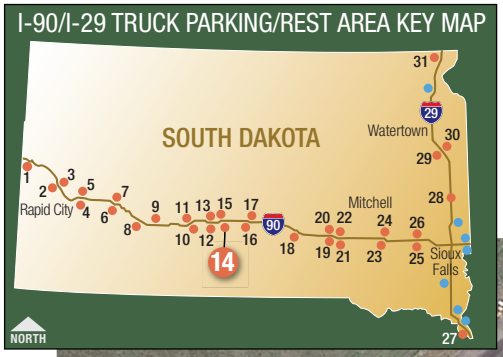
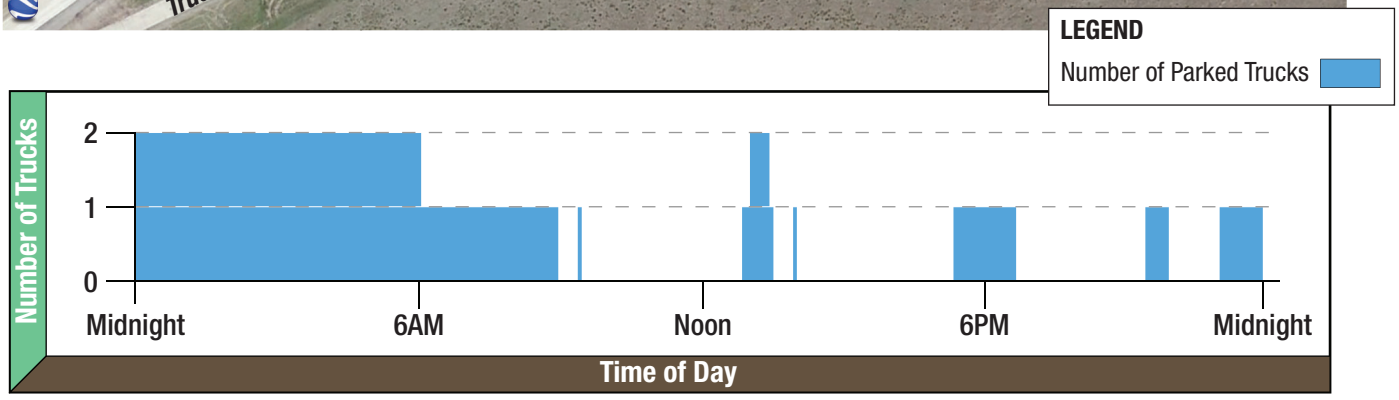
NOTE: Drawing Not to Scale

FIGURE 2-13

2018 Weekday Recorded Truck Parking Demand
13 - I-90 WB Okaton Pullout

SDDOT I-90/I-29 Rest Area Truck Parking 18-225 11/6/18





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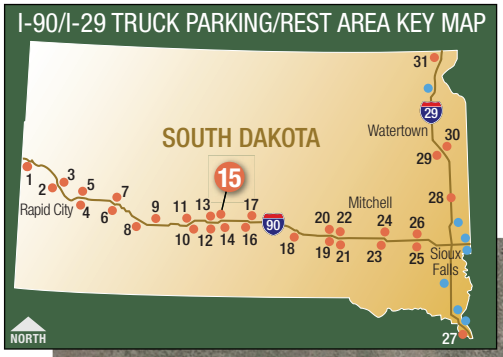
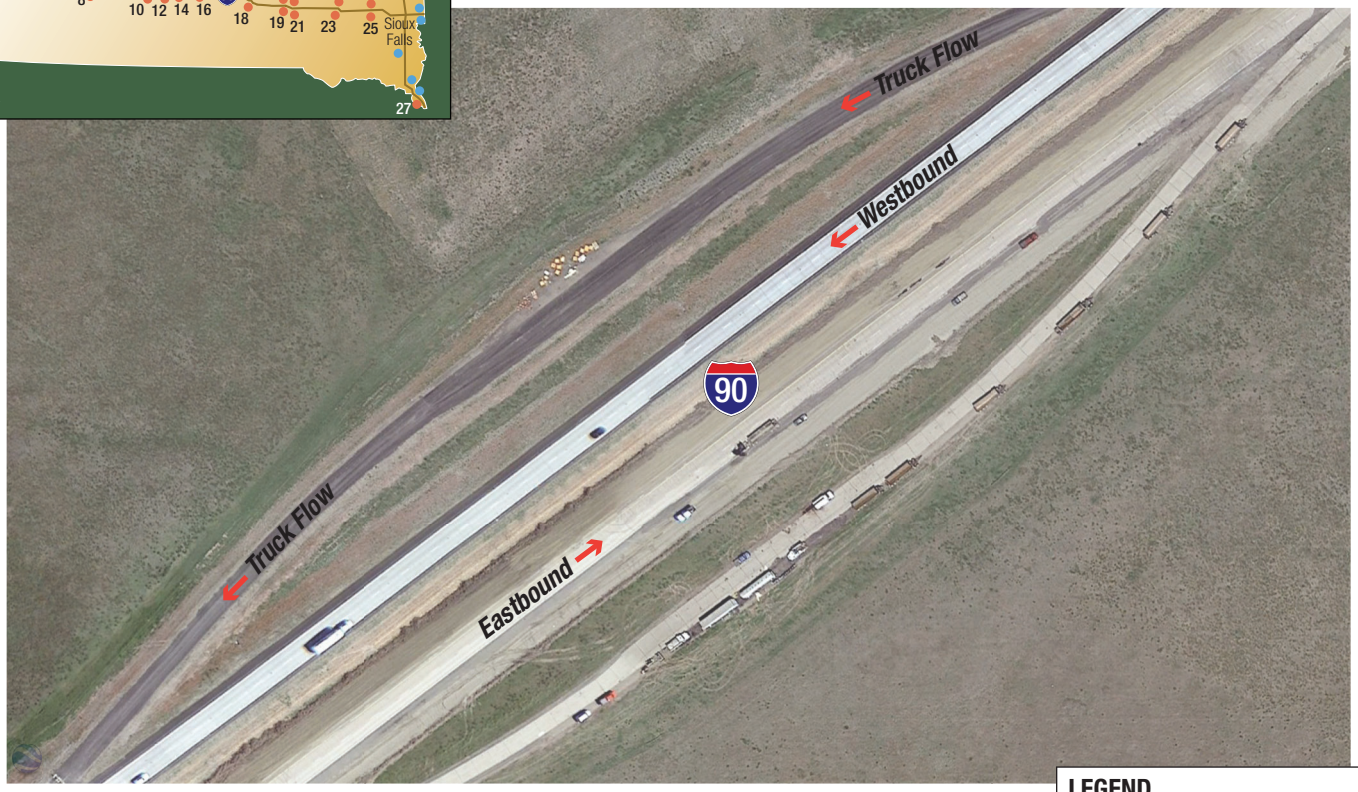
NORTH
NOTE: Drawing Not to Scale

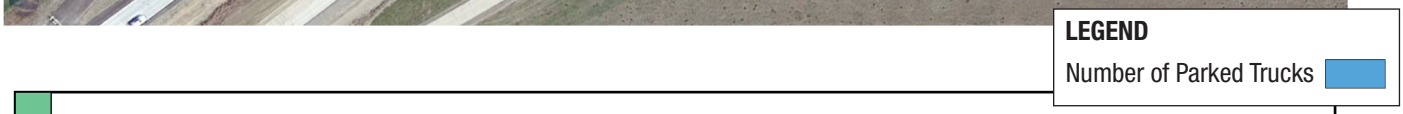
FIGURE 2-14

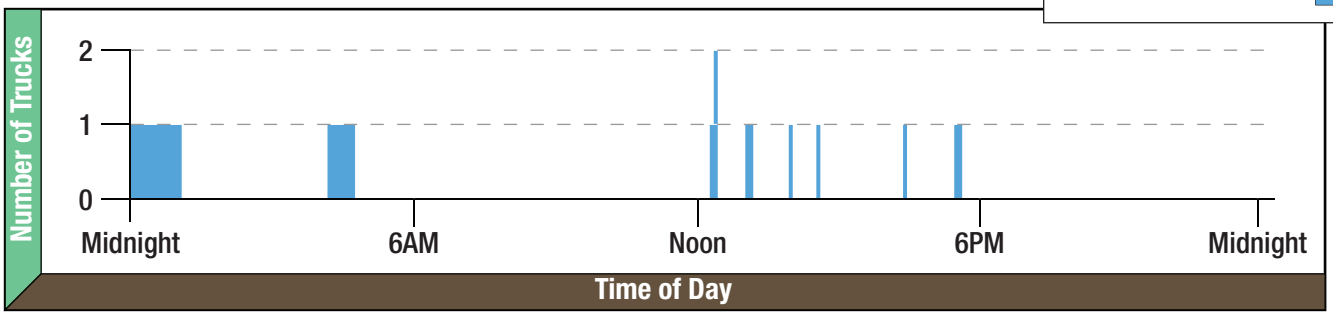
2018 Weekday Recorded Truck Parking Demand
14 - I-90 EB Murdo Pullout

SDDOT I-90/I-29 Rest Area Truck Parking 18-225 11/6/18









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NORTH

NOTE: Drawing Not to Scale

FIGURE 2-15

2018 Weekday Recorded Truck Parking Demand
15 - I-90 WB Murdo Pullout

SDDOT I-90/I-29 Rest Area Truck Parking 18-225 11/6/18

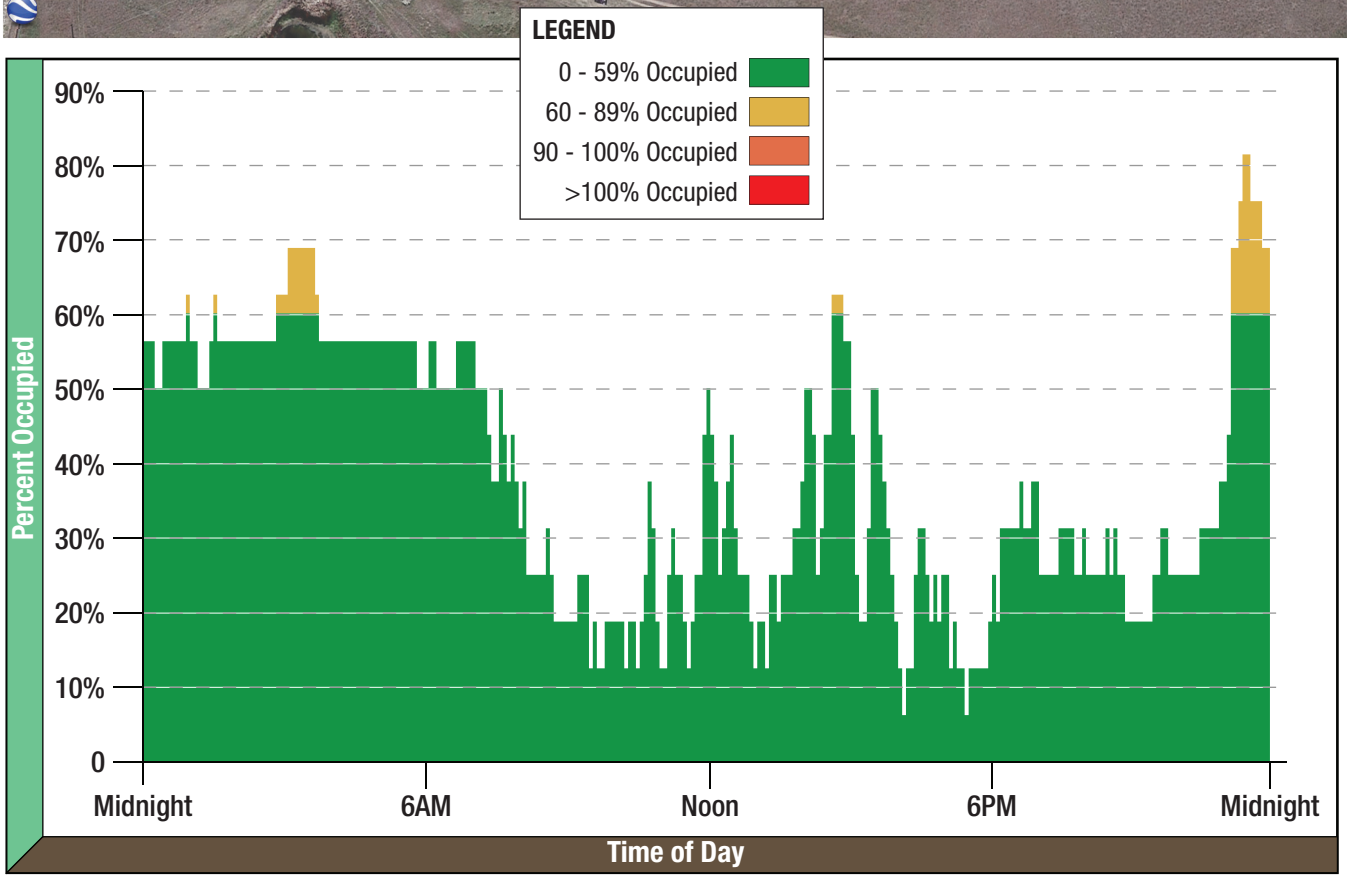
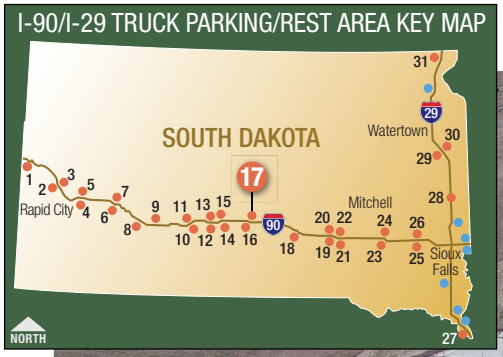


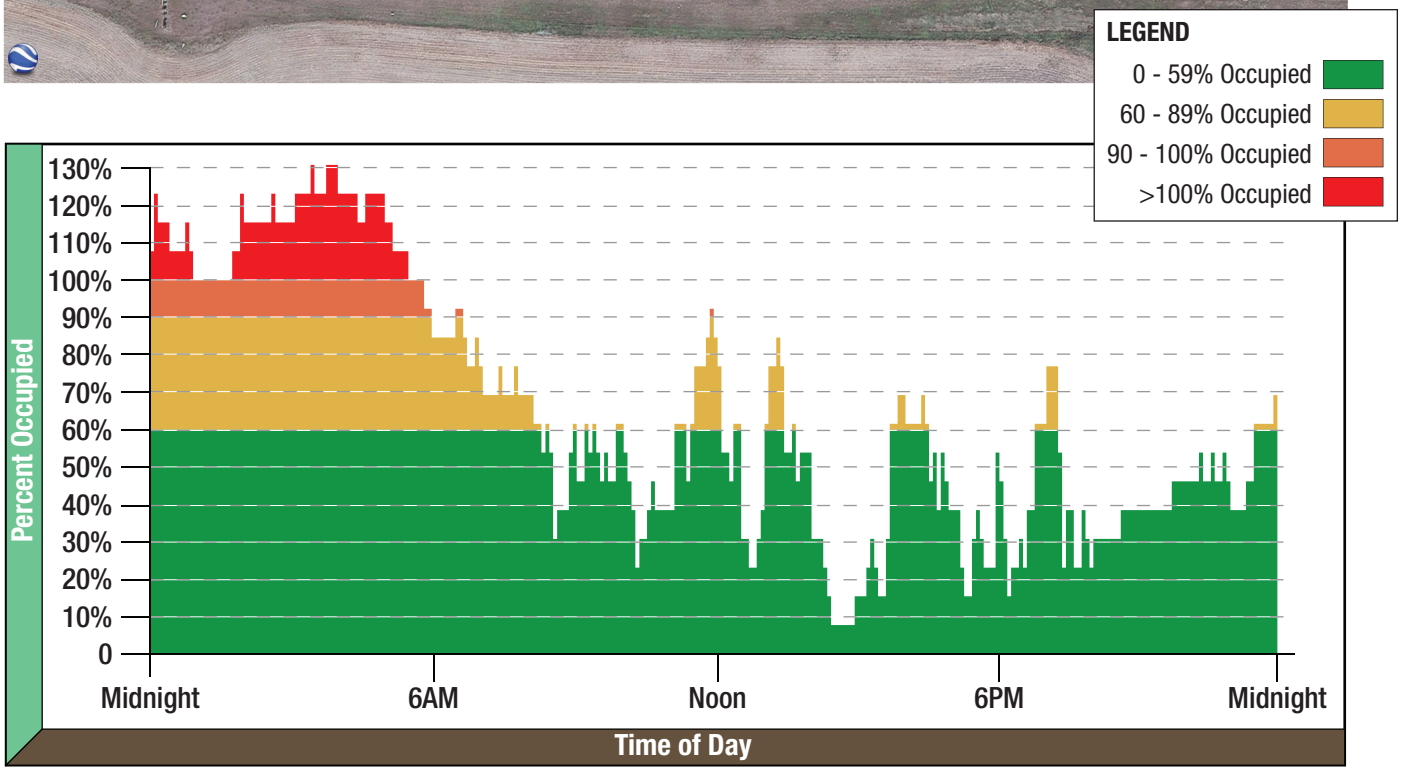
FIGURE 2-16

2018 Weekday Recorded Truck Parking Demand
16 - I-90 EB Presho Rest Area

NORTH
NOTE: Drawing Not to Scale

SDDOT I-90/I-29 Rest Area Truck Parking 18-225 11/6/18





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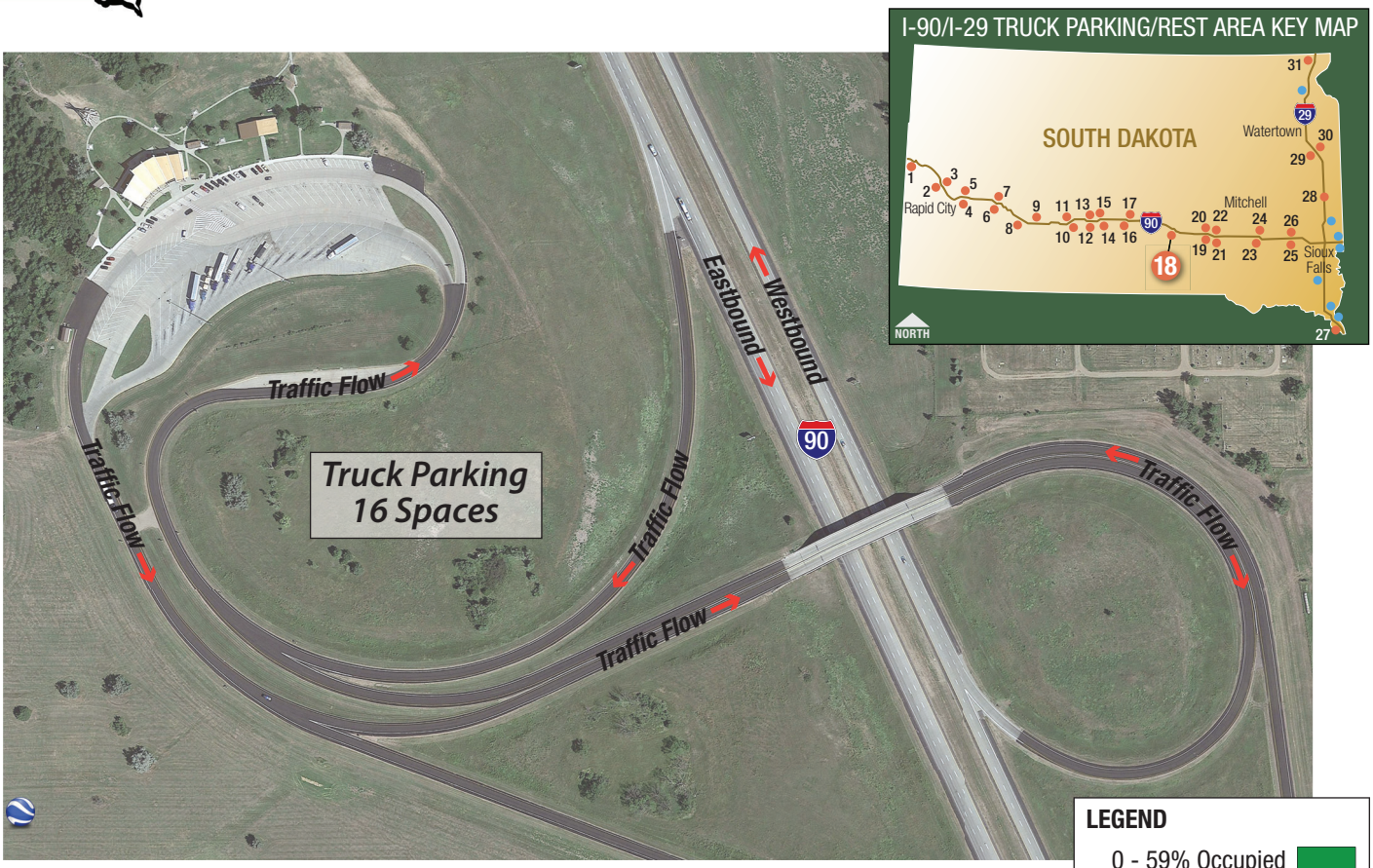
NORTH

NOTE: Drawing Not to Scale

FIGURE 2-17

2018 Weekday Recorded Truck Parking Demand
17 - I-90 WB Presho Rest Area

SDDOT I-90/I-29 Rest Area Truck Parking 18-225 11/6/18



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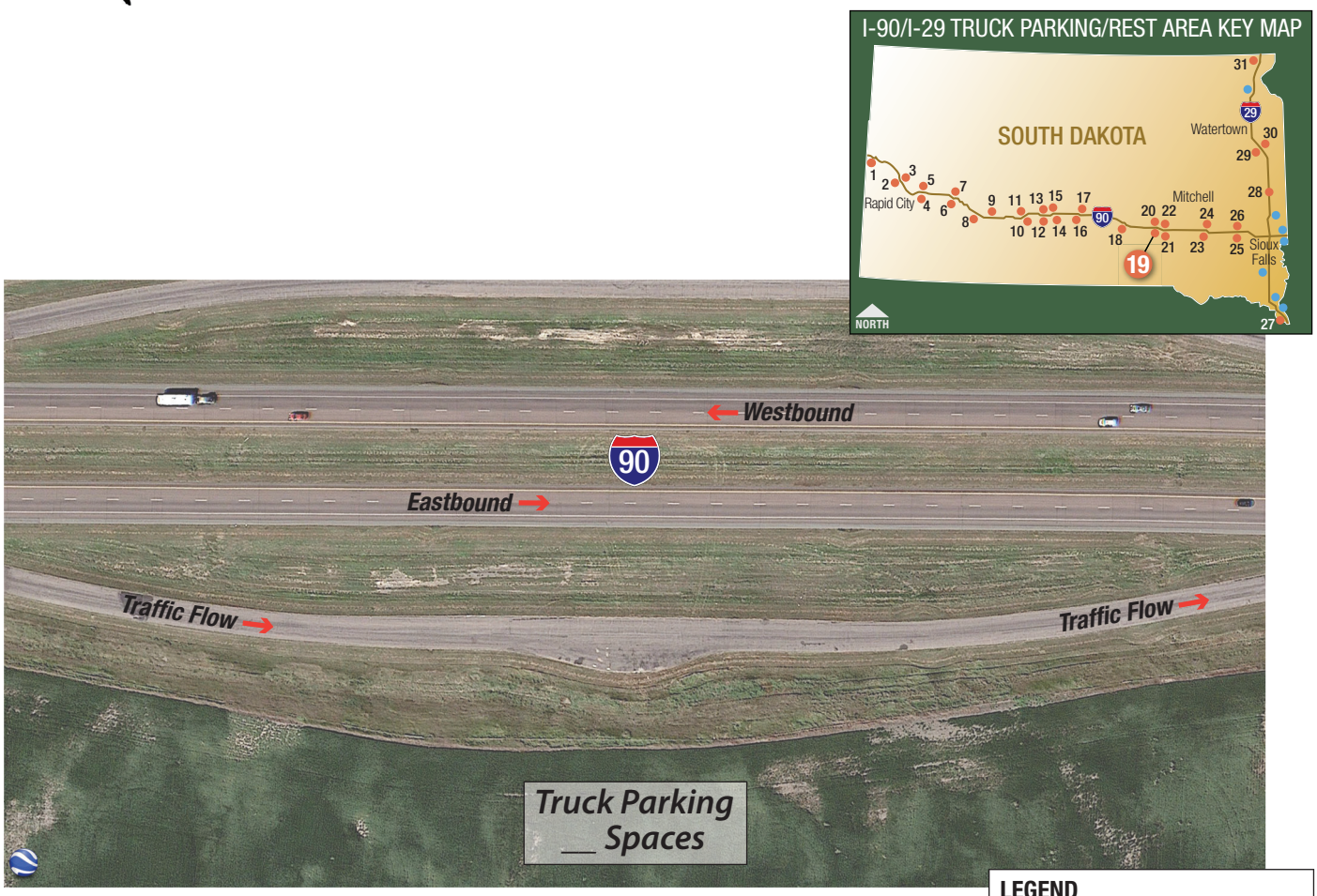
NORTH

NOTE: Drawing Not to Scale

FIGURE 2-18

2018 Weekday Recorded Truck Parking Demand
18 - I-90 EB/WB Chamberlain Rest Area

SDDOT I-90/I-29 Rest Area Truck Parking 18-225 11/6/18



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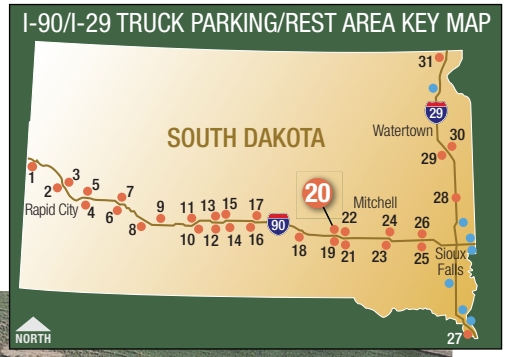
NORTH

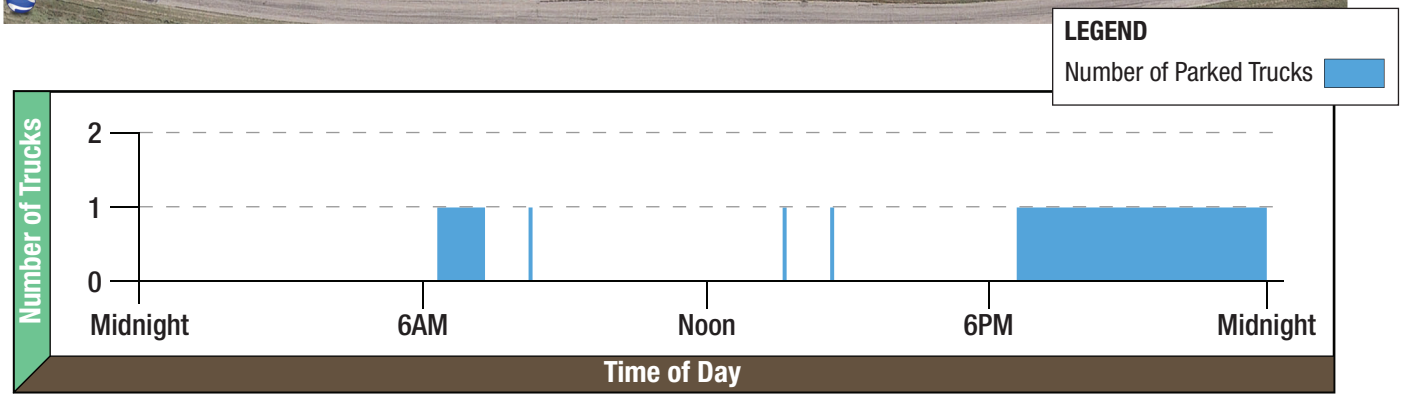
NOTE: Drawing Not to Scale

FIGURE 2-19

2018 Weekday Recorded Truck Parking Demand
19 - I-90 EB White Lake Pullout

SDDOT I-90/I-29 Rest Area Truck Parking 18-225 11/6/18





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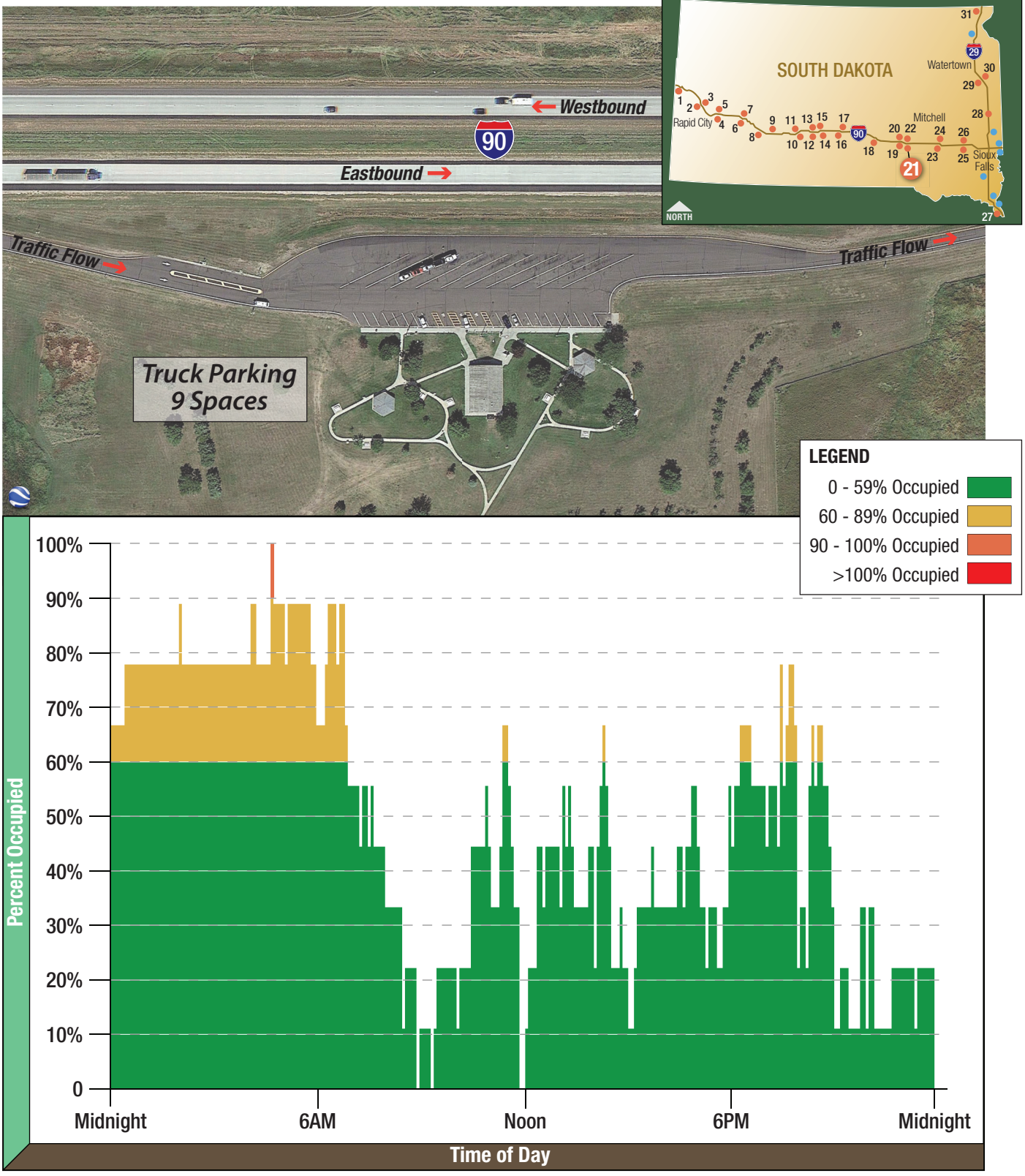
NOTE: Drawing Not to Scale

FIGURE 2-20

2018 Weekday Recorded Truck Parking Demand
20 - I-90 WB White Lake Pullout

SDDOT I-90/I-29 Rest Area Truck Parking 18-225 11/6/18



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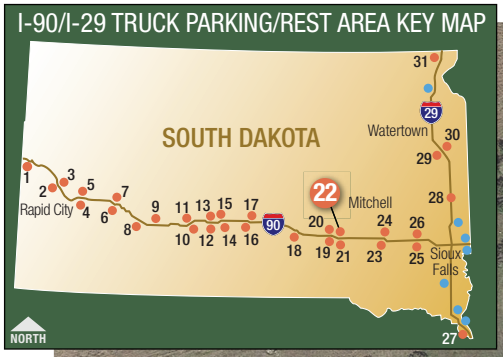
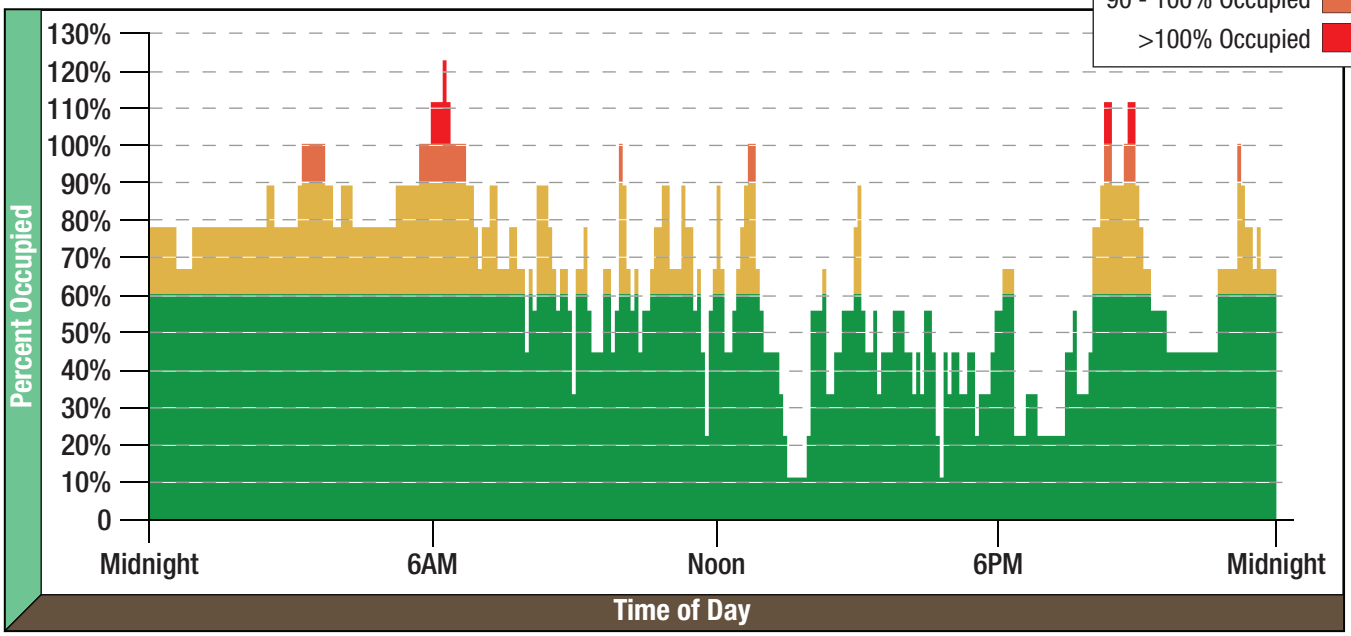
NOTE: Drawing Not to Scale

FIGURE 2-21

2018 Weekday Recorded Truck Parking Demand
21 - I-90 EB White Lake Rest Area

SDDOT I-90/I-29 Rest Area Truck Parking 18-225 11/6/18



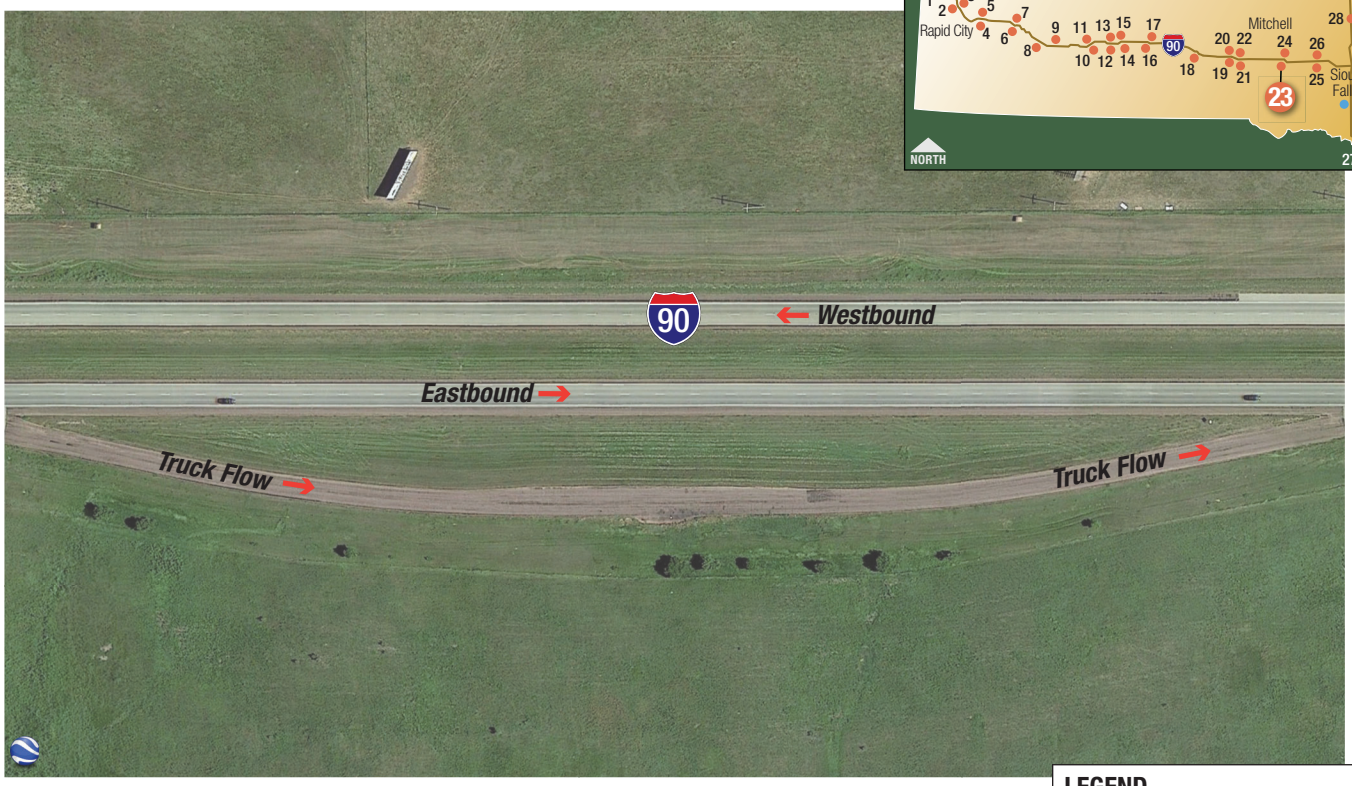


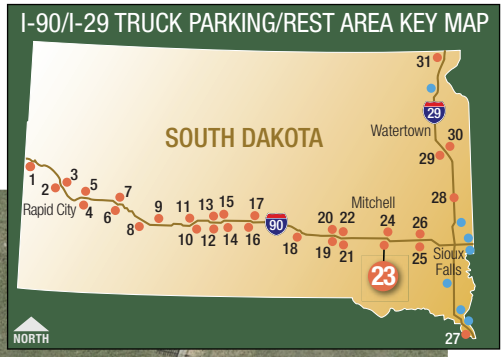
NORTH
NOTE: Drawing Not to Scale

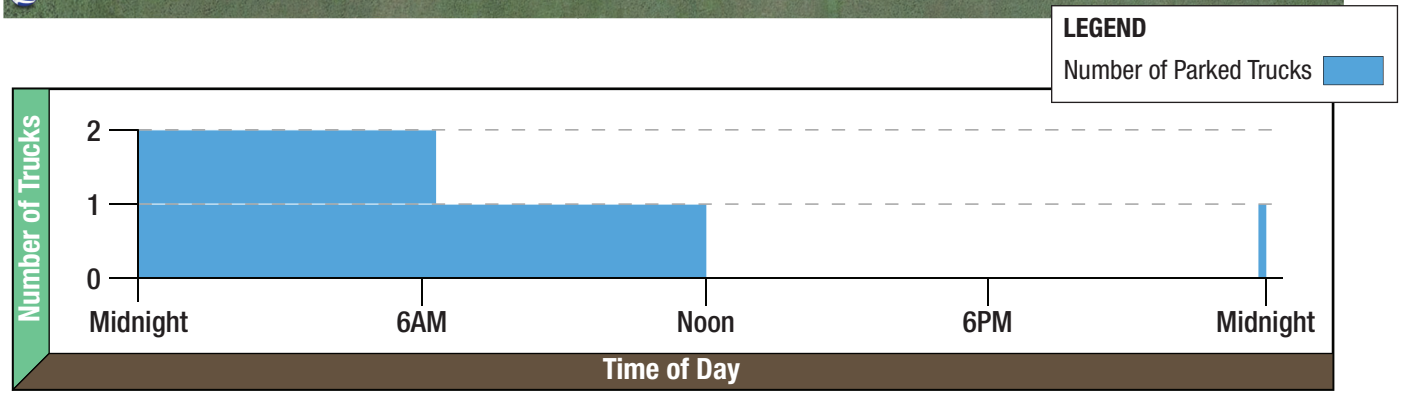
FIGURE 2-22

2018 Weekday Recorded Truck Parking Demand
22 - I-90 WB White Lake Rest Area

SDDOT I-90/I-29 Rest Area Truck Parking 18-225 11/6/18







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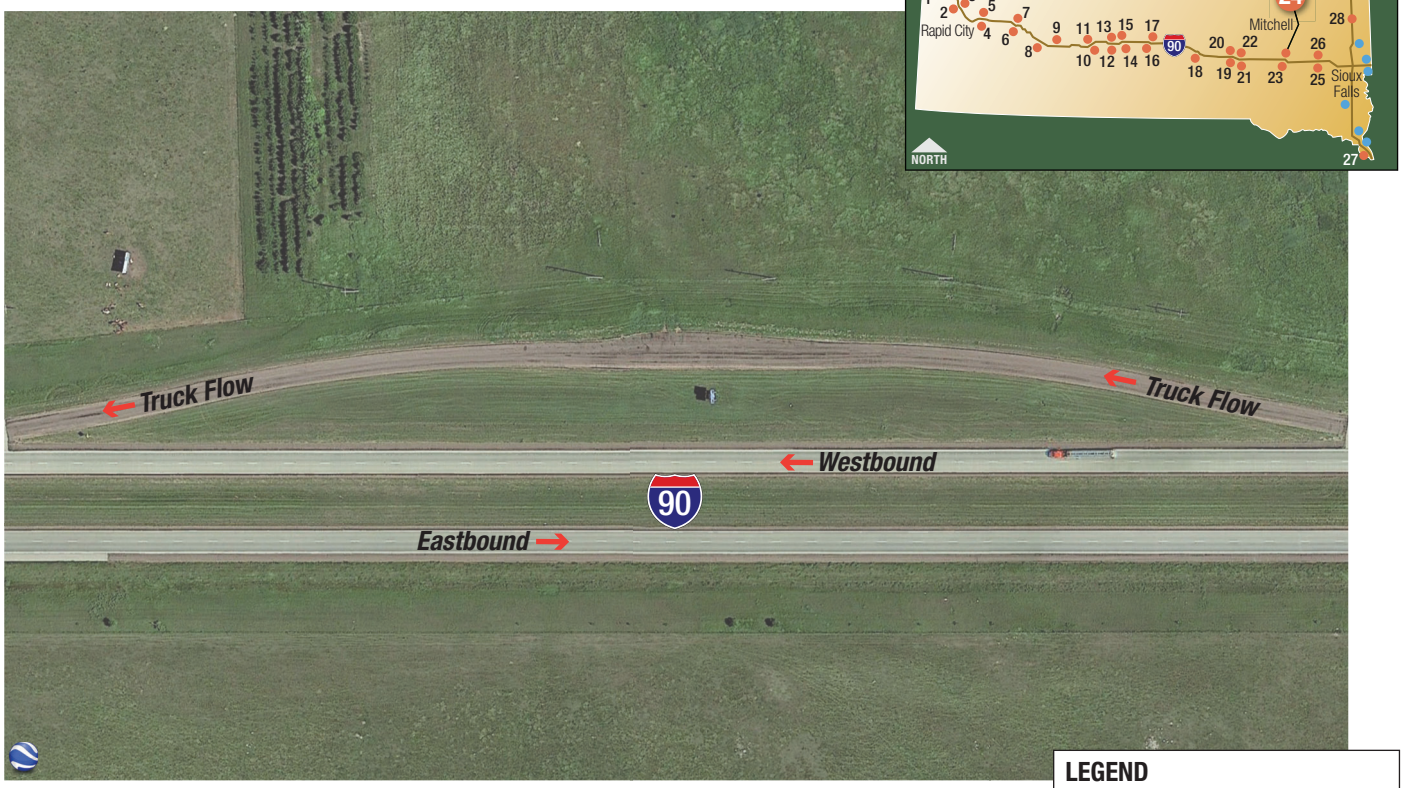
NORTH

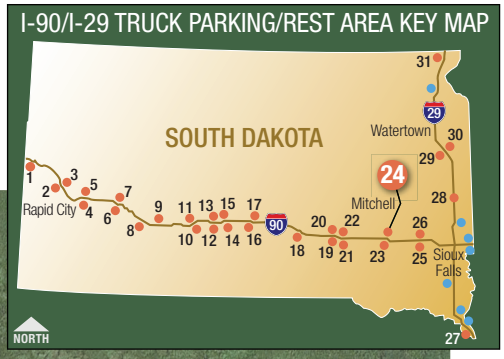
NOTE: Drawing Not to Scale

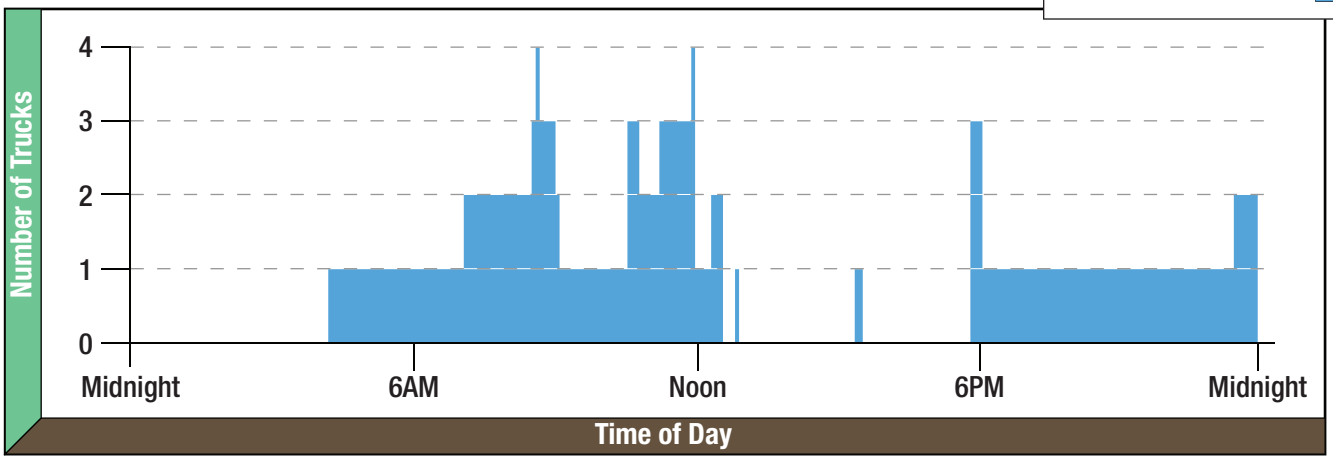
FIGURE 2-23

2018 Weekday Recorded Truck Parking Demand
23 - I-90 EB Mitchell Pullout

SDDOT I-90/I-29 Rest Area Truck Parking 18-225 11/6/18







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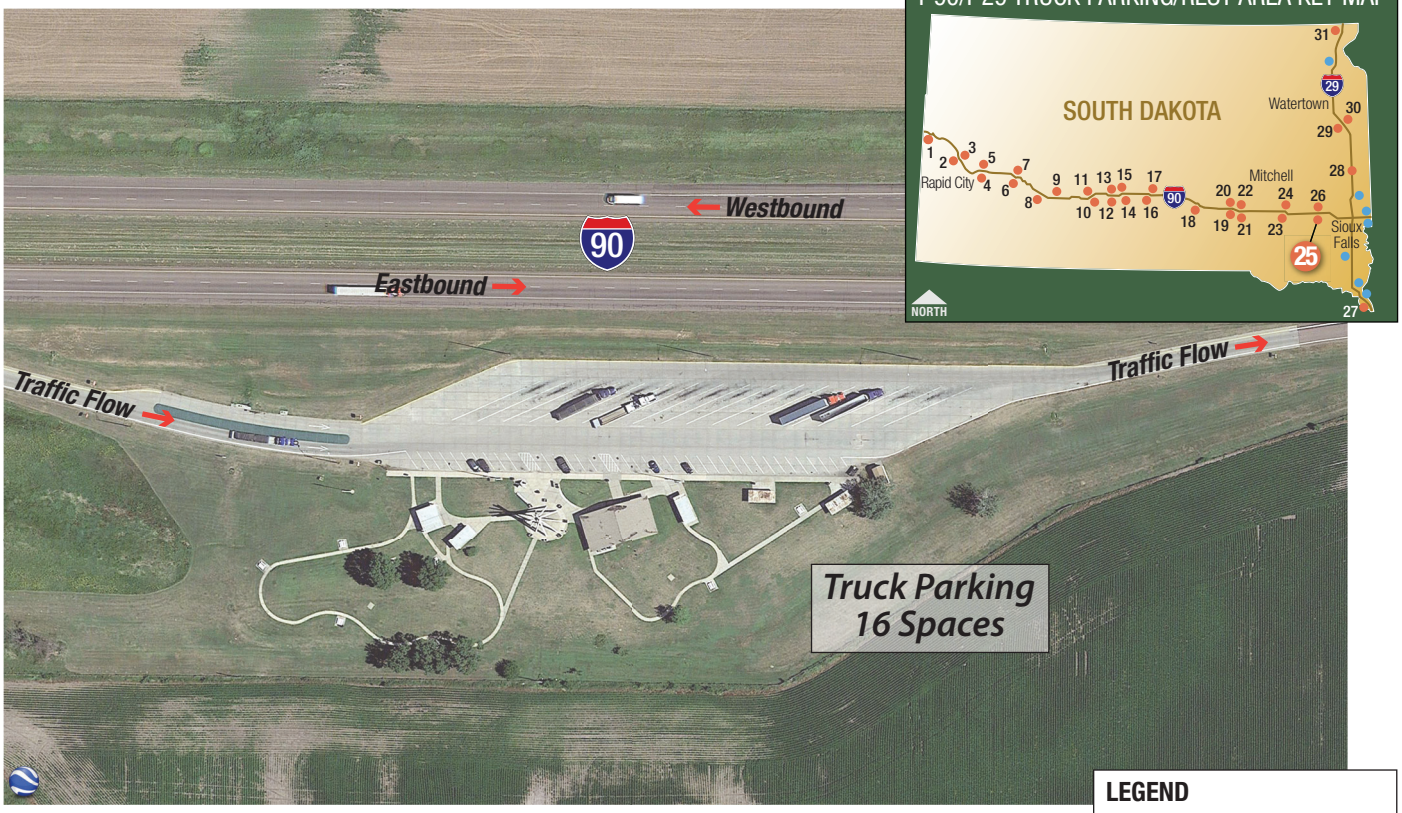
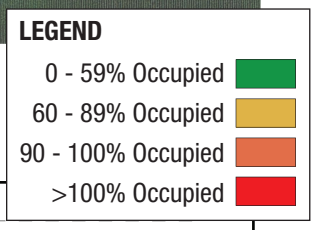
NORTH
NOTE: Drawing Not to Scale

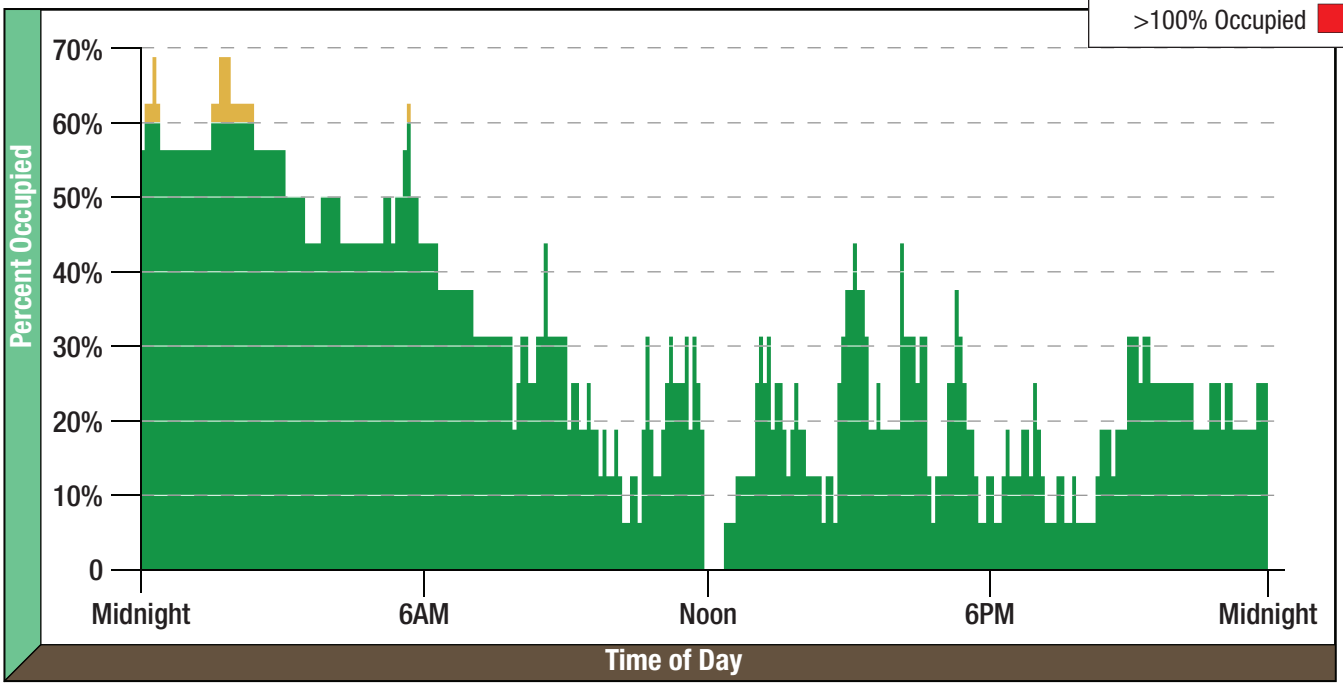
FIGURE 2-24

2018 Weekday Recorded Truck Parking Demand
24 - I-90 WB Mitchell Pullout

SDDOT I-90/I-29 Rest Area Truck Parking 18-225 11/6/18







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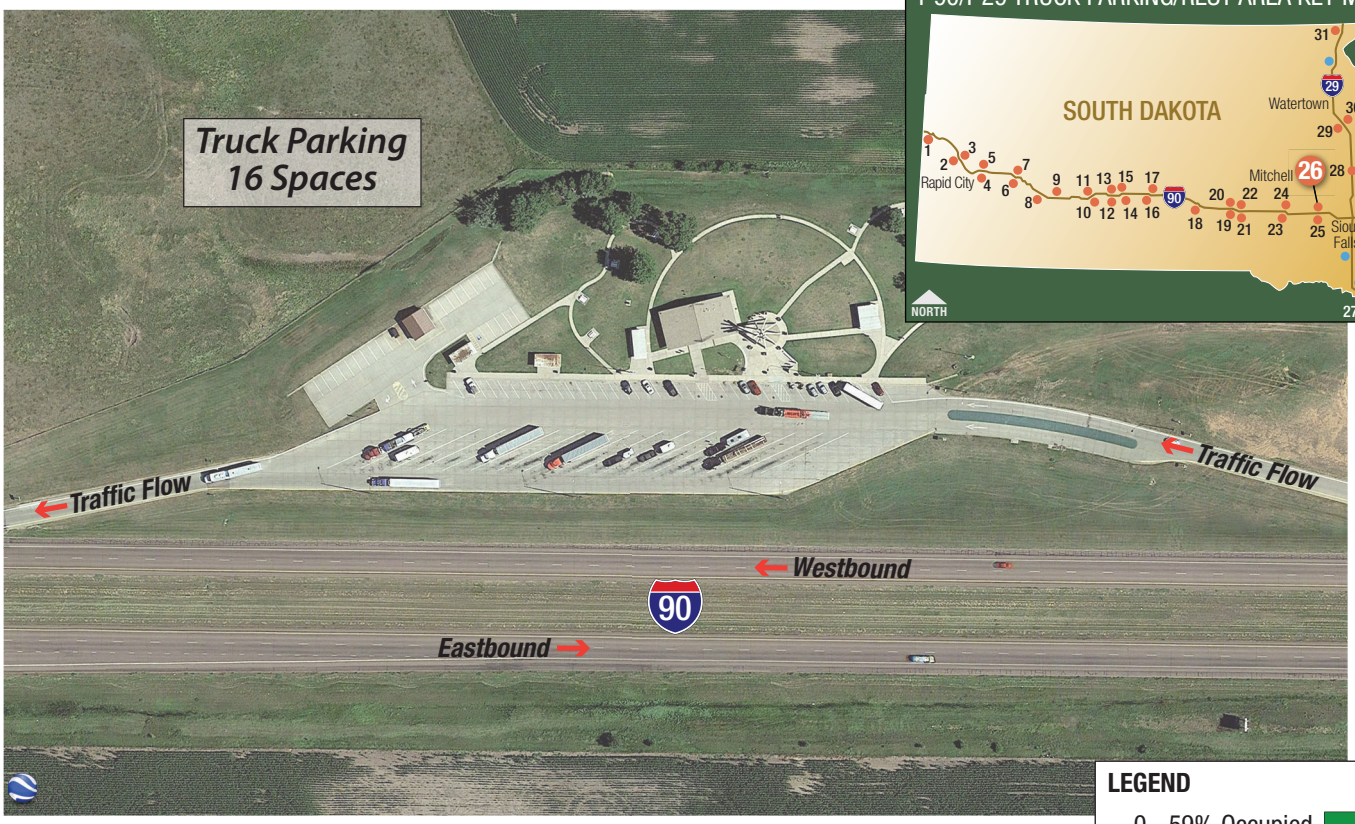
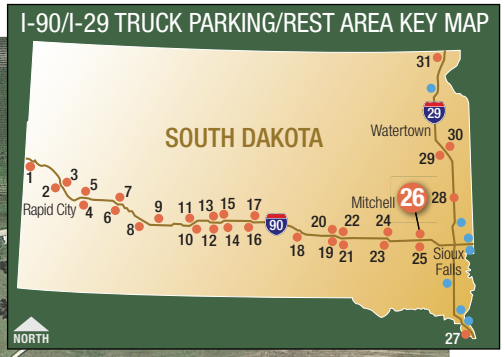
NOTE: Drawing Not to Scale

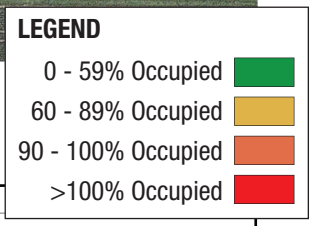
FIGURE 2-25

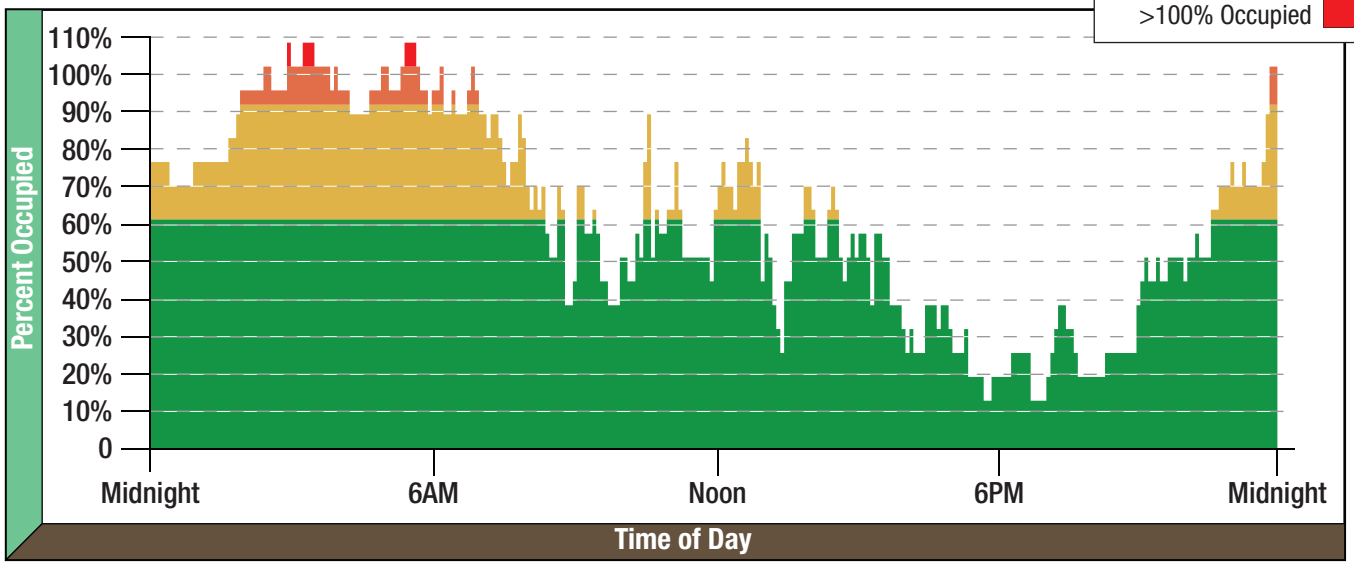
2018 Weekday Recorded Truck Parking Demand
25 - I-90 EB Salem Rest Area

SDDOT I-90/I-29 Rest Area Truck Parking 18-225 11/6/18









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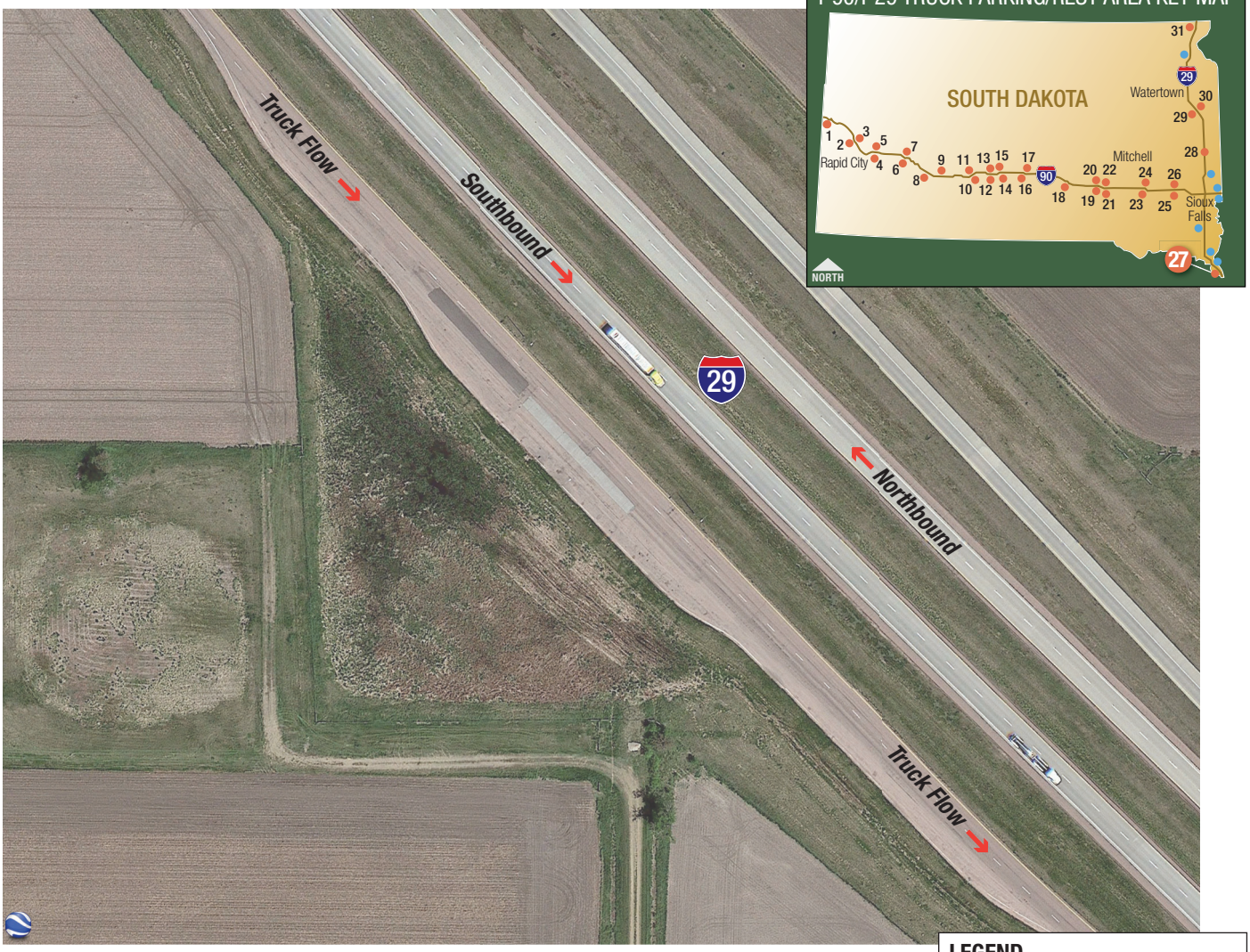
NORTH

NOTE: Drawing Not to Scale

FIGURE 2-26

2018 Weekday Recorded Truck Parking Demand
26 - I-90 WB Salem Rest Area

SDDOT I-90/I-29 Rest Area Truck Parking 18-225 11/6/18



NORTH
NOTE: Drawing Not to Scale

FIGURE 2-27

2018 Weekday Recorded Truck Parking Demand
27 - I-29 SB Jefferson Pullout

SDDOT I-90/I-29 Rest Area Truck Parking 18-225 11/6/18

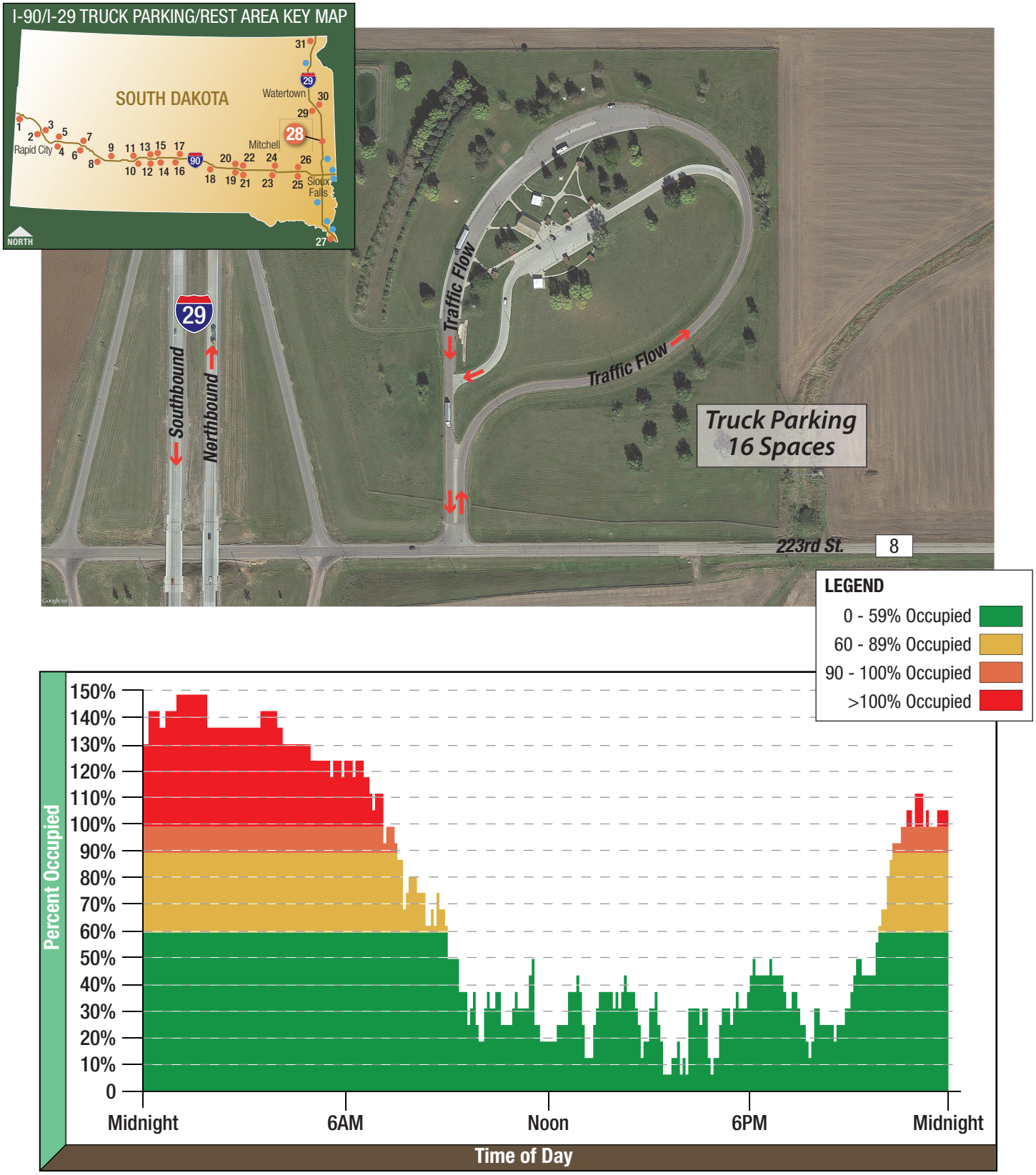
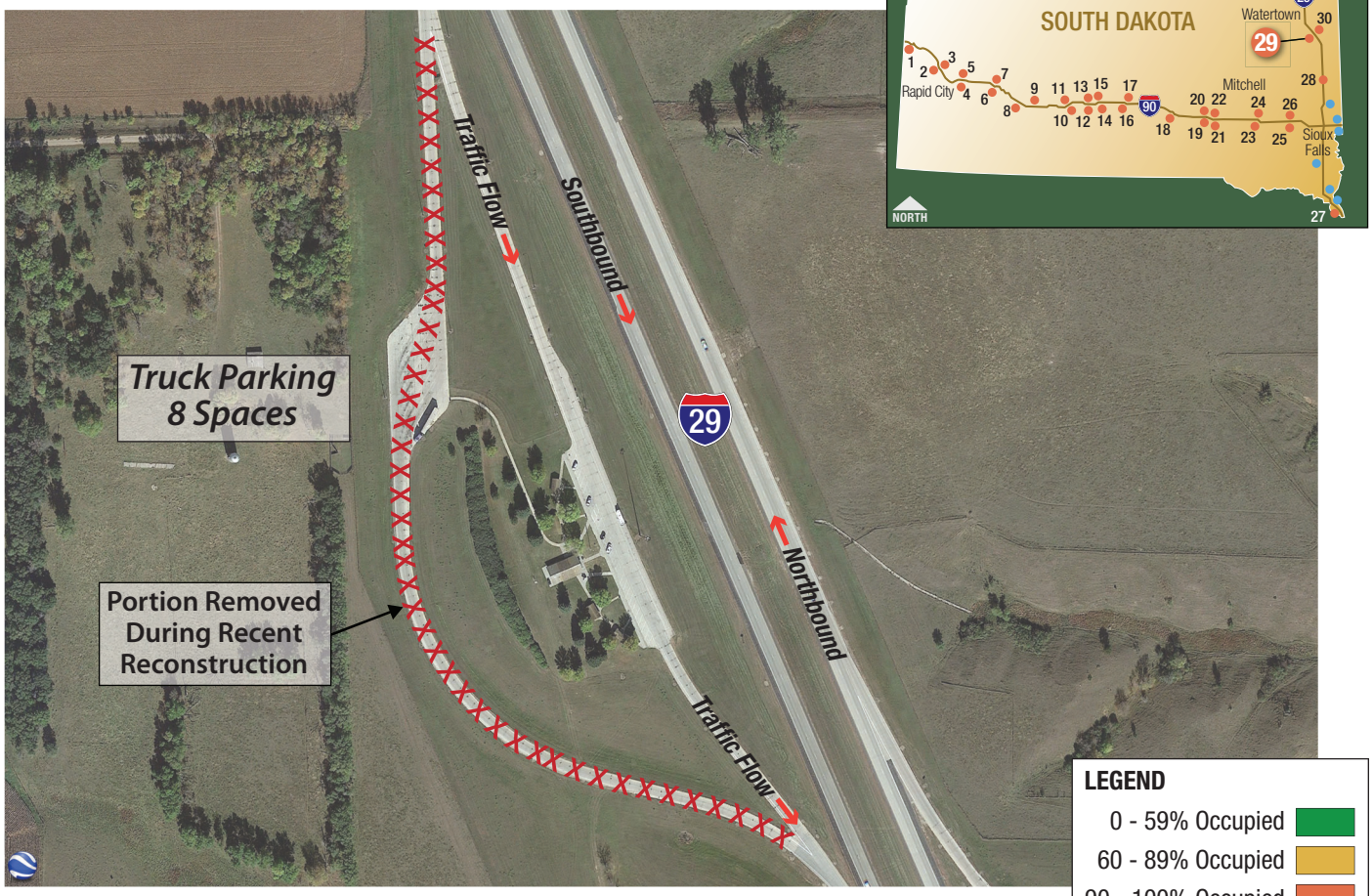


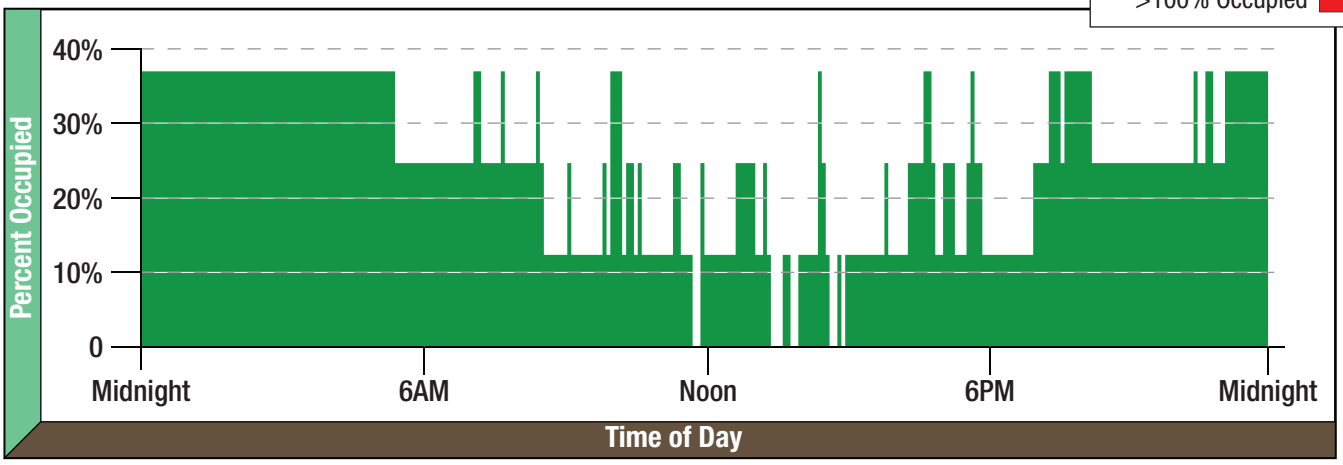
FIGURE 2-28

2018 Weekday Recorded Truck Parking Demand
28 - I-29 NB/SB Ward Rest Area

NORTH
NOTE: Drawing Not to Scale

SDDOT I-90/I-29 Rest Area Truck Parking 18-225 11/6/18



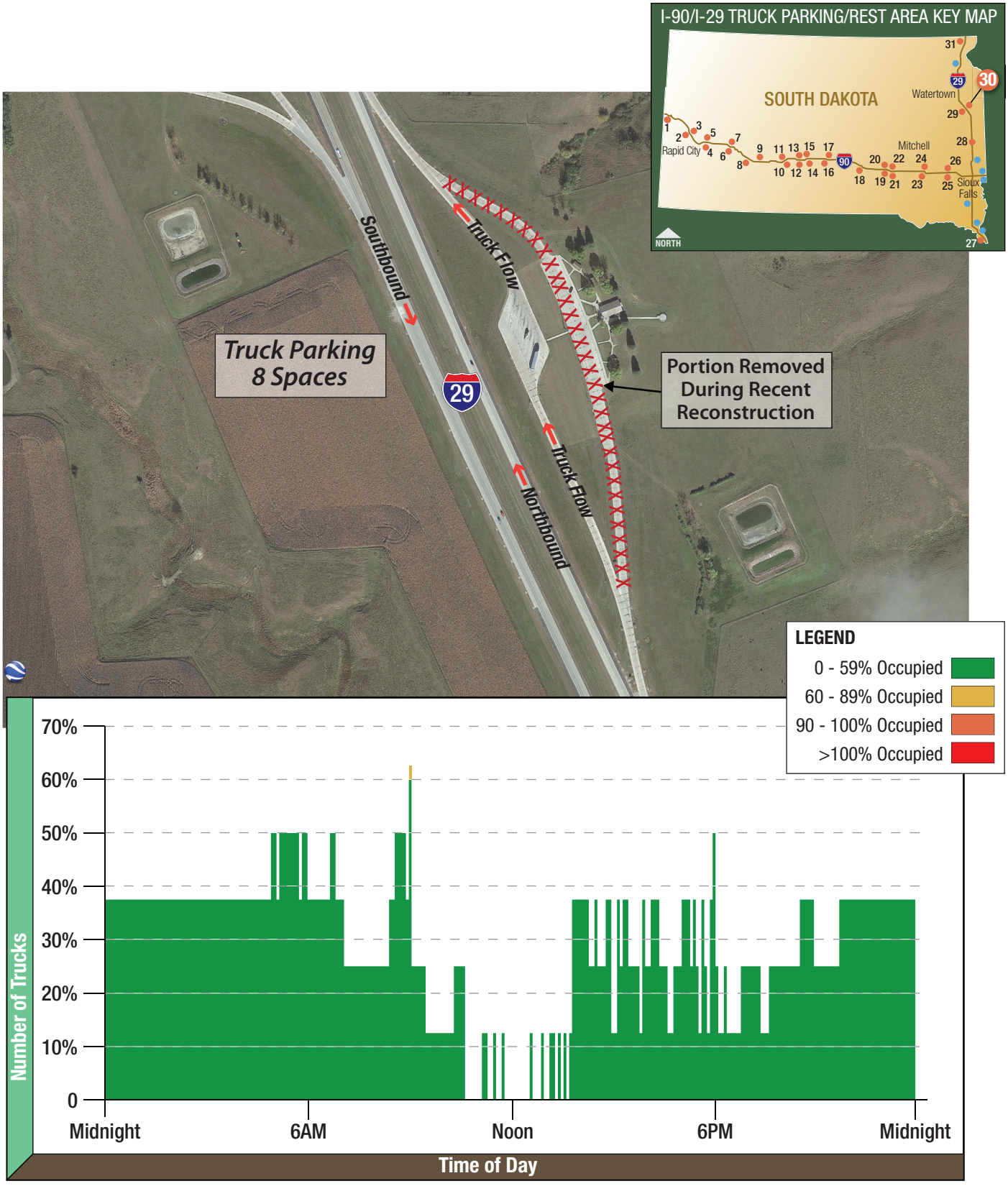


NORTH
NOTE: Drawing Not to Scale

FIGURE 2-29

2018 Weekday Recorded Truck Parking Demand
29 - I-29 SB Hidewood Pullout

SDDOT I-90/I-29 Rest Area Truck Parking 18-225 11/6/18



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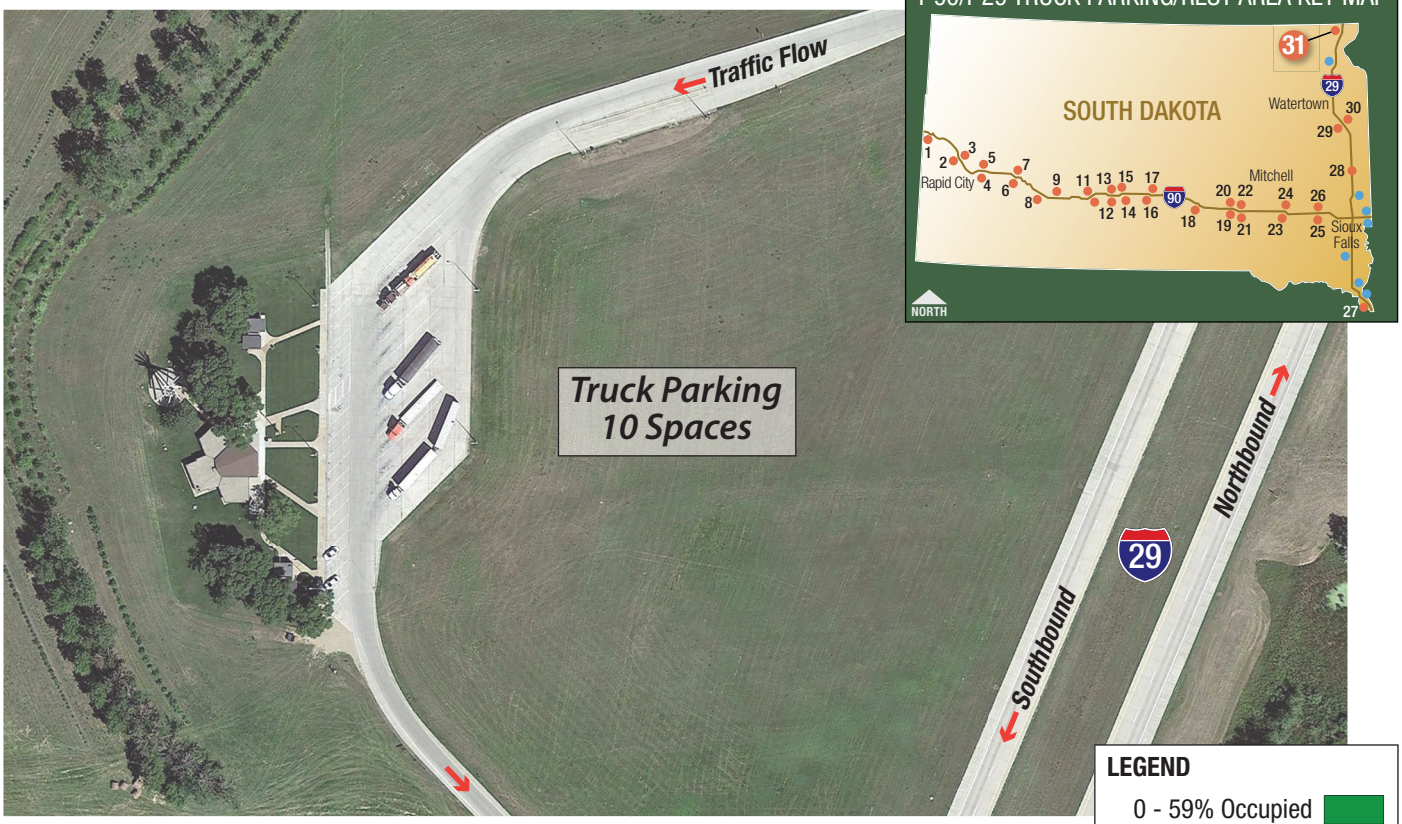
NORTH

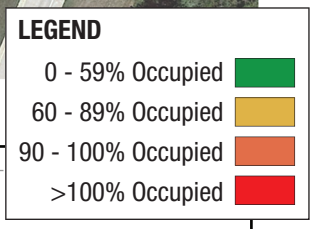
NOTE: Drawing Not to Scale

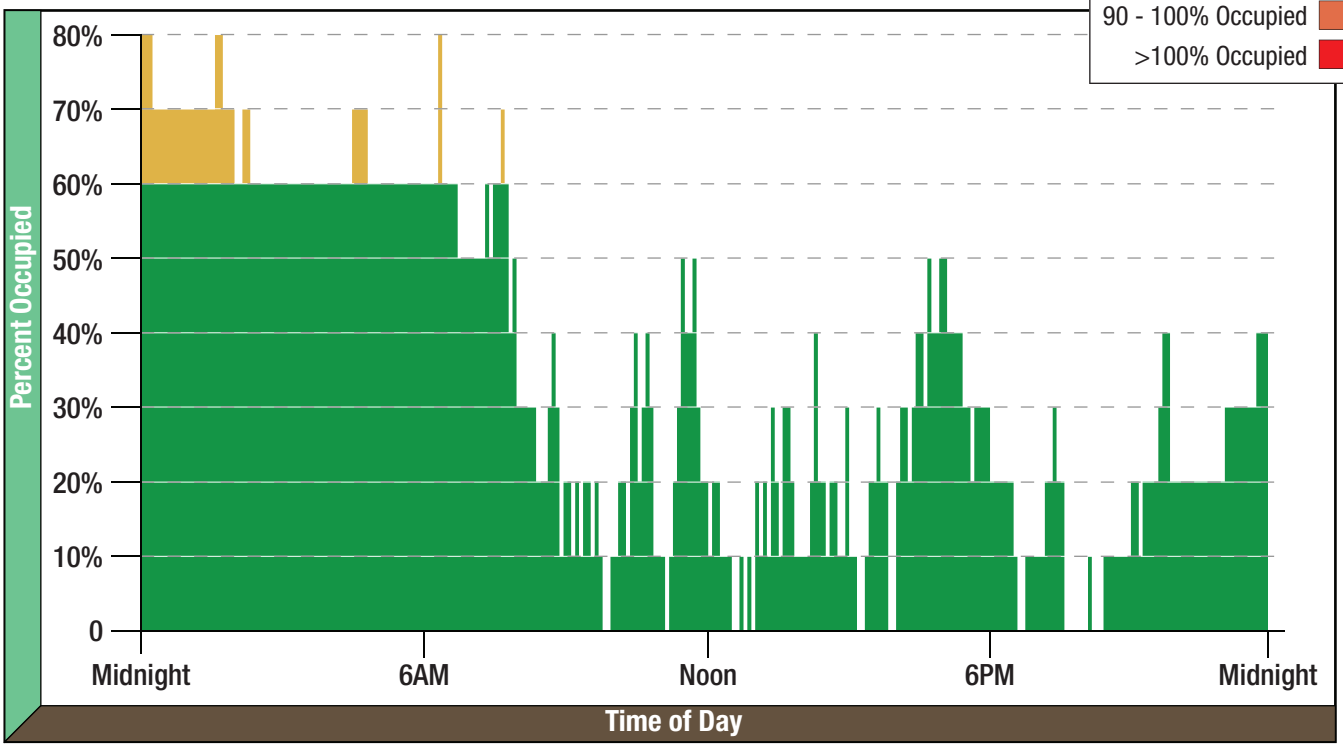
FIGURE 2-30

2018 Weekday Recorded Truck Parking Demand
30 - I-29 NB Hidewood Pullout

SDDOT I-90/I-29 Rest Area Truck Parking 18-225 11/6/18







NORTH
NOTE: Drawing Not to Scale

FIGURE 2-31

2018 Weekday Recorded Truck Parking Demand
31 - I-29 SB Glacial Lakes Rest Area

SDDOT I-90/I-29 Rest Area Truck Parking 18-225 11/6/18

Rest areas that currently experience at least a one-hour cumulative average at or over capacity include:

- 6 – Wasta (I-90 Eastbound)
- 11 – Belvidere (I-90 Westbound)
- 17 – Presho (I-90 Westbound)
- 18 – Chamberlain (I-90 Eastbound/Westbound)
- 22 – White Lake (I-90 Westbound)
- 26 – Salem (I-90 Westbound)
- 28 – Ward (I-29 Northbound/Southbound)

Truck pullouts that experience a maximum average-hourly demand greater than two trucks include:

- 5 – Box Elder Pullout (I-90 Eastbound)
- 8 – Cactus Flats Scenic Pullout (I-90 Eastbound)
- 9 – Cactus Flats Scenic Pullout (I-90 Westbound)
- 14 – Murdo Truck Pullout (I-90 Eastbound)
- 23 – Mitchell Truck Pullout (I-90 Eastbound)
- 24 – Mitchell Truck Pullout (I-90 Westbound)

Congested, overcapacity hours were observed during the nighttime hours when truckers stop to sleep.

3. FUTURE (2045) CONDITIONS

Forecasting future truck parking demand is a key consideration in determining the adequacy of the truck parking infrastructure along the I-90 and I-29 corridors.

3.1 Demand Forecasting Methodology

Growth in truck parking demand has been derived from information in the Federal Highway Administration (FHWA) Freight Analysis Framework (FAF), Version 4. Updated demand growth factors have been calculated using the updated FAF, Version 4 methodology.

The HOS rules and their impact on truck drivers in South Dakota have been noted, but no adjustment will be made to future truck parking forecasts under the assumption that current HOS rules will not be adjusted.

The FAF4 provides base year truck volumes estimated from the HPMS 2012 database, state truck percentages, and functional class information. Year 2045 forecast annual average truck volumes have been estimated using the HPMS 20-year growth factor and projected using linear growth and are shown in **Table 3-1**. For this study, the calculated annual linear growth rate was used to forecast Year 2045 truck parking demand from the 2018 observed truck parking demand.

Table 3-1. 2045 Truck Parking FAF4 Expansion Factors

	Facility	FAF4 2012 Truck AADT	FAF4 2045 Truck AADT	Annual % Growth	2018 to 2040 Expansion Factor
1	Spearfish Rest Area (I-90 Eastbound)	856	2552	3.37%	2.44
2	Tilford Truck Parking (I-90 Eastbound) – UNDER CONSTRUCTION	2551	4042	1.40%	1.46
3	Tilford Truck Parking (I-90 Westbound)	2551	4042	1.40%	1.46
4	Box Elder Pullout (I-90 Eastbound)	1875	3746	2.12%	1.76
5	Box Elder Pullout (I-90 Westbound)	1875	3746	2.12%	1.76
6	Wasta (I-90 Eastbound)	1961	3918	2.12%	1.76
7	Wasta (I-90 Westbound)	1961	3918	2.12%	1.76
8	Cactus Flats Scenic Pullout (I-90 Eastbound)	1474	2945	2.12%	1.76
9	Cactus Flats Scenic Pullout (I-90 Westbound)	1679	1884	0.35%	1.10
10	Belvidere (I-90 Eastbound)	1693	1900	0.35%	1.10
11	Belvidere (I-90 Westbound)	1693	1900	0.35%	1.10
12	Okaton Truck Pullout (I-90 Eastbound)	1700	3190	1.93%	1.67
13	Okaton Truck Pullout (I-90 Westbound)	1700	3190	1.93%	1.67
14	Murdo Truck Pullout (I-90 Eastbound)	1574	2952	1.92%	1.67
15	Murdo Truck Pullout (I-90 Westbound)	1574	2952	1.92%	1.67
16	Presho (I-90 Eastbound)	2223	3183	1.09%	1.34
17	Presho (I-90 Westbound)	2223	3183	1.09%	1.34
18	Chamberlain (I-90 Eastbound/Westbound)	1767	2662	1.25%	1.40
19	White Lake Truck Pullout (I-90 Eastbound)	1873	2821	1.25%	1.40
20	White Lake Truck Pullout (I-90 Westbound)	1873	2821	1.25%	1.40
21	White Lake (I-90 Eastbound)	1811	2442	0.91%	1.28
22	White Lake (I-90 Westbound)	1811	2442	0.91%	1.28
23	Mitchell Truck Pullout (I-90 Eastbound)	2414	4349	1.80%	1.62
24	Mitchell Truck Pullout (I-90 Westbound)	2414	4349	1.80%	1.62
25	Salem (I-90 Eastbound)	2591	4339	1.57%	1.52
26	Salem (I-90 Westbound)	2591	4339	1.57%	1.52
27	Jefferson Truck Pullout (I-29 Southbound)	2583	5322	2.21%	1.81
28	Ward (I-29 Northbound/Southbound)	2764	3051	0.30%	1.08
29	Hidewood Truck Parking (I-29 Northbound)	1419	2531	1.77%	1.61
30	Hidewood Truck Parking (I-29 Southbound)	1419	2531	1.77%	1.61
31	Glacial Lakes (I-29 Southbound)	1259	1975	1.37%	1.45

AADT = annual average daily traffic FAF4 = Freight Analysis Framework, Version 4

The FAF4 expansion factors indicate that the highest annual growth is projected to occur near the portions of I-90 on the western side of the state, between Wasta and Cactus Flats (over 2 percent annually) and between Okaton and Murdo (just under 2 percent annually). Along the I-29 corridor, only the Jefferson truck pullout is projected to see over 2 percent annual growth.

3.2 Future Use Projections

The future truck parking projections are the basis of determining the future 2045 parking needs. By 2045, ten locations have at least one hour of average demand that exceeds the existing capacity. The locations shown in **bold** are those that do not currently experience demand that exceeds capacity.

- 6 – Wasta (I-90 Eastbound)
- **7 – Wasta (I-90 Westbound)**
- 11 – Belvidere (I-90 Westbound)
- 17 – Presho (I-90 Westbound)
- 18 – Chamberlain (I-90 Eastbound/Westbound)
- **21 – White Lake (I-90 Eastbound)**
- 22 – White Lake (I-90 Westbound)
- 26 – Salem (I-90 Westbound)
- 28 – Ward (I-29 Northbound/Southbound)
- **31 - Glacial Lakes (I-29 Southbound)**

Truck pullouts that will experience the top five, highest average-hourly demand include:

- 5 – Box Elder Pullout (I-90 Eastbound)
- 8 – Cactus Flats Scenic Pullout (I-90 Eastbound)
- 22 – White Lake (I-90 Eastbound)
- 23 – Mitchell Truck Pullout (I-90 Eastbound)
- 24 – Mitchell Truck Pullout (I-90 Westbound)

Hourly truck parking demand at each location has been summarized against existing demand and capacity in **Chart 3-1** through **Chart 3-30**. Similar to the figures depicting the recorded existing demand and capacity, these charts depict the projected 2045 average truck parking occupancy at each facility evaluated in 1-hour intervals to determine the adequacy of the existing parking supply. For locations with designated truck parking spaces, the charts reflect demand as a percentage of available capacity. Because the truck pullouts do not have designated truck parking spaces, the 2045 forecasted demand has been reported as the number of parking spaces required to meet the demand.

Chart 3-1. 1 – Spearfish Rest Area (I-90 Eastbound) – Demand vs. Capacity

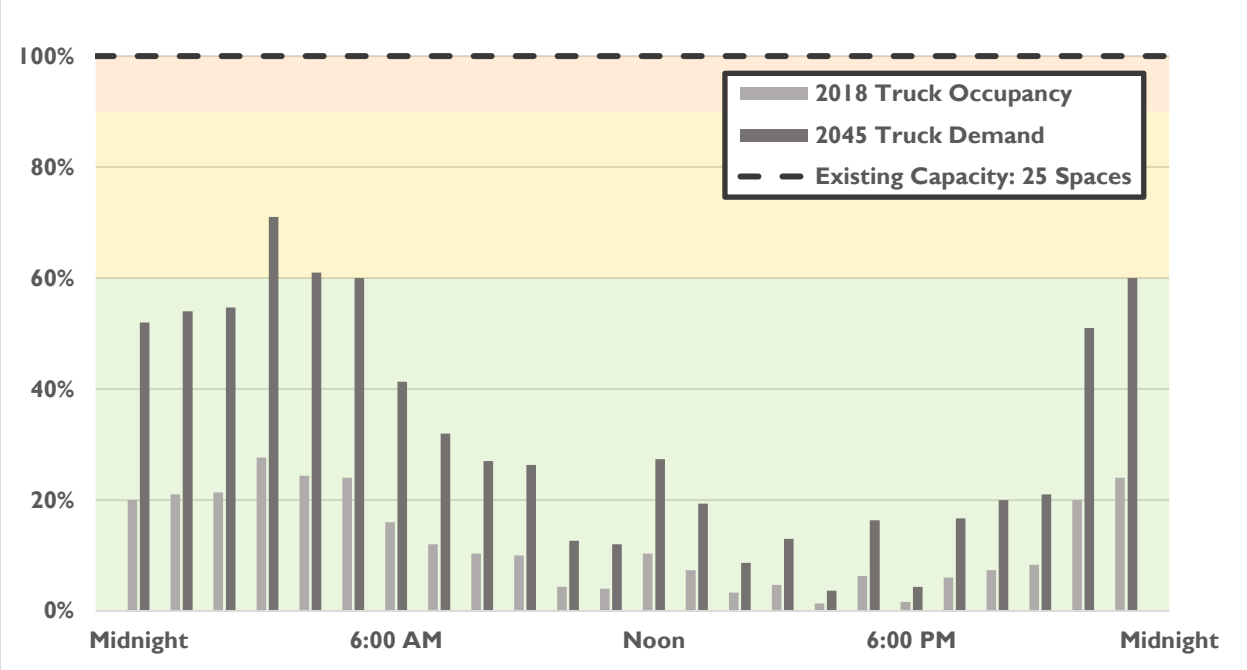


Chart 3-2. 3 – Tilford Truck Parking (I-90 Westbound) – Demand vs. Capacity

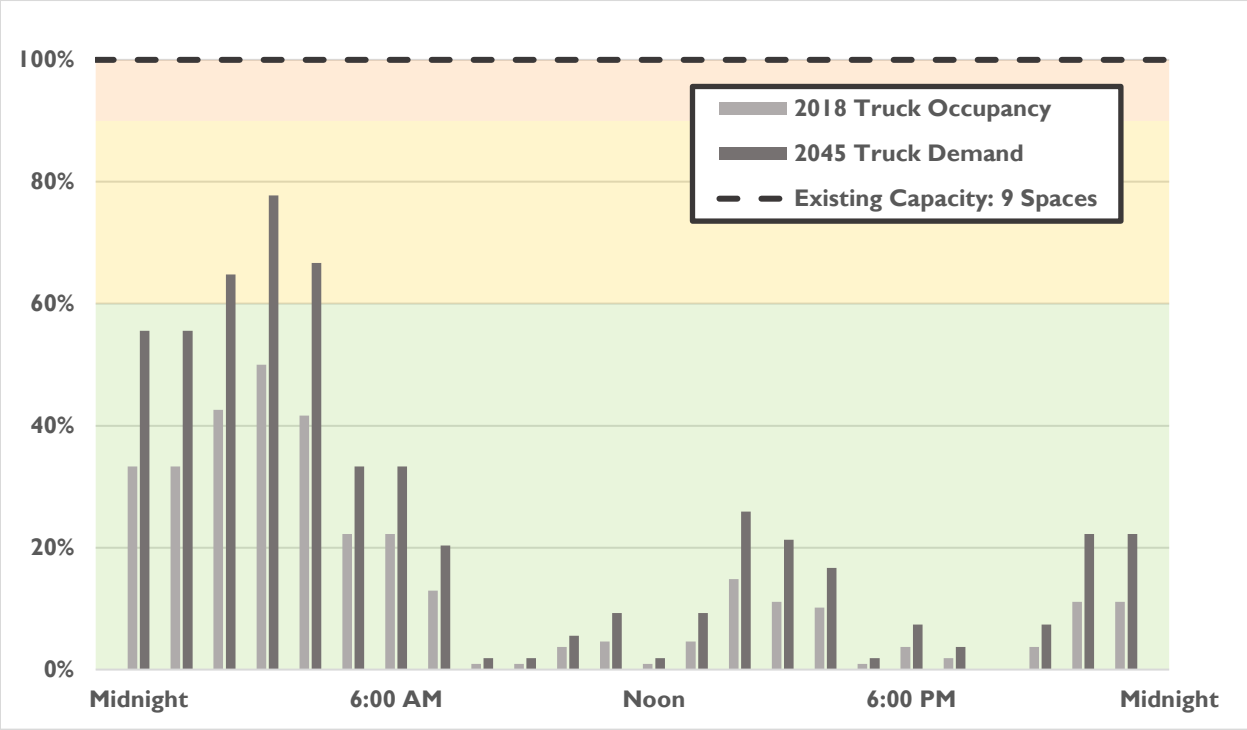


Chart 3-3 4 – Box Elder Pullout (I-90 Eastbound) – Demand vs. Capacity

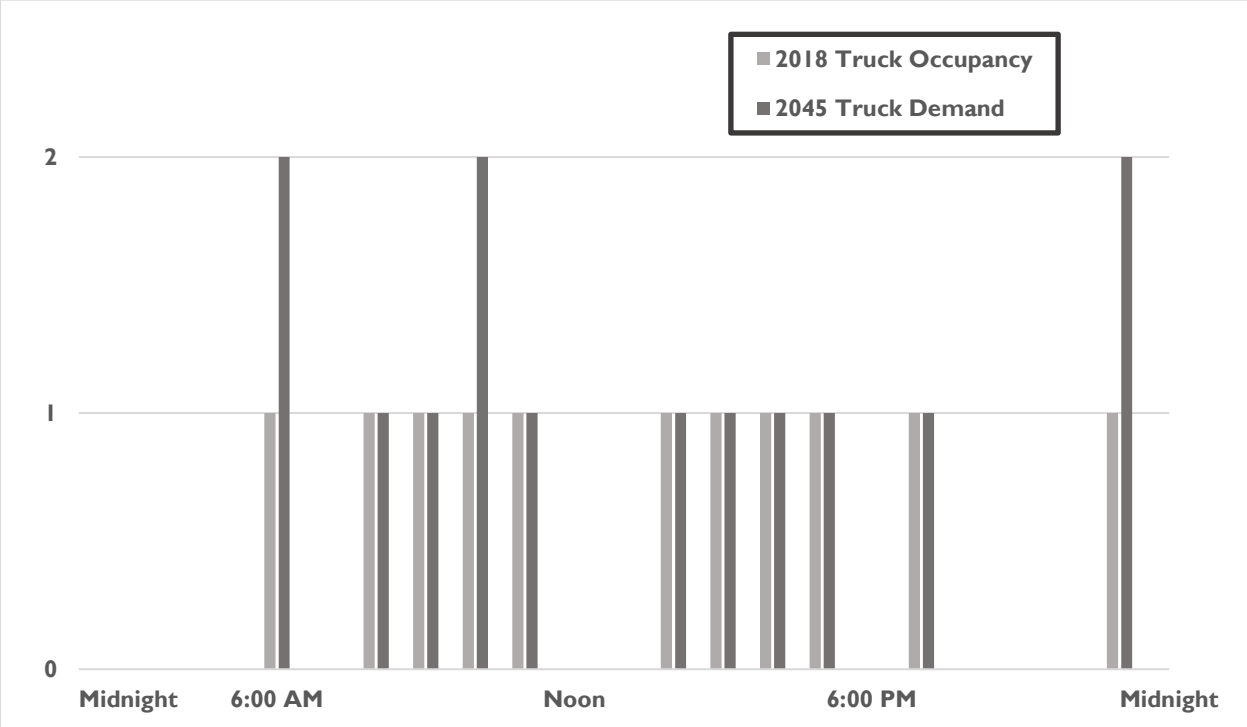


Chart 3-4. 5 – Box Elder Pullout (I-90 Westbound) – Demand vs. Capacity

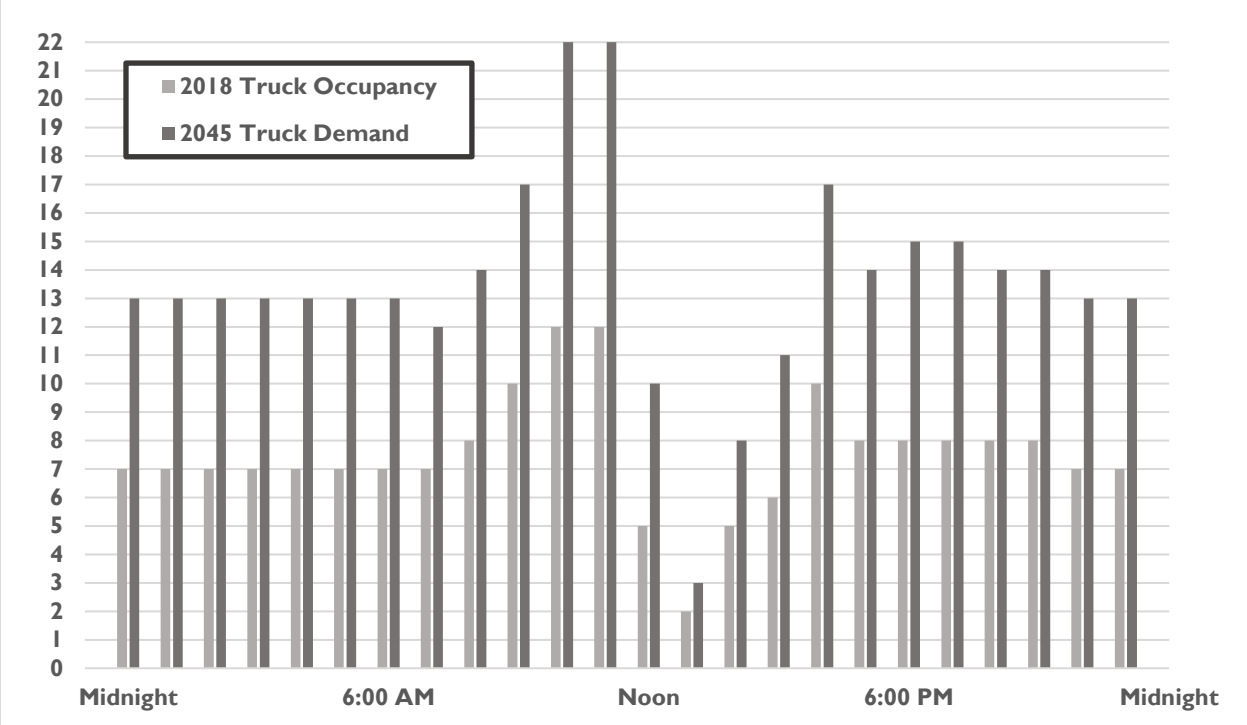


Chart 3-5. 6 – Wasta (I-90 Eastbound) – Demand vs. Capacity

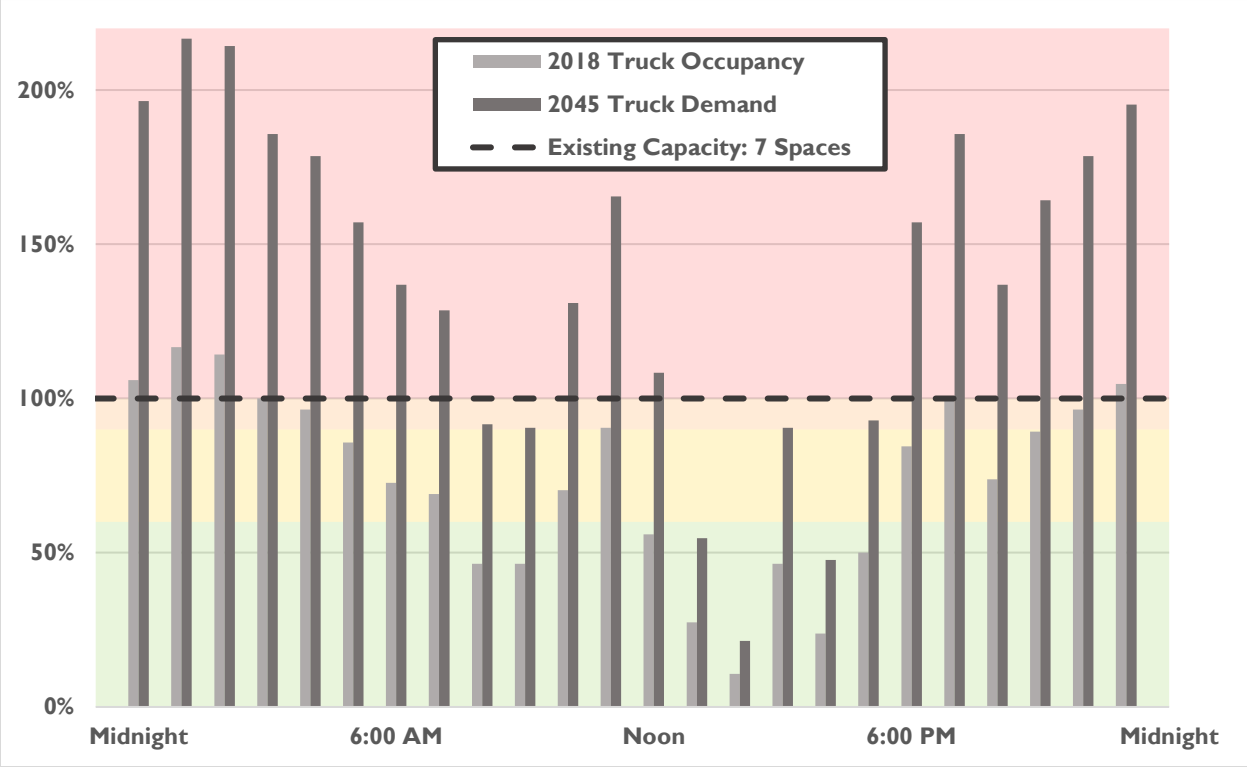


Chart 3-6. 7 – Wasta (I-90 Westbound) – Demand vs. Capacity

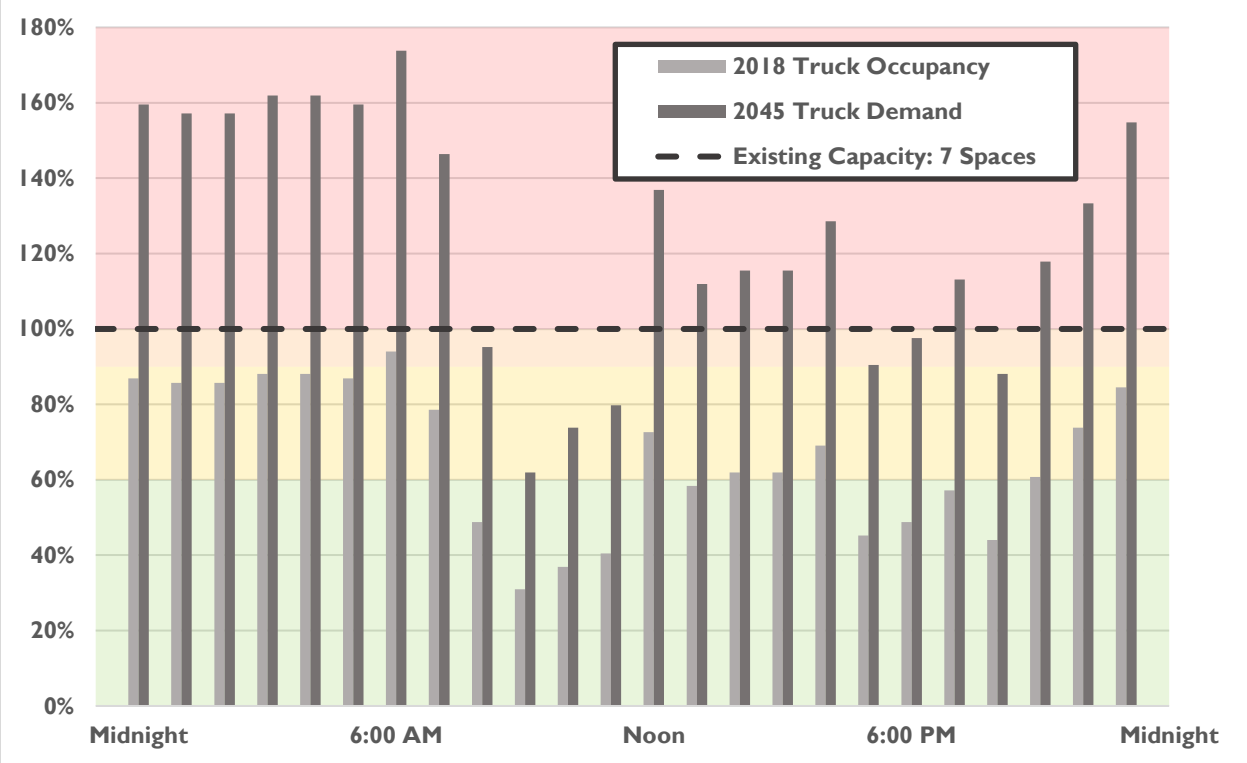


Chart 3-7. 8 – Cactus Flats Scenic Pullout (I-90 Eastbound) – Demand vs. Capacity

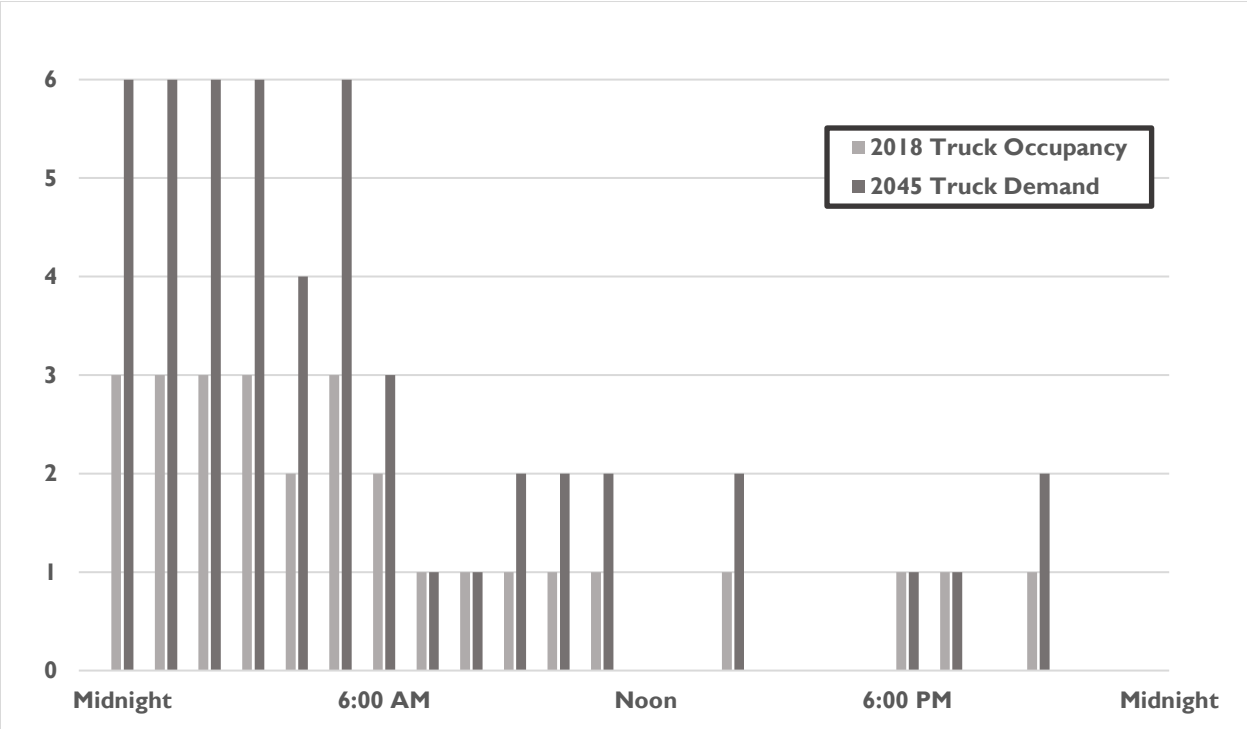


Chart 3-8. 9 – Cactus Flats Scenic Pullout (I-90 Westbound) – Demand vs. Capacity

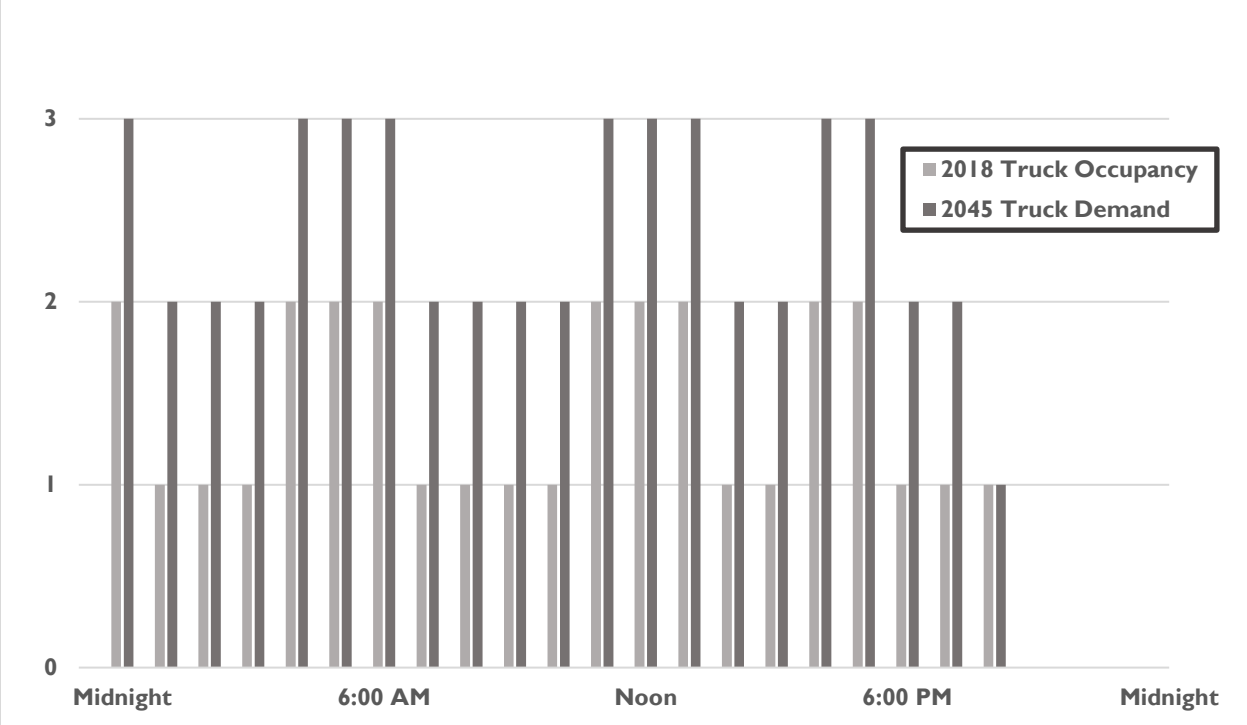


Chart 3-9. 10 – Belvidere (I-90 Eastbound) – Demand vs. Capacity

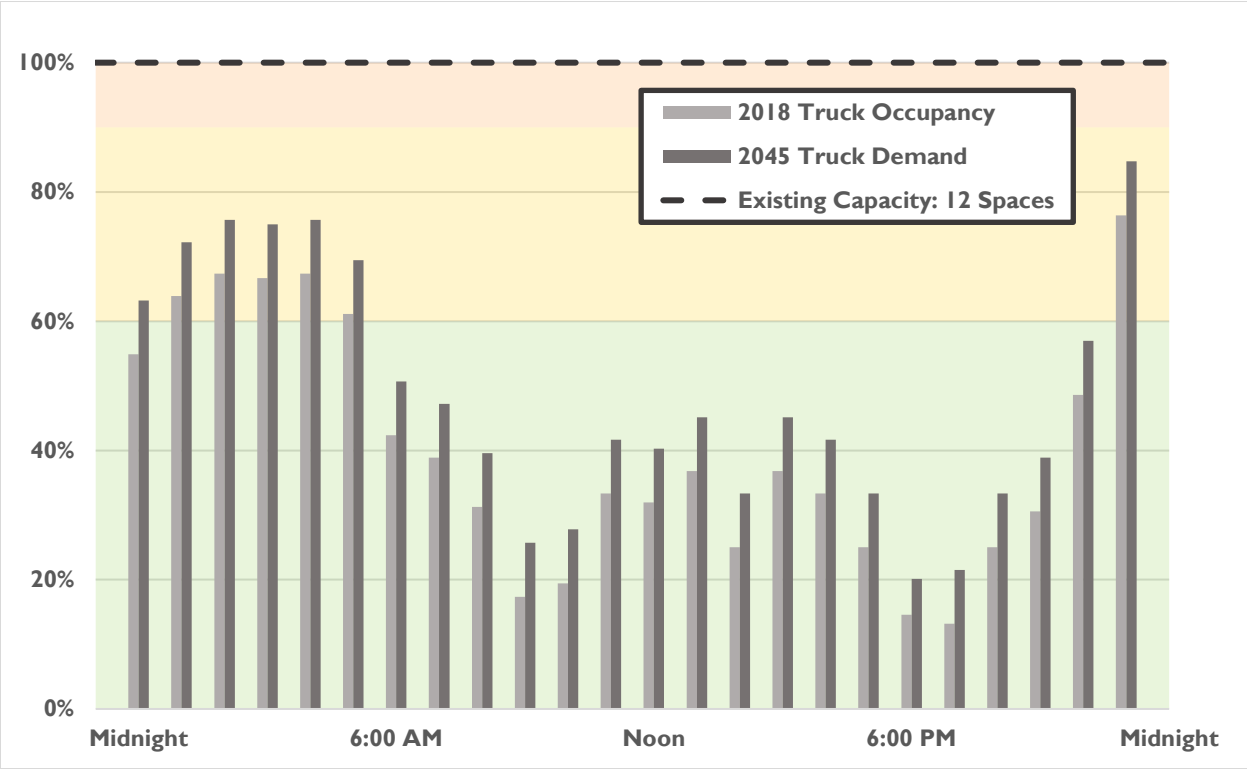


Chart 3-10. 11 – Belvidere (I-90 Westbound) – Demand vs. Capacity

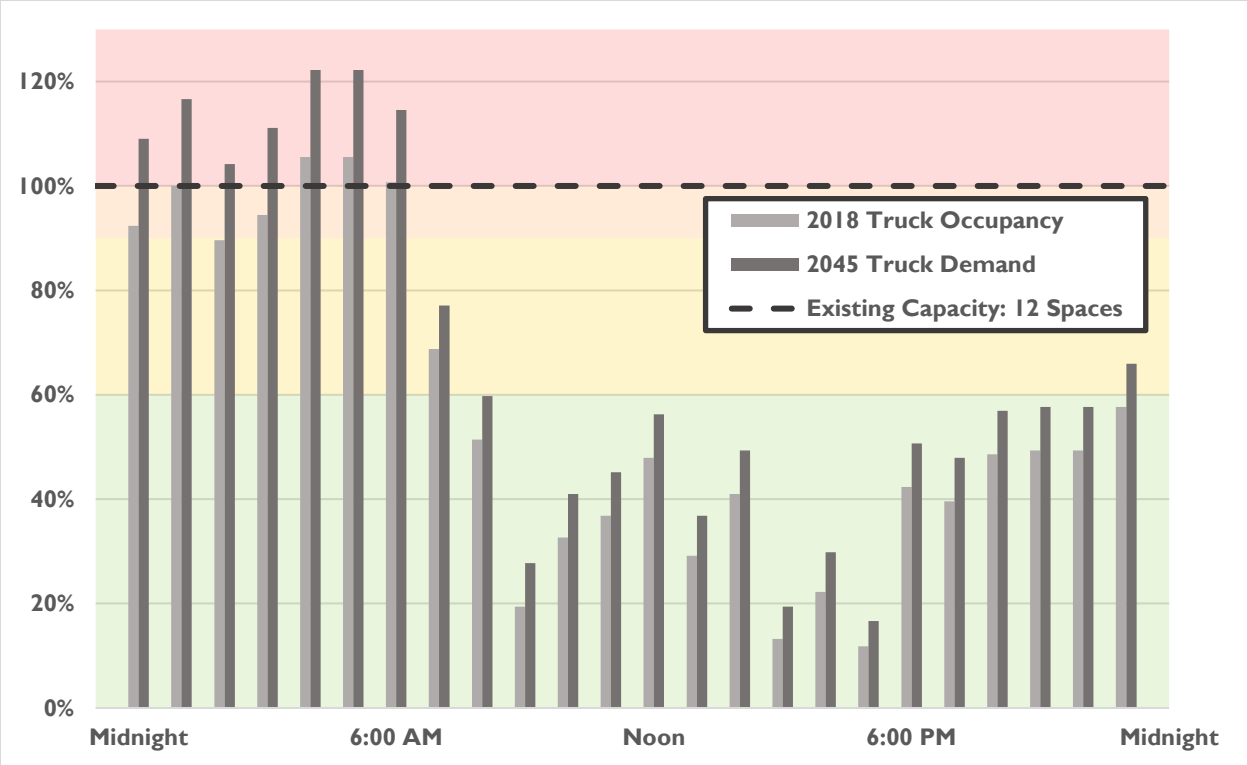


Chart 3-11 12 – Okaton Truck Pullout (I-90 Eastbound) – Demand vs. Capacity

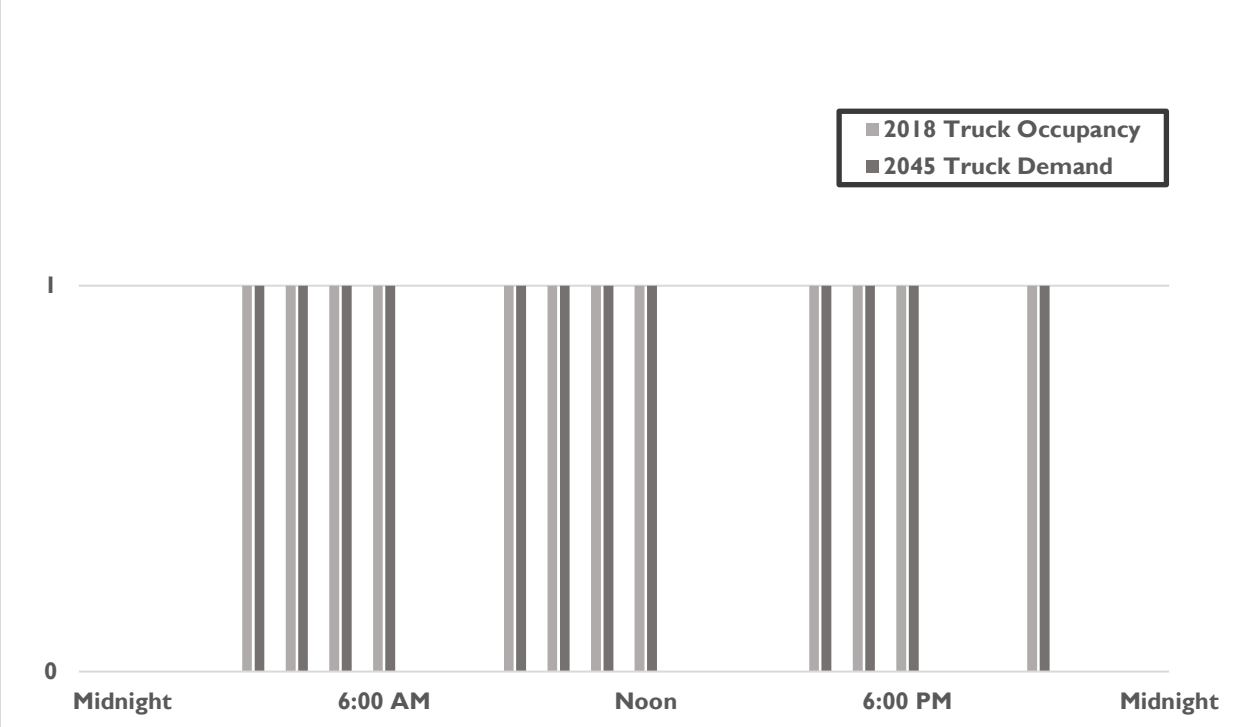


Chart 3-12. 13 – Okaton Truck Pullout (I-Westbound) – Demand vs. Capacity

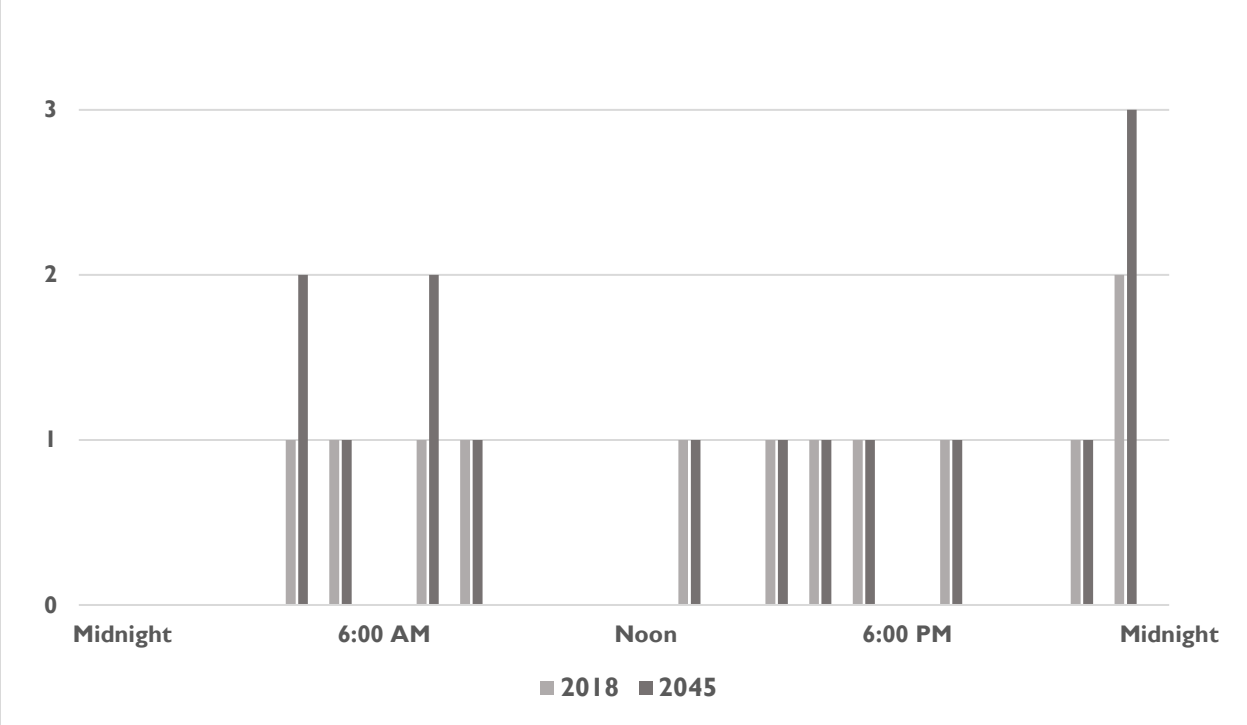


Chart 3-13. 14 – Murdo Truck Pullout (I-90 Eastbound) – Demand vs. Capacity

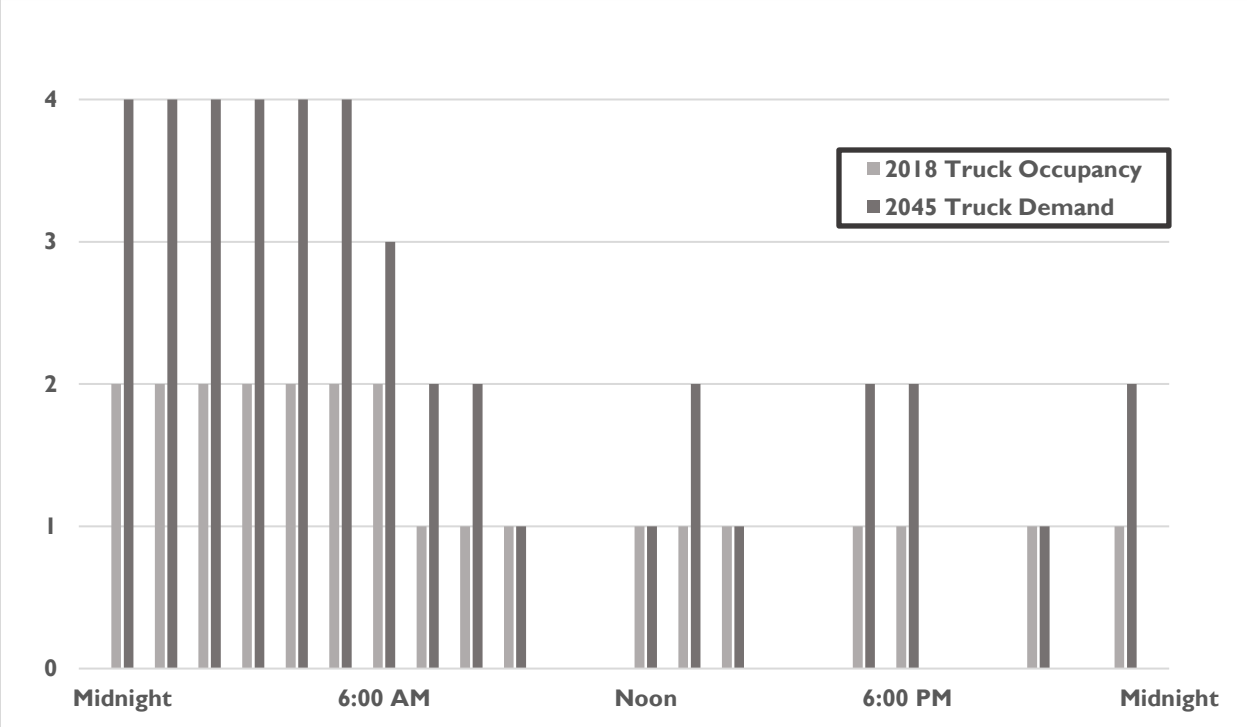


Chart 3-14. 15 – Murdo Truck Pullout (I-90 Westbound) – Demand vs. Capacity

Chart 3-15. 16 – Presho (I-90 Eastbound) – Demand vs. Capacity

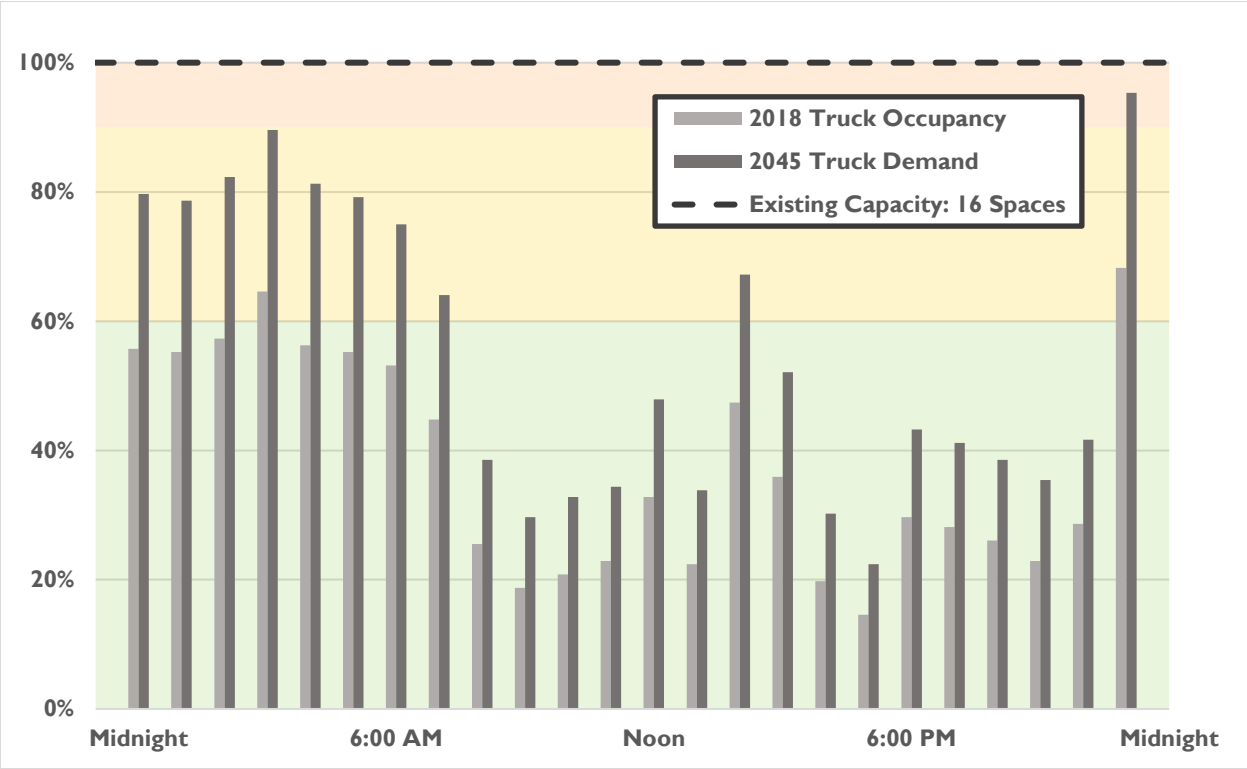


Chart 3-16. 17 – Presho (I-90 Westbound) – Demand vs. Capacity

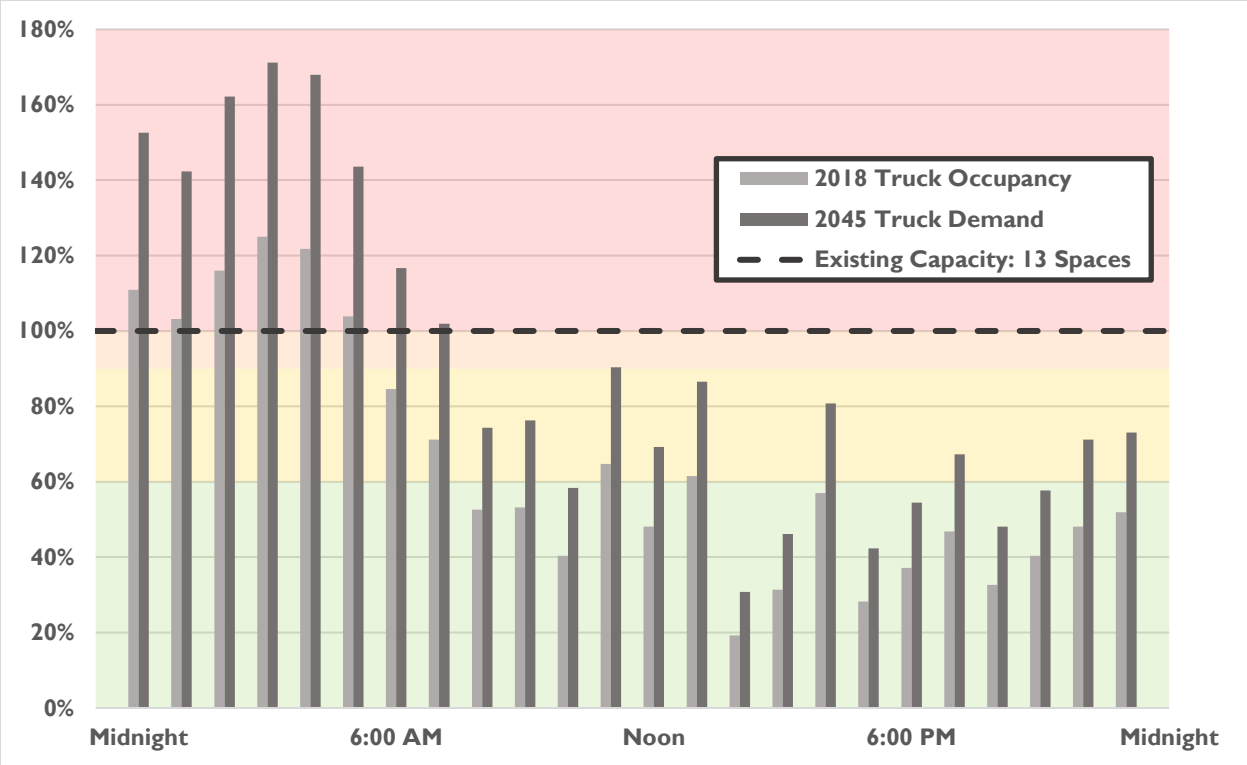


Chart 3-17. 18 – Chamberlain (I-90 Eastbound/Westbound) – Demand vs. Capacity

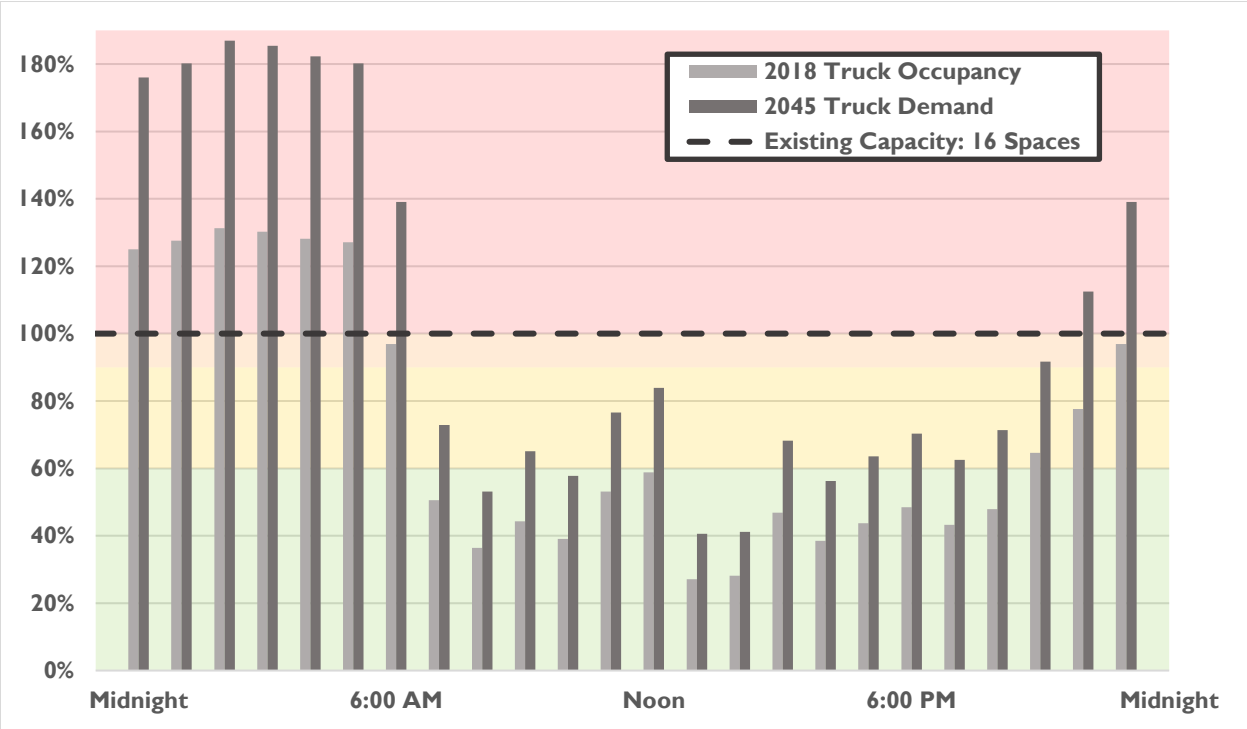


Chart 3-18. 19 – White Lake Truck Pullout (I-90 Eastbound) – Demand vs. Capacity

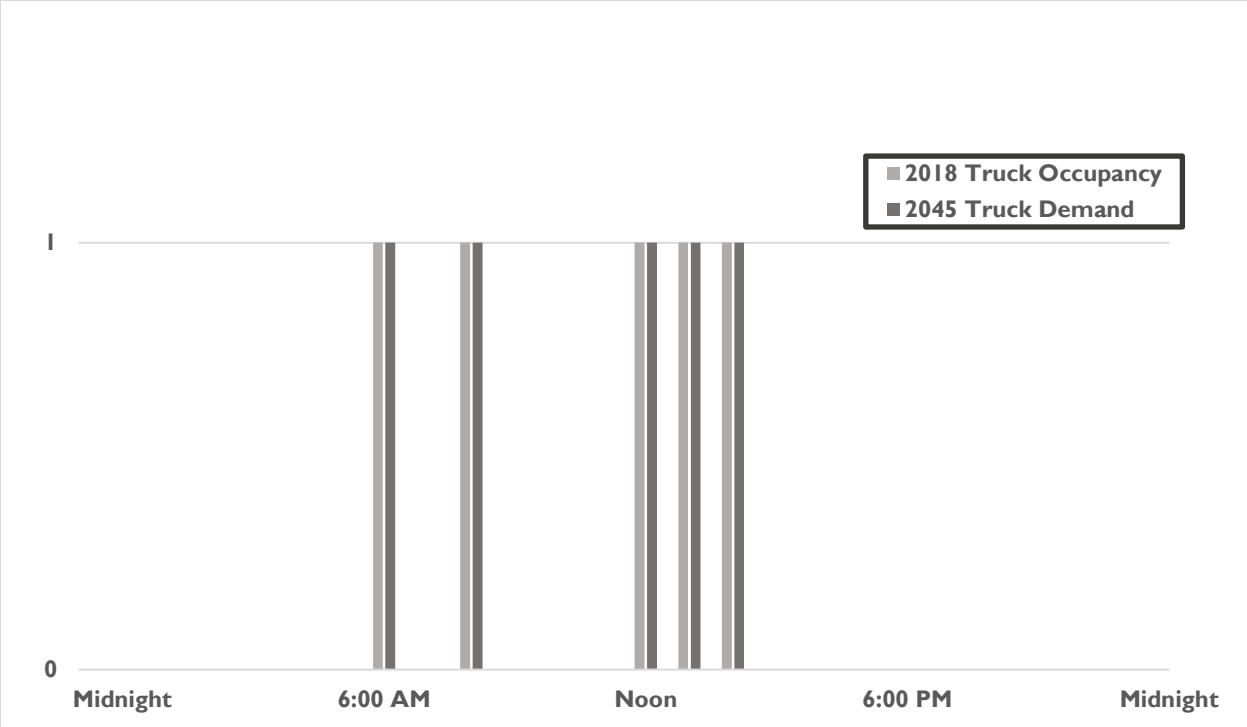


Chart 3-19. 20 – White Lake Truck Pullout (I-90 Westbound) – Demand vs. Capacity

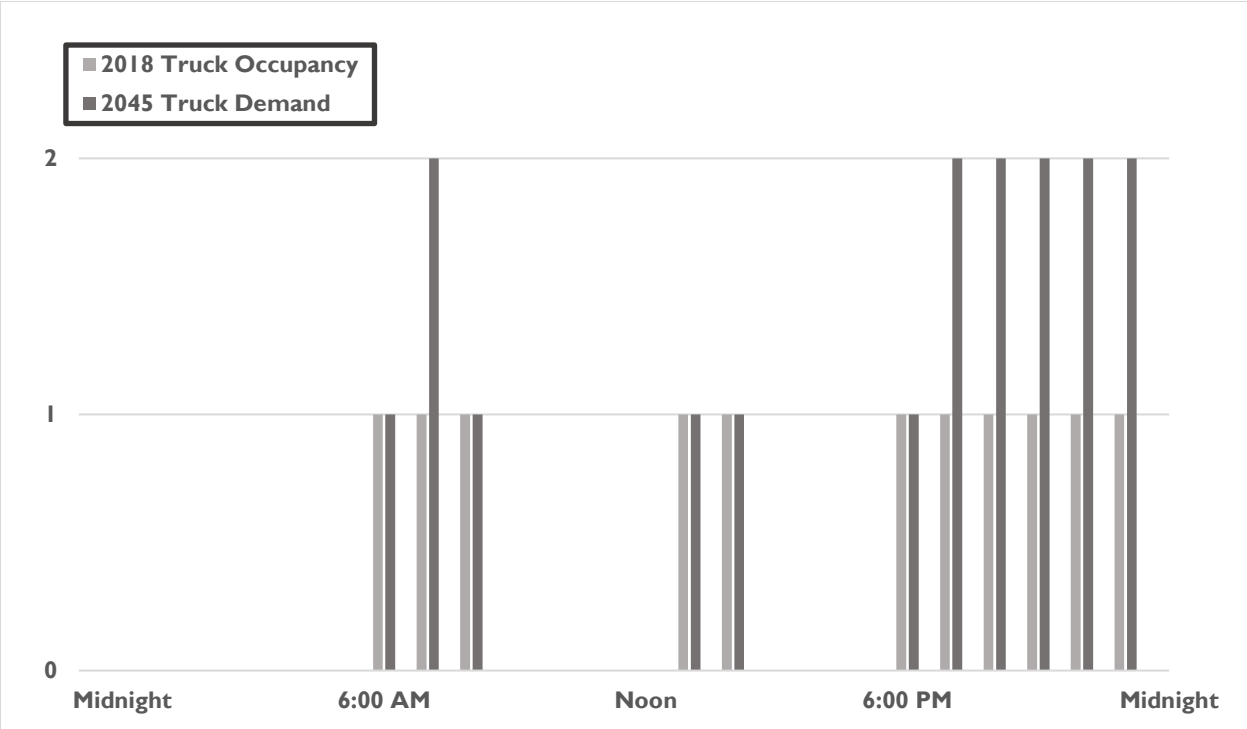


Chart 3-20. 21 – White Lake (I-90 Eastbound) – Demand vs. Capacity

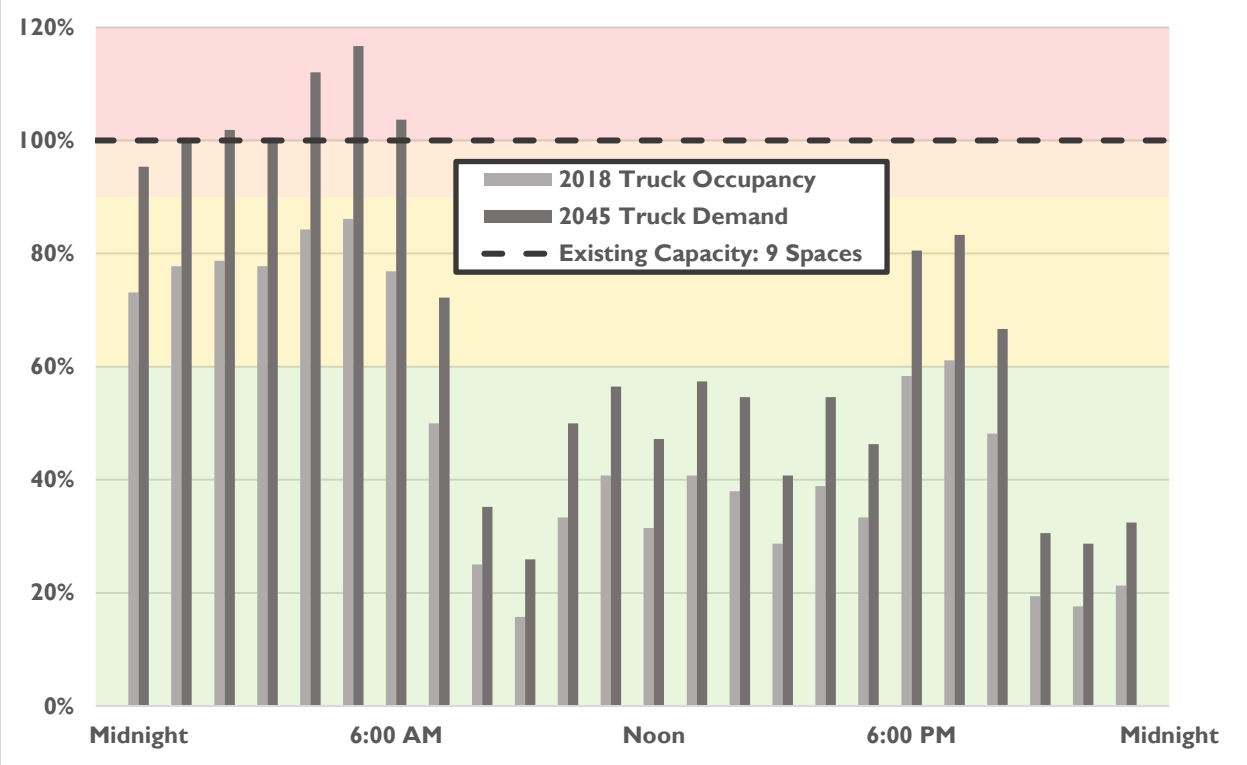


Chart 3-21. 22 – White Lake (I-90 Westbound) – Demand vs. Capacity

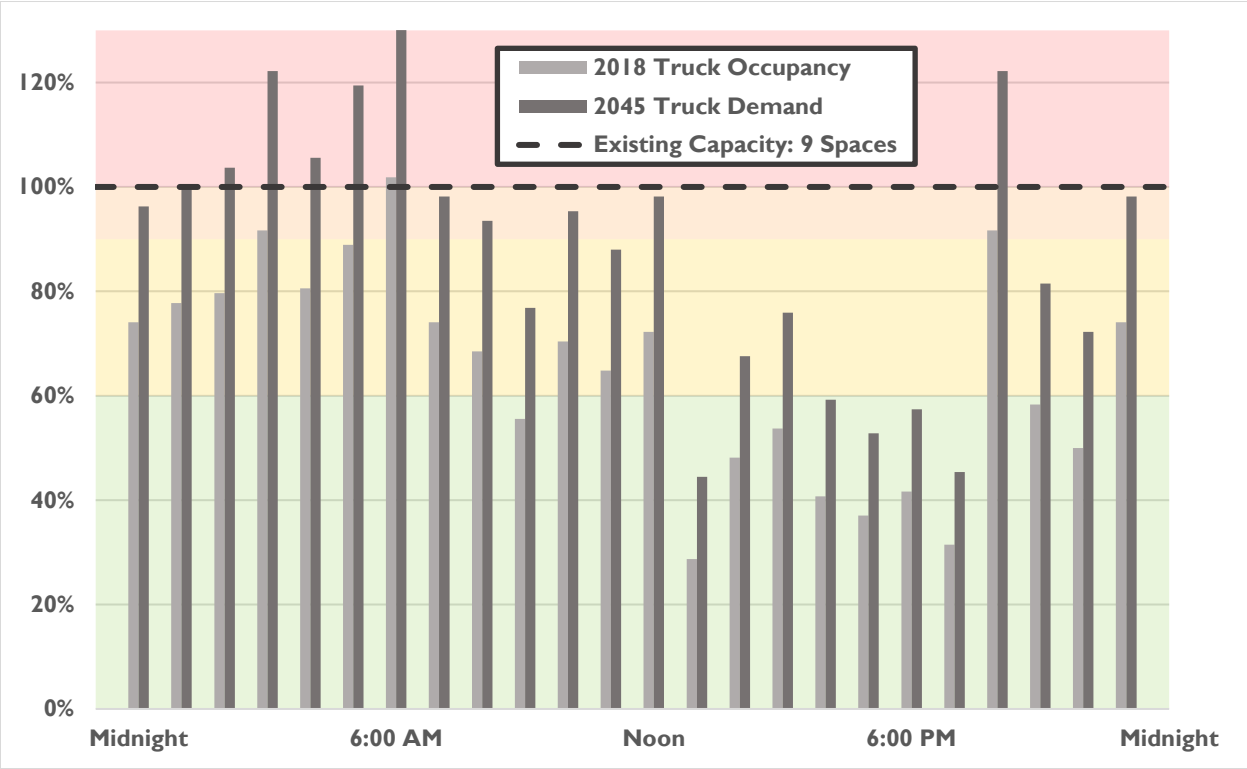


Chart 3-22. 23 – Mitchell Truck Pullout (I-90 Eastbound) – Demand vs. Capacity

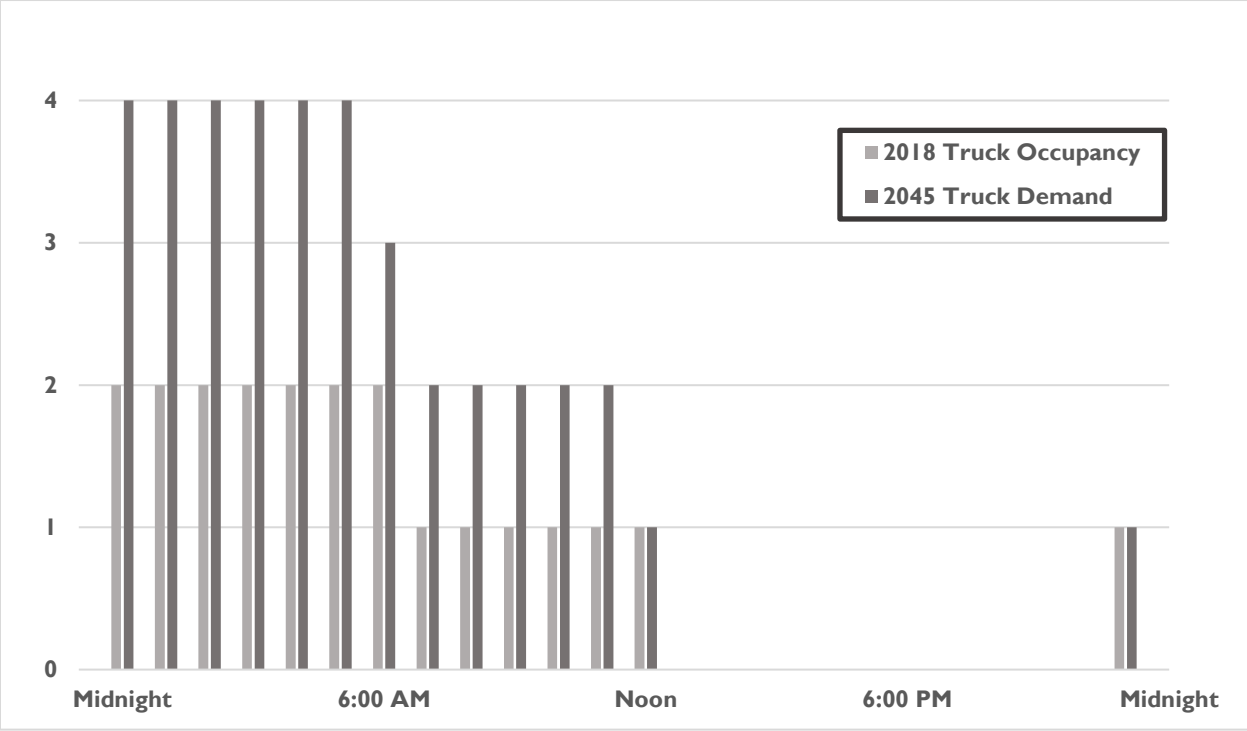


Chart 3-23. 24 – Mitchell Truck Pullout (I-90 Westbound) – Demand vs. Capacity

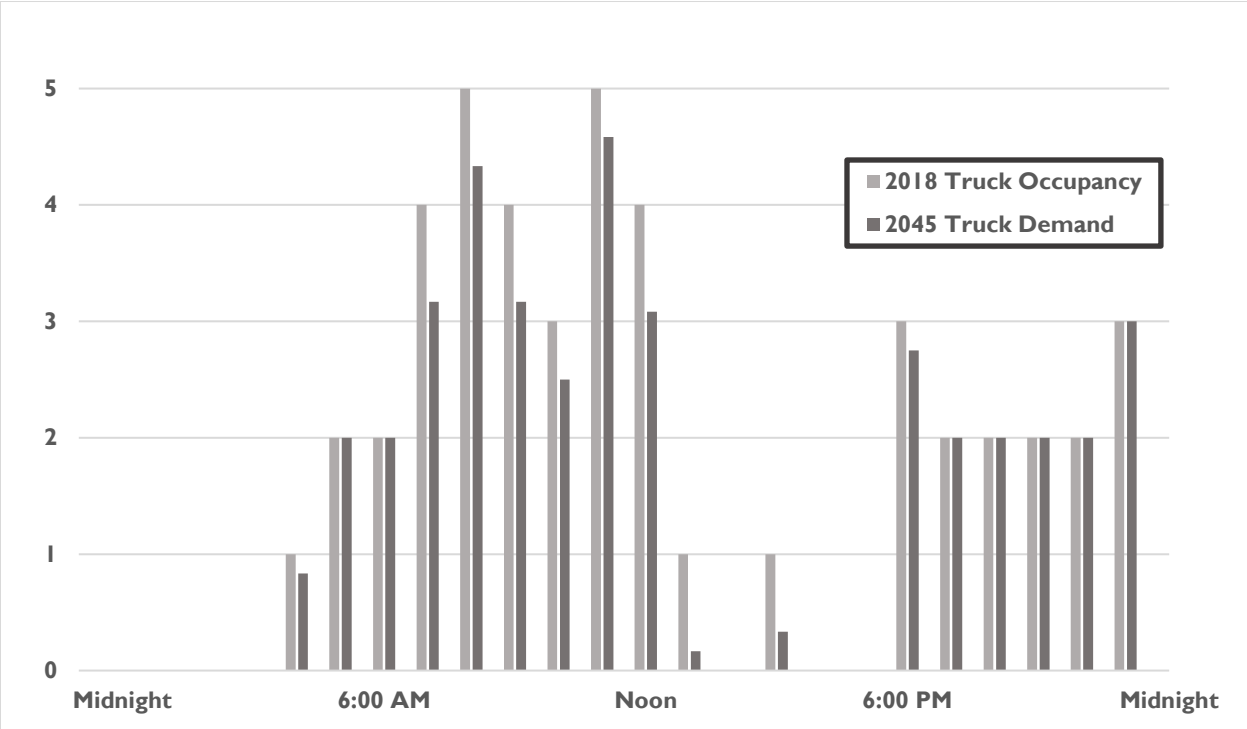


Chart 3-24. 25 – Salem (I-90 Eastbound) – Demand vs. Capacity

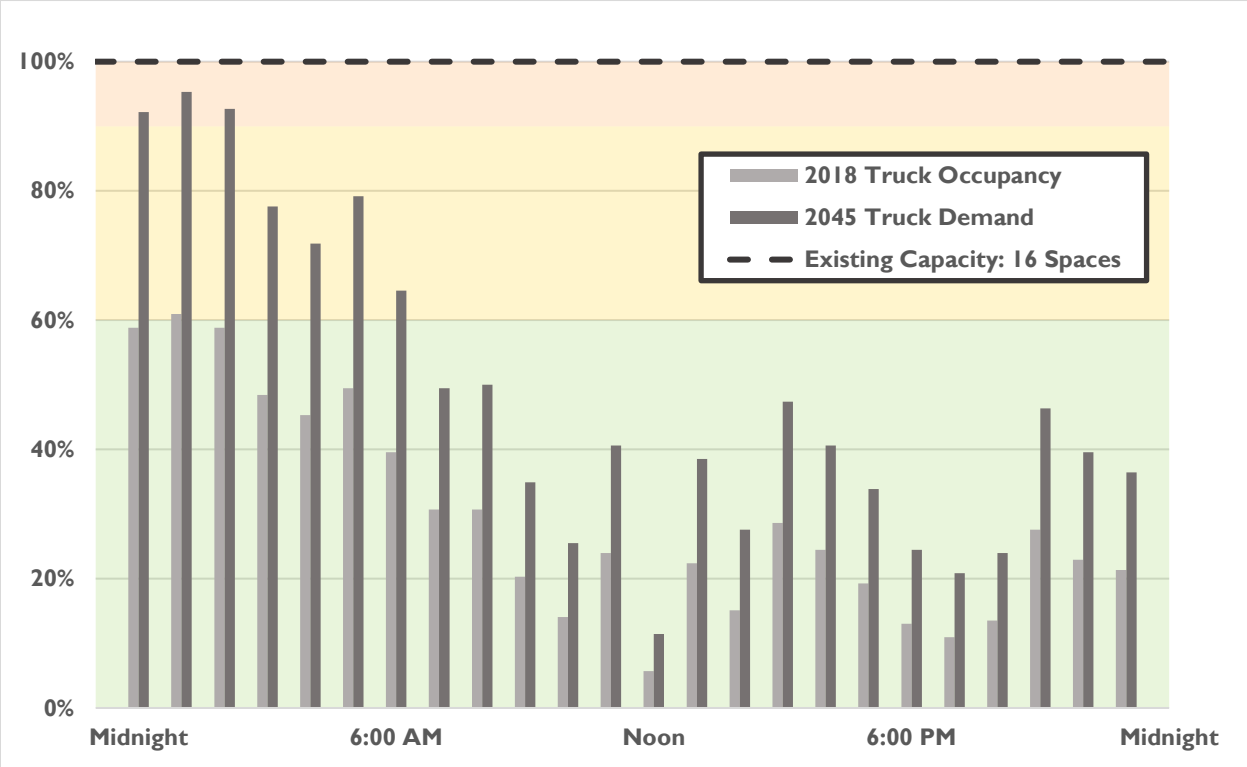


Chart 3-25. 26 – Salem (I-90 Westbound) – Demand vs. Capacity

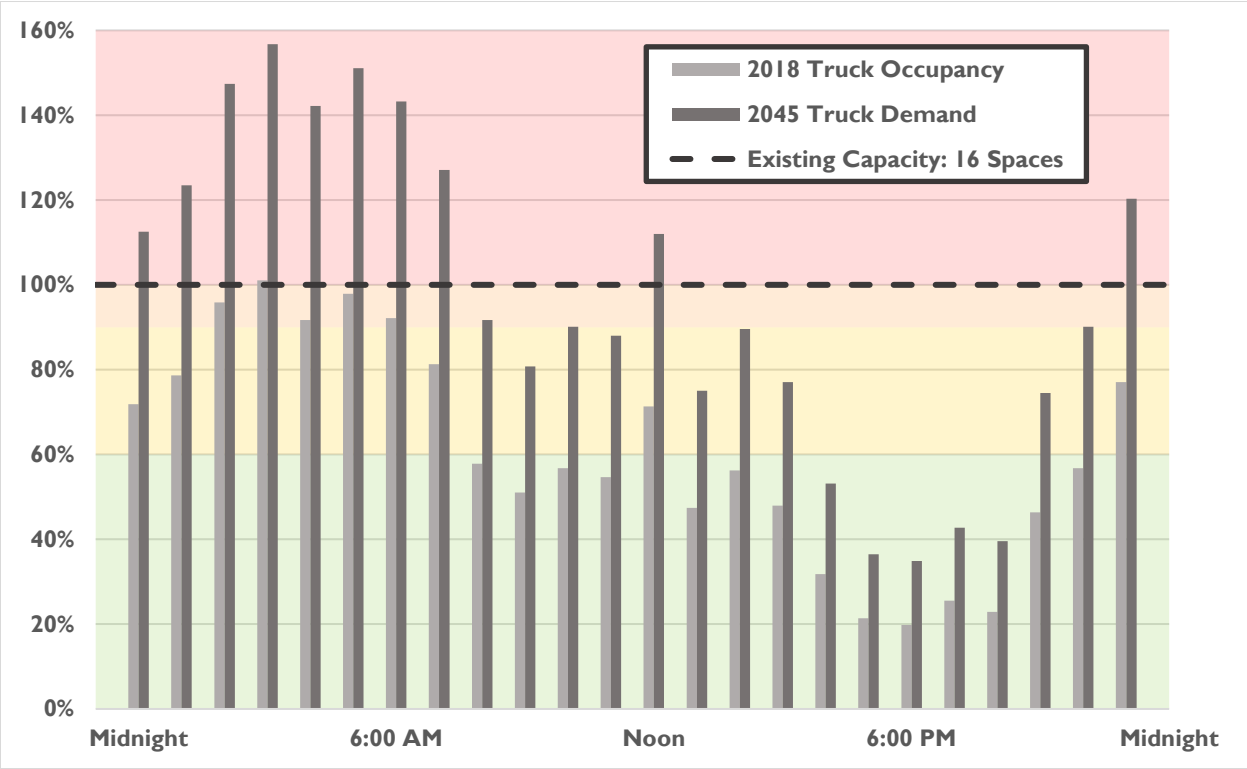


Chart 3-26. 27 – Jefferson Truck Pullout (I-29 Southbound) – Demand vs. Capacity

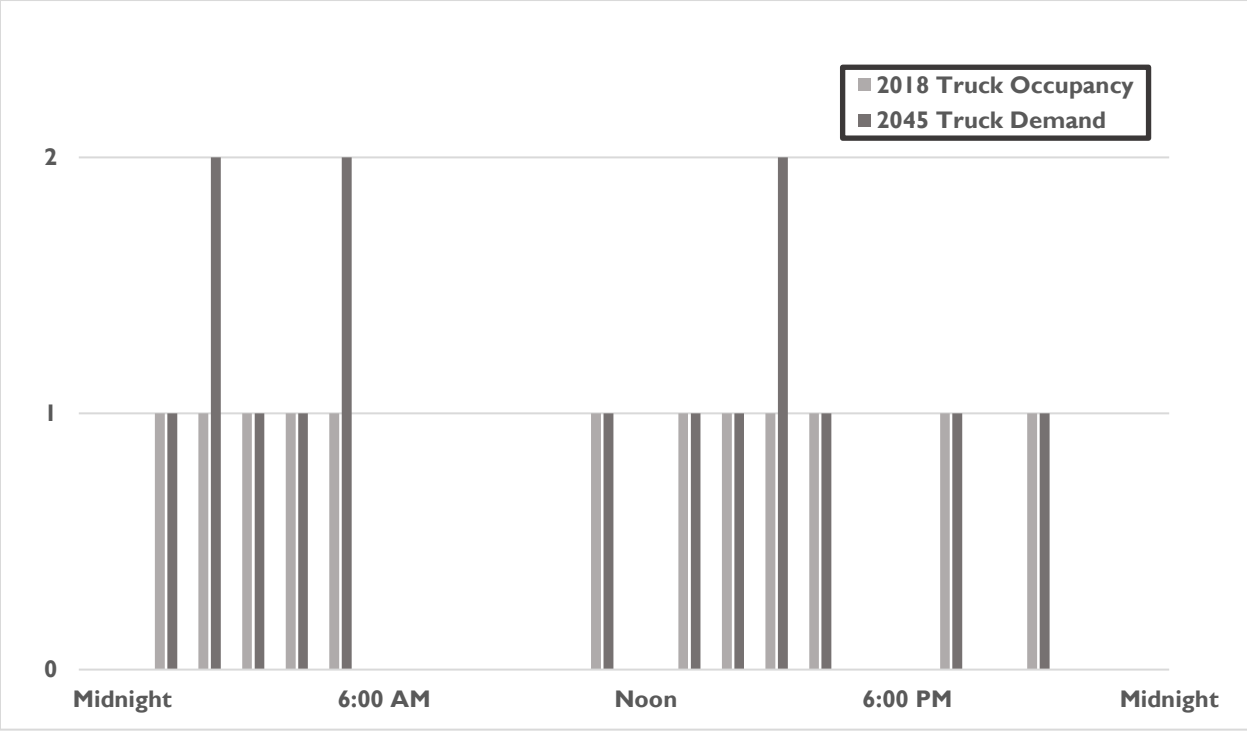


Chart 3-27. 28 – Ward (I-29 Northbound/Southbound) – Demand vs. Capacity

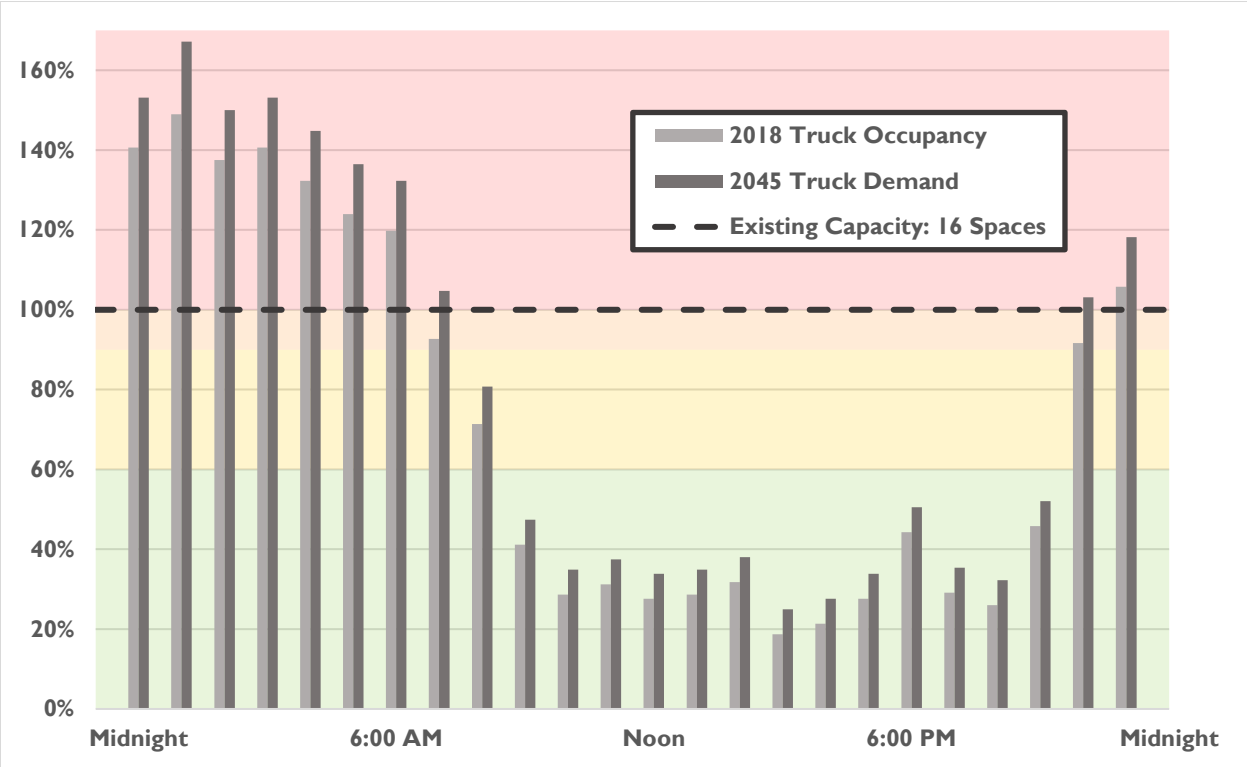


Chart 3-28 29 – Hidewood Truck Parking (I-29 Northbound) – Demand vs. Capacity

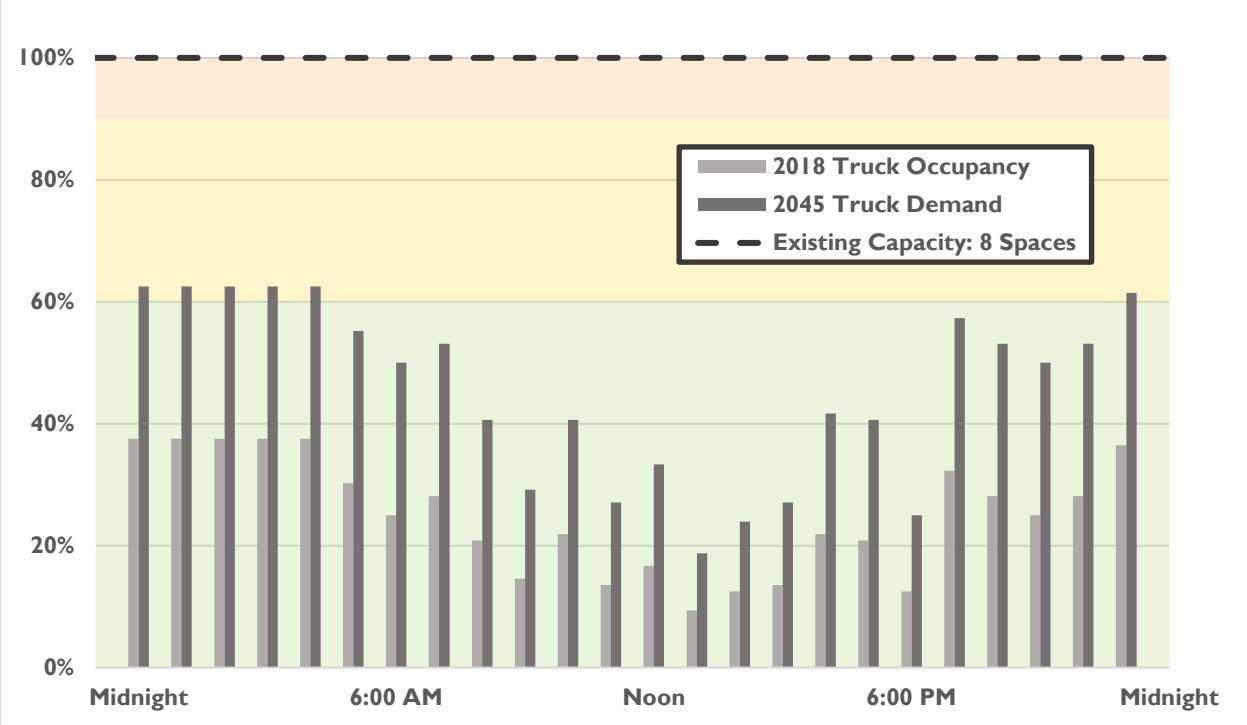


Chart 3-29. 30 – Hidewood Truck Parking (I-29 Southbound) – Demand vs. Capacity

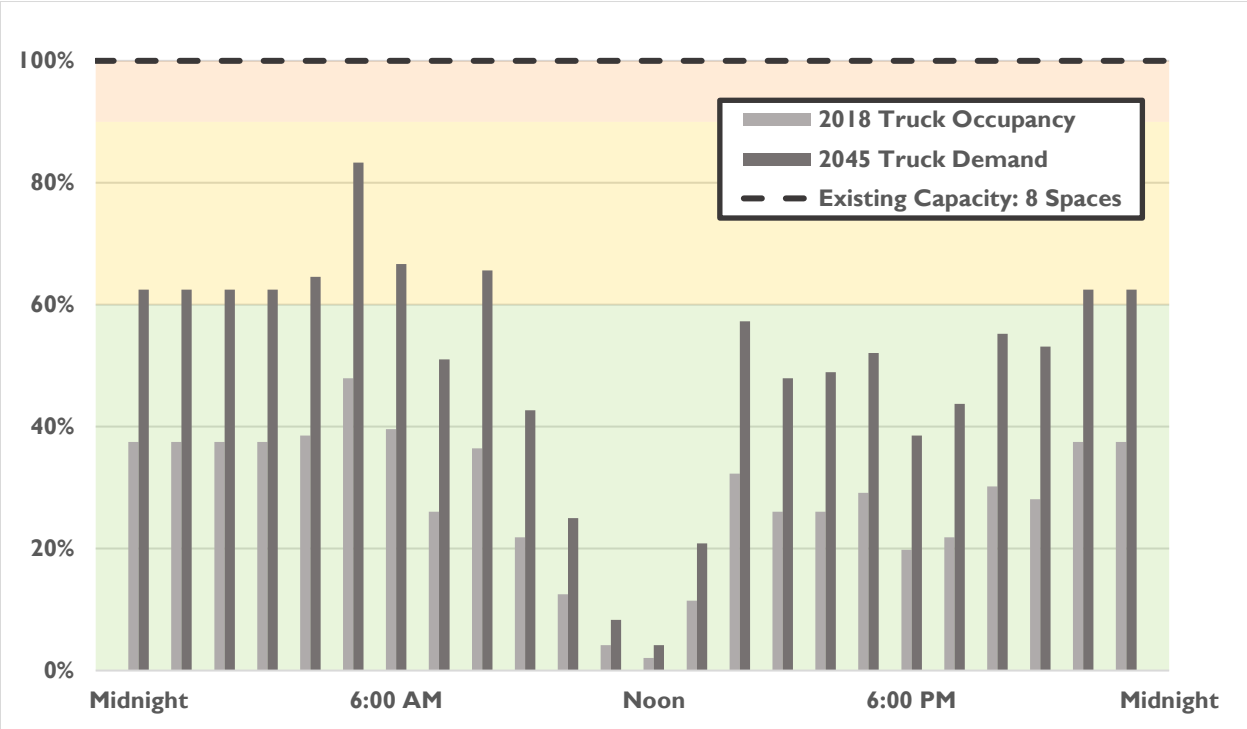
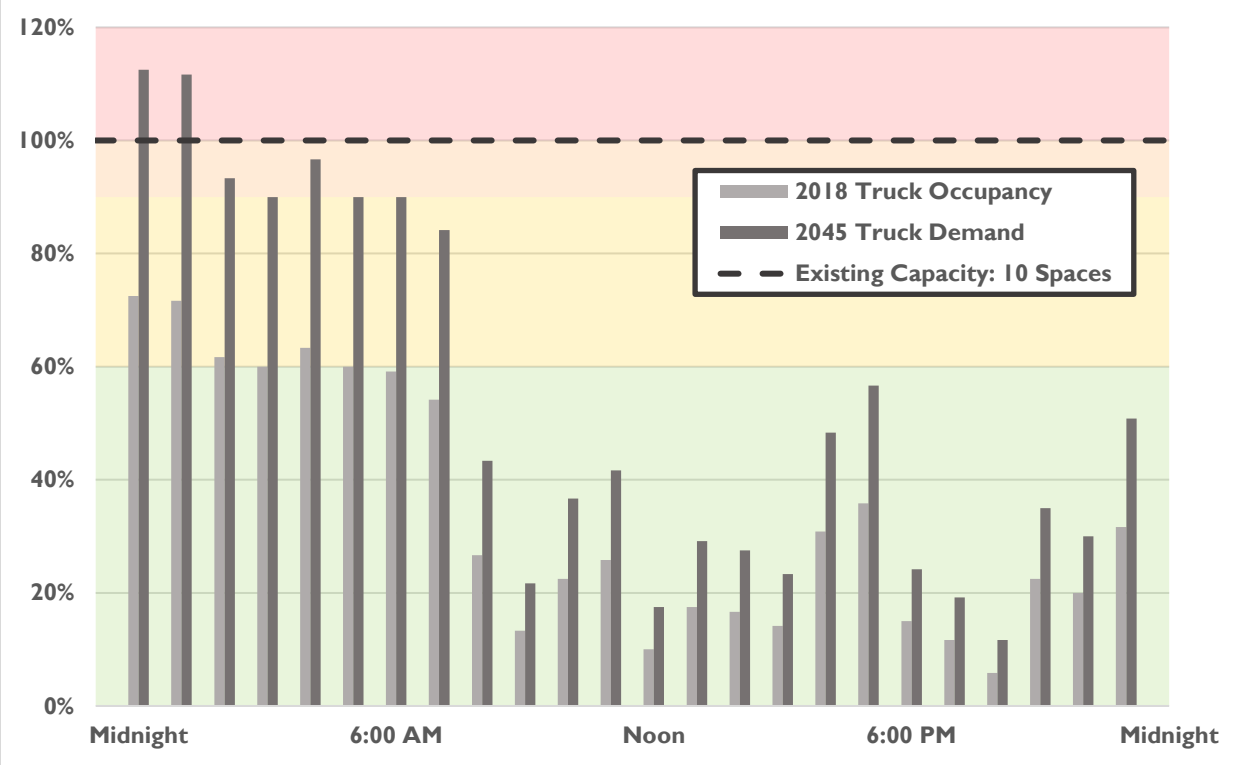


Chart 3-30. 31 – Glacial Lakes (I-29 SB) – Demand vs. Capacity



3.3 Future Needs

Based on the results of this future demand analysis, additional capacity needs are reflected in **Table 3-2**.

Table 3-2. 2045 Future Capacity Needs

	Facility	# of Spaces	2045 Parking Demand	# of Spaces to Add
6	Wasta (I-90 Eastbound)	7	16	9
7	Wasta (I-90 Westbound)	7	13	6
11	Belvidere (I-90 Westbound)	12	15	3
17	Presho (I-90 Westbound)	13	23	10
18	Chamberlain (I-90 Eastbound/Westbound)	16	30	14
21	White Lake (I-90 Eastbound)	9	11	2
22	White Lake (I-90 Westbound)	9	13	4
26	Salem (I-90 Westbound)	16	26	10
28	Ward (I-29 Northbound/Southbound)	16	27	11
31	Glacial Lakes (I-29 Southbound)	10	12	2

4. CONCEPTUAL DESIGN

Conceptual designs for expanding truck parking capacity within the existing right-of-way have been developed for rest area locations where future demand exceeds capacity. Consideration was also given to Belvidere EB, Presho EB, and Salem EB to coincide with concurrent construction/maintenance efforts at these locations. Conceptual options at these locations explored opportunities to reconfigure the striping and to provide additional capacity within the existing curb line.

4.1 Conceptual Design Considerations

The conceptual designs explored opportunities to provide angled head-in parking, where possible. Angled head-in parking was observed to provide easier maneuverability for trucks and reduced conflicts between passenger vehicles and trucks.

The conceptual design options also included recommendations for modifications to the entry and exit ramps to ensure the appropriate acceleration and deceleration lengths for an 80-mph design speed. The ramps have been designed to meet the *SDDOT Road Design Manual* criteria. Table 13-1 and Table 13-2 in Chapter 13 of the *Road Design Manual* provide minimum acceleration and deceleration lengths.

4.2 Conceptual Design Descriptions

The following summarizes the conceptual designs, including the recommended added capacity at each location identified in **Table 3-2**. **Appendix B** includes conceptual designs illustrations.

4.2.1 Location 2 – Tilford Truck Parking (I-90 Eastbound)

The 2045 demand forecasts indicate that the Tilford eastbound rest area has the existing capacity to meet future peak hour demand. However, this effort includes a conceptual design option to convert the existing parallel parking configuration to provide nine angled head-in parking spaces.

4.2.2 Location 3 – Tilford Truck Parking (I-90 Westbound)

The 2045 demand forecasts were not completed for this location. However, this effort includes a conceptual design option to convert the existing parallel parking configuration to provide nine angled head-in parking spaces.

4.2.3 Location 6 – Wasta (I-90 Eastbound)

The Wasta I-90 eastbound rest area conceptual design proposes modifying the existing truck parking area to provide 16 angled head-in truck parking spaces that direct trucks to park facing away from the rest area facilities and the passenger parking area. To accommodate the necessary parking spaces and provide adequate space for trucks to maneuver and exit the facility, the exit lane has been realigned to direct exiting trucks and vehicle toward the west end of the rest area. The exit lane in the conceptual design has the lane circling away from the rest area behind the southern picnic area to head east and back to I-90.

4.2.4 Location 7 – Wasta (I-90 Westbound)

The conceptual design provides 13 angled head-in truck parking spaces. This design has a shared approach for trucks and passenger cars, allowing trucks to pull into their designated space facing away from the passenger vehicle parking area, reducing potential conflicts when exiting.

4.2.5 Location 10 – Belvidere (I-90 Eastbound)

The 2045 demand forecasts indicate that the Belvidere eastbound rest area has the existing capacity to meet future peak hour demand. As noted during the data collection process, the current parallel parking design presents challenges accessing spaces depending on the occupancy and where trucks choose to park. The conceptual design provides an option to replace the existing 12 parallel parking spaces with 12 angled head-in parking spaces.

The conceptual design also includes modifications to the entering and exiting ramps to ensure the necessary acceleration and deceleration lengths.

4.2.6 Location 11 – Belvidere (I-90 Westbound)

As noted during the data collection process, the current parallel parking design presents challenges accessing spaces depending on the occupancy and where trucks choose to park. The conceptual design provides an option to replace the existing 12 parallel parking spaces with 15 angled head-in parking spaces.

4.2.7 Location 16 – Presho (I-90 Eastbound)

The 2045 demand forecasts indicate that the Presho eastbound rest area has the existing capacity to meet future peak hour demand. The conceptual design process did not identify an opportunity to add additional capacity and continues to reflect 16 truck parking spaces.

4.2.8 Location 17 – Presho (I-90 Westbound)

The conceptual design provides the additional spaces on the east end of the rest area, providing a total of 23 angled head-in parking spaces.

4.2.9 Location 18 – Chamberlain (I-90 Eastbound/Westbound)

Two conceptual options have been provided for the Chamberlain Rest Area. Alternative 1 has extended the existing truck parking area to the east to provide a total of 30 truck parking spaces.

Discussions with SDDOT staff indicated a potential concern regarding the grade to the east of the existing rest area drive. The realignment of the entry drive, as shown in Alternative 1, may require a retaining wall. Further evaluation would be needed to evaluate the feasibility of this option. A second option was developed that seeks to avoid potential grade challenges adding capacity largely within the existing footprint of the rest area. Alternative 2 also provides 30 designated truck parking spaces by adding 10 spaces on the north side of the entry drive and expanding the existing truck parking area to accommodate 20 parking spaces.

4.2.10 Location 21 – White Lake (I-90 Eastbound)

Two additional truck parking spaces have been added to the west side of the truck parking area to provide a total of 11 truck parking spaces.

4.2.11 Location 22 – White Lake (I-90 Westbound)

An additional 4 truck parking spaces have been added to the east end of the White Lake westbound truck parking area to provide a total of 13 truck parking spaces.

4.2.12 Location 25 – Salem (I-90 Eastbound)

The 2045 demand forecasts indicate that the Salem eastbound rest area has the existing capacity to meet future peak hour demand. Like Presho eastbound, given the concurrent construction/maintenance efforts at this location, a striping alternative has been developed that would accommodate 17 designated truck parking spaces without requiring a change to the overall paved area of the rest area.

4.2.13 Location 26 – Salem (I-90 Westbound)

The conceptual design provides the additional spaces on the east end of the rest area, providing a total of 26 angled head-in parking spaces. Expanding to the east centered the truck parking area on the rest area building to minimize the walking distances from the furthest parking spaces to the building. The expansion on the east end of the rest area requires a new alignment for the I-90 exit ramp (entering the rest area) to meet the deceleration length requirements.

4.2.14 Location 28 – Ward (I-29 Northbound/Southbound)

The Ward rest area truck parking has been modified from its existing parallel parking design to provide angled head-in 27 truck parking spaces.

4.2.15 Location 31 – Glacial Lakes (I-29 Southbound)

The conceptual design accommodates a total of 12 truck parking spaces by extending the truck parking area to the south.

5. CONCLUSION

On average, existing truck parking capacity is adequate to accommodate the demand for most hours of the day at most of the observed locations. Existing demand exceeds capacity for at least one hour at the following locations:

- 6 – Wasta (I-90 Eastbound)
- 11 – Belvidere (I-90 Westbound)
- 17 – Presho (I-90 Westbound)
- 18 – Chamberlain (I-90 Eastbound/Westbound)
- 22 – White Lake (I-90 Westbound)
- 26 – Salem (I-90 Westbound)
- 28 – Ward (I-29 Northbound/Southbound)

The 2045 forecasts indicate that future demand will exceed capacity for at least one hour at the following locations:

- **6 – Wasta (I-90 Eastbound)**
- **7 – Wasta (I-90 Westbound)**
- 11 – Belvidere (I-90 Westbound)
- **17 – Presho (I-90 Westbound)**
- **18 – Chamberlain (I-90 Eastbound/Westbound)**
- 21 – White Lake (I-90 Eastbound)
- 22 – White Lake (I-90 Westbound)
- **26 – Salem (I-90 Westbound)**
- **28 – Ward (I-29 Northbound/Southbound)**
- 31 - Glacial Lakes (I-29 Southbound)

The forecasts and demand analysis indicate that demand at the locations in bold above exceed capacity by 5 spaces or more.

APPENDIX A. METHODS & ASSUMPTIONS

1. COVER PAGE

SDDOT REST AREA AND TRUCK PULLOUT TRUCK PARKING ANALYSIS

Methods & Assumptions Document

Prepared for:

South Dakota Department of Transportation
700 East Broadway Avenue
Pierre, South Dakota 57501

Prepared by:

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FHU Reference No. 118225-01

June 2018

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12. Deviations/Justifications 4
13. Conclusion 4
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2. STAKEHOLDER ACCEPTANCE

The undersigned parties concur with the Methods and Assumptions for the South Dakota Department of Transportation (SDDOT) Rest Area and Pullout Truck Parking Analysis as presented in this document.

SDDOT

Signature

TRANSPORTATION SPECIALIST II

Title

6-8-18

Date

Participation of the Study Team and/or signing of this document does not constitute approval of the SDDOT Final Analysis Report or conclusions.

All members of the Study Team will accept this document as a guide and reference as the study progresses through the various stages of development. If there are any agreed upon changes to the assumptions in this document a revision will be created, endorsed and signed by all the signatories.

3. INTRODUCTION AND PROJECT DESCRIPTION

3.1 Background Information

In recent years, truck parking pressure is increasing due to general freight traffic growth and implementation of regulations that require monitoring of truck traffic to ensure that drivers are complying with Hours of Service (HOS) rules. Accordingly, the SDDOT has continued to monitor truck parking needs along its Interstate System to ensure that current and future needs are adequately met by the available infrastructure. This analysis is intended to provide data to support decisions regarding strategic investment in parking areas – both rest areas and truck pullouts. The analysis will build upon two prior similar studies: The I-90/I-29 Rest Areas Truck Parking Study completed in 2013 and a truck parking analysis of select rest areas completed in 2016.

3.2 Location

Thirty-one (31) specific truck parking, truck pull-out and rest area locations will be analyzed in this study. All locations are located along Interstates 90 (I-90) and 29 (I-29). These locations include:

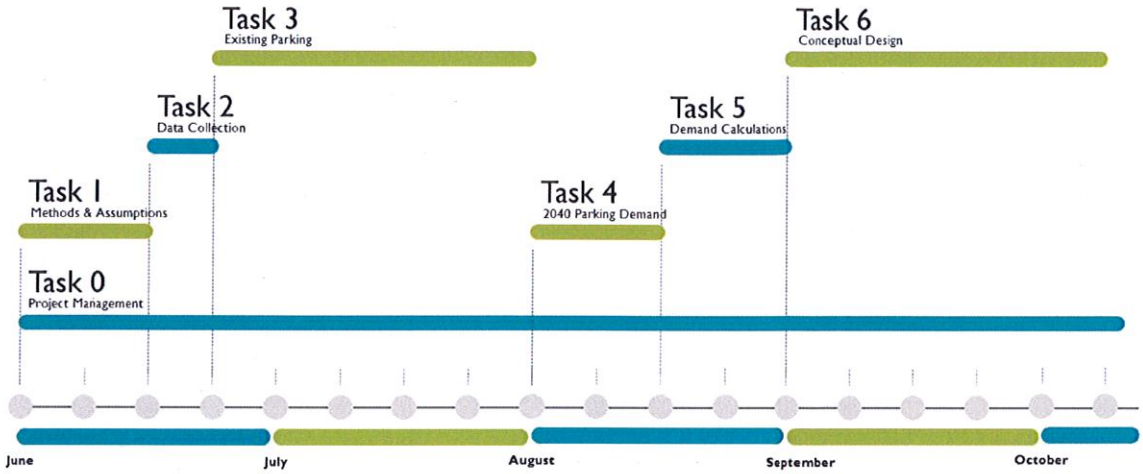
- Spearfish (I-90 Eastbound)
- Tilford Truck Parking (I-90 Eastbound)
- Tilford Truck Parking (I-90 Westbound)
- Box Elder Pullout (I-90 Eastbound)
- Box Elder Pullout (I-90 Westbound)
- Wasta (I-90 Eastbound)
- Wasta (I-90 Westbound)
- Cactus Flats Scenic Pullout (I-90 Eastbound)
- Cactus Flats Scenic Pullout (I-90 Westbound)
- Belvidere (I-90 Eastbound)
- Belvidere (I-90 Westbound)
- Okaton Truck Pullout (I-90 Eastbound)
- Okaton Truck Pullout (I-90 Westbound)
- Murdo Truck Pullout (I-90 Eastbound)
- Murdo Truck Pullout (I-90 Westbound)
- Presho (I-90 Eastbound)
- Presho (I-90 Westbound)
- Chamberlain (I-90 Eastbound/Westbound)
- White Lake Truck Pullout (I-90 Eastbound)
- White Lake Truck Pullout (I-90 Westbound)
- White Lake (I-90 Eastbound)
- White Lake (I-90 Westbound)
- Mitchell Truck Pullout (I-90 Eastbound)
- Mitchell Truck Pullout (I-90 Westbound)
- Salem (I-90 Eastbound)
- Salem (I-90 Westbound)
- Jefferson Truck Pullout (I-29 Southbound)
- Ward (I-29 Northbound/Southbound)
- Hidewood Truck Parking (I-29 Northbound) – under construction until June 15th
- Hidewood Truck Parking (I-29 Southbound) – under construction until June 15th
- Glacial Lakes (I-29 Southbound)

3.3 Need for Study

The purpose of the project is to quantify current truck parking demand at the selected locations, forecast future growth and identify opportunities for expanding parking capacity where necessary to accommodate current and/or future needs.

3.4 Study Schedule

It is anticipated that the project can be completed in 5 months from notice to proceed. The following graphic illustrates the proposed schedule:



3.5 Facilities That Will Be Affected by the Study

Video cameras will be placed at each rest area to record the number of parked trucks in truck-only parking spots, over a single 24-hour period. During that time, it is anticipated that day-to-day operations will not be impacted significantly, and each facility will remain open and functioning to the traveling public during the data collection process.

3.6 Previous Studies

This project will build on two previously completed analyses:

- *The Interstate Rest Areas Study: Along the I-29 and I-90 Corridors*, September 2014
- South Dakota Rest Area Parking Analysis, March 2016

3.7 Study Advisory Team Members

The following table summarizes the key members of the project team.

Table 3-1. Project Team – Key Members

Felsburg Holt & Ullevig	
Rachel Ackermann – Project Manager	Lyle DeVries – Principal-in-Charge
South Dakota Department of Transportation	
Brad Remmich – Project Manager	
All Traffic Data	
Eric Boivin – Project Manager	

4. STUDY AREA

The study area for each rest area or pullout location is generally bound by property / right-of-way line and at the pavement cut separating the rest area from the adjacent transportation network. The locations included in the analysis are listed in **Section 3.2**.

5. ANALYSIS YEARS/PERIODS

The truck parking data collection effort will occur on a typical weekday in June of 2018. No seasonal adjustments are anticipated because the June period is considered to represent an appropriate design condition. The existing (2018) and 2045 truck parking demand projections will be compared to existing parking capacity to identify locations were existing demand or future demand exceeds capacity and determine the number of additional spaces need to accommodate the 20-year demand.

6. DATA COLLECTION

The data collection will occur in two major phases, described as follows:

1. **Parking Supply Inventory:** The truck parking supply at each location will be compiled using data available from the SDDOT and recent aerial photos.

2. **Truck Parking Demand Counts:** On a weekday agreed to by the project team (anticipated to occur the 3rd or 4th week of June 2018), video collection data will be placed at each rest area by ATD staff and will be run for a 24-hour period.

   Video cameras will be placed at each rest area to record the number of parked trucks in truck-only parking spots, over a single 24-hour period. Parked trucks will be counted in 5-minute increments. Counts will be conducted by reviewing the video footage. FHU and All Traffic Data (ATD) will coordinate to develop a data collection and camera plan to ensure complete coverage of parking facilities.

7. TRAFFIC OPERATIONS ANALYSIS

No traffic operations analysis will be performed for this project.

8. TRAVEL FORECAST

Growth in truck parking demand will be derived from information in the Federal Highway Administration (FHWA) Freight Analysis Framework (FAF), Version 4. Updated demand growth factors will be calculated using the updated FAF, Version 4 methodology. The Hours of Service (HOS) Rules and their impact on truck drivers in South Dakota is noted, but no adjustment will be made to future truck parking forecasts, under the assumption that current HOS rules will not be adjusted.

The FAF4 provides base year truck volumes estimated from the HPMS 2012 database, state truck percentages and functional class information. Year 2045 forecast annual average truck volumes have been estimated using the HPMS 20-year growth factor and projected using linear growth. For this study, the calculated annual linear growth rate will be used to forecast Year 2045 truck parking demand from the 2018 observed truck parking demand.

9. SAFETY ISSUES

Specific accident data will not be analyzed as part of this project.

10. SELECTION OF MEASURES OF EFFECTIVENESS

The following outlines the specific Measures of Effectiveness (MOEs) that will be utilized in the project:

- Parking – Current truck parking demand will be quantified as the number of parked trucks within truck parking areas. Year 2045 parking demand will be projected by applying growth rates to the current truck parking demand levels.

11. FHWA INTERSTATE ACCESS MODIFICATION POLICY POINTS

Additional access will not be gained onto either I-29 or I-90.

12. DEVIATIONS/JUSTIFICATIONS

We do not anticipate any deviations from stated standards.

13. CONCLUSION

The SDDOT has identified the need to routinely monitor truck parking supply and demand throughout the interstate system. The data collection, forecasting and analysis procedures outlined herein will address this need by collecting current, on-site information, applying the most up-to-date freight forecasting tools to quantify future needs, and informing conceptual design of truck parking expansion options at locations where the need is revealed by current and/or future demand.

14. APPENDICES

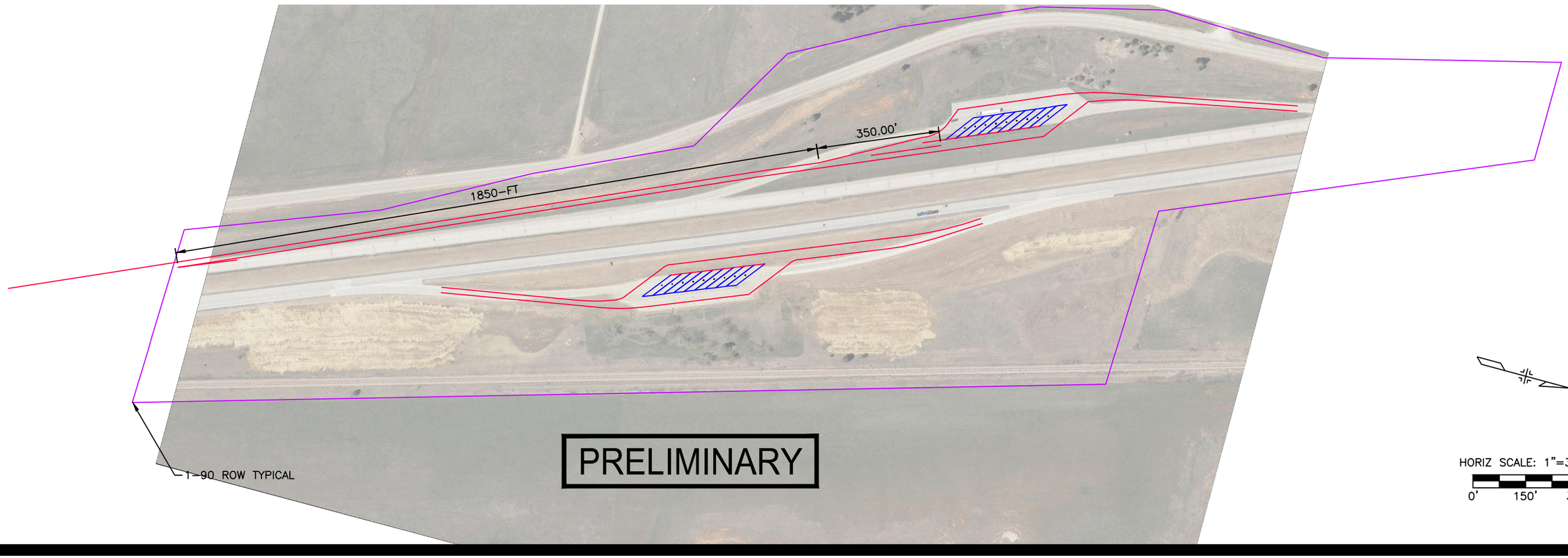
There are no appendices to this document.

APPENDIX B. CONCEPTUAL DESIGNS

FELSBURG HOLT & ULLEVIG

SOUTH DAKOTA TRUCK PARKING

I-90 EASTBOUND - TILFORD REST AREA - TRUCK LAYOUT



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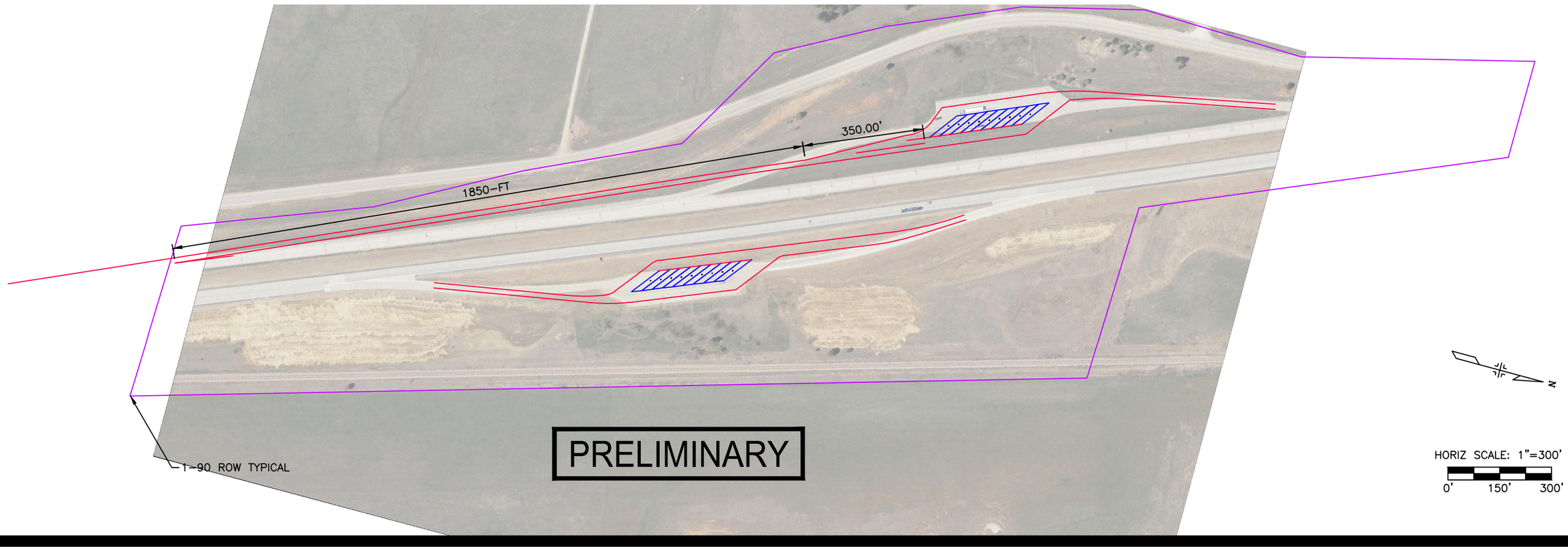
FELSBURG HOLT & ULLEVIG

SOUTH DAKOTA TRUCK PARKING

I-90 WESTBOUND - TILFORD REST AREA - TRUCK LAYOUT



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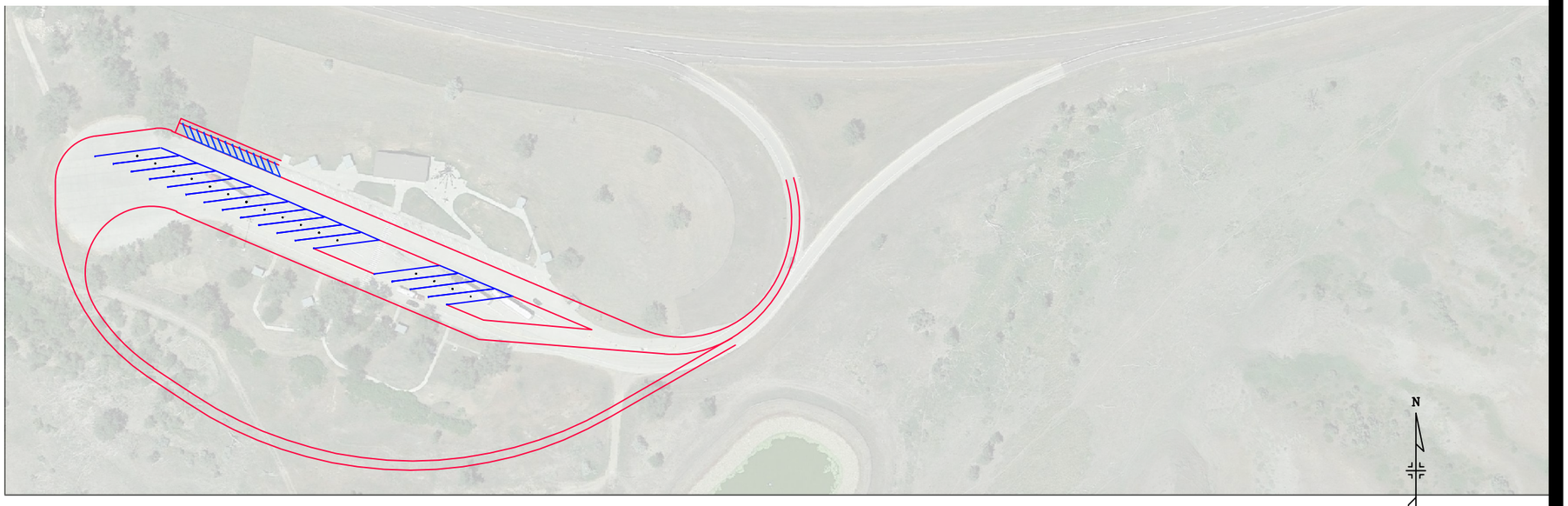
FELSBURG HOLT & ULLEVIG

SOUTH DAKOTA TRUCK PARKING

I-90 EASTBOUND - WASTA REST AREA - TRUCK LAYOUT



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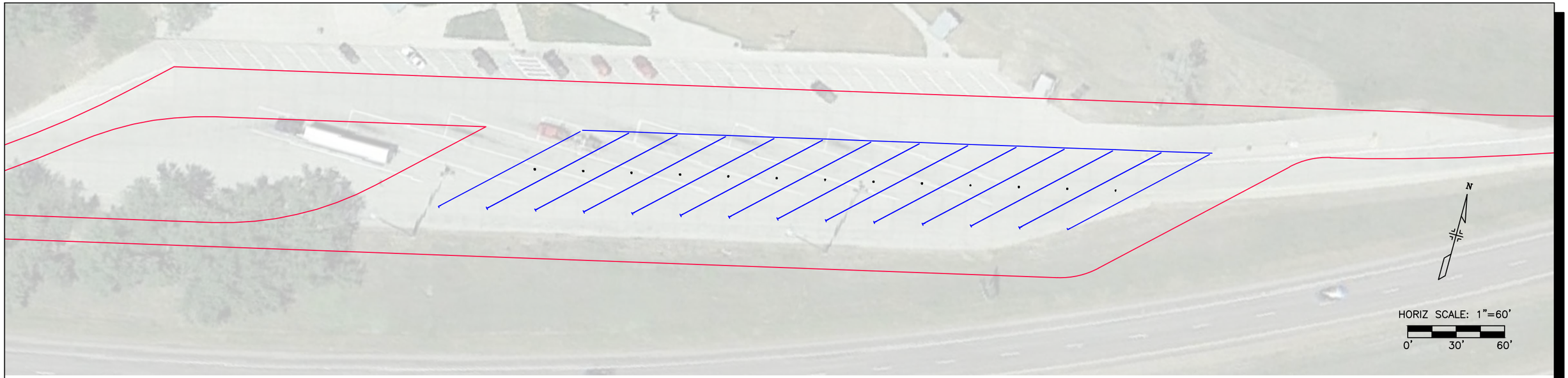
FELSBURG HOLT & ULLEVIG

SOUTH DAKOTA TRUCK PARKING

I-90 WESTBOUND - WASTA REST AREA - TRUCK LAYOUT



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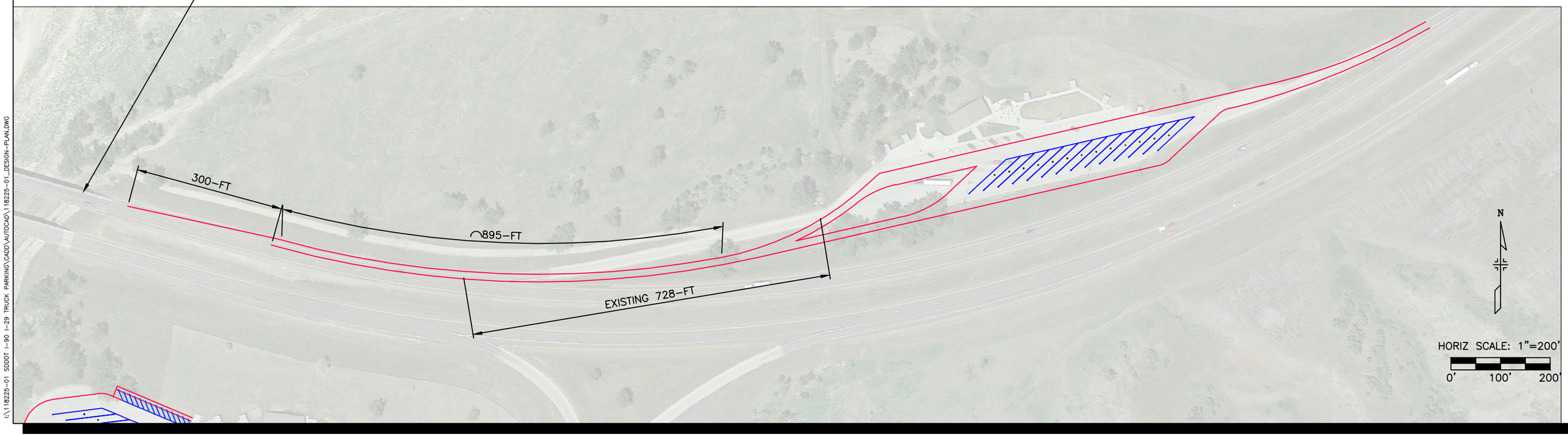

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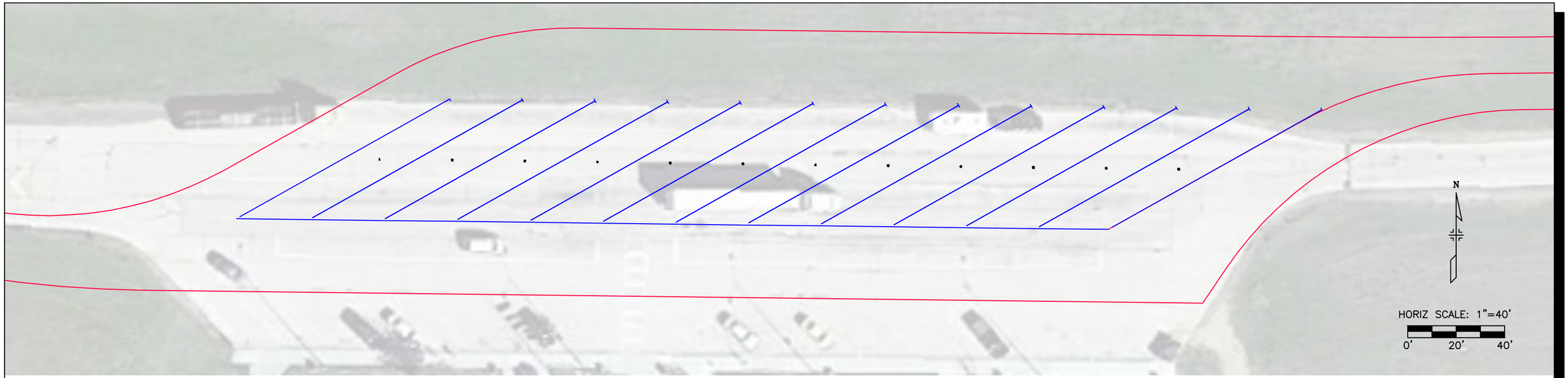
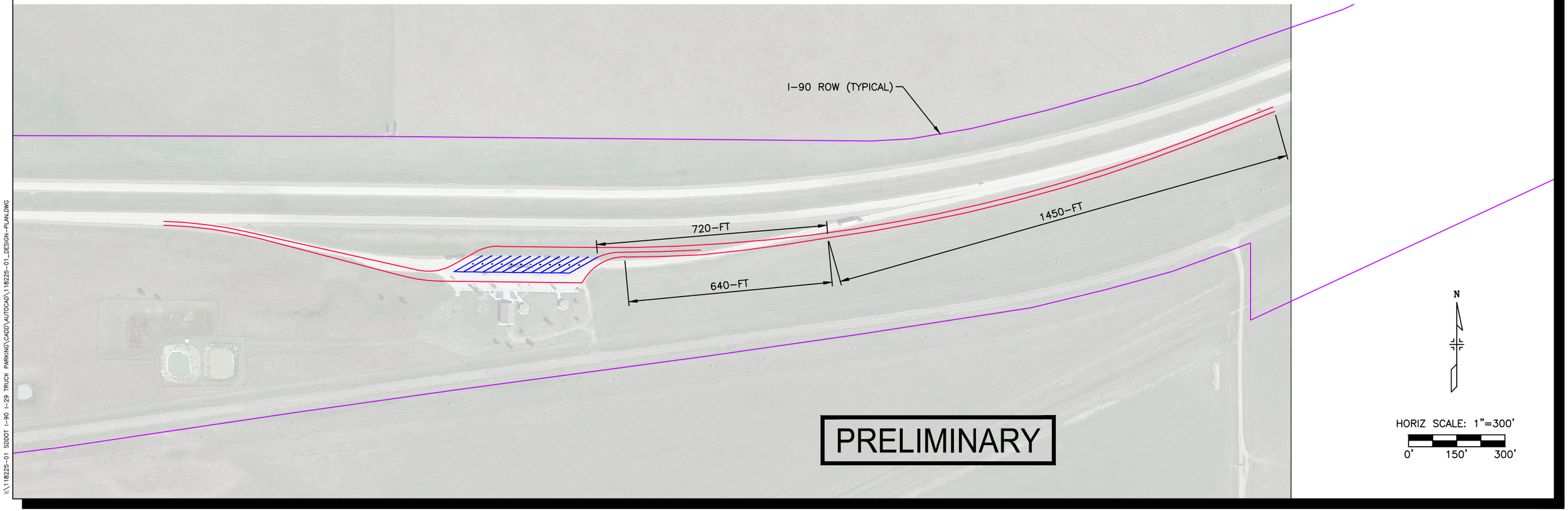
FELSBURG HOLT & ULLEVIG

SOUTH DAKOTA TRUCK PARKING

I-90 EASTBOUND - BELVIDERE REST AREA - TRUCK LAYOUT





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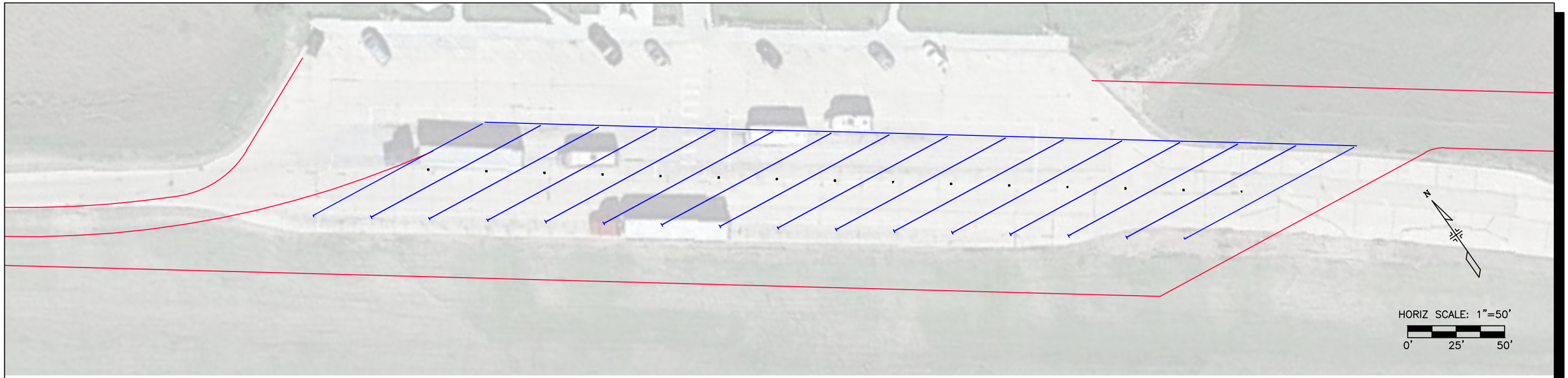
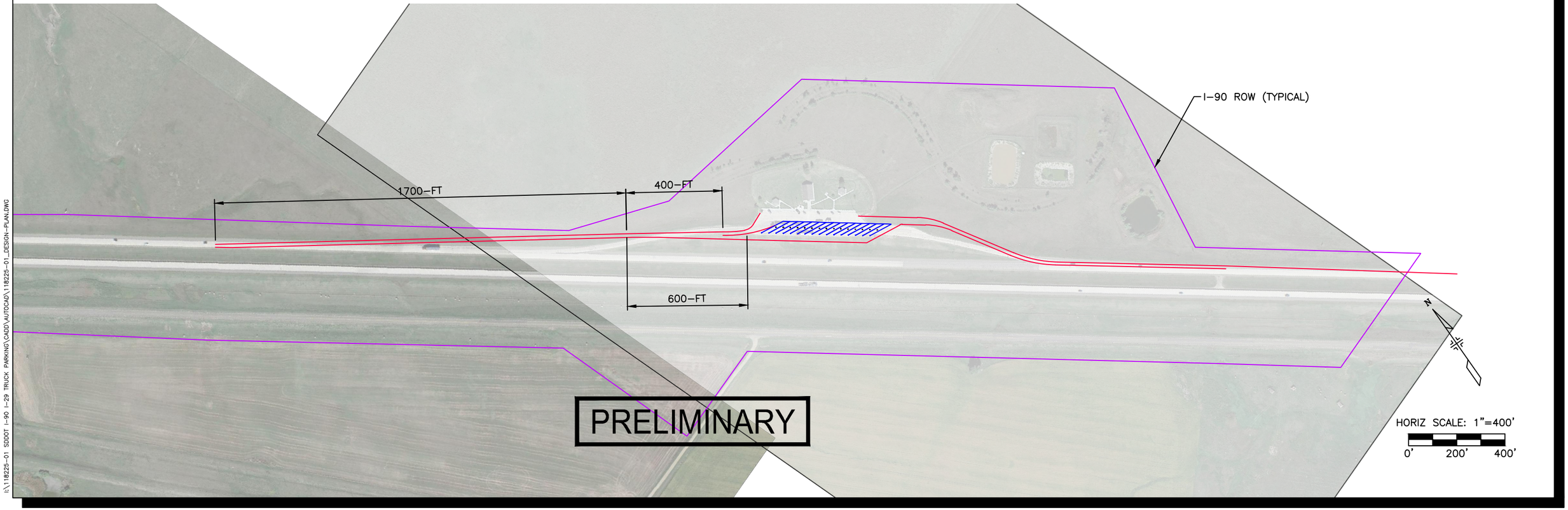
FELSBURG HOLT & ULLEVIG

SOUTH DAKOTA TRUCK PARKING

I-90 WESTBOUND - BELVIDERE REST AREA - TRUCK LAYOUT





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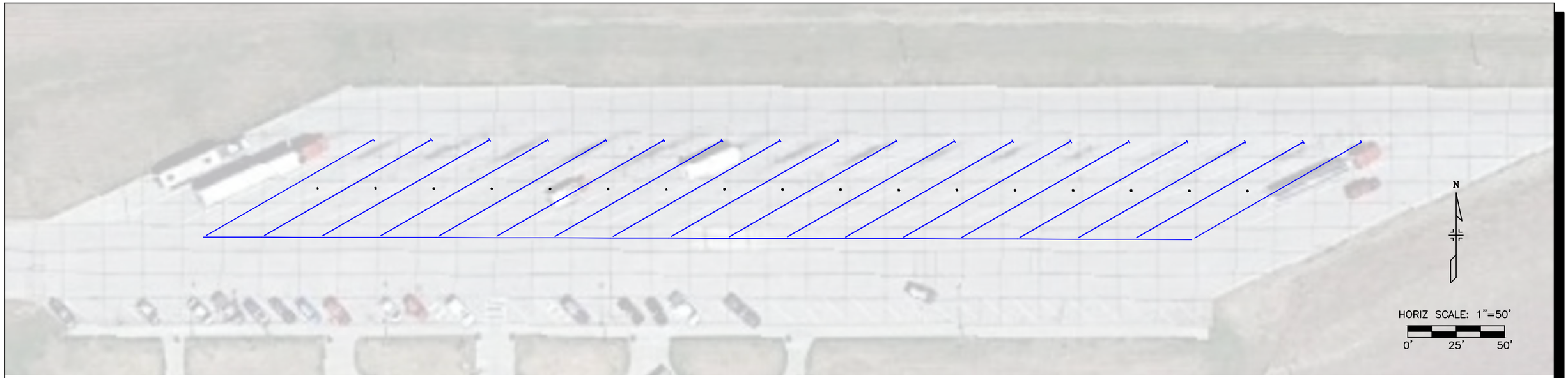
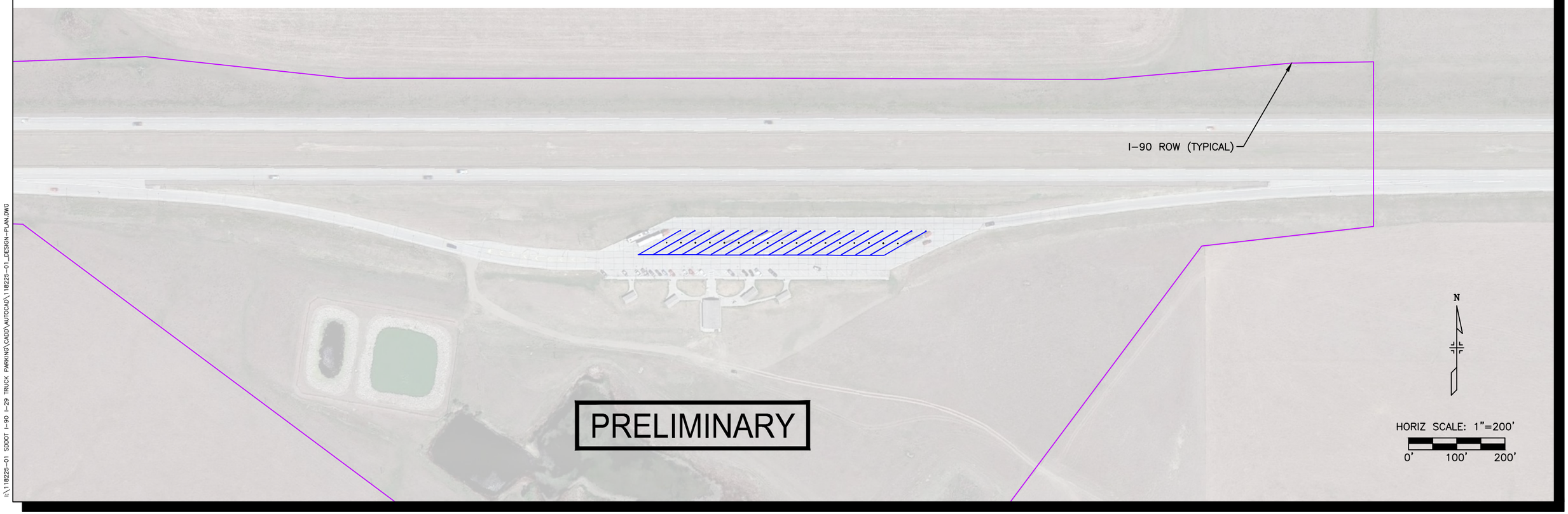
FELSBURG HOLT & ULLEVIG

SOUTH DAKOTA TRUCK PARKING

I-90 EASTBOUND - PRESHO REST AREA - TRUCK LAYOUT





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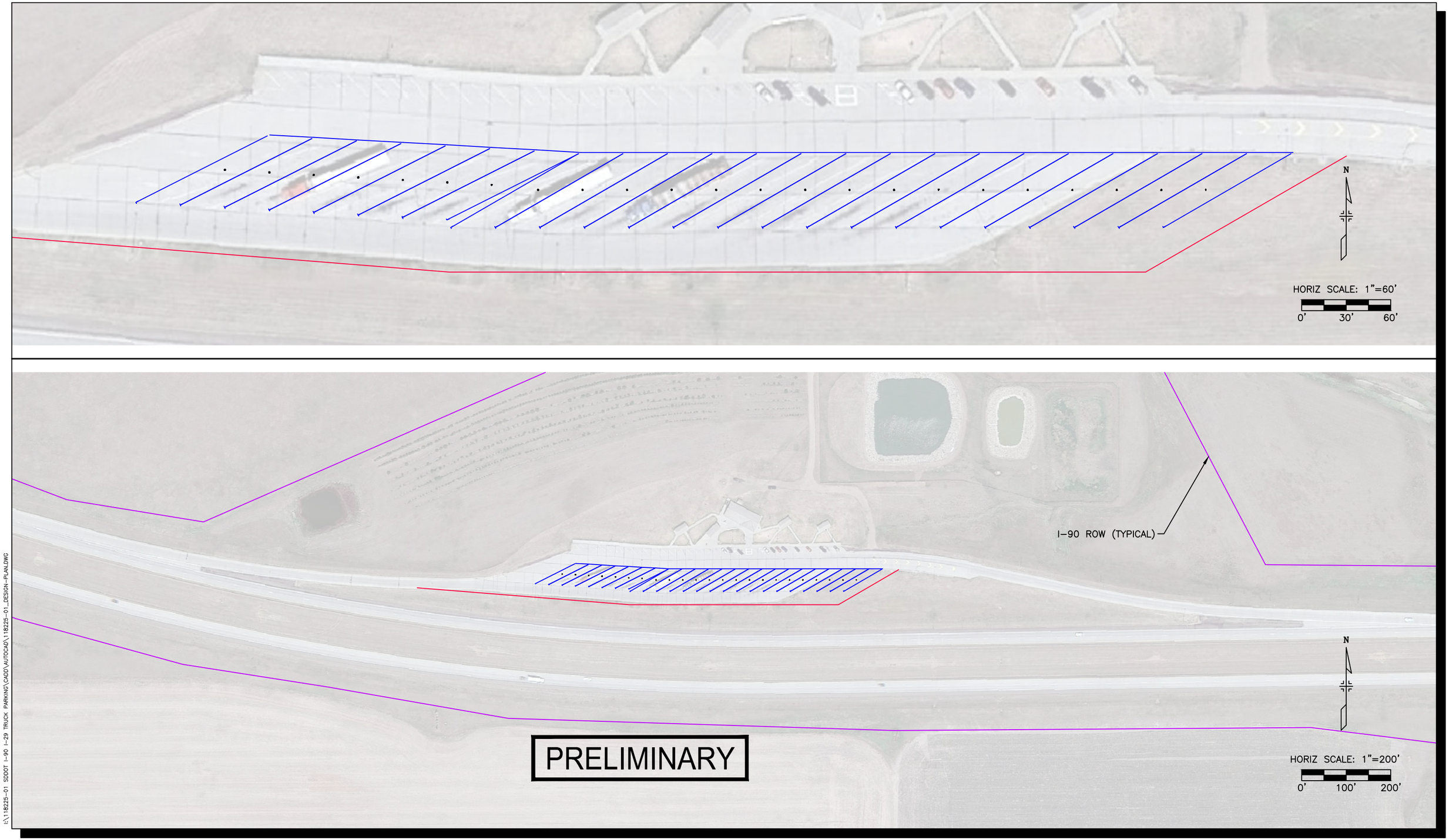
FELSBURG HOLT & ULLEVIG

SOUTH DAKOTA TRUCK PARKING

I-90 WESTBOUND - PRESHO REST AREA - TRUCK LAYOUT



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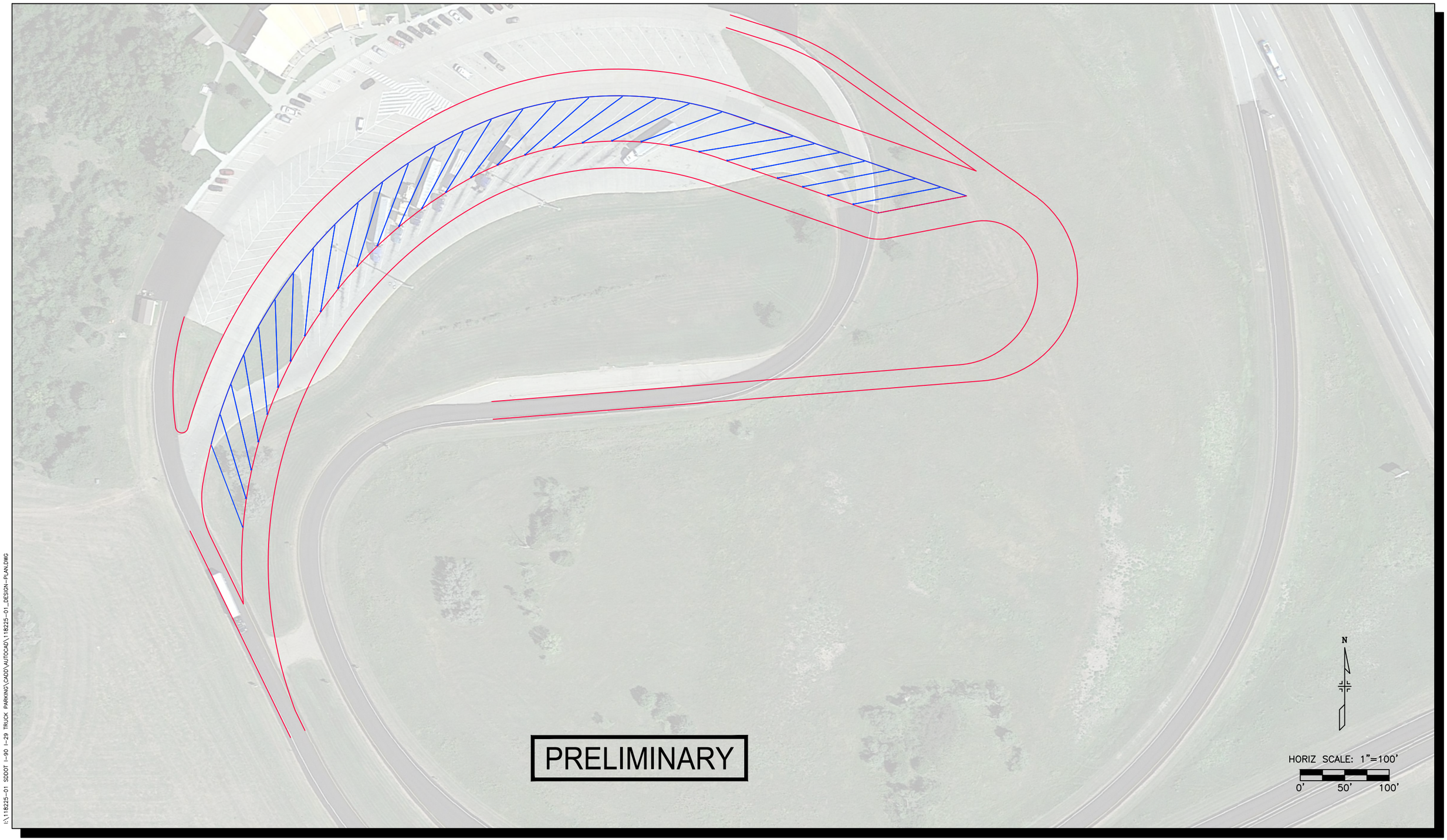
FELSBURG HOLT & ULLEVIG

SOUTH DAKOTA TRUCK PARKING

I-90 - CHAMBERLAIN REST AREA - TRUCK LAYOUT - ALTERNATIVE 1



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FELSBURG HOLT & ULLEVIG

SOUTH DAKOTA TRUCK PARKING

I-90 - CHAMBERLAIN REST AREA - TRUCK LAYOUT - ALTERNATIVE 2

PRELIMINARY

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HORIZ SCALE: 1"=100'

0' 50' 100'

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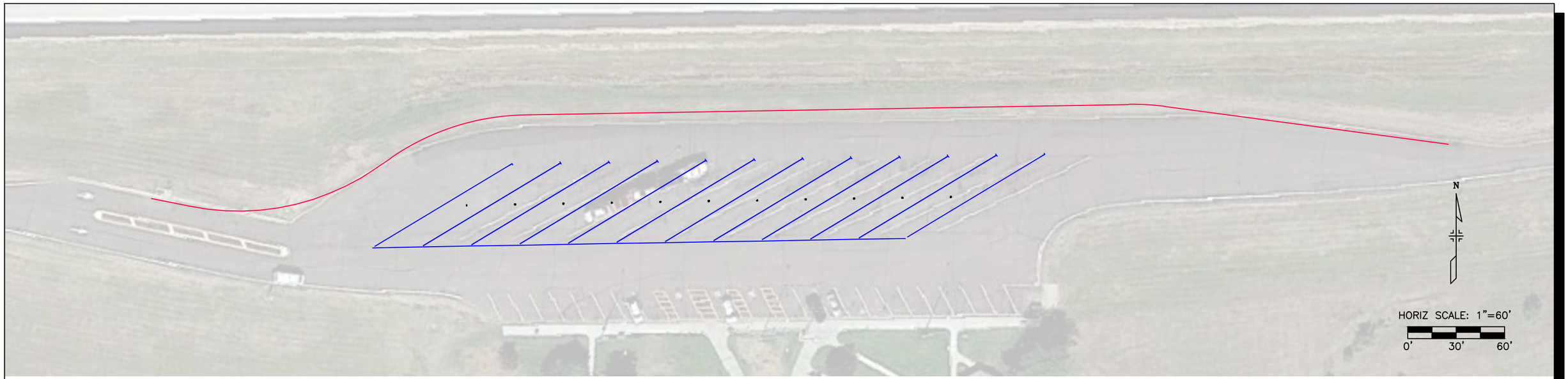
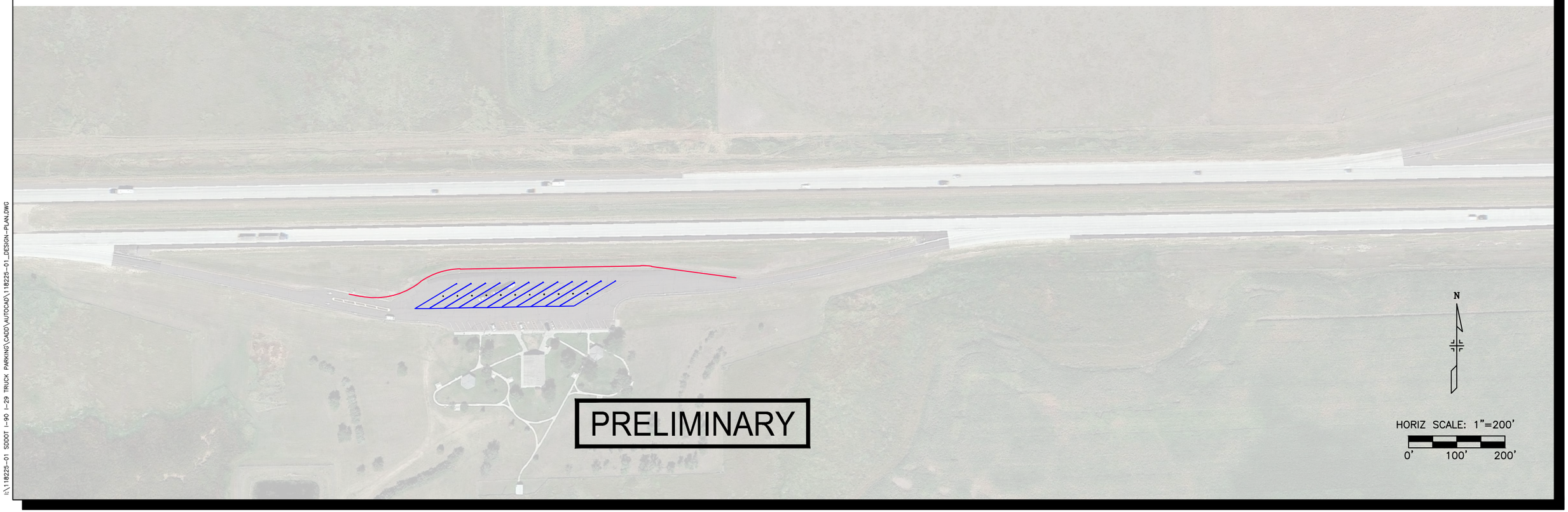
FELSBURG HOLT & ULLEVIG

SOUTH DAKOTA TRUCK PARKING

I-90 EASTBOUND - WHITE LAKE REST AREA - TRUCK LAYOUT





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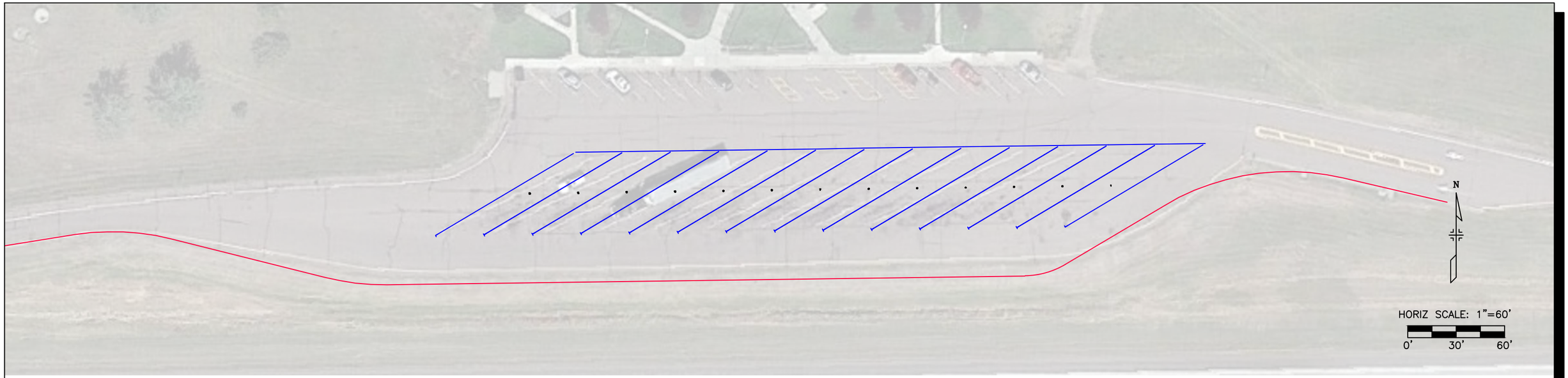
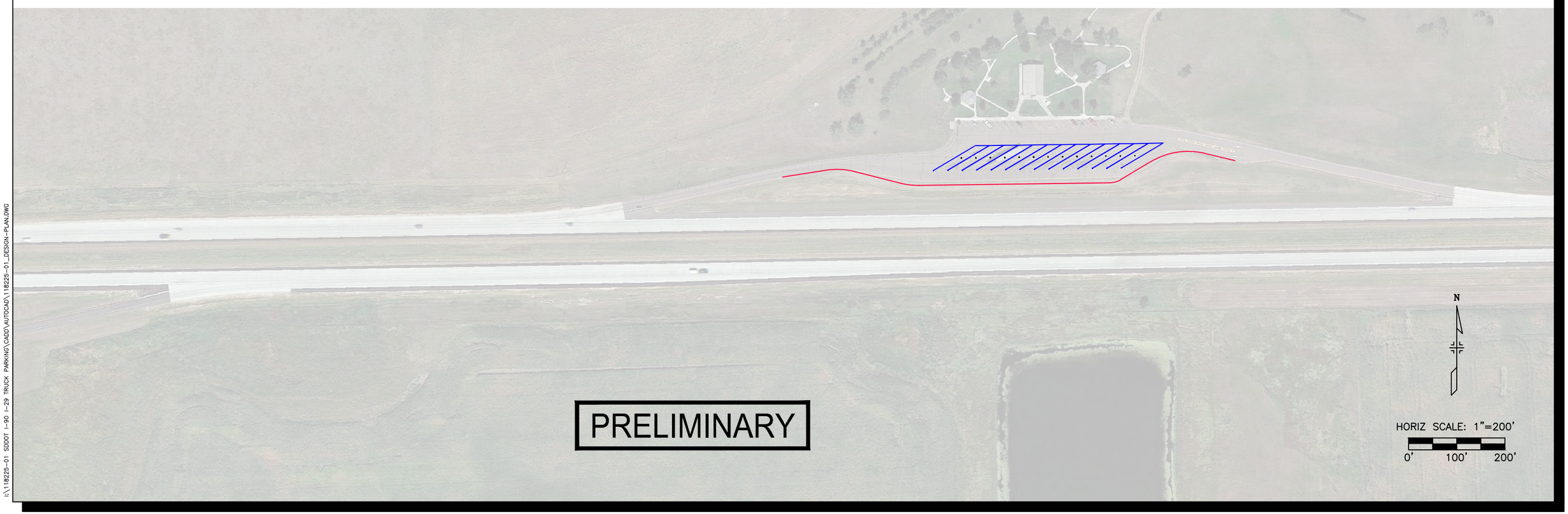
FELSBURG HOLT & ULLEVIG

SOUTH DAKOTA TRUCK PARKING

I-90 WESTBOUND - WHITE LAKE REST AREA - TRUCK LAYOUT





PRELIMINARY

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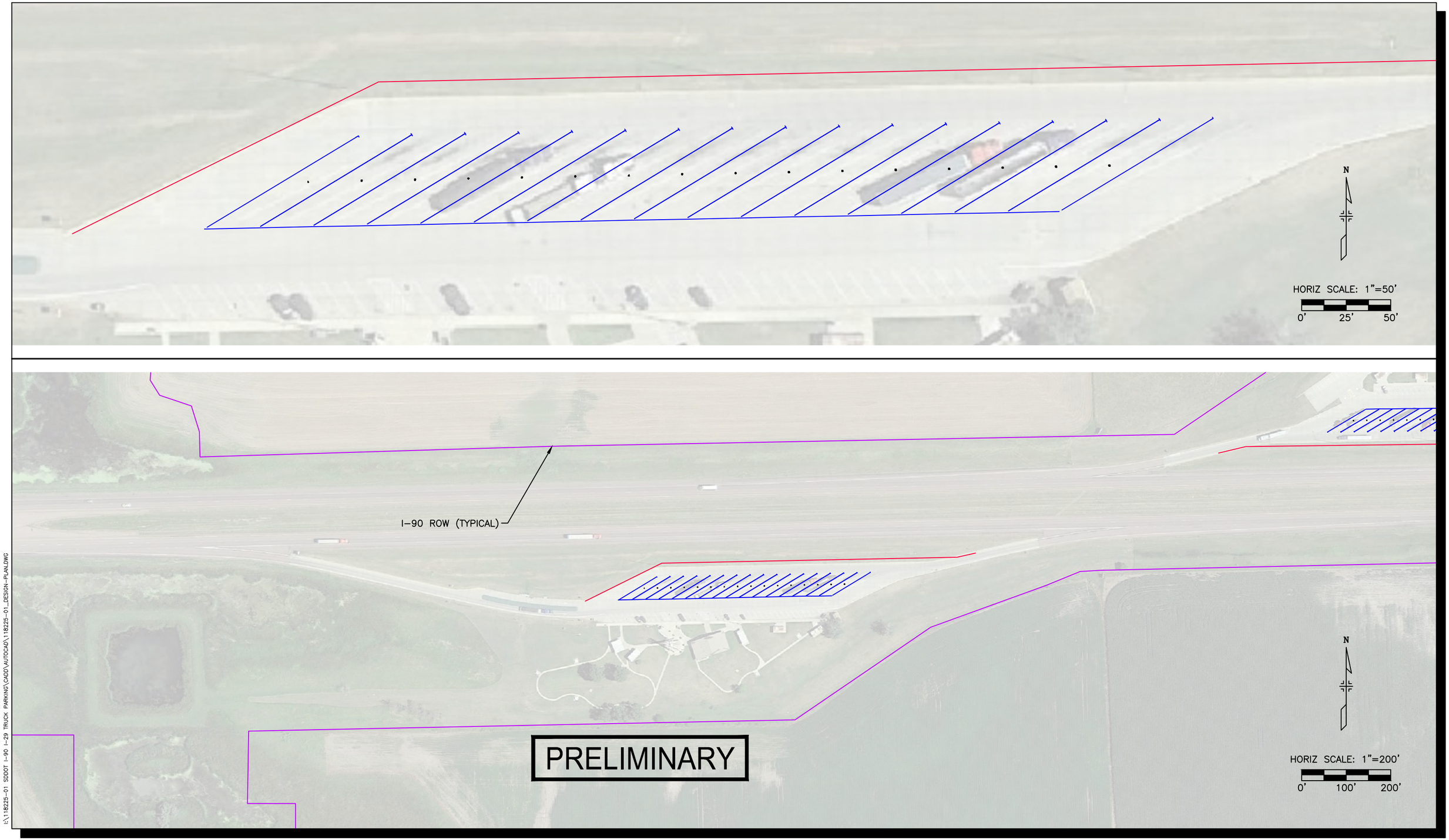
FELSBURG HOLT & ULLEVIG

SOUTH DAKOTA TRUCK PARKING

I-90 EASTBOUND - SALEM REST AREA - TRUCK LAYOUT



PRELIMINARY

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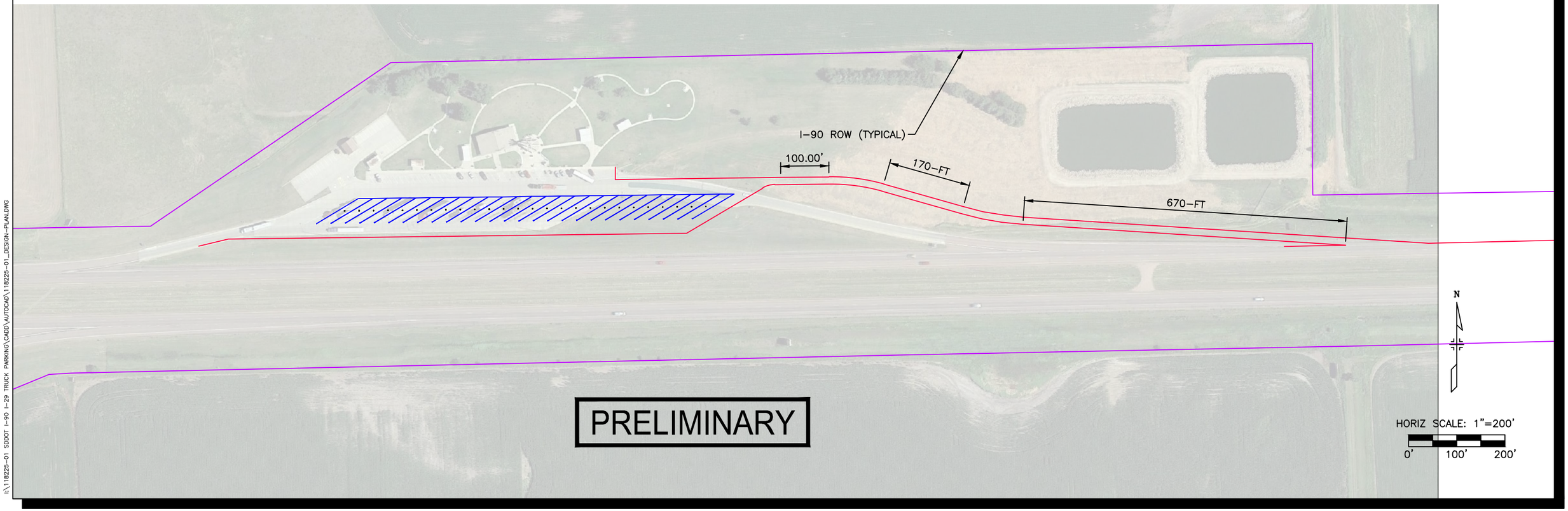
FELSBURG HOLT & ULLEVIG

SOUTH DAKOTA TRUCK PARKING

I-90 WESTBOUND - SALEM REST AREA - TRUCK LAYOUT



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FELSBURG HOLT & ULLEVIG

SOUTH DAKOTA TRUCK PARKING

I-29 - WARD REST AREA - TRUCK LAYOUT

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FELSBURG HOLT & ULLEVIG

SOUTH DAKOTA TRUCK PARKING

I-29 - GLACIAL LAKES REST AREA - TRUCK LAYOUT

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