

VDOT TRUCK PARKING STUDY

PHASE 2 RESULTS – TPB Freight TAC

May 12, 2022

AGENDA



Meeting Objectives:

Understand data strengths and limitations

Understand truck parking capacity needs and hot spots

Present ideas for next steps

- 1 Project Need
- 2 Data Analysis
- 3 Methodology
- 4 Hot Spots
- 5 Next Steps

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PROJECT NEED

- 1 Project Need
- 2 Data Analysis
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- **Where** are trucks parking?
- **When** are the peak truck parking seasons?
- **Supply:** How many truck parking spaces do we have today?
- **Demand:** How many truck parking spaces do we need today? in 2045?
- Where do we need to add more truck parking spaces?

PERFORMANCE MEASURES

SYSTEM INFORMATION

- Number of parking spaces (public and private)
- Amenities at truck parking locations
- Representative sample size of probe data compared to total truck volumes

PERFORMANCE

- Number of parking events (authorized and unauthorized)
- Utilization by facility
- Percent spillover by location
- Frequency of over-capacity parking by location

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DATA ANALYSIS

- 1 Project Need
- 2 Data Analysis
- 3 Methodology
- 4 Hot Spots
- 5 Next Steps

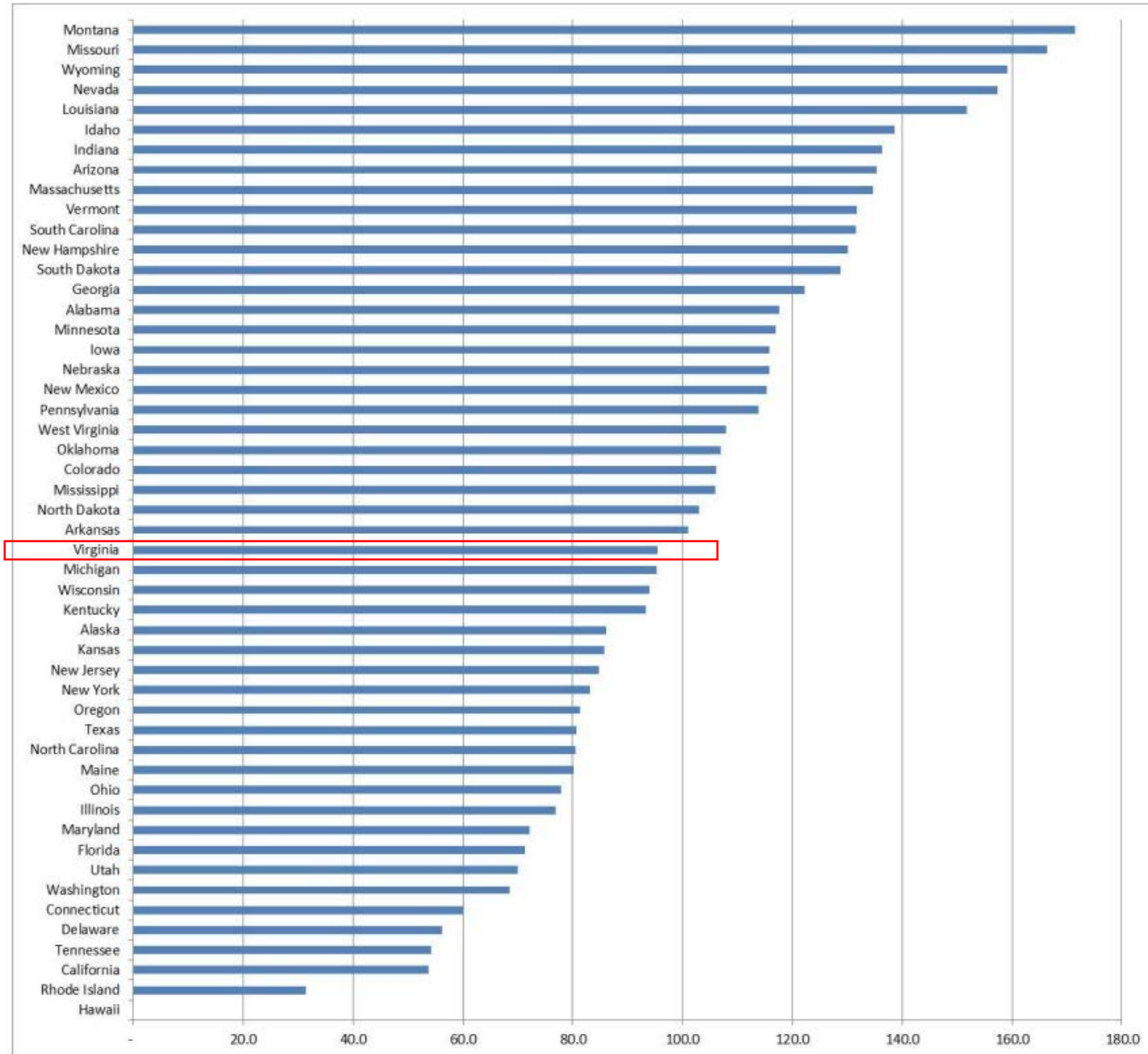
Data	Use
Truck Parking Facilities from 2015 Study	Truck parking inventory
InfoUSA land use data	Freight generators
VDOT Truck AADT truck counts	Seasonal peaks
StreetLight GPS-based location data	Parking events and duration
ATRI GPS-based location data	Parking events and duration

EXISTING TRUCK PARKING SUPPLY

VDOT DISTRICT	PUBLIC FACILITIES		PRIVATE FACILITIES		TOTAL	
	# of FACILITIES	# of TRUCK SPACES	# of FACILITIES	# of TRUCK SPACES	# of FACILITIES	# of TRUCK SPACES
BRISTOL	4	119	17	1,269	21	1,388
CULPEPER	2	28	3	109	5	137
FREDERICKSBURG	3	82	6	594	9	676
HAMPTON ROADS	1	2	18	1,006	19	1,008
LYNCHBURG	0	0	5	125	5	125
NORTH VIRGINIA	4	142	0	0	4	142
RICHMOND	10	231	19	1,281	29	1,512
SALEM	5	72	17	556	22	628
STAUNTON	8	106	20	2,349	28	2,455
GRAND TOTAL	37	782	105	7,289	142	8,071

HOW DOES VIRGINIA COMPARE TO OTHER STATES?

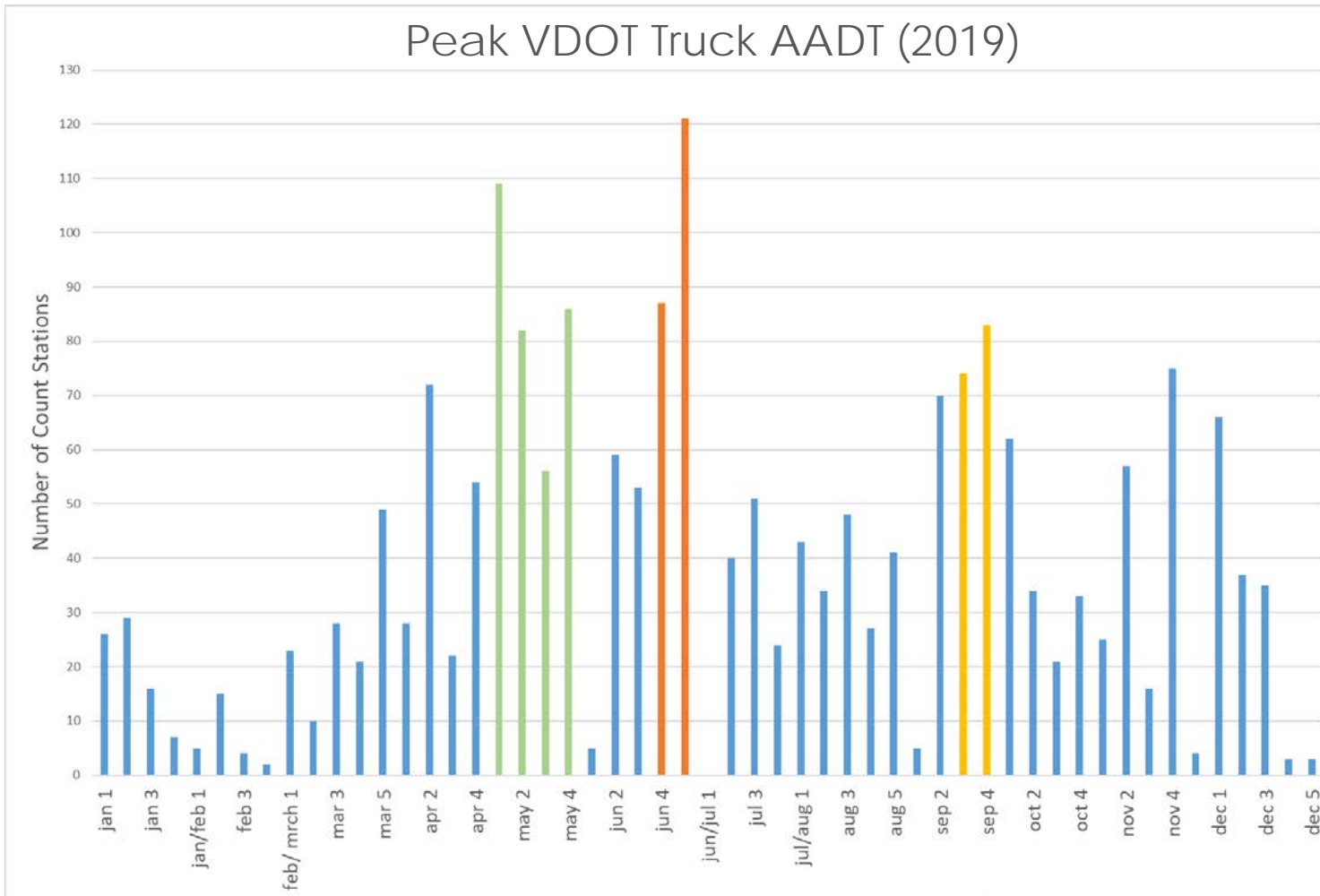
- Top 25% of states for Spaces per 100 miles of NHS
- Top 25% of states with OOIDA or ATA driver-reported parking shortages



Source: 2015 Trucker's Friend

Figure 7 - Commercial Vehicle Truck Parking Spaces per Daily 100,000 Miles of Combination Truck Vehicle Miles of Travel (VMT)

SEASONALITY OF TRUCKING ACTIVITIES IN VIRGINIA

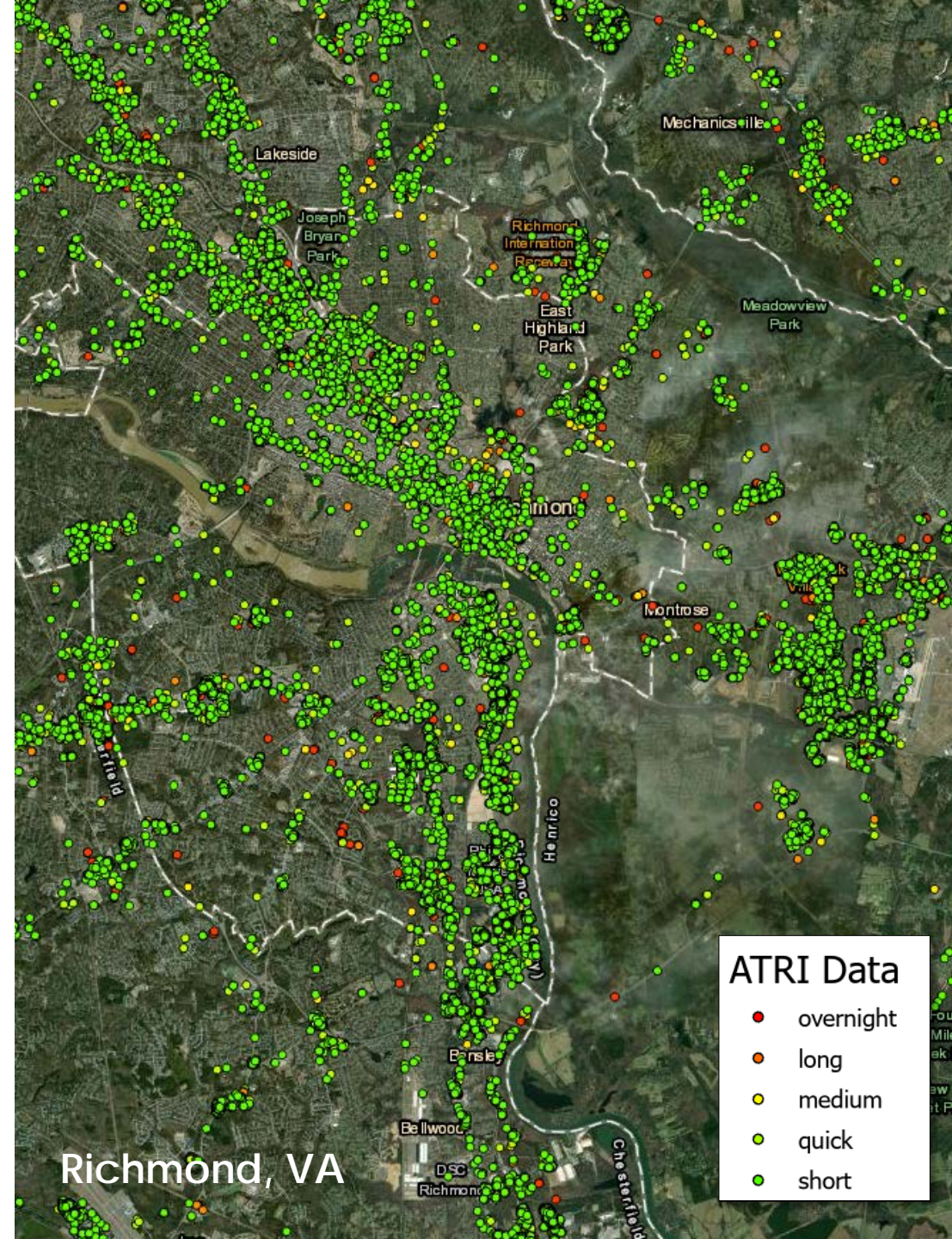


8 weeks of ATRI Data
Purchased for study:

- **MAY** 3-31 (4 weeks)
- **JUN** 16-29 (2 weeks)
- **SEP** 15-28 (2 weeks)

PARKING EVENT ATRI DATA

- GPS probe data for 8 weeks (2019)
 - May (4 weeks)
 - June (2 week)
 - Sept (2 weeks)
- More than 1.3 million data points
- Each data point:
 - Truck parking activity
 - Date of parking activity
 - Start and end time of activity



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METHODOLOGY

- 1 Project Need
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- Event Types:
 - Authorized / Unauthorized
 - Duration
- Facility analysis
- Junction Analysis

PARKING EVENTS PUBLIC FACILITIES

VDOT Public Facilities:

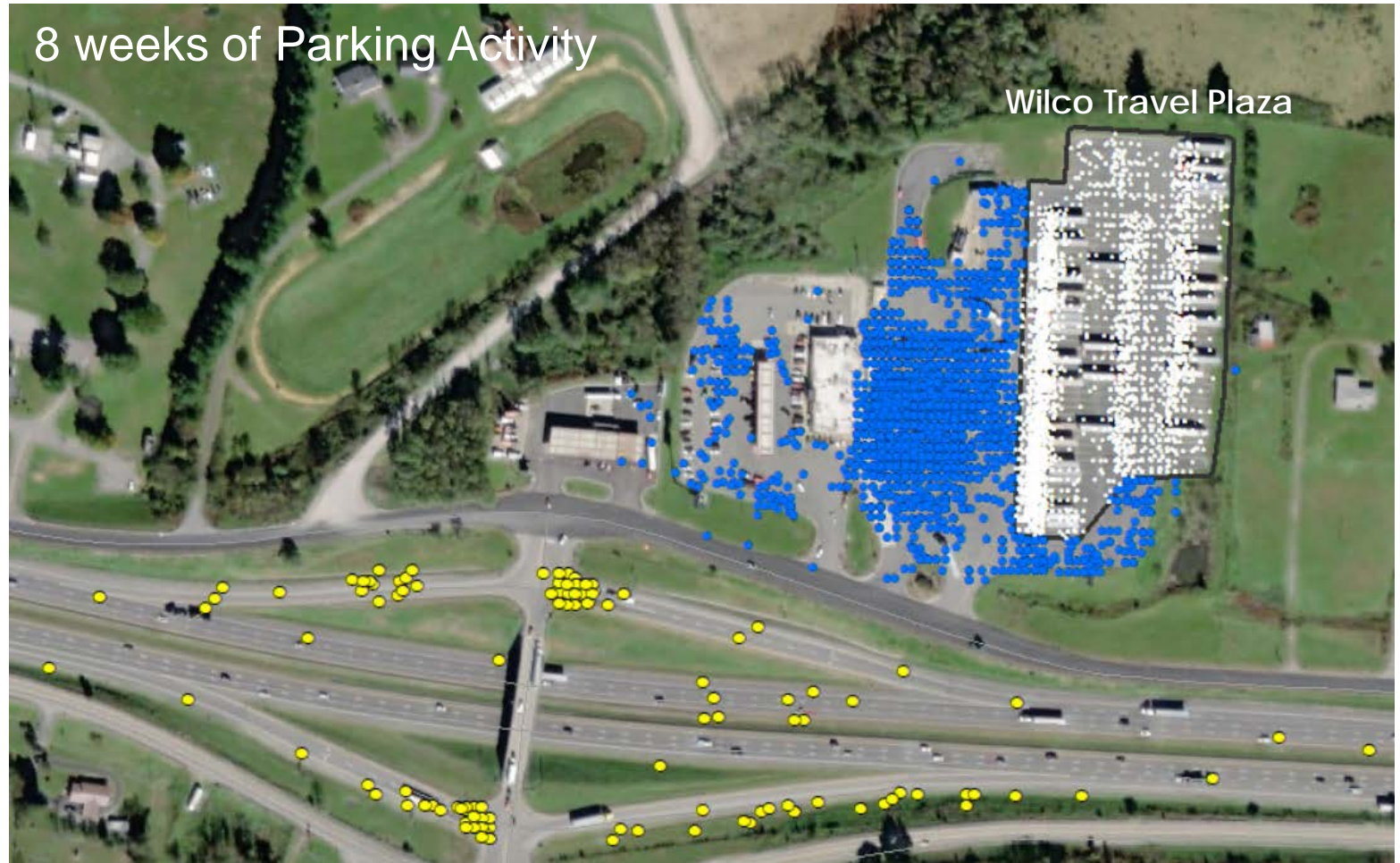
- Identify authorized parking
- Overflow parking



PARKING EVENTS PRIVATE FACILITIES

Private Facilities:

- Identify authorized parking
- Overflow parking
- Ramp/Shoulder parking



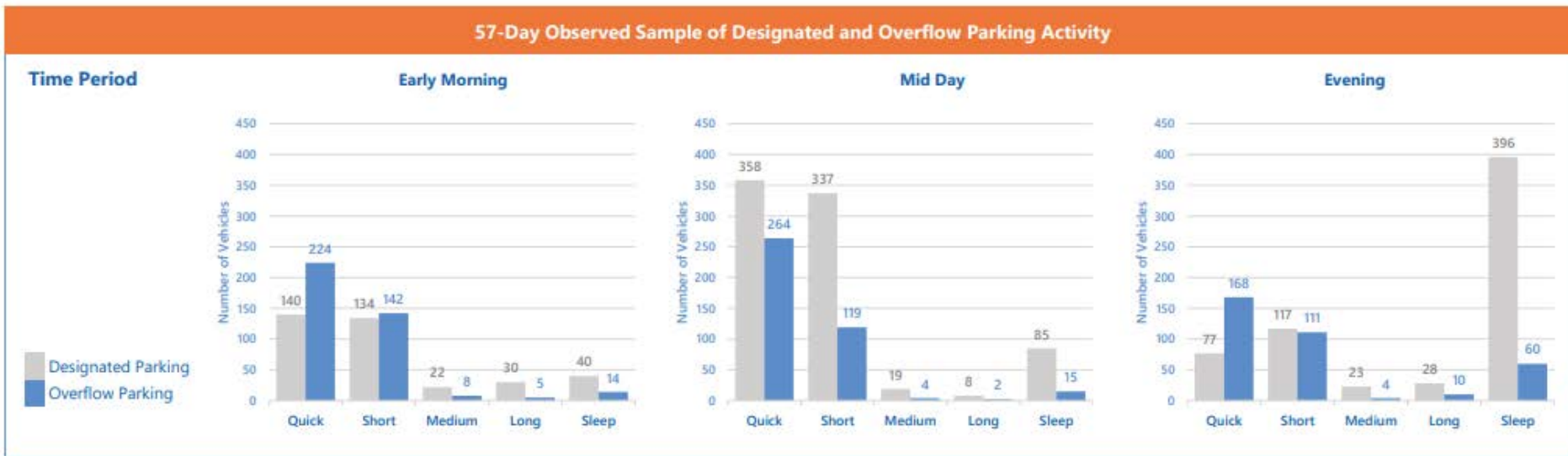
PARKING FACILITY REPORT CARDS

will be available for download on project Dashboard

Parking Facility Summary	
District:	Hampton Roads
Total Spots Available:	80
Range of Additional Spots Needed:	15 - 38
Overall Priority:	Medium
Private Facility Priority:	Medium
Facility Amenities:	
Restroom <input checked="" type="checkbox"/>	Fuel <input checked="" type="checkbox"/>
Shower <input checked="" type="checkbox"/>	Lighted <input checked="" type="checkbox"/>
Wifi <input checked="" type="checkbox"/>	Overnight Parking <input checked="" type="checkbox"/>



Time Period	Early Morning	Mid Day	Evening	Daily
Percent Overflow Parking Activity	47%	25%	18%	23%



Notes: Time Periods: Early Morning: 12 AM - 8 AM; Mid Day: 8 AM - 4 PM; Evening: 4 PM - 12 AM
 Parking Activity Category: Quick Stop: 10 min - 30 min; Short Stop: 30 min - 2 hours; Medium Stop: 2-4 hours; Long Stop: 4 - 8 hours; Sleep Stop: >8 hours

PARKING EVENTS JUNCTION ANALYSIS

- Identify junctions along each corridor
- Private and Public Parking Facilities
 - **Supply:** # of spots at each facility
 - **Unmet-Demand:** Range of additional spots needed (Minimum and Maximum)
- Ramp and Shoulder Parking
 - **Extra demand:** # of parking activities that happened at the same hour at the same junction
- Junction Summary
 - **Total supply:** sum of # of spots of all facilities
 - **Total unmet-demand:** unmet-demand at parking facilities + extra demand from ramp and shoulder parking activities



PARKING EVENTS JUNCTION ANALYSIS

FACILITY	SPOTS	MINIMUM ADDITIONAL SPOTS NEEDED	MAXIMUM ADDITIONAL SPOTS NEEDED	MINIMUM RAMP AND SHOULDER PARKING	MAXIMUM RAMP AND SHOULDER PARKING
PILOT TRAVEL CENTER, PROVIDENCE FORGE	30	9	16	N/A	N/A
LOVE'S PROVIDENCE FORGE	85	16	33	N/A	N/A
TOTAL	115	25	49	N/A	N/A

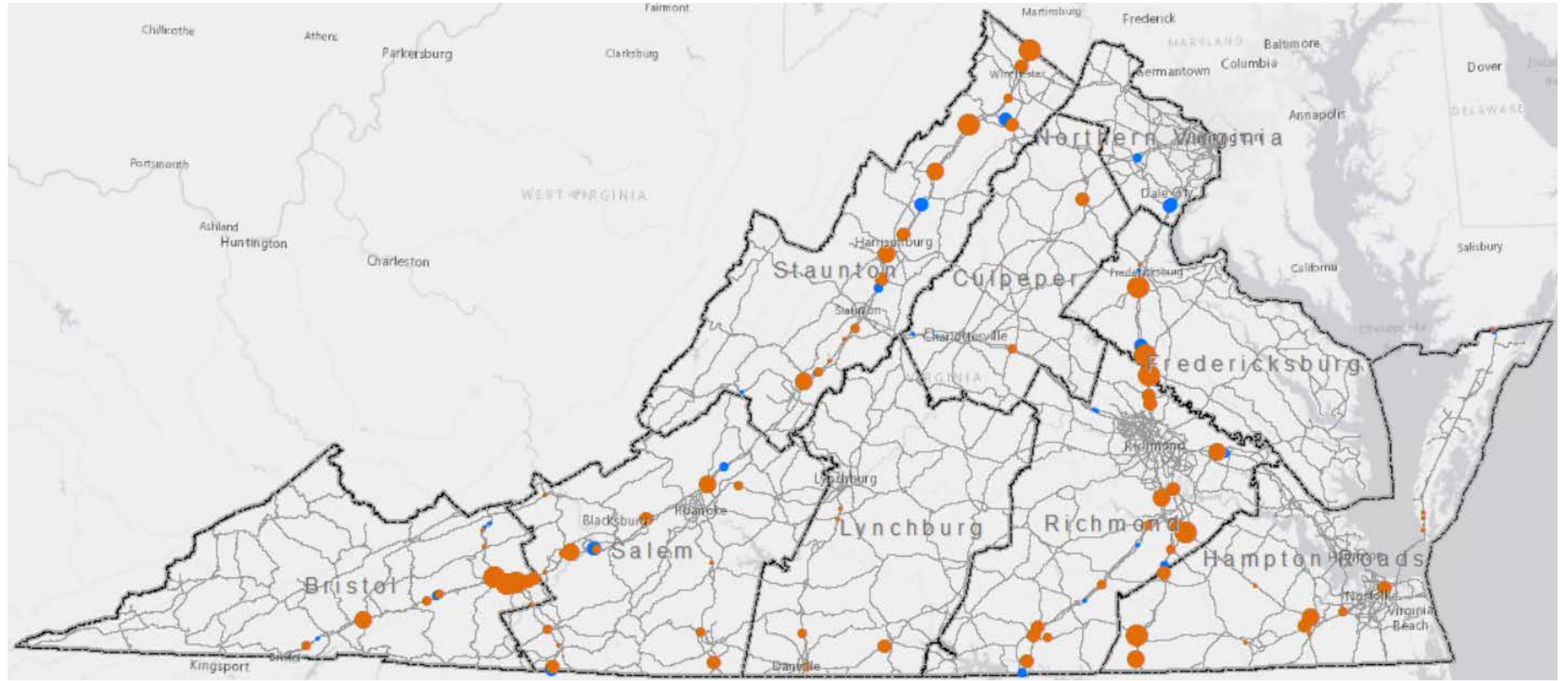


JUNCTION	SPOTS	MINIMUM ADDITIONAL SPOTS NEEDED	MAXIMUM ADDITIONAL SPOTS NEEDED	MINIMUM RAMP AND SHOULDER PARKING	MAXIMUM RAMP AND SHOULDER PARKING
I-64W 211.428	115	25	49	2	2

- Total Min Additional Spots Needed: 27
- Total Max Additional Spots Needed: 51

DEMAND BY JUNCTION

- VDOT Parking Facilities
- Private Facilities



JUNCTION ANALYSIS SUMMARY

- 119 truck parking junctions were analyzed
 - 37 VDOT public parking junctions (rest areas)
 - 82 private parking junctions
- Today:
 - 3,244 additional spaces are needed to meet peak demand
 - Only 3 junctions were not overutilized at some point during the 8-week peak demand period (overflow, unauthorized, ramp, or shoulder)
- By 2045, if no additional truck parking spaces are added:
 - 8,574 additional spaces will be needed
 - All junctions are estimated to be over capacity by 2045

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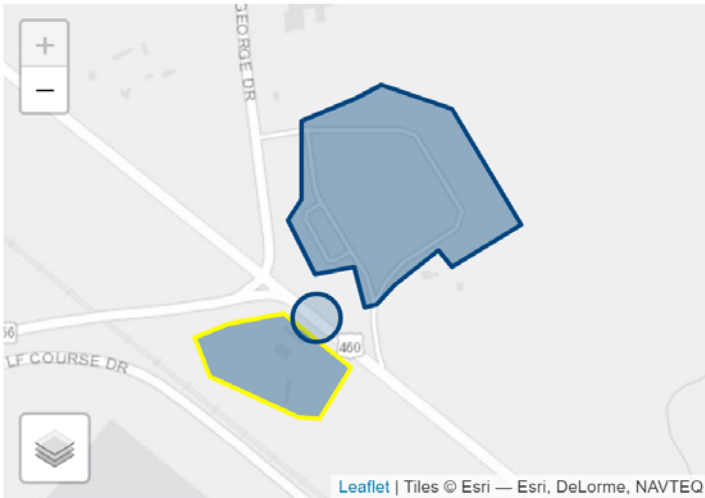
HOT SPOTS ANALYSIS

- 1 Project Need
- 2 Data Analysis
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- Rank junctions by maximum additional spots needed
 - Statewide (VDOT facilities and all facilities)
 - Districtwide
- Hot Spot: overutilized junction where at least 10 extra spots are needed

TOP JUNCTION: US-460 MM 328 Disputanta, VA (Richmond District)

☰
VDOT Truck Parking Dashboard



Filter Junction Data

Filter by Districts ✕

Public/Private Ownership: ?

Publicly Owned

Privately Owned

Include: ?

Hotspots Only


Top 20 Hotspots

Bottom 20 Hotspots

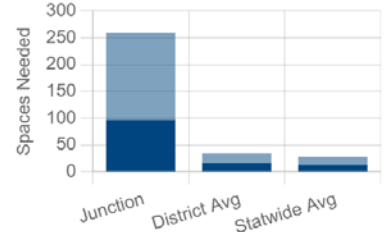
Junction: US-460E 328.065
✕ CLEAR

Ratio of Max Spaces Needed to Total Spaces Available

Max Ratio: 278.5%



Additional Spaces Needed



Category	Spaces Needed
Junction	~250
District Avg	~40
Statwide Avg	~30

Junction Summary

Hotspot Junction:	Yes	District Ranking ?	1
Statewide Ranking ?	1	Statewide Public Ranking	N/A

Junction Parking Facilities:

SHELL/LOVE'S TRAVEL STOP
LOVE'S TRAVEL STOP

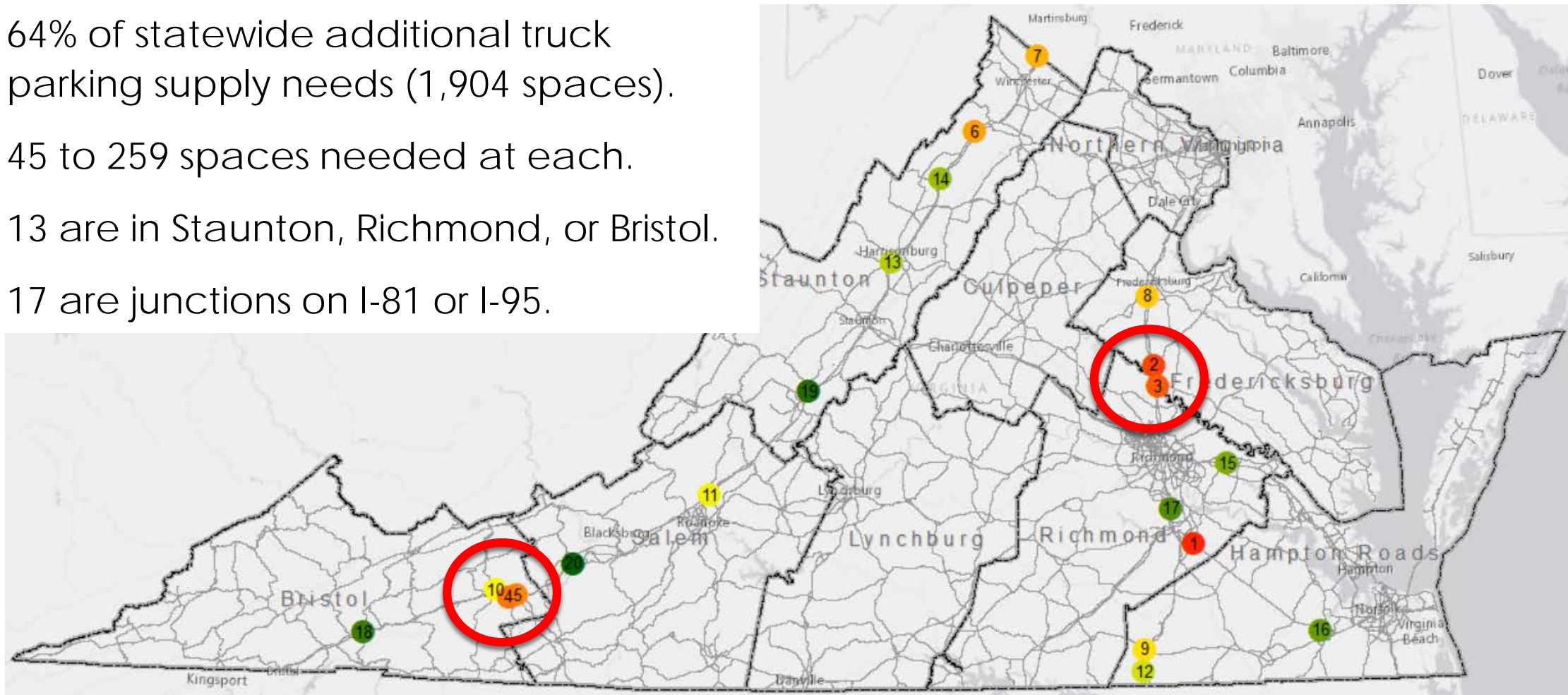
District:	Richmond (District 4)												
Total Spots Available:	20												
Owner:	Private												
Range of Additional Spots if Needed	97 - 259												
Facility Amenities	<table border="0" style="width: 100%; font-size: x-small;"> <tr> <td>Restroom</td><td>✓</td> <td>Fuel</td><td>✓</td> </tr> <tr> <td>Shower</td><td>✗</td> <td>Lighted</td><td>✓</td> </tr> <tr> <td>Wifi</td><td>✗</td> <td>Overnight Parking</td><td>✗</td> </tr> </table>	Restroom	✓	Fuel	✓	Shower	✗	Lighted	✓	Wifi	✗	Overnight Parking	✗
Restroom	✓	Fuel	✓										
Shower	✗	Lighted	✓										
Wifi	✗	Overnight Parking	✗										

Name	Total Spaces	Max Spaces Needed	Max Ratio	District Rank	Statewide Rank ↑
US-460E 328.065	93	259	278.5%	1	1
I-95N 104.632	569	207	36.4%	1	2
I-95N 98.17	215	191	88.8%	2	3
I-81S 78	352	136	38.6%	1	4
I-81N 80.361	272	129	47.4%	2	5

Rows per page: 20 ▼ 1-20 of 119 ◀ ▶

TOP 20 HOT SPOTS

- **Top 20 Hot Spots:** junctions with the largest unmet truck parking demand.
- 64% of statewide additional truck parking supply needs (1,904 spaces).
- 45 to 259 spaces needed at each.
- 13 are in Staunton, Richmond, or Bristol.
- 17 are junctions on I-81 or I-95.



HOT SPOTS BY DISTRICT

**Future demand
based on VDOT AADT
2019-2045 growth*

DISTRICT	# OF TOP 20 HOT SPOTS	TOTAL # OF JUNCTIONS	2019 MAX SPOTS NEEDED IN TOP 20	% OF MAX SPOTS NEEDED IN DISTRICT WITHIN TOP 20	2045 MAX SPOTS NEEDED ACROSS DISTRICT (ASSUMING NO EXPANSION)*
Staunton	5	23	392	62%	1492
Richmond	4	26	549	67%	1850
Bristol	4	16	377	80%	1285
Hampton Roads	3	16	185	61%	954
Fredericksburg	2	6	291	88%	858
Salem	2	19	110	38%	706
Lynchburg	0	5	0	0%	118
Northern Virginia	0	4	0	0%	153
Culpeper	0	4	0	0%	102
TOTAL	20	119	1,904	64%	7,518

BOTTOM 20 HOT SPOTS

- **Bottom 20 Hot Spots:** junctions needing over 10 spaces but with the least unmet truck parking demand.
- **Potential “low-hanging fruit”** problem areas.
- 6% of statewide additional truck parking supply needs (281 spaces).
- 11 to 18 spaces needed at each.
- 11 are junctions on I-81 or I-95.
- Local planning studies needed to identify expansion/development opportunities.

DATA CHALLENGES & LIMITATIONS (1)

Study Challenges

COVID-19 Pandemic Limitations: By analyzing 2019 data, we avoided COVID-19 impacts on truck parking supply and demand.

Additional Research Needs

VDOT may want to monitor truck parking demand changes over the next few years to see if trends have changed since the pandemic.

Data Validation Limitations: We cancelled site visits and aerial data collection, because travel patterns and volumes during the pandemic were not representative of the 2019 ATRI data's pre-pandemic patterns.

Further investigation is required to validate the data and to review the ATRI sample size coverage.

DATA CHALLENGES & LIMITATIONS (2)

Study Challenges

2045 Future Trends: Future demand was estimated using VDOT AADT growth per year, which may have changed since the pandemic.

Origin-Destination Data: The ATRI origin-destination dataset provided truck flows at the county level within the state and at the state level outside the state boundary. The county level and state level origin-destinations are too broad for facility- and junction-level analysis.

Additional Research Needs

Identify post-pandemic travel patterns and demands. Adjust future demand estimates. Further investigate future land uses near each hot spot to find local opportunities to solve the unmet demand issue for each hot spot specifically.

Conduct origin-destination analysis for individual hot spots or focus areas using StreetLight data to answer:

- Can the unmet demand be allocated to other facilities with enough supply based on the traffic pattern?
- Does the high truck demand come from the same corridor or a connecting corridor?

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NEXT STEPS

- 1 Project Need
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- Final Report – under review
- Phase 3:
 - Develop messaging for business case of truck parking
 - Conduct deeper dive into I-81 and I-95 data and needs

**THANK
YOU!**

QUESTIONS?

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