MARYLAND STATEWIDE

TRUCK PARKING STUDY

FINAL REPORT

2020

MDOT MARYLAND DEPARTMENT OF TRANSPORTATION

Maryland Statewide Truck Parking Study

The purpose of the Maryland Statewide Truck Parking Study is to assess the truck parking needs statewide and develop opportunities and actions to improve truck parking in Maryland.

Acknowledgements

The Maryland Department of Transportation acknowledges and is thankful for the input of internal and external stakeholders consulted in the development of this study.

Cover image sources: *Top left and bottom right—Maryland Department of Transportation*
Bottom left and top right—Getty Images

Table of Contents

Table of Figures

List of Acronyms

ATCMTD	Advanced Transportation and Congestion Management Technologies Deployment
ATRI	American Transportation Research Institute
BUILD	Better Utilizing Investments to Leverage Development
CAV	Connected and Automated Vehicles
CMAQ	Congestion Mitigation and Air Quality Improvement Program
DERA	Diesel Emissions Reduction Act
DMS	Dynamic Message System DMS
DOT	Department of Transportation
ELD	Electronic Logging Device
EPA	Environmental Protection Agency
EWG	External Working Group
FAST	Fixing America's Surface Transportation
FASTLANE	Fostering Advancements in Shipping & Transportation for The Long-Term Achievement of National Efficiencies
FHWA	Federal Highway Administration
FL	Florida
FMCSA	Federal Motor Carrier Safety Administration
GHG	Greenhouse Gas
HOS	hours of Service
HPO	Highway Police Office
HRRR	High-Risk Rural Road
HSIP	Highway Safety Improvement Program
INFRA	Infrastructure for Rebuilding America
IRT	Idling Reduction Technologies
ITS	Intelligent Transportation System
IWG	Internal Working Group
LRTP	Long-Range Transportation Plan
MAA	Maryland Aviation Administration
MAASTO	Mid America Association of State Transportation Officials
MAP-21	Moving Ahead for Progress in the 21st Century
MD	Maryland
MDOT	Maryland Department of Transportation

MDTA	Maryland Transportation Authority
MPA	Maryland Port Administration
MPO	Metropolitan Planning Organization
MTA	Maryland Transit Administration
MVA	Motor Vehicle Administration
NATSO	National Association of Truck Stop Operators
NB	Northbound
NHFN	National Highway Freight Network
NHFP	National Highway Freight Program
NHPP	National Highway Performance Program
NHS	National Highway System
OOTS	Office of Traffic and Safety
OSOW	Over-Sized Over-Weight
P3	Public-Private Partnership
PA	Pennsylvania
pm	Particulate Matter
RCV	Remaining Capital Value
RHCP	Railway-Highway Crossing Program
ROW	Right of Way
SB	Southbound
SGMP	Strategic Goods Movement Plan
SHA	State Highway Administration
SHSP	Strategic Highway Safety Plan
STBG	Surface Transportation Block Grant Program
TA	Travel Centers of America
TBU	Transportation Business Unit
TIGER	Transportation Investment Generating Economic Recovery
TPAS	Truck Parking Availability Systems
TPIMS	Truck Parking Information and Management System
TWIS	Truck Weigh and Inspection Stations
TSO	The Secretary's Office
US	United States
VMT	Vehicle Miles Traveled
VSL	Value of Statistical Life

1. INTRODUCTION

The Maryland Department of Transportation (MDOT) recognizes that safe and available truck parking is critical to safety, roadway condition, and the efficient movement of goods. The Maryland Statewide Truck Parking Study inventoried truck parking locations, identified factors affecting truck parking demand, identified and prioritized undesignated truck parking, conducted outreach with public and private sector freight stakeholders, and identified recommendations to address truck parking needs. The Maryland Statewide Truck Parking Study provides the data, context, and actionable solutions needed to advance priority projects, policies, and partnerships to improve truck parking statewide.

The Maryland Statewide Truck Parking Study was prepared using a collaborative approach with internal stakeholders along with valuable input from trucking industry representatives, a survey of freight stakeholders, a literature review of existing MDOT truck parking studies, qualitative and quantitative data. Key data sources include the MDOT State Highway Administration's (SHA) Annual Overnight Truck Parking Survey, INRIX truck GPS data, and crowd-sourced truck parking data provided by Trucker Path.

1.1. STUDY BACKGROUND

The Maryland Department of Transportation (MDOT) has a history of identifying and addressing truck parking needs, recognizing that when truck drivers are unable to find safe and available truck parking, they park in undesignated locations, such as roadway shoulders or on/off ramps. Undesignated truck parking poses a safety risk for truck drivers and other roadway users, damages infrastructure, and impacts Maryland's economic competitiveness.

Additionally, truck parking has been a focus of MDOT's efforts to improve the movement of goods statewide. In response to the ongoing shortages of truck parking, Maryland's Strategic Goods Movement Plan – 2017 Update (SGMP) identified truck parking demand constraints as a critical freight need statewide and recommended that MDOT and MDOT SHA improve its understanding of the supply and demand of truck parking, existing truck parking infrastructure, system gaps, and future needs statewide.

In 2019, MDOT and MDOT SHA embarked on an effort to identify truck parking needs and solutions through the development of the Maryland Statewide Truck Parking Study. The study included a variety of methods to develop the assessment and provide recommendations for the advancement of truck parking solutions in Maryland. This approached included:

- Outreach and engagement with public and private sector freight stakeholders.
- The identification of factors and trends affecting truck parking demand.
- A detailed analysis that inventoried public and private truck parking supply and availability.
- The identification and prioritization of undesignated truck parking.
- The development of recommendations that leverage opportunities and address truck parking needs.

Designated vs. Undesignated Truck Parking

Truck parking can be classified into two categories: designated and undesignated. "Designated" truck parking is a facility intended for parking trucks, while "undesignated" truck parking refers to trucks parked at locations, such a highway shoulder or an on/off ramps, that is not designed and intended for such use. Undesignated truck parking is often prohibited. For example, Title 21, Section 1003 of Maryland Code expressly prohibits parking on ramps or highways with two or more lanes of traffic moving in the same direction, among other locations. In other cases, truck parking may be undesirable but not expressly prohibited, such as truck parking along roadways that connect to industrial and commercial land uses.

1.2. WHY STUDY TRUCK PARKING?

As a provider of truck parking at rest areas, welcome centers, service plazas, park and rides, and Truck Weigh and Inspection Stations (TWIS), MDOT serves a role in supplying adequate truck parking to help meet the Maryland Transportation Plan goal to ensure a safe, secure, and resilient transportation system. Figure 1-1 displays the difficult decision truck drivers encounter when they are unable or not certain if they will be able to find truck parking. Each option displayed and described below negatively impacts one or more of MDOT's goals shown in Figure 1-1.

Figure 1-1: MTP Goals

Parking in Undesignated Places. Truck drivers who park on roadway shoulders or on/off ramps (undesignated truck parking locations) create site distance issues that expose other roadway users to a large fixed object just off the

roadway and themselves to an increased risk of theft. Trucks parked on roadway shoulders were involved in two fatal crashes, one in 2011 and another 2018, demonstrating the risk posed by trucks using roadway shoulders.[1,2] An observation from an attendee at the Maryland Truck Parking Workshop highlighted the risk of undesignated parking (safety) as follows: although crashes with trucks parked on roadway shoulders or on/off ramps are infrequent, they are often fatal. Additionally, undesignated truck parking locations are not designed to support the weight of a truck, resulting in increased damage to infrastructure and decreased infrastructure longevity.

Drivers Stopping Early and Leaving Drive Time Unused. Truck drivers reduce their efficiency and productivity when they stop driving early to find available truck parking. A 2016 study by the American Transportation Research Institute (ATRI) found that truck drivers had a median of 56 minutes of drive time left at the end of the day, which translates to truck drivers missing over 9,300 miles per year of potential wage-earning miles.[3] Applying the average wage for truck drivers in the Northeast of $0.598 per mile results in almost $5,600 per year in lost wages per truck driver per year.[4] Therefore, Maryland's 23,320 heavy and tractor-trailer truck drivers lose out on $130 million in potential wage-earning miles or about 12 percent of their average wage.[5] A truck driver submitted the following comment on the study's online survey about how a lack of truck parking affects whether truck drivers prefer to offer service to an area: "Safe secure truck parking as a whole is lacking throughout MD and the northeast. Particularly at peak traffic times. As a truck driver I do my best to avoid MD as a whole because of this but I am forced to pick up and deliver in MD often." If truck drivers routinely detour past Maryland, the result could affect access to trucking and the cost of shipping goods via truck for Maryland's businesses, especially during times when the trucking market is tight.

Drivers Exceed Hours of Service (HOS) Looking for Truck Parking. HOS regulations define the rules for how long a truck driver can drive and be on-duty before requiring a break. HOS regulations have the objective of reducing acute and chronic fatigue by ensuring that truck drivers are provided with enough time off to get the rest they need to operate their vehicle safely. HOS regulations have a direct impact on how many miles a truck can drive on a given day and, therefore, the income of the driver and asset utilization for the company. Truck drivers exceeding their HOS looking for truck parking may be fatigued increasing the risk of an incident.

1 WJLA, May 21, 2011. "Shaft Hunter, Maryland State Police trooper, killed in car accident." WJLA.
2 Dearth, D, January 19th, 2018. "Inwood man killed when car hits tractor-trailer parked along Lappans Road." Herald Mail Media.
3 Boris, C. and R. M. Brewster, 2016. "Managing Critical Truck Parking Case Study –Real World Insights from Truck Parking Diaries." American Transportation Research Institute.
4 D. Murray and S. Glidewell, November 2019. "Analysis of the Operational Costs of Trucking: 2019 Update." American Transportation Research Institute. Arlington, VA. https://truckingresearch.org/wp-content/uploads/2019/11/ATRI-Operational-Costs-of-Trucking-2019-1.pdf.
5 U.S. Bureau of Labor Statistics, April, 2, 2019. "May 2018 State Occupational Employment and Wage Estimates Maryland." https://www.bls.gov/oes/current/oes_md.htm.

2. STAKEHOLDER OUTREACH

Public and private sector freight stakeholders were engaged throughout the development of the Maryland Statewide Truck Parking Study. This engagement was important to help identify truck parking priorities, needs, and opportunities in Maryland. The study used an Internal Working Group (IWG) and External Working Group (EWG), a truck parking workshop, multiple surveys, and multiple public and private sector focus groups to solicit input during the study.

Invitations to attend in-person workshops/meetings and participate in online surveys were sent to over 100 individuals, plus associations and groups inviting members, representing the following organizations:

- MDOT Transportation Business Units—MDOT The Secretary's Office, MDOT State Highway Administration, MDOT Motor Vehicle Administration, MDOT Maryland Port Administration, MDOT Maryland Aviation Administration, MDOT Maryland Transit Administration, and the Maryland Transportation Authority.

- All seven Maryland Metropolitan Planning Organizations (MPOs)—National Capital Region Transportation Planning Board (TPB), Baltimore Regional Transportation Board (BRTB), Cumberland Area Metropolitan Planning Organization (CAMPO), Hagerstown/Eastern Panhandle Metropolitan Planning Organization (HEPMPO), Wilmington Area Planning Council (WILMAPCO), Salisbury/Wicomico Metropolitan Planning Organization (S/WMPO), and the Calvert-St. Mary's Metropolitan Planning Organization (C-SMMPO).

- State and Federal Agencies—Federal Highway Administration, Federal Railroad Administration, Maryland Department of Commerce, Maryland Transportation Authority, and the Maryland State Police.

- Local Jurisdictions and Surrounding State DOTs—Baltimore County, Montgomery County, Prince George's County, Washington County, Baltimore City Department of Transportation, and Virginia Department of Transportation.
- Corridor Coalitions—I-81 Corridor Coalition and I-95 Corridor Coalition.
- State Freight Advisory Committee and private sector representatives—Belt's Transportation Services, Cowan Systems, LLC, CSX, D.M. Bowman, David A. Bramble, Sysco, Maryland Motor Truck Association, National Association of Truck Stop Operators, Norfolk Southern, Owner-Operator Independent Driver Association, Perdue AgriBusiness, Maguire Development, RSR Truck Stop, Sagamore Development, Specialized Carriers & Rigging Association, The Terminal Corporation, UPS, W.R. Grace Inc., and Wallenius Wilhelmsen Line, Walmart, and The University of Maryland CATT Labs & MTI.

2.1. OVERVIEW OF STAKEHOLDER INVOLVEMENT

Stakeholder engagement efforts started with an introductory webinar with internal MDOT stakeholders. The purpose of this webinar was to set the stage for identifying truck parking issues and challenges in Maryland, inform truck parking stakeholders of the planned approach and share the expected outcomes of the study.

After the webinar, the participating stakeholders received an invitation to participate in a short survey to indicate their desired level of involvement in the study. As a result, 62 of the stakeholders joined the IWG list, while 74 stakeholders chose to contribute as a member of the EWG.

During the next meeting, the IWG met to discuss preliminary results of the truck GPS data analysis. The purpose of the meeting was to identify truck parking challenges and discuss potential opportunities including key concerns regarding safety, costs and capacity improvements.

Truck Parking Stakeholders

MDOT The Secretary's Office
MDOT State Highway Administration
MDOT Maryland Port Association
MDOT Maryland Transit Administration
MDOT Motor Vehicle Administration
Maryland Transportation Authority
Maryland/MDTA State Police
Federal Highway Administration
Baltimore Metropolitan Council
Hagerstown Eastern Panhandle Metropolitan Planning Organization
Metropolitan Washington Council of Governments
Wilmapco
Baltimore City DOT
Prince George's County
Montgomery County
Queen Anne's County
Frederick County
Virginia Department of Transportation
Maryland Motor Truck Association
National Association of Truck Stop Operators
Walmart

2.2. MARYLAND TRUCK PARKING WORKSHOP

Following the second IWG meeting, MDOT engaged the EWG and IWG stakeholders for the Maryland Truck Parking Workshop. The workshop was a half day event where the findings of the truck GPS and Trucker Path data analysis were presented and validated. Comments were received during the workshop and through small group breakouts used to discuss opportunities to address truck parking challenges in Maryland and identify solutions (Figure 2-1), discussed further in Section 2.4.

Figure 2-1: Breakout Groups Discussing Truck Parking Opportunities and Solutions

2.3. REGIONAL FOCUS GROUP CONSULTATIONS

Four targeted focus group consultations explored ideas discussed during the workshop, identify region-specific needs and solutions, and engage stakeholders that were not able to attend the workshop. The targeted consultations included meetings with private sector stakeholders, such as an industrial developer, truck drivers, and trucking companies. Additional meetings with public sector stakeholders provided a local, district, and state perspective on truck parking opportunities and priorities, discussed further in the next section and including insufficient capacity and lack of capacity.

2.4. TRUCK PARKING ISSUES IDENTIFIED BY STAKEHOLDERS

MDOT solicited input from truck parking stakeholders on the top truck parking issues and needs throughout the study. Although the point of view of stakeholders varied, consistent themes emerged that unified input throughout the study. Figure 2-2 displays a word cloud of the top truck parking issues submitted by stakeholders during the first IWG meeting. The most frequently submitted issues by the IWG, as shown in Figure 2-2, were safety, capacity, perception of truck parking, and the cost of truck parking projects.

Figure 2-2: Most Pressing Truck Parking Issues Identified by the Internal Working Group

Source: Stakeholder input on collected via Mentimeter during a meeting of the Internal Working Group.

Similarly, public and private truck parking stakeholders highlighted the following issues during the Maryland Truck Parking Workshop:

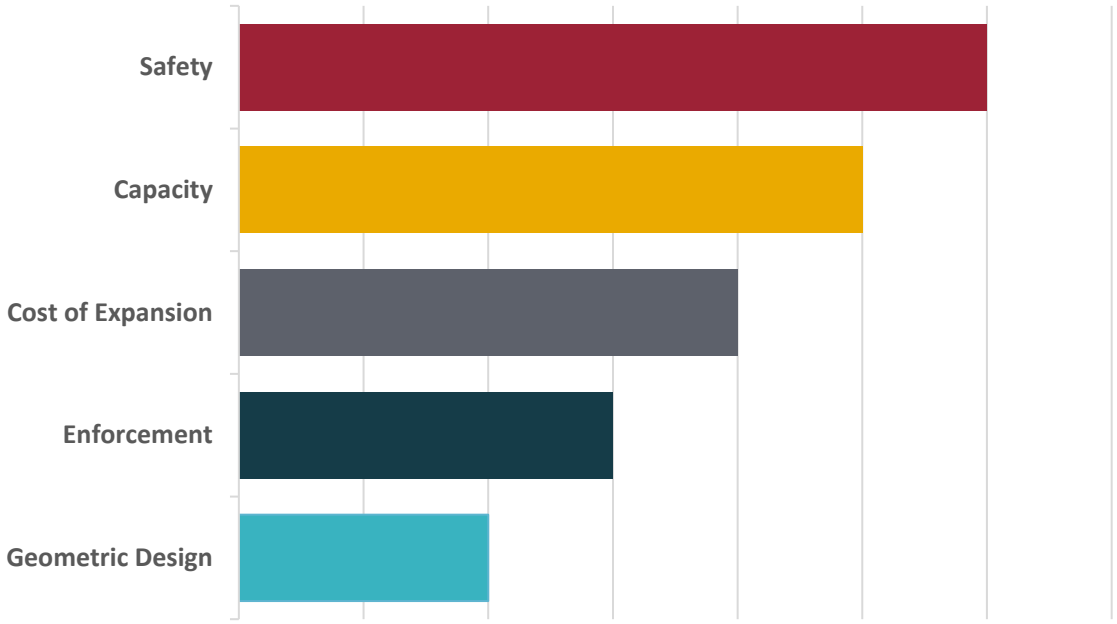
- Insufficient capacity—Undesignated truck parking is a symptom of a shortage of truck parking capacity that leads to safety impacts, infrastructure damage, and causes HOS violations.
- Safety—Truck parking impacts the safety of truck drivers and is a potential hazard for other roadway users.
- Land-use conflicts—Residential development and community concerns create challenges for truck parking capacity expansion, especially in more urbanized areas and where there are industrial and other incompatible land uses nearby.
- Truck parking at TWIS locations—Truck drivers are concerned that they will be subject to increased scrutiny and inspections if they park at TWIS locations.
- Lack of amenities—There are a lack of amenities at truck parking facilities such as restrooms, showers, and fresh food. As such, certain locations can only provide a temporary solution to limited truck parking capacity as they were not designed or developed with overnight truck parking in mind.

- Cost—The cost of expanding or developing new facilities may vary based on the amount of spaces added or if ROW must be purchased. Additional costs may include adding noise walls and/or mitigating for storm water management (SWM). Attaining grants may assist with these costs, otherwise state and federal funding is limited. P3s for truck parking are an innovative option which have not been explored in Maryland but have shown promise in a few states and local jurisdictions.

- Environmental impacts—Truck idling at parking locations as is a source of noise and increased emissions on nearby communities and conflicts with emissions goals and strategies of county planning initiatives.

When asked to identify the top three truck parking issues in Maryland, workshop participants identified safety, capacity, and the cost of expansion as the top truck parking issues in Maryland (Figure 2-3).

Figure 2-3: Top Truck Parking Issues in Maryland



Source: Mentimeter Survey Results, September 2019.

In addition to the workshop, MDOT reached out to truck drivers, maintenance and enforcement authorities, private truck parking developers/operators, the Baltimore Metropolitan Area, and the Helen Delich Bentley Port of Baltimore in Maryland to solicit inputs from various perspectives and to establish partnership opportunities between public agencies and private entities. The following is a summary of key takeaways from focus group discussions:

- Truck parking and Oversize and Overweight (OS/OW) freight—OS/OW freight presents unique truck parking challenges, especially when major construction projects are underway. OS/OW

freight can wait for their required escorts at the Port of Baltimore and MDOT has identified escort waiting areas adjacent to highways. However, some of these locations pose safety challenges to other roadway users. An example is where OS/OW trucks queue at the I-695 waiting area (near MD 702); drivers must make a U-turn to access the highway.

- Supply chain trends are affecting truck parking demand—An increasing number of vendors practice Just-in-Time delivery operations to reduce supply chain costs. These practices result in truck drivers spending more time waiting for loading/unloading at vendor facilities. Vendors rarely offer overnight parking to drivers, and the majority ask the drivers to leave their premises and do not allow the drivers on the premises until their appointment time. This situation exacerbates the undesignated truck parking issue in industrial areas.

- Trucking companies rarely pay for parking fees—Truck drivers often must pay the cost of reserved or paid truck parking out of pocket without reimbursement, which results in undesignated truck parking as a means to avoid the fees.

- Difficult geometry at park-and-ride facilities—Park-and-ride facilities in Maryland are available for emergency truck parking in severe weather conditions; however, these facilities lack the geometric designs required for truck parking maneuvers.

- Safety of undesignated parking at emergency stop areas and paved roadside lots — Emergency stop areas and paved roadside lots within highway ROW may offer an opportunity for parking the trucks, but safe ingress/egress is the main concern related to these locations.

2.5. TRUCK PARKING SOLUTIONS IDENTIFIED BY STAKEHOLDERS

As part of the outreach efforts, MDOT collected stakeholder input on truck parking opportunities and solutions. Figure 2-4 visually displays the responses from the IWG when asked to identify the most important truck parking opportunities. The many different opportunities identified by the IWG further underscores that there are a variety of potential approaches to address truck parking issues.

Although there were a variety of solutions proposed, a consistent theme shared by stakeholders was the importance of addressing community concerns and land use conflicts. Stakeholders also recommended outreach to local government and communities to explain the truck parking issues and potential solutions to improve implementation. The input received from stakeholders organized by project type is shared in the next section.

Figure 2-4: Most Important Truck Parking Opportunities Identified by the Internal Working Group

Source: Stakeholder input on collected via Mentimeter during a meeting of the Internal Working Group.

2.5.1 TRUCK PARKING PROJECTS

The truck parking capacity and information projects identified by truck parking stakeholders are included below.

CAPACITY PROJECTS

- Use alternate locations for truck parking.
  - Use facilities with daytime peak use such as tour bus parking, park-and-ride lots, stadiums, and retail locations for truck parking.
  - Retrofit highway shoulders at select locations with guardrails or other treatments to separate the shoulder from traffic to accommodate trucks as a short-term solution.
  - Survey vacant land and brownfield near interstates using county and MPO land use data to identify vacant facilities and brownfield sites for use as a short-term parking solution. Temporary truck parking could be developed at vacant properties while the land sits empty in advance of redevelopment.

- Increase the use of TWIS locations—Conduct a pilot to explore the possible approaches to providing amenities at larger TWIS locations and promote the use of TWIS locations to truck drivers through signs and outreach.

INFORMATION PROJECTS

- Improve access to information—Provide truck parking information on short-term parking locations, new facilities, and underused truck parking facilities to help balance the demand for truck parking on the main truck route.

- Incentivize ITS applications and automation of private truck parking facilities—Provide the ITS equipment and include private truck stops in a real-time truck parking system.

2.5.2 TRUCK PARKING PARTNERSHIP

The truck parking partnership solutions identified by truck parking stakeholders are included below.

- Establish a platform for Public Private Partnerships (P3).
  - Establish the criteria and policies to increase partnership opportunities for truck parking expansion.
  - Provide opportunities for the private sector to sponsor public rest areas (e.g., developers interested in developing MDOT owned property with existing truck parking facility land use, Geico sponsoring a Virginia rest area, etc.).
  - Remove barriers to building private truck parking facilities, including the infrastructure upgrades that are required when building a truck parking facility.

- Provide financial/tax incentives for truck parking—Encourage the development of truck parking through business incentives for truck stop operators, industrial developers, and retail locations to provide truck parking with amenities.

2.5.3 TRUCK PARKING POLICIES

The truck parking policies identified by truck parking stakeholders are included below.

- Anticipate future truck parking demand—Use goods movement forecasting models and promote data-driven solutions to address truck parking issues where there is a need for increased capacity in the future.

- Adapt land use policies—Match land use policies to enable goods movement by working with freight shippers/suppliers/carriers in local communities to schedule pick-up/delivery hours.

- Mitigate environmental impacts—Reduce the emission impacts of truck parking by limiting access to newer trucks at specific truck parking facilities, provide clean fuel options for trucks at newer facilities, and provide alternatives to idling.

- Provide truck parking on roadways connecting to industrial areas—Work with locals to widen shoulders, properly pave and light roads in industrial areas which will provide additional truck parking for staging.

- Improve **the public's perception of truck parking—**Re-engineering and rebranding truck parking facilities as environmentally friendly safe havens and critical for economic growth.

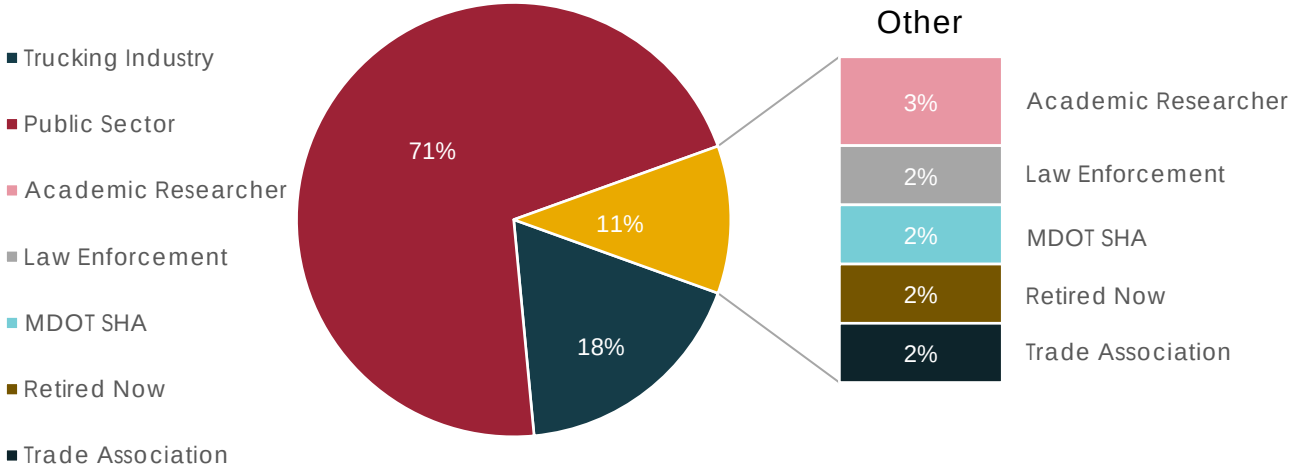
- Educate communities about truck parking—Improve local governments' understanding of the importance and severity of truck parking issues by highlighting the impacts of the imbalance between truck parking capacity and demand using safety statistics such as accident data and HOS.

Appendix F provides a summary of additional truck parking project opportunities collected during stakeholder outreach. The opportunities submitted by stakeholders are at various stages and serve as an initial list that can be expanded, built upon, and refined during implementation.

2.5.4 Stakeholder Input on Clusters of Undesignated Truck Parking

Building on the input received during the IWG meetings, workshop, and targeted consultations, a survey of truck parking stakeholders was used to validate the Priority Clusters and support the development of truck parking recommendations. Using the MetroQuest public engagement tool, input was received by 44 unique users from organizations, such as public transportation agencies, academic researchers, law enforcement, trade associations, truck drivers, and private trucking entities. Figure 2-5 summarizes the types of stakeholders who participated in the survey. Most of the survey participants were from the public sector and private trucking industry.

Figure 2-5: Type of Organization of MetroQuest Survey Respondents



Source: MetroQuest survey results.

The respondents were asked to verify the Priority Clusters identified in this study using the MetroQuest map survey tool. Only 15 of the 18 Priority Clusters were presented, due to a limit within MetroQuest. Respondents were able to explore the location of each priority cluster within the mapping window and were asked whether a specific cluster should or should not be a priority. Respondents were also asked to provide any opportunity locations that were not presented on the map. Information about how Priority Clusters were identified will be discussed in Chapter 6.

Figure 2-7 shows the number of times a respondent confirmed that a cluster should be a priority and Figure 2-6 shows the locations of the clusters. Priority Cluster #1: I-95 at Welcome Center in Laurel was selected the highest number of times, followed by Priority Cluster #11: I-83 near Cockeysville, and Priority Cluster #17: US 301 Stevensville. Only one response indicated that a cluster should not be a priority, suggesting overall agreement with the locations identified in the study. Comparing the frequency that clusters were selected as a priority and the results of the prioritization process revealed alignment for many of the clusters, with Clusters #11 (I-83 in Cockeysville), #17 (US 301 in Stevensville), and Cluster #18 (US 50 in Salisbury) receiving higher levels of support than expected. The high rank of Clusters #11, #17, and #18 appear to reflect areas where survey respondents have experience or where very few truck parking facilities are located within Maryland's Eastern Shore and where no truck parking facilities are located along I-83 in Maryland. Furthermore, these results indicate routes with gap areas where parking is needed but scarce or non-existent.

Figure 2-6: Clusters of Undesignated Truck Parking

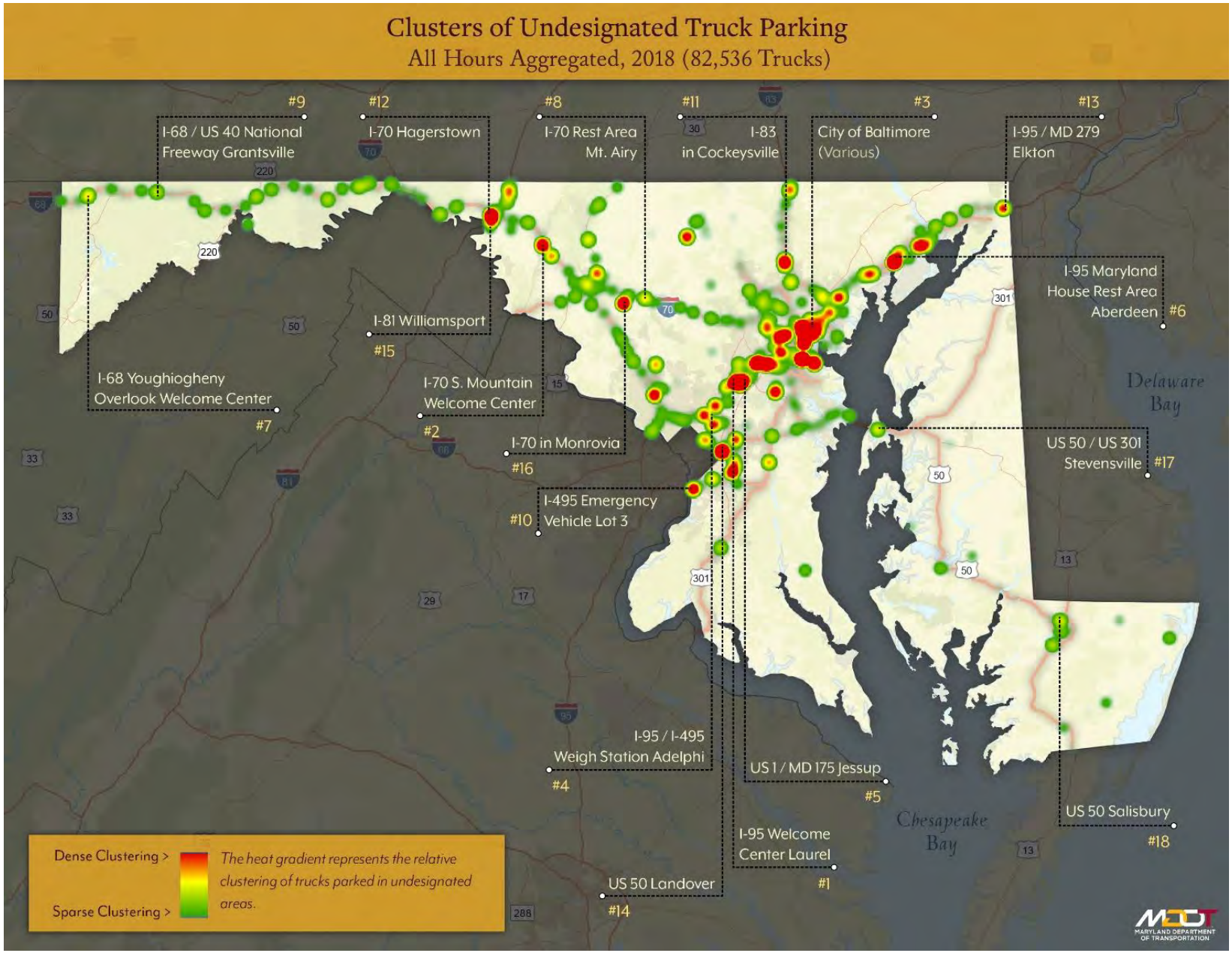
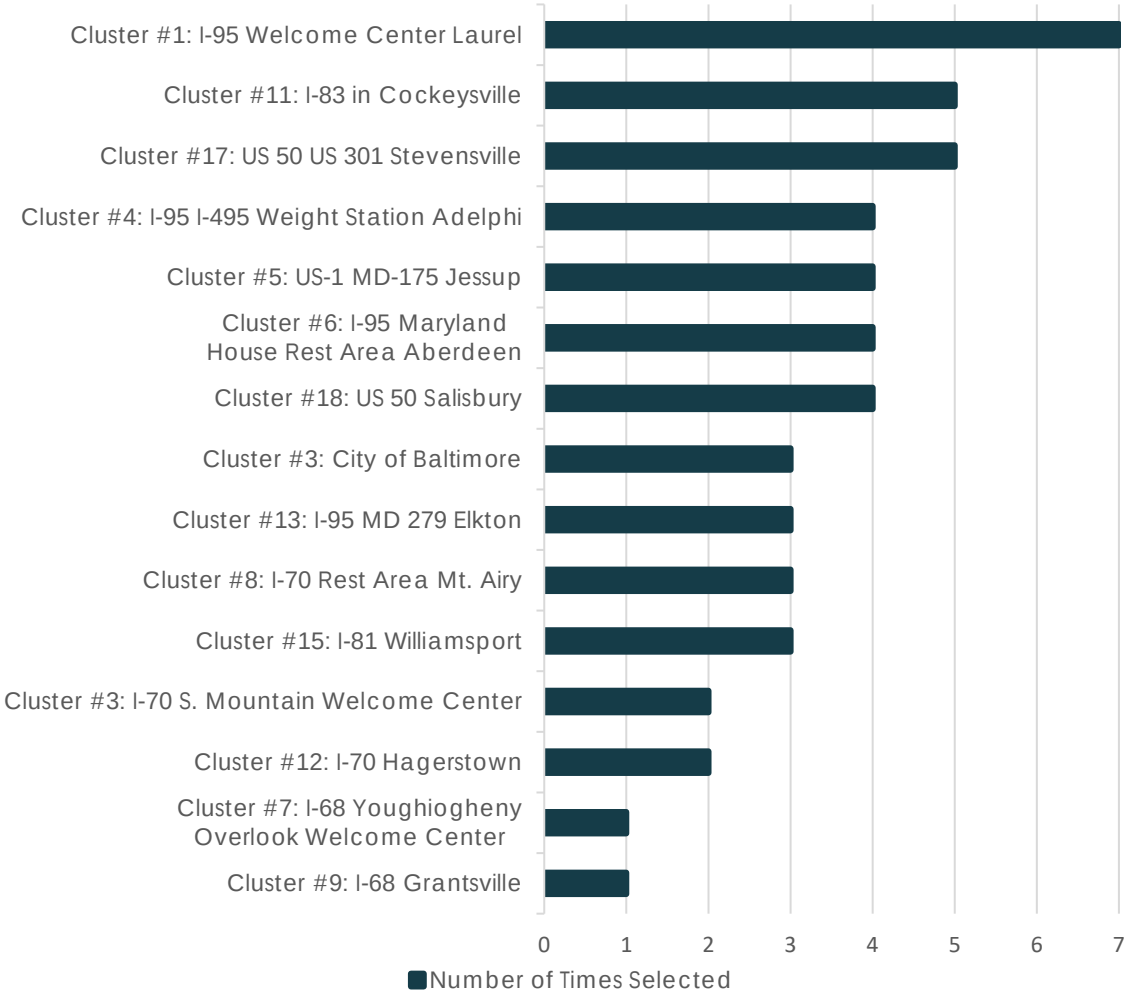


Figure 2-7: Number of Times a Cluster was Selected as a Priority Cluster



Source: MetroQuest survey results.

In addition to the clusters identified and prioritized in the study, stakeholders identified other areas that had undesignated truck parking. These additional areas stakeholders identified as places where trucks parked in undesignated space were reviewed and considered for inclusion in the identified or new clusters, but the number of trucks was found not to have as high as other locations. These smaller locations may indicate areas where coordination with local jurisdictions and developers could identify solutions to address local volume of undesignated truck parking needs. Finally, most locations cited by stakeholders were near the clusters identified in this study and implementation activities that address truck parking issues at one location would likely affect these other locations.

3. FACTORS AFFECTING TRUCK PARKING SUPPLY AND DEMAND

Truck parking supply and demand are affected by the need for truck transportation, federal regulations, the historic location of existing truck parking facilities, land use/development patterns, and emerging freight technology trends.

The factors affecting truck parking supply and demand demonstrates the role of adequate truck parking in facilitating compliance with federal regulations, as well as the safe and efficient operation of commercial motor vehicles and Maryland's freight transportation system. The factors also highlight the challenges to developing an adequate number of truck parking spaces in the locations where they are needed.

The factors affecting truck parking supply and demand serve as the context for understanding the remainder of the report. The factors identified in Chapter 3 will affect the future supply of and demand for truck parking, implementation actions, and potential opportunities to address truck parking needs.

3.1. BACKGROUND

Where and when truck drivers look for truck parking is influenced by the origin and destination of freight, federal HOS and Electronic Logging Device (ELD) regulations, land use, truck parking spaces available and emerging transportation technology trends. Each of these factors is described below and provides the context for understanding why trucks are parked in undesignated locations and the utilization of existing truck parking facilities.

3.2. MARYLAND'S FREIGHT CLUSTERS AND TRANSPORTATION INFRASTRUCTURE

Freight moves to, from, within, and through Maryland using roadways, the rail network, airports, waterways, seaports, and multimodal freight terminals. In 2018, the State's transportation system carried about 271 million tons of freight worth nearly $383 billion (Figure 3-1).[6]

[6] Federal Highway Administration (FHWA), Freight Analysis Framework (FAF) 4.5, 2018.

Figure 3-1: **Maryland's Transportation Infrastructure**

32,372 Miles of Public Roads	758 Miles of Rail Lines	530 Miles of Inland Waterways	50,000 Feet of Air Cargo Runways

Nearly 84 percent of the weight and 98 percent of the value of goods carried across Maryland relies on trucks. Figure 3-2 summarizes the share of cargo carried by trucks in Maryland.

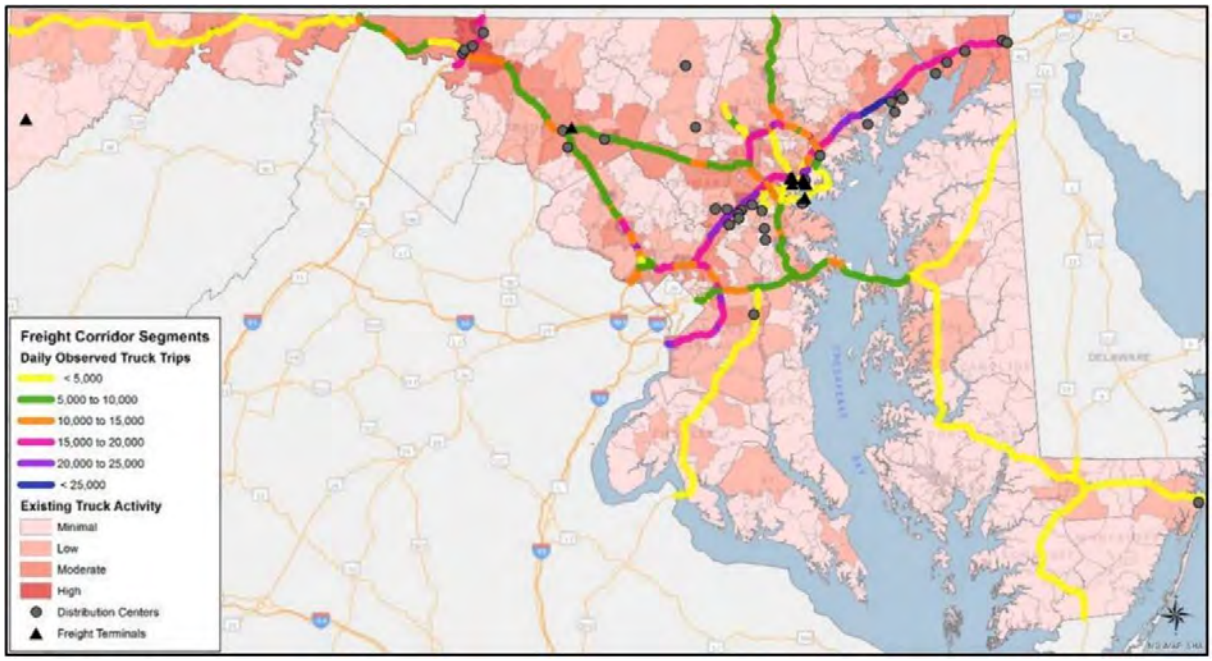
Figure 3-2: Proportion of 2018 Freight Transported by Truck in Maryland

	Within Maryland	From Maryland	To Maryland
Truck Tonnage	97 %	48 %	67 %
Truck Value	92 %	68 %	77 %

Source: Federal Highway Administration, Freight Analysis Framework, 2018.

Figure 3-3 displays the daily truck volumes on the State's major truck routes in 2015, the overall truck activity level in different localities, and the location of distribution centers and freight terminals in Maryland. Overall, Central and Western Maryland experience the highest daily truck activity. Analysis of updated combination truck counts from 2017 shows the highest combination truck counts on segments of I-81, I-83, and I-95 particularly in the northern part of Maryland.

Figure 3-3: **Daily Truck Volumes on Maryland's Highway System, 2015**



Source: Maryland Goods Movement Plan, 2017.

In addition to the truck trips, Figure 3-3 also highlights multiple distribution centers located along the length of I-95, and near Hagerstown at the intersection of I-70 and I-81. The intersection of these major corridors attracts and generates thousands of truck trips daily.[7] Trucks destined for distribution centers and freight terminals may need truck parking to stage in advance of pick up or delivery, which increases truck parking demand in the area around these freight facilities.

The importance of trucks to the movement of freight in Maryland, the State's freight critical corridors, and the location of distribution centers and freight terminals provides context to where trucks originate, are destined, and travel within Maryland. These locations indicate where truck parking is needed to support the safe and efficient movement of freight in Maryland, regionally and nationally.

Ranked 4th as a Port, #1 in Roll-on/ Roll-off nationwide, and with an annual cargo value of $59.7 billion, the Port of Baltimore is the State's most significant truck traffic generation and attraction point.[a]

[a] Baltimore Regional Transportation Board (BRTB), Freight Movement Task Force Overview, Presented at Transportation Planning Board (TPB) Freight Subcommittee, July 2019.

The Role of Truck Parking in Supply Chains

Truck parking facilities also have a critical role in supply chains, providing truck drivers a place to wait or "stage" in advance of a scheduled pick up or delivery appointment. Truck parking near freight clusters (warehousing, distribution centers, intermodal connectors, manufacturers, ports, etc.) is especially important because truck drivers often find inadequate, or a complete prohibition of truck parking where they need to deliver or pickup. Additionally, the demand for truck parking near freight clusters will likely increase due to urban congestion and the resulting unreliable travel times. The unreliability caused by congestion forces truck drivers to stage as close as possible to their final destination, often forcing drivers into the urban periphery or onto local roads, to minimize the risk of missing their delivery window.

3.3. REGULATORY FACTORS

Federal, state, and local regulations impact the supply and demand for truck parking. Recognizing the role of regulations in where and when trucks require truck parking is critical context to identifying potential policy solutions.

3.3.1 HOURS OF SERVICE (HOS) REGULATIONS

HOS regulations are issued by the Federal Motor Carrier Safety Administration (FMCSA) to improve roadway safety by placing limits on the number of hours that truck drivers are allowed to be on-duty to drive and off-duty to rest. Figure 3-4 presents the current HOS regulations for truck drivers.

[7] Washington County, I-81/Halfway Boulevard Freight Connection, 2018.

Violation of HOS regulations can result in a range of penalties, including written warnings, fines, and putting a driver out of service.

Figure 3-4: HOS Regulations for Truck Drivers[8]

Regulation	Description
11-Hour Driving Rule	Allows a maximum of 11 hours driving after 10 consecutive hours off-duty.
14-Hour Rule	Allows a maximum of 14 hours working after 10 consecutive hours off-duty. Extending the off-duty time does not extend the 14-hour period.
Rest Breaks Rule	Allows a maximum of 8 hours driving since the end of driver's last off-duty or sleeper-berth period of at least 30 minutes.
60/70-Hour Rule	Prohibits driving after 60 hours on-duty in 7 consecutive days or 70 hours on-duty in 8 consecutive days. The drivers can restart driving after at least 34 consecutive off-duty hours.
Sleeper Berth Rule	Allows the drivers to use the sleeper berth to get the equivalent of 10 hours off-duty at one time or in two sections: 1.) At least 8 consecutive hours in the sleeper berth and 2.) A separate break that is at least two consecutive hours in the sleeper berth and/or off duty.

Source: Federal Motor Carrier Safety Administration, Summary of HOS Regulations, 2017.

Although the current HOS rules were fully implemented in 2013, FMCSA is currently the middle of the process that could change HOS rules. The stated goal of the HOS rule change is to increase flexibility for truck drivers and increase safety. FMCSA released a Notice of Proposed Rulemaking in August 2019 that solicited comments on the following proposed modifications to the HOS regulations:[9]

- Extending the short-haul truck drivers' maximum on-duty period from 12 to 14 hours, and the maximum operation distance from 100 to 150 air miles.
- Lengthening the maximum window during which driving is permitted by 2 hours to provide more flexibility in adverse driving conditions.
- Increasing flexibility of the 30-minute break rule.
- Allowing the truck drivers to split their required 10-hour off duty into two periods (an 8 and 2 split or a 7 and 3 split).
- Enabling drivers to pause the 14-hour driving window by taking one off-duty break of 30 minutes to 3 hours, conditional to a 10-hours off-duty time at the end of the work shift.

[8] FMCSA Hours of Service were updated in May 2020, the rules listed here have changed the short-haul exception to 150 air miles from 100, and 14 hours on duty from 12, they extended the current 14-hour-on-duty limitations by up to two hours when adverse driving conditions are experienced, revised the current mandatory 30-minute break for truck drivers after eight hours of continuous driving, and reinstated the option for splitting up the required 10-hour off-duty rest break for drivers with a sleeper berth.
[9] FMCSA, Hours of Service Proposed Rule, September 2019.

Almost 8,200 public comments were submitted on the proposed changes to the HOS rules. FMCSA Hours of Service were updated in May 2020, the rules changed the short-haul exception to 150 air miles from 100, and 14 hours on duty from 12, they extended the current 14-hour-on-duty limitations by up to two hours when adverse driving conditions are experienced, revised the current mandatory 30-minute break for truck drivers after eight hours of continuous driving, and reinstated the option for splitting up the required 10-hour off-duty rest break for drivers with a sleeper berth. Due to the direct relationship between HOS and truck parking, monitoring changes to HOS and assessing the likely impacts of rule changes when they are published is critical to understanding future truck parking demand.

3.3.2 Electronic Logging Device (ELD) Mandate

Truck drivers and trucking service providers have tracked HOS using manual logbooks since 1938. In 2012, Congress mandated the use of ELDs in the Moving Ahead for Progress in the 21st Century (MAP-21) Act. ELDs automatically record the duty status of truck drivers by monitoring the vehicle's engine, mileage, and location information. ELDs allow limited edits, but an original copy of the records must be retained and driving time cannot be changed to non-driving time. Additionally, paper logs recorded time in 15-minutes intervals, which allowed drivers some flexibility to drive beyond HOS limits to search for truck parking before they crossed a threshold for the next 15-minute interval. Conversely, ELDs track driving time by the minute, which removes the flexibility of paper logs.

Although MAP-21 was passed in 2012, FMCSA had to develop rulemaking for the ELD mandate. Additionally, FMCSA conducted a phased approach that first raised awareness of the ELD mandate from February 2016 to December 2017. A phased compliance with the ELD mandate from December 2017 to December 2019 was amended to advise when ELD-mandated drivers and carriers must use an ELD.[10]

Figure 3-5 lists the HOS related violations across Maryland in 2018. For each type of violation, the number of violations is greater than the number of inspections. This high rate of violations per inspection is due to law enforcement finding multiple violations during the logbook inspections.

Figure 3-5: HOS and Recordkeeping Violations in Maryland, FY2018

Regulation	Violation Description	Inspections	Violations
10	No drivers record of duty status	847	847
12	General log violation	692	751
14	Driving beyond the 14-hour duty period	593	718
15	False report of drivers records of duty status	646	673
22	Driver failing to retain previous 7 days records of duty status	475	475

[10] Federal Motor Carrier Safety Administration "Implementation Timeline," 2018. https://www.fmcsa.dot.gov/hours-service/elds/implementation-timeline

Regulation	Violation Description	Inspections	Violations
24	Driving beyond 11-hour driving limit in a 14-hour period	306	372
28	Driving beyond 8-hour limit since the end of the last off duty or sleeper period of at least 30 minutes	203	250
45	Driving beyond 11-hour driving limit in a 14-hour period (nominal violation)	71	75
51	Driving after 70 hours on-duty in an 8-day period	36	49
74	Driving after being declared out-of-service for HOS violation	9	9
106	Driving after 60 hours on-duty in a 7-day period	1	3

Source: Federal Motor Carrier Management Information System, 2018.

The increased accuracy and accountability when moving from paper logs to ELDs, as well as the limited editing of ELDs, could cause truck drivers to stop earlier than they might have in the past. This update could add to the number of trucks looking for truck parking or shift where and when drivers start to look for truck parking.

A 2018 survey of truck drivers by Trucker Path, a cell phone application used by drivers to find truck parking, found that 80 percent of truck drivers said that the ELD mandate has made it harder to find truck parking.[a]

[a] Trucker Path, July, 2018. "Truck Parking Report." http://files.truckerpath.com/web/trucker-path-parking-white-paper-2018.pdf

3.3.3 Truck Route Restrictions

Truck route restrictions vary by state but serve a common goal — they all intend to improve safety by limiting trucks of a specific size, weight, and configuration to corridors with truck-oriented design characteristics. The main factors prohibiting large trucks from using certain highways are the capability of the infrastructure to handle a truck's weight and dimensions (vertical and horizontal clearance).

The MDOT SHA Office of Traffic and Safety's Motor Carrier Division (OOTS - MCD) publishes the Motor Carrier Handbook to provide information on various truck-related rules and regulations, including route restrictions and fines, location of truck stops and rest areas, vehicle registration, size and weight limitations, and Oversize/Overweight (OS/OW) hauling permits. According to the Handbook, trucks with semi-trailers more than 48 feet in length, doubles, and some other trailer combinations are required to operate on the National Highway System (NHS). These trucks are restricted from traveling on local roadways for more than 0.5 to one mile to rest or obtain food, fuel, and repairs.[11] In the absence of information systems to notify truck drivers about nearby truck stop locations and space availability, drivers of these or longer combination trucks face uncertainty about the availability of truck parking nearby. In addition to route restrictions, local jurisdictions may further restrict where trucks are allowed to park, which actually reduce the number of truck parking spaces in a given area and push the issue elsewhere.

[11] State Highway Administration, Office of Traffic and Safety "Maryland Motor Carrier Handbook," January 2018.

In an effort to provide truck drivers with information about the location and availability of truck parking, state DOTs and private truck stops throughout the U.S. are implementing Intelligent Transportation Systems (ITS) real-time truck parking technology. These systems involve the installation of parked vehicle detection systems that communicate the availability of truck parking to roadside dynamic message signs (DMS), third party applications, and websites.[12] Other approaches to collecting and sharing truck parking availability information include truck stop operators conducting physical counts and submitting the information to an app or using crowdsourced parking information submitted by app users.

3.4. LAND USE AND DEVELOPMENT

Existing land use and the development trends in a given area affect whether a truck parking facility matches the surrounding land use and whether it is economically viable. Similarly, development can negatively affect roadway congestion and impact the distance trucks can travel in a given day, the variability in their arrival time, and where trucks look for truck parking.

3.4.1 CONGESTION IN URBAN AREAS

The areas surrounding major truck origins and destinations, especially in urban areas, experience intensified truck parking issues. Trucks are often required to meet pick up or delivery time windows, which incentivizes trucks to stage as close to the origin or destination as possible, especially if congestion increases the chance of missing a pickup or delivery window.

3.4.2 COST OF LAND

Expanding the number of truck parking spaces and locations is an apparent solution for addressing truck parking challenges; however, the high cost of land affects the supply for truck parking in urban and suburban areas. Ideally, truck parking facilities are developed near the origins and destinations of freight and near major corridors. In the rare occasions that such locations become available, the high cost of land often make large-scale development cost prohibitive. As a result, the limited number of spaces and lack of amenities at smaller truck stops near urban and suburban areas force truck drivers to find other locations to park. Similarly, the cost of land, development, and the potential for liability are also impediments to shippers and receivers providing truck parking and results in limits on when truck drivers are allowed onto their property.

Additionally, truck parking competes against road and bridge projects for limited public sector resources. Therefore, a clear purpose and need are required to make the case of spending limited funding on a truck parking project. This purpose and need for truck parking is further complicated by a significant portion of truck parking spaces being provided by the private

[12] MAASTO TPIMS Website: https://trucksparkhere.com/

sector, which creates a perception that truck parking is an issue that should be addressed by the private sector. The net result is truck parking projects often encounter difficulty receiving funding.

3.4.3 Land Use Conflicts

Truck parking development and expansion projects may face challenges and obstacles in local approval processes, especially in urban areas and near residential land use. Residents consider truck parking facilities undesirable mainly due to noise, emissions, reduction in property values, safety impacts and (perceived or real) unsavory behavior of some truckers. Communities have expressed their opposition to multiple truck parking development projects across Maryland. The opposition to truck parking is a challenge throughout the U.S. for both new and existing truck parking facilities. The approach used to address land use conflicts and community concerns varies by project and context, but the following approaches help mitigate land use conflicts and community concerns:

- Develop education and outreach materials about the importance of truck parking and the role of designated truck parking in addressing undesignated truck parking.
- Conduct outreach to neighborhoods on truck parking benefits, needs, and safety.
- Educate local jurisdictions on approaches to proactively incorporate truck parking into land use planning.
- Include truck parking in comprehensive plans.
- Require warehouses/distribution centers to provide truck parking to meet just-in-time needs.

3.5. Emerging Technology Trends

Emerging technology trends affect how truck drivers find truck parking and the resulting demand for parking. Three prominent trends affecting truck parking are digitized logistics, Connected and Automated Vehicles (CAV), and battery-powered electric truck motors.

3.5.1 Digitized Logistics Systems

As a solution for truck parking availability issues, truck drivers are increasingly using their smartphones or other smart devices to locate and even reserve available truck parking. Major truck stop companies, such as Travel Centers of America (TA)/Petro, Love's, and Pilot/Flying J offer applications specifically designed to direct truck drivers to their nearest facility and in some cases, provide information about the availability of truck parking at the facility.[13] These private systems compliment public ITS real-time truck parking technology implemented by states. Truck

[13] TruckSmart Mobile Application information: https://www.ta-petro.com/trucksmart

drivers are also using crowdsourced parking information submitted by app users to find truck parking.

Additionally, ports and freight terminals are implementing appointment systems that enable truck drivers to avoid waiting for long periods. Ports are often located in urban areas where there is insufficient parking, forcing trucks to stage at undesignated locations. The U.S. Maritime Administration has conducted a series of studies on the ITS technologies used at ports, including a recent study of truck staging including access, queuing, and parking at ports. The study identified stakeholder needs and conducted an economic feasibility study of automated truck queuing technologies.[14]

3.5.2 Connected and Automated Trucks

The continuing evolution of autonomous vehicle technology has the potential to significantly impact the trucking industry and even result in a change or elimination of HOS regulations.[15] The six levels of automation and the associated attributes of each level are displayed in Figure 3-6.

Figure 3-6: Autonomous Driving Levels

Level of Automation	Description
Level 0: No Automation	The driver performs all operating tasks.
Level 1: Driver Assistance	The driver handles all operating tasks while the vehicle assists with either steering or acceleration/deceleration. Examples of level 1 systems include adaptive cruise control or automatic braking.
Level 2: Partial Automation	The driver may disengage from both steering and acceleration/deceleration but must be ready to retake control of the vehicle. For example, the combination of lane centering and adaptive cruise control meet Level 2 criteria.
Level 3: Conditional Automation	The driver provides critical attention when requested, while the vehicle controls all aspects of the driving.
Level 4: High Automation	The vehicle controls the operation of all aspects of the vehicle in safe conditions.
Level 5: Full Automation	The vehicle can perform all aspects of driving under all conditions.

Source: NHTSA, Automated Vehicles for Safety, accessed 2019.

Vehicles on the road today operate at a level of automation associated with 0, 1, or 2, but progressing to automation Levels 3 and 4 marks a transition to more impactful levels of automation. As the level of automation increases, the potential impacts on truck parking also increase. For example, Level 3 technology allows for hands-free driving in safe conditions, making it possible that future regulations could allow a truck driver to find available parking and (if possible) reserve their spot using a smartphone or other in-cab devices while the vehicle is moving.

[14] Phelan, T., R. Macdonald, and K. Chase, March 20, 2019. Talking Freight: ITS MARAD Truck Staging Program. FHWA. https://www.fhwa.dot.gov/planning/freight_planning/talking_freight/march_2019/

[15] American Transportation Research Institute, Identifying Autonomous Vehicle Technology Impacts on the Trucking Industry 2016.

Level 4 automation enables the driver to rest while the vehicle is moving under specific conditions, presenting an opportunity for changes to HOS regulations that allow truck drivers to rest or save their drive time for use when the autonomous system is not in control. At Level 4, truck drivers will likely still need truck stops and rest areas for staging and other HOS requirements. Additionally, truck stop amenities such as food, showers, fuel, inspection, and maintenance will likely increase in importance. Widespread application of Level 4 automation could decrease the demand for truck parking spaces through changes to HOS regulations or the restructuring of supply chains to maximize miles driven under automation, resulting in a significant reduction in the need for truck parking spaces.

As shown in Figure 3-6, Level 5 automation entails a truck performing all driving activities under all conditions. Therefore, Level 5 automation could eliminate HOS regulations for autonomous trucks and thus result in more truck parking availability for all other trucks. Level 5 trucks could operate without a driver and may only stop for delivery, pick up, fuel, and maintenance.

While the majority of the individual technologies associated with the autonomous vehicle applications have matured for market-wide application, current efforts are still focused on testing whether these technologies can be leveraged by trucks and integrated into real-world operation. The timing, rate of market adoption, regulations, and impact to supply chains is currently unknown. MDOT's development of CAV Strategic Plans for MDOT, MDOT SHA, and MDTA, as well as CAV working groups, presents an opportunity for MDOT to monitor the development of CAVs and assess their impact on truck parking and the recommendations of this study. For example, connected trucks could be sent truck parking availability information as they get close to a truck parking facility, thus reducing or eliminating the need for physical signs that display the availability of truck parking spaces.

3.5.3 Battery-Powered Electric Truck Motors

Nearly 60 percent of freight-related emissions can be traced back to heavy-duty truck activity.[16] The Greenhouse Gases (GHGs) emitted by trucks primarily consist of nitrogen, water vapor, and CO2. Approximately 1 percent of diesel engine exhaust includes harmful pollutants, the most significant of which are nitrogen oxides and dioxides (NOx) and particulate matter (PM).[17]

To meet the fuel economy standards and mitigate the health and air quality impacts of trucking activities, vehicle makers have targeted innovation in truck powertrain systems. Current powertrain technologies have reduced the emissions of trucks, but electric motors provide an opportunity to substantially reduce the emissions associated with freight transportation. Although truck electrification is now proven as a viable solution for light-duty and urban delivery vehicles, the prospect for heavy-duty long/line-haul trucking presents additional challenges. The energy density required for a heavy-duty truck to operate with an electric motor requires heavy and

[16] EDF, The Green Freight Handbook, 2014. http://business.edf.org/files/2014/07/EDF-Green-Freight-Handbook.pdf

[17] Resitoglu et al., The pollutant emissions from diesel-engine vehicles and exhaust after treatment systems, 2015, Clean Technologies and Environmental Policy, Vol 17, Issue 1, pp 15-27.

voluminous batteries with relatively high prices.[18] Hybrid-electric technologies offer a solution in this case by combining the mileage range of internal combustion diesel engines with the fuel economy and emissions benefits provided by electric propulsion.

At-scale, battery-powered electric trucks require a nationwide investment in charging stations and equipping truck stops with single-system or dual-system electrified spots.[19] In the absence of specialized and dedicated funding programs, truck and truck stop electrification investments will likely encounter difficulties competing against other transportation infrastructure needs.

Truck electrification has the potential to positively impact the perception of truck stops and their development. Truck parking facility development or expansion plans that are near residential neighborhoods often face community backlash, due in part to community concerns around increased air and noise pollution as trucks may idle while parked. Electric engines produce zero tailpipe emissions and lack the vibration of diesel-powered engines, which results in noise. Therefore, the characteristics of electric trucks may improve the community perception of truck parking facilities and allow for more flexibility in site selection.

The combination of the need to provide charging infrastructure at truck parking spaces and the potential to improve the perception of truck parking makes the development of electric trucks a trend that could impact future truck parking needs and solutions.

3.6. CONCLUSION

The factors affecting truck parking supply and demand demonstrates the role of adequate truck parking in facilitating compliance with federal regulations and its role in the safe and efficient operation of trucks on Maryland's transportation system. Ensuring an adequate supply of truck parking is challenging and may leave truck drivers with a difficult decision between stopping early, driving beyond their HOS to find truck parking, or parking in undesignated areas.

The factors described in this chapter demonstrate the changing nature of truck parking supply and demand which suggests the importance of monitoring and revisiting truck parking supply, demand, and implementation actions periodically. Addressing these factors is the context for the study's recommendations.

Maryland, like many other states, is tracking potential changes to the HOS legislation, which is currently being re-evaluated. Additionally, drivers in Maryland utilize public real-time systems such as National Association of Truck Stop Operators (NATSO)'s Park My Truck application and the Trucker's Path Application. Maryland is continuing to evaluate ITS real-time truck parking

[18] Nopmongcol, U., Air Quality Impacts of Electrifying Vehicles and Equipment Across the United States, 2017. Environmental Science and Technology.

[19] In a single-system electrified truck stop, off-board equipment provide internet access, heating, ventilation, and air conditioning, whereas, in a dual-system electrified stop, trucks equipped with energy inverter and other electrical systems can plug in to outlets at the truck stop. For more information see: https://afdc.energy.gov/conserve/idle_reduction_electrification.html

technology to determine what would be best utilized in the state. Within the Mid-Atlantic megaregion this technology could allow trucks from other states to tie into a transferrable application, similar to the EZ Pass toll system along the eastern seaboard.

4. SYNTHESIS OF EXISTING STUDIES, DATA COLLECTION, AND INITIATIVES

4.1. INTRODUCTION

The Maryland Statewide Truck Parking Study builds upon the existing truck parking studies conducted by MDOT and MDOT SHA, regional truck parking studies, and the Federal Highway Administration's (FHWA) Jason's Law legislation and study. This chapter summarizes the key findings of each of the studies reviewed during the study. Appendix A provides additional detail about the existing studies, data, and initiatives summarized below.

4.2. MARYLAND FREIGHT NETWORK TRUCK PARKING SURVEY

The Maryland Annual Overnight Truck Parking Survey provides an overview of the overnight public truck parking supply, utilization, and truck parking across the State. Other than 2015, the Maryland Freight Network Truck Parking Survey has been conducted annually since 2012. The survey summarizes the issues related to truck parking availability and undesignated parking along Maryland's Truck Route system at rest areas, truck stops, highway shoulders, and on/off ramps. The reports also update the total number of truck parking spaces at rest areas, TWIS locations, and select private truck parking facilities.

Maryland's first truck parking survey report was published in 2012. At the time, the survey included all the routes within the Maryland Truck Route System. Multiple routes were eliminated from the survey in 2013 and 2014 due to the low number of parked trucks and no new routes have been added since the 2014 survey.

Figure 4-2 lists the routes with the highest number of trucks parked according to the most recent Maryland Annual Overnight Truck Parking Survey (collected in 2017). Additionally, Figure 4-2 displays the day and time of the peak volume observed for each route, displaying that the demand for truck parking varies by day of the week, time of day, and corridor. Figure 4-1 shows the same information by location geographically.

Figure 4-1: Regional Routes with Average Number of Trucks Parked

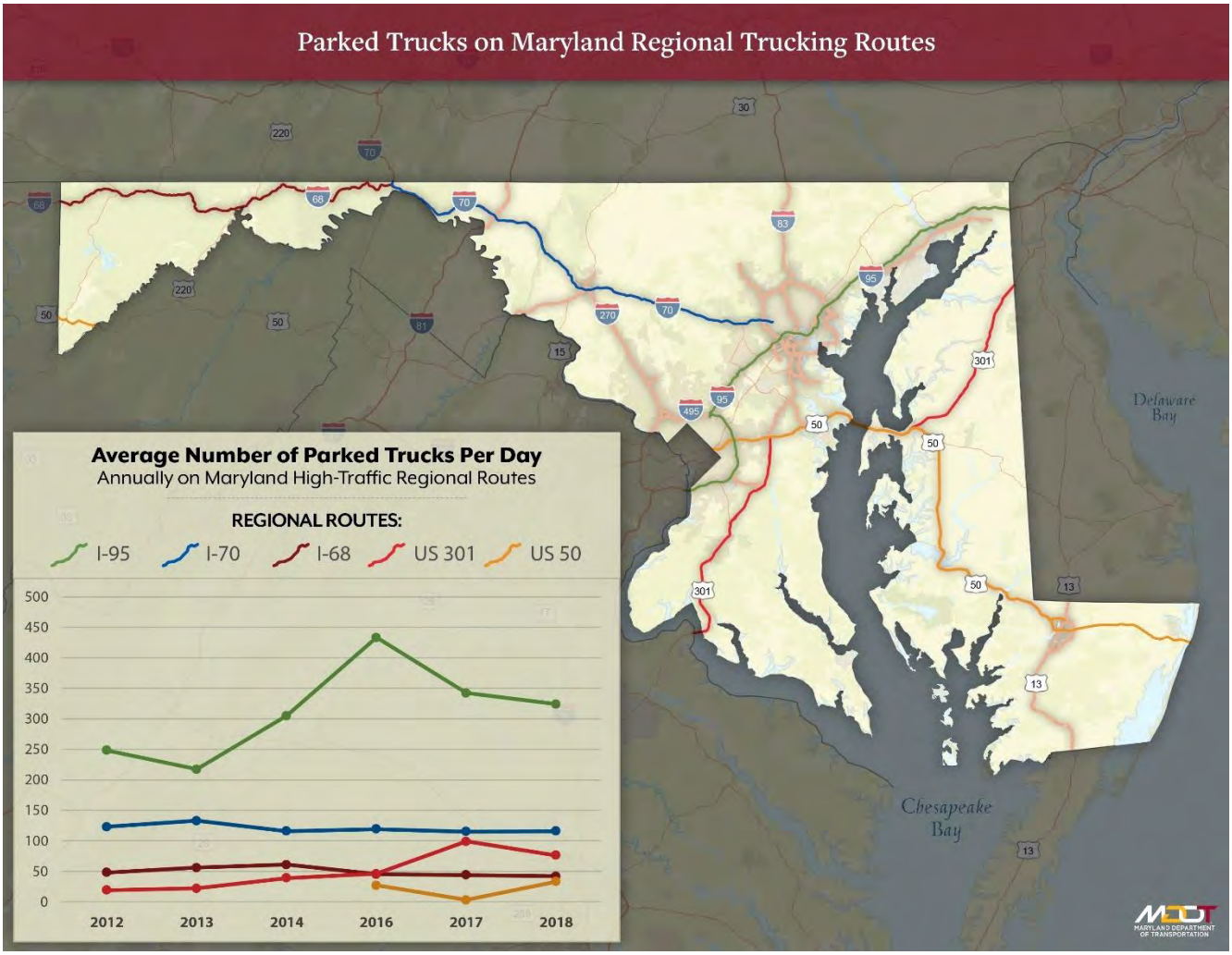


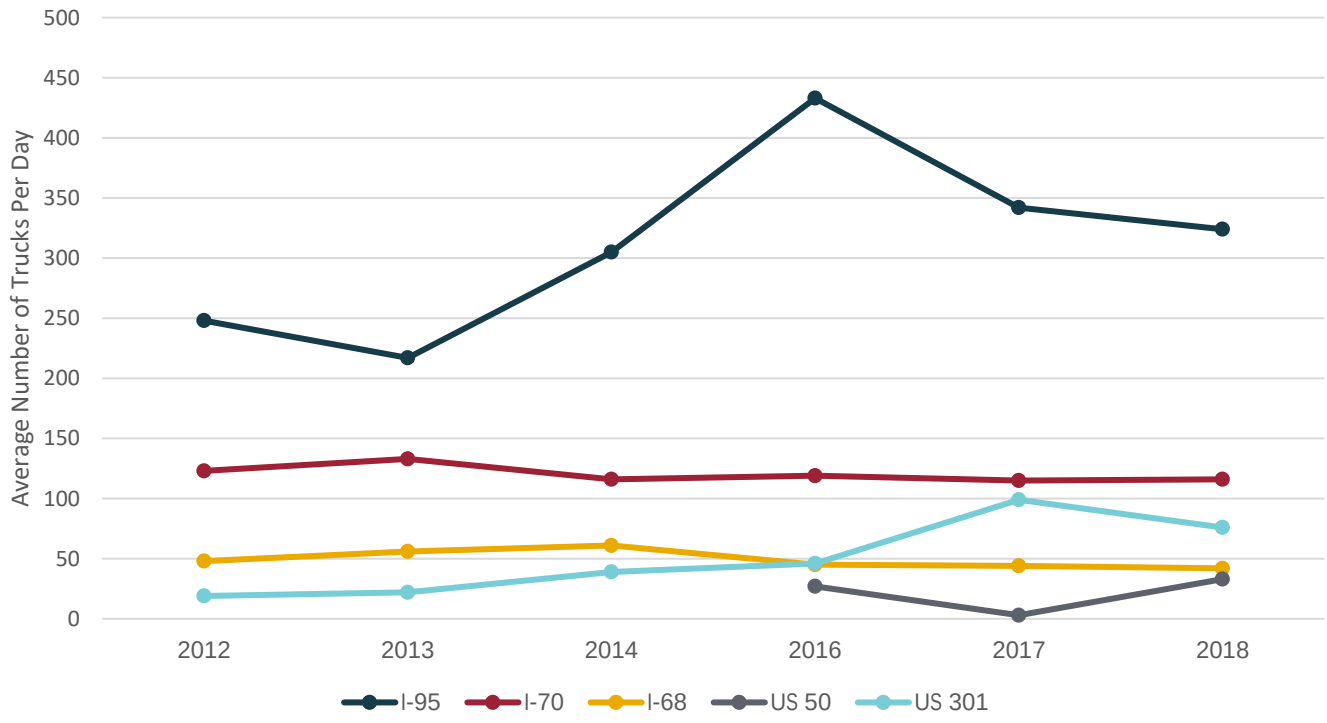
Figure 4-2: Highest Number of Parked Trucks by Route—2018

Route	Total Number of Parked Trucks	Average Number of Parked Trucks	Day/Time/ Highest Number of Parked Trucks
I-95	1,942	324	Wednesday, 4:00 am, 372
I-70	697	116	Wednesday, 4:00 am, 127
US 301	455	76	Wednesday, 4:00 am, 85
I-68	251	42	Wednesday, 4:00 am, 59
US 50	195	33	Wednesday, 4:00 am, 47

Figure 4-3 displays the annual change in the average number of trucks parked per day along high-volume highways. I-95 and I-70 have consistently been listed as the corridors with the highest number of overnight truck parking observations. Some sudden changes in the average number of trucks parked between 2012 and 2018 can be attributed to changing closing hours and

construction projects at or around TWIS locations or rest areas, which forced the truck drivers to change where they park overnight. The number of trucks parked along surveyed routes has increased by 20 percent from 2012 to 2017 with the most significant increases seen on I-95 and US 301.[20]

Figure 4-3: Changes in the Average Number of Trucks Parked along High-Volume Corridors



Source: Maryland Annual Overnight Truck Parking Surveys 2012 to 2017.

4.3. MARYLAND STRATEGIC GOODS MOVEMENT PLAN

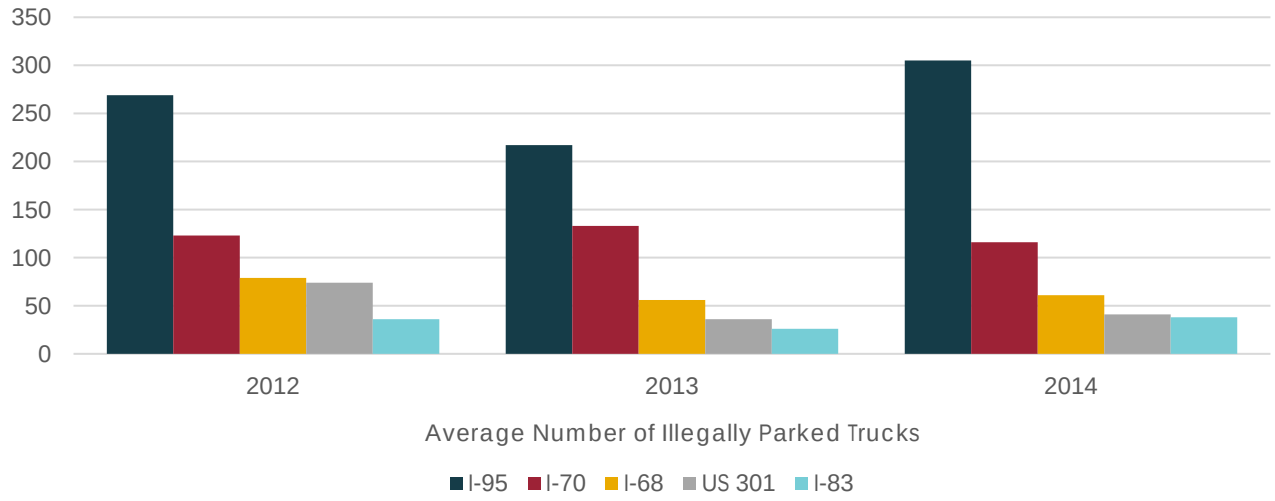
As an addendum to the Maryland Long-Range Transportation Plan (LRTP 2035), the 2017 Strategic Goods Movement Plan (SGMP) focused on the movement of freight across the State. The freight-related policies and strategies of the plan were developed in line with the requirements of the Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America's Surface Transportation (FAST) Act. The plan analyzed the data provided by Maryland Overnight Truck Parking Surveys 2012 to 2014 and acknowledges the shortage of truck parking, a large number of

[20] A. Morton Thomas and Associates, Inc., March 2018. 2017 Maryland Annual Overnight Truck Parking Survey. Maryland State Highway Administration.

trucks parked at undesignated locations, and the impacts of HOS regulations on truck parking demand as major trucking-related issues across the State, particularly along the I-95 corridor.

Figure 4-4 shows the average utilization at designated overnight truck parking facilities and the top locations of illegal truck parking in Maryland.

Figure 4-4: Top Truck Parking Locations of Illegal Truck Parking by Route



Source: Maryland Strategic Goods Movement Plan 2017.

The findings of the SGMP related to truck parking issues in Maryland are as follows:

- Truck parking is a current problem and a future issue due to projected freight demand and less flexibility in delivery time windows, which impact the need for staging locations.
- I-95, I-70, and I-68 were consistently among the top five routes for truck parking due to their regional significance. Additionally, US 301, I-83, and I-270 often rounded out the top five routes but had a lower average number of trucks parked due to their local use from 2012 to 2014.

As an overall strategy to better identify truck parking needs and issues, the SGMP recommended the application of advanced data analysis methods, such as partnering with crowdsourcing entities to promote sharing of truck parking information and additional collection of truck parking supply and demand data. Truck parking performance is also tracked and reported by the MDOT Excellerator Program.[21] The SGMP also provides strategic recommendations for MDOT to improve truck parking availability across Maryland. These strategies include:

[21] The MDOT Excellerator is a performance management program comprising 10 tangible results. Quarterly published documents report the performance of MDOT relevant to each of the Tangible Results based on specific indicators. For more information see: http://www.mdot.maryland.gov/newMDOT/Planning/Excellerator/MDOTExcellerator

- Expanding the supply of truck parking by identifying where truck parking spaces could be added to existing state-owned facilities.
- Identifying areas along freight corridors with enough Right of Way (ROW) to develop a truck holding (staging) area.
- Researching the use of TWIS locations for overnight truck parking.
- Collaborating with the private sector travel services providers to increase private truck parking capacity across the State.
- Maximizing the utilization of the currently available parking facilities by evaluating the state-of-the-practice in truck parking technology applications and the potential for deployment of those technologies in Maryland.

4.4. JASON'S LAW TRUCK PARKING SURVEY

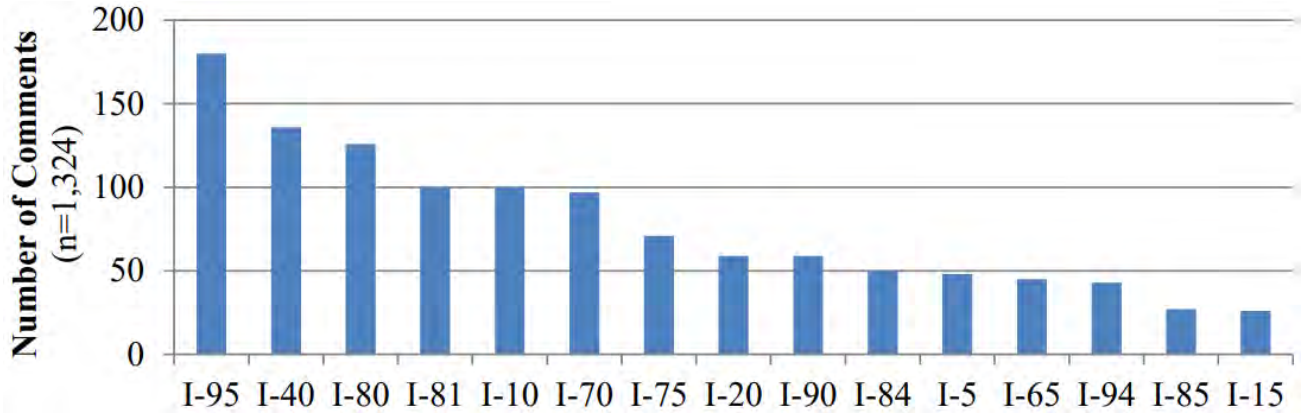
In 2012, Section 1401 of MAP-21, known as "Jason's Law," required the U.S. Department of Transportation to initiate a truck parking survey and assessment that develops a system of metrics to measure the adequacy of truck parking facilities in each state, assess the volume of truck traffic in each state, and evaluate the capability of each state to provide adequate truck parking. Jason's Law surveyed enforcement personnel, state DOTs, truck drivers, personnel of trucking firms, and truck stop and rest area owners and operators.

Jason's Law Background

Jason's Law is named after truck driver Jason Rivenburg, who was murdered while parked overnight at an abandoned gas station. Following Rivenburg's death in 2009, truck parking legislation was introduced and named in his honor and integrated into MAP-21. This legislation directed the FHWA to study the availability of truck parking in all states and provided resources for the development of additional truck parking in the future. This legislation also requires state DOTs to provide safe and reliable truck parking.

The 2015 Jason's Law Survey found that most states have a truck parking shortage with higher shortages at public truck parking facilities compared to private facilities. Additionally, when asked which states have a shortage of safe truck parking in the 2015 Jason's Law Survey, Maryland was ranked fifth and thirteenth by drivers from the Owner-Operator Independent Drivers Association (OOIDA) and the American Trucking Association (ATA), respectively. The responses from truck drivers in the 2015 Jason's Law Survey displays a general knowledge of the shortage of truck parking in Maryland relative to other states. Figure 4-5 displays the Interstates where truck drivers and industry professionals identified truck parking shortages. The Interstates that fall within Maryland include I-95, I-81 and I-70.

Figure 4-5: Top 15 Interstates with a Shortage of Truck Parking According to Truck Drivers and Industry Professionals



Source: Jason's Law Truck Parking Survey Results 2015.

Other findings from the 2015 Jason's Law Survey include:

- Most of the private truck stops were reported having less than 100 spaces available and were primarily full overnight, with some at full capacity during the day.
- Land use, zoning laws, and a lack of funding and authority were identified as the challenges for expanding the capacity at private truck parking facilities. State DOTs identified inclement weather conditions, delivery window limitations, a lack of funding for truck parking projects, and enforcement as the primary challenges.

About 75 percent of truck drivers and 66 percent of logistics personnel reported that they regularly encounter difficulty finding safe parking locations.

The ratio of private to public spaces was 5.2 in Maryland compared to the national ratio of 7.5, meaning that compared to other states, MDOT provides a greater proportion of total truck parking spaces across Maryland.

Figure 4-6 shows the number of public and private spaces available in Maryland, neighboring states, and nationwide according to the 2015 Jason's Law Survey. In 2015, nearly 84 percent of Maryland's 3,036 total truck parking spaces were offered by private facilities.

Figure 4-6: Public and Private Parking Inventory

State	Public Truck Spaces	Private Truck Spaces	Ratio of Private to Public Spaces	Total Spaces
Delaware	28	294	10.5	322
Maryland	*492*	*2,544*	*5.2*	*3,036*
New Jersey	757	2,213	2.9	2,970
Pennsylvania	1,569	9,363	6.0	10,932

State	Public Truck Spaces	Private Truck Spaces	Ratio of Private to Public Spaces	Total Spaces
Virginia	729	7,463	10.2	8,192
West Virginia	641	1,747	2.7	2,388
United States	36,222	272,698	7.5	308,920

Source: Jason's Law Truck Parking Survey Results 2015.

Figure 4-7 places the number of truck parking spaces in the context of the daily vehicle miles traveled (VMT) traveled by trucks for Maryland and its neighboring states. Although Maryland had the third-highest total number of truck parking spaces compared to neighboring states, when measured in terms of VMT, Maryland ranked fifth. The calculation of the number of truck parking spaces per truck VMT displays the connection between trucking activity and truck parking.

Figure 4-7: Public, Private, and Total Parking Spaces per VMT in Maryland and Neighboring States

State	Number of Public Facilities	Public Truck Spaces	Number Private Truck Stops	Private Truck Spaces	Ratio of Private to Public Spaces	Total Spaces	Public Spaces per 100K Daily Truck VMT	Private Spaces per 100K Daily Truck VMT	All Spaces per 100 K Daily Truck VMT	Public Spaces per 100 Miles of NHS	Private Spaces per 100 Miles of NHS	All Spaces per 100 Miles of NHS
Delaware	1	28	15	294	10.5	322	4.9	51.3	56.1	6.1	64.5	70.6
Maryland	20	492	49	2544	5.2	3036	11.7	60.5	72.2	20.9	108.1	129
Pennsylvania	66	1569	223	9363	6	10932	16.3	97.5	113.8	21.8	130.3	152.1
New Jersey	15	757	112	2213	2.9	2970	21.6	63.1	84.7	26.2	76.6	102.8
Virginia	35	729	148	7463	10.2	8192	8.5	87	95.5	16.3	166.7	182.9
West Virginia	30	641	37	1747	2.7	2388	29	78.9	107.9	31.2	85	116.1

Source: Jason's Law Truck Parking Survey Results 2015.

4.5. I-95 CORRIDOR COALITION — TRUCK PARKING INITIATIVE

The I-95 Corridor Coalition started in the 1990s as an alliance of the states along I-95 from Florida to Maine to improve mobility and safety in the region through the application of ITS technologies.[22] Among other projects, the I-95 Corridor Coalition undertook a Truck Parking Initiative that aimed to address overnight truck parking issues through sustainable solutions. The report recognized truck parking as a "multifaceted" problem, which not only affects the safety of all road users but also impacts the capacity of available truck parking facilities and, ultimately, the overall efficiency of goods movement. Important takeaways from the I-95 Corridor Coalition Truck Parking Initiative for Maryland include:

[22] I-95 Corridor Coalition-Beyond Boundaries. https://i95coalition.org/the-coalition-2/

- Regulatory changes such as HOS, growth in the demand for goods due to a growing population, and the application of just-in-time delivery practices in supply chains as leading to an increase in the demand for long-term and overnight truck parking.
- Most of the truck parking facilities along the I-95 are over capacity.
- Truck parking issues often span multiple states and affect both public and private operations. Therefore, truck parking shortages should be addressed through innovative solutions involving multiple partners from both the public and private sectors.
- The Real-Time Information Dissemination System implemented, because of the Truck Parking Initiative, aimed to provide truck drivers with live information about the availability of truck parking spaces. Additionally, Maryland was a part of the I-95 truck parking real-time information dissemination effort though the State did not move forward with full deployment due to issues with cost.

4.6. OBSERVATIONS OF TRUCK PARKING PROBLEMS IN MARYLAND

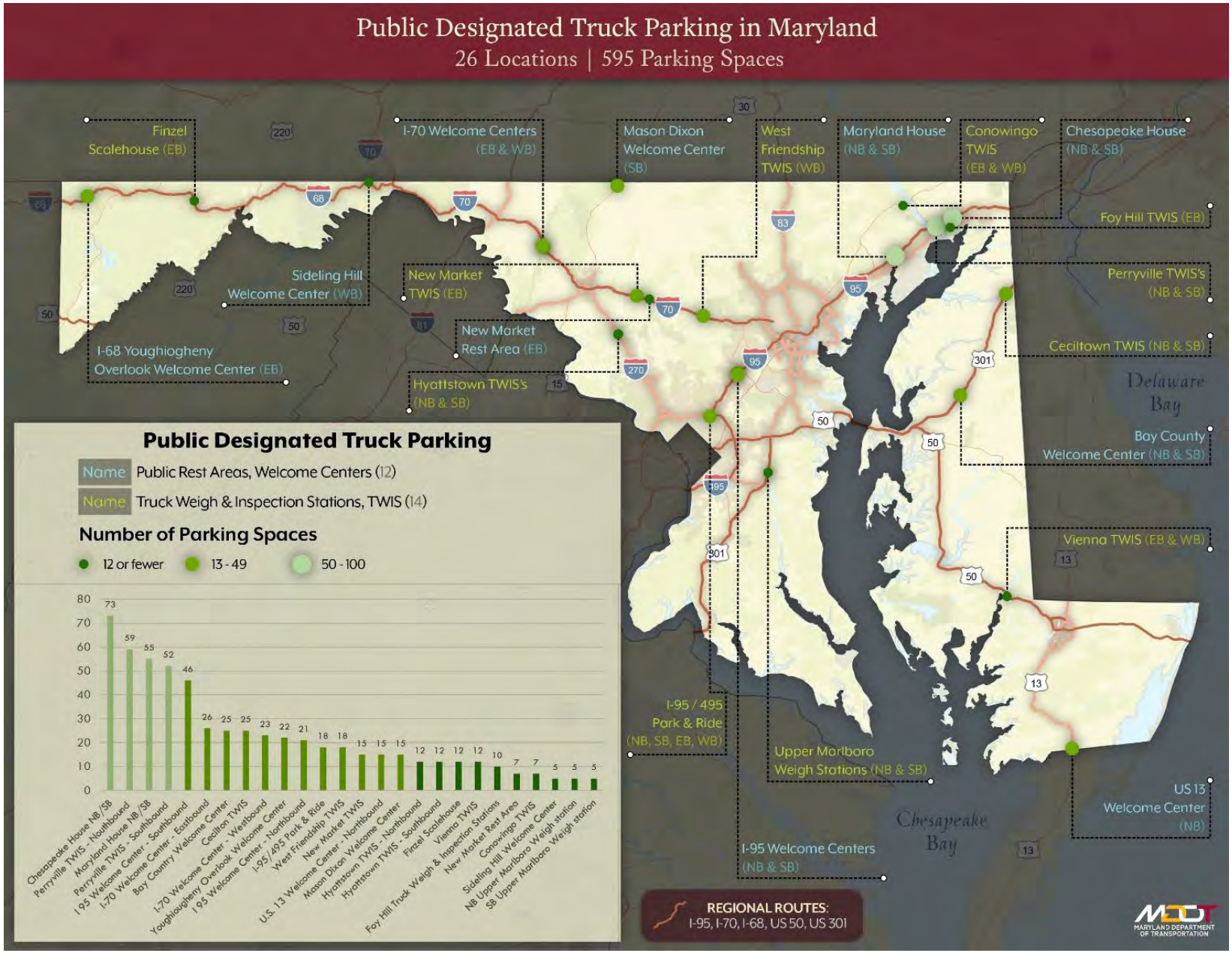
According to the Maryland Annual Overnight Truck Parking Survey, the top five corridors with the highest number of parked trucks are I-95, I-70, US 301, I-68, and I-83. With I-95 indicating a significantly higher number of trucks parked along the corridor, shown in Figure 4-8,truck drivers often have a difficult time finding safe spaces to park overnight in Maryland. In 2017, an average of 702 trucks parked overnight in Maryland, at or near the Maryland Truck Route system.

Maryland's total number of truck parking spaces per 100,000 truck VMT is relatively low compared to neighboring states. However, MDOT provides more of the truck parking spaces in the State compared to private supply of truck parking spaces, than the national ratio (Maryland provides a ratio of 5.2 public spaces whereas the national average is 7.5).

Maryland was frequently cited as having a shortage of safe truck parking in the 2015 Jason's Law Survey, ranking fifth and 13th according to drivers from the Owner-Operator Independent Drivers Association and the American Trucking Association, respectively.

The findings of the synthesis of existing studies, data collection, and initiatives will serve as a validation point and inform the identification of truck parking issues and needs throughout the State.

Figure 4-8: Public Designated Parking



5. TRUCK PARKING INVENTORY AND AVAILABILITY

5.1. PUBLIC TRUCK PARKING FACILITIES

Public truck parking facilities are classified into two types: rest areas and Truck Weight and Inspection Stations (TWIS) locations to reflect the primary purpose of the facility and the hours that trucks are allowed to park on-site. Rest areas include travel plazas, welcome centers, and truck rest areas. As shown in Figure 5-2, with the exception of the Mason Dixon Welcome Center, all rest areas allow trucks to park at the facility during the day and overnight. Figure 5-1 displays the public parking facilities and available spaces on a map.

Conversely, TWIS locations are used during the day to conduct inspections and enforce state and federal safety, size, and weight requirements. Therefore, with the exception of the Perryville TWIS, trucks are allowed to park at TWIS locations from 7pm to 7am. TWIS locations offer restrooms on-site, whereas public rest areas offer restrooms and additional amenities such as vending machines. The Maryland House and Chesapeake House Travel Plazas offer restrooms and amenities such as hot food services, convenience stores and fuel.

Maryland has 26 public truck parking facilities that provide a total of 595 truck parking spaces. Maryland's public truck parking facilities are split between 12 public rest areas and 14 TWIS locations. Although there are more TWIS locations, rest areas provide 56 percent of truck parking spaces and the majority allow truck parking all day. Additionally, not all truck parking facilities can be accessed by both directions of travel, for example, some facilities are on one side of a divided highway. Therefore, the direction(s) that can access a facility is listed after the name of the facility based on whether a truck would have to pass the facility and backtrack to reach the access point. The access point of a facility can affect utilization, depending on truck traffic, origin, destination, and the driver's remaining drive or on-duty time.

Almost 55 percent of the spaces at public truck parking facilities are located along or accessible via I-95. I-70 has the second-highest proportion of the public truck parking spaces with 15 percent, and US 301 has the third-highest proportion with about 10 percent of the public truck parking spaces.

Figure 5-1: Public Designated Parking

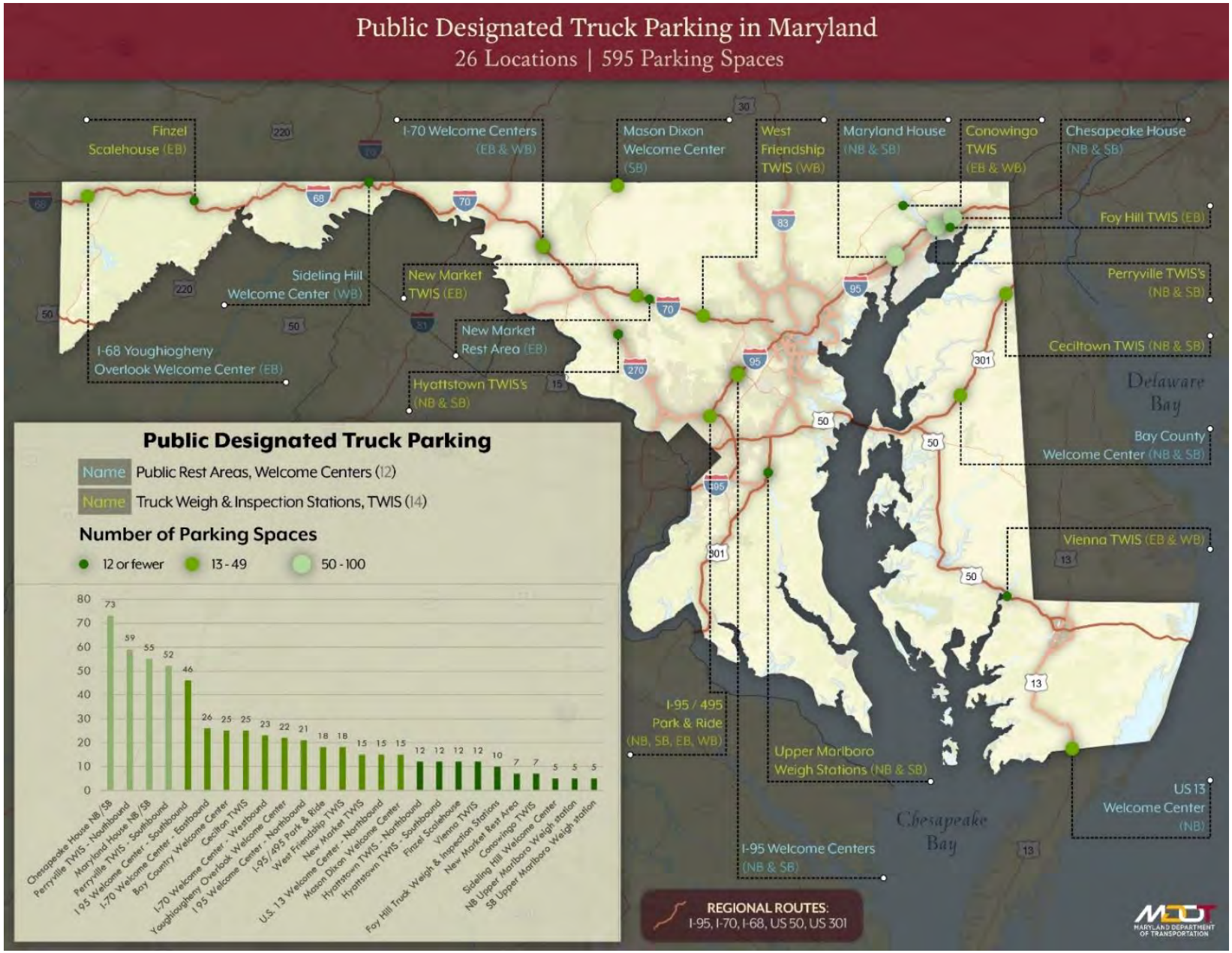


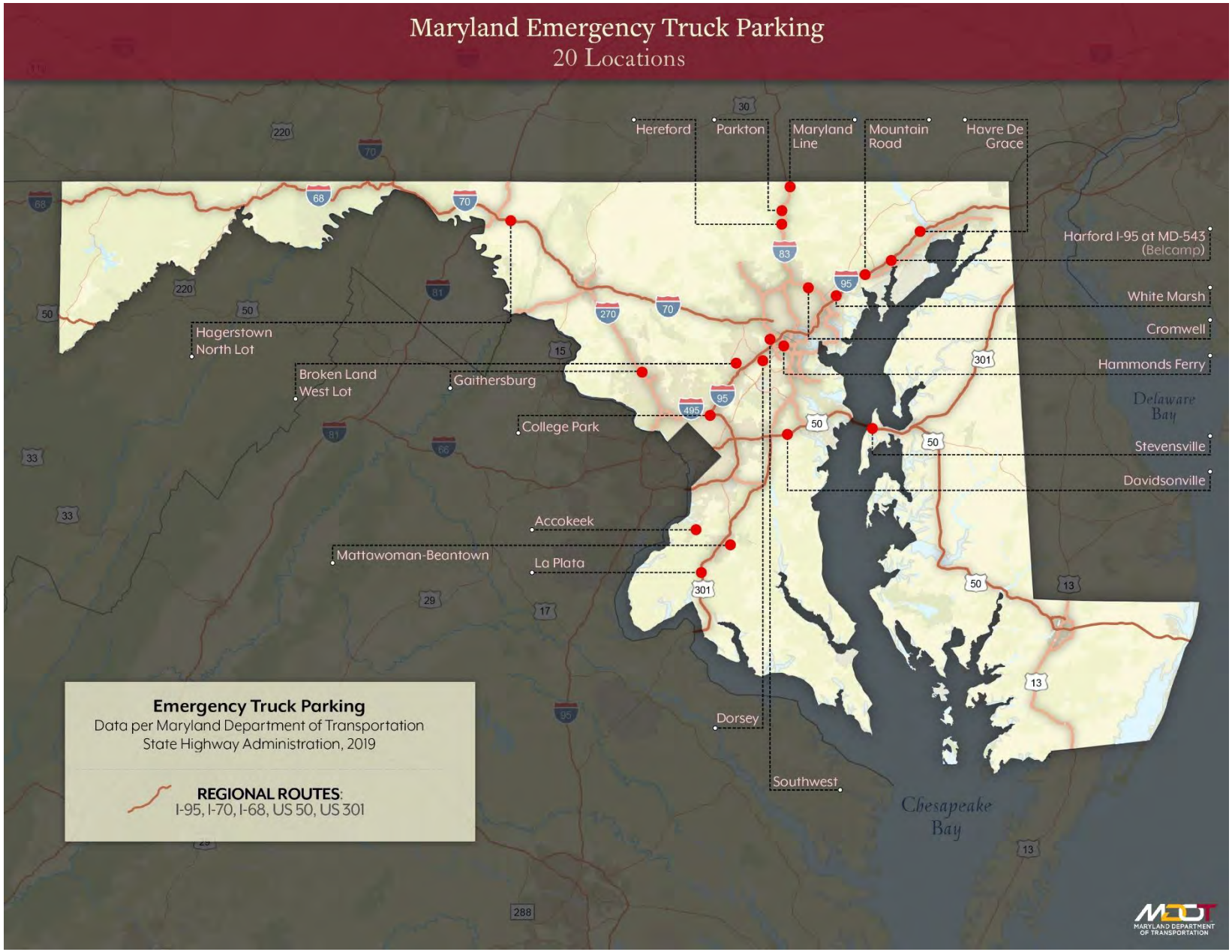
Figure 5-2: Public Truck Parking Facilities and Available Spaces

	Public Parking Name (Access Point)	Route	City	Hours Trucks Allowed to Park	Truck Parking Spaces
Public Rest Areas	Youghiogheny Overlook Welcome Center (EB)	I-68	Friendsville	24 hours	22
	Sideling Hill Welcome Center (WB)	I-68	Hancock	24 hours	5
	New Market Rest Area (EB)	I-70	Mount Airy	24 hours	7
	I-70 Welcome Center (WB)	I-70	Myersville	24 hours	23
	I-70 Welcome Center (EB)	I-70	Myersville	24 hours	26
	Maryland House Travel Plaza (NB/SB)	I-95	Aberdeen	24 hours	55
	I-95 Welcome Center (SB)	I-95	Savage	24 hours	46
	I-95 Welcome Center (NB)	I-95	Savage	24 hours	21
	Chesapeake House Travel Plaza (NB/SB)	I-95	North East	24 hours	73
	U.S. 13 Welcome Center (NB)	US 13	Pocomoke City	24 hours	15
	Mason Dixon Welcome Center (SB)	US 15	Emmitsburg	7pm to 7am	15
	Bay Country Welcome Center (NB/SB)	US 301	Centreville	24 hours	25
				Rest Areas Subtotal	333
Truck Weigh and Inspection Stations	Finzel TWIS (EB)	I-68	Frostburg	7pm to 7am	12
	New Market TWIS (EB)	I-70	Monrovia	7pm to 7am	15
	West Friendship TWIS (WB)	I-70	West Friendship	7pm to 7am	18
	Perryville TWIS (NB)	I-95	Perryville	24 hours	59
	Perryville TWIS (SB)	I-95	Perryville	24 hours	52
	Hyattstown TWIS (NB)	I-270	Clarksburg	7pm to 7am	12
	Hyattstown TWIS (SB)	I-270	Clarksburg	7pm to 7am	12
	I-95/495 Park & Ride (All Directions)	I-495/ I-95	Adelphi	7pm to 7am	18
	Conowingo TWIS (EB/WB)	US 1	Darlington	7pm to 7am	7
	Foy Hill TWIS (EB)	US 40	Perryville	7pm to 7am	10
	Vienna TWIS (EB/WB)	US 50	Delmar	7pm to 7am	12
	NB Upper Marlboro TWIS (NB)	US 301	Upper Marlboro	7pm to 7am	5
	SB Upper Marlboro TWIS (SB)	US 301	Upper Marlboro	7pm to 7am	5
	Cecilton TWIS (NB/SB)	US 301	Warwick	7pm to 7am	25
				Truck Weight & Inspection Stations Subtotal	262
				Statewide Total Public Spaces	595

5.1.1 EMERGENCY TRUCK PARKING

In addition to the parking spaces provided at public truck parking facilities, MDOT provides spaces for emergency truck parking at commuter parking lots and park-and-ride facilities. The location of these facilities can be seen in Figure 5-3. The emergency truck parking spaces become available in severe weather conditions, such as snowstorms, to provide a safe location for trucks to park and reduce the number of drivers parking at undesignated locations, such as highway ramps. Emergency truck parking also removes trucks from the sides of roads and reduces the chance they get stuck on a roadway, both of which aid in efficient snow removal. Truck drivers can access information about the availability of these parking locations through Maryland's Emergency Truck Parking Portal.

Figure 5-3: Emergency Truck Parking



5.2. PRIVATE TRUCK PARKING FACILITIES

Identifying the location and counting the truck parking spaces at private truck parking facilities is critical to fully understanding the supply of truck parking. MDOT used a variety of sources to identify truck parking spaces in Maryland, including the Maryland Annual Overnight Truck Parking Study, Trucker Path, INRIX truck GPS data, satellite images, and desktop research. For this study, the total number of private truck parking does not count informal truck parking in locations, such as vacant lots. MDOT did not include retail locations in the count of truck parking facilities due to the variation and potential for changes in store policy concerning truck parking. Generally, retail parking lots are not marked for truck parking and would likely overinflate the total number of truck parking spaces with temporary or dynamic locations.

Figure 5-4 displays a list of Private truck parking facilities by the name, milepost, and route number of the nearest major corridor, the brand of the truck parking location, and the number of truck parking spaces and Figure 5-5 displays the private truck parking facilities and truck parking spaces available by location in a map. Maryland has 27 private truck parking facilities with a total of 2,307 truck parking spaces. Over 53 percent of the private truck parking spaces are located along I-95, Maryland's top significant regional truck route. The I-81 corridor is the second significant regional truck route and has the second-highest proportion of private truck parking spaces with m 17 percent.

Figure 5-4: Private Truck Parking Facilities

Name	Milepost	Route	City	Company	Spaces
Liberty—Keysers Ridge	14	I-68	Keysers Ridge	Liberty	19
Pilot Travel Center #408	22	I-68	Grantsville	Pilot	80
Sunoco—Grantsville #151	22	I-68	Grantsville	Sunoco	40
Love's Cumberland #537	47	I-68	Cumberland	Loves	90
Exxon—Little Orleans	68	I-68	Little Orleans	Exxon	15
				I-68 Subtotal	244
Liberty—Hancock	3	I-70	Hancock	Liberty	90
Exxon—Big Pool	12	I-70	Big Pool	Exxon	7
Pilot Travel Center #150	24	I-70	Hagerstown	Pilot	90
				I-70 Subtotal	187
Exxon—Hagerstown	5	I-81	Hagerstown	Exxon	173
Pilot Travel Center #179	5	I-81	Hagerstown	Pilot	90
Bowman Secure Truck Lot	5	I-81	Hagerstown	DM Bowman	50
Love's Hagerstown #682	10	I-81	Hagerstown	Loves	84
				I-81 Subtotal	397
TA Baltimore South	41	I-95	Jessup	TA	436
TA Baltimore #216	57	I-95	Baltimore	TA	181
Pilot Travel Center #290	93	I-95	Perryville	Pilot	50
Flying J Travel Center #784	100	I-95	North East	Flying J	185

Name	Milepost	Route	City	Company	Spaces
TA Elkton #19	109	I-95	Elkton	TA	151
Flying J Travel Center #875	109	I-95	Elkton	Flying J	230
				I-95 Subtotal	1,233
New Transit—Millersville	10	I-97	Millersville	Transit Truck Stop	60
				I-97 Subtotal	60
Exxon—Denton	15	MD 404	Denton	Exxon	14
				MD 404 Subtotal	14
Sunoco—Mechanicsville	239	MD 5	Mechanicsville	Sunoco	3
				MD 5 Subtotal	3
7-Eleven—Thurmont	28	US 15	Thurmont	7-11	18
				US 15 Subtotal	18
White Marsh Truck Stop	182	US 40	White Marsh	White Marsh	18
Sunoco—Aberdeen	198	US 40	Aberdeen	Sunoco	20
				US 40 Subtotal	38
WAWA—Annapolis	29	US 50	Annapolis	WAWA	3
				US 50 Subtotal	3
Citgo—Newburg	3	US 301	Newburg	Citgo	50
Trailway Truck Terminal	92	US 301	Centreville	Trailway	60
				US 301 Subtotal	110
				Total Private Truck Parking Spaces	2,307

Figure 5-5: Private Designated Parking

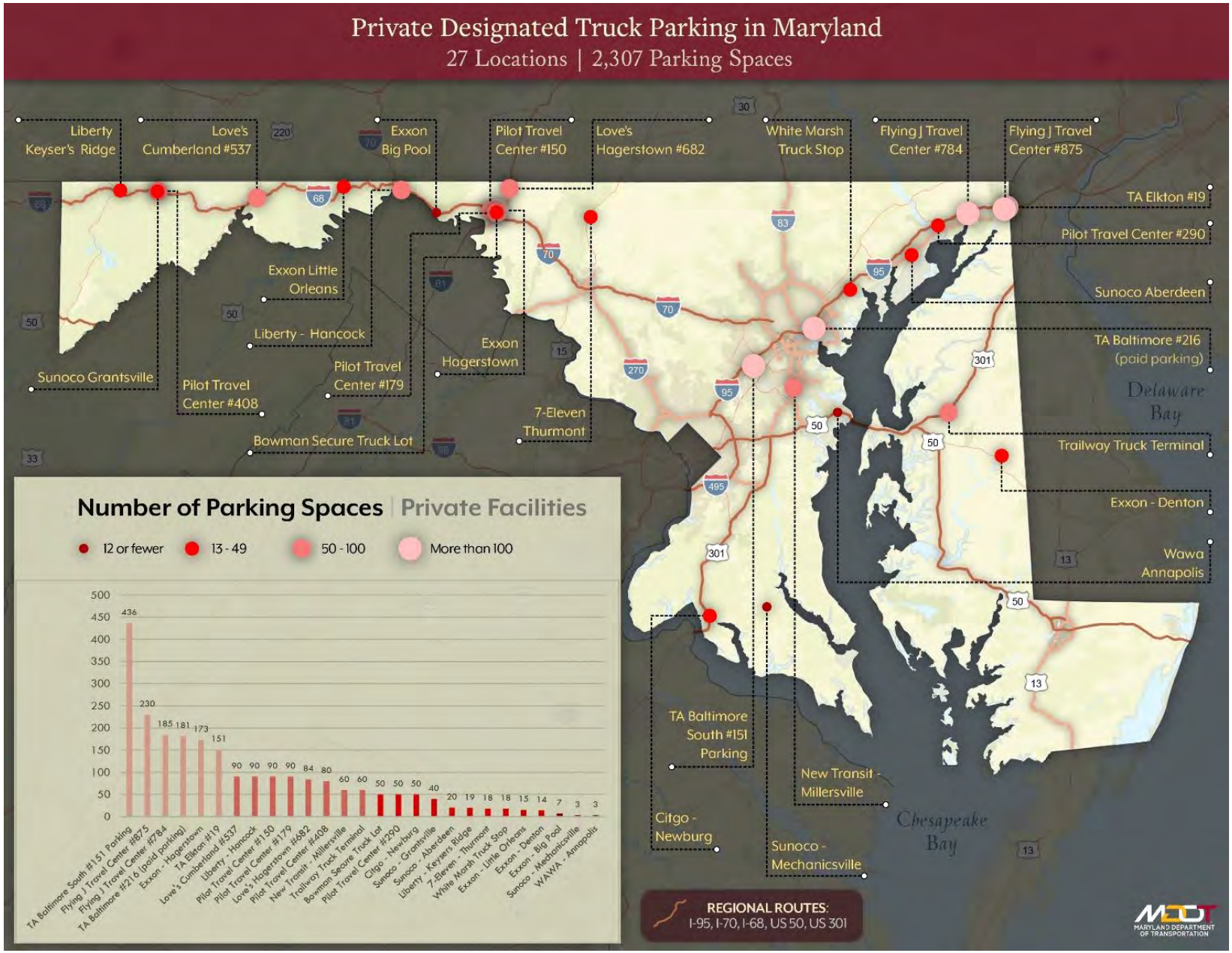


Figure 5-6 displays the proportion of truck parking spaces according to the company or brand displayed on the facility's signage. In some cases, the company advertised is the brand of fuel or reflects that the location is independently owned. The top three companies providing the largest proportion of truck parking in Maryland are as follows:

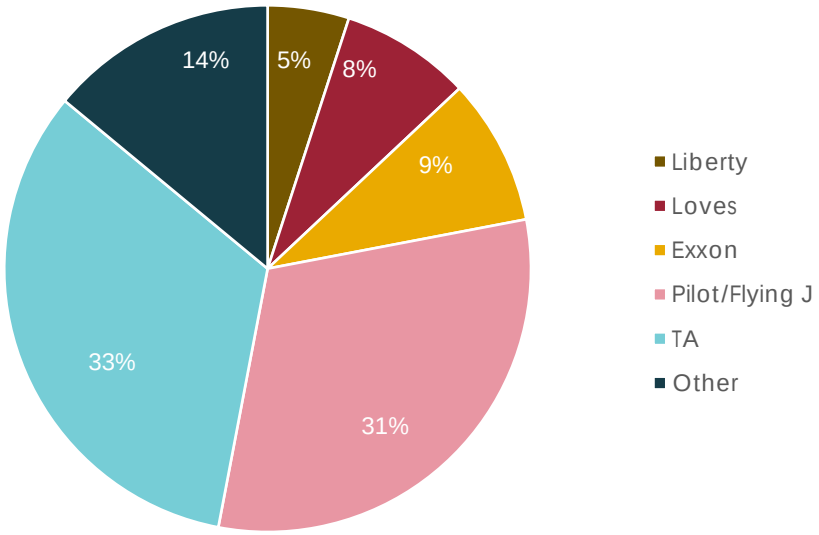
1. TA—TA provides the largest proportion of private truck parking spaces in Maryland with 33 percent or 768 spaces at three facilities, resulting in an average of 256 truck parking spaces per location.

2. Pilot/Flying J—Pilot and Flying J have individual brands but are owned by one company following Pilot's buy-out of Flying J facilities in 2010. In total, Pilot/Flying J provide 31 percent or 725 truck parking spaces at six facilities, resulting in an average of almost 121 truck parking spaces per location.

3. Exxon—Truck parking facilities using Exxon branding provide 9 percent or 209 truck parking spaces at four facilities, resulting in an average of about 52 truck parking spaces per location.

As shown in Figure 5-6, the three companies with the largest number of truck parking spaces provide about 74 percent (1,702 spaces) of all private truck parking spaces at 13 facilities (131 spaces per location on average). For comparison, MDOT provides 595 truck parking spaces at 26 facilities or almost 23 spaces per location.

Figure 5-6: Proportion of Private Truck Parking Spaces by Company[23]



Source: MDOT, Trucker Path, Google Earth, Park My Truck, and Truck Stop Website Data.

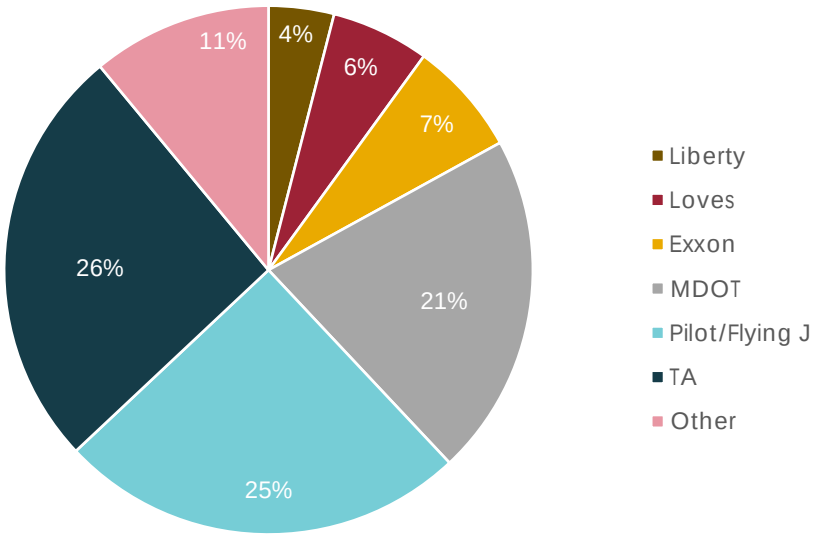
[23] Other encompasses the remainder of spaces operated by many different companies/operators not shown in Figure 5-6.

5.3. OVERVIEW OF TRUCK PARKING SUPPLY IN MARYLAND

Maryland has a total of 2,902 truck spaces located at 53 truck parking facilities. Similar to the findings of the 2015 Jason's Law Report, the private sector provides about 3.9 truck parking spaces for every public truck parking space. Although there are more private truck parking spaces than public spaces, as was the case in the 2015 Jason's Law Report, MDOT provides comparatively larger number of public truck parking spaces relative to private truck parking spaces than the US on average.

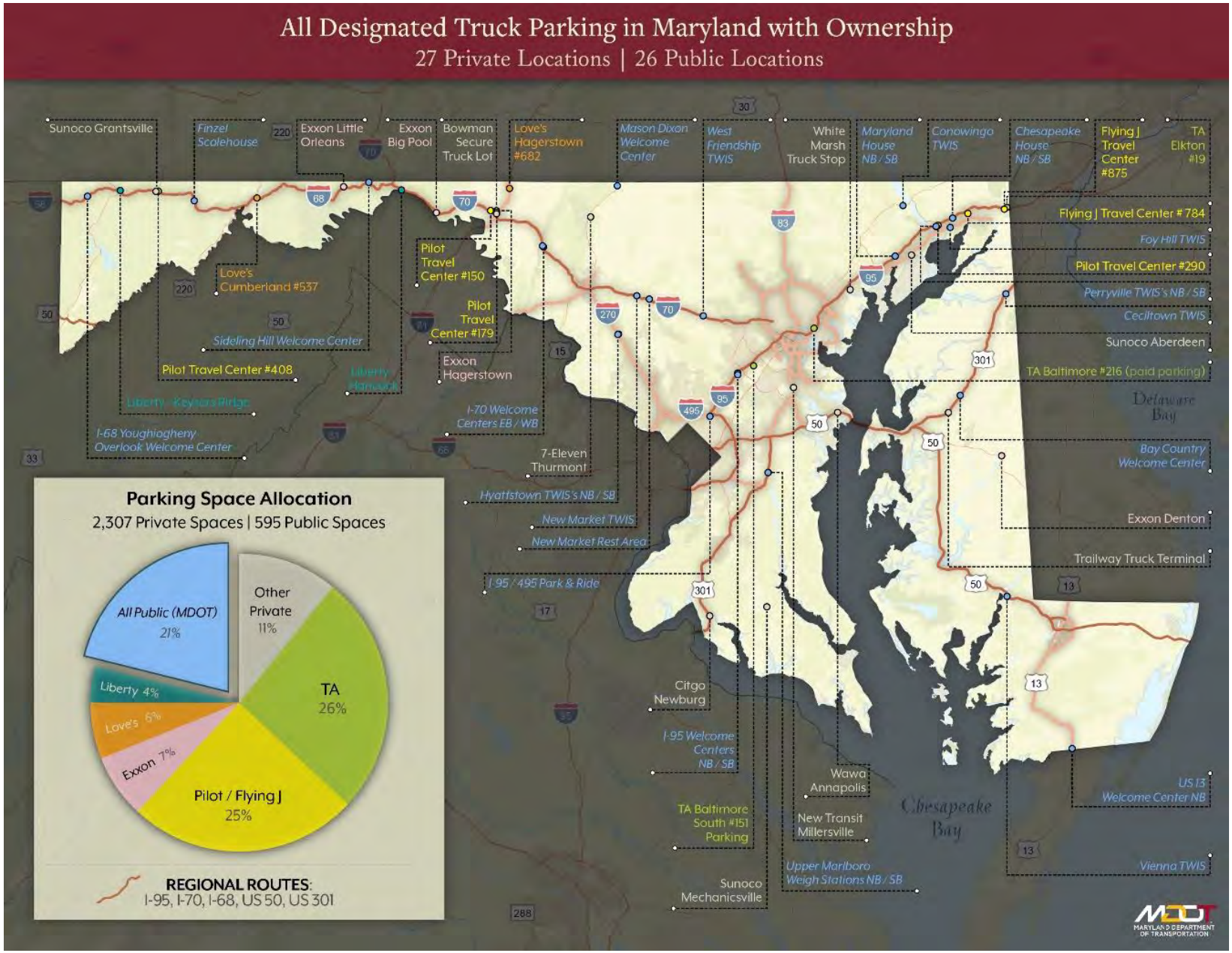
Figure 5-7 displays the proportion of total truck parking spaces by brand or operator, including MDOT facilities and Figure 5-12 displays the locations of private truck provided facilities, color coded by ownership. After TA (26 percent) and Pilot/Flying J (25 percent), MDOT provides the third-most truck parking spaces statewide (21 percent). Figure 5-8 shows this same ownership information in a map.

Figure 5-7: Proportion of Total Truck Parking Spaces by Company/Operator



Source: MDOT, Trucker Path, Google Earth, Park My Truck, and Truck Stop Website Data.

Figure 5-8: Public and Private Designated Parking with Ownership



Analysis of the distribution of truck parking by corridor demonstrates that the majority of truck parking spaces are along Maryland's most heavily trafficked freight corridors (Figure 5-9). Specifically, I-95, I-70, and I-68 have the highest daily truck VMT, collectively accounting for 50 percent of daily truck VMT on the NHS and over 72 percent of truck parking spaces.[24] The average daily truck VMT per mile, in Figure 5-9 displays the concentration of truck traffic. In addition to I-95 and I-81, I-70 and I-495 are notable for the high average daily truck VMT per mile, but limited truck parking compared to other truck corridors due to a variety of truck parking needs such as land use constraints and staging.

[24] Truck VMT on the NHS was calculated using the 2017 Highway Performance Monitoring System (HPMS) data.

Figure 5-9: Truck Parking Spaces and Vehicle Miles Traveled by Corridor

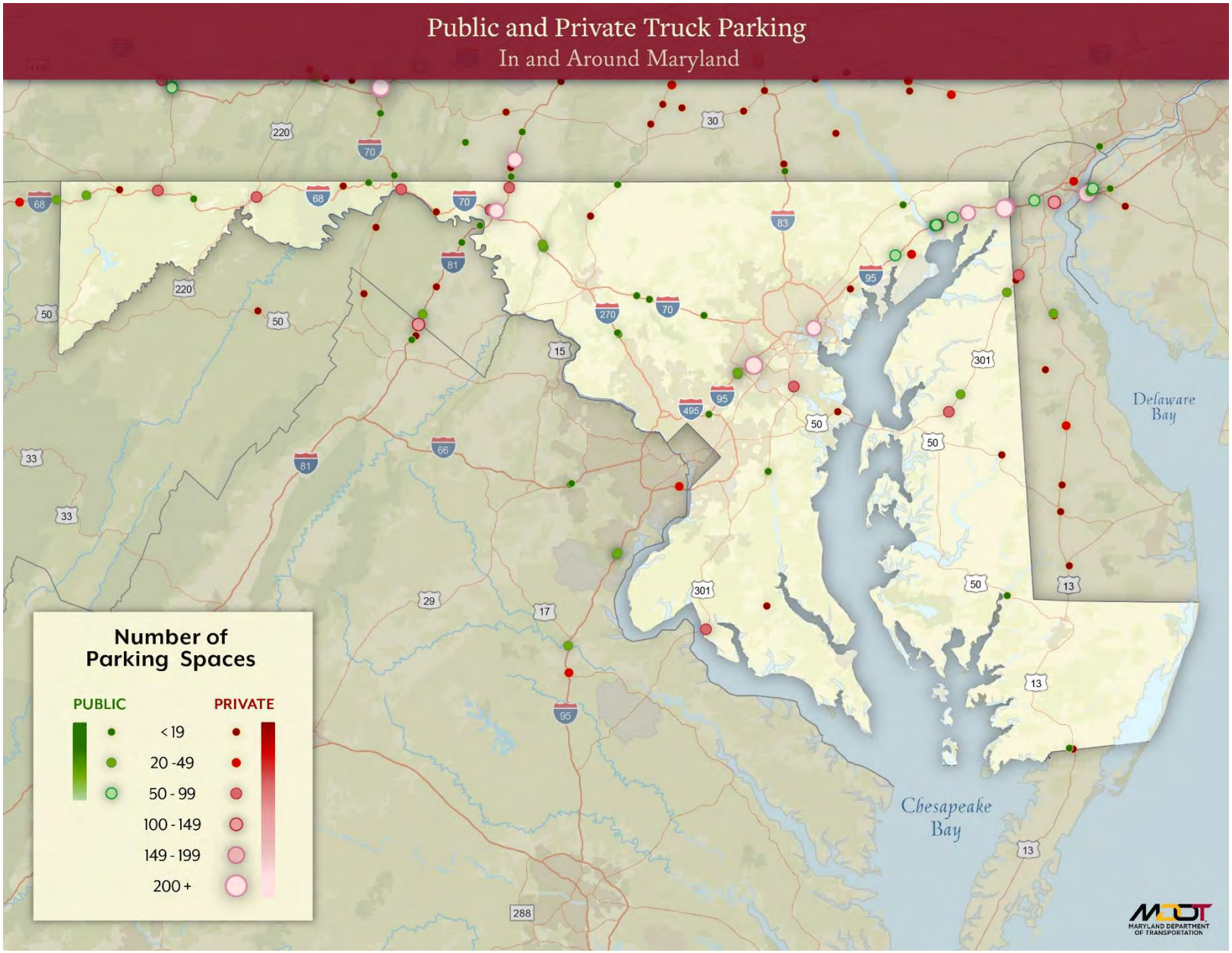
Route	Miles	Number of Facilities	Proportion of Total Facilities	Number of Spaces	Proportion of Total Spaces	Daily Truck VMT (Thousands)	Proportion of Daily Truck VMT on the NHS	Average Daily Truck VMT per Mile (Thousands)
I-95	109	12	22.6%	1,539	53.0%	1,252	29.8%	11.5
I-70	94	8	15.1%	276	9.5%	601	14.3%	6.4
I-68	81	8	9.4%	283	9.8%	249	5.9%	3.1
US 50	117	2	3.8%	15	0.5%	202	4.8%	1.7
I-81	12	4	7.5%	397	13.7%	181	4.3%	15.1
US 301	90	6	11.3%	170	5.9%	150	3.6%	1.7
I-270	33	2	3.8%	24	0.8%	123	2.9%	3.7
I-495/I-95	16	1	1.9%	18	0.6%	96	2.3%	6.0
US 15	37	2	3.8%	33	1.1%	69	1.6%	1.9
I-97	18	1	1.9%	60	2.1%	66	1.6%	3.7
US 13	42	1	1.9%	15	0.5%	57	1.4%	1.4
US 40	82	3	5.7%	48	1.7%	51	1.2%	0.6
MD 5	34	1	1.9%	3	0.1%	27	0.6%	0.8
MD 404	24	1	1.9%	14	0.5%	23	0.5%	1.0
US 1	81	1	1.9%	7	0.2%	21	0.5%	0.3
Total	868	53	100%	2,902	100%	3,168	75%	3.6

Source: MDOT, HPMS, Trucker Path, Google Earth, Park My Truck, and Truck Stop Website Data.

Figure 5-10 displays the public (green) and private (purple) truck parking facilities in Maryland and within 25 miles of the Maryland state border. Adding truck parking facilities around Maryland illustrates the value of assessing truck parking statewide and at a multi-state corridor level. There are over 2,800 public and private truck parking spaces within 25 miles of Maryland, nearly as many spaces as there are within Maryland. This underscores the fact that truck parking is a multistate issue, as well as a public/private concern.

Truck parking gaps are apparent in Figure 5-10 which displays the lack of truck parking on I-83 between Baltimore City and the Maryland/Pennsylvania state line, as well as Maryland's Eastern Shore between Maryland/Delaware and Virginia state lines. Comparing the locations of public to private truck parking facilities demonstrates how public truck parking facilities are often the only facilities along long stretches of major truck corridors, for example, I-70 from Baltimore to Hagerstown. This section of I-70 was highlighted during the focus group meeting with the truck drivers as a significant need and gap area in truck parking facilities.

Figure 5-10: Public and Private Truck Parking in Maryland and within 25 miles of the State



5.4. ASSESSING THE AVAILABILITY OF TRUCK PARKING

Going a step beyond the supply of truck parking spaces, the availability of truck parking identifies the relationship between truck parking supply and demand. The assessment of truck parking availability is combined with undesignated truck parking to identify if trucks parking in undesignated areas could be rerouted to a public or private truck parking or if capacity needs to be added.

5.4.1 CROWDSOURCED TRUCK PARKING DATA

MDOT commissioned CPCS to use data from Trucker Path, a truck parking application that crowdsources information about the availability of truck parking spaces, to identify how the availability of truck parking differs throughout the State at different times of the day. Trucker Path is used by over one million users to find truck parking and report the availability of truck parking spaces for other users of the application. Trucker Path collects information about the availability of truck parking by prompting users to respond if a truck parking facility has "lots," "some," or if it is "full" when a user's phone is located near the truck parking facility. MDOT received over one year of data (2018 – 2019) from Trucker Path to complete this study.

The truck parking availability updates submitted by users were transformed from a single point in time to a continuous data set covering a full year of data. The year of data was split into 30-minute time bins that could be assigned one of four statuses, lots, some, full, or no value, depending on when the last update to the facility was submitted and what status was submitted. No value was assigned if more than three hours elapsed since the last update to a facility's truck parking availability.

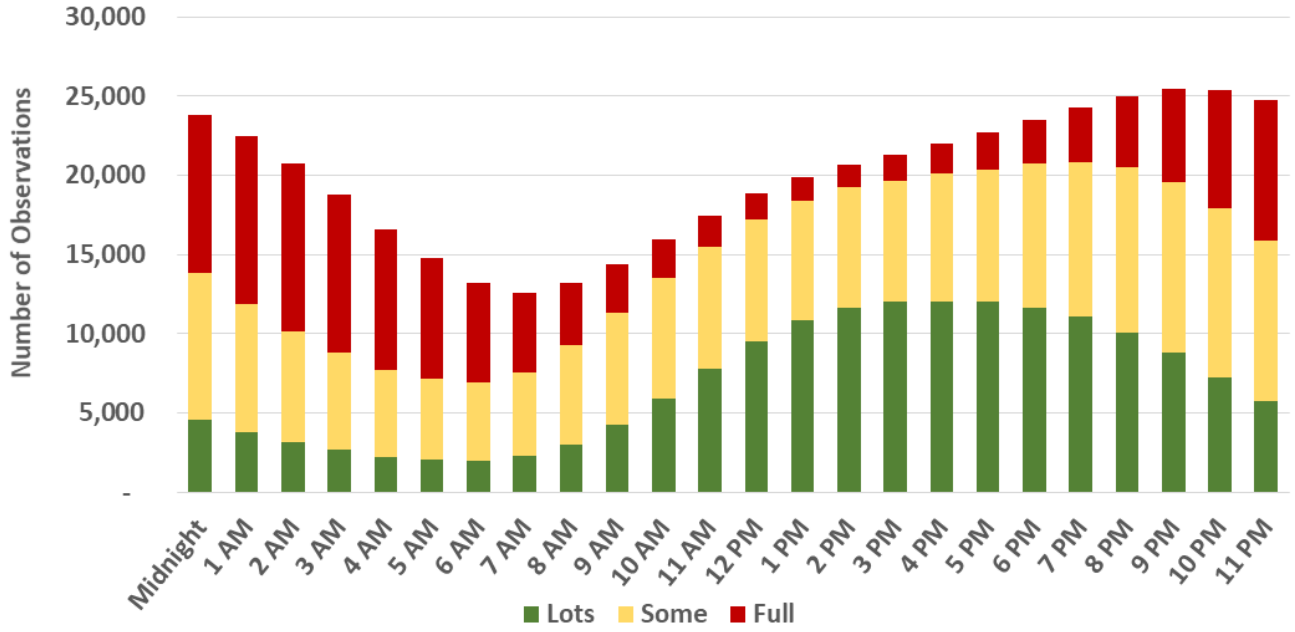
The data are limited to the truck parking facilities included in Trucker Path and the frequency of updates to the truck parking status. Therefore, MDOT was unable to identify the utilization for truck parking at facilities not included in the Trucker Path app and facilities with an insufficient number of truck parking availability updates. Maryland facilities not included in the Trucker Path application include weigh stations, Sideling Hill, and the DM Bowman facility. The continuous data set was then mapped and analyzed to identify how the availability of truck parking changes during the day and if the availability suggests that there is a need for truck parking capacity or information.

5.5. TRUCK PARKING AVAILABILITY BY TIME OF DAY

Data from the Trucker Path application displays the observed number of times that truck parking facilities in Maryland had a status of lots, some, or full during the year as shown in Figure 5-11. The total number of responses provides insight into when trucks are looking for and/or finding truck parking because Trucker Path users cannot enter information into the app unless they are within one and a half miles of the truck parking facility. Based on the Trucker Path data, most trucks look

for truck parking in the early evening, with 8pm through 11pm displaying the highest number of observations.

Figure 5-11: Reported Truck Parking Availability by Time of Day



Source: Trucker Path Data.

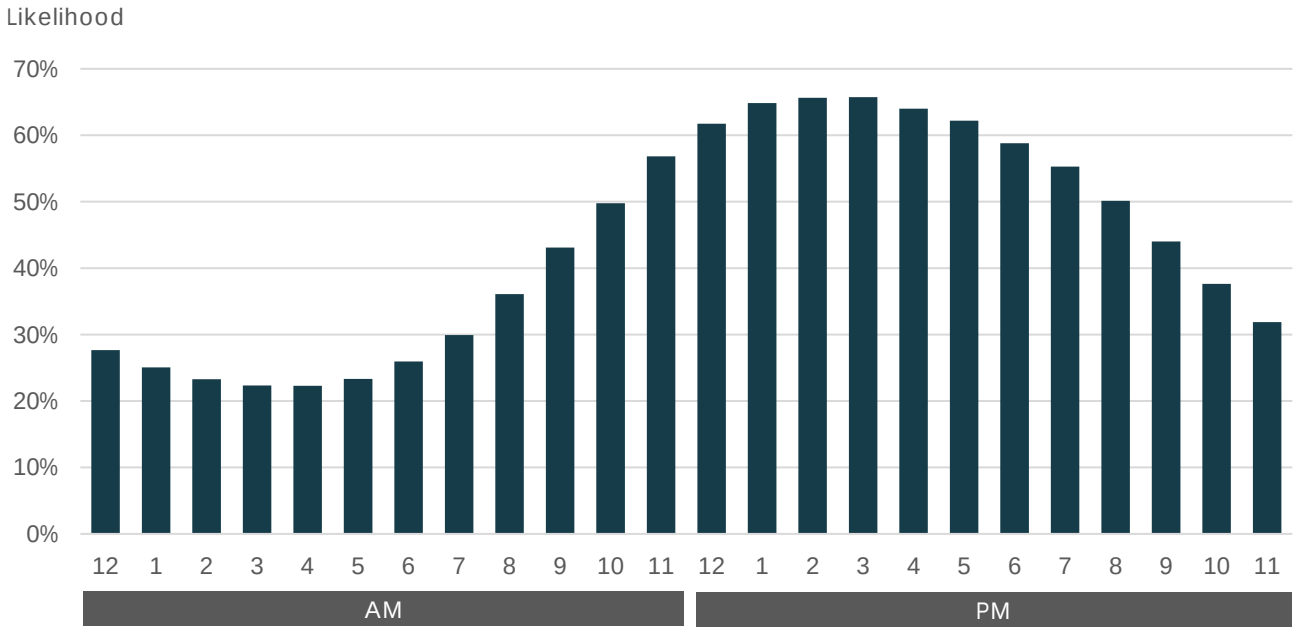
Similarly, the relative proportion of full observations provides insight into when truck parking is most difficult to find. In general, public truck parking facilities have a lower availability compared to private facilities, especially during the early morning and morning hours. The proportion of full observations for all locations peak between 3am and 4am, at about 53 percent. After 5am, truck parking availability increases until 2pm when facilities begin to fill up as shown in Figure 5-12.

Weighing the likelihood of finding a truck parking space according to the number of spaces at a truck parking facility takes into account the difference in the number of spaces between public and private truck parking facilities. Therefore, facilities with more truck parking spaces are generally private and must be reserved for a fee. Since many truckers are not guaranteed reimbursement from their company, the

Statewide, the likelihood of finding truck parking from 1am to 5am is 22 to 25 percent. This means that if a truck driver pulls into a truck parking location in Maryland from 1am to 5am, there is only a 22 to 25 percent chance they will find truck parking. Additionally, the likelihood of finding truck parking displayed in Figure 5-12 includes weekends, so the likelihood of finding truck parking during weekdays would be lower. Overall, truck drivers face considerable uncertainty when looking for truck parking in Maryland, especially along Maryland's most heavily used corridors and in the early morning.

preference for free parking options create a greater impact on the expected public truck parking availability in Maryland.

Figure 5-12: Likelihood of Finding Available Truck Parking in Maryland by Time of Day



Source: Trucker Path Data.

5.6. LIKELIHOOD OF FINDING AVAILABLE TRUCK PARKING

The likelihood of finding truck parking at a facility was calculated by assigning lots, some, and full observations a probability of 100 percent, 20 percent, and 0 percent, respectively. For example, a truck driver entering a site that is reported as having some truck parking available has a 20 percent chance of finding an available truck parking space. This approach accounts for the uncertainty truck driver's face when looking for truck parking.

The probabilities were then weighted by the number of lots, some, and full observations over the year for each time of day to calculate the likelihood of finding available truck parking. Figure 5-13 displays the likelihood a truck driver can find available truck parking throughout Maryland and in the 25 miles surrounding the State. Figure 5-13 was developed by using the likelihood of finding truck parking at public and private truck parking facilities from Trucker Path to create a layer that weighs the likelihood throughout the study area based on distance. Specifically, the closer a truck parking facility is to a specific roadway section, the greater the impact is on the likelihood value shown on that roadway. Figure 5-13 also visualizes truck parking from what a driver is likely to encounter at nearby truck parking facilities along a specific corridor during the period analyzed. Roadways in red have a low likelihood of finding available truck parking at nearby facilities. Conversely, the likelihood of finding available truck parking increases as

roadways change from red to yellow and finally to green. The following observations were identified while completing the analysis shown in Figure 5-13:

- Most truck drivers have a very low likelihood of finding truck parking at a facility in Maryland from 3am to 4am.
- Availability along I-95 is largely limited to two small paid truck parking facilities, one near Alexandria, Virginia and one north of Baltimore, (shown in green and yellow). The two facilities shown in yellow on the northeastern portion of I-95 are the Chesapeake House Travel Plaza (73 truck parking spaces) and Flying J #784 (185 truck parking spaces) in North East, Maryland.
- Truck parking at TWIS locations is not listed in Trucker Path and therefore their availability is not included in the Trucker Path analysis. Stakeholders highlighted a need to promote truck parking at Maryland's TWIS locations and provide information about these facilities. Truck GPS data from INRIX and Maryland's Annual Overnight Truck Parking Surveys indicate that very few trucks use TWIS facilities.

Even though there is a higher chance of finding available truck parking, truck drivers essentially face a coin flip regarding whether there is truck parking at sites shown in yellow. The likelihood of finding truck parking is an average over the entire year, meaning the spaces may be available on weekends, but very limited on weekdays. Comparing the number of trucks parked along surveyed routes on Sunday at 11pm to Tuesday and Wednesday at 11pm in the 2012-2017 Maryland Annual Overnight Truck Parking Survey shows that there are between 18 and 40 percent more trucks parked along the surveyed routes on Tuesday or Wednesday compared to Sunday, suggesting higher demand for overnight truck parking during weekdays.

Figure 5-13: Likelihood of Finding Truck Parking from 3am to 4am

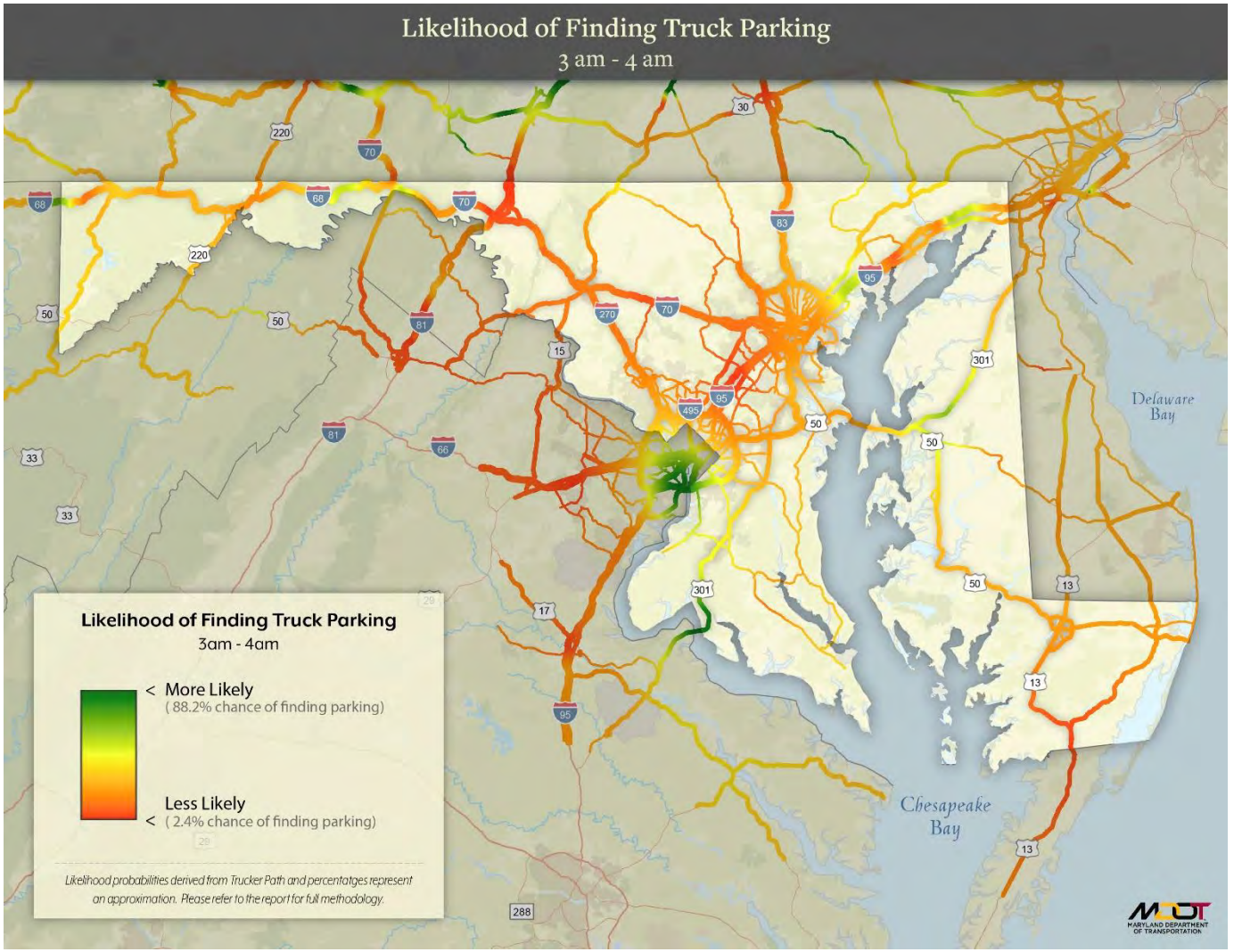
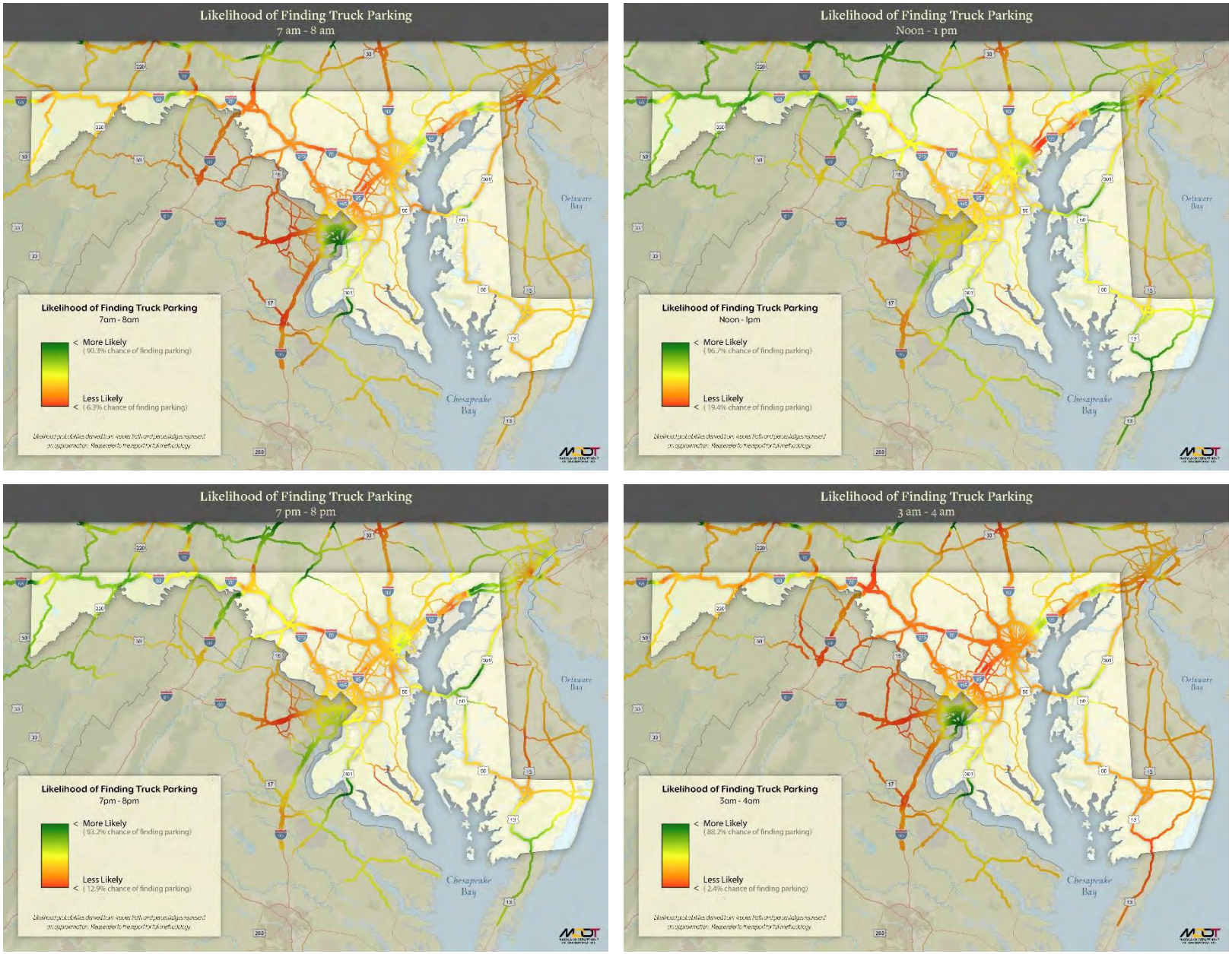


Figure 5-14 displays how the likelihood of finding truck parking changes during the day (full page statewide maps are available in Appendix B). Truck parking availability increases from the morning starting around 5 am until about 2pm when availability starts to decrease. Specifically, I-70, I-270, and I-95 begin to fill first and by midnight, most truck parking in Central Maryland and around Hagerstown are full or have limited availability.

Figure 5-14: Changes in the Likelihood of Finding Truck Parking during the Day



5.7. SUMMARY OF TRUCK PARKING IN MARYLAND

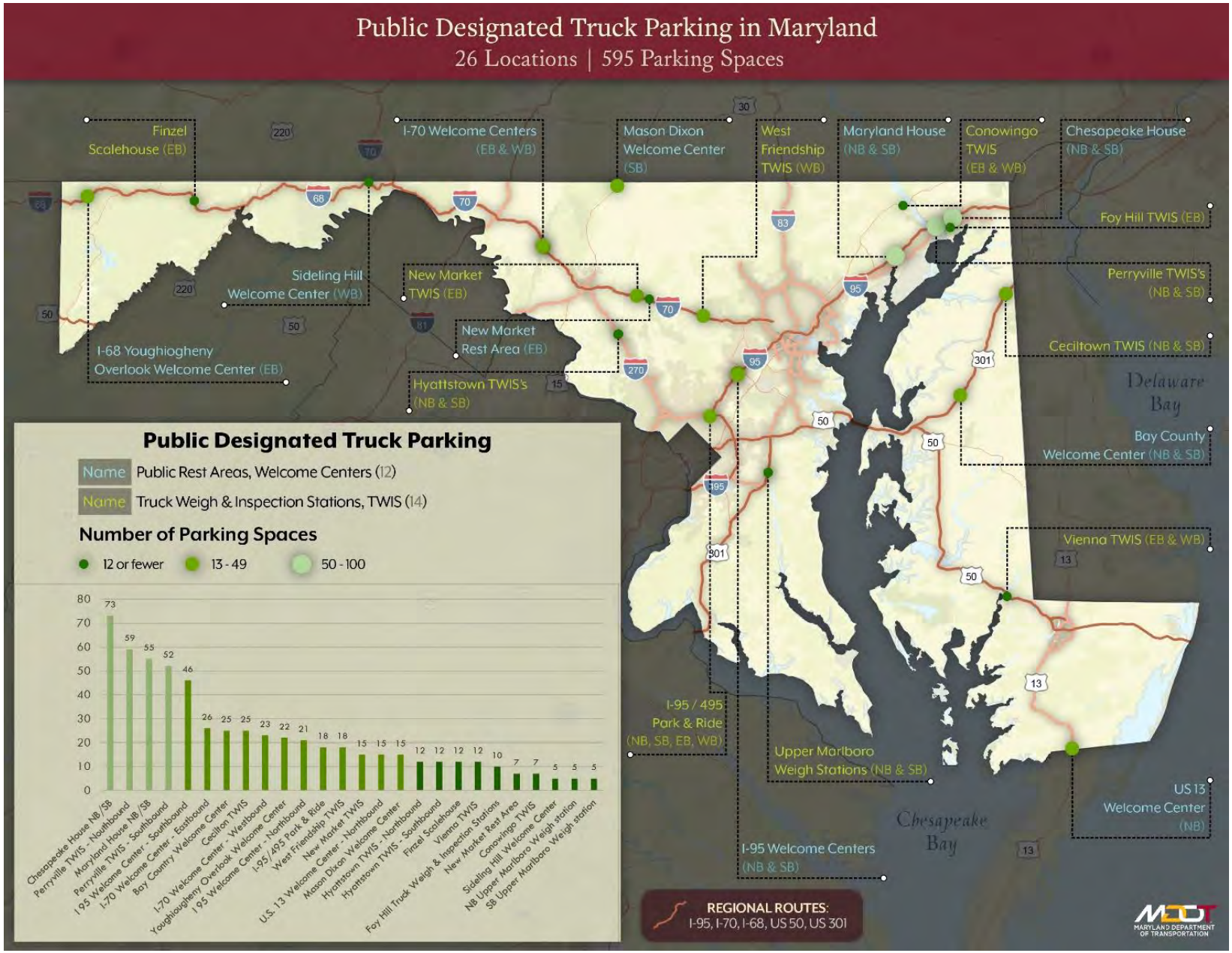
Maryland has 26 public truck parking locations that provide a total of 595 truck parking spaces. Public truck parking facilities are classified into two types:

- Public Rest Areas—There are 12 public rest areas with a total of 333 truck parking spaces. Most rest areas are open 24 hours a day and provide restrooms and vending machines, with travel plazas providing additional amenities.
- TWIS locations—There are 14 TWIS locations that allow truck parking on-site, providing 262 truck parking spaces. Most TWIS locations only allow truck parking from 7pm to 7am and offer amenities limited to restrooms.

The locations of these facilities in Maryland are shown in Figure 5-15.

The assessment of truck parking availability quantitatively shows that the availability of truck parking is lowest in the late evening into the early morning, especially from 1am to 6am. Overall, the analysis of truck parking availability shows that truckers face considerable difficulty and uncertainty when looking for truck parking in Maryland, specifically near metropolitan areas, the most heavily used freight corridors such as I-95, I-81 and I-70 and in the early morning.

Figure 5-15: Public Designated Parking



6. IDENTIFYING AND PRIORITIZING UNDESIGNATED TRUCK PARKING

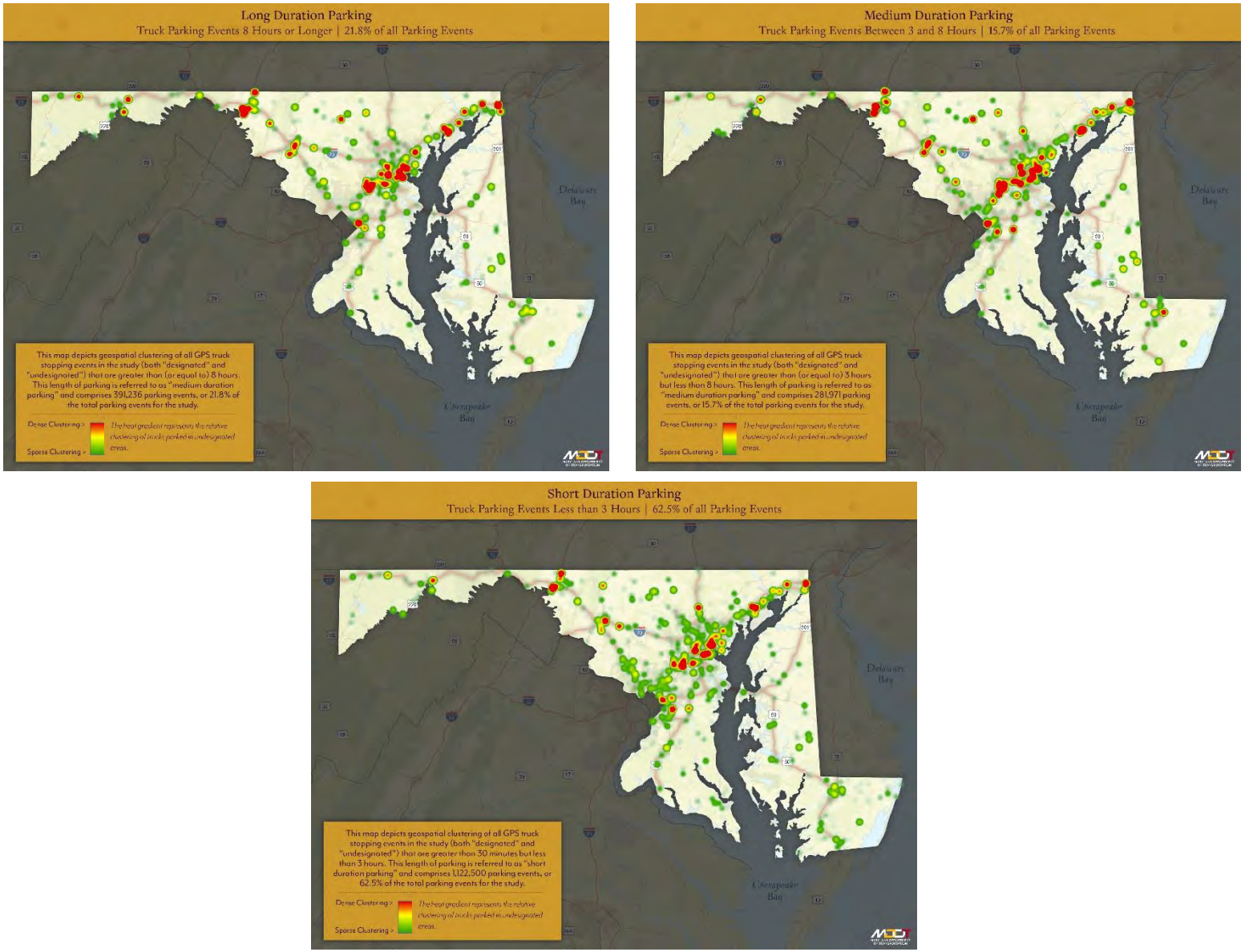
6.1. IDENTIFYING UNDESIGNATED TRUCK PARKING

As the most noticeable indication of a truck parking issue, undesignated truck parking is used to identify and prioritize clusters of undesignated truck parking. MDOT used GPS data from INRIX covering four one-month periods in 2018 (January, April, July, and October) to identify where trucks stopped and then classify the stops as designated or undesignated. Truck GPS data provide a series of waypoints that, when analyzed in sequence, can be used to calculate travel speed, time stopped, location, and stop duration of trucks in Maryland. Overlaying truck GPS data to the Trucker Path analysis provides insight into where trucks park compared to the availability of truck parking nearby.

MDOT used the four months of INRIX data to identify and create a database of 1.9 million stop events for heavy-duty trucks, using 30 minutes as a minimum threshold to classify a stop. Figure 6-1 displays the densest locations of heavy-duty truck stop events in Maryland based on all 1.9 million truck stop events. The substantial freight parking activity is shown by stop events used to create the density map in Figure 6-1 and include both designated (parking in truck parking spaces or at origins/destinations) and undesignated truck parking locations.

In general, heavy-duty trucks are stopped near major freight corridors and in areas with substantial freight activity. For example, the cluster of stop events between Washington, DC and Baltimore coincides with the I-95 near MD 175 area identified in the SGMP as a major freight corridor and the Jessup area with a cluster of distribution centers.

Figure 6-1: Density of all Heavy Duty Truck Stop Events



Source: INRIX data.

Once the truck stop events were identified, the following quantitative screens were used to classify truck stop events as designated or undesignated:

- Identify freight intensive land uses—Parcels with land uses that were likely origins and/or destinations of freight, such as truck terminals, warehousing, manufacturing, retail, truck stops, etc. were identified and trucks stopped within these parcels were classified as making designated stops.
- Identify trucks parked on highway ramps—Stop events occurring within 75 feet of roadway features classified as a ramp were defined as undesignated.
- Classify stop events at public rest areas—Polygons were developed to classify parts of rest areas as designated or undesignated truck parking locations. For example, Figure 6-2 displays a blue polygon for undesignated truck parking and an orange polygon for designated truck parking locations.

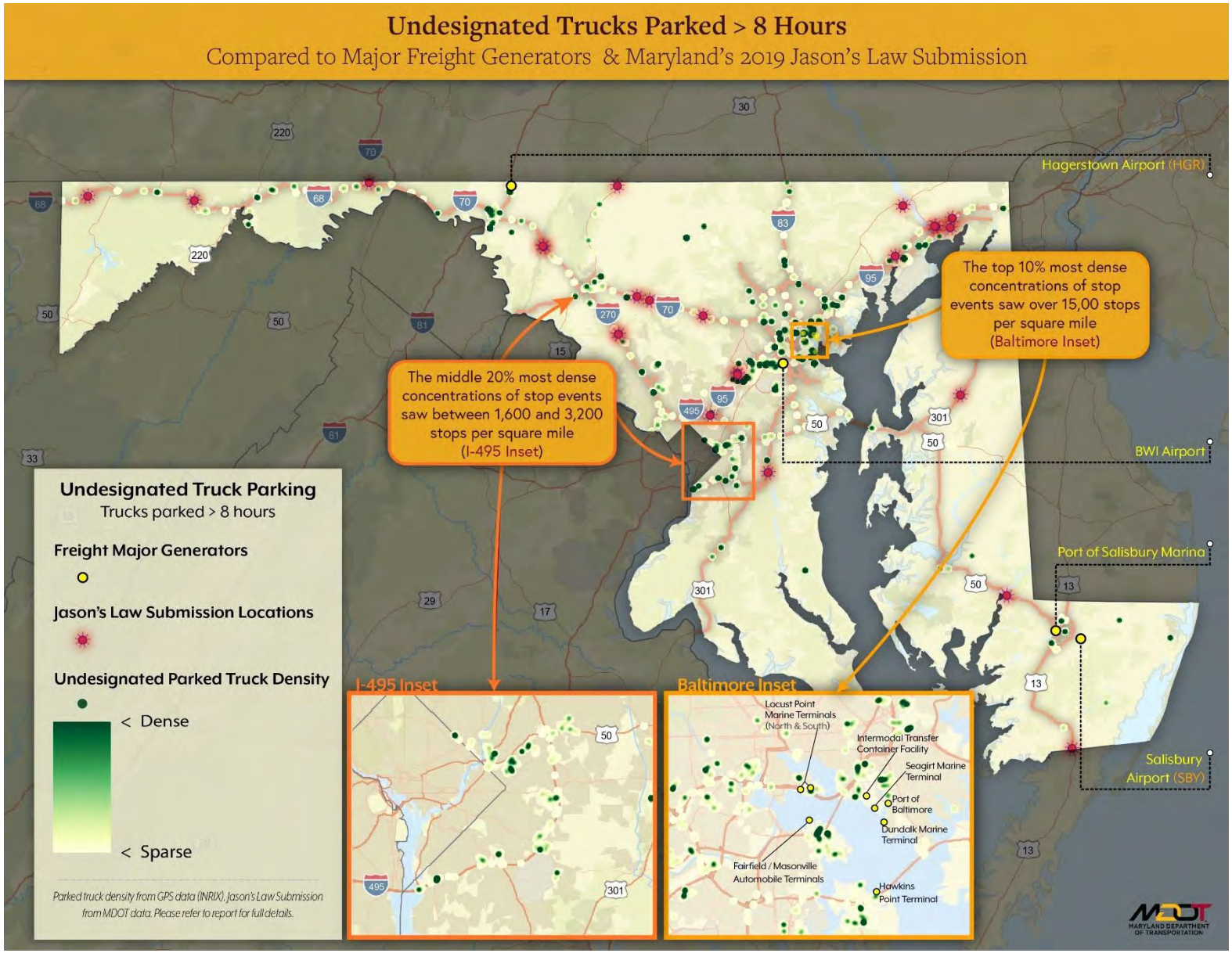
Figure 6-2: Designated and Undesignated Polygons and Stops at I-95 Welcome Center at Laurel

Source: INRIX data. Imagery: Google, 2019 Commonwealth of Virginia, Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

The combination of land use, highway ramps, and classifying stop events at rest areas resulted in about 81 percent of stop events classified as designated or undesignated, with the remainder requiring manual validation. A density function was used to identify clusters of unclassified stop events for manual inspection and classification. Ultimately, the classification process assigned 85 percent or 1.6 million stops as a designated or undesignated.

Figure 6-3 displays locations where there are clusters of undesignated trucks that were parked over eight hours using the INRIX Truck GPS data. Figure 6-3 also displays red circles around the locations MDOT identified as having undesignated truck parking as part of the 2019 Jason's Law Survey. Comparing the locations submitted to the 2019 Jason's Law Survey to the INRIX GPS data revealed concurrence between the data sources. One exception was on US 301 on Maryland's Eastern Shore where the INRIX GPS data did not show undesignated parking, but the Jason's Law Survey indicated undesignated parking occurred. However, this could be attributed to the timeframe captured by the INRIX data.

Figure 6-3: **Undesignated Trucks Parked over 8 Hours Compared to Maryland's 2019 Jason's** Law Submission



Source: INRIX data and MDOT Jason's Law Submission

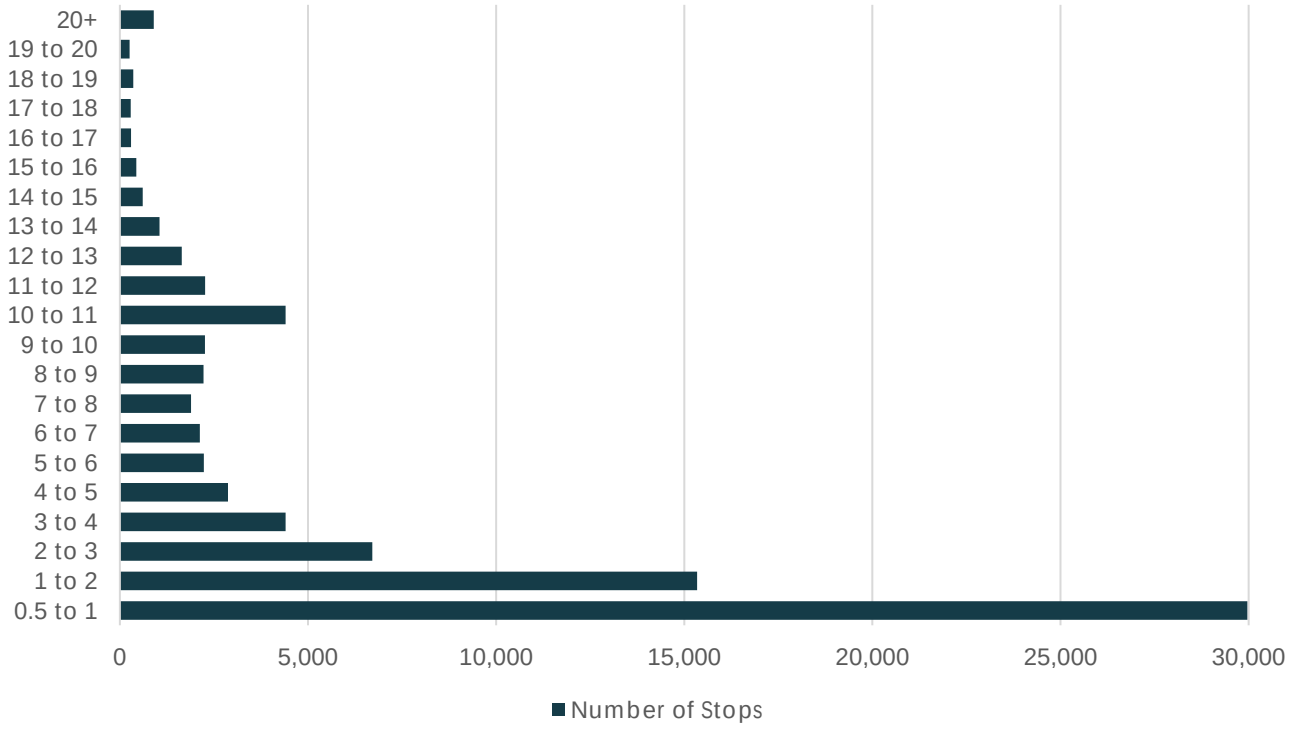
6.1.1 TRUCKER PATH DATA

The Maryland Statewide Truck Parking Study leveraged Trucker Path data to identify the availability of truck parking in Maryland. Trucker Path provided a whole year of data, as opposed to a sample of weeks or months for each quarter and based on observations of truck drivers at truck parking locations.

6.2. DISTRIBUTION OF STATEWIDE UNDESIGNATED STOP EVENTS

Figure 6-4 displays the distribution of undesignated stops by the total duration stopped. The figure displays a high proportion of short duration stops in undesignated truck parking locations. Short duration truck stops are associated with taking a short break for HOS compliance (at least a half-hour) and staging (one to 4 hours) for pick up or delivery of freight. A notable second peak in the number of stop events by duration occurs at 10 to 11 hours stopped, which coincides with end of the work shift (overnight) HOS breaks.

Figure 6-4: Number of Undesignated Truck Stops by Duration Stopped

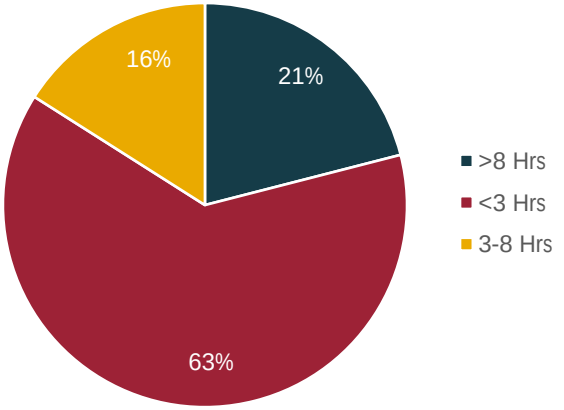


Source: INRIX Truck GPS.

Figure 6-4 displays the distribution of undesignated stop events by grouping stop events into length of time stopped. Short-term parking, less than three hours, is generally a driver stopping for a break. Three to eight- hour stopping is generally a staging stop, when a driver stops to prepare their load. Eight-plus hours is generally on overnight HOS stop. The three groupings further display

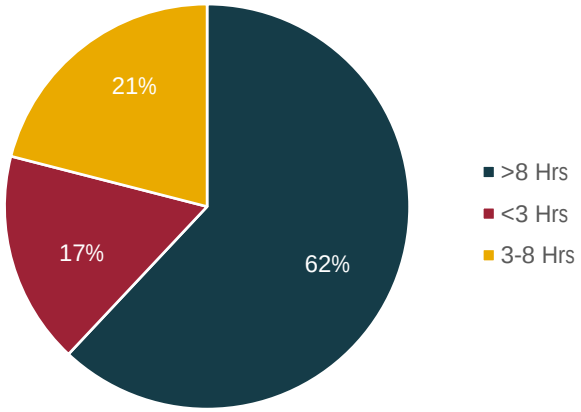
that short stops are the most frequent type of undesignated truck parking. Figure 6-5 totals the amount of time undesignated trucks time stopped using the three groups. The differences in the distribution between the figures show that even though there are more short-duration stops, long-duration stops occupy an area in an undesignated location for a longer period. The stark difference in the distribution when measured by stop events versus total duration stopped suggests that capacity solutions should reflect the type of undesignated truck parking occurring. Namely, areas with short duration stop events could be served by a few truck parking spaces that turnover quickly, whereas long duration stops need greater capacity because trucks occupy a space for a duration that is many times longer, generally overnight.

Figure 6-6: Number of Undesignated Truck Stop Events by Duration



Source: INRIX Truck GPS.

Figure 6-5: Length of Time Stopped for Undesignated Stop Events

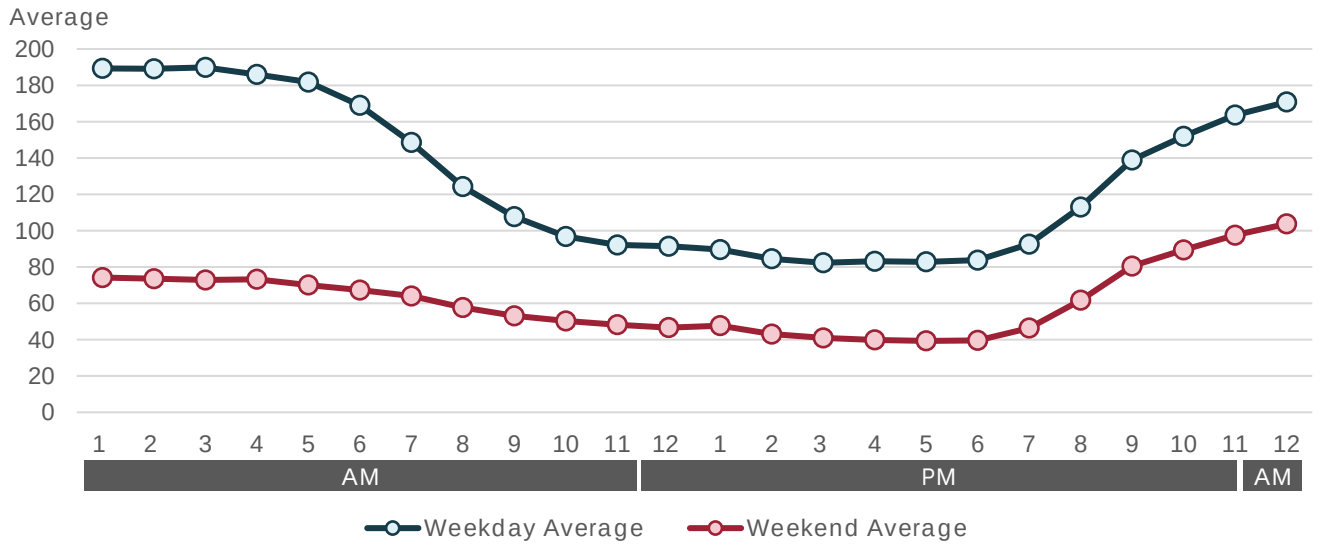


Source: INRIX Truck GPS.

Analyzing the time that undesignated stops begin, shorter duration stops are frequently parked during the day and early evening, whereas long stops are concentrated in the late evening and early morning. The short duration truck stops are typically staging for pick-up and delivery of freight or short HOS breaks, which explains the increase in their frequency during business hours. The trucks parking for over eight hours start parking in undesignated truck areas in the highest numbers from 6pm until midnight. The start time of undesignated truck parking matches the data from Trucker Path, which displays truck parking beginning to fill up in the early evening and then reaches capacity in the late evening and early morning.

Figure 6-8 displays the average daily number of trucks parked in undesignated areas by time of day for weekdays and weekends using the INRIX truck GPS data. Figure 6-8 is the unmet truck parking demand in Maryland based on the truck GPS data. Not all of the unmet truck parking demand has the same priority, for example, trucks parking along dead-end connectors to warehouses for short periods of time may not raise concern to the local community or affect safety compared to truck parking along highway shoulders, on/off ramps, or other roadside lots .

Figure 6-8: Average Daily Number of Trucks Parked in Undesignated Areas by Time of Day



Source: INRIX Truck GPS.

6.3. PRIORITIZING THE LOCATIONS OF UNDESIGNATED TRUCK PARKING

Undesignated truck parking occurs throughout Maryland and ranges from a couple of trucks to over 3,000 trucks parking in undesignated areas during the four-month truck GPS sample. Therefore, MDOT and CPCS identified and prioritized clusters of undesignated truck parking to focus the analysis and solutions on the most severely impacted areas.

6.3.1 TYPES OF UNDESIGNATED TRUCK PARKING

The location of clusters of undesignated truck parking varies, but the densest clusters fit into two types of locations:

- Clusters on heavy use corridors—Undesignated truck parking often occurs on highway on/off ramps, shoulders, or other roadside lots near truck stops or rest areas with no available spaces. Undesignated truck parking on heavy use corridors is a significant safety concern because trucks are a large fixed object that could be hit by other roadway users and/or block the sight distance for other roadway users coming down ramps and roadways.

- Clusters on last-mile connectors—Undesignated truck parking is often found along the roadway shoulders of last-mile connectors leading to industrial land uses, such as warehouses and distribution centers. Although undesignated truck parking along last-mile connectors is less of a safety concern because of the lower speeds and traffic volumes compared to highway shoulders/ramps, undesignated truck parking on last-mile connectors can still impede traffic, spill onto busier roads, and damage shoulders.

Informed by the two types of undesignated truck parking occurring, the first step in the identification of Priority Clusters was to split the data into two types of undesignated stop events, ones that occurred less than 75 feet from the NHS (Clusters on Heavy Use Corridors) and those that occurred over 75 feet from the NHS (Clusters on last-mile connectors).

The clusters of undesignated truck parking were prioritized using safety, duration of undesignated truck parking, and the total number of trucks parked. The distribution of points and the process for assigning points to each cluster is explained below:

- Safety (30 Points)—The safety criterion assessed the potential safety impact of the undesignated truck parking. Clusters were allocated points based on the location of the undesignated truck parking in relation to nearby roadways, specifically:
  - Clusters of undesignated truck parking that are primarily along last-mile connectors to freight generators—0 points.
  - Clusters of undesignated truck parking that encompasses substantial parking on heavy use corridors—10 points.
  - Clusters of undesignated truck parking using roadside facilities developed for emergency use—15 points.
  - Clusters of parking using on/off ramps—30 points.
- Duration Parked (50 Points)—The duration parked criterion differentiates the number of trucks in a cluster of undesignated truck parking by the duration of the stops. More points were assigned to clusters with a greater number of long undesignated stop events. The following categories were used to allocate the 50 points assigned to this criterion:
  - Number of short truck parking events (0.5 to 3 hours)—Scaled value based on the number of undesignated stop events between a half hour and three hours, a maximum of 10 points.[25]
  - Number of medium duration stops (3 to 8 hours)—Scaled value based on the number of undesignated stop events between three and eight hours, a maximum of 15 points.
  - Number of long duration stops (8+ hours)—Scaled value based on the number of undesignated stop events over eight hours, a maximum of 25 points.
- Total Number of Trucks Parked (20 Points)—This criterion assigns a maximum of 20 points that are scaled based on the total number of undesignated stop events occurring in an undesignated cluster.

[25] Scaled criteria assign points based on how a cluster's performance on a specific criteria compares to the highest and lowest value for that criteria. Practically, scaling means the cluster with the highest value receives the maximum number of points and the lowest value receives zero points. Values between the highest and lowest receive a portion of the maximum score.

Clusters that were within the top 10 percent, as measured by density, were then used to count the total number of undesignated trucks parked within them, regardless of the stop's distance from the NHS. The top 20 polygons with the highest number of undesignated trucks for each type of cluster were advanced for prioritization. With the addition of clusters covering underrepresented portions of the State, a total of 41 clusters were then grouped and prioritized into 26 distinct clusters of undesignated truck parking.

Figure 6-9: Prioritization Process

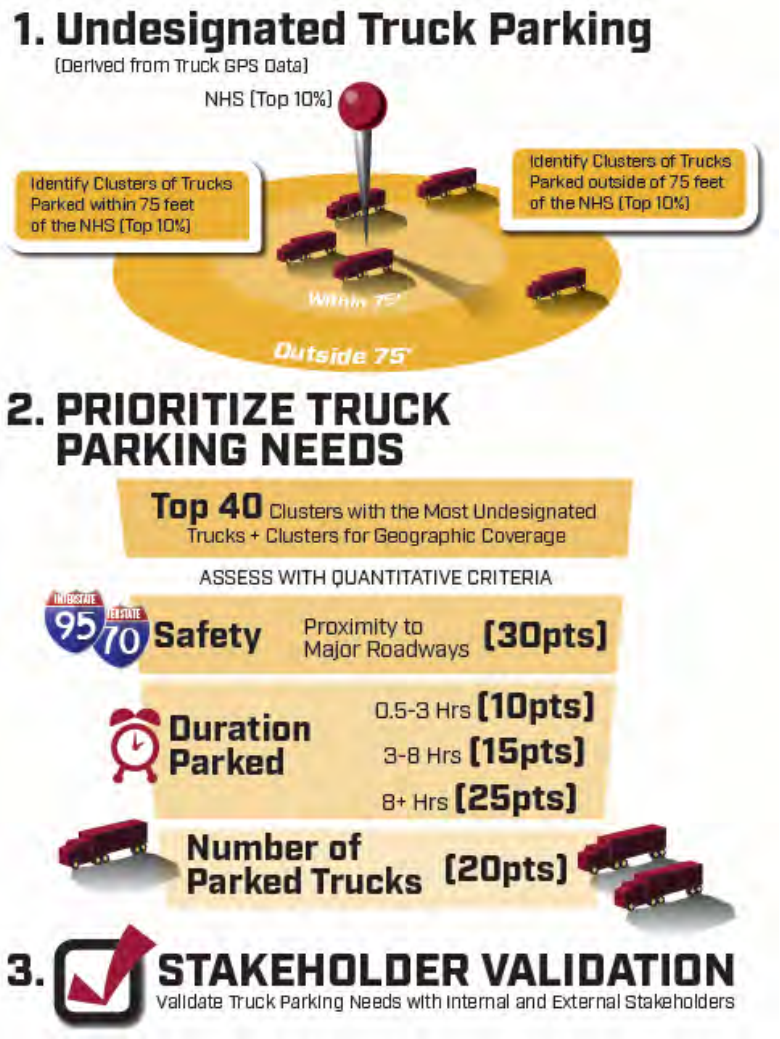
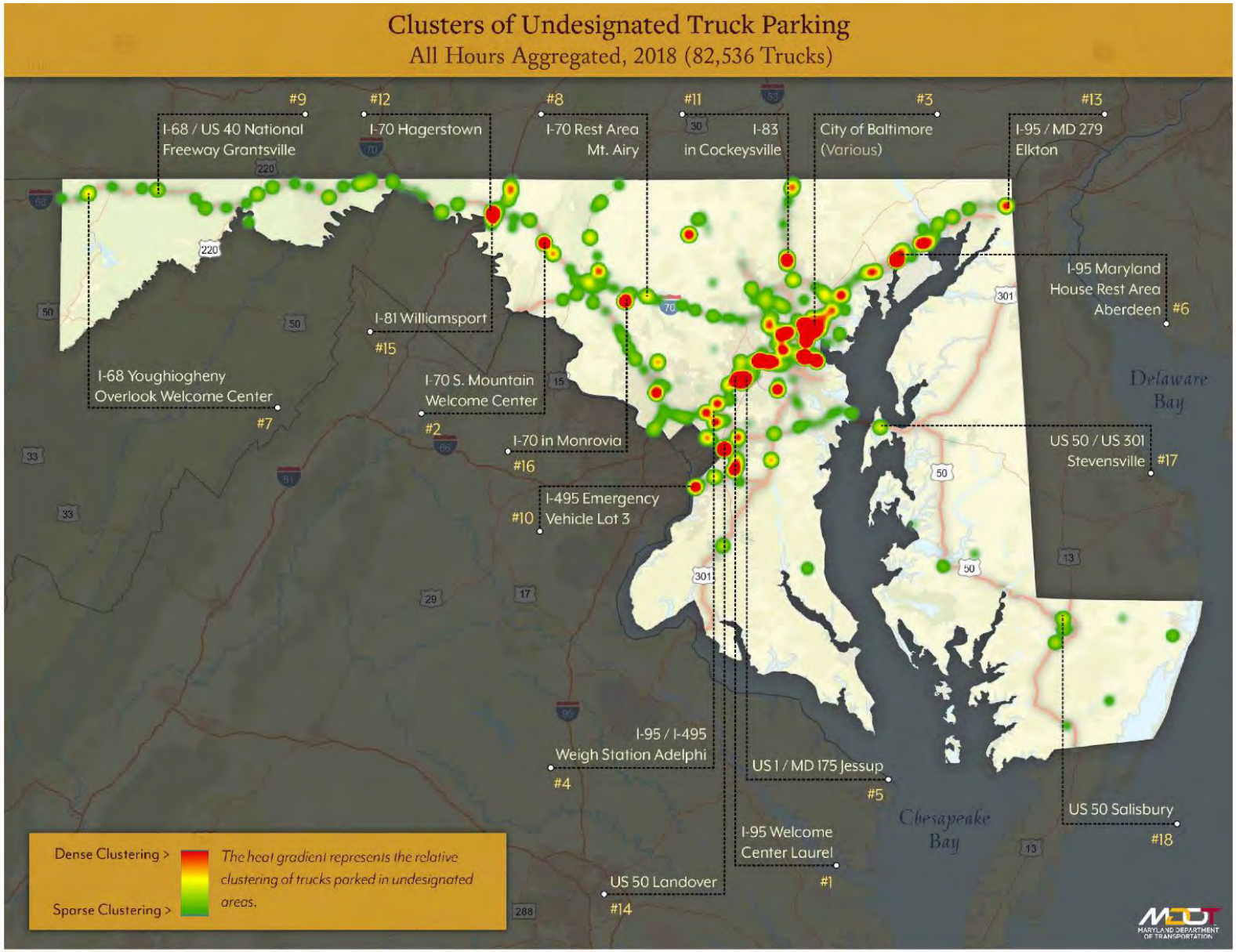


Figure 6-10 displays the top 18 of the 26 clusters of undesignated truck parking, with the highest counts of undesignated truck parking in Central Maryland and rural clusters which were included to ensure Western Maryland and the Eastern Shore were represented. Figure 6-10 displays the statewide locations where each cluster is located, as well as the number, duration parked, and the proportion of long stop (overnight parking) events within each cluster of undesignated truck parking.

Figure 6-10: Clusters of Undesignated Truck Parking



6.3.2 PRIORITIZATION PROCESS AND RESULTS

Figure 6-11 displays the results of the prioritization process, which are mapped in Figure 6-12. Priority Clusters were selected from the top 18 locations with the highest prioritization score as well as rural clusters were included to ensure Western Maryland and the Eastern Shore were represented.

Figure 6-10 displays the location of clusters of undesignated truck parking. As expected, the clusters of undesignated truck parking follow Maryland's major freight corridors and are located near public truck parking facilities and areas associated with industrial land uses.

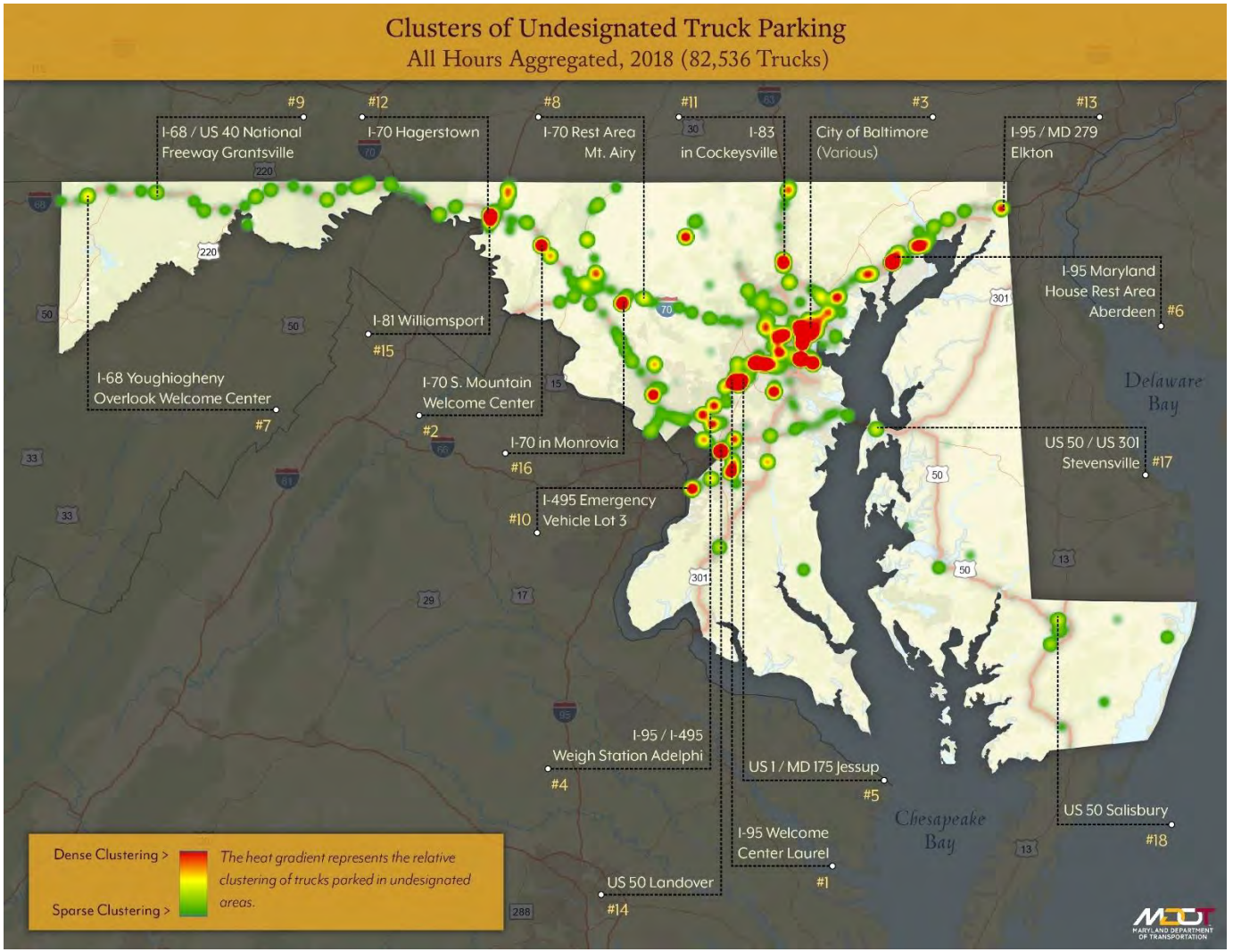
The rank of each Priority Cluster is shown within each marker in Figure 6-12 and a red (higher priority) to green (lower priority) gradient is used to further differentiate Priority Clusters. Overall, Priority Clusters are primarily located along I-95 and I-70 in Central Maryland. The prioritization score is based on the number of total undesignated trucks (scaled) and the duration that trucks park within a cluster. Locations in Western Maryland near I-81 and along the Eastern Shore along US 301 and US 50 were included to ensure statewide coverage and address the rural truck parking needs.

Figure 6-11: Results of the Prioritization Process

Rank	Description	Safety	Total Number of Trucks	Number of Trucks by Duration (Hours)			
				<3	3-8	8+	Total
1	On/Off Ramps along I-95 at Welcome Center in Laurel	30	19.0	7.5	5.4	25.0	86.9
2	On/Off Ramps along I-70 at S. Mountain Welcome Center	30	9.7	3.0	2.3	19.1	64.1
3	In and around the City of Baltimore Connecting to the Port and Industrial Clusters	0	20.0	10.0	15.0	19.0	64.0
4	On/Off Ramps along I-95/I-495 at Weigh Station in Adelphi	30	8.8	3.9	2.2	10.7	55.5
5	Roadways Connecting to Warehousing near US 1/MD 175 in Jessup	0	18.9	7.0	11.4	18.1	55.4
6	On/Off Ramps along I-95 at Maryland House Travel Plaza near Aberdeen	30	7.2	3.0	1.5	10.3	52.0
7	On/Off Ramps along I-68 at Youghiogheny Overlook Welcome Center	30	1.5	0.6	0.4	3.5	36.0
8	On/Off Ramps along I-70 at Rest Area near Mount Airy	30	1.0	0.6	0.2	1.7	33.5
9	Exit 22 On/Off Ramps on I-68 in Grantsville	30	0.3	0.3	0.1	0.7	31.4
10	Emergency Vehicle Lot along I-495 at Exit 3	15	4.0	1.1	2.7	7.1	29.9
11	Emergency Roadside Shoulder on I-83 near Cockeysville	15	5.0	3.2	0.6	1.9	25.7
12	Truck Stop overflow in Hagerstown and Exit 24 On/Off Ramps on I-70	15	2.4	1.0	0.6	4.5	23.5
13	Shoulders along I-95/MD 279/ MD 277 near Elkton	15	2.8	1.5	1.9	1.2	22.4

Rank	Description	Safety	Total Number of Trucks	Number of Trucks by Duration (Hours)			
				<3	3-8	8+	Total
14	Roadways Connecting to Warehousing near US 50 in Landover	0	7.9	3.1	6.6	4.5	22.0
15	Roadways Connecting to Warehousing near Exit 1 on I-81 in Williamsport	10	3.9	1.5	4.1	2.1	21.0
16	Roadways Connecting to Warehousing in Monrovia near I-70	0	7.4	2.9	6.3	4.3	20.9
17	Local road near US 301 Stevensville	10	0.1	0.3	0.3	0.0	15.7
18	Roadways Connecting to Warehousing near US 50 near Salisbury	0	0.0	0.2	0.1	0.5	0.8

Figure 6-12: Ranked Undesignated Truck Parking Clusters

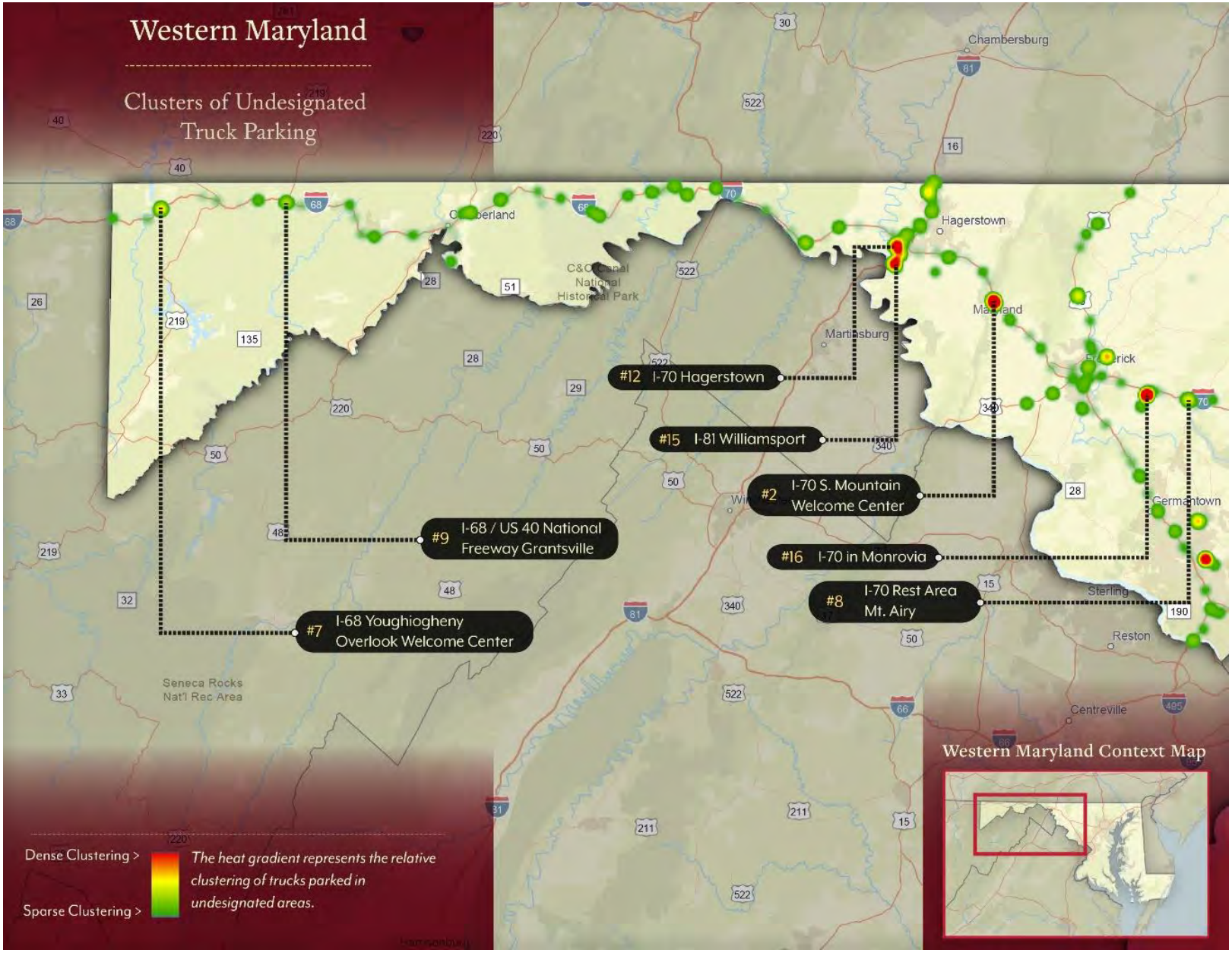


Each Priority Cluster was systematically analyzed to identify solutions and opportunities based on the location of undesignated truck parking and the availability of truck parking nearby. The opportunities to address undesignated truck parking in Priority Clusters in Western, Central, and Eastern Maryland are summarized below. Additional detail for each Priority Cluster is included in Appendix C.

6.3.1 Priority Clusters in Western Maryland

Priority Clusters in Western Maryland are displayed in Figure 6-13. Of note, Priority Cluster #2 is on the border of Western and Central Maryland and is described in this section due to its proximity to major freight generators in Western Maryland. Overall, I-81 has the most limited truck parking availability in Western Maryland, followed by I-70, particularly from Hagerstown to Baltimore. Generally, I-68 has limited truck parking availability along the corridor, with many locations nearing capacity.

Figure 6-13: Priority Clusters in Western Maryland



The Priority Clusters and truck parking opportunities in Western Maryland, starting with the highest-ranked Priority Cluster are listed as follows:

OPPORTUNITIES:

Expand existing facility

In the following clusters in Western Maryland there is an opportunity to expand the existing truck parking facility.

In Priority Cluster #2 the I-70 South Mountain Welcome Center (Milepost 39, I-70) can be expanded to accommodate a minimum of eight spaces and a max of 20 spaces at the westbound facility and a minimum of 10 spaces and max of 30 spaces at the eastbound facility with no need to acquire ROW. The eastbound and westbound sides of the I-70 South Mountain Welcome Center are both currently in the design phase for expansion projects, to add 10+ truck spaces in each direction.

Priority Cluster #7, Youghiogheny Overlook Welcome Center (Milepost 6, I-68), can be expanded to accommodate a total of 52 spaces with no need to acquire ROW.

Utilize existing Park-and-Ride

In the following clusters in Western Maryland there is an opportunity to further utilize existing MDOT SHA Park-and-Ride facilities for truck parking for overnight parking.

In the vicinity of Priority Cluster #2, I-70 South Mountain Welcome Center (Milepost 39, I-68), there is an opportunity to use a nearby park and ride facilities at night. Nearby facilities along I-70 include one in Hagerstown (exit 35) and one in Myersville (exit 42).

The Youghiogheny Overlook Welcome Center (Milepost 6, I-68), Priority Cluster #7, has a nearby state-owned park and ride facility at Friendsville (exit 4) along I-68.

In the vicinity of Priority Cluster #16, Roadways connecting to warehousing in Monrovia near I-70, there are nearby state-owned park and ride facilities along I-70. These facilities include locations in Frederick (exit 54 and 56), Mount Airy (exit 68), Cooksville (exit 76), and Sykesville (exit 80).

In the vicinity of Priority Cluster #15, t Roadways connecting to warehousing (Exit 1, I-8) in Williamsport, has nearby state-owned park and ride facilities along I-81 and I-70. These facilities include locations in Williamsport (exit 1) and Hagerstown (exit 7A) along I-81 and in Hagerstown, MD (exit 28, two near exit 29, exit 32, and exit 35) along I-70.

Incentivize Public-Private Partnerships (P3s)

In the following clusters in Western Maryland present opportunities for public-private partnerships.

In the vicinity of Priority Cluster #9 at in Grantsville (Exit 22, I-68), the following opportunities to further develop truck parking via a public-private partnership (P3) include:

1. Exit 14A - The Keyser's Ridge Auto Truck Stop has limited availability, however the owner has nearby land zoned for commercial use and MDOT SHA has significant land and ROW around the truck stop.

2. Exit 22 – There are two private truck parking facilities, with opportunities to MDOT ROW before the ramps and expand on undeveloped land within the truck stop's parcel for additional truck parking.

Truck parking facilities near Priority Cluster #12 (the Truck Stop Overflow in Hagerstown and Exit 24 On/Off Ramps on I-70) and Priority Cluster #15 (the roadways connecting to warehousing near Exit 1 on I-81 in Williamsport) include a truck stop with 70 spaces less than a mile from Priority Cluster #12 near MD 63 and a convenience store less than a mile from Priority Cluster #15 along Lappans Road. Both of these private facilities could be developed to provide hundreds of truck parking spaces. The proposed development of the parcel near Priority Cluster #15 is the subject of an ongoing court case.

Utilize existing TWIS location

In the following clusters in Western Maryland there is an opportunity to increase utilization of existing TWIS location in New Market. Priority Cluster #8, the on/off ramps along I-70 at the New Market Rest Area near Mount Airy (Milepost 67, I-70) would benefit from utilizing the New Market TWIS for truck parking due to its current underutilization.

In the vicinity of Priority Cluster #9 in Grantsville (Exit 22, I-68), the Finzel TWIS (milepost 31, I-68) could be utilized in the evening for overnight truck parking.

Integrate Truck Parking into Land Use, Zoning, and Planning

In the following clusters in Western Maryland there is an opportunity to integrate truck parking into land use, zoning, and planning to facilitate truck parking solutions and greater capacity.

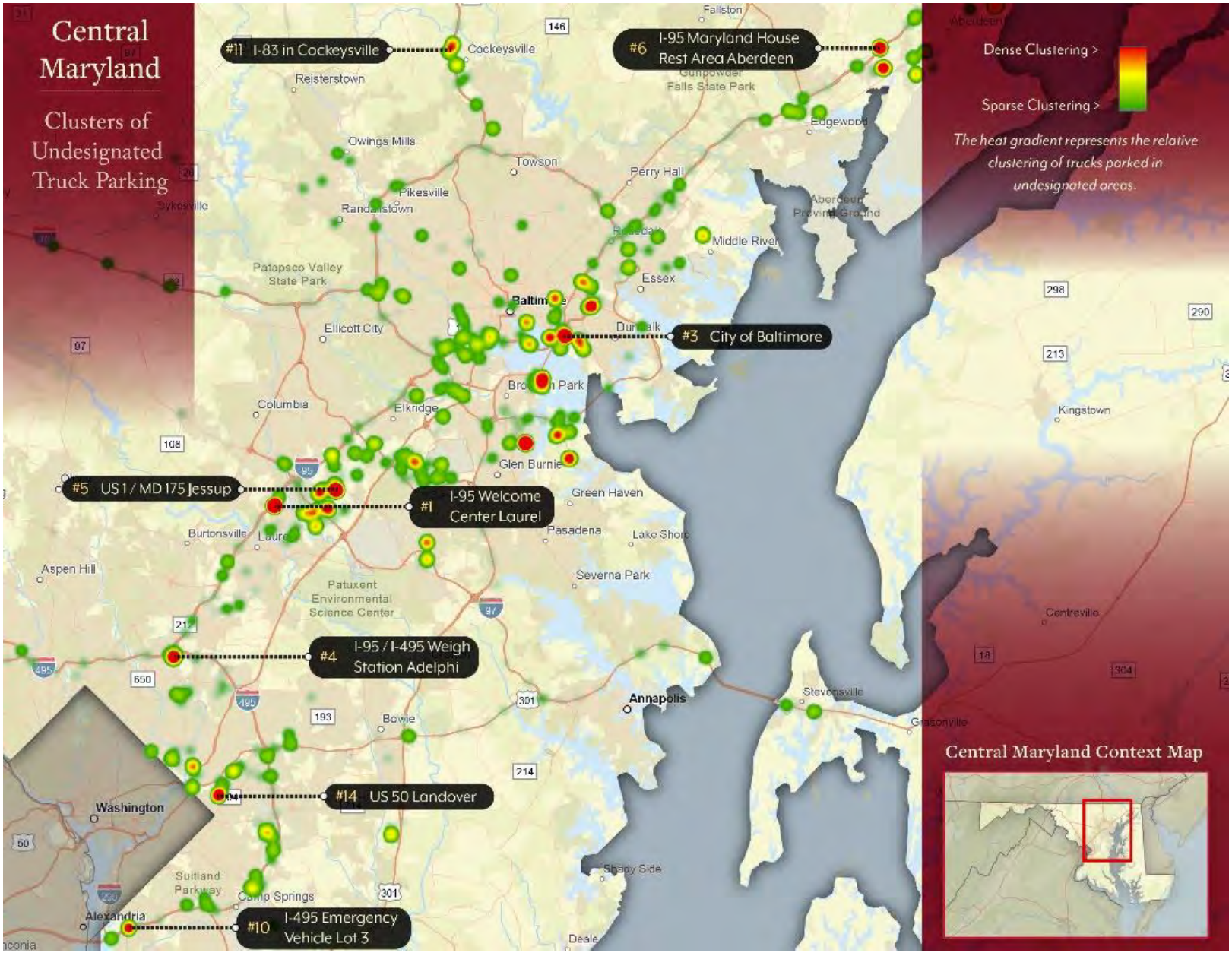
The proximity of the undesignated truck parking at Priority Cluster #16, where roadways connect to warehousing in Monrovia near I-70, to a Costco Distribution Center would benefit from local jurisdiction and/or private-sector solution. If developments drive increase origin or destination truck trips, exploring solutions such as providing truck parking on-site, would assist in addressing undesignated truck parking.

In the vicinity of Priority Cluster #15, where roadways connect to warehousing in Williamsport (Exit 1, I-81), there is land adjacent to a Save-A-Lot distribution center which could be utilized for overnight truck parking. Further coordination with local jurisdictions and developers to highlights the suggesting an opportunity indicates the need to include truck parking in future planning, zoning, and land use.

6.3.2 Priority Clusters in Central Maryland

Priority Clusters in Central Maryland are displayed in Figure 6-14. Central Maryland has the highest number and highest-ranked Priority Clusters in Maryland. The Priority Clusters are generally located along I-95 near Maryland's top freight generators and intermodal facilities. The Central Maryland segments begin at the Maryland/Pennsylvania/Delaware state line to the north, passes through Baltimore City and end at the Maryland/Washington, D.C./Virginia state line. Within the state, I-70 and I-95 serve as significantly regional routes but experience limited truck parking availability at night, resulting in undesignated truck parking throughout the region. Central Maryland encompasses heavily urbanized areas with dense development that often make the identification of vacant land use for new truck parking challenging and costly.

Figure 6-14: Priority Clusters in Central Maryland



This section discusses the Priority Clusters and truck parking opportunities in Central Maryland, starting with the highest-ranked Priority Cluster.

OPPORTUNITIES:

Community Outreach

In the following clusters in Central Maryland there is an opportunity to engage the community to help further address truck parking needs in the State.

Priority Cluster #5, the roadways that connect to warehousing near US 1/MD 175 in Jessup, conduct outreach to local communications to facilitate, provide data, identify potential solutions, and work in concert with local jurisdictions, other public agencies and private stakeholders to identify truck parking concerns and explore project, partnership, and policy opportunities.

Priority Cluster #3, roadways in and around the City of Baltimore that connect to the Port and other industrial clusters, address truck parking issues in partnership with the City of Baltimore and other public sector agencies, such as the City, MDOT, Port of Baltimore, and Metropolitan Planning Organizations (MPO), and MDOT agencies, as well as the private sector. Conduct outreach to locale businesses and surrounding residential communities in the vicinity of potential truck parking development to discuss how to establish mutually beneficial solutions to address truck parking needs.

Priority Cluster #14, roadways connecting to warehousing near US 50 in Landover, identify opportunities to address truck parking needs which will require partnering with local government to identify truck parking concerns and explore project, partnership, and policy opportunities.

Incentivize Public-Private Partnerships

The following clusters in Central Maryland present an opportunity for public-private partnerships.

Priority Cluster #5, roadways connecting to warehousing near US 1/MD 175 in Jessup, have the following opportunities to explore off-peak use or development of truck parking on publicly owned land via a public-private partnership (P3):

1. Partner with local jurisdictions, public agencies, and private stakeholders to identify publicly owned land and facilities near Priority Cluster #5 that could be used for truck parking during off-peak periods or developed into new truck parking.

2. Partner with the Maryland Food Center Authority, a quasi-public agency, to develop a parcel of land on Oceano Avenue in the middle of Priority Cluster #5 into truck parking. The parcel is near an existing TA truck stop in Jessup, reducing the need for the public truck parking location to provide amenities on-site.

Priority Cluster #3, roadways in and around the City of Baltimore that connect to the Port and industrial clusters, coordination with the City of Baltimore is critical to identifying approaches, sites, and matching long-term development plans with solutions for P3s. Potential activities include:

1. Identify facilities that are used during the day, but empty at night to allow for overnight truck parking. Participants in the Maryland Truck Parking Workshop highlighted tour bus parking lots, as well as stadiums, vacant malls, and other brownfield sites as potential options.
2. Partner with the city to identify vacant lots and state-owned ROW for truck parking.
3. Identify city and state park and ride facilities for potential overnight truck parking options.

Priority Cluster #14, where roadways connect to warehousing near US 50 in Landover, coordination with the local jurisdiction is critical to ensuring that potential solutions for P3s match long-term development plans and targets truck parking that ensures the most significant improvement. Potential activities include:

1. Identify parking facilities that are used during the day, but empty at night to allow for overnight truck parking. Participants in the Maryland Truck Parking Workshop highlighted both FedEx Field and the Landover Mall (both located near Priority Cluster #14), and other brownfield sites, as potential options. The Washington Metropolitan Area Transit Authority (WMATA) has Landover Metro Station and New Carlton park and ride facilities and there are MDOT park and rides in Davidsonville and Greenbelt nearby.
2. Partner with the local jurisdiction to identify vacant lots and state-owned ROW for truck parking.

Develop a New Facility

In Central Maryland there is an opportunity to develop a new truck parking facility in the following clusters:

Priority Cluster #4, I-95/I-495 Weight Station in Adelphi (Milepost 27, I-95/495), there is an opportunity to develop a dedicated truck parking facility at the I-95/I-495 Weigh Station (Priority Cluster #4) and assess the park and ride overnight for truck parking. There are about 13 acres of undeveloped land within the MDOT ROW that could be used for truck parking and the park and ride could be opened to truck drivers overnight. This site also provides an opportunity to improve community outreach materials to address community concerns. In Laurel near Exit 33A on I-95, there is also a park and ride that could be utilized for overnight truck parking.

Integrate Truck Parking into Land Use, Zoning, and Planning

In Central Maryland there is an opportunity to integrate truck parking into land use, zoning, and planning to facilitate truck parking solutions and greater capacity in the following clusters.

Priority Cluster #1 (I-95 Welcome Center in Laurel (Milepost 37, I-95)), Priority Cluster #4 (I-95/I-495 Weight Station in Adelphi (Milepost 27, I-95/495)), and Priority Cluster #5 (Roadways Connecting to Warehousing near US I/MD 175 in Jessup)) all have substantial demand and should be evaluated for opportunities to meet the truck parking demand through new zoning, land use, or planning opportunities and integration. The density of freight traffic and freight generators along I-95 from Washington, D.C. to Baltimore, Maryland leads to substantial truck parking demand and undesignated truck parking near warehousing and industrial developments, which highlights the opportunity for local jurisdictions to include truck parking in planning, zoning, and land use development.

Priority Cluster #3, roadways in and around the City of Baltimore that connect to the Port and industrial clusters, comprises of multiple clusters located near freight generators. This access provides the opportunity to work with the City of Baltimore to address truck parking concerns through future land use, zoning, and development coordination.

Priority Cluster #14, where roadways connect to warehousing near US 50 in Landover, comprises of multiple clusters located in Landover and the surrounding area which generate substantial truck parking demand and undesignated truck parking near warehousing and industrial developments. This access highlights the opportunity to address truck parking concerns with the local jurisdiction through planning, zoning, and land use coordination.

Utilize existing Park-and-Ride

In Central Maryland there is an opportunity to further utilize existing Park-and-Ride facilities for overnight truck parking in the following clusters.

Priority Cluster #4 at I-95/I-495 Weight Station in Adelphi (Milepost 27, I-95/495) is an opportunity to assess the feasibility of using the park and ride overnight for truck parking. In Laurel near Exit 33A on I-95, there is a park and ride that could provide overnight truck parking. near.

Priority Cluster #6 (on/off ramps along I-95 at Maryland House Travel Plaza near Aberdeen (Milepost 81, I-95), including those in Joppa (exit 74), Edgewood (exit 77), Bel Air (exit 80), Aberdeen (exit 85), and Havre De Grace (exit 89), there are several park and ride facilities that can be further utilized to provide truck parking overnight.

Priority Cluster #11 (emergency roadside shoulder on I-83 near Cockeysville at Exit 20B) along I-695 are in Towson (exit 28 and 29) are lots which could provide overnight truck parking or staging options. Along I-83 in Cockeysville (exit 20), Hereford (exit 27), and Parkton (exit 31), there are park and rides which could provide additional truck parking overnight.

Utilize existing TWIS location

In Central Maryland there is an opportunity to further utilize an existing TWIS location in the following clusters.

Priority Cluster #6 at the on/off ramps along I-95 at Maryland House Travel Plaza near Aberdeen (Milepost 81, I-95), could benefit from the utilization of the Perryville TWIS (milepost 92, I-95) and Chesapeake House Travel Plaza (milepost 99, I-95), both the northbound and southbound. Both locations are currently underutilized and could improve undesignated truck parking along I-95 by providing additional overnight truck parking.

Improve Existing Facility

In Central Maryland there is an opportunity to improve the existing truck parking facilities in the following clusters.

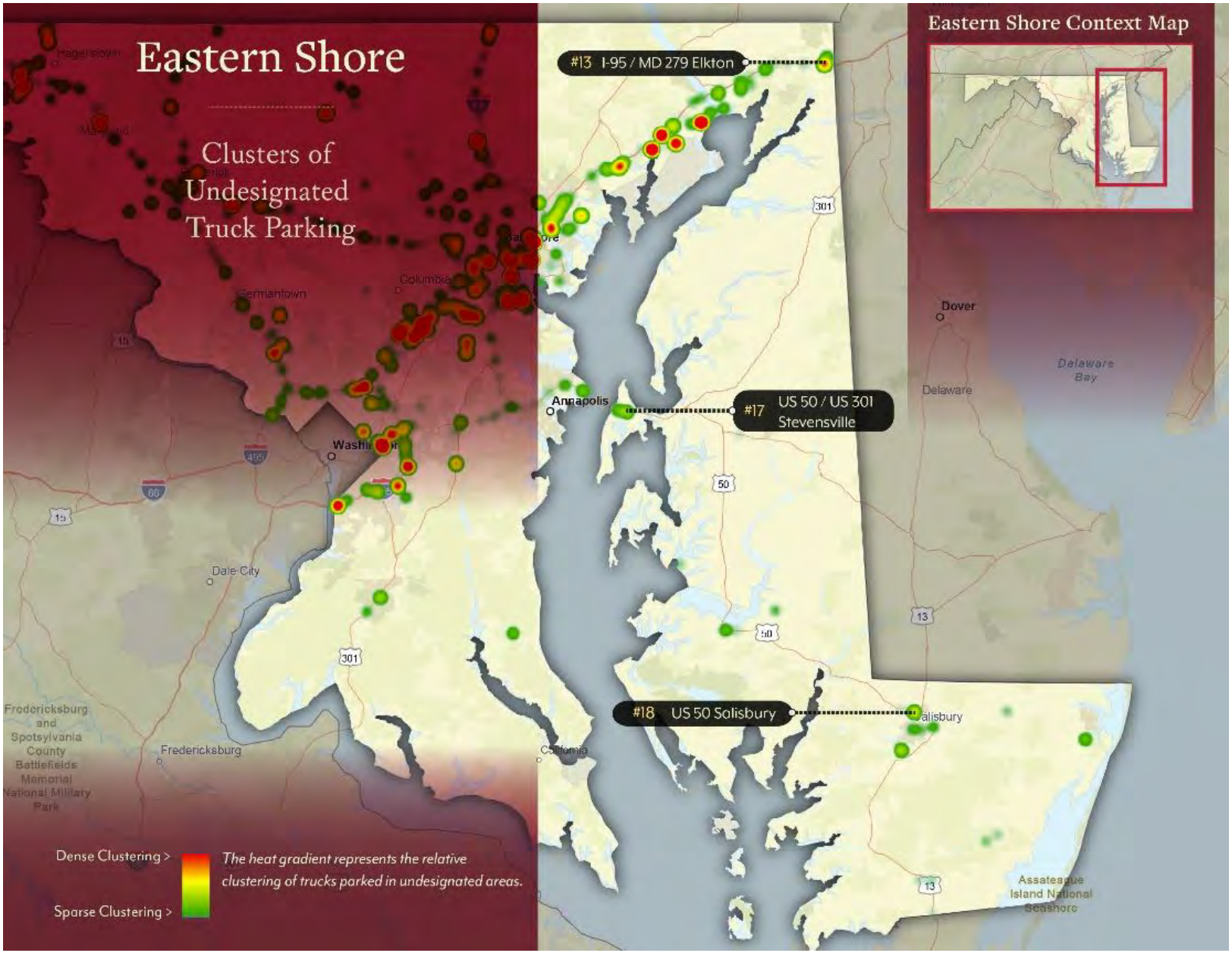
Priority Cluster #10, access to the Emergency Vehicle Lot on the north side of I-495, was blocked off during the study. A primary concern for MDOT was the safety of trucks entering and exiting the lot with direct accesses to the I-495 ramp. To address the safety concerns, adequate entry, exit and merge areas would need to be designed to allow trucks to park at this lot. At the time that this study was concluded, this lot is still closed and will be removed from consideration for overnight truck parking.

Priority Cluster #11, the emergency roadside shoulder (Exit 20 B, I-83) near Cockeysville, adding acceleration and deceleration lanes to existing or newly developed emergency lots or wide shoulders would enable trucks to safely enter and exit the traffic stream. These locations could serve as a low-cost approach to adding truck parking along rural corridors.

6.3.3 Priority Clusters in Eastern Maryland

The Priority Clusters in Eastern Maryland are displayed in Figure 6-15. Eastern Maryland has the fewest Priority Clusters compared to the other regions and a few truck parking locations spread throughout a large geographic area. This region extends from the Maryland, Delaware/ Pennsylvania state lines in the north is connected by the Bay Bridge to the Central Maryland region and ends at the Maryland/Virginia state line. There are significant gaps in truck parking options along the Eastern Shore although this rural region generates significant agribusiness and seasonal local business in Salisbury and Ocean City, respectively. Strategic areas for truck parking were included based on routes with high truck percentages to demonstrate the deficiency in overnight truck parking coverage in our rural areas along the Eastern Shore.

Figure 6-15: Priority Clusters in Eastern Maryland



OPPORTUNITIES:

Utilize existing TWIS location

In Central Eastern Maryland there is an opportunity to further utilize an existing TWIS location in the following clusters.

Priority Cluster #13 (along I-95/MD 279 near Elkton near Exit 109B on I-95), could benefit from the utilization of the Perryville TWIS (milepost 92, I-95) and Chesapeake House Travel Plaza (milepost 99, I-95). Both locations are currently underutilized and could improve undesignated truck parking along I-95 by providing additional overnight truck parking.

Integrate Truck Parking into Land Use, Zoning, and Planning

In the following clusters in Eastern Maryland there is an opportunity to integrate truck parking into land use, zoning, and planning to facilitate truck parking solutions and greater capacity.

Priority Cluster #13, (along I-95/MD 279/MD 277 near Elkton near Exit 109B on I-95) is near warehousing and industrial developments, which highlights the opportunity to coordinate with local jurisdictions to incorporate truck parking needs in planning, zoning, and land s development.

Priority Cluster #18, where roadways connect to warehousing near US 50 near Salisbury. The undesignated truck parking in Salisbury occurs on local roadways, near warehousing and other industrial land use. This indicates the opportunity to coordinate with the local jurisdictions to integrate truck parking needs into planning, zoning, and land use development.

Incentivize Public-Private Partnerships

In Eastern Maryland there is an opportunity to incentivize public-private partnerships in the following clusters.

Priority Cluster #17 (US 50/301) in Stevensville shows about 72 percent of the 202 trucks parked stop for less than three hours, with the majority of those stops being less than an hour. The short stops and the proximity of Priority Cluster #17 to restaurants and a shopping center, suggests that truck drivers are stopping for short breaks and meals. Therefore, working with the restaurants and shopping center to define truck parking that is located near these facilities could address the undesignated truck parking.

Utilize existing Park-and-Ride

In Eastern Maryland there is an opportunity to further utilize existing Park-and-Ride facilities in the following clusters.

Priority Cluster #13, along I-95/MD 279/ MD 277 near Elkton near Exit 109B on I-95, has nearby park and ride facilities along I-95 in Elkton (Exit 109) and in North East (Exit 100) that could be utilized for truck parking overnight.

Priority Cluster #17, local roads near US 301 Stevensville near exit 38B, has nearby park and ride facilities along US 301 are in Stevensville (exit 37) and in Chester (exit 39A) that could be used for overnight or nighttime truck parking.

Priority Cluster #18, roadways Connecting to Warehousing near US 50 near Salisbury, has a nearby park and ride facility at the junction of US 50 and Morris Drive that could be used for nighttime truck parking.

6.4. SUMMARY OF UNDESIGNATED TRUCK PARKING ANALYSIS

The analysis of Priority Clusters demonstrates that truck parking issues occur due to multiple reasons which must be addressed through variety of opportunities and potential solutions. The following are the key takeaways from the identification and analysis of Priority Clusters and inform the recommendation of the study:

- Urban areas have little to no truck parking facilities or available truck parking spaces and many roadways experiencing substantial undesignated truck parking.
- Undesignated truck parking in urban areas often occurs on local roadways that connect to commercial/industrial land uses, often large footprint warehouses and distribution centers.
- Most highway on/off ramps and areas where roadways have wide shoulders exhibited some undesignated truck parking, with rest area ramps exhibiting the highest density of undesignated truck parking.
- MDOT has opportunities to expand truck parking at key facilities, such as the I-70 South Mountain Welcome Center, and the I-95/I-495 Weigh Station at Adelphi. Other opportunities to add truck parking involve partnership with other public agencies, the private sector, local jurisdictions, and local communities, statewide.

7. TRUCK PARKING SOLUTIONS

The potential solutions to address truck parking issues depend on various factors, such as geography, asset/infrastructure availability, and the cause of undesignated truck parking in a given area. Although there is not a "silver bullet" solution to address truck parking in all instances, a consistent theme put forth by stakeholders was the importance of addressing community concerns and land use conflicts generally. Stakeholders also highlighted the importance of educating local governments and citizens about truck parking issues and potential solutions.

7.1. TYPES OF TRUCK PARKING SOLUTIONS

There are many potential solutions to address truck parking issues, in part because there is not a "silver bullet" solution that will work in all instances. This study identifies different types of truck parking solutions, categorized by whether the solution is a project, policy, or partnership. The types of truck parking solutions are defined as follows:

- Projects—Projects are a traditional implementation mechanism to address a truck parking issue. Projects are physical investments such as building, expanding, or redesigning infrastructure to provide new truck parking or distribution of information to direct drivers to existing parking.

- Policies—Policies address truck parking by setting the stage to improve truck parking through legislation/regulation, the development of programs, or making other institutional changes to improve truck parking. For example, developing a dedicated funding program for truck parking or adding truck parking to an existing project selection or prioritization process.

- Partnership—Partnerships may overlap the other implementation mechanisms but are differentiated by MDOT taking a supporting role to another stakeholder that leads the project or policy. Solutions classified under partnership could be implemented by other public agencies or the private sector and could include implementing a project or policy, along with conducting education/outreach.

Each type of truck parking solution presented in this chapter can be used as a resource for identifying approaches to address current and future truck parking issues. The solutions outlined below position MDOT and its external freight stakeholders to select a solution that fits the context and challenges of a specific truck parking issue or location.

7.2. TRUCK PARKING PROJECTS

The purpose and need for a truck parking project are informed by the geographic area and is generally addressing at least one of the following:

- Lack of truck parking capacity—Undesignated truck parking due to a lack of capacity occurs when the number of trucks looking for truck parking exceeds the available supply. The characteristics of an area with a lack of truck parking capacity are undesignated truck parking occurring at a time when all nearby truck parking facilities are full.

- Lack of Information about truck parking facilities and/or availability—Undesignated truck parking due to a lack of information about truck parking availability occurs when truck drivers are unaware of truck parking facilities and/or if a facility has available truck parking. A marker of a lack of information is undesignated truck parking while nearby public or private truck parking facilities have available parking spaces.

7.2.1 PROJECTS ADDRESSING A LACK OF TRUCK PARKING CAPACITY

Truck parking capacity solutions focus on increasing the supply of truck parking to address unmet truck parking demand. Figure 7-1 displays an assortment of truck parking capacity solutions ranging from lower cost to higher cost. Overall, the cost to the public, implementation timeline, and complexity of truck parking capacity projects vary depending on the solution and the location the solution is implemented.

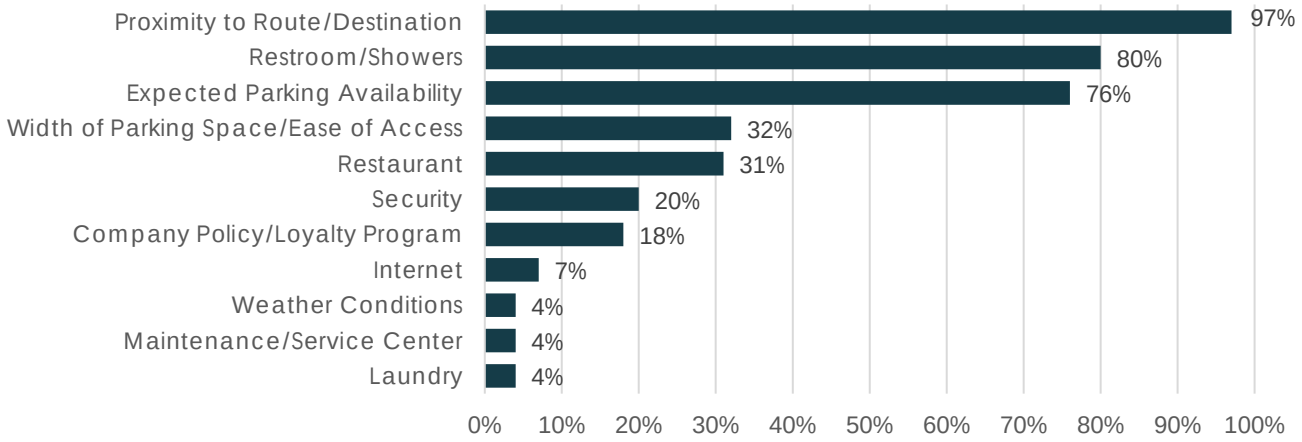
Figure 7-1: Truck Parking Capacity Solutions

Image Source: MDTA, SHA, and Google, 2019 Maxar Technologies, Sanborn, U.S. Geological Survey, USDA Farm Service Agency.

Additionally, truck parking projects come in a array of configurations, but they uniformly involve adding or otherwise improving truck parking through investment. The location to improve or build truck parking should be influenced by what affects a truck driver's decision to park at a specific location. Figure 7-2 displays that the most important factor affecting where a truck driver decides to park is the proximity of truck parking spaces to the truck driver's route or destination, followed by restrooms/showers and the expected availability of truck parking.[26] Overall, Figure 7-2 provides a summary of the factors to consider when selecting a site for new truck parking, the amenities to provide on-site, or how to improve existing parking facilities to make them useful for truck drivers.

[26] Boris, C. and R. M. Brewster, 2016. "Managing Critical Truck Parking Case Study –Real World Insights from Truck Parking Diaries." American Transportation Research Institute.

Figure 7-2: Influential Factors Affecting where Truck Drivers Park for their 10-Hour Rest Break



Source: Data from ATRI Managing Critical Truck Parking Case Study — Real World Insights from Truck Parking Diaries December 2016.

ADD SPACES AND OPTIMIZE THE USE OF EXISTING TRUCK PARKING FACILITIES

Adding spaces and optimizing the use of existing facilities focuses on using existing truck parking facilities to add capacity or increase the number of spaces through a more efficient use of space. Truck parking facilities could be improved to increase their utilization. The following provides examples of approaches:

- Systematically analyze the ROW, amenities, current condition, and impediments to expanding existing facilities, along with a planning-level cost estimate to identify potential projects to position the State for pursuing federal grants and traditional funding sources.
- Adding minimal spaces based on the demand, an overflow lot, or identifying whether a different configuration to maximize the use of existing pavement.
- Utilize the design process and time that public facilities are closed during rehabilitation projects to explore low-cost opportunities to add or reconfigure truck parking spaces.
- Add amenities to underutilized facilities to attract truck drivers.

FORMALIZE ROADSIDE FACILITIES

Roadside areas and lots with wide shoulders are frequently used for undesignated truck parking. In some cases, these roadside lots or wide shoulders could be signed to allow for overnight truck parking. Figure 7-3 provides an example of a truck turnout developed by the Wyoming Department of Transportation as a truck parking only site (no amenities). According to the National Coalition on Truck Parking, truck turnouts require between 270 to 300 feet of right of way

and work well on lower volume corridors where there is good visibility of the on/off ramps.[27] The addition of on/off ramps is critical to trucks safely entering and exiting the location. In addition to the acceleration and deceleration lanes, stakeholders suggested using a guardrail to separate parked trucks from the main traffic flow and ensuring sites provide a level of safety commensurate with other MDOT truck parking sites. In this scenario, trash removal and portable or vault toilets could be added to provide minimum amenities.

Figure 7-3: Example of Wyoming Truck Turnouts

Source Imagery: Google, 2019, Maxar Technologies.

DEVELOP NEW FACILITIES

Developing a new low amenity truck parking facility or new rest area is one of the most complex and high-cost truck parking solutions. Therefore, it is a best practice to compare the cost of developing a new truck parking facility to other options, such as promoting the use of nearby underutilized facilities, exploring the expansion of existing facilities, and identifying other partnership opportunities. If developing a new truck parking facility is the best approach, low-cost approaches such as locating it near existing truck stops, restaurants, and/or providing minimum amenities on-site could be compared to developing a full-service facility and matched to the truck parking needs in a particular area. For example, the Wyoming Department of Transportation constructed truck parking next to an existing truck stop, providing additional truck parking and removing the need for the State to provide amenities on site.

Developing a low amenity truck parking location or a new rest area also requires a long implementation timeline. In cases where new facilities are needed now or in the future, the following approaches could be used:

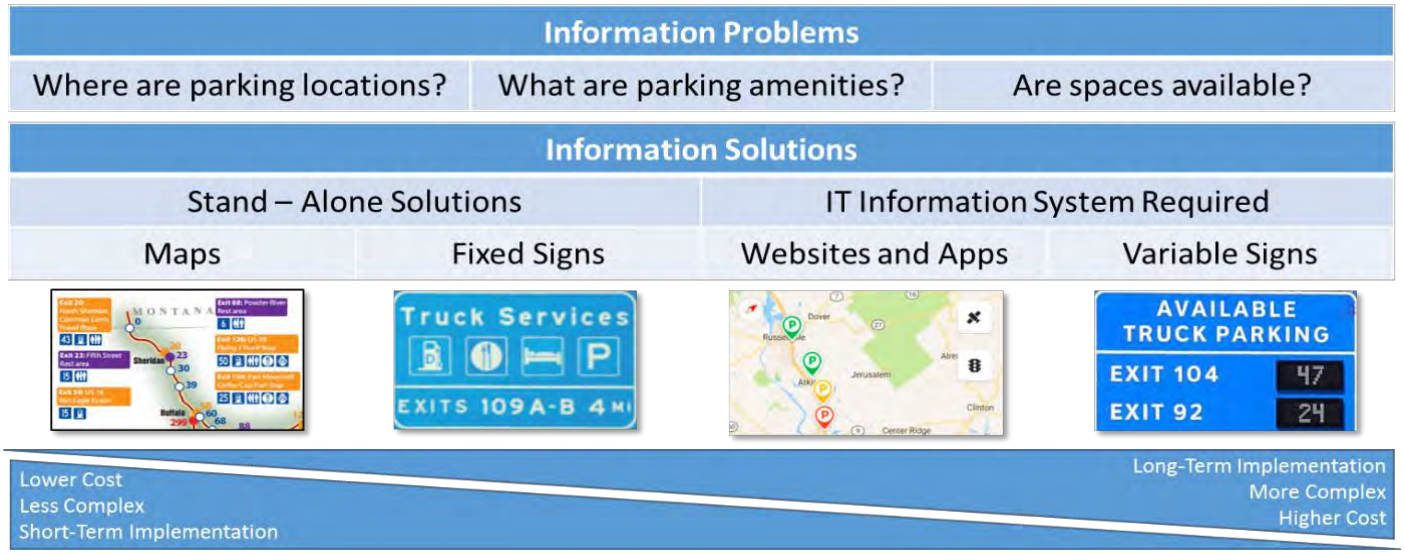
[27] National Coalition on Truck Parking: Parking Capacity Working Group, 2019. Creative Uses of the Right-of-way and Adjacent Areas. Federal Highway Administration.

- Incorporate ROW acquisition into the development of larger roadway projects or the consideration of truck parking during the clearance of excess right of way.
- Use construction staging areas for truck parking after construction projects are completed.
- Identify brownfield sites near freight corridors to develop truck parking in the future.

7.2.2 Projects Addressing a Lack of Truck Parking Information

Lack of information about truck parking availability results in overflow and undesignated truck parking at some facilities while spots are available at other facilities. In the absence of an ITS real-time truck parking system, truckers experience problems finding available parking spaces.[28] The approaches presented in Figure 7-4 provide truck parking information to truck drivers using a range of approaches, from maps and static signs to installing variable message signs as part of an ITS real-time truck parking system. Similar to capacity projects, different information solutions have different implementation timelines, complexity, and cost.

Figure 7-4: Information Problem and Potential Solutions



MAPS AND STATIC SIGNS

Providing truck parking maps and static wayfinding signs for both public and private truck parking facilities can assist truck drivers in finding truck parking. These approaches are low cost, quick to implement, and less complex than other information solutions, but they do not tell truck drivers if there is available truck parking at each facility. Therefore, while developing a truck parking map

[28] Dills, T, 2018. "ELDs' parking impact: Trucker Path data show big shift in planning, little in capacity stress." Overdrive. https://www.overdriveonline.com/elds-parking-impact-trucker-path-data-show-shift-in-planning-practices-little-in-capacity/.

is a best practice, it's effectiveness as a solution to undesignated truck parking is limited to facilities that have available truck parking at all hours of the day.

Although static signs face similar constraints and are higher cost than maps, static signs could be used to inform truck drivers about long stretches of roadway without truck parking facilities. Additionally, static signs may be the only approach if private truck parking facilities do not provide real-time truck parking availability information.

ITS REAL-TIME TRUCK PARKING SYSTEM

An ITS real-time truck parking system uses sensors and dynamic signs to provide real-time truck parking information about the location and availability of truck parking spaces. The truck parking information can be pushed to third party applications, such as phone or in-cab truck parking applications, through an application program interface (API) or connected vehicle technology

A key component of developing an ITS real-time truck parking system is providing information to truck drivers that help them make decisions. Therefore, the placement of DMS should be far enough in advance of a truck parking facility to allow a driver time to look for other parking if the site is full. States such as Michigan and Iowa have successfully integrated a limited number of private truck parking facilities into their systems, but no state has successfully integrated most private truck parking facilities. Therefore, a combination of an ITS real-time truck parking system and static signs could be used to inform truck drivers about the availability of public truck parking spaces and the location of private facilities. The combination of real-time and static signs provides as much real-time information as possible to supplement static signs.

COORDINATING TRUCK PARKING INFORMATION WITH NEIGHBORING STATES

There is an opportunity to coordinate with neighboring states to display truck parking information across state borders, as well as inform each other about changes to truck parking near state borders. Providing truck drivers with truck parking availability, distance, and travel time could also help drivers make informed truck parking decisions. Similarly, a uniform approach to presenting truck parking information on signs would also limit confusion when truck drivers travel between Maryland and neighboring states.

7.3. TRUCK PARKING PARTNERSHIP

Truck parking partnerships come in many forms and will often include multiple public agencies and/ or the private sector. For example, the truck parking provided at welcome centers throughout Maryland is a partnership between MDOT and the Maryland Department of Commerce's Office of Tourism Development. Addressing truck parking issues in urban areas will also require partnerships with local jurisdictions. Similarly, multiple public agencies may need to be involved in advancing P3 opportunities.

7.3.1 PUBLIC-PRIVATE PARTNERSHIPS (P3S)

P3s are generally lower-cost options for public agencies compared to the public sector developing and operating area facility, but examples of truck parking P3s are limited. Approaches to developing a truck parking P3 and real-world examples include:

- Operating agreements for rest areas—The application of P3s to rest areas is limited by a federal ban on commercial activity within the Interstate ROW (23 U.S. Code § 111), with the exception of grandfathered sites or roadways, non-Interstates, and locations outside the Interstate ROW.[29] MDTA's P3 with Areas USA for Chesapeake House and Maryland House Travel Plazas provides an example of a P3 resulting in net revenue for the public sector and an example of an exemption to the federal ban on commercial activity within the Interstate ROW. Commercialized rest areas also face industry opposition from other truck stop operators, including the National Association of Truck Stop Operators (NATSO). A NATSO study in 2010 and their update in 2018, found fewer truck parking spaces per mile on Interstates with commercialized rest areas compared to Interstates without commercialized rest areas.[30]

- Improving land adjacent to a private facility—States such as Wyoming and Utah and cities such as Weed, California and Elmira, New York have constructed truck parking adjacent to or near existing truck stops and businesses to limit the need to provide amenities on-site. For example, the Wyoming Department of Transportation constructed truck parking next to an existing truck stop, providing additional truck parking and removing the need for the State to provide amenities on-site.

- Funding/incentivizing truck parking—Another P3 approach to facilitate creation of private truck parking facilities. Private development of truck parking could be incentivized through grants, accelerated depreciation, low-interest financing, or subsidizing required roadway improvements. An incentive program could target private truck stops, shippers and receivers that allow truck parking on-site, or communities that are near public/private truck parking facilities. For example, the City Council in Decatur, Illinois used $750,000 in local motor fuel taxes to reconstruct a roadway that connects to a new Love's Travel Stop (opened in April 2019). The roadway reconstruction would have otherwise been paid for by Love's, but Decatur opted to incentivize the construction of the truck stop with an agreement from Love's to repay the cost of roadway reconstruction if they did not build the facility by May 2019.[31]

---

29 23 U.S. Code § 111 provides an exemption for sites (grandfathered sites) that were in existence before January 1, 1960, are owned by a State, and are operated through concessionaries or otherwise. Access to grandfathered sites must also comply with Interstate standards.

30 Knipling, R.R. 2017. "Rest Area Commercialization and Truck Parking Capacity: 2018 Update." National Association of Truck Stop Operators.

31 Beckett, D, 2019. Love's Travel Stops opens location on Decatur's northwest side near I-72. Herald & Review. https://herald-review.com/business/local/love-s-travel-stops-opens-location-on-decatur-s-northwest/article_3acb6dba-fb77-5a5c-b564-2086ecea6a15.html

- Rest area sponsorship—Although FHWA limits what can be displayed within the ROW, several states have successfully sold rest area sponsorships, such as GEICO sponsored safe phone zones.

In addition to the P3 opportunities listed above, other approaches highlighted by stakeholders or proposed in other truck parking studies include partnering with stadiums, large venues, retail businesses, and owners of brownfield sites to use existing paved lots for truck parking when the facilities are not in use or during off-peak periods. Specific locations proposed by stakeholders throughout the study included the Westfield Shopping Mall in Annapolis, the former Landover Mall, and Walmart and Costco locations. Input from truck drivers during the study indicated that the ability to park at retail stores varies, in the case of Walmart the landowner and store manager decide whether trucks are allowed to park at a store.[32]

Pursuing this solution would likely require incentives and community outreach depending on the nearby land use. Partnering with local jurisdictions and communities to identify locations, address community concerns, and provide incentives will be critical to successful implementation.

7.3.2 Encourage Shippers and Receivers to Provide Truck Parking On-Site

The trucking industry frequently brought up that they are often not allowed to park overnight at their origin or destination. The lack of overnight truck parking at shippers and receivers requires truck drivers to find truck parking near these facilities, but truck parking is often not available. The National Coalition on Truck Parking identified examples of businesses such as Meijer and Unilever providing truck parking at their distribution centers for drivers serving their facility. In 2015, Unilever developed a pilot that allowed truck drivers to park on-site at their Newville, Pennsylvania distribution center, located 25 miles north of the Maryland/Pennsylvania border near I-81. Unilever pursued the pilot after approaching one of their carriers to identify how Unilever could become a "shipper of choice." Unilever wanted to make its facilities easy for truck drivers to serve and therefore increase their ability to get trucking service when the trucking market is tight. The pilot program has now been implemented at all of Unilever's North American distribution centers and manufacturing plants. [33]

The Unilever and Meijer examples demonstrate what is possible when shippers and receivers are a part of the process and solution. This presents an opportunity for targeted outreach and supporting information to promote on-site truck parking, as well as partnering with associations such as the Maryland Motor Truck Association or local economic development departments to encourage shippers and receivers to allow truck parking on-site.

[32] Maryland truck Parking Workshop discussions, September 2019.
[33] National Coalition on Truck Parking, 2019. "National Coalition on Truck Parking: Parking Capacity Working Group - Involving Shippers/Receivers to Address Truck Parking Capacity." Federal Highway Administration.

7.3.3 Partner with other State Agencies and local jurisdictions

Partnering with other state agencies and local jurisdictions to increase truck parking capacity includes identifying existing land or paved areas that could be used overnight for truck parking or developed to provide truck parking and staging areas in high demand areas. As noted, the partnership between MDOT and the Maryland Department of Commerce's Office of Tourism Development results in truck parking at welcome centers throughout Maryland.

7.3.4 Partner with Cities and Metropolitan Planning Organizations

In general, prioritizing solutions in urban areas should be led by MPOs and local jurisdictions to match long-term development plans with the area needs for truck parking. Partnering with MPOs and local jurisdictions governments may include:

- Providing data—Truck GPS and truck parking facility data could be used to support land use planning and to identify truck parking projects that serve freight clusters and support freight corridor development.

- Educational materials and support—Statewide context and resources are often needed for MPOs and local governments to assess vacant land that could be developed into staging areas or overnight truck parking facilities in urban areas. Local governments and cities in other parts of the U.S. have developed municipal truck parking lots such as those in Weed, California and Elmira, New York, or explicitly designated roadways for truck parking in Moreno Valley and Carson, California.[34]

7.4. TRUCK PARKING POLICIES

Policies address truck parking by setting the stage to improve truck parking through legislation/regulation, the development of programs, or making other institutional changes.

7.4.1 Integrate Truck Parking into Planning, Roadway Design, Zoning, and/or Land Use

The role of designated truck parking in ensuring a safe and efficient transportation system is demonstrated by the proximity of undesignated truck parking to existing warehousing and industrial developments. There is an opportunity to systematically identify future designated truck parking in state, county, and/or local plans and standards.

For example, there is an opportunity for local jurisdictions to incorporate truck parking into the design of roadways leading to freight intensive facilities and add zoning requirements that require

[34] National Coalition on Truck Parking, 2019. "National Coalition on Truck Parking: State, Regional, Local Government Coordination Group - Parking and Staging Requirements in Local Zoning and Planning." Federal Highway Administration.

truck parking on-site for truck drivers. Another approach to promoting the development of truck parking near origins and destination is requiring developers to provide a minimum number of truck parking spaces based on the square footage or the number of loading docks at new developments. For example, the Township of Lower Macungie, near Allentown, Pennsylvania requires a minimum number of truck parking spaces based on square footage for commercial and industrial land uses. Warehouses, distribution centers, wholesalers, and storage businesses are required to provide an on-site lounge and truck parking.[35,36]

Similarly, truck parking could be added to state, county, and/or city traffic impact or corridor studies for developments, redevelopments, and projects that are projected to have a substantial impact on freight. The inclusion of truck parking in relevant transportation studies and planning, such as master and sector plans, provides the permitting jurisdiction with an opportunity to identify truck parking issues and mitigation requirements proactively.

Roadway design standards, zoning, and traffic impact studies are existing frameworks that are administered by public agencies and institutions, providing an opportunity for streamlined implementation. The various avenues for incorporating truck parking into existing development and redevelopment decision-making demonstrates the role cities and counties have in planning, promoting, or providing truck parking.

7.4.2 Integrate Truck Parking into State Freight Planning

The role of truck parking in supply chains and the movement of freight suggests it should be considered in state freight plans. Potential approaches to incorporating truck parking into a state freight plan include analyzing the adequacy of truck parking near freight intensive clusters, identifying truck parking needs in the plan, developing truck parking performance measures, and considering truck parking projects for National Highway Freight Program (NHFP) funding. The latest 2017 update of Maryland's Strategic Goods Movement Plan provides an opportunity to consider how to incorporate truck parking into the analysis and recommendations.

7.4.3 Formalize the Truck Parking Program

A formalized truck parking program at MDOT builds upon existing activities by defining and communicating a process to identify, select, and develop existing and new truck parking capacity and information projects. The following activities outline steps to formalize a streamlined and strategic truck parking program.

[35] Lower Macungie Township Municipal Code § 27-2304.
[36] Lower Macungie Township Municipal Code § 27-2406.

IDENTIFYING FUNDING OPPORTUNITIES AND ESTABLISH A PIPELINE OF TRUCK PARKING PROJECTS

A key outcome of the truck parking program is the implementation of projects, policies, and partnerships. Therefore, identifying funding opportunities, such as developing a dedicated source of funding for truck parking or positioning projects to compete for federal grants, is a key first step. In addition to identifying funding, projects need to be identified and advanced from a conceptual level through the design process. The following activities seek to identify the locations for new information and capacity projects and continue the development of projects that are already in development:

- Identify locations and routes to develop a real-time truck parking system and wayfinding application.
- Re-assess opportunities to expand truck parking at public truck parking facilities.
- Establish a truck parking selection prioritization process for public truck parking facilities.
- Advance prioritized projects through the design and construction process and/or position projects for federal grant opportunities.

DEFINE AND MEASURE TRUCK PARKING PERFORMANCE

Streamlining and strategizing the truck parking program also includes the identification and systematic collection of truck parking performance measures. The 2015 Jason's Law Survey Report identified many potential performance metrics, but examples of the systematic collection of performance data over multiple years is not frequently done by state DOTs. In addition to MDOT's survey of overnight truck parking, there is an opportunity to use and capture real-time data with the development and implementation of ITS real-time truck parking system to connect truckers to available spaces. In the Midwest, an eight-state coalition developed the eight state Truck Parking Information Management System (TPIMS) regional truck parking information system which provides a data source for truck parking performance measures. According to a 2019 presentation to the I-95 Corridor Coalition, the following qualitative and quantitative performance measures are used to assess the performance of the TPIMS project:[37]

- Are drivers utilizing TPIMS to inform their parking decisions?
- Have driver-perceived parking shortages declined? Utilization of the truck parking information system to make parking decisions
- Are truck parking facilities more safe and secure?

[37] Luley, D, 2019. "Indiana TPIMS." https://docs.lib.purdue.edu/cgi/viewcontent.cgi?article=4407&context=roadschool

- Is there a reduction in illegal or informal parking?
- Is there a reduction in fatigue-related crashes?
- Is there a decline in the average time spent looking for parking?
- Is the system meeting its performance requirements for accuracy?

The TPIMS performance measures require analysis of TPIMS and safety data, as well as the survey data. Collecting truck parking data over time provides an opportunity for MDOT and MDOT SHA to assess the impact of truck parking over time. Additionally, adding and including safety performance measure(s) provides additional insights into how truck parking affects roadway safety.

Utilizing Existing and Collecting New Data to Assess Truck Parking Performance

MDOT is uniquely positioned with the historic existing data and collection methods needed to monitor truck parking performance over time and assess the impact of truck parking implementation on undesignated truck parking. Maryland's collection of truck parking data since 2012 together with the current study, presents an opportunity for MDOT to recalibrate existing truck parking performance measures. The existing performance measures count report both designated and undesignated truck parking along major corridors, which mixes good truck parking (designated) with undesirable truck parking (undesignated) behavior. Recalibrating the performance measures to output report the count of change in undesignated truck parking and utilization of public and private facilities would improve the application of the data to assess the impact of Maryland's truck parking projects, policies, and partnerships MDOT and stakeholder action.

Additionally, MDOT could utilize its access to INRIX truck GPS data and the collection of truck counts during the Maryland Freight Network Truck Parking Survey to compare the number of trucks at each location on the specific collection day to the INRIX data. This refinement would allow MDOT to calculate expansion factors for designated and undesignated trucks on critical corridors and at locations with greater specificity than previously possible in other studies. The results could allow MDOT to use the INRIX or another provider of truck GPS data to calculate the number of undesignated trucks throughout the State in between periodic overnight surveys to validate the data. The INRIX data would also allow the number of undesignated truck stops to be counted quarterly and. The resulting data set could be used to compare the change in designated and undesignated truck parking before and after the implementation of a truck parking project or policy, as well as monitor for truck parking trends, providing MDOT with valuable insight to inform future projects and policies.

7.4.4 Pilot Overnight Use of Park and Rides for Truck Parking

Park and ride facilities are already used for emergency truck parking, but trucks are not allowed to park at these locations year-round. Piloting the use of park and rides for truck parking at night would leverage times when they have lower demand and take advantage of facilities that are already owned and built by MDOT. The selection of pilot park and ride facilities could consider the ability of the location to handle the turning radii of trucks, infrastructure for trucks to safely enter and exit the location, the existing automobile demand at night, lighting/safety of the location, proximity to incompatible land uses, and the approaches to providing restrooms and other amenities. Other considerations include enforcement, trash collection, and provide a level of safety that is comparable to other truck parking locations.

A pilot project would provide an opportunity to assess the potential issues with allowing truck parking at park and ride facilities to inform the site selection and approach to a wider rollout.

7.4.5 Improve Amenities and Awareness to Increase the Use of Truck Weigh and Inspection Stations

The addition of amenities at TWIS locations with truck parking could increase the utilization of these facilities. When assessing amenities, considering improvements to the safety, lighting, and cleanliness could be considered in addition to providing physical amenities such as restrooms. The location and size of Maryland's TWIS locations make them an attractive opportunity to add truck parking on busy corridors with minimal cost. MDOT could also promote parking at TWIS locations to truck drivers through industry outreach, static signage, incorporation of TWIS locations into a future statewide ITS real-time truck parking system and adding TWIS locations to truck parking applications like Trucker Path. Lastly, MDOT could promote the "safe haven" status outlined in the Maryland Motor Carrier Handbook and Maryland Truckers Map to the trucking community to inform users about parking at TWIS locations and that inspections will not occur unless a violation is visually apparent. MDOT has the opportunity to use existing and new approaches to market TWIS locations for truck parking. For example, MDOT can reach truck drivers through Maryland Motor Truck Association, the Owner-Operator Independent Drivers Association, social media, and through outreach to trade schools that are training new drivers.

7.4.6 Leverage Federal Grant Opportunities

Federal grants provide an opportunity to fund truck parking projects and initiatives. Appendix D provides an overview of grant opportunities that can fund truck parking. Two notable sources of grant funding for truck parking capacity and information projects are the Infrastructure for Rebuilding America (INFRA) and Better Utilizing Investments to Leverage Development (BUILD) programs. Both programs use benefit-cost analysis as a criterion for project selection and are highly competitive. Chapter 9 provides the categories of benefits and costs, as well as resources for developing the benefit-cost analysis for a truck parking project. The outcome of this study

positions MDOT to pursue future grants by identifying projects for near-term implementation and securing support and commitments from public and private stakeholders.

7.4.7 Provide Resources and Support Community Conflict Mitigation

Stakeholders throughout the study indicated that incompatible land use is a significant challenge for truck parking capacity expansion and that counties in Maryland face mounting pressure from developers to adapt zoning for building multi-unit housing. This resulted in development that creates conflicts between industrial and residential land uses.

Land use conflicts affect the trucking industry, shippers and receivers. It will require innovative solutions to provide for appropriate truck practices in new zoning trends. For example, truck idling at parking facilities is an issue for nearby communities as it causes noise and emissions. Trucks are often idling their engine for in-cab heating, air-conditioning, and power. The perception that noise, emissions, and the fear that truck parking will lower the value of nearby houses values often result in community opposition to truck parking development. Developing project approaches, such as the electrification of truck parking spaces and installing noise walls could make truck parking projects more acceptable to local communities.

8. TRUCK PARKING RECOMMENDATIONS

8.1. OVERVIEW OF THE RECOMMENDATIONS

The data, stakeholder input, and research analyzed and throughout the Maryland Statewide Truck Parking Study informed the development of the recommendations identified in this chapter. The overall purpose of the recommendations are to reduce undesignated truck parking through the implementation of projects, policies, and partnerships that positively affect safety, economic prosperity, and the condition of transportation infrastructure.

8.2. MARYLAND'S TRUCK PARKING OBSTACLES AND CHALLENGES

The nine obstacles and challenges described below were identified during the data analysis, stakeholder input, and research analyzed during the Maryland Statewide Truck Parking Study. The obstacles and challenges highlight the truck parking needs in Maryland and inform the development of the study's recommendations.

8.2.1 LACK OF DEDICATED AND OVERALL TRUCK PARKING

Based on the INRIX truck GPS data analysis, an estimated 190 trucks per day are unable to find truck parking in the early morning and, therefore, park in undesignated areas. About 19 percent of the trucks parked in undesignated areas were parked along on/off ramps at MDOT Welcome Centers, Rest Areas, and Travel Plazas. The remaining undesignated truck park at other locations, such as the side of highways or last-mile connectors (such as local roadways leading to warehouses/distribution centers). Additionally, when asked which states have a shortage of safe truck parking in the 2015 Jason's Law Survey, Maryland was ranked fifth and 13th by drivers from the Owner-Operator Independent Drivers Association and the American Trucking Association, respectively. The responses from truck drivers in the 2015 Jason's

Law Survey displays a general knowledge of the shortage of truck parking in Maryland relative to other states.

8.2.2 Lack of Knowledge of Where/How to Find Truck Parking

The availability of truck parking is limited in Maryland, with the largest number of spaces available at Maryland's Truck Weight and Inspection Station (TWIS) locations. Although the overnight parking hours (7pm to 7am) at TWIS locations are listed on the MDOT's Trucker's Map, many truck drivers were either unaware of the ability to use truck parking at TWIS locations or they are hesitant to park at a TWIS location. Truck drivers highlighted this hesitance when we conducted a focus group in the fall of 2019, specifically due to the perception that there is an increased risk of being inspected by enforcement officials when parking at a TWIS location.

Figure 8-1: Truck Weight and Inspection Stations.

TRUCK WEIGH & INSPECTION STATIONS *(Parking Permitted when Station is Closed)*	
Location	Spaces
Cecilton	25
Conowingo - US 1 S/B	7
College Park Facility - I-95/I495	17
Finzel - I-68 E/B	12
Hyattstown - I 270 N/B & S/B	NB 12, SB 12
New Market - I 70 E/B	15
Perryville - I 95 N/B & S/B	NB 59, SB 52
Vienna - US 50 EB	12
West Friendship - I 70 W/B	18

Source: Maryland Department of Transportation.

8.2.3 Different Truck Parking Needs in Rural and Urban Areas

The mix of truck parking issues in urban and rural Maryland and the importance of local issues and community concerns requires a balanced approach for improving truck parking, including policy-making, outreach/education, and land use planning combined with capacity and real-time information projects. Urban areas have very few parking facilities and little to no available truck parking spaces during overnight hours. Many of these spaces are used for shorter stops related to staging throughout the day and switch to longer Hours of Service (HOS) stops at night. Rural truck parking locations are used primarily for longer overnight HOS breaks.

8.2.4 Safety and the Perception of Safety

Undesignated truck parking endangers truck drivers and other roadway users. In addition to public and private stakeholders identifying safety as the top truck parking issue during the Maryland Truck Parking Study Workshop, trucks parked on Maryland roadway shoulders were involved in two fatal crashes, one in 2011 and another 2018, demonstrating the risk posed by undesignated truck parking. An observation on the risk of undesignated parking (safety) provided by a workshop participant noted that although crashes with trucks parked on roadway shoulders or on/off ramps are infrequent, they are often fatal.

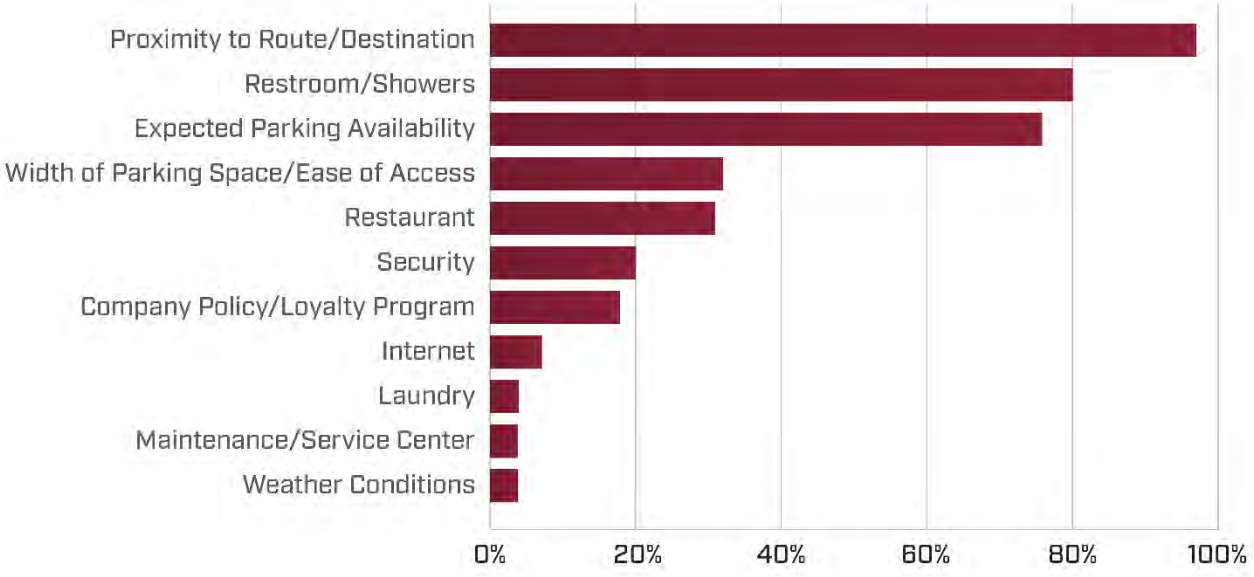
In addition to the safety impacts of undesignated truck parking, communities are often concerned over the real or perceived safety impacts of the development or expansion of truck parking facilities.

8.2.5 Lack of Amenities at Truck Parking Facilities

On-site amenities are one of the factors affecting where a truck driver decides to park. Amenities should be a consideration when developing new truck parking facilities or improving existing parking lots to make them attractive for truck drivers. Restrooms/showers are a critical factor for making truck parking more attractive to truck drivers.[38] Developing additional amenities was identified as an approach to increasing the utilization at TWIS locations and other underutilized facilities. In addition to restrooms, the turning radii of trucks, infrastructure for trucks to safely enter and exit the location, trash collection, and safety are attributes that could be improved at underutilized locations.

[38] Boris, C. and R. M. Brewster, 2016. "Managing Critical Truck Parking Case Study –Real World Insights from Truck Parking Diaries." American Transportation Research Institute.

Figure 8-2: Influential Factors Affecting where Truck Drivers Park for their 10-Hour Rest Break



Source: Data from ATRI Managing Critical Truck Parking Case Study — Real World Insights from Truck Parking Diaries December 2016

8.2.6 Noise in Neighboring Communities near Truck Parking Facilities

Similar to the perception of the safety of truck parking facilities, communities have pointed to the noise and emissions related to truck parking facilities. Communities are also concerned that a new or expanded truck parking facility will negatively impact property values. The result of these concerns has been community opposition to truck parking projects.

8.2.7 Lack of Innovation in Truck Parking

New innovations are anticipated to affect the demand for truck parking, amenities needed at truck parking facilities, and provide opportunities to address existing and future truck parking needs. Two innovative examples are electric vehicles and Connected and Automated Vehicles (CAV). Electric vehicles will impact where and how long trucks park, as well as the amenities needed at public and private truck parking facilities. Additionally, CAVs provide an opportunity to push and receive information to/from trucks to help drivers decide where to park and could greatly decrease the demand for truck parking as CAV technology advances in sophistication and use.

8.2.8 Lack of Real-Time Truck Parking System and Navigation

Innovations, such as Real-time Truck Parking Systems are a new approach some states have been able to implement to provide truck drivers with information about the availability of truck parking as needed. These real-time systems may use sensors, cameras, and/or DMS to provide real-time truck parking information about the location and availability of truck parking spaces to help inform a truck driver's decision about where and when to look for truck parking. The information can be pushed to third party applications, such as phone or in-cab truck parking applications, through an application program interface (API) or connected vehicle technology, making it available to drivers to plan their stops as they approach or enter the State. Static wayfinding signs could be used to inform truck drivers about the location of public and private facilities that are not integrated into the real-time truck parking system.

8.2.9 Legislative Challenges

The primary legislative challenges related to truck parking are the lack of a requirement for freight generators (i.e., suppliers, carriers, etc.) to provide truck parking and local planning for warehouse/distribution center locations that often do not account for truck parking needs. The lack of truck parking requirements for freight generators and incorporation of truck parking in local planning often results in undesignated truck parking near freight generators on local or state roadways, creating safety hazards and infrastructure breakdowns.

8.3. TRUCK PARKING RECOMMENDATIONS

The need to address truck parking issues is highlighted in this study by identifying the major undesignated truck parking clusters occurring throughout the state and its impact on the safe and efficient use of highway infrastructure, the operation of supply chains, and infrastructure conditions. Therefore, the findings and challenges identified in this study were used to develop the four recommendations, each of which include Legislative, Policy, Program, Project, Partnership, and Education and Outreach actions to advance truck parking in Maryland:

8.3.1 Recommendation 1: Further Develop the Truck Parking Program

Formalize the truck parking program within MDOT by establishing performance measures and the associated data needed to evaluate those performance measures. Based on the metrics, further recommendations and priorities will be established to improve existing truck parking capacity, identify new truck parking capacity and truck parking information projects/initiatives. Some initial initiatives for the Truck Parking Program include:

- Annually collect truck parking counts of overnight truck parking.
- Establish truck parking performance measures to annually assess the program.

- Establish a truck parking selection prioritization process for public truck parking facilities utilizing the priority truck cluster analysis, areas, and opportunities.
- Identify pilot opportunities (could also be P3s) for full-service parking facilities.
- Establish a pilot project providing overnight parking facilities at existing park-and-ride lots.
- Identify additional locations and routes to develop a real-time truck parking system and wayfinding application.
- Support and incorporate identified actions from the Action Plan for Zero Emissions Medium and Heavy Duty Vehicles, to be developed in 2021.
- Analyze park-and-ride lots to identify opportunities for overnight truck parking (especially near priority clusters).
- Continue design work for truck parking projects (i.e., I-70 South Mountain Welcome Centers).
- Re-assess opportunities to expand truck parking at MDOT welcome centers, rest areas, and TWIS locations.
- Identify opportunities to provide restrooms and other amenities, including electrification infrastructure, at TWIS locations and truck rest areas.
- Ensure safe, well-lit, and clean truck parking facilities (including TWIS locations) with amenities (i.e., trash removal, security).
- Monitor federal and state legislation for any changes that could impact statewide truck parking needs.
- Ensure that truck parking needs such as truck parking plans, projects and initiatives are part of the State freight plan.
- Ensure that state and local staff consider truck parking facilities prior to property clearance of excess right of way.

8.3.2 Recommendation 2: Convene a Standing Truck Parking Committee and Further Outreach on Truck Parking Issues

This study emphasized the need to develop a standing Truck Parking Committee, similar to the Working Groups that provided input and direction for this study, to help oversee the implementation of study recommendations and facilitate continued advancement and input for truck parking in Maryland. In addition, consistent and coordinated communication with external stakeholders outside of the Truck Parking Committee generates understanding and awareness of

truck parking issues and importance to the economy of Maryland. Initial action items include but are not limited to the following recommendations:

- Meet annually with the Freight Stakeholder Advisory Group and identify priority projects and opportunities to partner and/or seek grants.
- Develop a stakeholder list and stakeholder outreach plan for each type of stakeholder (i.e., elected officials, MPOs, local jurisdictions, trucking industry, carriers, and shippers, etc.).
- Develop materials for outreach and education:
  - One-page summary of the report and recommendations.
  - Template for projects on truck parking needs.
  - Information on undesignated parking restrictions.
  - Other outreach materials and resources, including data.
- Update the truck parking web page with a report summary and recommendations for implementation.
- Outreach to the internal/external freight stakeholder groups, provide any project updates, and discuss strategies and opportunities that each stakeholder group can provide assistance.
- Provide outreach to the trucking industry on TWIS locations (safe haven TWIS locations) overnight truck parking (200 total spaces available statewide).
- Explore social media and other opportunities (media sources) to reach trucking industry customers.
- Outreach on real-time truck parking system and wayfinding application (as developed).
- Outreach to neighborhoods on truck parking benefits, needs, and safety.
- Pilot the community outreach template using the I-495/I-95 park-and-ride concept (and learn what worked).

8.3.3 Recommendation 3: Integrate Truck Parking into Land Use, Zoning, and Planning

The following recommendations address the overall limited and lack of dedicated truck parking statewide by integrating truck parking needs into legislative, policy, and planning activities. This recommendation highlights the shared responsibility of MDOT, local jurisdictions, and freight stakeholders by formalizing the need to provide truck parking and their importance within the

supply chain (i.e., shippers, carriers, and suppliers) to support the state's economic vitality and future. Action items include but are not limited to the following recommendations:

- Comprehensive plans should be required to include planning for truck parking needs, including a freight network of roadways, warehouse/distribution center locations and truck parking including just-in-time truck parking needs.
- Local land use zoning should be reflective of truck parking needs, especially near warehouse/distribution centers and other freight generators.
- Tax incentives for communities near new public and public/private truck parking facilities.
- Business tax incentives for businesses that provide new truck parking facilities.

8.3.4 Recommendation 4: Utilize Grants and Other Alternative Funding and Partnership Opportunities

The Funding and Partnership Recommendations focus on MDOT identifying and understanding lessons learned and implementing best practices from peers, applying for grants, and pursuing P3s for truck parking projects. Initial action items include but are not limited to the following recommendations:

- Work with the Federal Highway Administration (FHWA) peer exchange for ITS real-time truck parking system best practices.
- Identify partners and grant opportunities to develop the real-time truck parking system and wayfinding application.
- Identify and seek grants for truck parking expansion projects and innovative technologies (i.e., CAV, EV charging stations, etc.).
- Coordinate with corridor coalitions for opportunities to partner and/or seek grants (strategic planning, design, or construction).
- Seek P3s for truck parking facilities, amenities, and innovation.
- Pursue opportunities with federal re-authorization for truck parking pilot projects, discretionary grants, and dedicated funding.
- Provide funding opportunities for public and public/private truck parking facilities.
- Consider the use of National Highway Freight Program funds for truck parking projects and initiatives.

9. FUNDING ELIGIBILITY

Identifying and allocating available funding resources is central to addressing the most pressing truck parking needs. This section lists the federal funding programs that may be used to support truck parking capacity and information improvement projects. Examples of how funding programs have been successfully applied to truck parking projects are presented to better clarify the types of projects eligible for each program.

Infrastructure for Rebuilding America (INFRA): INFRA is a discretionary grant program (formerly known as FASTLANE) that provides dedicated funding for investments in critical highway infrastructure. In 2019, the US DOT allocated $856 million in INFRA grants to support small and large projects across the nation.[39] MDOT can apply for this grant program to cover up to 60 percent of truck parking project costs. Eligible truck parking projects should be located along the National Highway Freight Network (NHFN).

Truck Parking Availability Project, Florida DOT (2016)

INFRA Grant Amount: $10.78 million

Location: Statewide

Florida received an INFRA grant to implement a truck parking information system called the Truck Parking Availability Systems (TPAS) at over 70 locations in Florida. The TPAS system involves the installation of in-pavement sensors at public rest areas. TPAS disseminates truck parking availability information on the Florida 511 website and smart device application. The INFRA grant built on existing research and implementation projects that Florida DOT was pursuing. Florida DOT has continued the installation of TPAS in rest areas throughout Florida.

[39] USDOT, INFRA, accessed December 2019. https://www.transportation.gov/buildamerica/infragrants

Better Utilizing Investments to Leverage Development (BUILD): BUILD is another competitive grant program that was previously known as Transportation Investment Generating Economic Recovery (TIGER). BUILD supports infrastructure improvement projects that have significant local and regional impacts. Since 2009, BUILD (and TIGER I and II) allocated about $2.4 billion of the total to 50 states.[40] MDOT could propose truck parking projects for a BUILD grant, but these and other competitive grant programs are very competitive and, therefore, incentivize innovative and cost-effective projects with demonstrable benefits.

I-80 Winter Freight Improvement Project, Wyoming DOT (2018)

BUILD Grant Amount: $20 million

Location: Albany and Carbon Counties, Wyoming

Wyoming DOT built 5.5-miles of passing lanes and two truck parking facilities along I-80 to improve the corridor's safety, especially during the winter. The passing lanes will help mitigate the risks of crashes on steeper segments of the I-80 corridor and adding truck parking facilities will also improve freight movement and reduce the costs of highway maintenance (BUILD Grants 2018 Awards).

Regional Truck Parking Information and Management System (TPIMS), DOTs of Kansas, Indiana, Iowa, Kentucky, Michigan, Minnesota, Ohio, and Wisconsin (2015)

TIGER Grant Amount: $25 million

Location: Multiple States

The TPIMS project included the development and implementation of a regional truck parking information system with eight Midwestern states collaborating under the Mid-America Association of State Transportation Officials (MAASTO). In this collaborative effort, the methodologies for collecting and reporting parking space availability information can be unique to each state. However, the resulting data is disseminated through common interfaces such as dynamic message signs, TrucksParkHere website, and a smart device application. The TPIMS system was launched in 2018 and is scheduled to extend to more than 150 truck parking facilities along high-volume corridors in 2019. (TrucksParkHere Project Details, accessed 2019).

[40] USDOT, BUILD Discretionary Grants, accessed December 2019. https://www.transportation.gov/BUILDgrants

Congestion Mitigation and Air Quality Improvement (CMAQ) Program: The CMAQ program provides nearly $2.5 billion in grants to State and local governments for transportation projects that target congestion mitigation and air quality improvements in line with the Clean Air Act requirements. Projects that involve the installation of diesel emission reduction technologies at non-road facilities are eligible to apply for the States' apportioned CMAQ funds.[41]

MDOT could apply CMAQ funding to diesel idle reduction projects that eliminate or reduce the need for trucks to idle at parking facilities and, therefore, address diesel emission issues. Idle reduction techniques eligible for CMAQ funding include Engine-off Idling, Diesel and Battery Auxiliary Units (APUs), Direct-Fired Heaters, and Truck Stop Electrification.

Surface Transportation Block Grant (STBG) Program: Formerly known as the Surface Transportation Program (STP), the STBG program provides about $12 billion annually in flexible funds to the State and local transportation agencies to address their infrastructure needs.[42] Truck parking capacity and information system improvement projects are eligible to receive STBG under Section 1401 of MAP-21.

National Highway Freight Program (NHFP): The NHFP was created by the FAST Act in 2015 and allocates funds to projects that aim to improve goods movement efficiency on the National Highway Freight Network. NHFP provides about $1.4 billion per year to be distributed among the states according to their proportion of federal-aid formula funding. States are required to develop a state freight plan and are encouraged to establish a Freight Advisory Committee to allocate NHFP funding.[43] The NHFP could be used by MDOT for implementing truck parking projects, such as developing a truck parking facility or developing an ITS real-time truck parking system.

Highway Safety Improvement Program (HSIP): HSIP is a federal-aid program that supports projects that significantly reduce traffic fatalities and injuries. HSIP consists of three programs: Strategic Highway Safety Plan (SHSP), Railway-Highway Crossing Program (RHCP), and High-Risk Rural Roads (HRRR).[44]

MDOT could apply HSIP funding to truck parking projects by making a case for the expected reduction in fatalities and injuries due to a reduction in undesignated parking. MDOT could also include prioritized truck parking safety needs in Maryland's SHSP developed under 23 U.S.C. 148.

41 USDOT, CMAQ Program, accessed December 2019. https://www.fhwa.dot.gov/fastact/factsheets/cmaqfs.cfm

42 USDOT, Special Federal-aid Funding, accessed December 2019. https://www.fhwa.dot.gov/specialfunding/stp/160307.cfm

43 USDOT, NHFP Fact Sheet, accessed December 2019. https://www.fhwa.dot.gov/fastact/factsheets/nhfpfs.cfm

44 USDOT, Safety, accessed December 2019. https://safety.fhwa.dot.gov/hsip/

National Highway Performance Program (NHPP): The NHPP supports projects that improve the performance of the NHS. About $24 billion is available annually through the NHPP, which is apportioned among states based on the FAST Act distribution formula.[45]

MDOT could use the NHPP dollars to fund truck parking projects that aim to reduce the risk of infrastructure failure due to undesignated parking, and projects involving the installation of infrastructure-based intelligence systems at facilities serving the NHS.

Diesel Emissions Reduction Act (DERA): Competitive funding through DERA provides grants and loans for engine replacement and alternative fuel consumption equipment and infrastructure to control diesel engine emissions. Eligible projects should use U.S. EPA verified technologies or emerging technologies that have an expected long-life in-service for that purpose.46

MDOT could apply for DERA funding to implement truck parking projects that involve truck stop electrification, whether to charge battery-electric trucks or provide power to run Auxiliary Power Units (APU) to run truck accessories to reduce the need for idling.

Truck Parking Space Electrification, Metropolitan Energy Center (2017)

DERA Grant Amount: $1.04 million

Location: Kansas City, Missouri

Using the funds awarded by the U.S. EPA's DERA program, the Metropolitan Energy Center replaced 21 diesel engine long-haul trucks and tractors with CNG trucks and Installed 41 electrified parking spaces at two private parking locations. This project qualified for the DERA fund due to its potentials for extensive carbon emission reductions (EPA News Release, Region 7 Releases, 2018).

Metropolitan ENERGY CENTER

Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD): The ATCMTD program provides up to $60 million annually (50/50 match) to projects that focus on deploying advanced transportation and congestion management technologies. MDOT could apply for ATCMTD funding for projects that deploy gate and truck stop spot reservation systems to reduce undesignated parking (for staging or overnight rest) or a truck parking information system across the State.47 Additionally, the I-10 corridor coalition received a grant for a ITS real-time truck parking system from Texas to California.

[45] USDOT, Special Federal-aid Funding, accessed December 2019. https://www.fhwa.dot.gov/specialfunding/nhpp/160309.cfm

[46] EPA, Clean Diesel and DERA Funding, accessed December 2019. https://www.epa.gov/cleandiesel

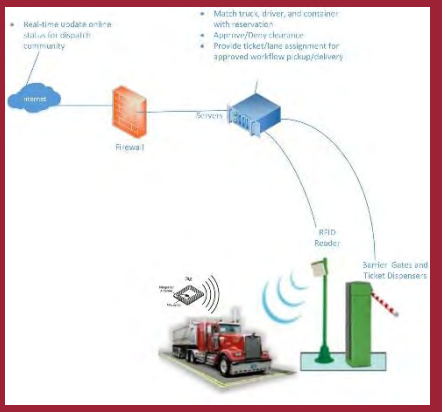
[47] USDOT, ATCMTD, accessed December 2019. https://www.fhwa.dot.gov/fastact/factsheets/advtranscongmgmtfs.cfm

Truck Reservation System, Virginia Port Authority (2017)

ATCMTD Grant Amount: $1.5 million

Location: Norfolk, Virginia

The main focus of this project was the development and implementation of a second-generation truck reservation system. The overall efficiency improvements at the port due to the reservation system can reduce the need for truck idling during staging and thus lower emissions. Also, the cloud-based data storage model used for this truck reservation system can serve as a standardized model for any other port facility in the US (Virginia Port Authority, Truck Reservation System Expansion, and Automated Work Flow Data Model, 2017).



Innovative Technology Deployment (ITD): Formerly known as the Commercial Vehicle Information Systems and Networks (CVISN) program administered by the FMCSA, ITD focuses on highway safety improvements related to commercial vehicle activity including enforcement, information exchange, and electronic screening projects. About $20 million is provided through the ITD program on an annual basis to 50 projects across the US.[48] MDOT could use the ITD funding for projects that improve truck parking availability information exchange.

Multiple Commercial Vehicle Activity Improvement Projects, Executive Office of the Commonwealth of Kentucky (2017)

ITD Grant Amount: $1.8 million

Location: Kentucky

Through the ITD fund, the Executive Office of the Commonwealth of Kentucky supported multiple trucking-related projects, including real-time information technology deployment in truck parking facilities to improve security and monitor space availability (The Innovative Technology Deployment (ITD) Grant Program, 2017 Annual Report).

[48] USDOT, ITD Program, accessed 2019. https://www.fmcsa.dot.gov/information-systems/itd/innovative-technology-deployment-itd

A APPENDIX: EXISTING STUDIES, DATA COLLECTION, AND INITIATIVES

A.1 MARYLAND FREIGHT NETWORK TRUCK PARKING SURVEY

The Maryland Freight Network Truck Parking Survey provides an overview of the overnight public truck parking supply, utilization, and undesignated truck parking across the State. Except for 2015, the Maryland Freight Network Truck Parking Survey has been conducted annually since 2012. The survey summarizes the issues related to truck parking availability and undesignated parking along Maryland's Truck Route system at rest areas, truck stops, highway shoulders, and on/off ramps. The reports also update the total number of truck parking spaces at rest areas, weigh and inspection stations, and select private truck parking facilities.

Maryland's first truck parking survey report was published in 2012. At the time, the survey included all the routes within the Maryland Truck Route System. Multiple routes were eliminated from the survey in 2013 and 2014 due to the low number of truck-stop events and no new routes have been added since the 2012 survey. Figure A-1 lists the routes included in the truck parking availability and demand survey for each of the annual reports and Figure A-2 displays Maryland's Truck Route System.

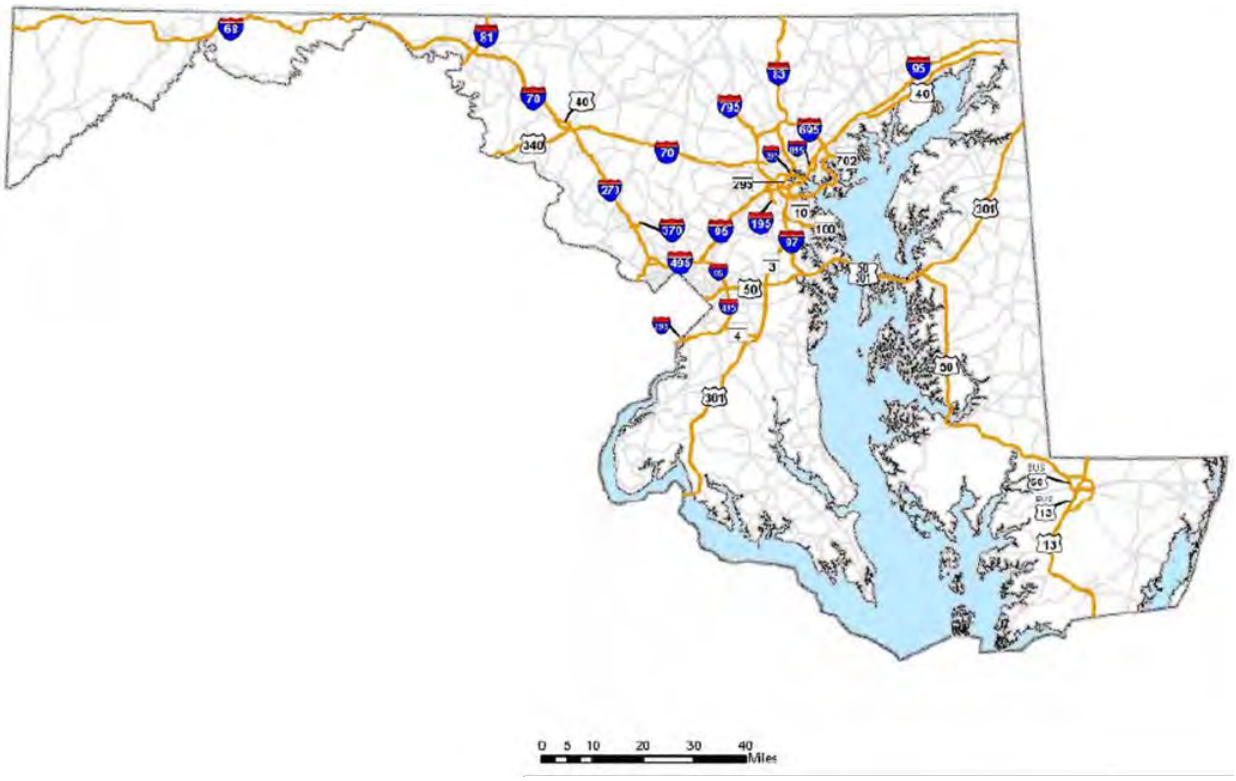
Figure A-1: List of Maryland's Truck Routes Subject to Detailed Surveys

Route	From	To	2012	2013	2014	2016	2017	2018
I-68	I-70/US 522 (Washington County)	West Virginia Stateline	●	●	●	●	●	●
I-70	I-695 Park & Ride Lot (Baltimore City)	Pennsylvania Stateline	●	●	●	●	●	●
I-81	West Virginia Stateline	Pennsylvania Stateline	●	●	●	●	●	●
I-83	I-695 (Baltimore County)	Pennsylvania Stateline	●	●	●	●	●	●
I-95	Woodrow Wilson Memorial Bridge	Delaware Stateline	●	●	●	●	●	●
I-97	I-695 (Anne Arundel County)	US 50 (Anne Arundel County)	●	●	●	●	●	●
I-270	I-495 (Montgomery County)	I-70 (Frederick County)	●	●	●	●	●	●

Route	From	To	2012	2013	2014	2016	2017	2018
I-895	I-95 (Howard County)	I-95 (Baltimore City)	●	●	●	●	●	●
US 13	Virginia Stateline	Delaware Stateline	●	●	●	●	●	●
US 13 BU	US 13 (Wicomico County)	US 50 (Wicomico County)	●	●	●	●	●	●
US 40	MD 152 (Harford County)	MD 279 (Cecil County)	●	●	●	●	●	●
US 50	MD 201 (at Washington D.C. Line)	US 13 (Wicomico County)	●	●	●	●	●	●
US 301	Virginia Stateline	Delaware Stateline	●	●	●	●	●	●
US 340	Virginia Stateline	US 15/US 40 (Frederick County)	●	●	●	●	●	●
I-695	I-83	MD 26	●	●				
I-370	I-270 in Gaithersburg	MD 200 (Inter County Connector)	●					
I-395	I-95 in Baltimore	Camden St. in Baltimore	●					
US 40	US 340	I-70 (Frederick)	●					
US 50 BU	US 50 West of Salisbury	US 50 East of Salisbury	●					
MD 3	US 50/301	Bowie	●					
MD 4	I-95	US 301	●					
MD 10	I-695	MD 2	●					
MD 100	I-97	MD 607	●					
MD 295	I-695	I-95 (Baltimore City Line)	●					
MD 702	I-695	Old Eastern Ave	●					

Source: Maryland Freight Network Truck Parking Survey Reports 2012 to 2018. Maryland's 2015 overnight truck parking data was published as part of Jason's Law Study, 2015.

Figure A-2: Maryland Truck Route System



Source: Maryland Freight Network Truck Parking Survey 2017.

Figure A-3 lists the routes with the highest number of trucks parked according to the most recent Maryland Freight Network Truck Parking Survey (collected in 2017). Additionally, Figure A-3 displays the day and time of the peak volume observed for each route, displaying that the demand for truck parking varies by day of the week, time of day, and corridor. The Maryland Freight Network Truck Parking Survey results consistently list I-95, I-70, I-68, and I-83 as the top corridors in Maryland in terms of the number of trucks parked overnight.

Figure A-3: Highest Number of Parked Trucks by Route—2017

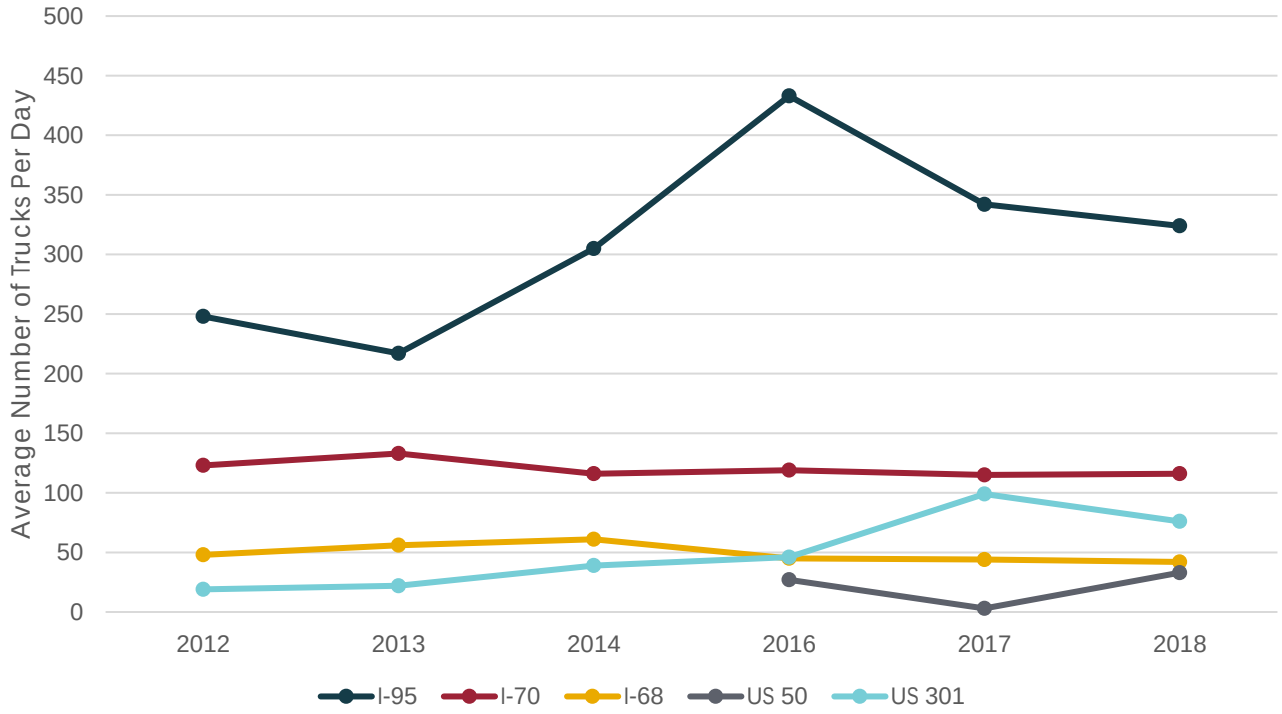
Route	Average Per Day	Peak Volume	Peak Volume Day and Time
I-95	342	403	Wednesday, 11:00pm
I-70	115	138	Tuesday, 11:00pm
US 609	99	124	Thursday, 4:00am
I-83	48	55	Wednesday, 11:00pm
I-68	44	55	Thursday, 4:00am

Source: Maryland Freight Network Truck Parking Survey 2017.

Figure A-4 displays the annual change in the average number of trucks parked per day along high-volume highways. I-95 and I-70 have consistently been listed as the corridors with the highest number of overnight truck parking observations. Some sudden changes in the average number

of trucks parked between 2012 and 2017 can be attributed to changing closing hours or construction projects at TWIS locations or rest areas, which forced the truck drivers to change where they park overnight.

Figure A-4: Changes in the Average Number of Trucks Parked along High-Volume Corridors



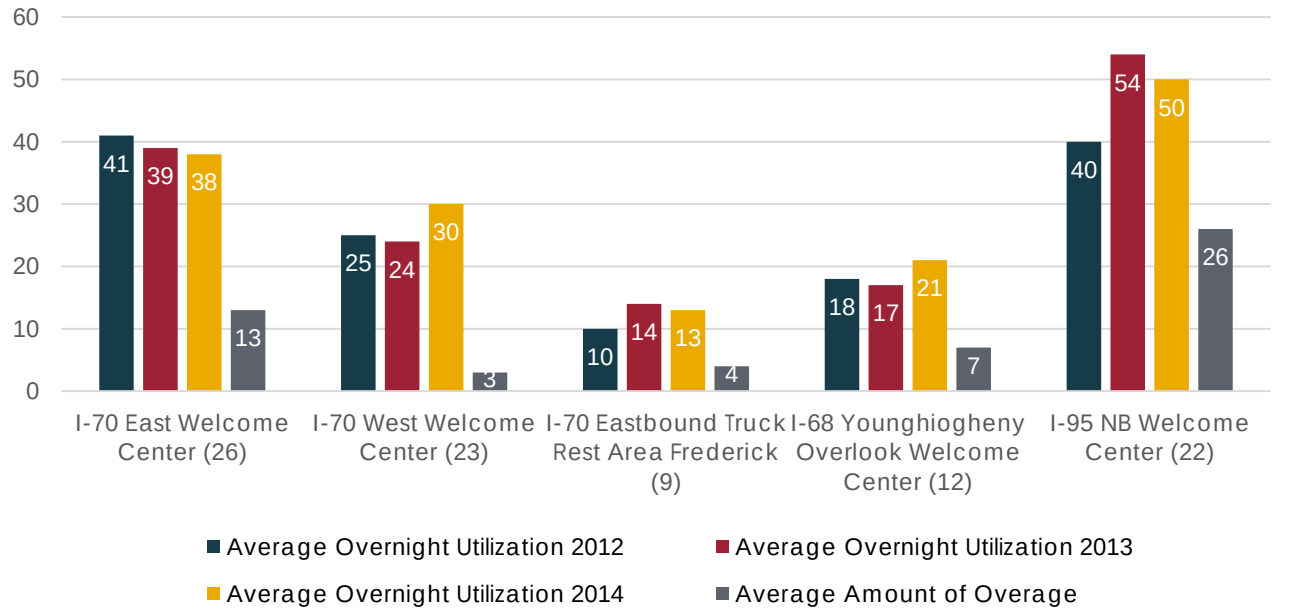
Source: Maryland Freight Network Truck Parking Surveys 2012 to 2017.

A.2 MARYLAND STRATEGIC GOODS MOVEMENT PLAN

As an addendum to the Maryland Long-Range Transportation Plan (LRTP 2035), the 2017 SGMP focused on the movement of freight across the State. The freight-related policies and strategies of the plan were developed in line with the requirements of MAP-21 and the Fixing America's Surface Transportation (FAST) Act. The plan analyzed the data provided by Maryland Freight Network Truck Parking Surveys 2012 to 2014 and acknowledges the shortage of truck parking, a large number of trucks parked at undesignated locations, and the impacts of HOS regulations on truck parking demand as major trucking-related issues across the State and especially along the I-95 corridor.

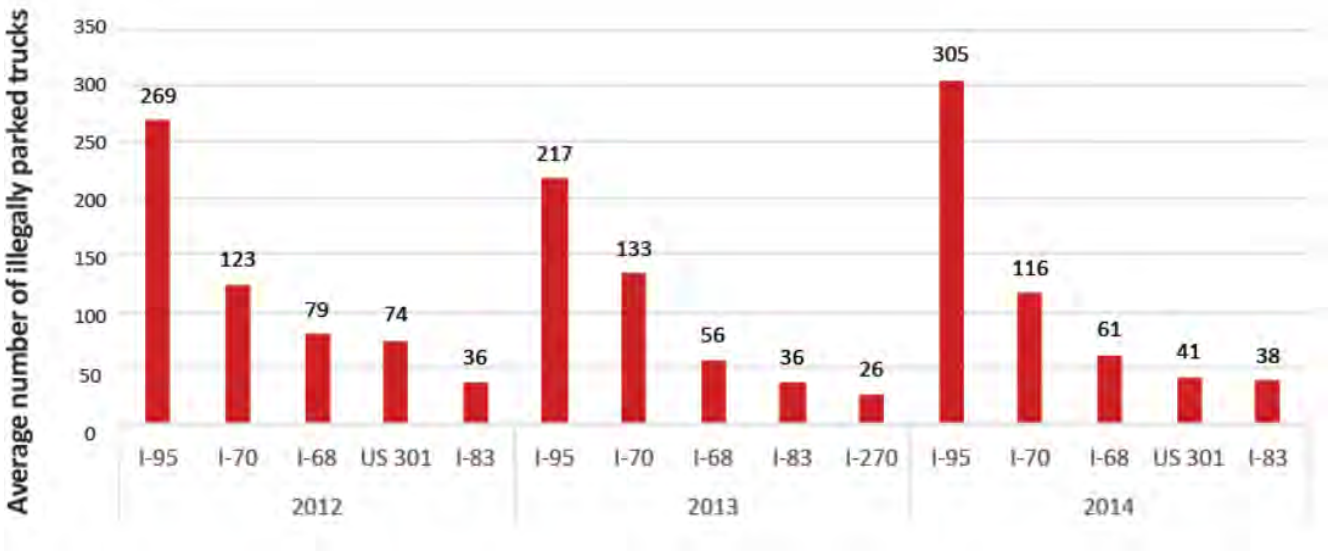
Figure A-5 and Figure A-6 show the average utilization at designated overnight truck parking facilities and the top locations of illegal truck parking in Maryland.

Figure A-5: Average Overnight Utilization of State Truck Parking Facilities Over Capacity



Source: Maryland Strategic Goods Movement Plan 2017.

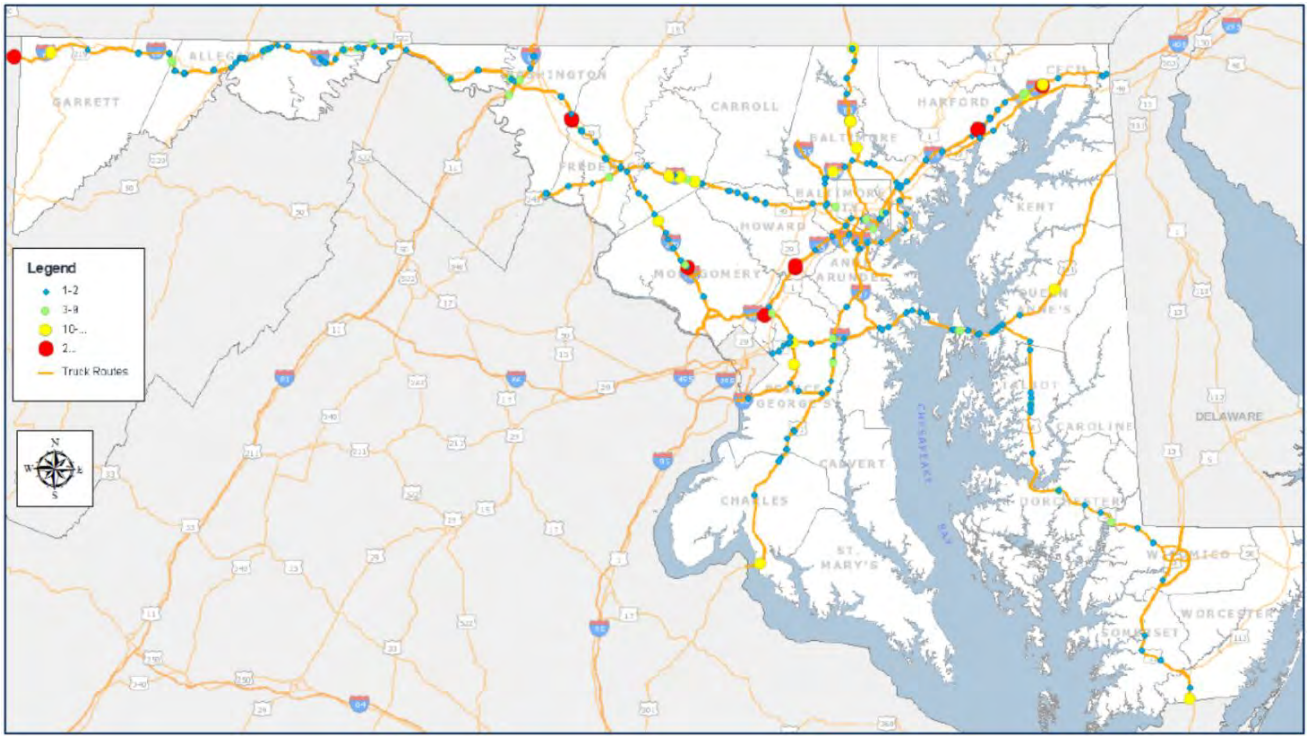
Figure A-6: Top Truck Parking Locations of Illegal Truck Parking by Route



Source: Maryland Strategic Goods Movement Plan 2017.

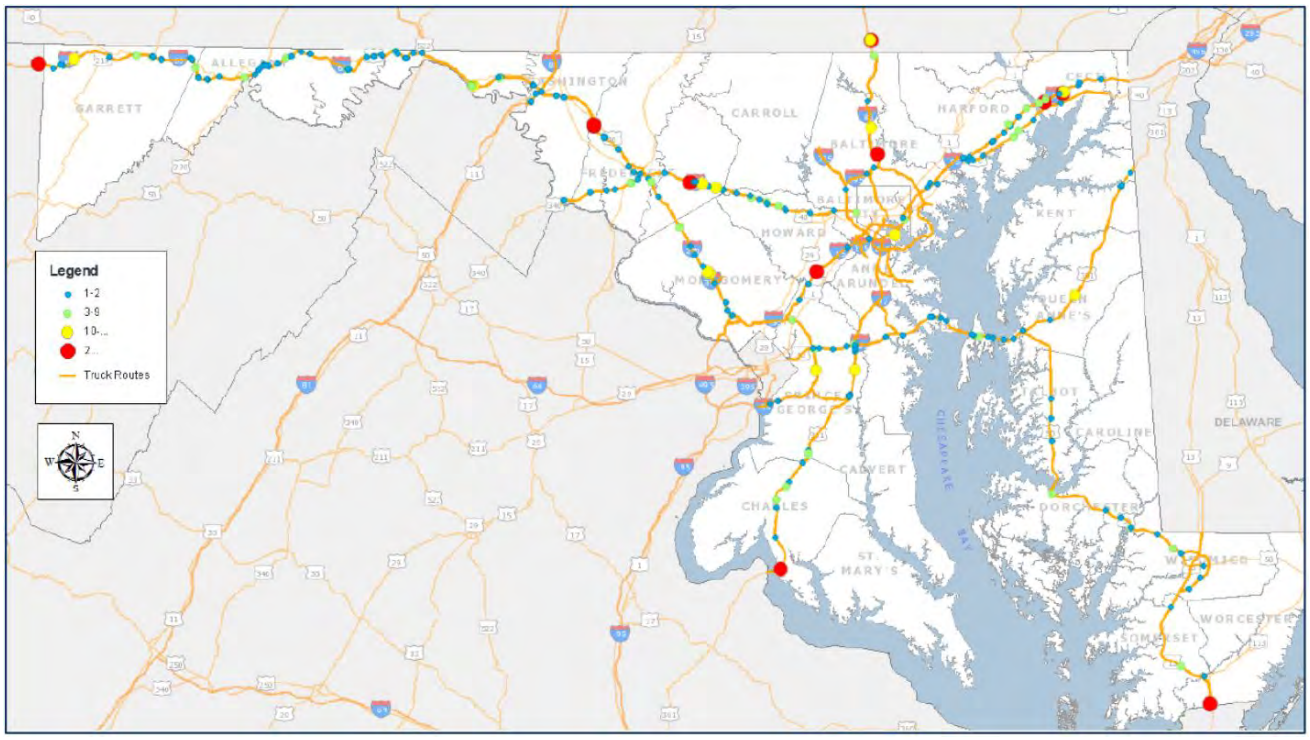
Figure A-7, Figure A-8, and Figure A-9 present the locations of undesignated truck parking from the 2012, 2013, and 2014 Maryland Freight Network Truck Parking Survey. As expected, undesignated truck parking is most heavily clustered near truck parking facilities or rest areas along Maryland's major corridors.

Figure A-7: Undesignated Truck Parking—2012 Maryland Freight Network Truck Parking Survey



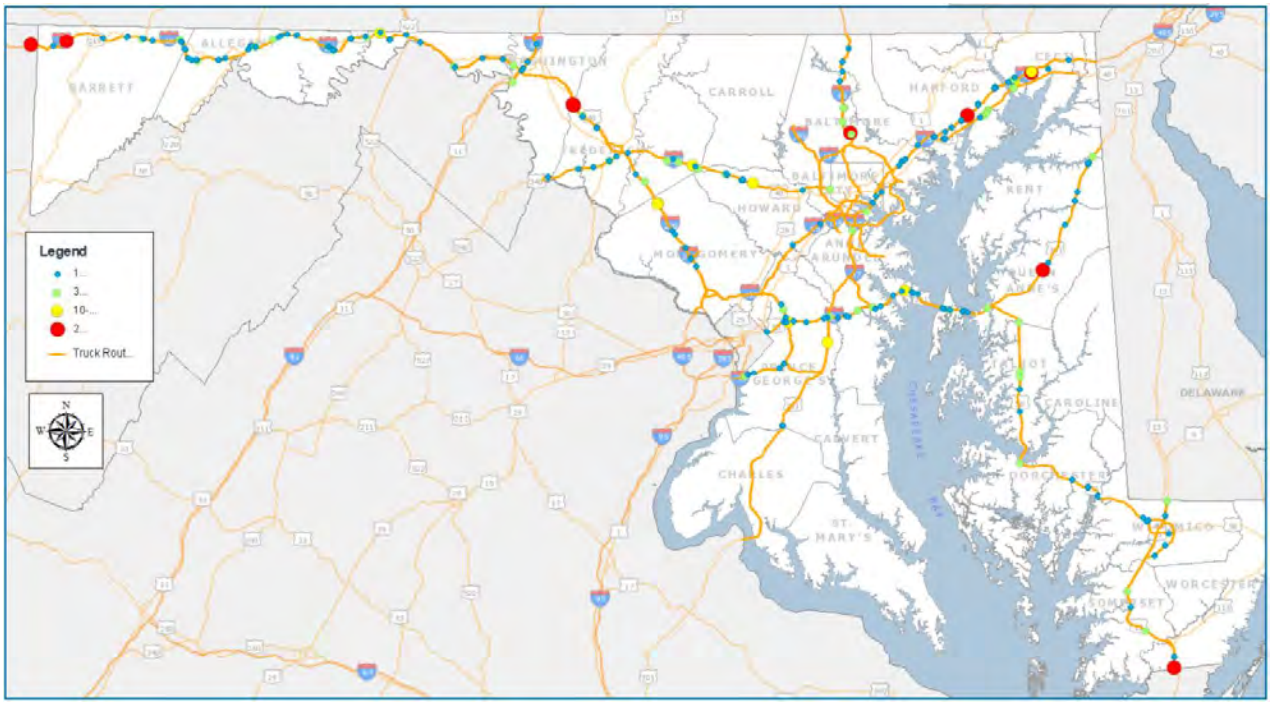
Source: Maryland Strategic Goods Movement Plan 2017.

Figure A-8: Undesignated Truck Parking—2013 Maryland Freight Network Truck Parking Survey



Source: Maryland Strategic Goods Movement Plan 2017.

Figure A-9: Undesignated Truck Parking—2014 Maryland Freight Network Truck Parking Survey



Source: Maryland Strategic Goods Movement Plan 2017.

The following summarizes the findings of the SGMP related to truck parking issues in Maryland:

- Truck parking is a current problem and a future issue due to projected demand and less flexibility in delivery time windows which impact the need for staging.

- I-95, I-70, and I-68 were consistently among the top five routes for truck parking. Additionally, US 301, I-83, and I-270 were often included in the top five routes but had a lower average number of trucks parked than I-95, I-70, and I-68 from 2012 to 2014.

As an overall strategy to better identify parking needs and to address the above-mentioned issues, the SGMP recommended the application of advanced data analysis methods, such as partnering with crowdsourcing entities, to promote sharing of parking information and additional collection of truck parking demand and supply data. Truck parking performance is also tracked and reported by the MDOT Excellerator Program.[49] The SGMP also provides strategic recommendations for MDOT to improve truck parking availability across Maryland. These strategies include:

- Expanding the supply of truck parking by identifying where truck parking spaces could be added to existing state-owned facilities.

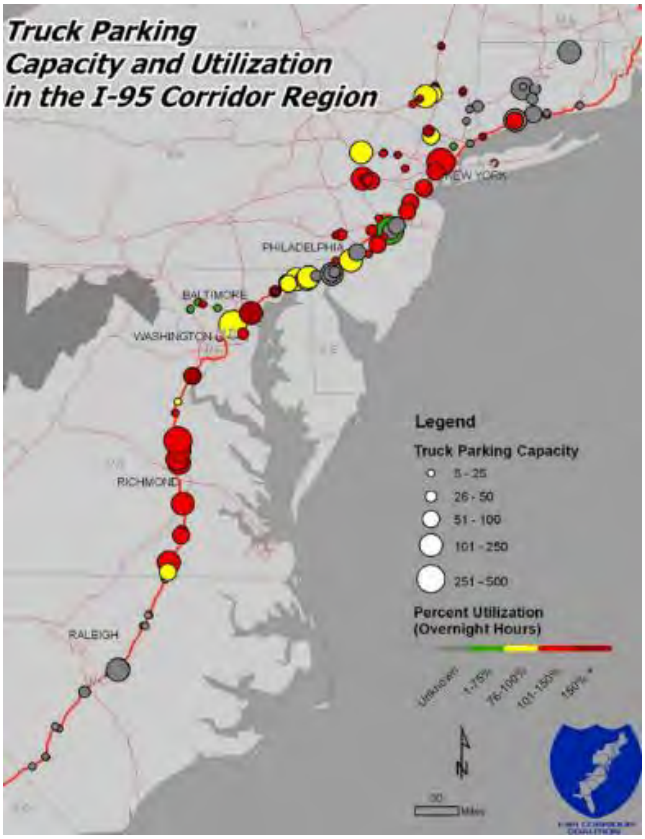
[49] The MDOT Excellerator is a performance management program comprised of 10 tangible results. Quarterly published documents report the performance of MDOT relevant to each of the Tangible Results based on specific indicators. For more information see: http://www.mdot.maryland.gov/newMDOT/Planning/Excellerator/MDOTExcellerator

- Identifying areas along freight corridors with enough Right of Way (ROW) to develop a truck holding area.
- Researching the use of TWIS locations for overnight truck parking.
- Collaborating with the private sector travel services providers to increase private truck parking capacity across the State.
- Maximizing the utilization of the currently available parking facilities by evaluating the state-of-the-practice in truck parking technology applications and the potential for deployment of those technologies in Maryland.

A.3 I-95 CORRIDOR COALITION - TRUCK PARKING INITIATIVE

The I-95 Corridor Coalition started in the 1990s to improve the mobility and safety in the region through the application of ITS technologies.[50] The I-95 Corridor Coalition is an alliance of the states that I-95 travels through, extending from Florida to Maine. The region included in the I-95 Corridor Coalition has 21 percent of the U.S.'s road miles, generates 5.3 billion tons of freight per year, and I-95 has average annual daily truck traffic counts of over 10,000 with some segments over 31,000 trucks per day.[51]

Figure A-10: Truck Parking Capacity and Utilization



Source: I-95 Corridor Coalition - Truck Parking Initiative 2015.

Among other projects, the I-95 Corridor Coalition undertook a Truck Parking Initiative that aimed to address overnight truck parking issues through sustainable solutions developed in collaboration with FHWA. The report recognized truck parking as a "multifaceted" problem, which not only affects the safety of all road users but also impacts the capacity of available truck parking facilities and, ultimately, the overall efficiency of goods movement. For example, the report identifies regulatory changes such as HOS, growth in the demand for goods due to a growing population, and the application of just-

[50] I-95 Corridor Coalition-Beyond Boundaries. https://i95coalition.org/the-coalition-2/
[51] I-95 Corridor Coalition-Facts and Stats. https://i95coalition.org/the-coalition-2/i-95-facts/

in-time delivery practices in supply chains as leading to an increase in the demand for long-term and overnight truck parking. Figure A-10 shows that most of the truck parking facilities along the I-95 corridor have utilization rates that are above 100 percent (red dots), meaning the facilities are over capacity.

The Truck Parking initiative identified that truck parking issues often span multiple states and affect both public and private operations. Therefore, truck parking shortages should be addressed through innovative solutions involving multiple partners from both the public and private sectors.

The Real-Time Information Dissemination System implemented, as a result of the Truck Parking Initiative, aims to provide truck drivers with live information about the availability of truck parking spaces. The system consists of a data collection sub-system positioned at the truck parking areas, a central data integration system, and a traveler information subsystem.

A.4 A.4 JASON'S LAW TRUCK PARKING SURVEY

The Section 1401 of MAP-21, known as "Jason's Law," required US DOT to initiate a truck parking survey and assessment that develops a system of metrics to measure the adequacy of truck parking facilities in each state, assess the volume of truck traffic in each state, and evaluate the capability of each state to provide adequate truck parking. Among the survey responders were enforcement personnel, state DOTs, truck drivers, personnel of trucking firms, and truck stop and rest area owners and operators.

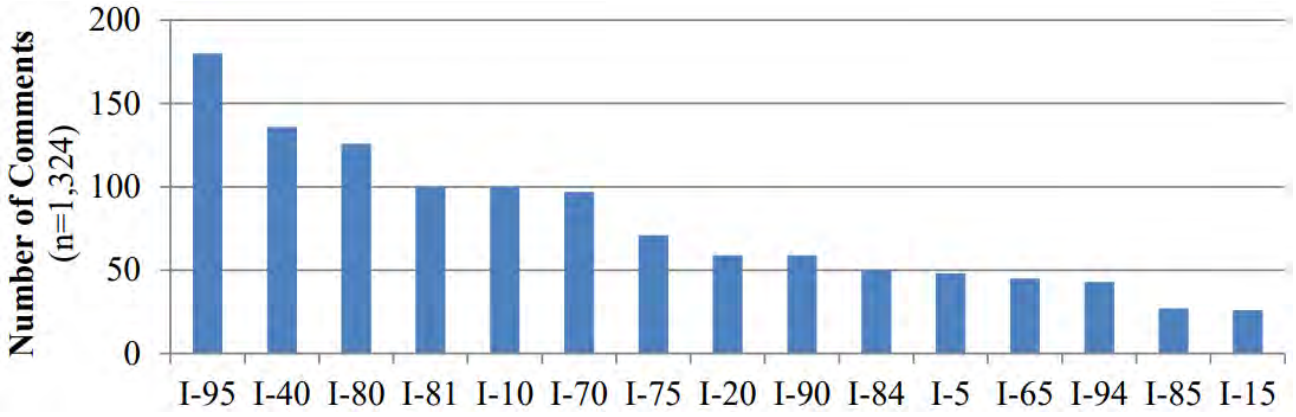
Jason's Law Background

Jason's Law is named after truck driver Jason Rivenburg, who was murdered while parked overnight at an abandoned gas station. Following Rivenburg's death in 2009, truck parking legislation was introduced and named in his honor and integrated into MAP-21. This legislation directed the FHWA to study the availability of truck parking in all states and provided resources for the development of additional truck parking in the future.

2015 JASON'S LAW SURVEY RESULTS

The 2015 Jason's Law Survey results demonstrated that most states have a truck parking shortage with higher shortages at public truck parking facilities compared to private facilities. As shown in Figure A-11, truck parking shortages were reported to cluster more densely along high truck volume corridors such as I-95. Also, many truck drivers reported challenges with finding parking space in New England and Northeast/Central regions.

Figure A-11: Top 15 Interstates with a Shortage of Truck Parking According to Truck Drivers and Industry Professionals



Source: Jason's Law Truck Parking Survey Results 2015.

The following are other highlights of the 2015 Jason's Law Survey report:

- Most of the private truck stops were reported having less than 100 spaces available. Private parking facilities were primarily full overnight, with some at full capacity during the day.
- Land use, zoning laws, and lack of funding and authority were identified as the challenges for expanding the capacity at private truck parking facilities. State DOTs identified inclement weather conditions, delivery window limitations, and a lack of funding for truck parking projects and enforcement as the primary challenges related to truck parking supply and demand.
- Undesignated truck parking events were reported by more than half of the state DOTs. Many of these observations were made at night or during weekend days. This is while Motor Carrier Safety officials reported consistent observation of trucks parked in undesignated locations with a slight drop in the numbers during winter months.
- About 75 percent of truck drivers and 66 percent of logistics personnel reported that they regularly encounter difficulty finding safe parking locations.

Figure A-12 shows the number of public and private spaces available in Maryland, its neighbor states, and nationwide according to the 2015 Jason's Law Truck Parking Survey Results and Comparative Analysis. In 2015, nearly 84 percent of Maryland's 3,036 total truck parking spaces were offered by private facilities. The ratio of private to public spaces was 5.2 in Maryland compared to the national ratio of 7.5, meaning that compared to other states, MDOT provides a greater proportion of total truck parking spaces across Maryland.

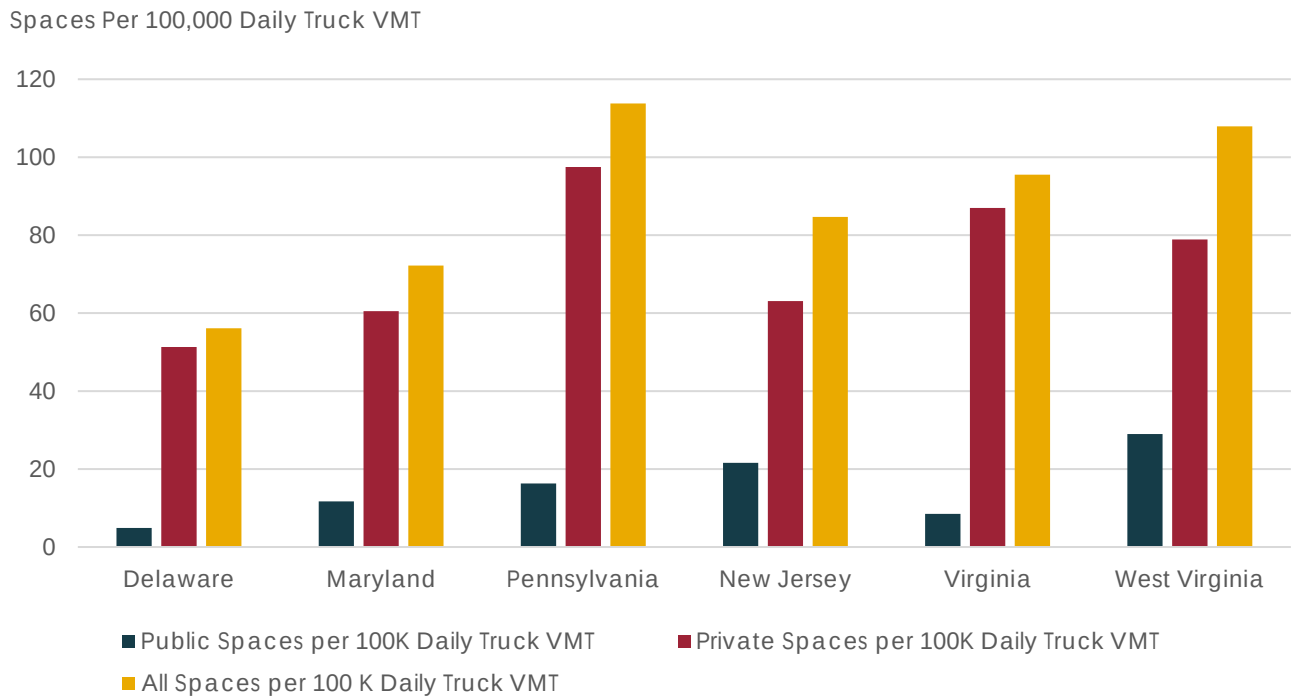
Figure A-12: Public and Private Parking Inventory

State	Public Truck Spaces	Private Truck Spaces	Ratio of Private to Public Spaces	Total Spaces
Delaware	28	294	10.5	322
Maryland	492	2,544	5.2	3,036
Pennsylvania	1,569	9,363	6	10,932
New Jersey	757	2,213	2.9	2,970
Virginia	729	7,463	10.2	8,192
West Virginia	641	1,747	2.7	2,388
United States	36,222	272,698	7.5	308,920

Source: Jason's Law Truck Parking Survey Results 2015.

Figure A-13 places the number of truck parking spaces in the context of the daily vehicle miles traveled (VMT) traveled by trucks by providing the total, public, and private truck parking spaces per 100,000 truck VMT in Maryland and its neighboring states. Figure A-13 shows that although Maryland had the third-highest total number of truck parking spaces compared to neighboring states, when measured in terms of VMT, Maryland ranked fifth. The calculation of the number of truck parking spaces per truck VMT displays the connection between trucking activity and truck parking.

Figure A-13: Public, Private, and Total Parking Spaces per VMT in Maryland and Neighboring States



Source: Jason's Law Truck Parking Survey Results 2015.

A.5 A.5 OBSERVATIONS OF TRUCK PARKING PROBLEMS IN MARYLAND

Truck drivers have a difficult time finding safe spaces to park trucks at night in Maryland. In 2017, an average of 702 trucks parked overnight in Maryland, at or near the interstates and highways of the State's truck routes system. The top five corridors in terms of the highest number of parked trucks were I-95, I-70, US 301, I-68, and I-83. The I-95 corridor had a significantly higher number of parked trucks (403) compared to the other corridors. Of note, the number of trucks parked along surveyed routes has increased by 20 percent from 2012 to 2017.[52]

The number of public and private truck parking spaces per 100,000 truck VMT is relatively low compared to neighboring states. This has led to truck parking shortages and undesignated parking along major corridors throughout the State.

The findings of the synthesis of existing studies, data collection, and initiatives will serve as a validation point and inform the identification of truck parking issues and needs throughout the State.

[52] A. Morton Thomas and Associates, Inc., March 2018. 2017 Maryland Freight Network Truck Parking Survey. Maryland State Highway Administration.

B Appendix: Likelihood of Finding Available Truck Parking Statewide

The following maps display the likelihood of finding truck parking for each hour of the day.

Figure B-1: Likelihood of Finding Available Truck Parking from 11pm to 12am

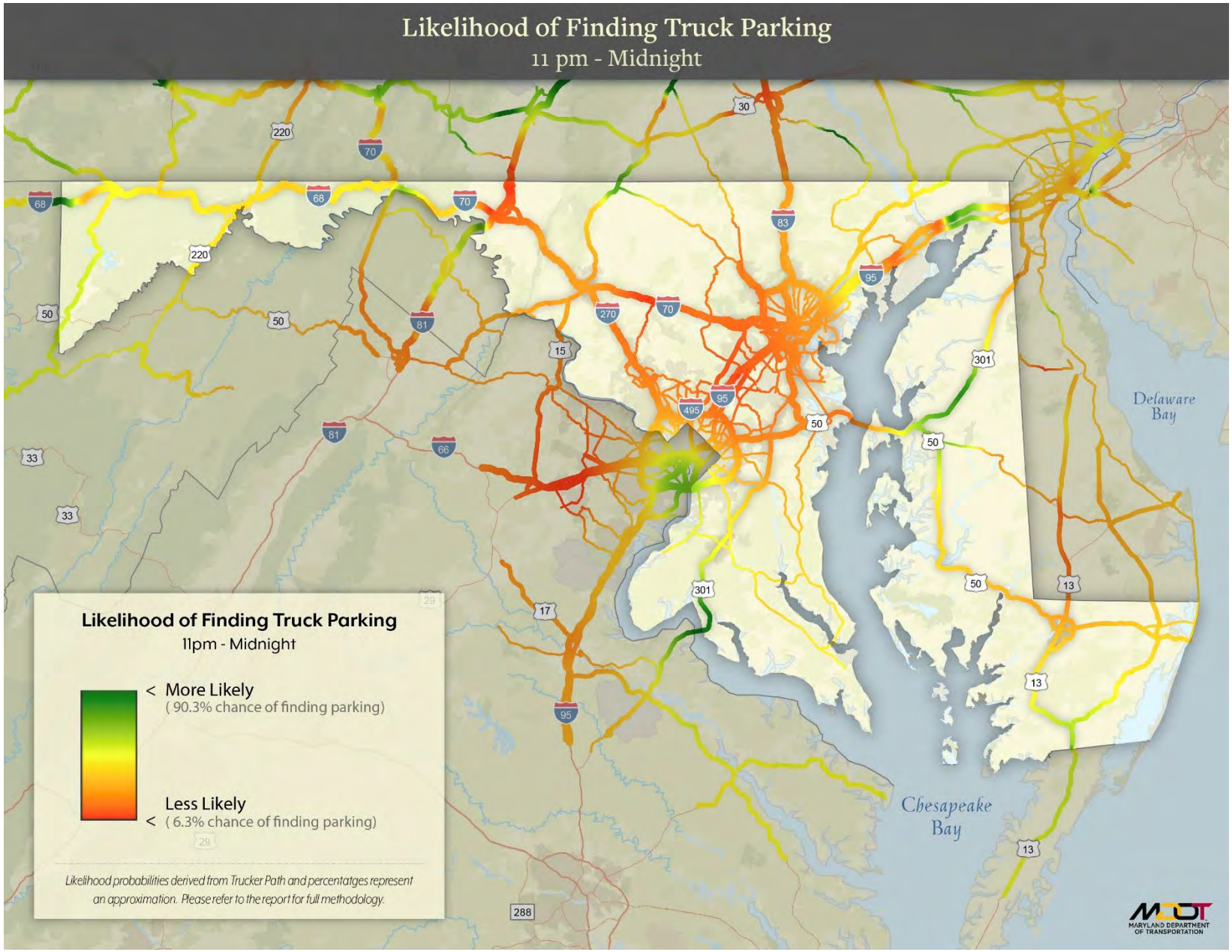


Figure B-2: Likelihood of Finding Available Truck Parking from 1am to 2am

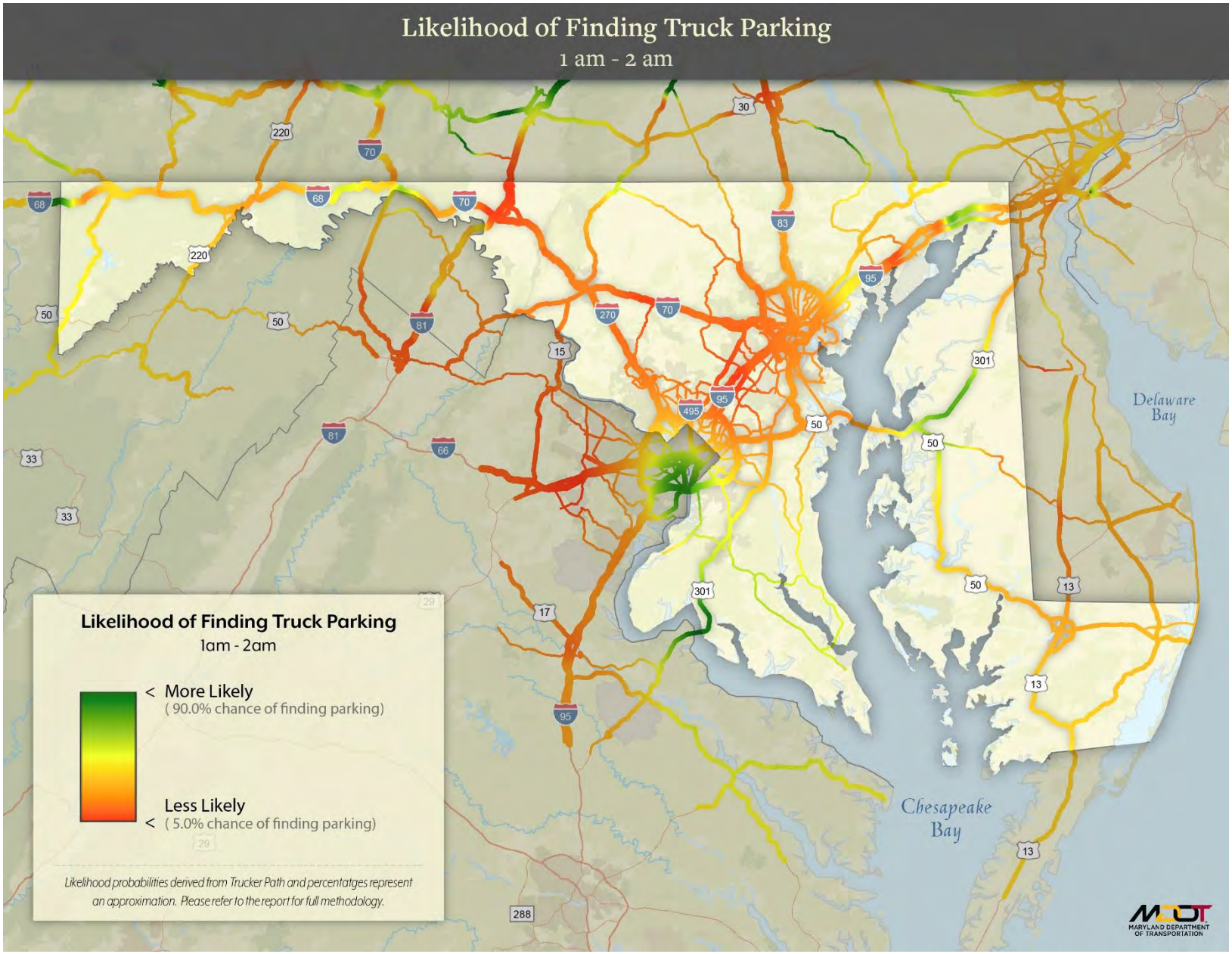


Figure B-3: Likelihood of Finding Available Truck Parking from 2am to 3am

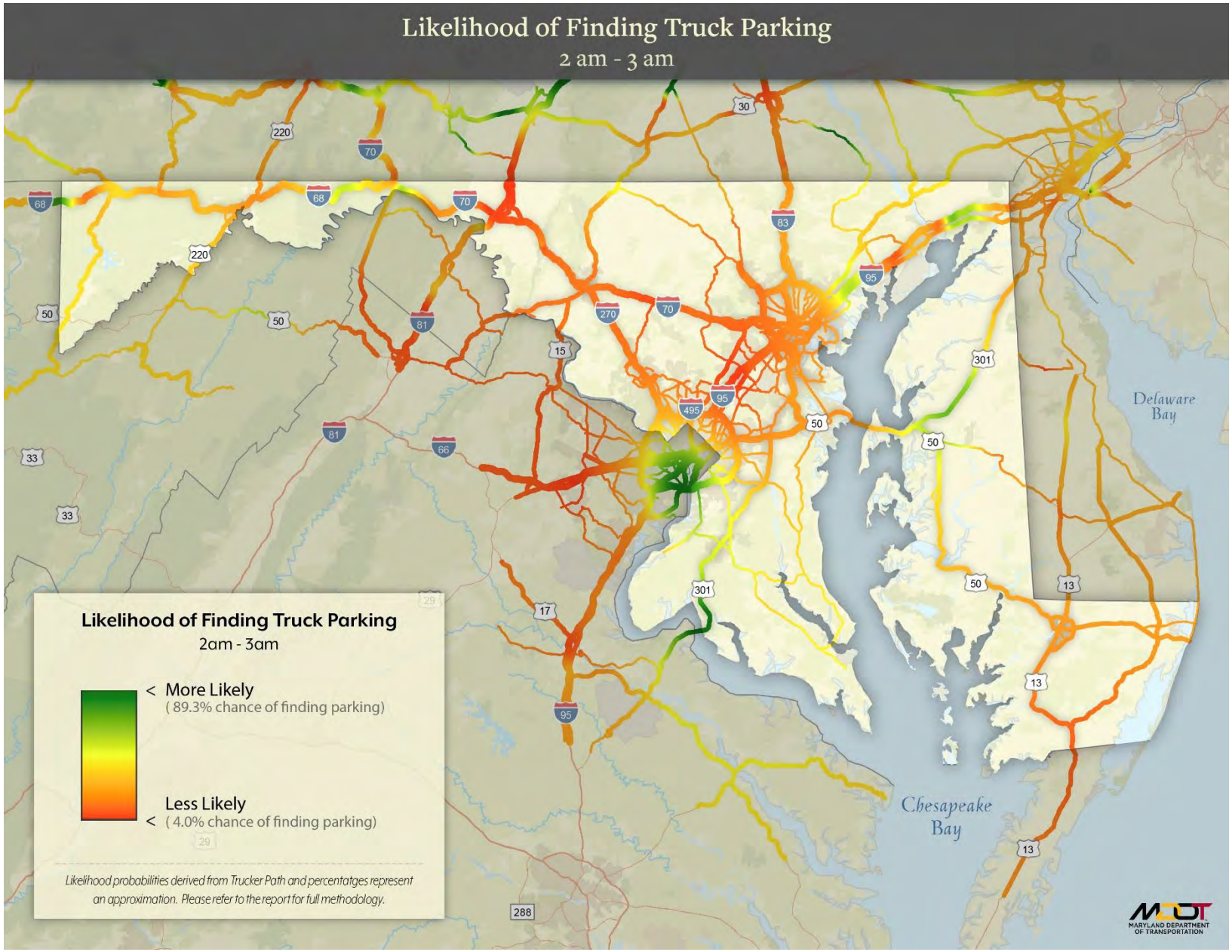


Figure B-4: Likelihood of Finding Available Truck Parking from 3am to 4am

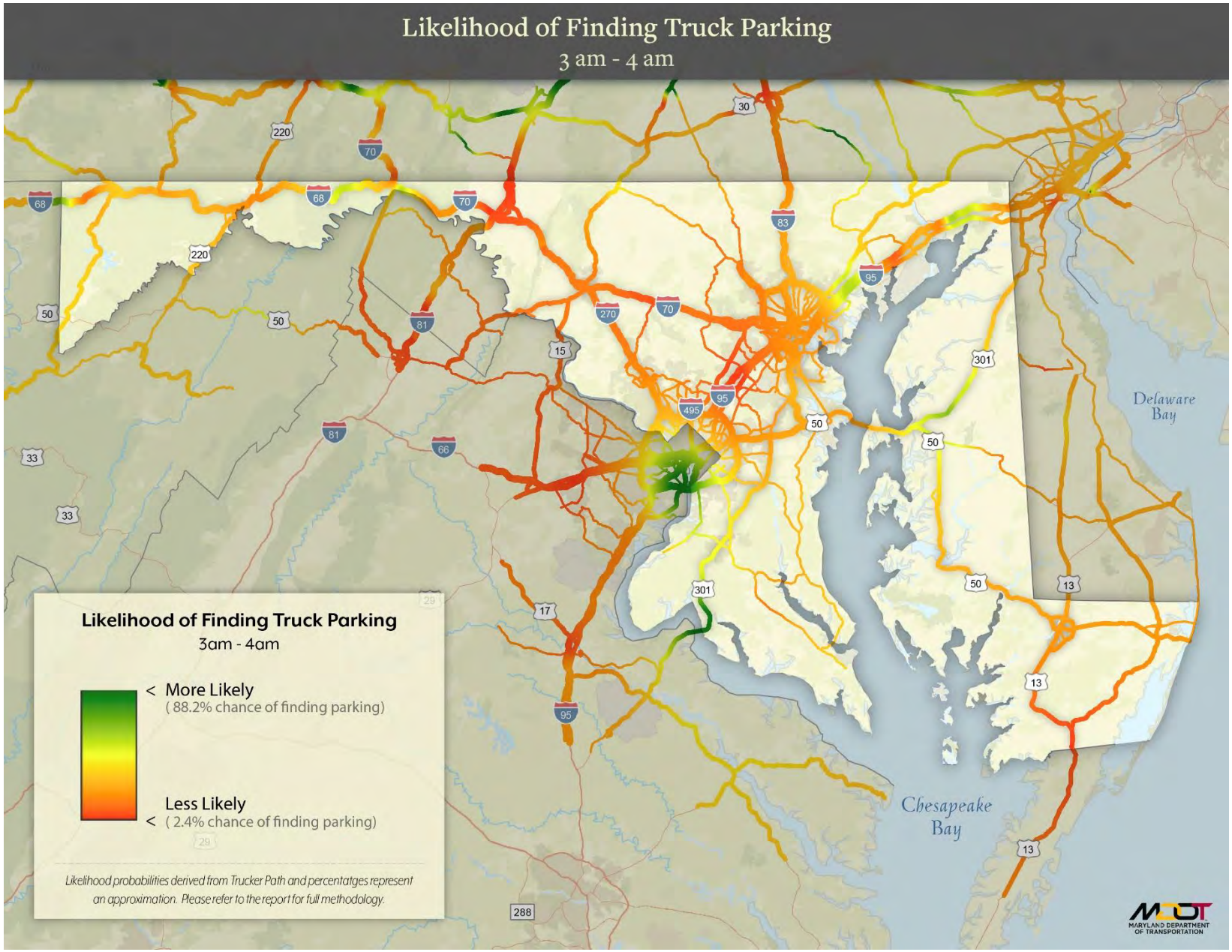


Figure B-5: Likelihood of Finding Available Truck Parking from 4am to 5am

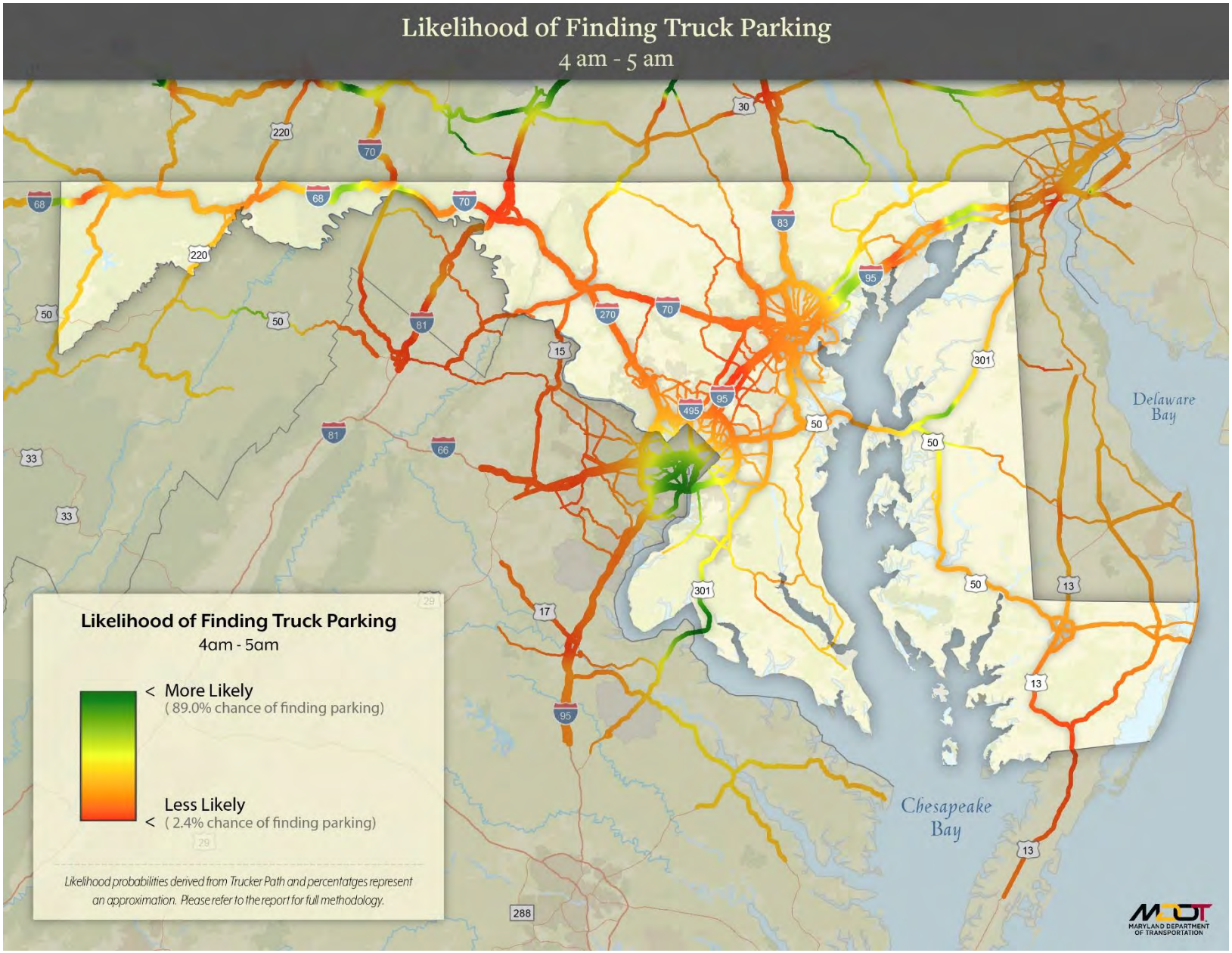


Figure B-6: Likelihood of Finding Available Truck Parking from 5am to 6am

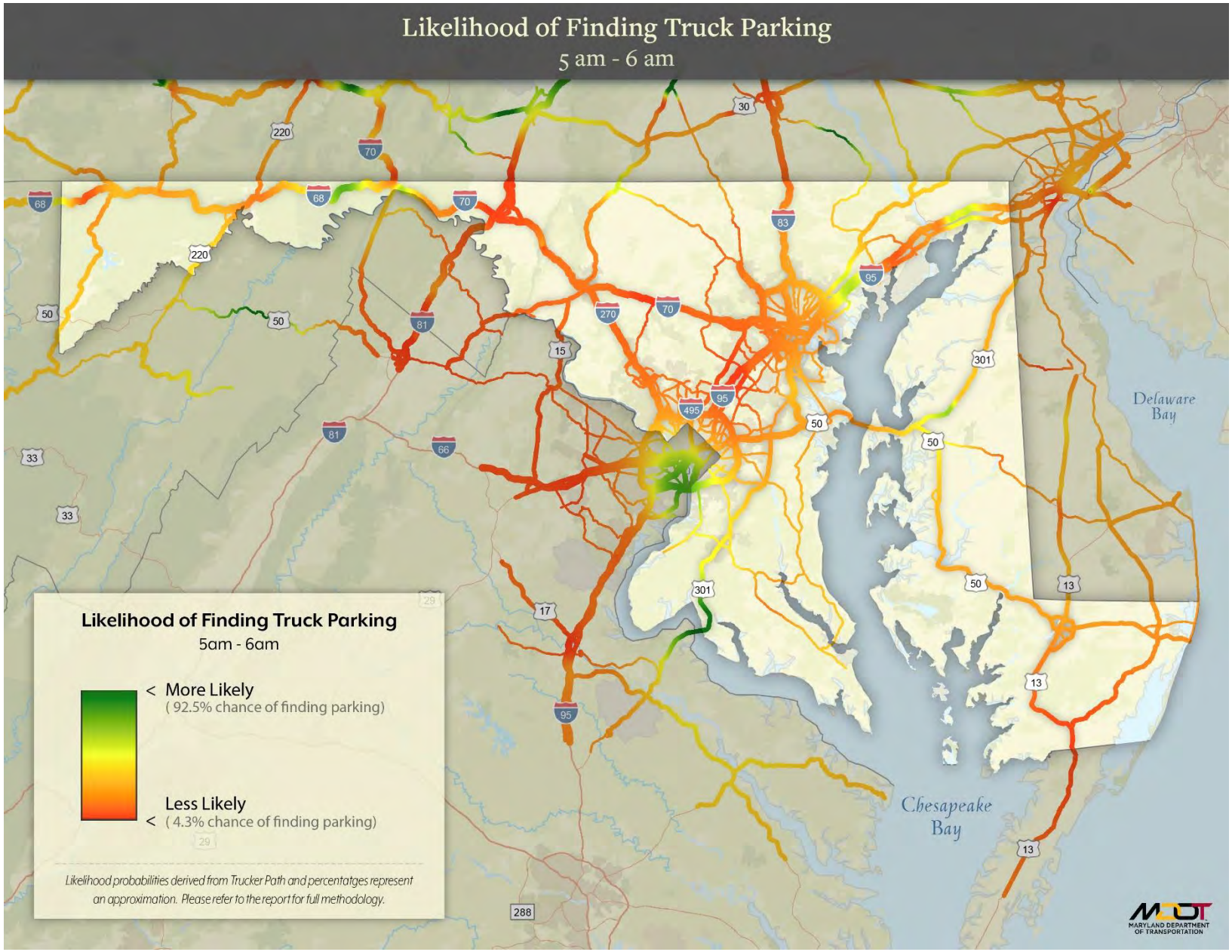


Figure B-7: Likelihood of Finding Available Truck Parking from 6am to 7am

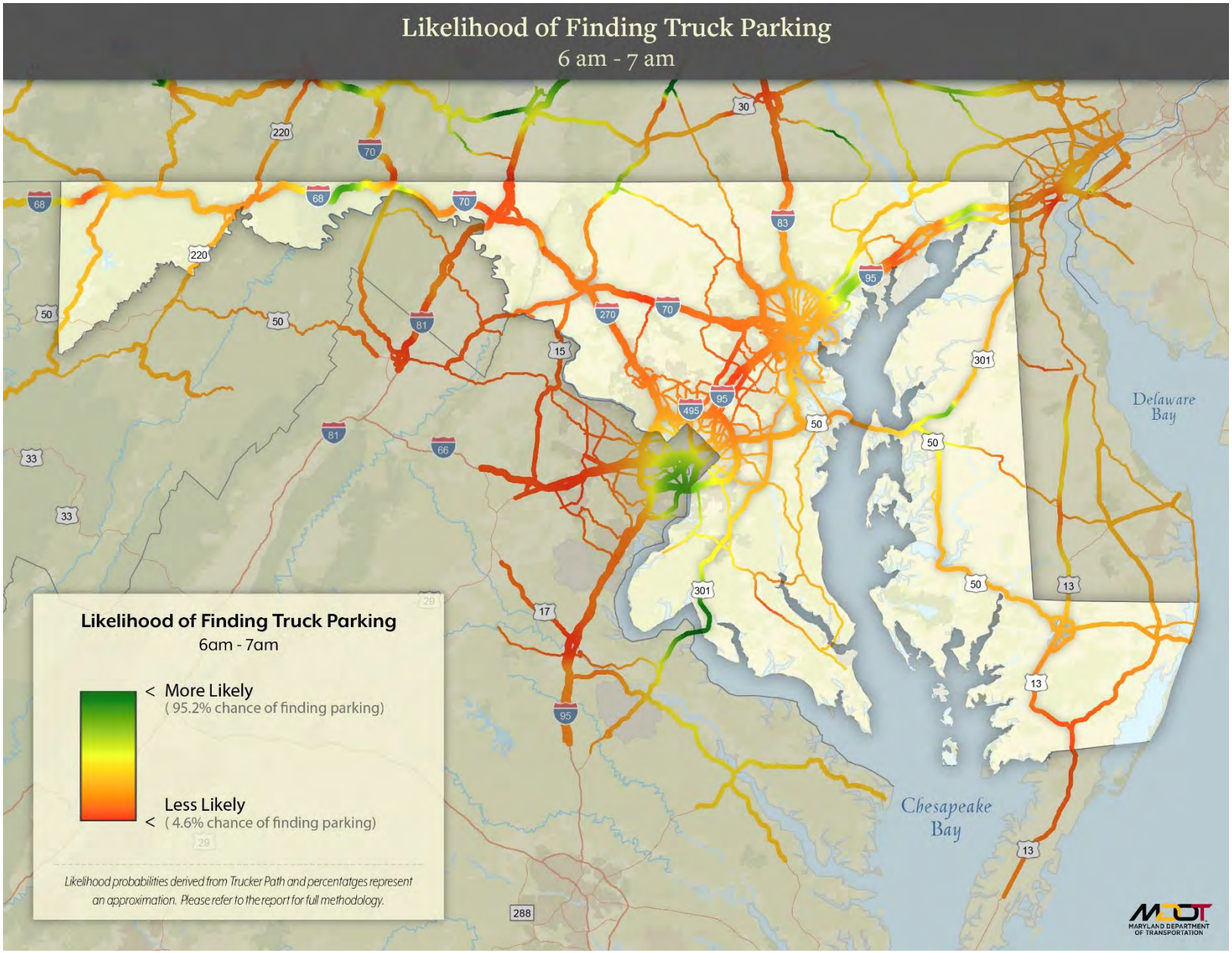


Figure B-8: Likelihood of Finding Available Truck Parking from 7am to 8am

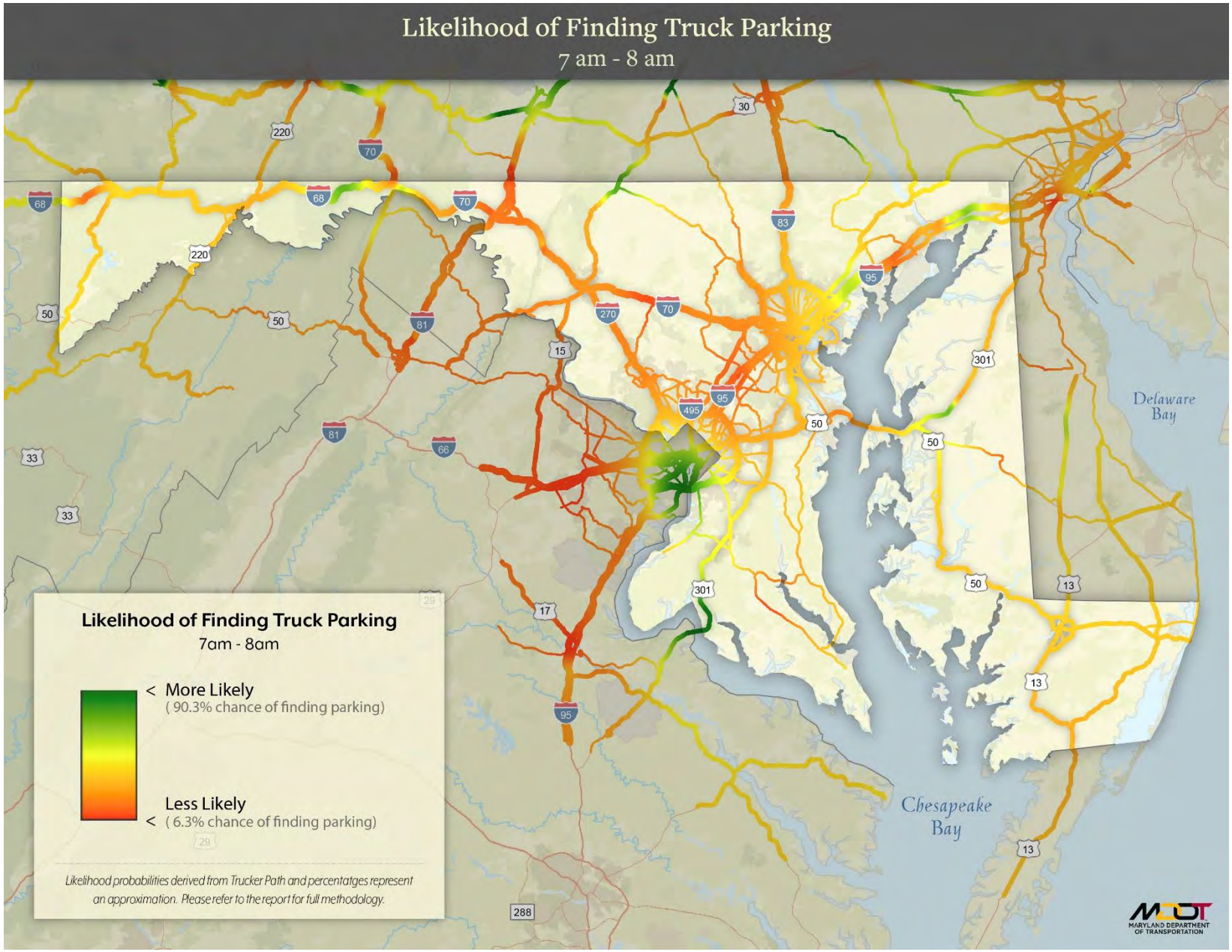


Figure B-9: Likelihood of Finding Available Truck Parking from 8am to 9am

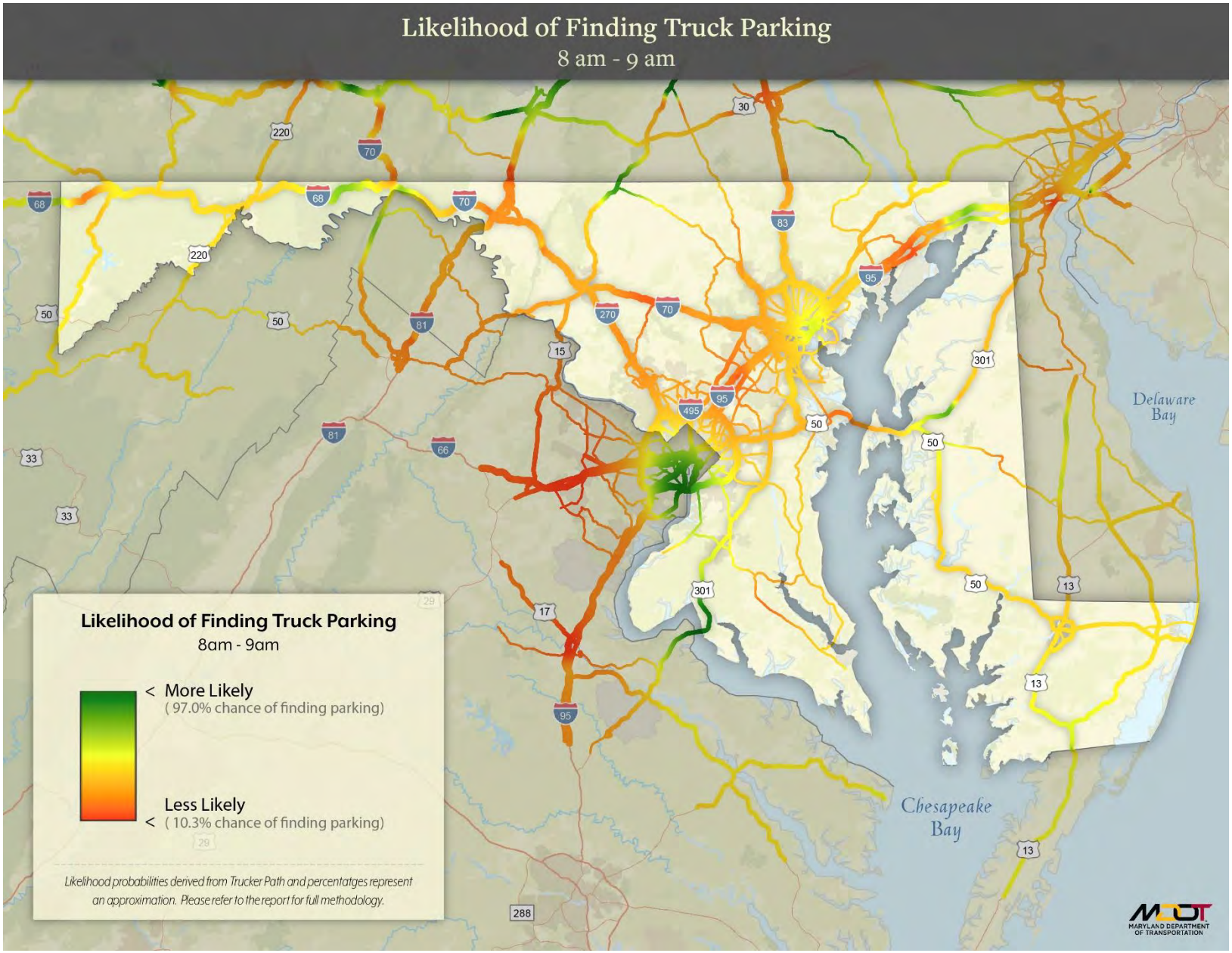


Figure B-10: Likelihood of Finding Available Truck Parking from 9am to 10am

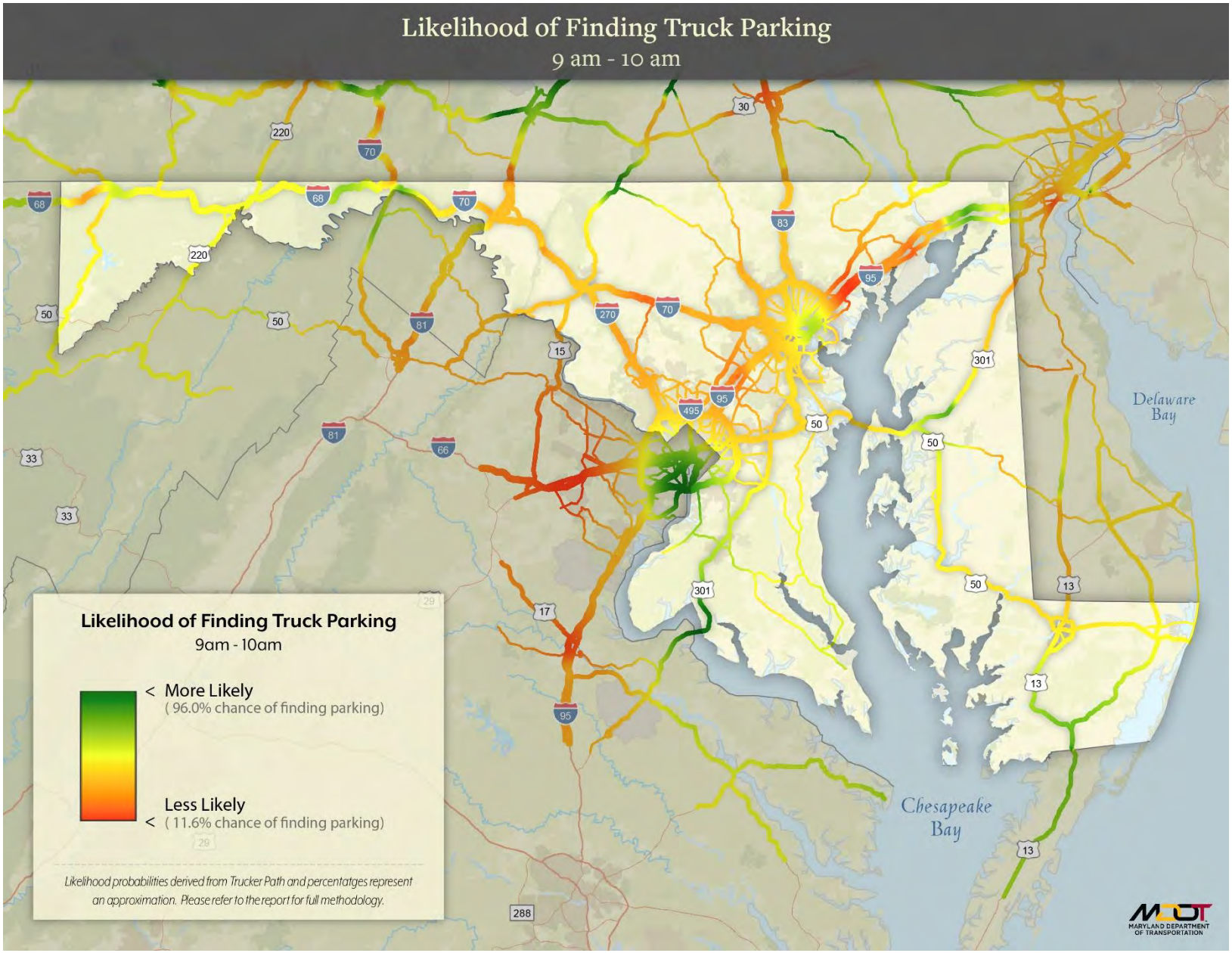


Figure B-11: Likelihood of Finding Available Truck Parking from 10am to 11am

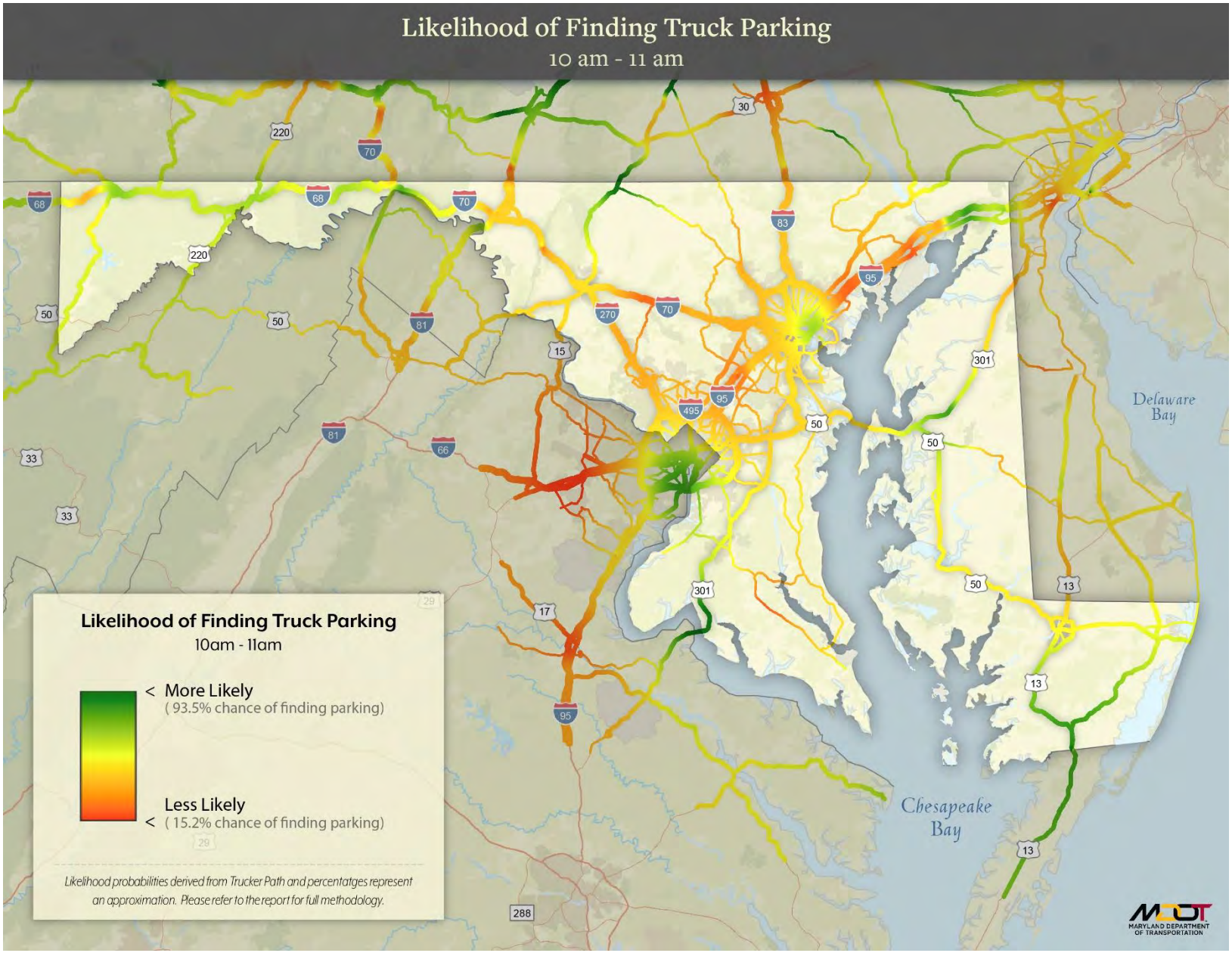


Figure B-12: Likelihood of Finding Available Truck Parking from 11am to 12pm

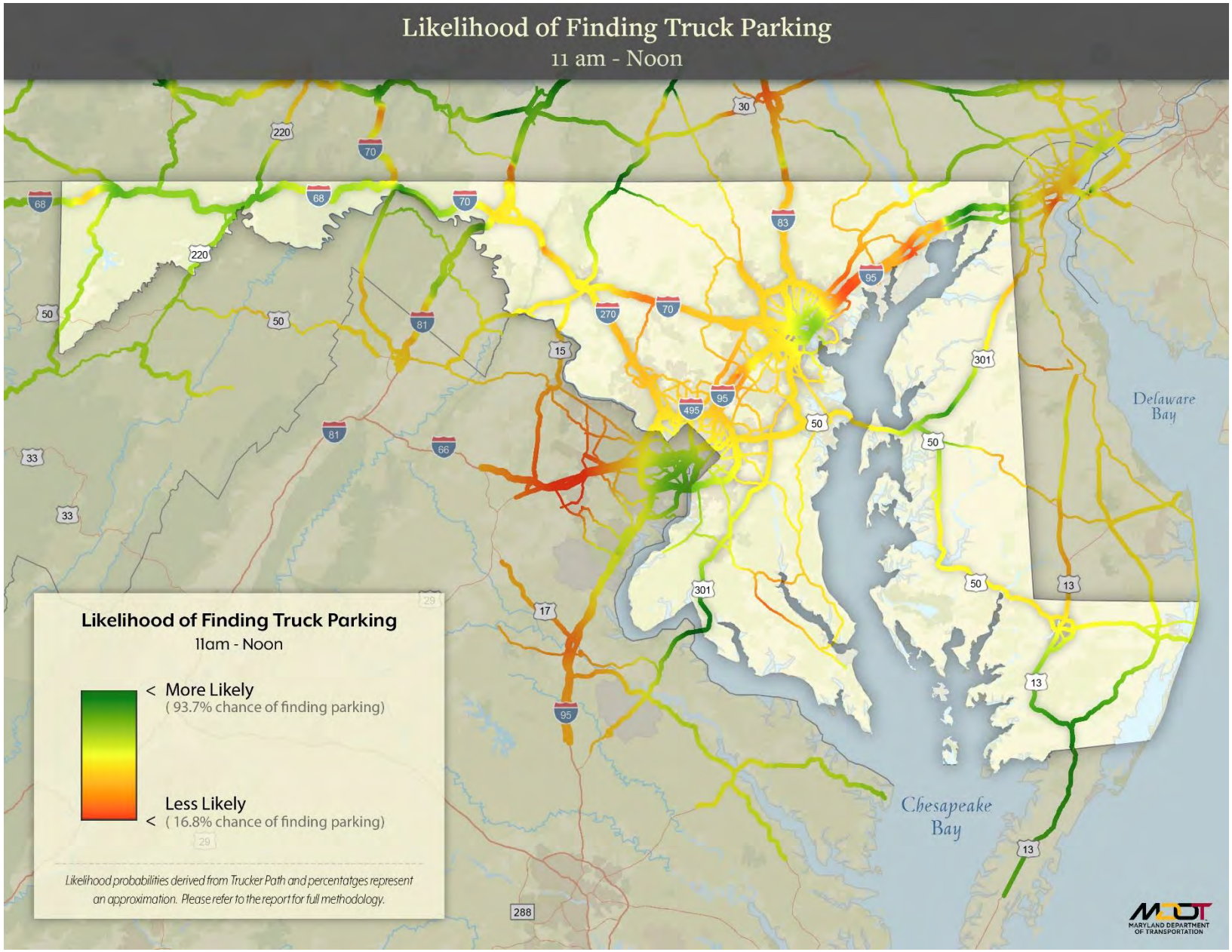


Figure B-13: Likelihood of Finding Available Truck Parking from 12pm to 1pm

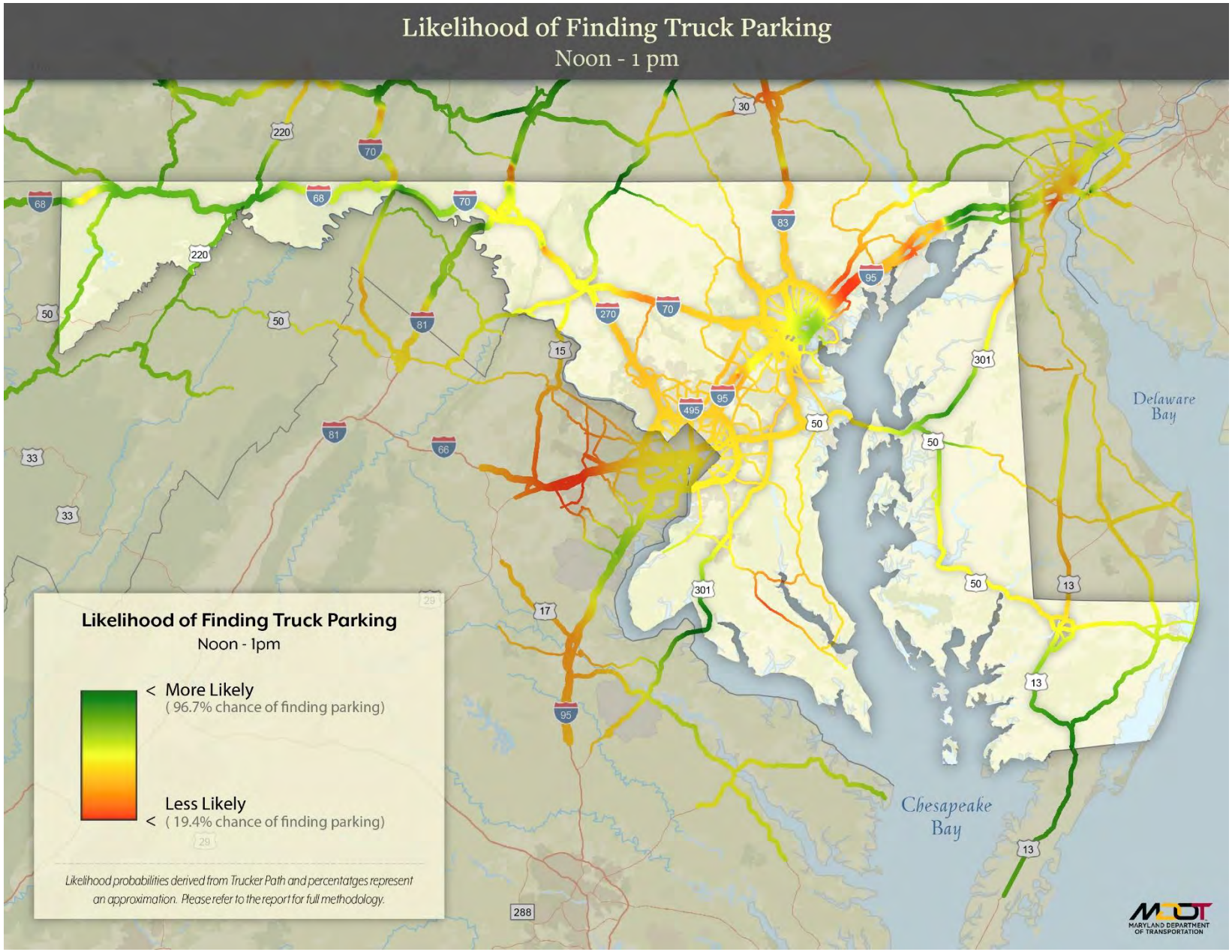


Figure B-14: Likelihood of Finding Available Truck Parking from 1pm to 2pm

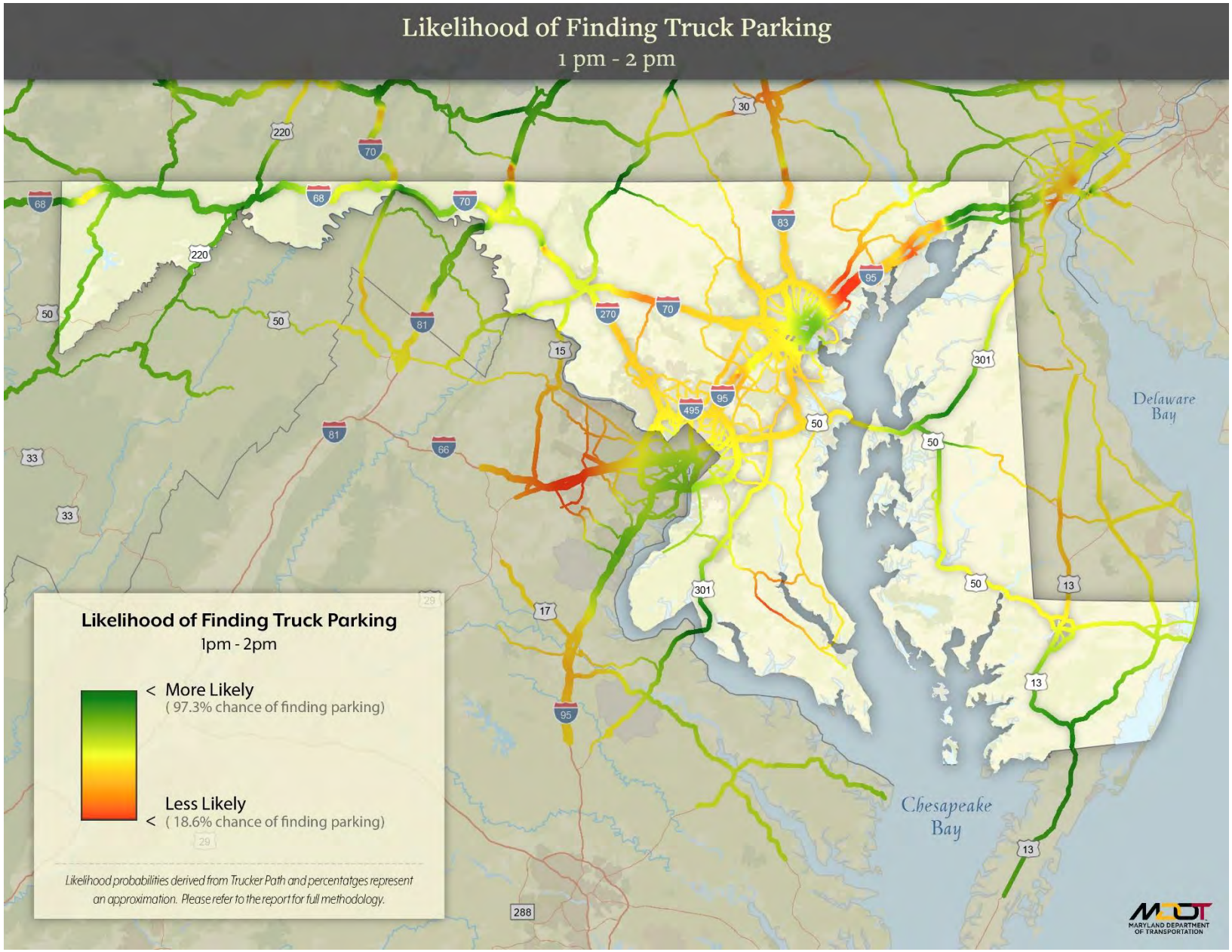


Figure B-15: Likelihood of Finding Available Truck Parking from 2pm to 3pm

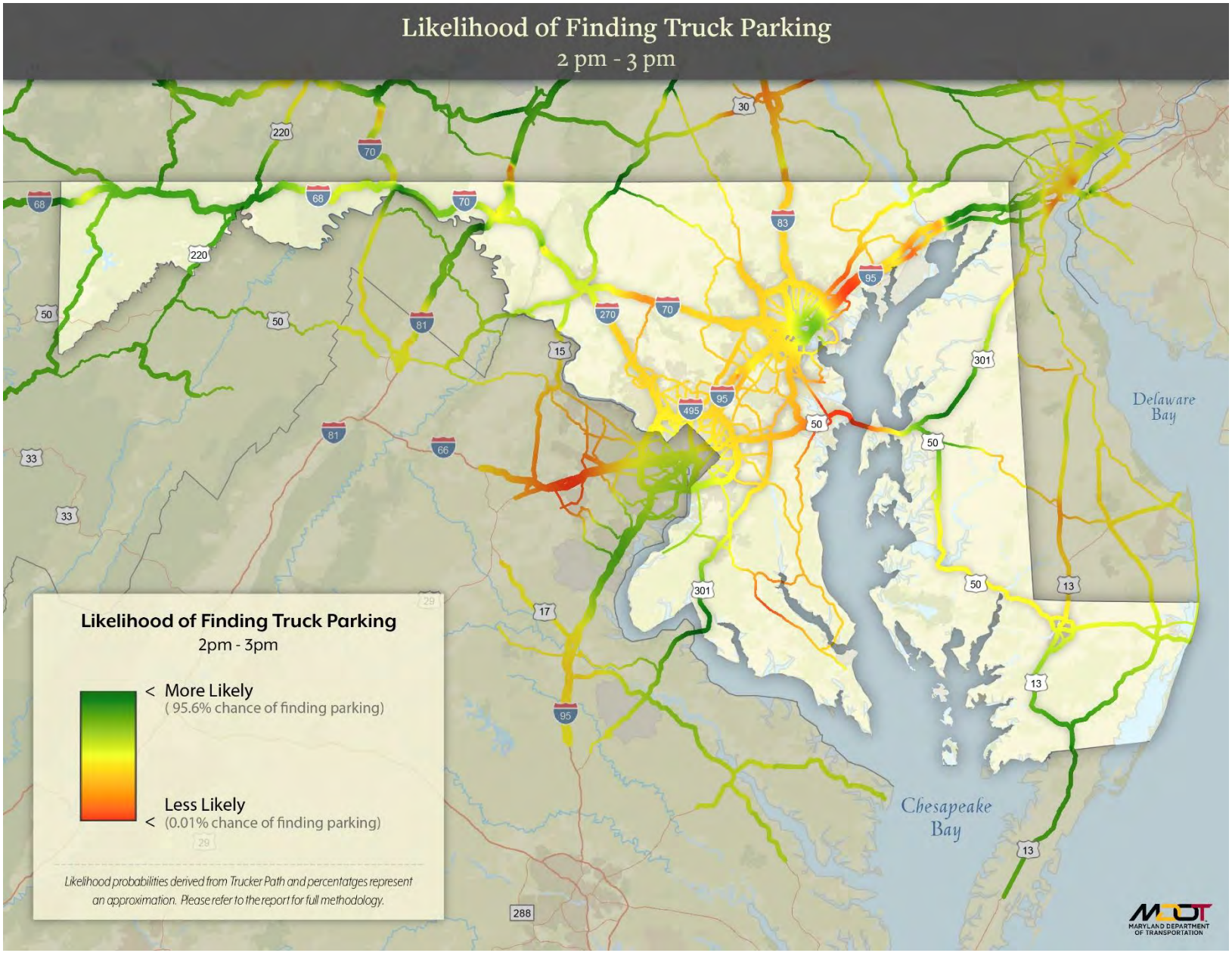


Figure B-16: Likelihood of Finding Available Truck Parking from 3pm to 4pm

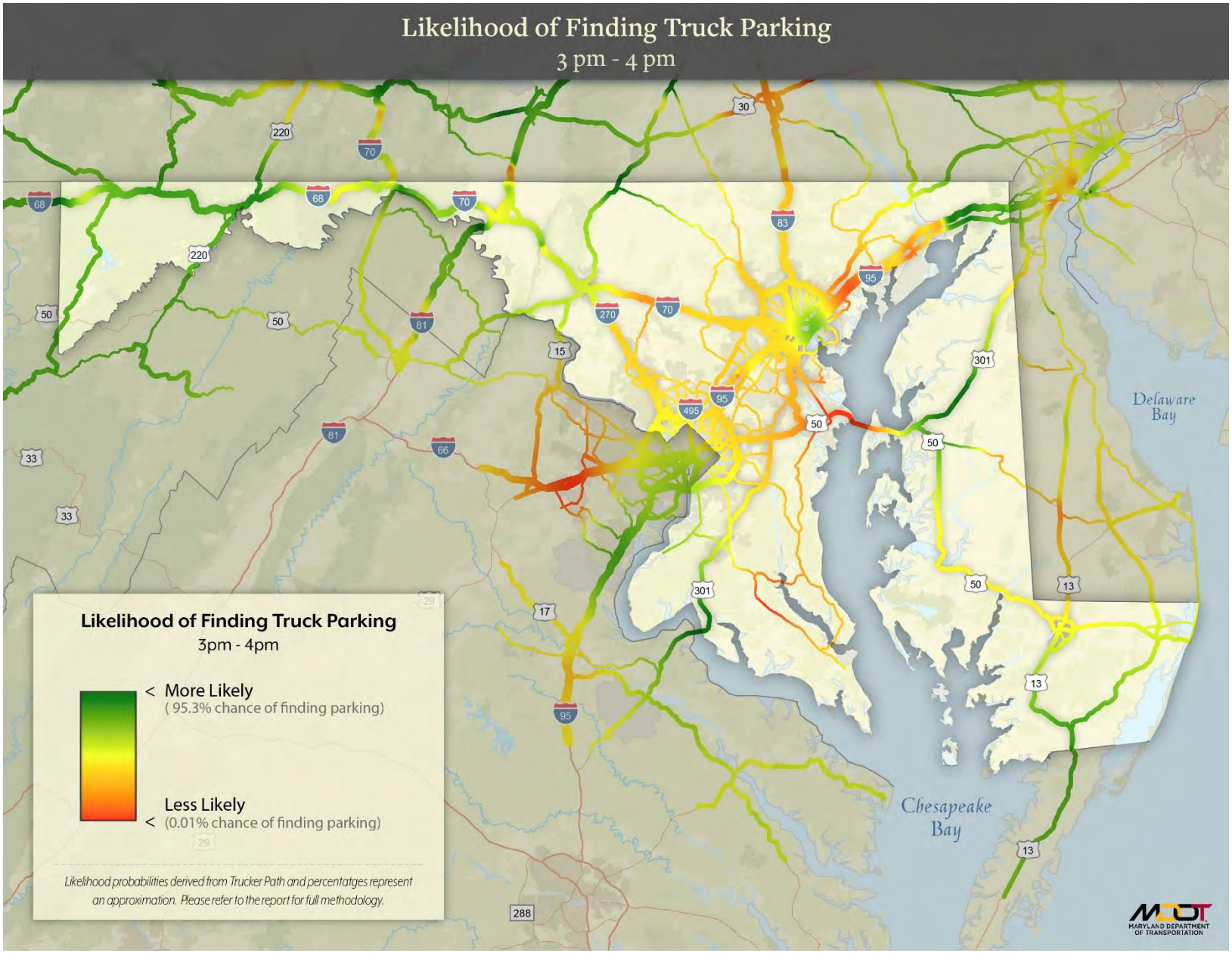


Figure B-17: Likelihood of Finding Available Truck Parking from 4pm to 5pm

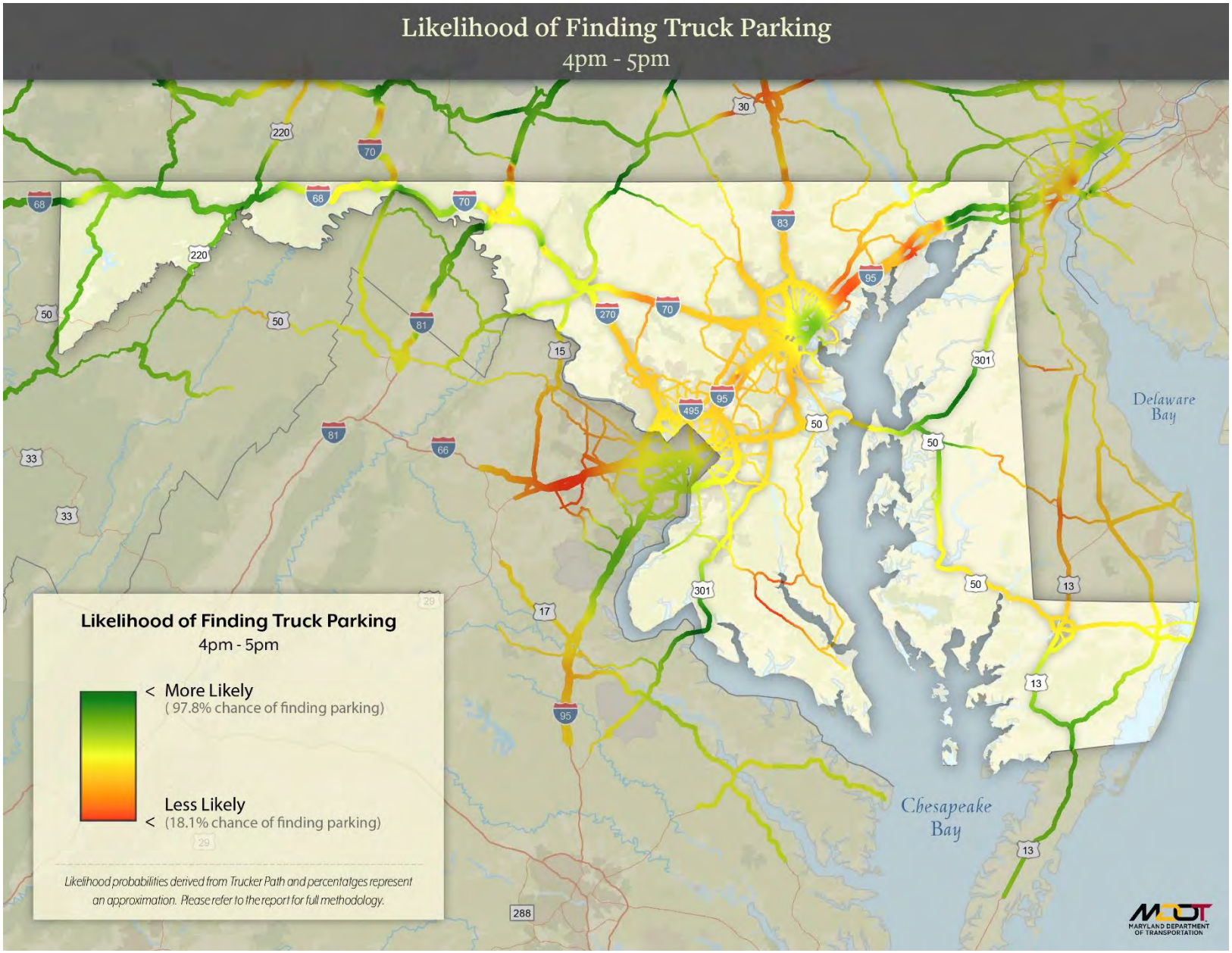


Figure B-18: Likelihood of Finding Available Truck Parking from 5pm to 6pm

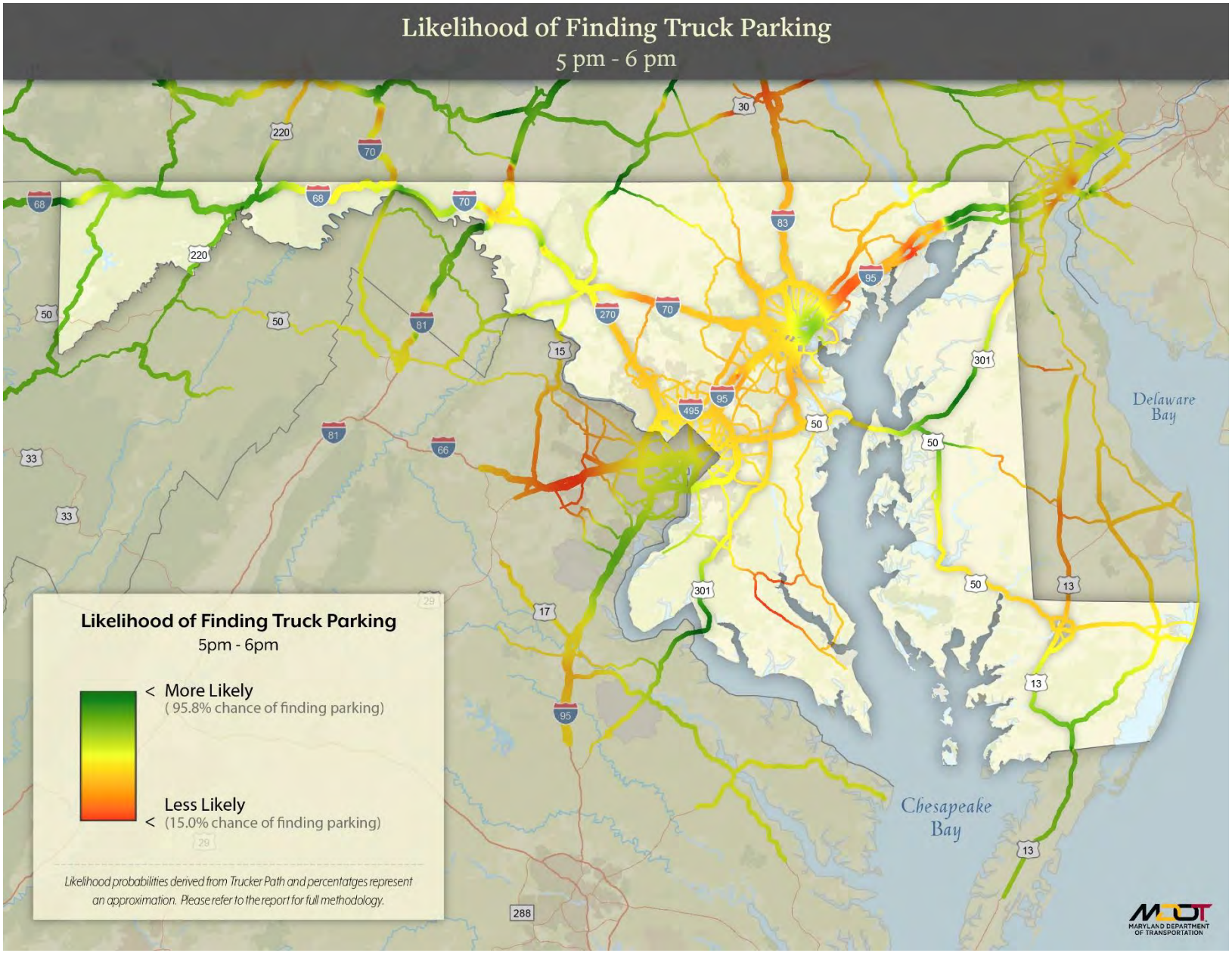


Figure B-19: Likelihood of Finding Available Truck Parking from 6pm to 7pm

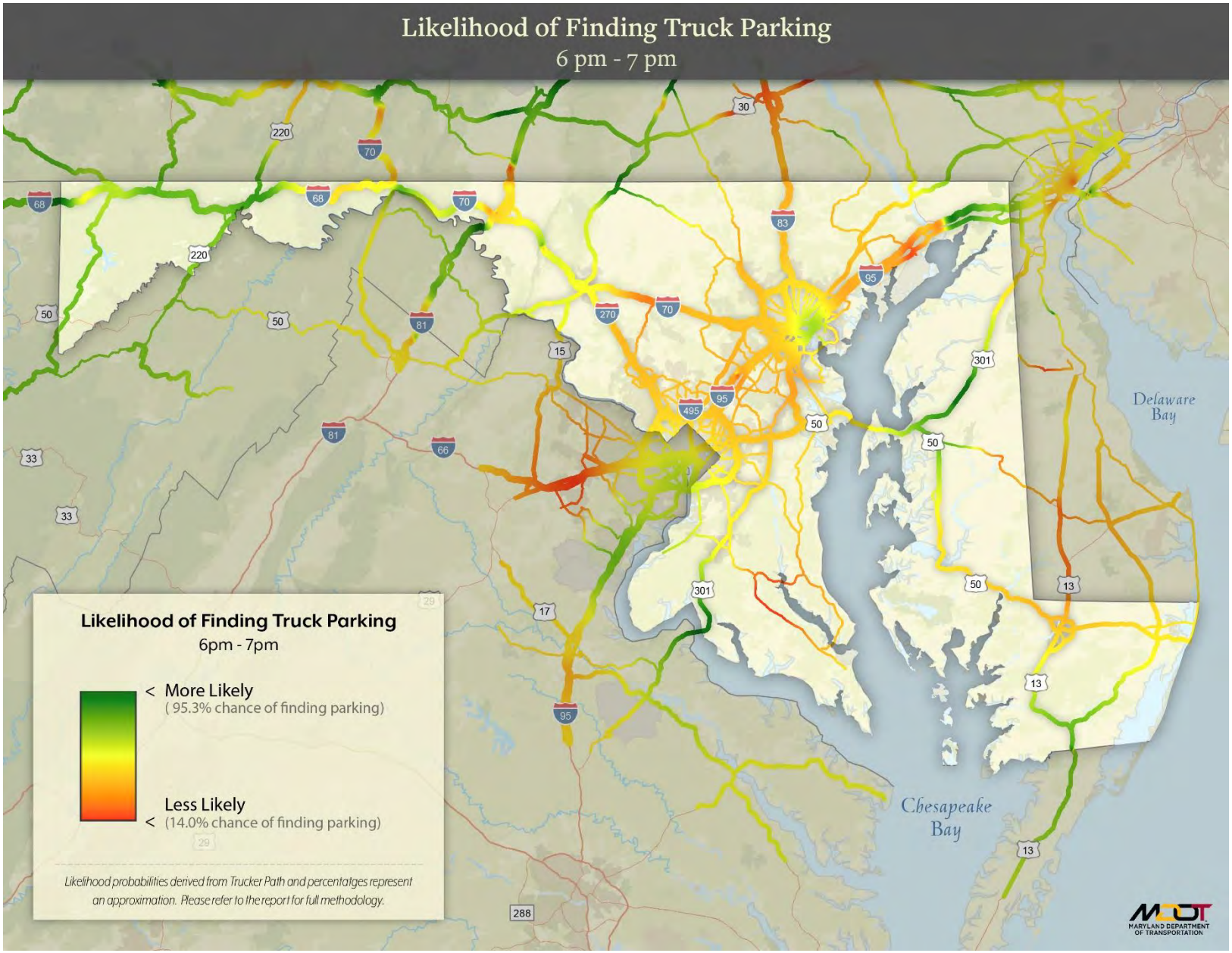


Figure B-20: Likelihood of Finding Available Truck Parking from 7pm to 8pm

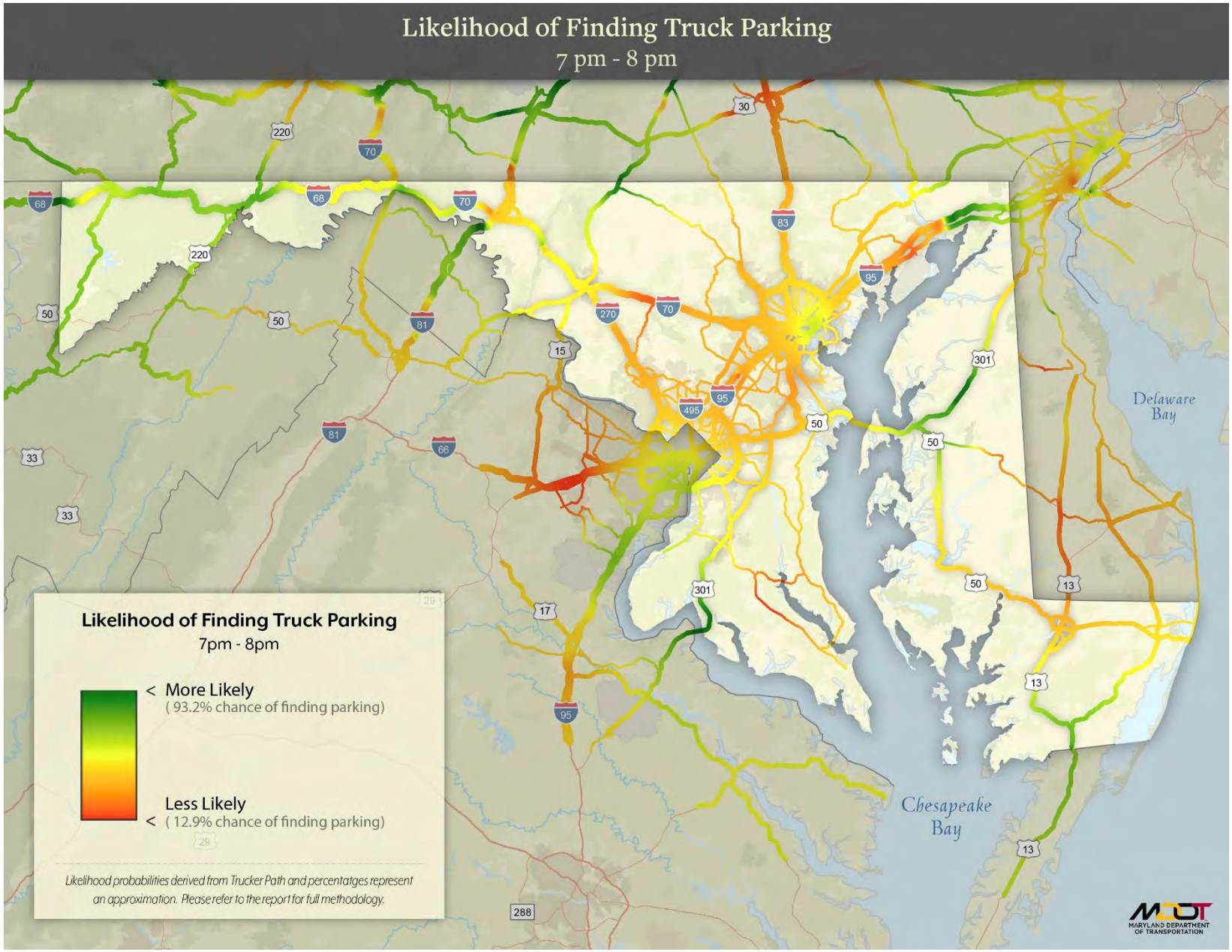


Figure B-21: Likelihood of Finding Available Truck Parking from 8pm to 9pm

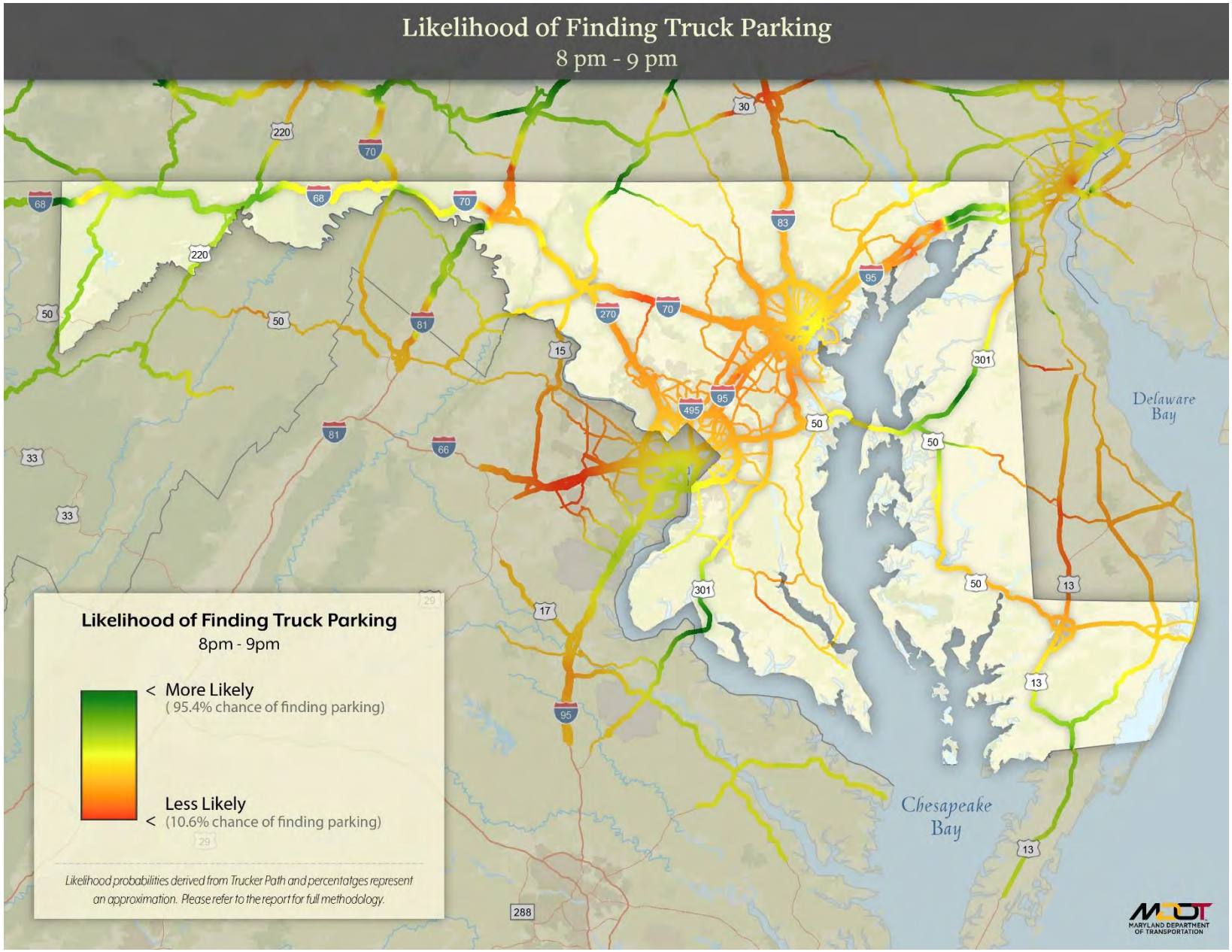


Figure B-22: Likelihood of Finding Available Truck Parking from 9pm to 10pm

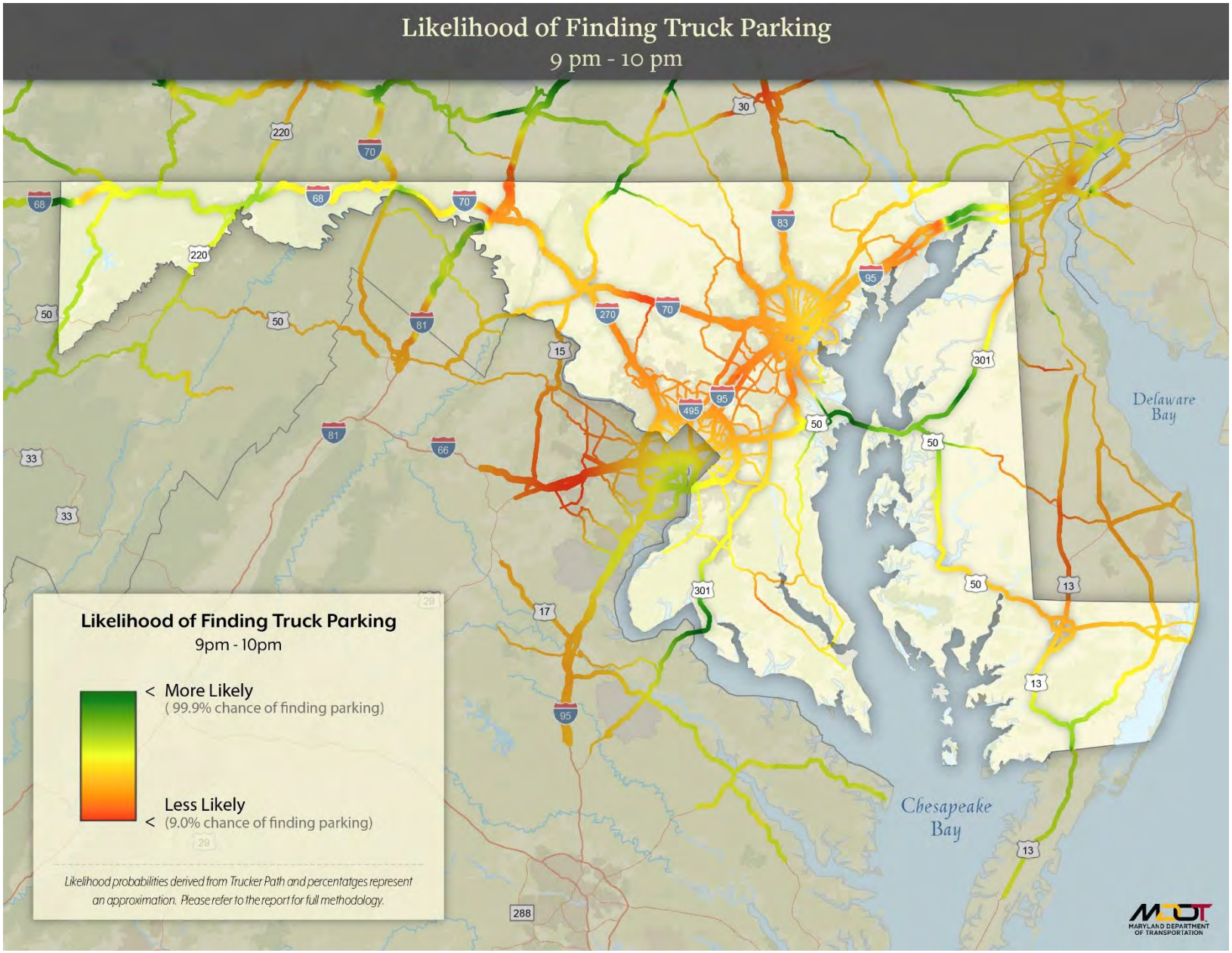


Figure B-23: Likelihood of Finding Available Truck Parking from 10pm to 11pm

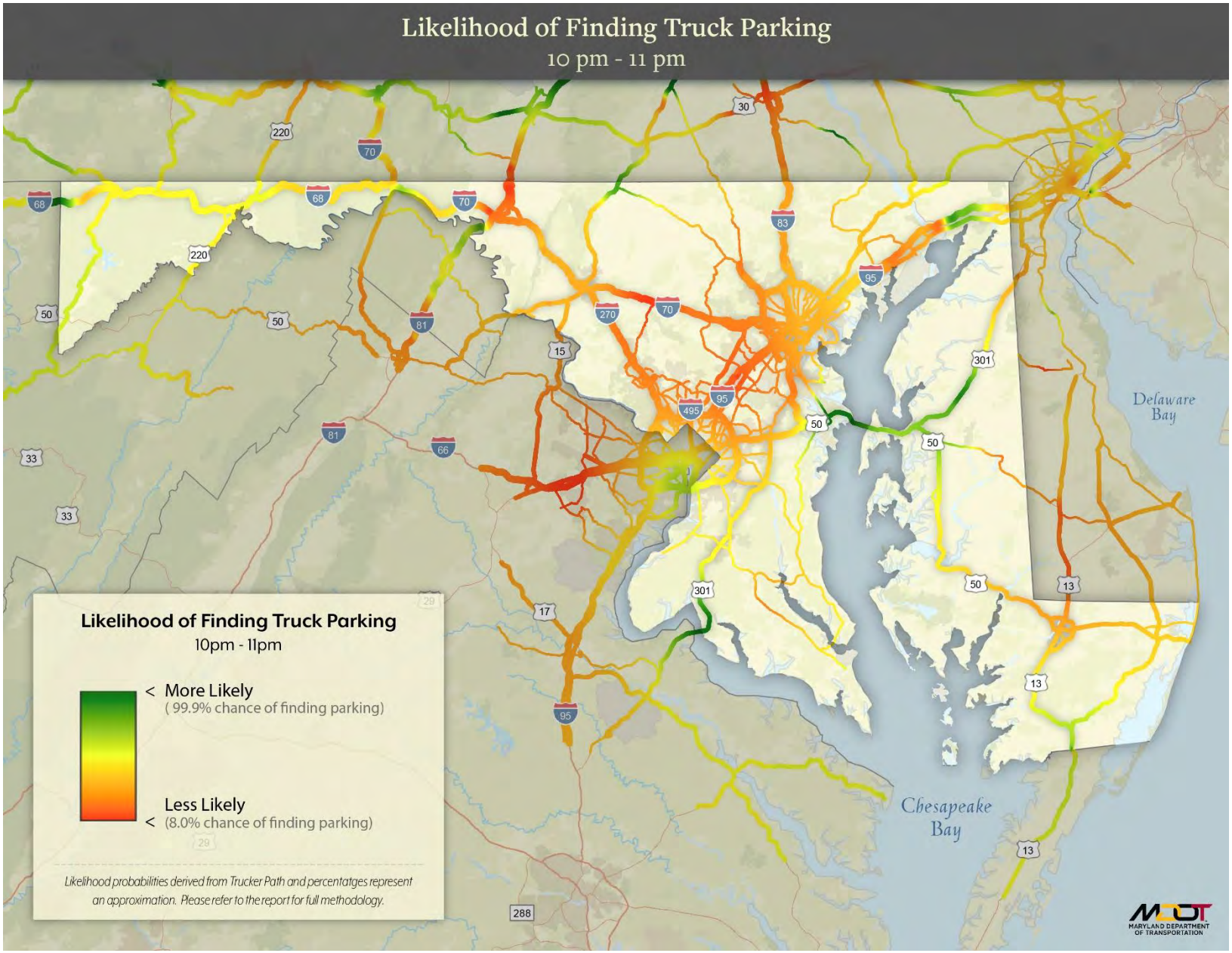
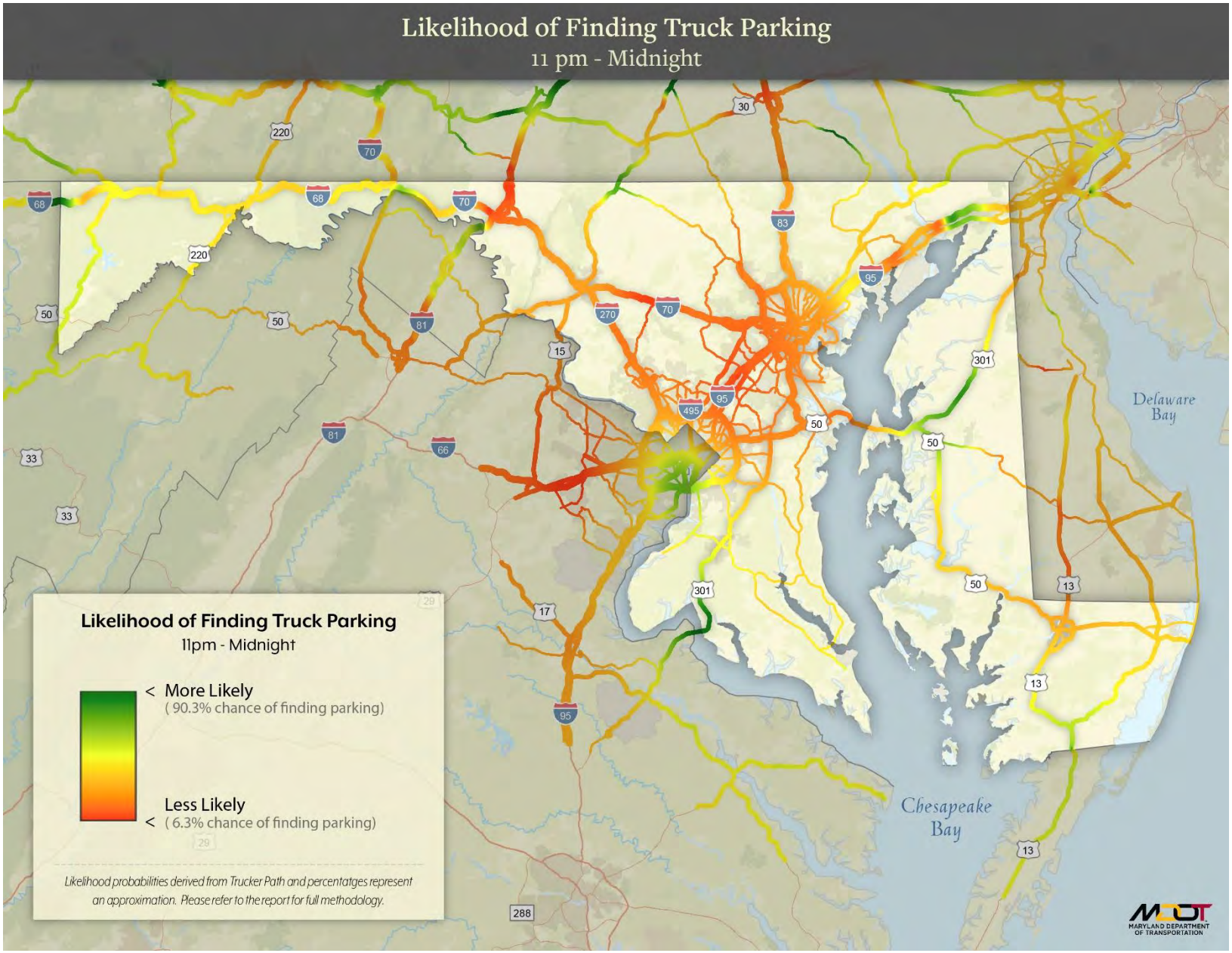


Figure B-24: Likelihood of Finding Available Truck Parking from 11pm to 12am

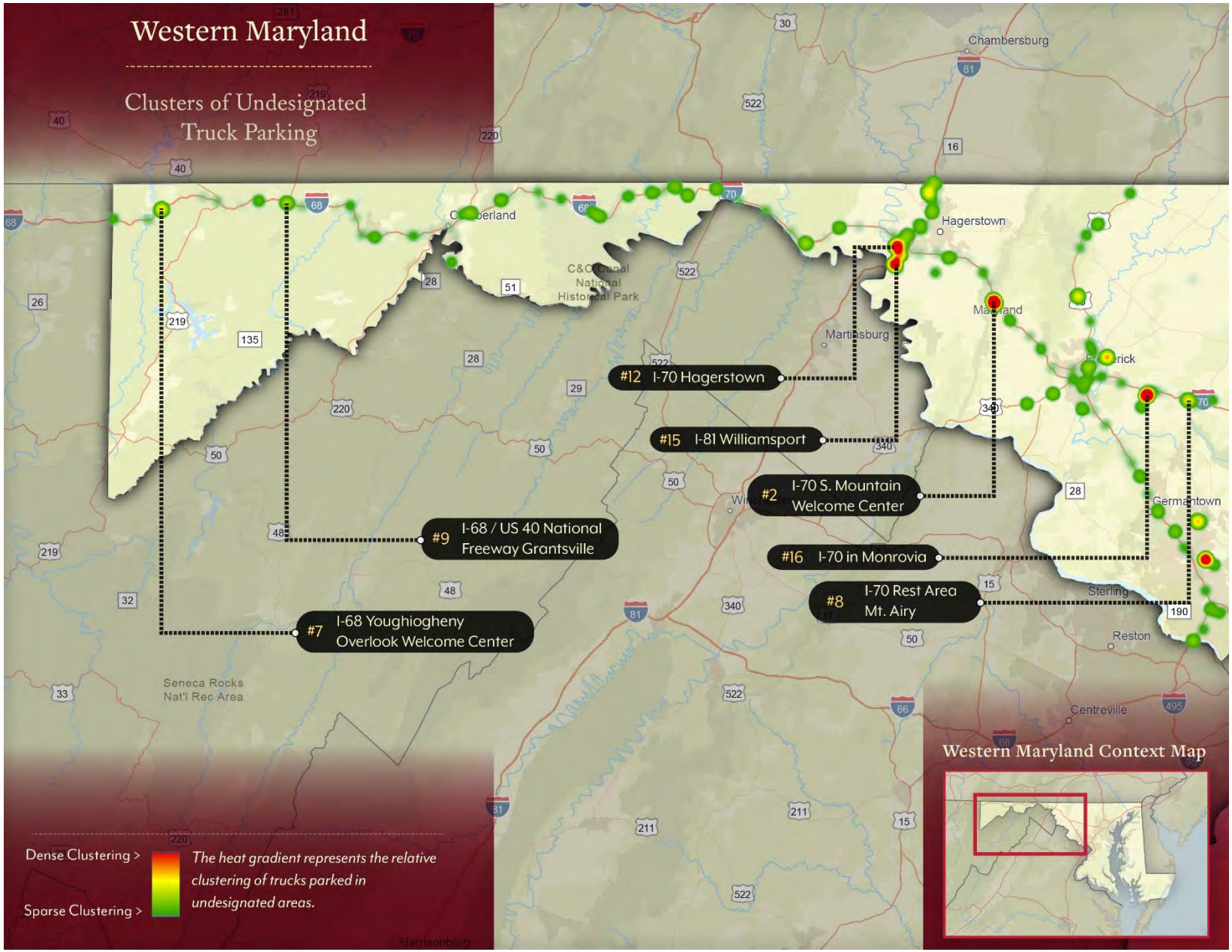


C APPENDIX: PRIORITY AREAS

C.1 PRIORITY CLUSTERS IN WESTERN MARYLAND

Figure C-1 displays the Priority Clusters in Western Maryland. Of note, Priority Cluster #2 is on the border of Western and Central Maryland and is described in this section due to many Priority Clusters in Central Maryland. Overall, I-83 has the most limited truck parking availability in Western Maryland, followed by I-70, particularly from Hagerstown to Baltimore. I-68 has limited truck parking availability along the corridor, with many locations nearing capacity.

Figure C-1: Priority Clusters in Western Maryland



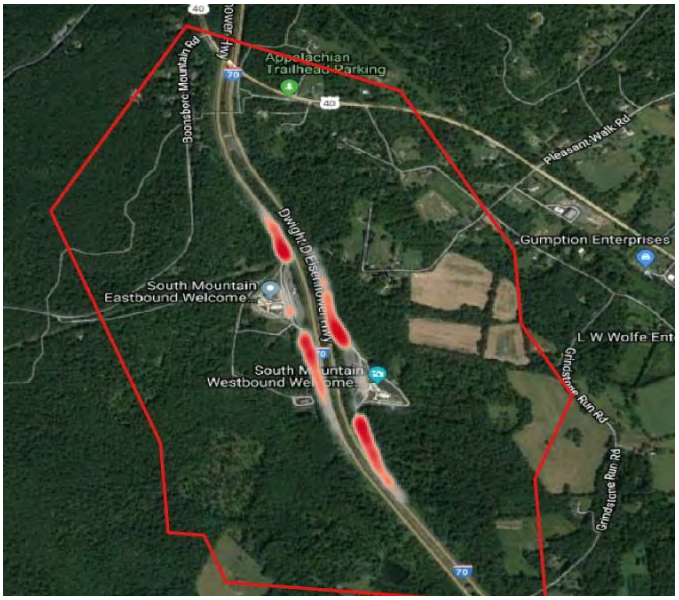
The remainder of this section discusses the Priority Clusters and truck parking opportunities in Western Maryland, starting with the highest-ranked cluster.

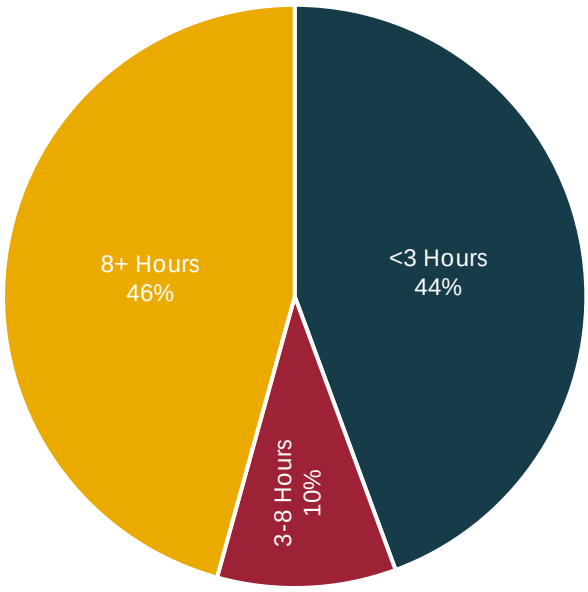
Priority Cluster #2: I-70 South Mountain Welcome Center

Figure C-2 displays the use of the on/off ramps at the I-70 South Mountain Welcome Center and the distribution of the more than 1,600 trucks parked in undesignated areas by duration. Of all the Priority Clusters, the South Mountain Welcome Center one has the highest proportion of trucks parked over eight hours. The proportion of trucks that are using the site for stops over eight hours shows the importance of this location to HOS compliance. Additionally, the eastbound and westbound sides of the South Mountain Welcome Center are individually listed in the top 10 locations with the highest truck parking volumes in every truck parking survey since 2012.

In terms of opportunities to address the undesignated truck parking at the welcome center, the eastbound and westbound sides of the I-70 South Mountain Welcome Center are both in the design phase for projects, with the opportunity to add 10+ spaces in each direction. The development of these projects is critical to meeting the truck parking needs on-site, as well as the insufficient truck parking along I-70 between Hagerstown and Baltimore.

Figure C-2: Undesignated Truck Parking at the I-70 South Mountain Welcome Center (Left) and Distribution of Undesignated Truck Stops by Duration Stopped (Right)





Source: INRIX data. Imagery: Google, 2019, Maxar Technologies U.S. Geological Survey, USDA Farm Service Agency.

PRIORITY CLUSTERS #7 AND #9

Priority Clusters #7 and #9, described below, are analyzed in one section because they are about 21 miles apart and a single project or partnership could address undesignated truck parking at both locations.

Priority Clusters #7: Youghiogheny Overlook Welcome Center: Priority Cluster #7 focuses on the area around the Youghiogheny Overlook Welcome Center (milepost 6) Near Friendship, where 411 trucks used the on/off ramps for the welcome center for parking. Figure C-3 displays that trucks park primarily on the off-ramp at the Welcome Center (22 spaces only on the eastbound side of I-68). About 52 percent of trucks parked in undesignated areas stopped for less than three hours, 10 percent parked from three to eight hours, and 38 percent of trucks parking in undesignated areas stopped for more than eight hours. Over one-third of the trucks stopped in undesignated areas were stopped for less than an hour. The mix of truck parking and the limited origins and destinations around the Youghiogheny Welcome Center make it unlikely that trucks are staging for pick up and delivery. Additionally, trucks stopped for long breaks in undesignated areas typically started their long break between 7pm and midnight, which coincides with the peak demand for truck parking.

Figure C-3: Priority Cluster #7 Youghiogheny Overlook Welcome Center

Source: INRIX data. Imagery: Google, 2019, Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

Analysis of Trucker Path, truck GPS, and the Maryland Freight Network Truck Parking Survey data suggests that the Youghiogheny Overlook Welcome Center is nearing or slightly over capacity at times. The Youghiogheny Overlook Welcome Center could be expanded to accommodate a total of 52 spaces with no need to acquire ROW. The estimated cost to add 40 spaces was $9-10 million in 2012. The closest truck stop is the Keyser's Ridge Auto Truck Stop, which is located about eight miles east of the Youghiogheny Welcome Center at Exit 14A. Keyser's Ridge Auto Truck Stop has limited availability, but the owner of the (Bruceton Farm Service Inc.) owns the truck Stop and McDonald's that is located across US 40 from the truck stop. The McDonald's has a 17-acre lot directly behind the facility that is also owned by Bruceton Farm Service Inc. and is zoned for commercial land use. Similarly, MDOT SHA owns significant land and ROW around the Keyser

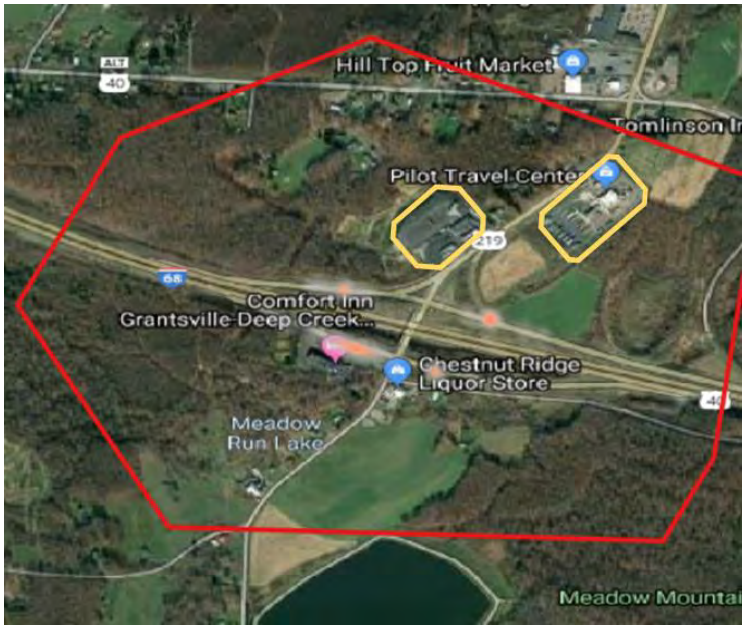
Ridge Auto Truck Stop. The next truck parking location is located at exit 22 on I-68, which is the location of Priority Cluster #9, discussed below.

Priority Cluster #9: Exit 22 in Grantsville: Priority Cluster #9 is located on exit 22 of I-68 where almost 230 trucks used the on/off ramps for parking. The clustering shown in Figure C-4 is less defined than other locations because there are fewer total trucks parking in undesignated areas and they are spread along both the eastbound and westbound on/off ramps.

Trucks parked on the exit 22 on/off ramps parked for a relatively short period. About 68 percent or 153 of the trucks were stopped for less than three hours. Of those stops, almost 100 were stopped for less than an hour.

Exit 22 has two truck parking facilities displayed in yellow in Figure C-4, the Pilot Travel Center #408 has 80 truck parking spaces and is located on the east side of US 219 and a Sunoco with 40 truck parking spaces on the west side of US 219. The area to the east of the Pilot Travel Center #408 is MDOT ROW and is zoned for commercial land use. Additionally, the parcel where the Sunoco is located is owned by Bruceton Farm Services and about one-third of the parcel is covered by the truck stop.

Figure C-4: Priority Cluster #9 Exit 22 in Grantsville



Source: INRIX data. Imagery: Google, 2019, Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

Lastly, the Finzel TWIS is located near milepost 31 or about nine miles from Priority Location #9. Truck parking is allowed at the Finzel TWIS (12 truck parking spaces) from 7pm to 7am. Only 360 trucks used the Finzel TWIS during the four-month truck GPS data sample, suggesting that the scale house has available truck parking capacity. Similar counts were observed in the Overnight truck Survey.

Truck Parking Opportunities: The analysis of I-68 from the Maryland/West Virginia Border to the Finzel TWIS revealed that undesignated truck parking occurs throughout the corridor, concentrated primarily on Interstate on/off ramps. The magnitudes of undesignated trucks included in the four-month truck GPS sample, apart from Priority Clusters #7 and #9, were not large enough to be included in the list of statewide Priority Clusters. Additionally, the many opportunities for private sector expansion of existing truck parking facilities suggest the following focus:

- Maximize the use of existing pavement at the Youghiogheny Overlook Welcome Center and opportunistically add marginal truck parking spaces as part of future welcome center maintenance and reconditioning projects, if possible.

- Incorporate the Finzel TWIS into outreach efforts to inform truck drivers about the availability of TWIS locations for overnight truck parking.

- Explore the potential opportunities to leverage or incentivizing private development of truck parking spaces along I-68.

The truck parking issues on I-68 are not as acute as other corridors and there are many opportunities for private truck stops to add truck parking, providing MDOT with time and potential opportunities to explore a P3 to develop truck parking.

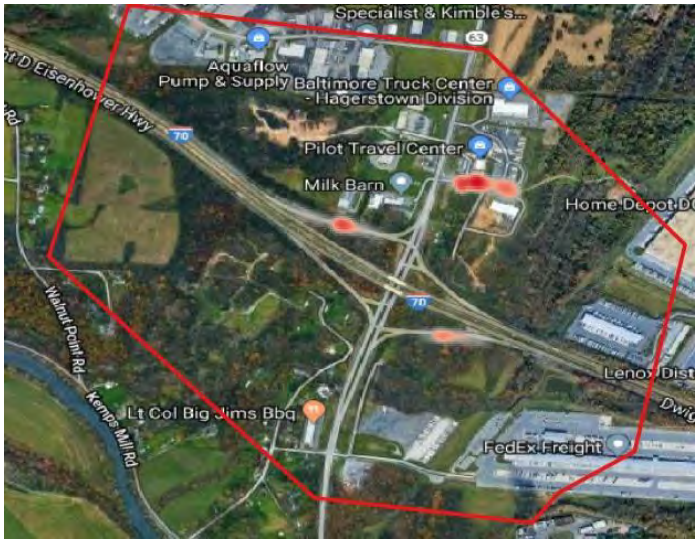
Priority Clusters #12 and #15

Priority Clusters #12 and #15 are analyzed together because they are located within five miles of each other and are both impacted by truck parking facilities and projects in and around Hagerstown.

Priority Cluster #12: Truck Stop Overflow in Hagerstown and Exit 24 On/Off Ramps on I-70: Undesignated truck parking at Priority Cluster #12 (Figure C-12) occurs on the on/off ramp of exit 24 on I-70 and the spillover of trucks onto a local access road from the Pilot Travel Center #150 (90 truck parking spaces). Of the 550 undesignated truck stops occurring at Priority Cluster #12, over 55 percent were parked less than three hours, of which, the majority parked less than an hour. About 35 percent of undesignated trucks were parked over eight hours, with the vast majority of undesignated parking starting to park between 6pm to 11pm. The Pilot Travel Center #150 has very limited availability, which further explains the spillover on the adjacent roadway and the undesignated truck parking on the on/off ramps.

Priority Cluster #15: Roadways Connecting to Warehousing near Exit 1 on I-81 in Williamsport: Located to the south of Priority Cluster #12 (Figure C-12), undesignated truck parking at Priority Cluster #15 is located primarily on Prosperity Lane adjacent to a Save-A-Lot distribution center, with some trucks parking on Lappans Road. Lappans Road was the location where a car fatally struck the back of a truck parked on the side of the road in the early morning of January 19, 2018. Reports about the crash indicate the truck driver was waiting to enter the Save-A-Lot distribution center and that parking is allowed along Lappans Road.[53]

Figure C-5: Priority Cluster #12



Source: INRIX data. Imagery: Google, 2019, Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

Google Street View does not show signs prohibiting truck parking along Prosperity Lane, demonstrating one potential approach to providing last-mile truck parking on the roadways leading to a freight intensive land uses. Prosperity Lane also demonstrates the potential hazards created by trucks using the shoulders of high speed and high volume (daily traffic is almost 11,800 vehicles) roadways when other options are not available or there is insufficient information about where trucks should park. Developing truck parking on low volume and low speed connecting roadways requires purposeful design, specifically, roadway shoulders that can withstand truck parking, signs prohibiting truck parking on nearby high-risk roadways and directing trucks to appropriate areas, and lighting if undesignated truck parking includes overnight breaks.

Priority Cluster #15 also demonstrates the potential for requiring truck parking on-site at freight intensive land uses. The Save-A-Lot Distribution Center has a trailer yard on the east side of Prosperity Lane for parking trailers, that could be used by truck drivers staging in advance of pick up or delivery, helping to solve overflow problems associated with staging and the risk to motorists on nearby roads.

[53] Dearth, D, January 19th, 2018. "Inwood man killed when car hits tractor-trailer parked along Lappans Road." Herald Mail Media.

Figure C-6: Priority Cluster #15

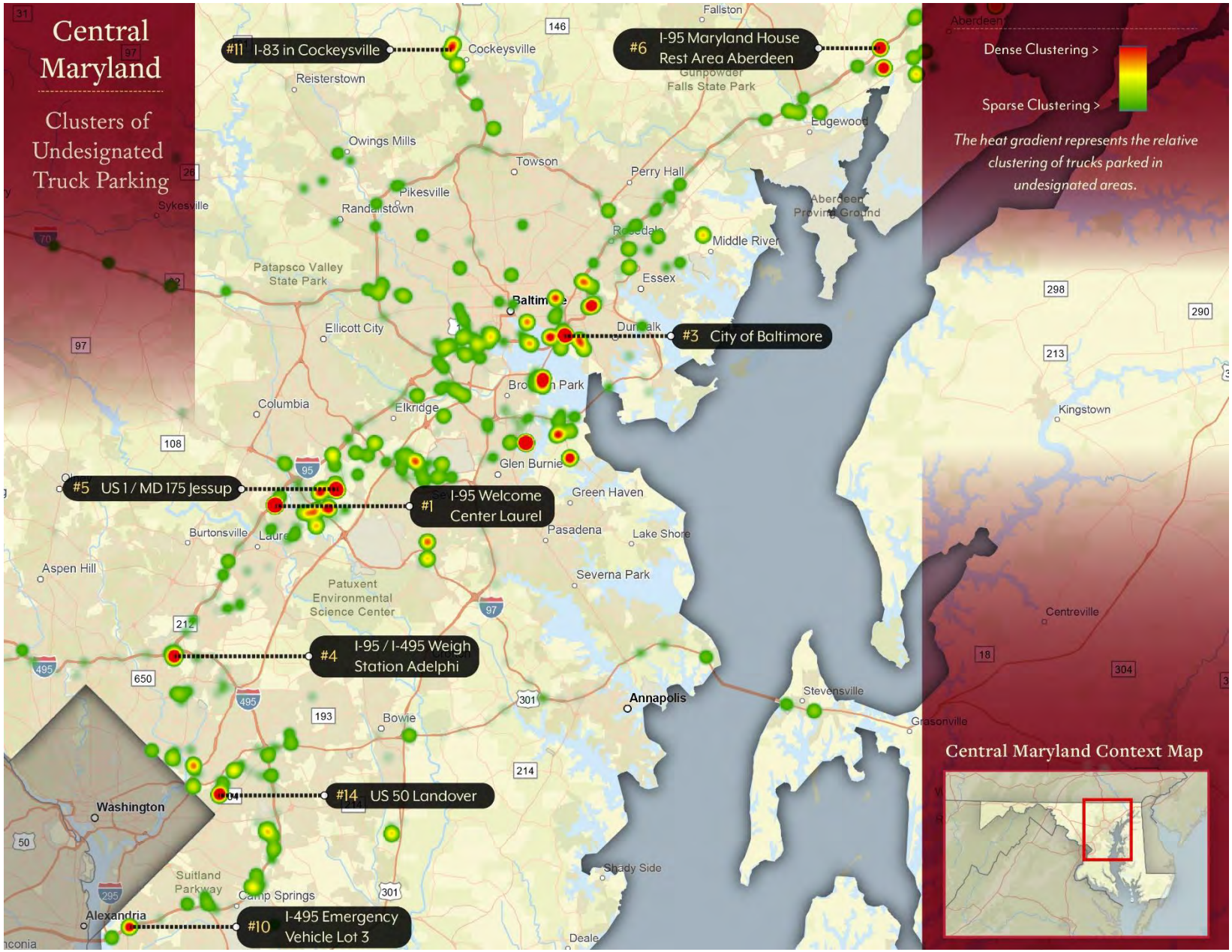
Source: INRIX data. Imagery: Google, 2019, Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

Truck Parking Opportunities: Although there are park and ride facilities near Priority Clusters #12 and #15 that could be retrofitted to allow overnight truck parking, the Bowman Group and their subsidiaries, have planned truck parking facilities near both Priority Clusters. The planned facilities include a truck stop with 70 spaces less than a mile from Priority Cluster #12 near MD 63. Similarly, the Bowman Group has proposed various development plans for a convenience store less than a mile from Priority Cluster #15 along Lappans Road. While plans differ, the development of the parcels could result in hundreds of truck parking spaces and a convenience store. The proposed development parcel near Priority Cluster #15 is the subject of a court case, where Bowman-Spielman LLC is appealing a previous court's decision that classified the development as a truck stop. The ongoing litigation puts the timeline for developing the Spielman Road facility in question. The planned development of truck parking in and around Priority Clusters #12 and #15 will likely be led by the private sector.

C.2 PRIORITY CLUSTERS IN CENTRAL MARYLAND

Figure C-7 displays the Priority Clusters in Central Maryland. Central Maryland has the highest number and many of the highest-ranked Priority Clusters in Maryland. The Priority Clusters are generally located along I-95 and near clusters of freight generating businesses. I-70 and I-95 both have limited truck parking availability at night, resulting in undesignated truck parking throughout the region. Central Maryland also has heavily urbanized areas that make the development of truck parking difficult and costly.

Figure C-7: Priority Clusters in Central Maryland

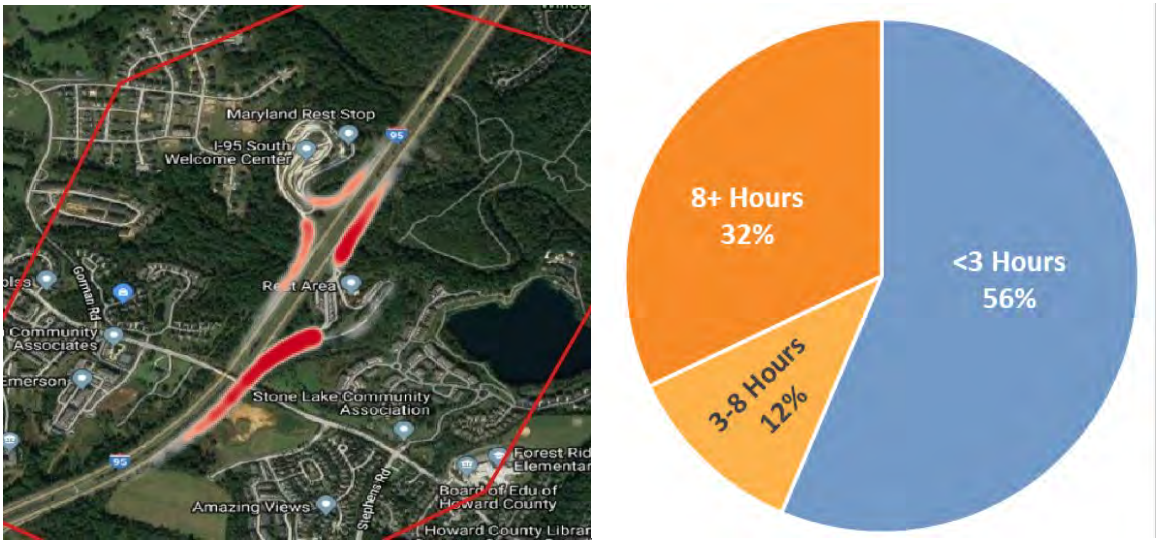


PRIORITY CLUSTERS #1, #4, AND #5

Priority Clusters #1, #4, and #5, described below, are analyzed in one section because of their proximity and potential projects in the area affect all three Priority Clusters.

Priority Cluster #1: I-95 Welcome Center in Laurel: Figure C-8 displays the undesignated truck parking at the I-95 Welcome Center in Laurel and the distribution of how long trucks park in undesignated areas. Almost 3,100 trucks parked in undesignated areas along the on/off ramps in the northbound and southbound direction, with almost 86 percent of undesignated truck parking occurring on the northbound side of I-95. About half of the undesignated truck parking is parked for less than three hours. Further analysis of the trucks stopped less than three hours suggests that they are using undesignated areas to take their required 30-minute rest break.

Figure C-8: On/Off Ramp Parking at I 95 Welcome Center in Laurel (Left) Distribution of the Duration Trucks Parked in Undesignated Areas at the Welcome Center (Right)



Source: INRIX data. Imagery: Google, 2019 Commonwealth of Virginia, U.S. Geological Survey, USDA Farm Service Agency.

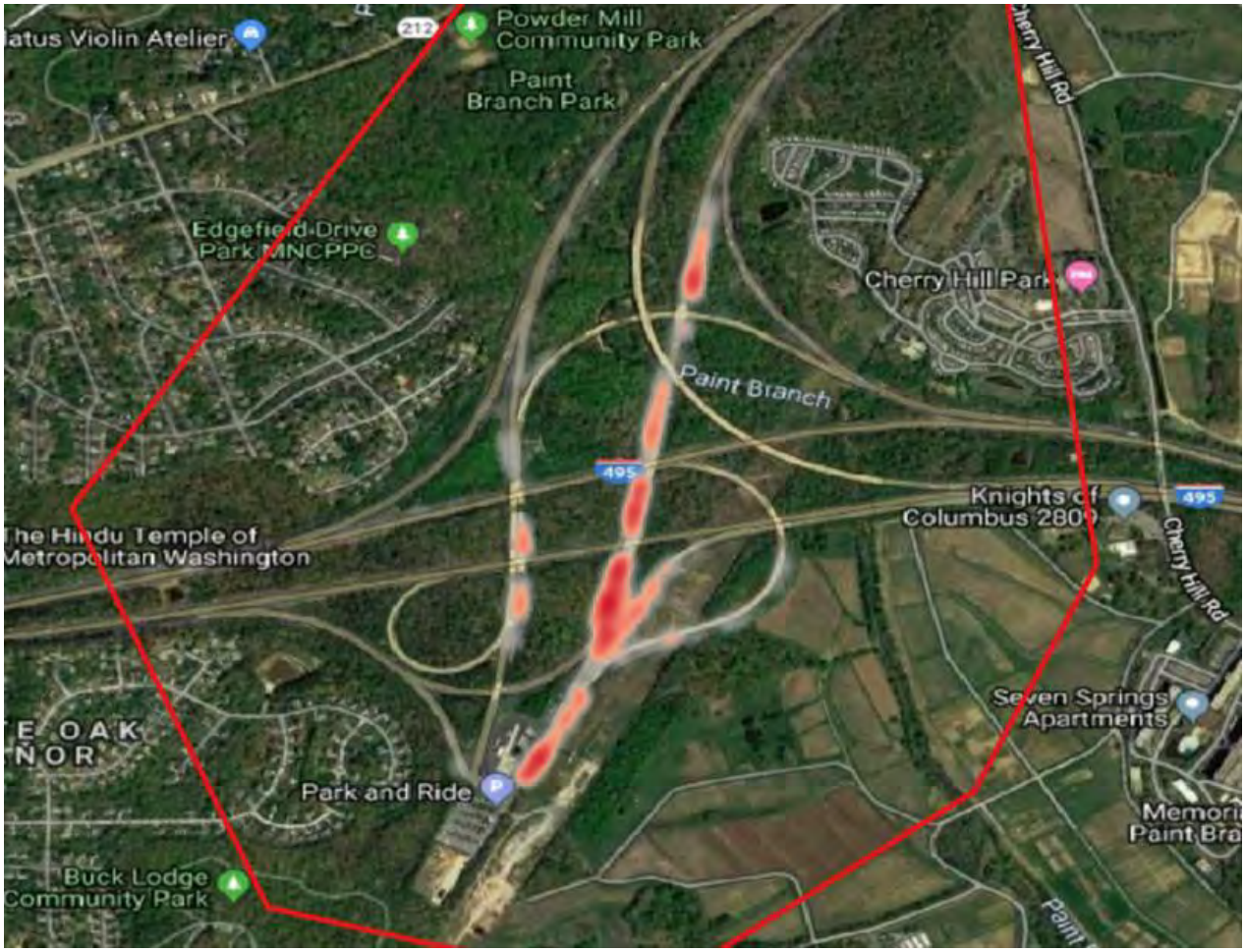
The closest truck parking facility to Priority Cluster #1 is the TA in Jessup with 436 spaces. The TA in Jessup is within Priority Cluster #5 (discussed below) and has limited truck parking availability. Additionally, the I-95/I-495 Weigh Station to the south has undesignated truck parking along on/off ramps, further highlighting the limited truck parking capacity in this region and the significant demand.

Consultations with freight stakeholders noted the area around the I-95 Welcome Center as an area with substantial truck parking demand and safety impacts due to undesignated truck parking. Additionally, stakeholders identified the opportunity to expand truck parking at the I-95 Welcome Center in Laurel, but a historic cemetery and noise/community concerns will be impediments to the expansion. Additionally, the undeveloped land to the north of the Welcome Center contains recreational trails and a river, further constraining the potential for expansion.

Priority Cluster #4: I-95/I-495 Weigh Station in Adelphi: The I-95/I-495 Weigh Station in Adelphi has 18 truck parking spaces on-site that can be used by truck drivers from 7pm to 7am. The analysis of the start time of undesignated truck parking puts over one-third of the 1,500 trucks parking in undesignated areas outside of the 7pm to 7am time they are allowed to use the weigh station (Figure C-9). Additionally, data from the 2018 Maryland Freight Network Truck Parking Survey showed the weigh station was at or near capacity during all six times the location was visited. The 2018 survey also cataloged undesignated truck parking along on/off ramps lead to the weigh station.

The park and ride facility to the south of the weigh station is an emergency truck parking location. Further south is about 13 acres of undeveloped land within the ROW that could be used for truck parking. Therefore, in addition to using the weigh station, the park and ride could be opened to truck drivers at night and additional truck parking could be added to the south of the park and ride. The consistent use of the park and ride for truck parking would require the facility to be redesigned to address geometric issues.

Figure C-9: I-95/I-495 Weigh Station



Source: INRIX data. Imagery: Google, 2019, Commonwealth of Virginia, Maxar Technologies, Sanborn, U.S. Geological Survey, USDA Farm Service Agency.

Priority Cluster #5: Roadways Connecting to Warehousing near US 1/MD 175 in Jessup: The clusters of undesignated truck parking that comprise Priority Cluster #5 are primarily located adjacent to warehousing, distribution centers, and other industrial land uses around US 1 and MD 175 (Figure C-10). TA operates a truck stop (436 truck parking spaces) that is within the northern section of Priority Cluster #5. If a truck driver parks at the TA in Jessup or at the TA in Baltimore (near Priority Cluster #3) longer than two hours, they must pay for parking. Both TA locations waive the parking fee if the truck driver spends at least $20 or buys at least 60 gallons of fuel (24 hours is free for every 60 gallons purchased, up to 72 total hours). The TA in Jessup and nearby public and private truck parking locations have limited availability in the early morning hours, resulting in undesignated truck parking.

Figure C-10: Roadways Connecting to Warehousing near US 1/MD 175 in Jessup

Source: INRIX data. Imagery: Google, 2019, Commonwealth of Virginia, Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

Truck Parking Opportunities: The intensity of freight traffic and freight generators along I-95 from Washington, D.C. to Baltimore, Maryland leads to substantial truck parking demand. Additionally, zoning along I-95 is often residential or mixed-use. Therefore, the truck parking opportunities along I-95 from Washington, D.C. to Baltimore, Maryland focus on maximizing the spaces at existing facilities and partnering where possible.

The opportunities to address truck parking issues in Priority Cluster #4 around the I-95/I-495 Weigh Station include developing a dedicated truck parking facility to the south of the park and ride at the I-95/I-495 Weigh Station and assessing the feasibility of using the park and ride at night for truck parking. The park and ride and weigh station are adjacent to residential housing, which will require community outreach to identify concerns and propose solutions.

Although much of Priority Cluster #5 has been developed, the presence of public institutions such as utilities and correctional facilities results in many publicly owned parcels of land. Some of the public agencies listed as owners of land within Priority Cluster #5 include the Howard County Department of Public Works, State of Maryland Department of Health and Mental Hygiene, and the Department of Public Safety and Correctional Services. Additionally, the Maryland Food Center Authority, a quasi-public agency, owns a parcel of land on Oceano Avenue in the middle of Priority Cluster #5. The presence of land owned by state agencies provides for the potential to leverage existing facilities during their off-peak period, such as overnight, or develop new truck parking. Developing parcels that are located close to the existing TA would reduce the need for the public truck parking location to provide amenities on-site, which would substantially reduce the cost of development. Additionally, the Maryland Food Center Authority could develop a truck parking site to serve the warehouses in the area and/or charge for parking on-site. An approach similar to the one used at Meijer and Unilever/Kriska could be used for the Maryland Food Center in Jessup.

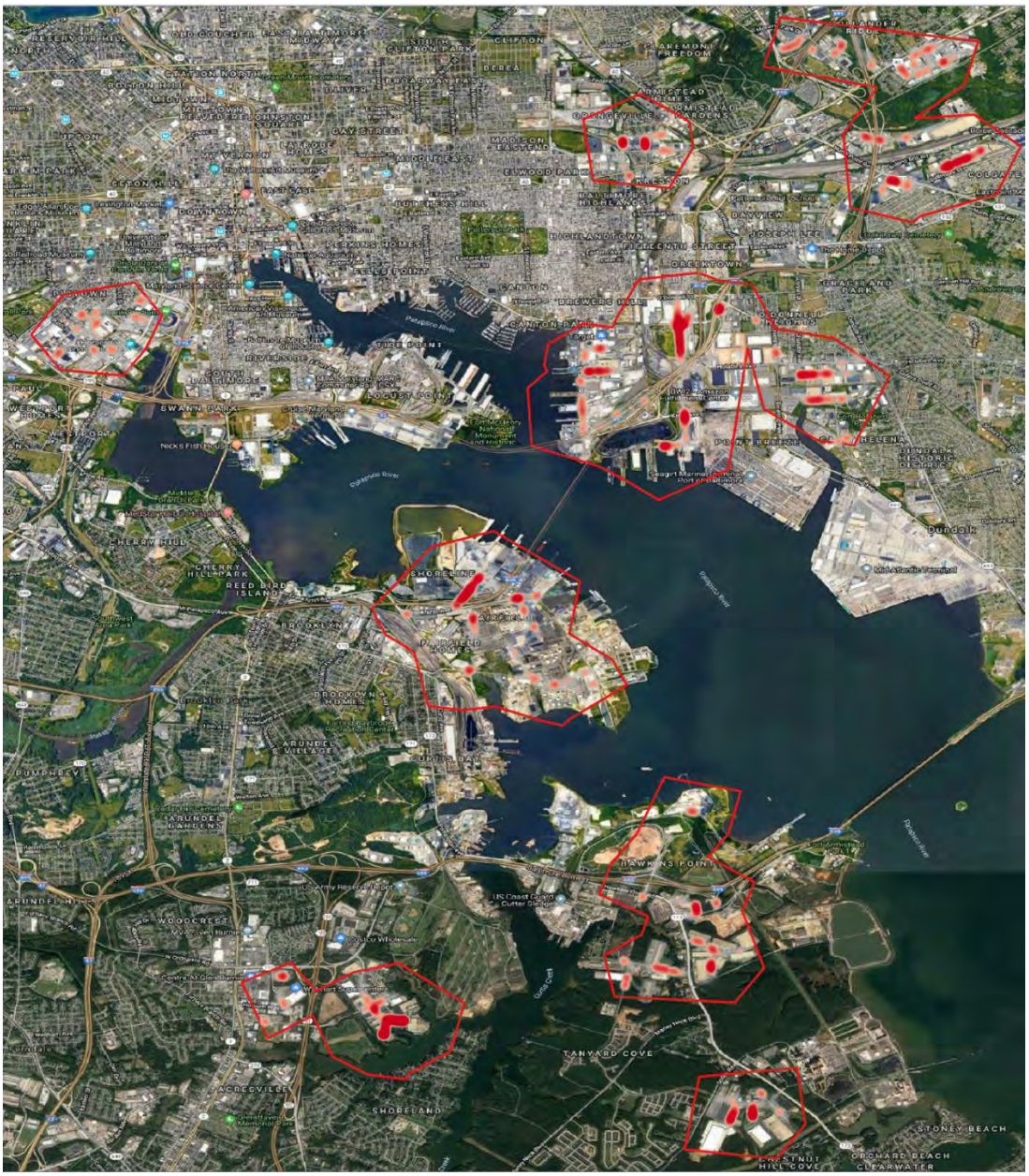
Additionally, the proximity of the undesignated truck parking to existing warehousing and industrial developments highlights the need to incorporate truck parking into the design of roadways leading to freight intensive facilities, requiring truck parking on-site for truck drivers picking up or delivering to the facility as part of land use requirements, and adding truck parking to traffic impact studies for developments and redevelopments that are projected to generate substantial truck traffic.

Overall, addressing truck parking issues occurring in Priority Cluster #5 involve assesses whether the area is a concern for the local community. If the truck parking near industrial land use is not an issue for the community and is not causing other negative impacts, it may not warrant additional research. Conversely, MDOT could serve as a facilitator to local communities, providing data, potential solutions, and working in concert with other public agencies and private stakeholders to identify and implement partnerships.

Priority Cluster #3: Roadways in and around the City of Baltimore that Connect to the Port and Industrial Clusters

As shown in Figure C-11, the area around the Port of Baltimore and other industrial clusters in and around the City of Baltimore show significant undesignated truck parking. On average, about 62 percent of undesignated truck parking stops are less than three hours in the sub-clusters that compose Priority Cluster #3, meaning the truck parking is primarily related to staging.

Figure C-11: Priority Cluster #3



Source: INRIX data. Imagery: Google, 2019, Commonwealth of Virginia, Maxar Technologies, Sanborn, U.S. Geological Survey, USDA Farm Service Agency

Exploration of the roadways where trucks are parking revealed some locations do not expressly prohibit truck parking and even plan for truck parking. Locations that did not expressly prohibit truck parking remained in the analysis to identify where trucks are parking outside of designated truck stops and rest areas. For example, Figure C-12 displays Childs Street which connects to port facilities focused on moving automobiles. Childs street has wide shoulders and plastic barrels attached to telephone poles, presumably for garbage disposal.

Figure C-12: Truck Parking on Childs Street

Source: Google, 2019

Truck parking was a topic of discussion for the Baltimore Regional Transportation Board during a 2017 Symposium about downtown/regional freight development. A particular focus was the impact of development at Tradepoint Atlantic, a 3,300-acre multimodal logistics center. The symposium's participants identified an increase in the incidence of illegal truck parking as an emerging challenge. Additionally, participants identified implementing more on-site truck parking and leveraging underutilized lots as staging areas during the construction of new facilities as potential initiatives to better manage truck parking.[54]

Similarly, when freight stakeholders were asked to highlight opportunities to address undesignated truck parking in and around the City of Baltimore for this study, public and private stakeholders identified the following opportunities:

- Support the inclusion of minimum truck parking requirements at industrial development and redevelopment.

[54] Federal Highway Administration, 2017. "Downtown/Regional Freight Delivery Symposium - Executive Summary | Baltimore, MD." U.S. Department of Transportation.

- Identify parking facilities that are used during the day, but empty at night to allow for overnight truck parking. Participants in the Maryland Truck Parking Workshop highlighted tour bus parking lots, as well as stadiums, as potential options.

- Reconfiguration or redesign park and ride facilities to accommodate truck maneuvers and enable trucks to use the facilities overnight.

- Partner with the city to identify vacant lots and state-owned ROW for truck parking.

A review of the opportunities identified by stakeholders and one of the subclusters in Priority Cluster #3 provides a good example of what to consider when identifying potential locations for developing a truck parking. Figure C-13 displays the area near Exit 57 on I-95, where trucks are using a parking area that is signed as "Authorized Vehicles Only" to the east of I-95 and South Newkirk Street to the West of I-95 for truck parking.

Additionally, Figure C-13 displays a vacant lot owned by Exxon that is adjacent to the undesignated parking along South Newkirk Street. The industrial zoning, undesignated truck parking, and the proximity of the two areas to a TA Truck Stop (across from the "Authorized Vehicles Only" lot) and Royal Farms (northeast of the vacant Exxon parcel) make this area a candidate for developing truck parking without amenities.

Figure C-13: Example of a Potential Area for Truck Parking Development

Source: INRIX data. Imagery: Google, 2019, Commonwealth of Virginia, Maxar Technologies, Sanborn, U.S. Geological Survey, USDA Farm Service Agency

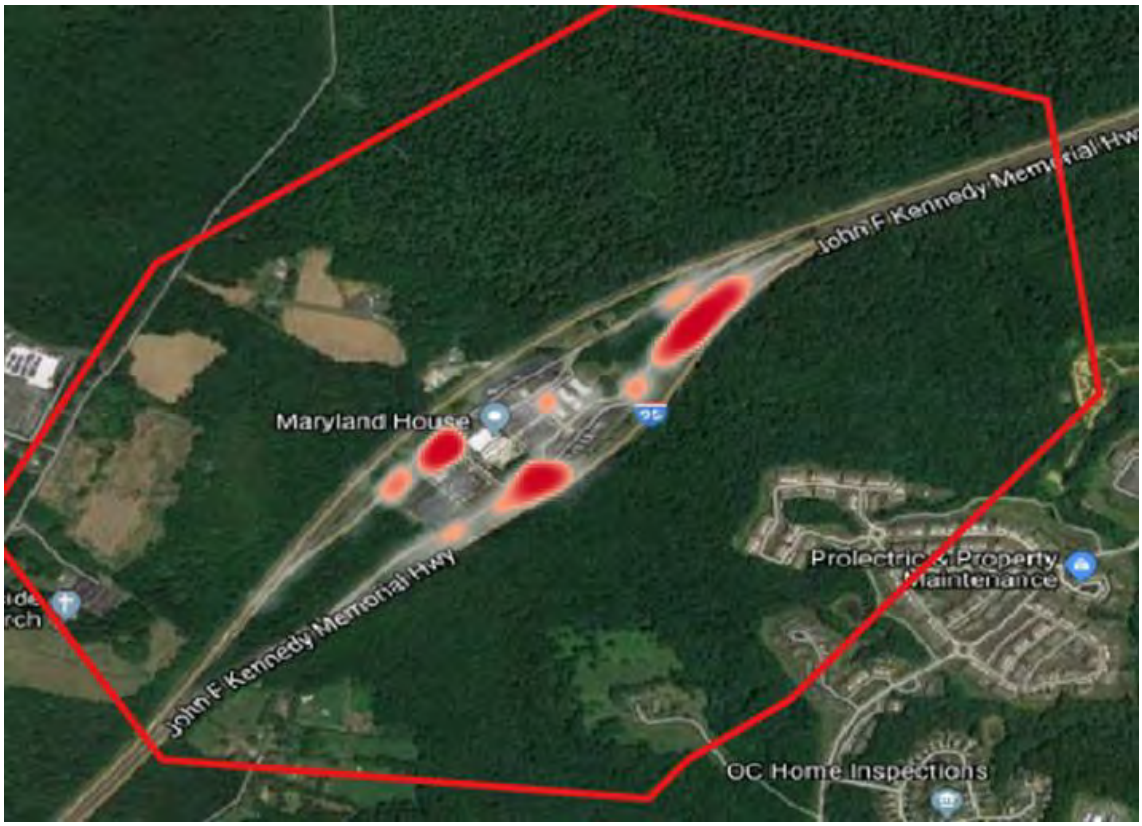
The solutions associated with undesignated truck parking in urban areas will often require a partnership between multiple public sector agencies, such as the city, port, and MDOT, as well as the private sector. Additionally, coordination with the city is critical to ensuring that the location of proposed sites matches long-term development plans and targets truck parking that causes the most significant impacts. For example, during consultations with stakeholders, the Port of Baltimore indicated that they have not heard complaints about truck parking near the port and that stops near the gates are limited to morning and afternoon hours. Therefore, undesignated truck parking around the port is a low priority but could increase in prominence as freight volumes and industrial development

changes. Additionally, new developments at Tradepoint Atlantic have the potential to require additional truck parking, some of which has been developed on-site.

Priority Cluster #6: On/Off Ramps along I-95 at Maryland House Travel Plaza near Aberdeen

The Maryland House Travel Plaza is accessible from I-95 northbound and southbound and has a total of 55 truck parking spaces. Figure C-14 displays that the undesignated truck parking at the Maryland House Travel Plaza is more concentrated on the northbound on/off ramps than southbound. About 62 percent of the undesignated truck parking and about 71 percent of designated truck parking occurs on the northbound side of the travel plaza suggesting a differential need for capacity on the northbound side of the Travel Plaza.

Figure C-14: Undesignated Parking at the Maryland House Travel Plaza



Source: INRIX data. Imagery: Google, 2019, Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

While there is ROW between the on/off ramps that is undeveloped, the TWIS in Perryville is about 11 miles north of Maryland House and has 59 spaces in the northbound direction and 52 spaces in the southbound direction truck parking spaces that are available 24 hours a day for truck parking. Both the northbound and southbound Perryville TWIS have availability, with an average of 13 trucks parking in designated areas on the northbound side and 3 parking in designated

areas on the southbound side. In addition to the Perryville TWIS, the Trucker Path data suggests that the Chesapeake House Travel Plaza has availability throughout the day and there were less than 40 trucks parked in undesignated areas during the four-month sample of INRIX data. The Maryland Freight Network Truck Parking Survey also highlights the Chesapeake House Travel Center as having truck parking utilization between 71 and 86 percent in the northbound direction and 38 to 43 percent in the southbound direction during 2014, 2016, 2017, and 2018.

Therefore, the Perryville TWIS and Chesapeake House Travel Plaza are alternatives to the Maryland House Travel Plaza if it is full. MDOT would need to provide an information system to notify truck drivers that there is availability at the Perryville TWIS and the Chesapeake House Plaza. For Maryland, instrumenting Maryland House, Chesapeake House, and the Perryville TWIS would provide truck drivers with the information they need to make parking decisions. Signs need to be placed far enough in advance of Maryland House and Chesapeake House to allow truck drivers to make a decision about stopping before they reach Maryland House (southbound) or continuing past Maryland House (northbound) to one of the other facilities.

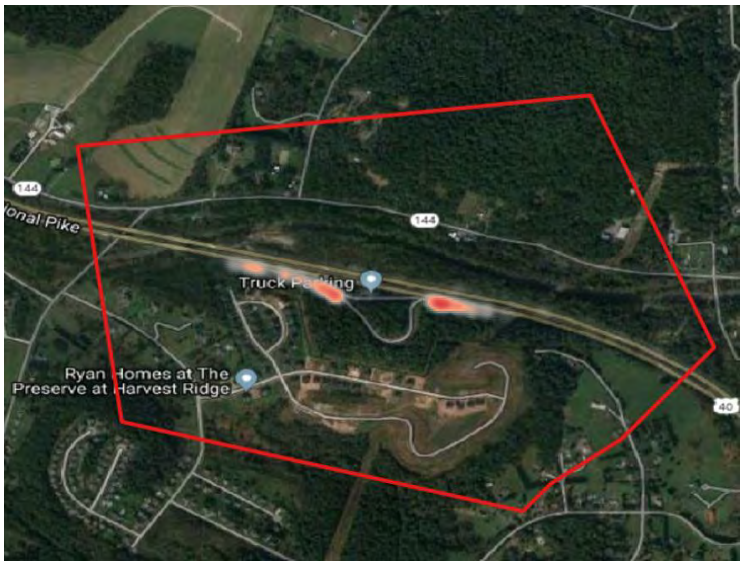
The Perryville TWIS may have trouble attracting truck drivers because of the perception by some that parking at a TWIS will subject them to a greater chance of an inspection. MDOT could promote these locations to truck drivers through an ITS real-time truck parking system, industry outreach, and static signage. Additionally, Trucker Path lists each TWIS on the app as a weigh station, but they are not included as a parking location. Adding the number of spaces and when trucks are allowed to park at each TWIS in Trucker Path and other applications could increase the use of these facilities.

Priority Cluster #8 and #16

Priority Cluster #8: On/Off Ramps along I-70 at the New Market Rest Area near Mount Airy: Figure C-15 displays Priority Cluster #8 located on the eastbound side of I-70 at the New Market Rest Area near Mount Airy (milepost 67). A total of 334 trucks used the rest area on/off ramps during the four-month sample of truck GPS data. The New Market Rest Area has seven truck parking spaces on-site, which have very low availability in the evening and early morning.

The potential to expand the New Market Rest Area is constrained by privately owned parcels, as well as the proximity of a neighborhood to the

Figure C-15: Priority Cluster #8



Source: INRIX data. Imagery: Google, 2019, Commonwealth of Virginia, Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

south of the rest area. There is undeveloped green space that could be used to add a couple of additional truck parking spaces but adding spaces will require coordination with the community.

About three miles to the west is the New Market TWIS, which is open to truck drivers from 7pm to 7am and has 15 truck parking spaces. The truck GPS data found a limited number of trucks parked at the New Market TWIS. In fact, the New Market Rest Area had more trucks park on-site than the TWIS, even though the TWIS has twice as many truck parking spaces. The New Market TWIS has available ROW to expand but is near a neighborhood to the south and the east.

Priority Cluster #16: Roadways Connecting to Warehousing in Monrovia near I-70: Figure C-16 is located about five miles to the west of the New Market Rest Area on Intercoastal Drive, which provides a connection point to a large Costco distribution center in Monrovia near I-70. Over 1,300 trucks parked along Intercoastal Drive during the four months of truck GPS data. About 54 percent of trucks parked along Intercoastal Drive stopped less than three hours, matching the use of the roadway for staging in advance of pick up or delivery of freight. Google Street View shows that Intercoastal Drive has "no parking" signs throughout the length of the roadway. There are undeveloped parcels near the Costco Distribution Center and at nearby parcels, none of which are owned by Maryland.

Figure C-16: Priority Cluster #16

Source: INRIX data. Imagery: Google, 2019, Commonwealth of Virginia, Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

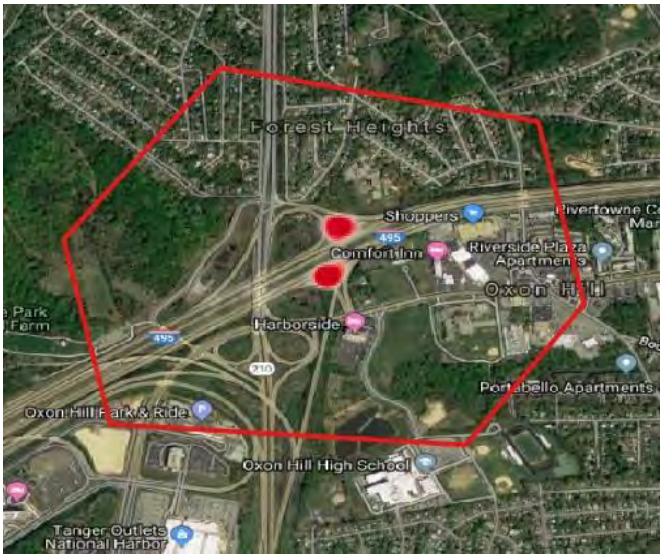
Truck Parking Opportunities: Overall, Priority Clusters #8 and #16 have challenges to expanding capacity and the availability of the New Market TWIS is a low-cost option that could be pursued in the short-term. Similar to the Perryville TWIS, MDOT could promote the New Market TWIS to truck drivers through an ITS real-time truck parking system, industry outreach, static signage, add the location to Trucker Path, and promote the "safe haven" status of MDOT's TWIS locations.

Additionally, an information system would also allow MDOT to monitor the New Market TWIS and explore the expansion of that location if the information system is successful in directing trucks to park at the TWIS. Additionally, the proximity of the undesignated truck parking at Priority Cluster #16 to a Costco Distribution Center suggests a private-sector solution would address undesignated truck parking.

Priority Cluster #10: Emergency Vehicle Lot along I-495 at Exit 3

Figure C-17 displays trucks using an Emergency Vehicle Lot along I-495 for truck parking. In total, 800 trucks parked at the Emergency Vehicle Lot during the four-month truck GPS sample. The trucks parked at the Emergency Vehicle Lot along I-495 had a similar distribution of short, medium, and long stops, 40 percent, 23 percent, and 37 percent respectively. In addition to the two lots at Priority Cluster #10, there are three other Emergency Vehicle Lots to the west, located just before the Woodrow Wilson Memorial Bridge on I-495 that were brought up by stakeholders and had undesignated truck parking in the truck GPS data.

Figure C-17: Priority Cluster #10



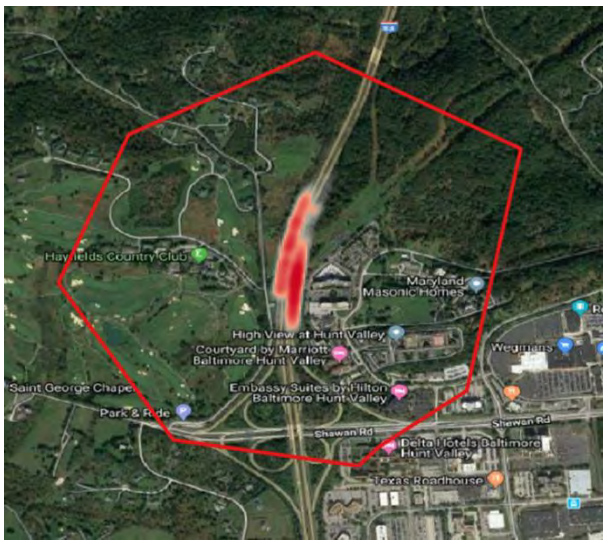
Source: INRIX data. Imagery: Google, 2019, Commonwealth of Virginia, District of Columbia (DC GIS) Maxar Technologies, Sanborn, U.S. Geological Survey, USDA Farm Service Agency

During this study, access to the Emergency Vehicle Lot on the north side of I-495 was blocked off. A primary concern for MDOT is the ability of trucks entering and exiting the roadway at safe speeds. In order to address the safety concerns of Priority Cluster #10, adequate entry and exit would need to be developed at the Emergency Parking Lots along I-495.

Priority Cluster #11: Emergency Roadside Shoulder on I-83 near Cockeysville

Similar to the roadside lots along I-495, Priority Cluster #11 occurs along I-83 where wide shoulders are marked for "Emergency Stopping Only." About 84 percent of trucks stopped along I-83 (Figure C-18) were stopped for less than three hours, some of which are likely using the roadside shoulders for their intended purpose. On the other hand, it is likely that some of the trucks, particularly those that are parked in the early morning, when truck parking is most difficult to find, are using the shoulders for rest breaks or staging.

Figure C-18: Priority Cluster #11



Source: INRIX data. Imagery: Google, 2019, Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

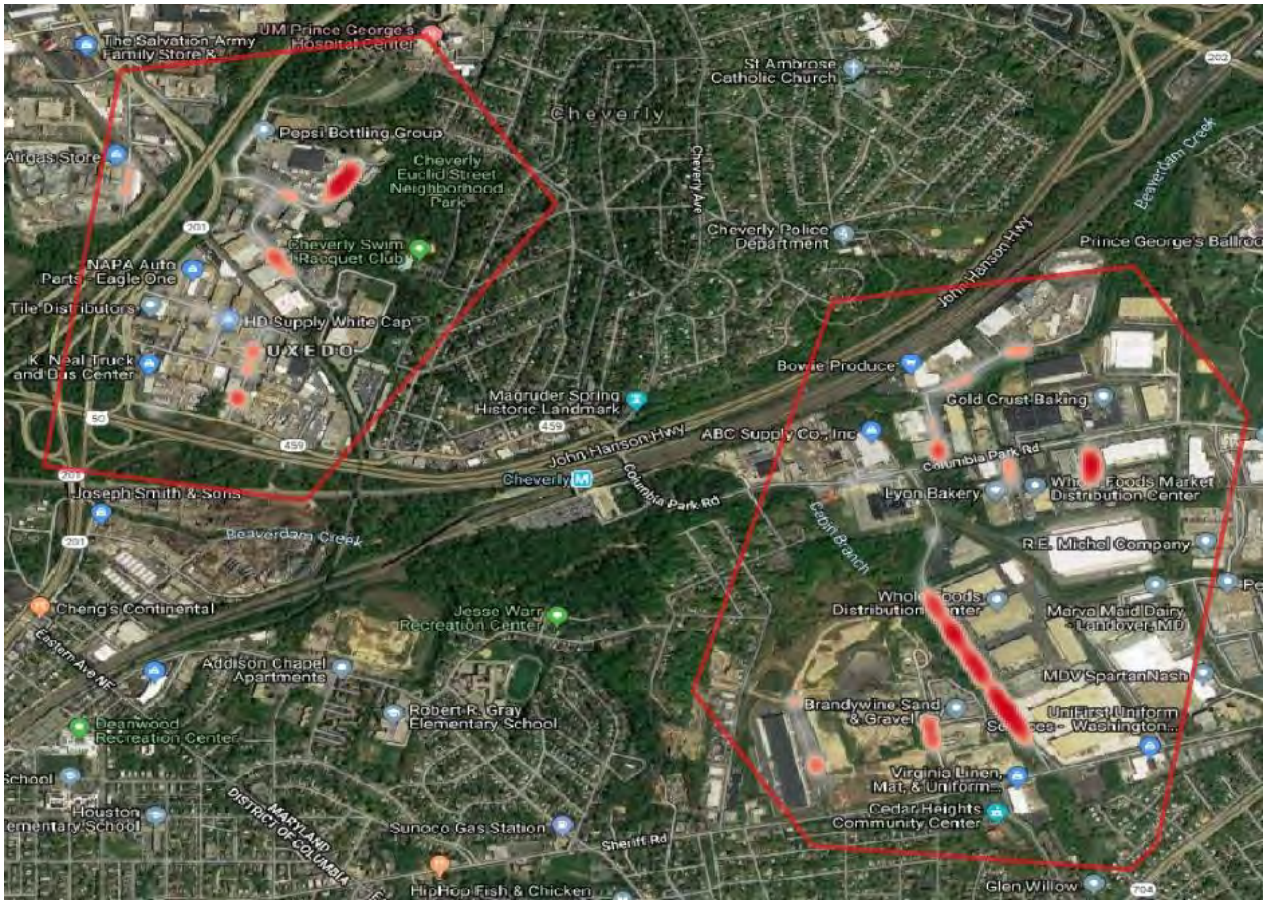
The proximity of residential and other developed land to the shoulders where trucks are parking makes formalizing the shoulder into a truck turnout unlikely. That said, a systematic assessment of wide shoulders and roadside lots would position MDOT to add acceleration and deceleration lanes to existing or newly developed emergency lots or shoulders. The addition of acceleration and deceleration lanes enable trucks to safely enter and exit emergency lots and these locations could serve as a low-cost approach to adding truck parking along rural corridors.

Additionally, the Cromwell park and ride in Towson (11 miles to the southeast of Cockeysville off of I-695), Hereford park and ride in Parkton (8 miles North of Cockeysville off of I-83), and Parkton park and ride in Parkton (11 miles North of Cockeysville off of I-83) are all are used for emergency truck parking and near the undesignated truck parking near Cockeysville. The Hereford and Parkton park and rides are located the ROW of I-83 and have undeveloped ROW nearby.

Priority Cluster #14: Roadways Connecting to Warehousing near US 50 in Landover

Priority Cluster #14 (Figure C-19) is comprised of two clusters located on roadways leading to warehousing and industrial areas. Cabin Branch Drive has the largest number and highest density of undesignated truck parking within the cluster. Only 14 percent of the almost 1,400 trucks parked in the southeastern cluster of Priority Cluster #14 was parked over eight hours. The low overall time stopped suggests trucks are staging in advance of their pickup or delivery. Google Street View shows trucks parked along Cabin Branch Drive in front of "No Parking" signs.

Figure C-19: Priority Cluster #14



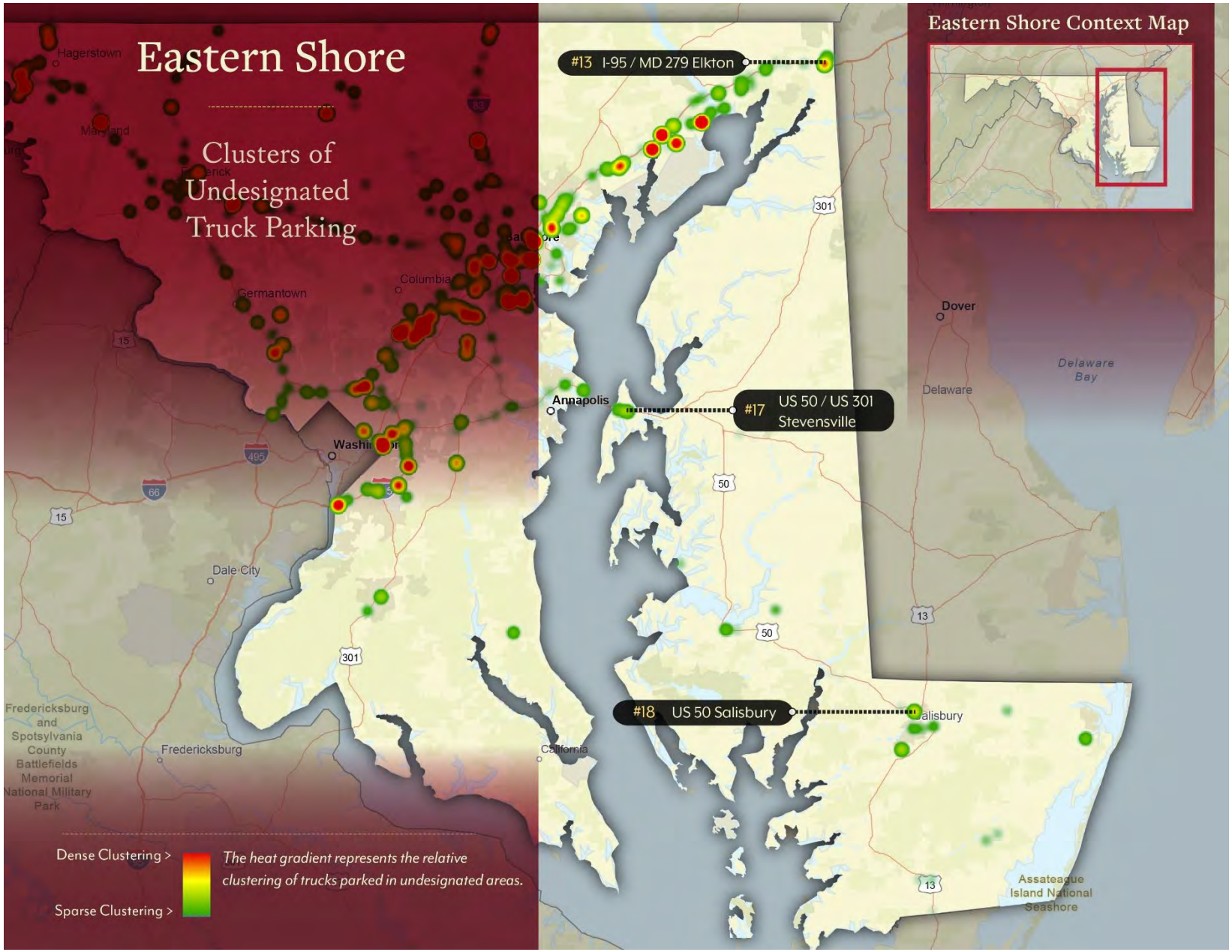
Source: INRIX data. Imagery: Google, 2019, Commonwealth of Virginia, District of Columbia (DC GIS) Maxar Technologies, Sanborn, U.S. Geological Survey, USDA Farm Service Agency

The urbanized and developed area around Priority Cluster #14 limits the options for expanding truck parking to partnering to leverage existing paved areas and developing policies to expand truck parking. Some of the ideas identified by stakeholders include partnering with stadiums and using vacant property for truck parking. Both FedEx Field and the Landover Mall are located near Priority Cluster #14. A partnership agreement could open these facilities to trucks when they are not in use. Additionally, the Washington Metropolitan Area Transit Authority has nearby Landover Metro Station and New Carlton park and ride facilities.

C.3 PRIORITY CLUSTERS IN EASTERN MARYLAND

Figure C-20 displays the Priority Clusters in Eastern Maryland. Eastern Maryland has the fewest Priority Clusters compared to the other regions and only has a few truck parking locations spread throughout a large geographic area.

Figure C-20: Priority Clusters in Eastern Maryland



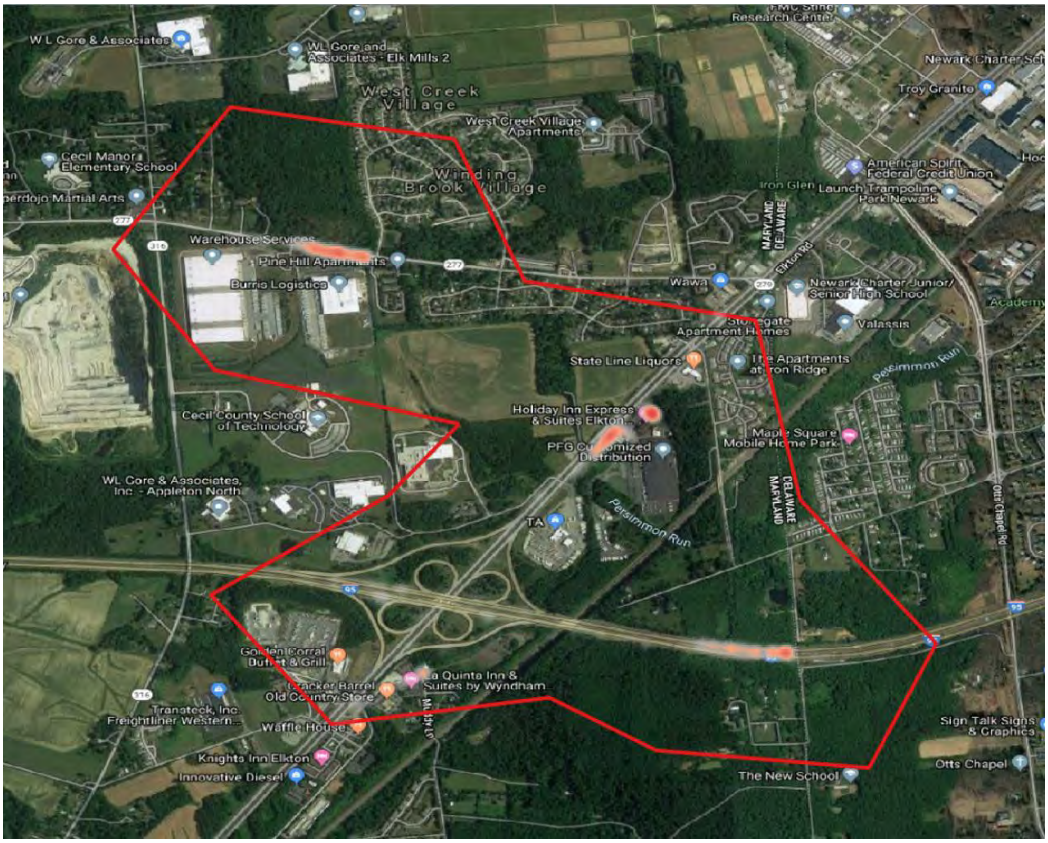
Priority Cluster #13: Along I-95/MD 279/ MD 277 near Elkton

Priority Cluster #13 is a combination of undesignated truck parking occurring on roadways leading to warehouses, as well as truck parking on the shoulder of I-95 (Figure C-21). In total almost 280 trucks parked at Priority Clusters #13, with over 69 percent parking for less than three hours. The short stops match the truck parking occurring around industrialized areas, which are likely the origins and destinations of trucks parked in the area.

There are two private truck parking locations within Priority Cluster #13, Flying J Travel Center #875 with 230 spaces to the south of I-95 and TA Elkton #19 with 151 spaces to the north of I-95. Additionally, Flying J Travel Center #784 with 185 spaces is located nine miles to the south of Priority Cluster #13 at Exit 100. Both private truck parking locations at Priority Cluster #13 are at or near capacity, but the Flying J Travel Center #784 at exit 100 on I-95 is at about 70 to 80 percent capacity on average. Similarly, the Chesapeake House Travel Plaza at mile marker 97 has about the same availability as the Flying J at exit 100.

As suggested during the discussion of undesignated truck parking at the Maryland House Travel Plaza (Priority Cluster #6), an information system that directs trucks to available parking at Chesapeake House and the Perryville TWIS could help distribute undesignated truck parking. In the case of Priority Cluster #13, trucks driving north on I-95 would have information about available parking before reaching Elkton. Additionally, placing a variable message sign that communicates truck parking availability at Chesapeake House and Perryville TWIS at the Maryland/Delaware border would provide information to truck drivers traveling South on I-95.

Figure C-21: Priority Cluster #13



Source: INRIX data. Imagery: Google, 2019, Landsat / Copernicus, Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

Priority Cluster #17: Local Road near US 301 Stevensville

Priority Cluster #17 occurs along a section of roadway that connects the on ramp to the off ramp at exit 38B of US 301 (Figure C-22). Further exploration of the location revealed that 72 percent of the 202 trucks parked at Priority Cluster #17 stop for less than three hours, with the majority of those stops being less than an hour. Priority Cluster #17 is adjacent to restaurants and a shopping center, suggesting that truck drivers are stopping for short breaks and meals. Therefore, working with the restaurants and shopping center to define truck parking that is located near these facilities could address the undesignated truck parking.

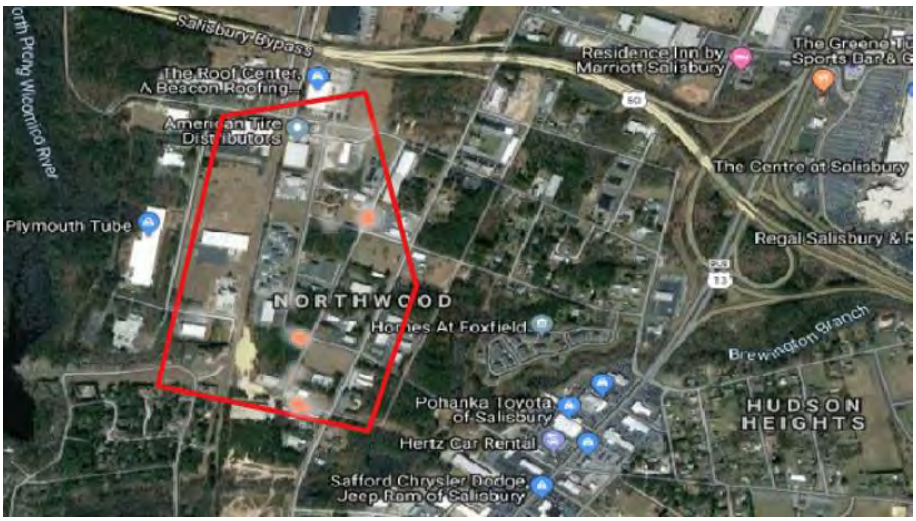
Figure C-22: Priority Cluster #17

Source: INRIX data. Imagery: Google, 2019, Maxar Technologies, U.S. Geological Survey

PRIORITY CLUSTER #18: ROADWAYS CONNECTING TO WAREHOUSING NEAR US 50 NEAR SALISBURY

As shown in Figure C-23, the undesignated truck parking in Salisbury occurs on local roadways, near warehousing and other industrial land use. The proximity of Priority Cluster #18 to The Centre at Salisbury (retail) and commercial land use, as well as the high proportion of trucks parked less than three hours suggests that trucks are using the area for staging. Therefore, addressing undesignated truck parking in Priority Cluster #18 will involve working with the local community to identify if truck parking is causing problems. Additionally, the short stop events suggest working with local businesses or providing a staging lot for truck parking in the area could address the undesignated truck parking.

Figure C-23: Priority Cluster #18



Source: INRIX data. Imagery: Google, 2019, U.S. Geological Survey, USDA Farm Service Agency

C.4 SUMMARY OF FINDINGS

Overall, the individual analysis of each of the Priority Clusters identifies the likely causes of undesignated truck parking, opportunities, and potential solutions. Although each cluster has specific nuances, the following key takeaways are used to inform the study's recommendations:

- Most highway on/off ramps and areas where roadways have wide shoulders exhibited some undesignated truck parking, with rest area and travel plaza on/off ramps exhibiting concentrated undesignated truck parking.
- Urban areas have very few parking facilities and little to no available truck parking spaces. Undesignated truck parking in urban areas occurs primarily on local roadways that connect to commercial/industrial land uses, often large footprint warehouses and distribution centers.
- The availability of truck parking is limited in Maryland, with the largest number of spaces available at Maryland's TWIS locations.

- The utilization of truck parking could be improved by implementing an ITS real-time truck parking system, industry outreach, static signage, adding truck parking information on apps like Trucker Path, and promoting the "safe haven" status of TWIS parking lots.

- MDOT has opportunities to expand truck parking at key facilities, such as the I-70 South Mountain Welcome Center and near the I-95/I-495 Weigh Station. Other opportunities to add truck parking involve partnerships with other public agencies, the private sector, and local communities, this is especially the case in urban areas.

D APPENDIX: BENEFIT/COST CATEGORIES

Although safety improvement is the most important factor justifying the business case for truck parking enhancement projects, such projects that have to compete with other (possibly more immediate) statewide needs, such as bridge rehabilitation and highway maintenance. Additionally, access to some federal funding programs is merit-and competition-based, and qualification for them involves a cost-benefit analysis.

This section provides high-level information regarding the cost and benefit categories associated with truck parking improvement projects to consider when evaluating the advantages and disadvantages of different investment alternatives. In addition to the information included below, MDOT has the opportunity to leverage the resources provided by U.S. DOT, particularly "Benefit-Cost Analysis Guidance for Discretionary Grant Programs," on the INFRA and Build Grant websites.[55,56] Lastly, the MAASTO TPIMS grant provides their benefit-cost analysis grant application documents, including an excel spreadsheet that provides their approach and monetizing factor to developing the benefit-cost analysis for the TPIMS project.[57]

D.1 TRUCK PARKING COST CATEGORIES

CAPITAL EXPENDITURES

The capital costs of truck parking projects may vary depending on the objectives and types of issues (e.g., capacity, information) aimed to address. The capital cost of a truck parking project is the sum of the monetary resources required for planning and building the facility. Capital costs may also include land acquisition and utility costs, as well as the cost of labor, material, and other resources used in the construction process. In addition to the costs of constructing or expanding the parking facilities, the costs associated with communication, security systems, and other

55 The frequently asked questions, notice of funding opportunity, webinars and other resources for BUILD: https://www.transportation.gov/BUILDgrants/about and INFRA: https://www.transportation.gov/buildamerica/infragrants

56 U.S. DOT developed guidance for conducting a benefit-cost analysis for discretionary grant programs, available here: https://www.transportation.gov/policy-initiatives/buildamerica/bca-and-project-readiness-guidance.

57 The benefit-cost analysis and tables for the MAASTO TPIMS project is available here: http://www.maasto.net/TIGERgrant.html

intelligent data collection and dissemination equipment and software may also be itemized as part of the total capital cost.

Operational and Maintenance Costs

Maintenance costs of truck parking facilities include all the recurring expenditures associated with providing continuous support to ensure ongoing functioning. Examples of operation and maintenance costs include trash removal, snow plowing, sanitation, and pavement rehabilitation. Such expenses should be estimated and included in federal funding application submission under a category separate from the capital costs.

D.2 TRUCK PARKING BENEFIT CATEGORIES

Safety Benefits

The most important advantage of truck parking improvement projects is the generated increase in the safety of the truck drivers and the reduction in crash risk for other roadway users. Although HOS regulations target fatigue-related accidents, insufficient truck parking may force the drivers to park at undesignated locations such as highway shoulders, on/off ramps, or empty lots. In such cases, the drivers may become exposed to cargo theft or other personal safety hazards.

Additionally, undesignated truck parking poses risks to the truck driver and other highway users due to line of sight obstruction and mix of high-and low-speed traffic. Crashes involving trucks parked at undesignated locations are often catastrophic and lead to fatalities and serious injuries. The safety advantages of truck parking projects are derived from the expected improvements in crash frequency and severity, which can be expressed as a monetary benefit when multiplied by the crash values. Crash values are estimated and published by FHWA, based on analysis of the Value of Statistical Life (VSL)[58], Value of Time (VoT), and injury level-specific costs.[59]

Economic Benefits

The efficient transportation of goods is critical to any state's economy. Insufficient truck parking leads to an increase in shipping time, which, in turn, causes lower customer satisfaction rates and increased freight costs. With nearly 84 percent of tonnage moved across Maryland carried by trucks,[60] the State's economic competitiveness heavily relies on the resources provided for the trucking industry to operate effectively.

---

58 VSL represents the "tradeoff rate between fatality risk and money". For more information: Kniesner, T.J., Viscusi, W.K., The Value of a Statistical Life, 2019, Vanderbilt Law Research Paper No. 19-15.

59 FHWA Safety Program, Highway Safety Benefit–Cost Analysis Guide, 2018. https://safety.fhwa.dot.gov/hsip/docs/fhwasa18001.pdf

60 Maryland Strategic Goods Movement Plan, 2017.

The economic benefits of a truck parking project are primarily enhanced driver productivity. According to an ATRI survey, drivers spend an hour on average to look for an available parking space.[61] The monetary benefits of each truck parking space added to the statewide inventory or better information about truck parking availability can be estimated using the results of supply-demand analysis (i.e., Chapters 4 and 5 of this study) and using resources such as ATRI's annual "An Analysis of the Operational Costs of Trucking: 2018 Update."

Environmental Impacts

Inadequate truck parking can lead to trucks stopping at undesignated spots for staging or HOS regulation compliance. Trucks parked at undesignated places typically idle to provide the drivers with air conditioning, heating, or electricity for auxiliary equipment. Thus, truck parking improvement projects that provide electrification mitigate diesel engine emissions by idling reduction. Additionally, truck drivers can find truck parking more efficiently will burn less fuel because they are not undertaking the inefficient process of searching for truck parking.

Infrastructure Damage Mitigation

Trucks stopped at undesignated locations, such as highway shoulders or on/off ramps increase the rate of infrastructure deterioration and thus increasing maintenance costs. If truck parking availability is improved, undesignated parking events will be shifted to designated locations, reducing the highway infrastructure maintenance costs.

[61] ATRI, Critical Issues In The Trucking Industry, 2019.

E

APPENDIX: TRUCK PARKING OPPORTUNITIES IDENTIFIED BY STAKEHOLDERS

Figure E-1: Potential Truck Parking Projects

Location	Highway	City	Opportunity
Partner with the Private Sector Locations			
Westfield Shopping Mall	US 50	Annapolis	Potential for providing overnight truck parking spaces and amenities
Costco Store Parking	I-70	Fredrick	Allows overnight parking
Former Landover Mall site	I-495	Kentland	Potential for use as a temporary overnight parking
General Motors Site	I-95	White Marsh	Potential for collaboration to designate a minimum required space for truck parking
Floor and Décor Distribution Center	I-695	Sparrows Point	Potential for collaboration to designate a minimum required space for truck parking
Dominos Sugar Distribution Center	I-95	Jessup	Potential for collaboration to designate a minimum required space for truck parking
The land below electric towers running parallel to I-95 between I-495 and US 212	I-95	–	Potential for overnight parking
Expand Truck Parking using Existing Facilities			
I-95 Park-&-Ride	I-95 and I-495	Adelphi	Potential for providing overnight truck parking spaces
I-95 Welcome Center	I-95	Savage	Existing truck parking facility with potential for expansion at the northbound welcome center
South Mountain Welcome Center	I-70	Myersville	Existing truck parking facility with potential for expansion
Paved Lot on I-95	I-495 and MD 210	Forest Heights	Potential for providing overnight truck parking spaces
MD State Police Office	I-95	Perryville	Potential for providing overnight truck parking spaces
I-695 inner loop close to 31C	I-695	Towson	Park and Ride facility with potential for providing overnight truck parking spaces
Weigh Station	US 301	Bowie	Allows overnight parking
Park & ride	I-270	Gaithersburg	Potential for overnight parking
Empty lot within ROW	MD-5	Brandywine	Potential for overnight parking-Ingress and Egress Issue

Location	Highway	City	Opportunity
OSOW Staging Lots	I-83	Freeland	The empty lot at PA line Currently used for OSOW staging
	I-81	Hagerstown	The empty lot at PA line
	US 301	Stevensville	US 301 EB near Thompson Creek Shopping Center
	I-695	Rosedale	Highway shoulder currently used for OSOW staging
	I-95	Whitemarsh	Highway shoulder currently used for OSOW staging
Chesapeake House Rest Area	I-95	Charlestown	Existing truck parking facility with potential for expansion

F

APPENDIX: REGIONAL MAPS OF SATELLITE IMAGES

Figure F-1: Priority Cluster #2 I-70 S. Mountain Welcome Center

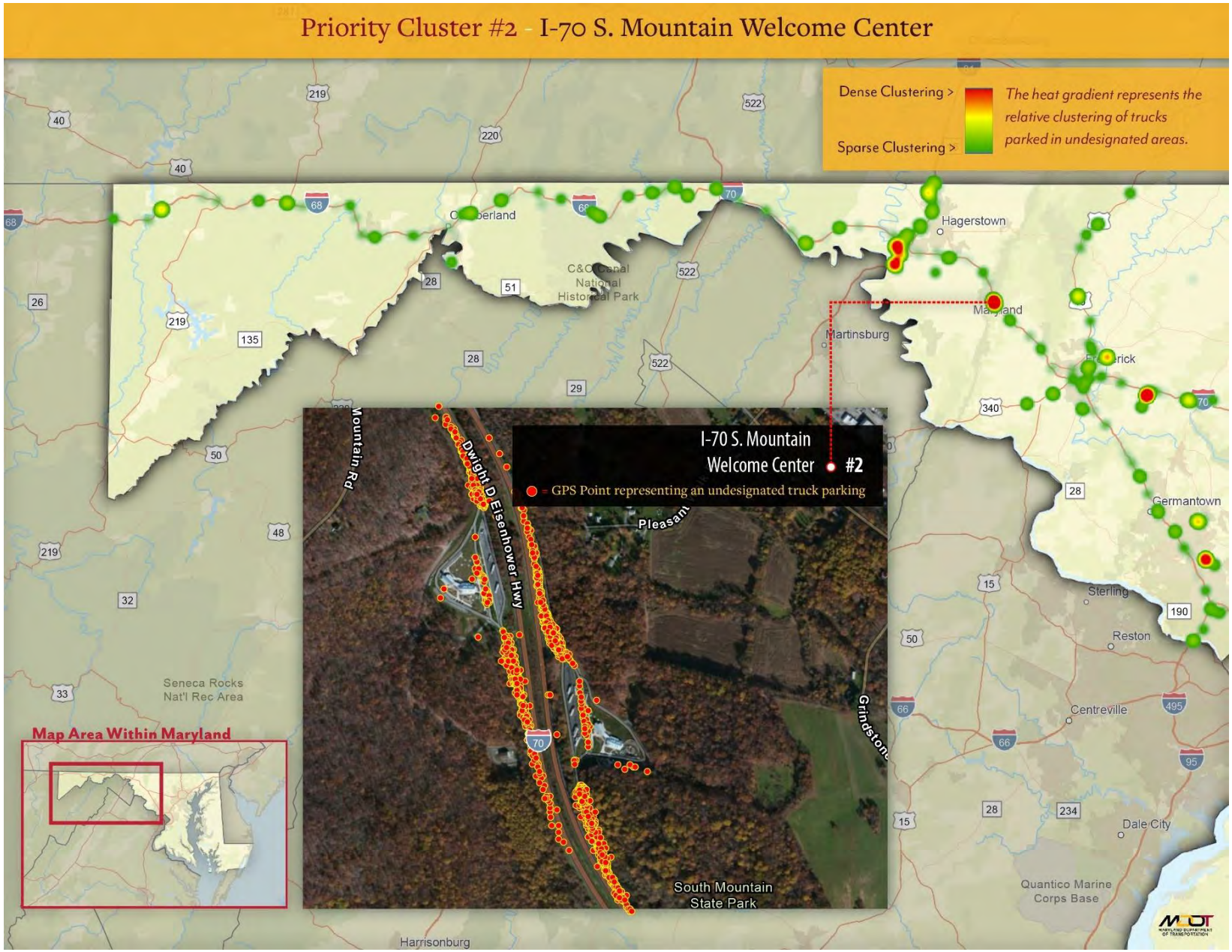


Figure F-1: Priority Cluster #7 I-68 Youghiogheny Overlook Welcome Center

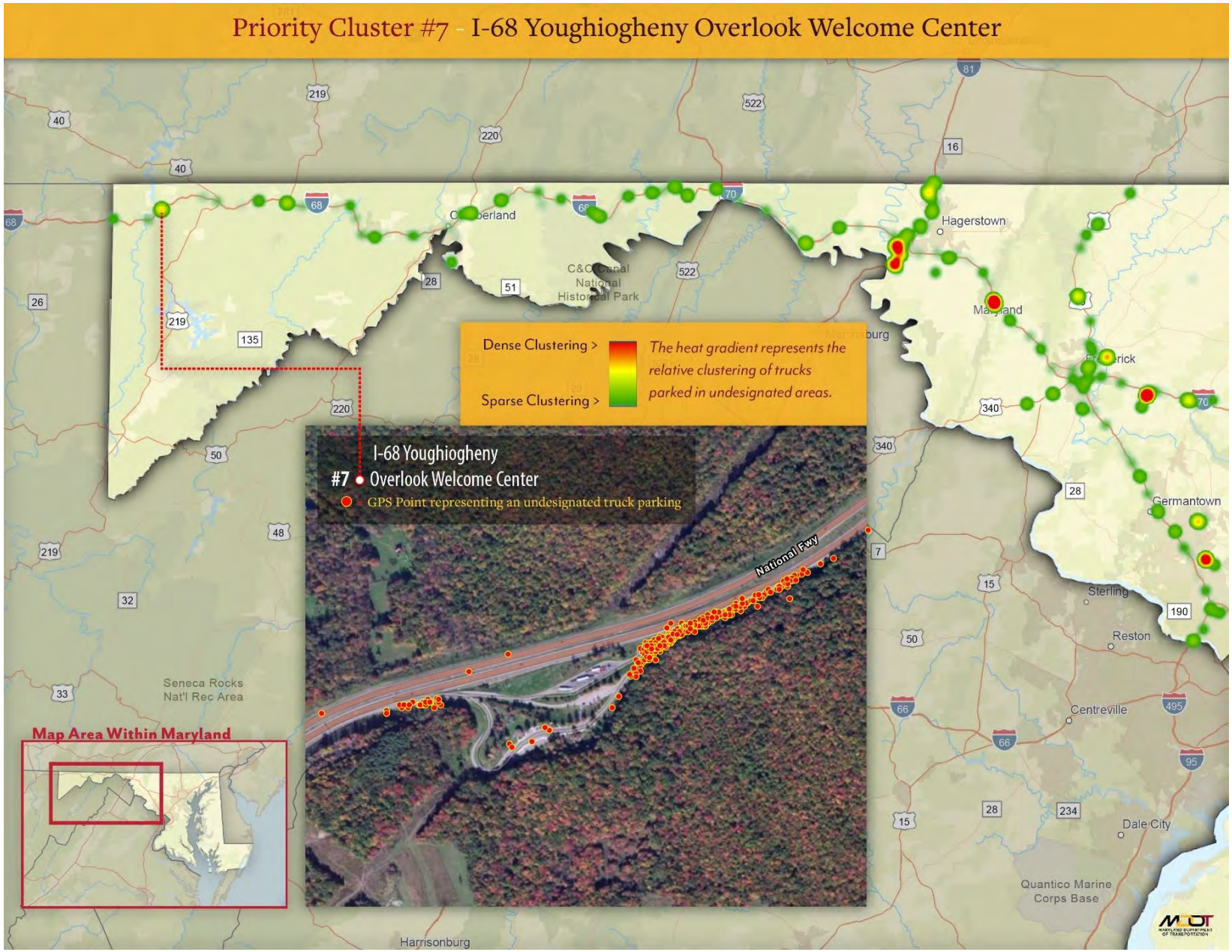


Figure F-2: Priority Cluster #8 I-70 Rest Area Mt Airy

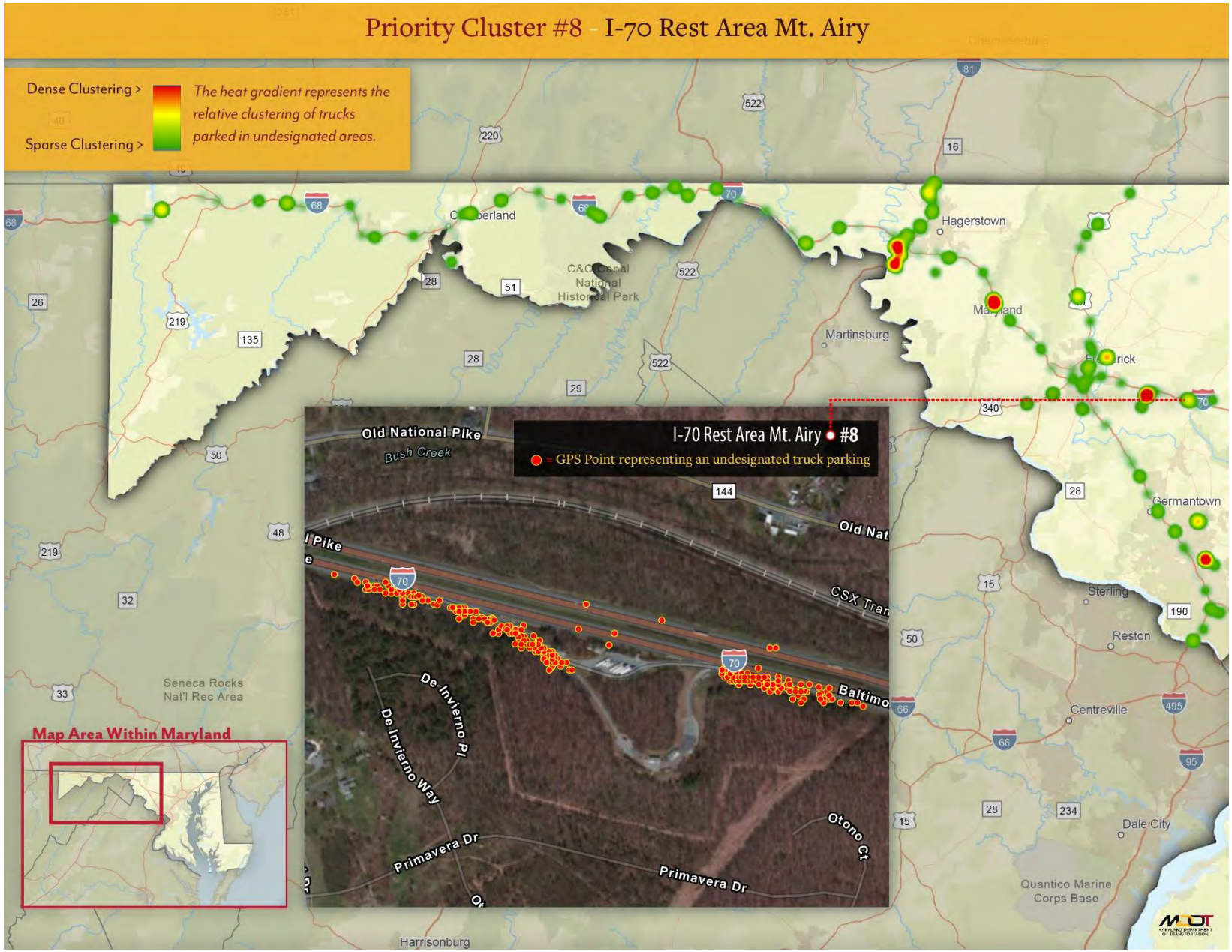


Figure F-3: Priority Cluster #9 I-68 Grantsville

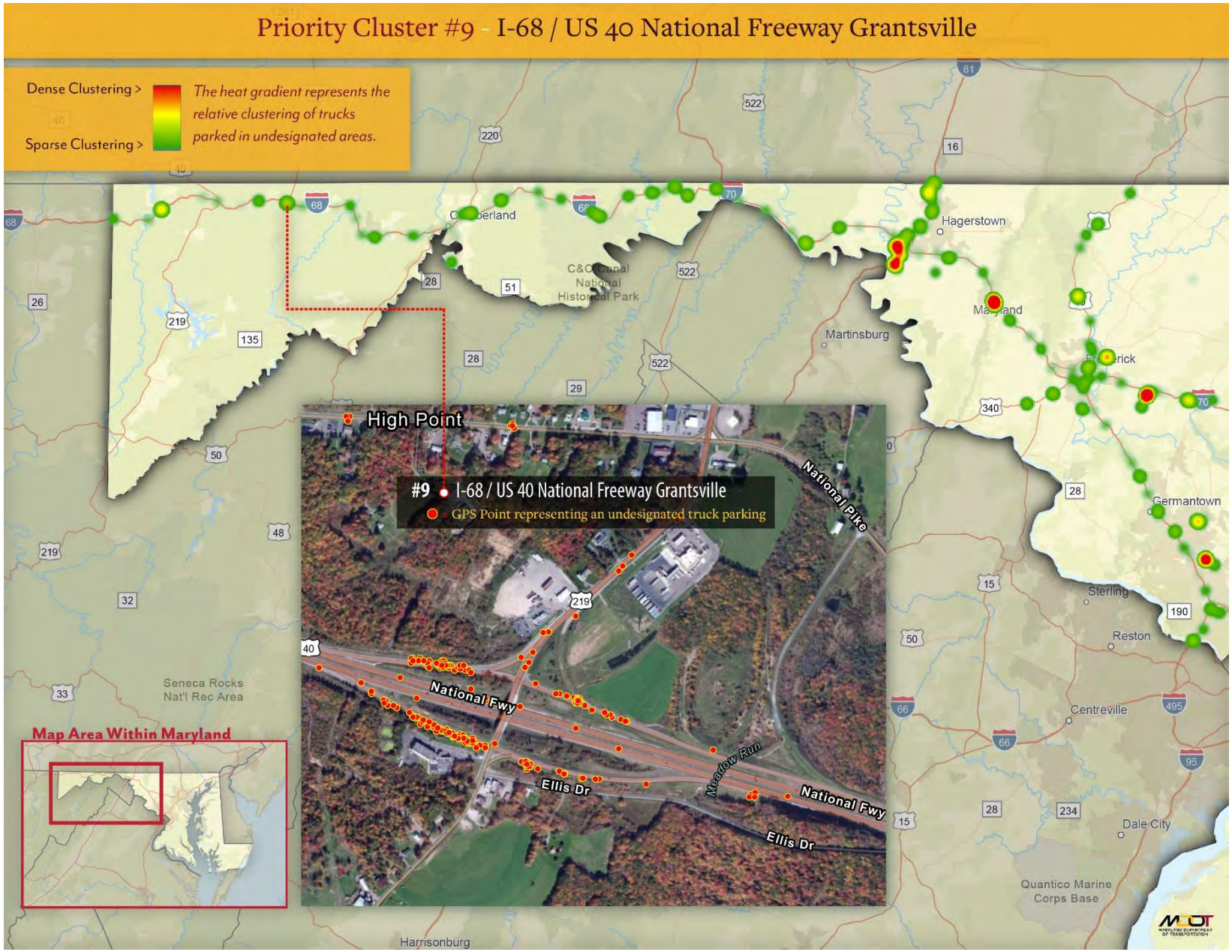


Figure F-4: Priority Cluster #12 I-70 Hagerstown

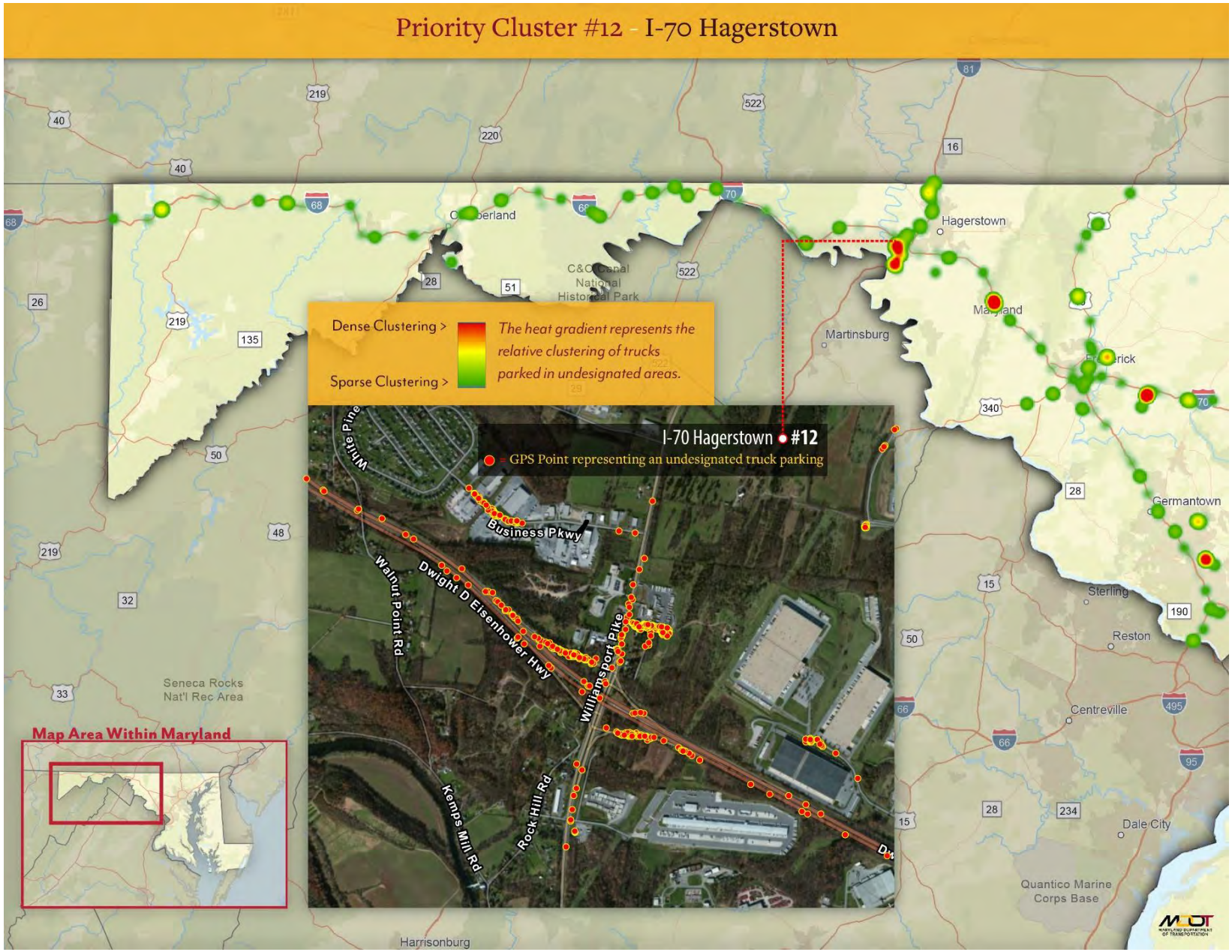


Figure F-5: Priority Cluster #15 I-81 Williamsport

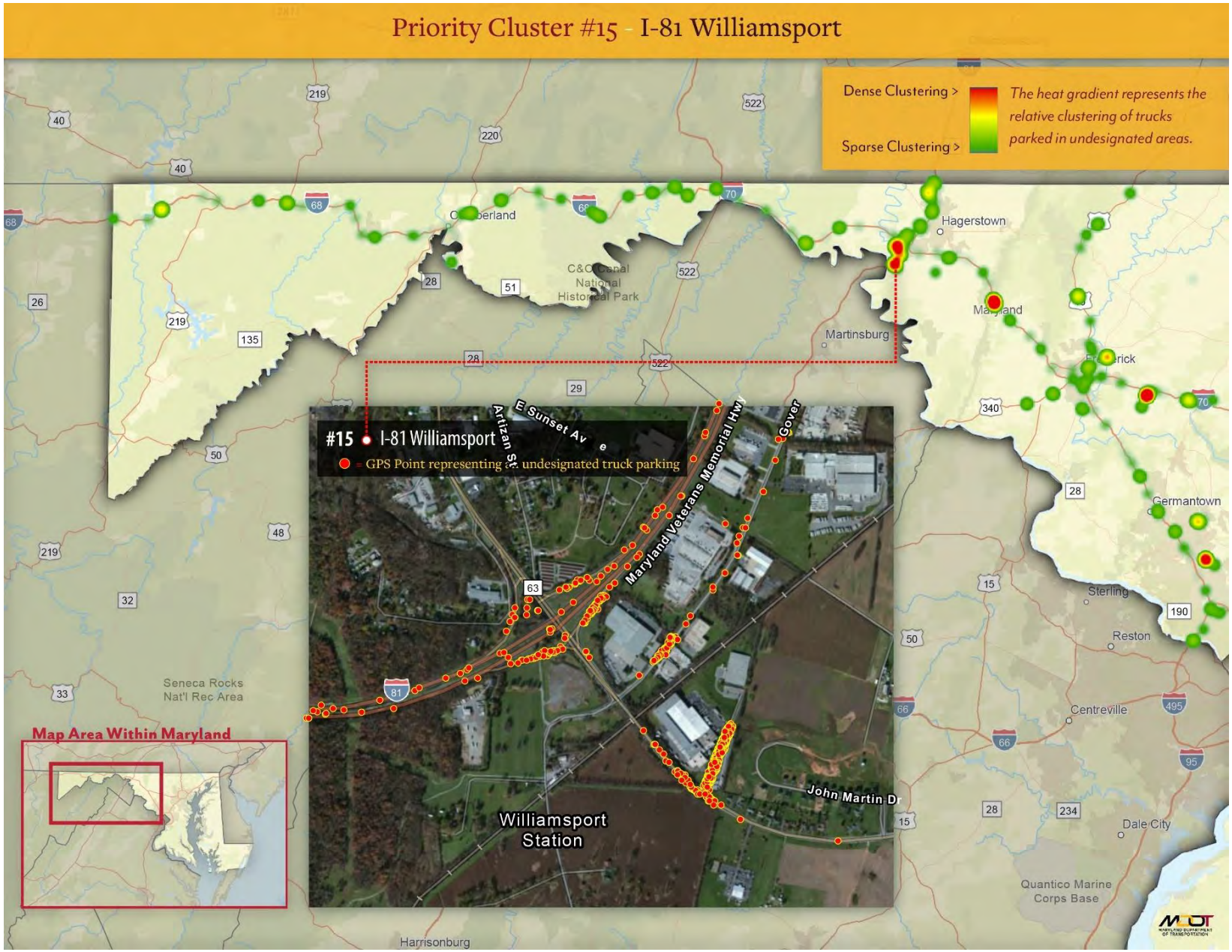


Figure F-6: Priority Cluster #16 I-70 in Monrovia

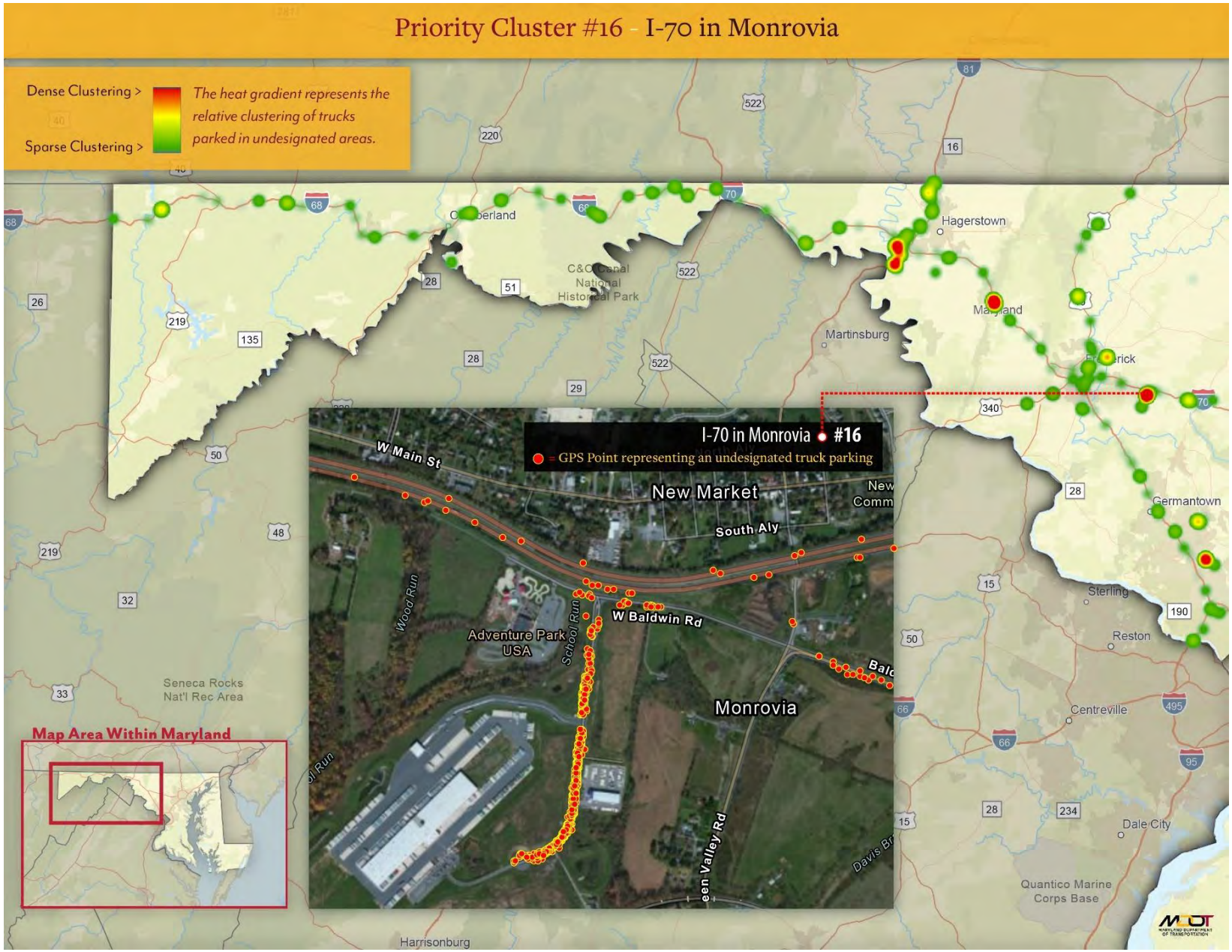


Figure F-7: Priority Cluster #1 I-95 Welcome Center Laurel

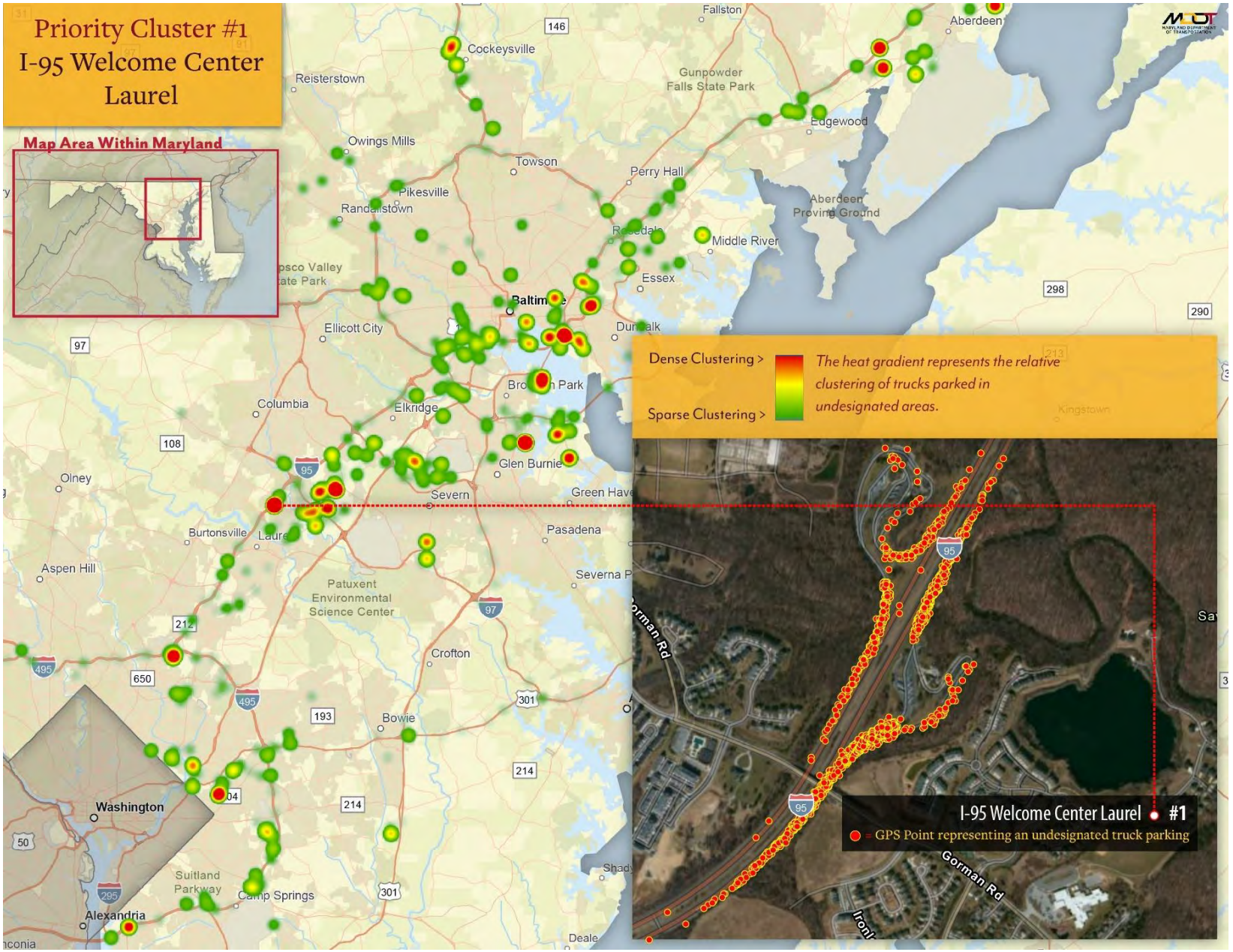


Figure F-8: Priority Cluster #3 City of Baltimore

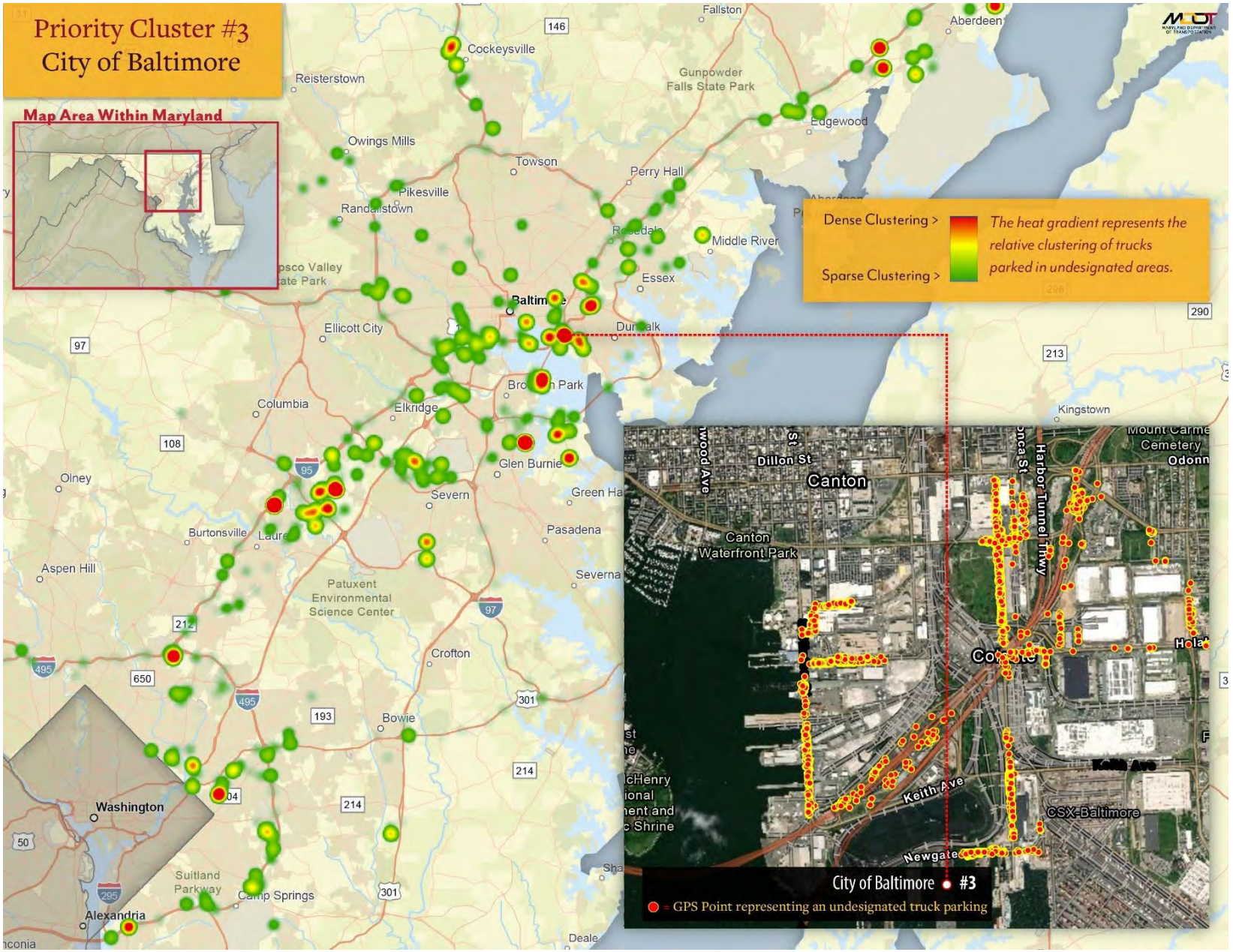


Figure F-9: Priority Cluster #4 I-95 I-495 Weight Station Adelphi

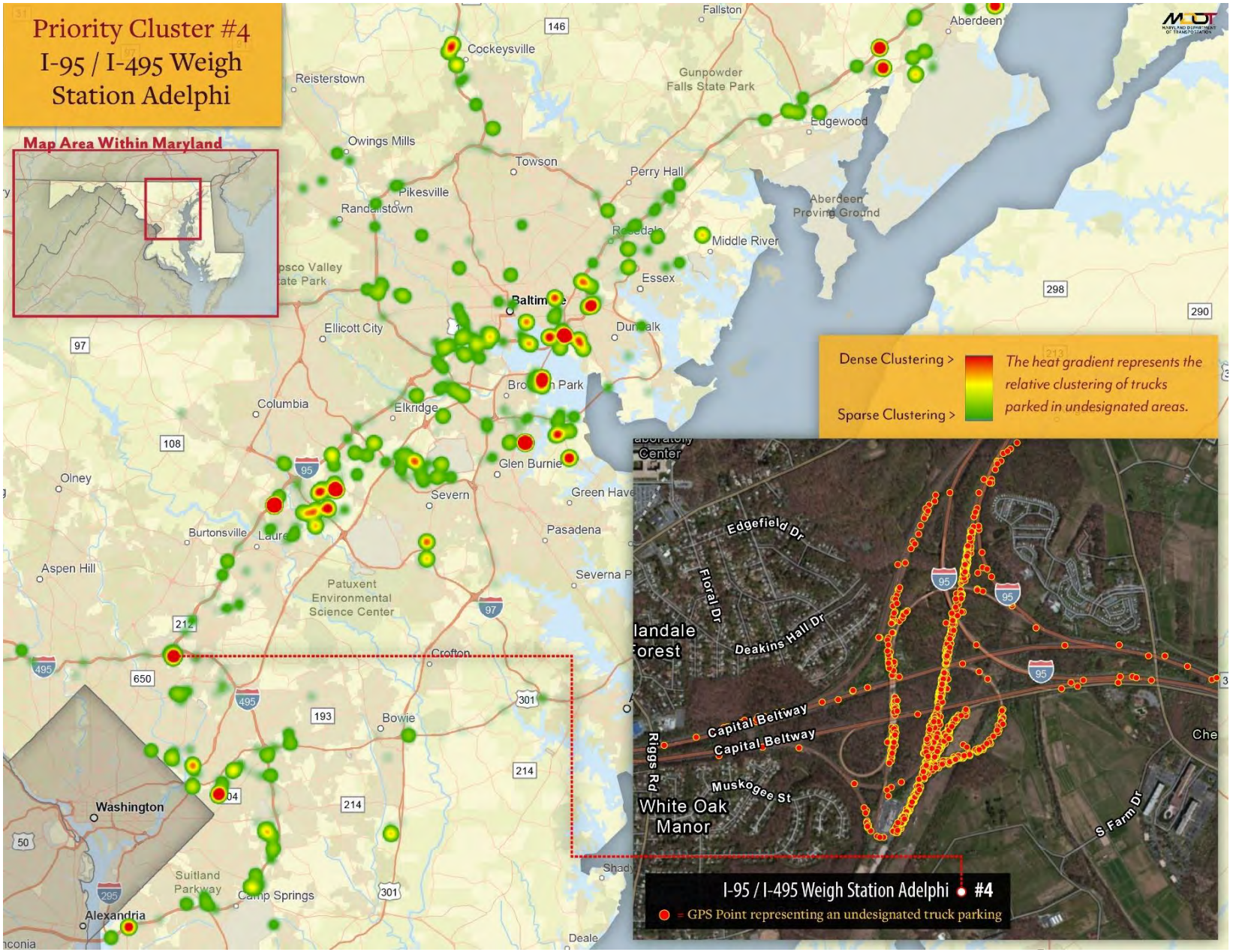


Figure F-10: Priority Cluster #5 US-1 MD – 175 Jessup

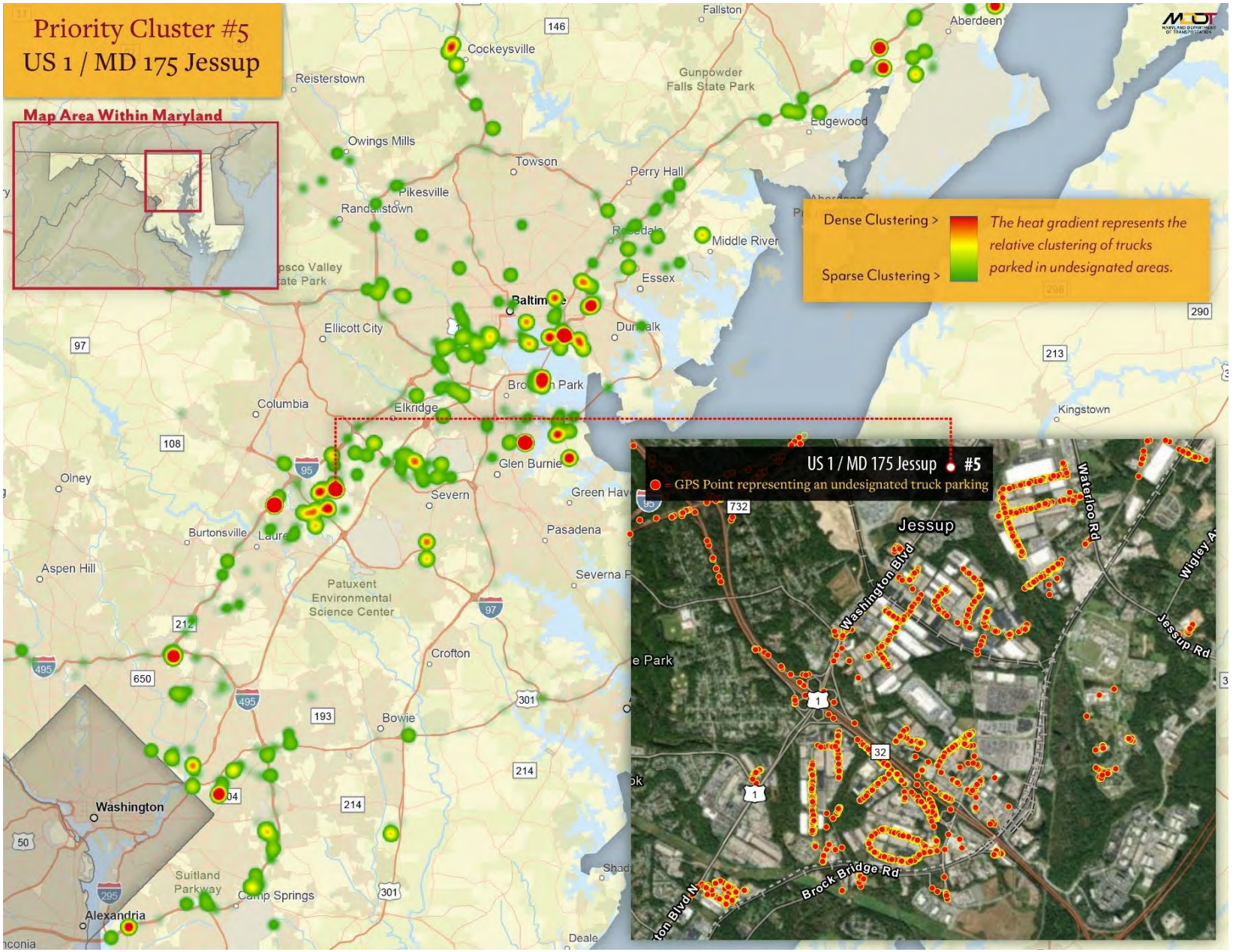


Figure F-11: Priority Cluster #6 I-95 Maryland House Rest Area Aberdeen

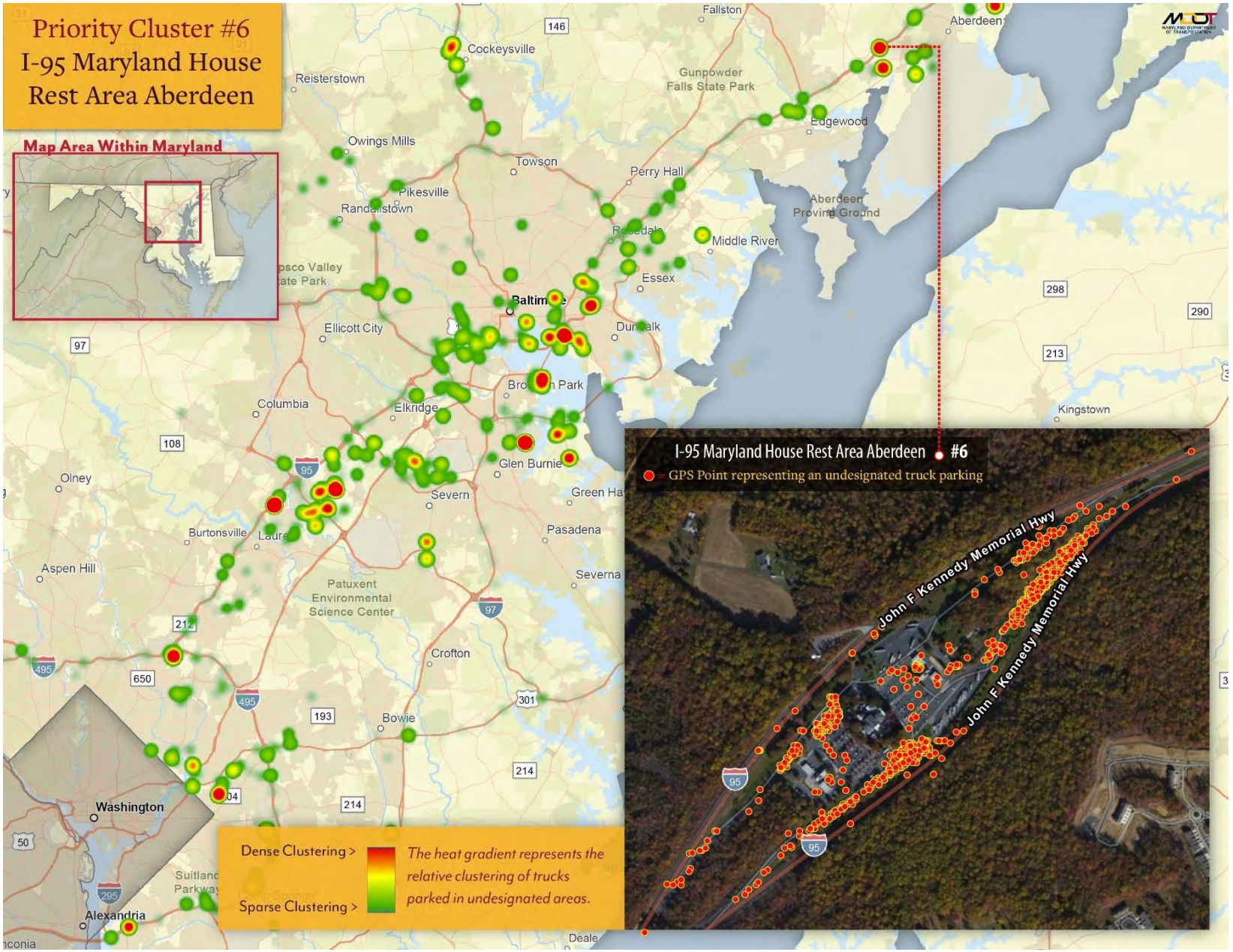


Figure F-12: Priority Cluster #10 I-485 Emergency Vehicle Lot 3

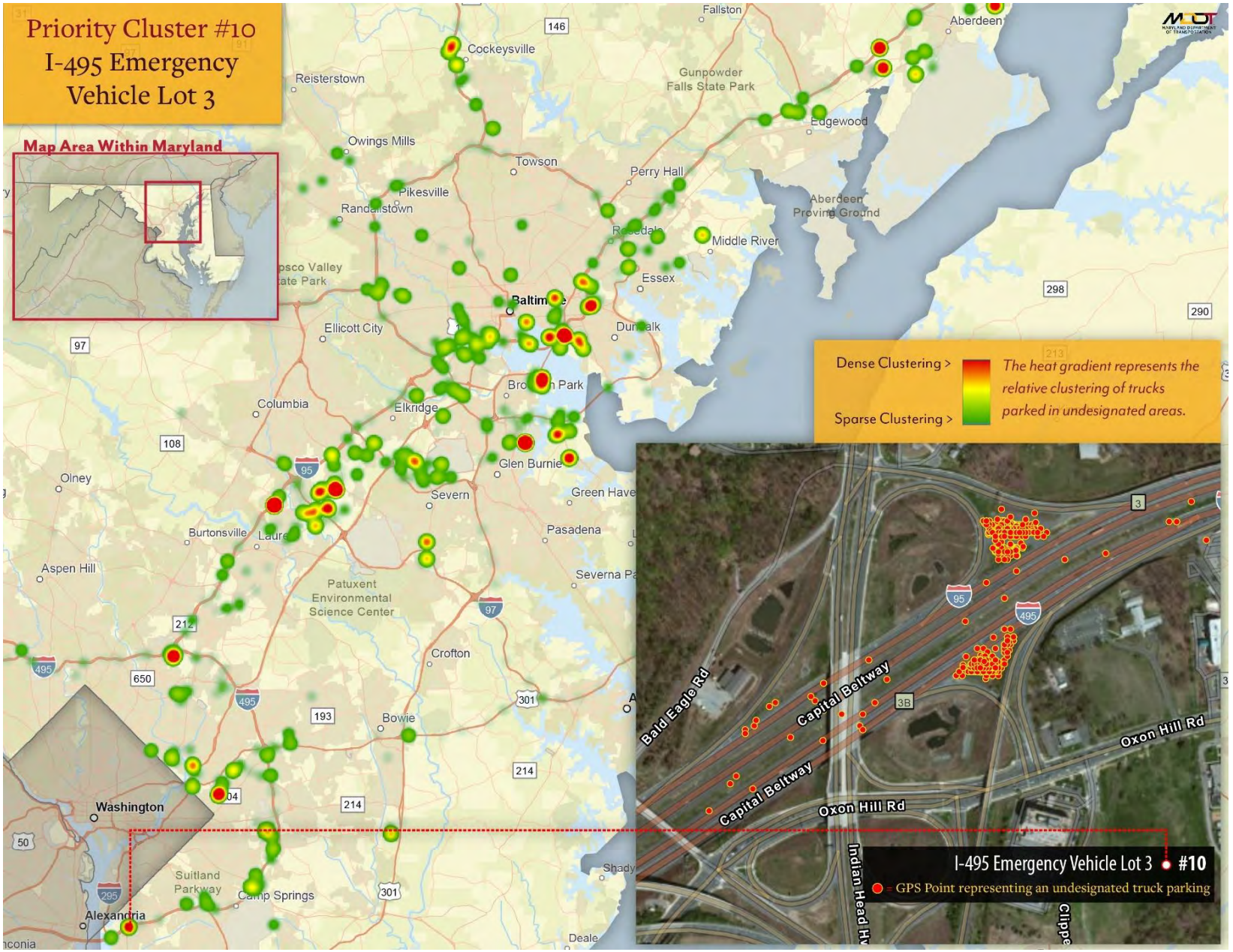


Figure F-13: Priority Cluster #11 I-83 in Cockeysville

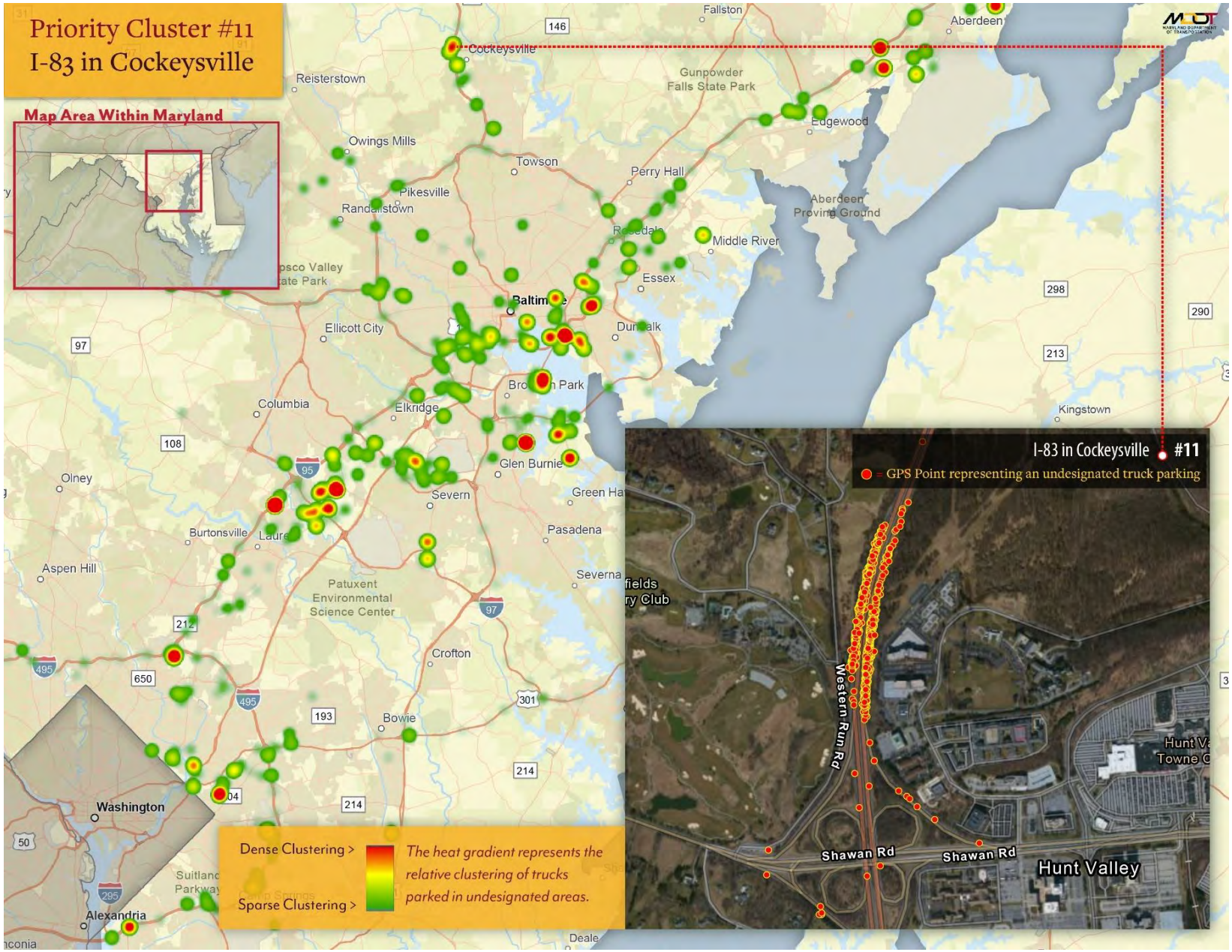


Figure F-14: Priority Cluster #14 US 50 Landover

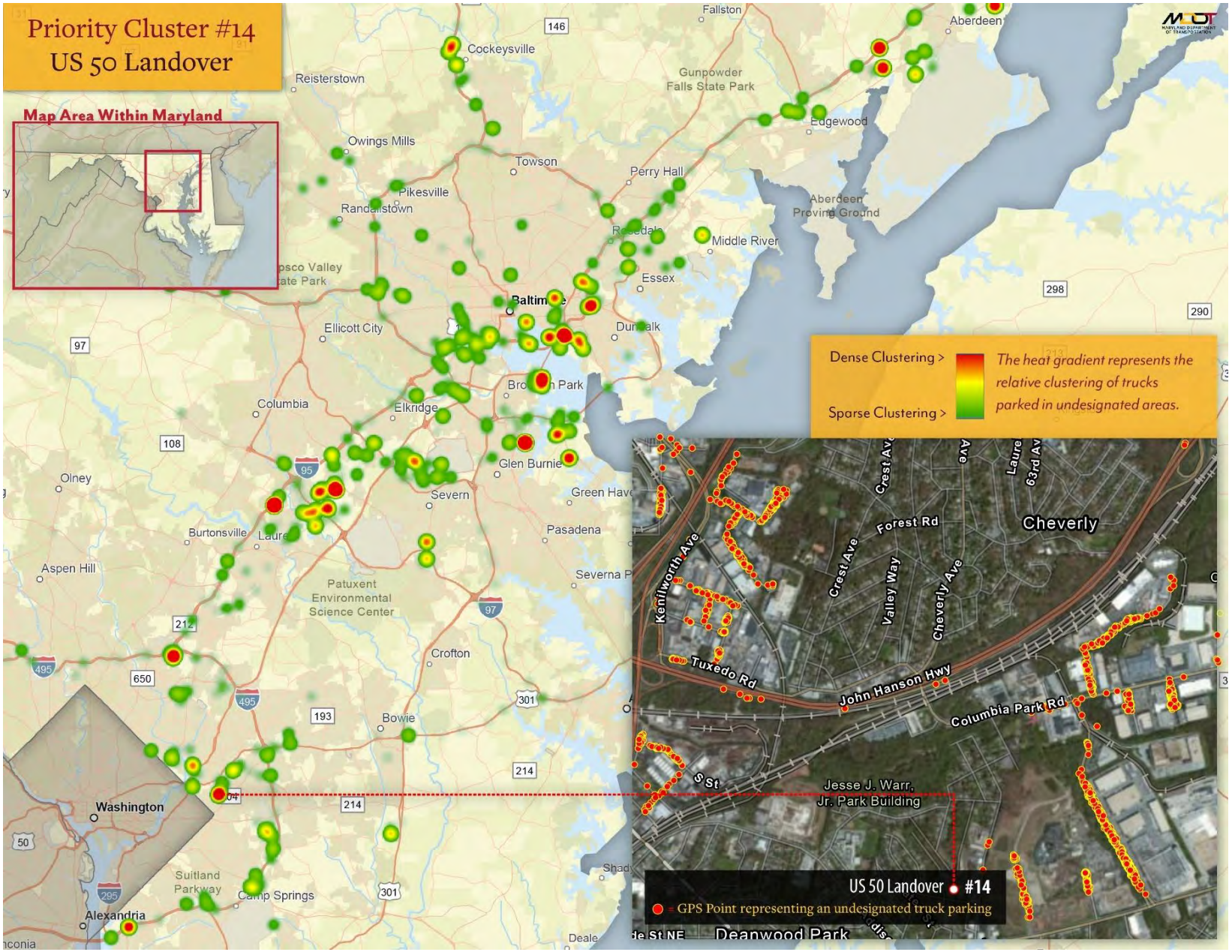


Figure F-15: Priority Cluster #13 I-95 MD 279 Elkton

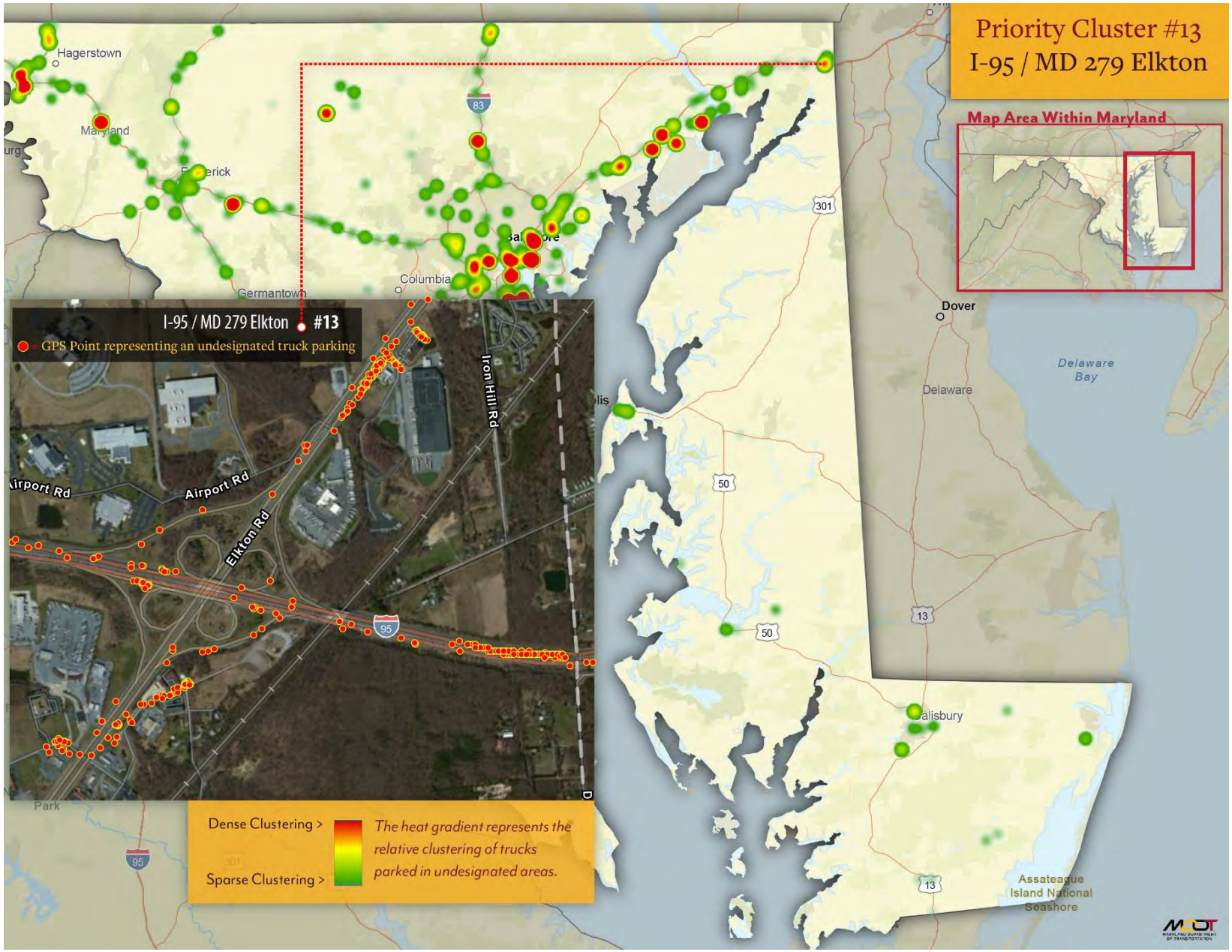


Figure F-16: Priority Cluster #17 US 50 US 301 Stevensville

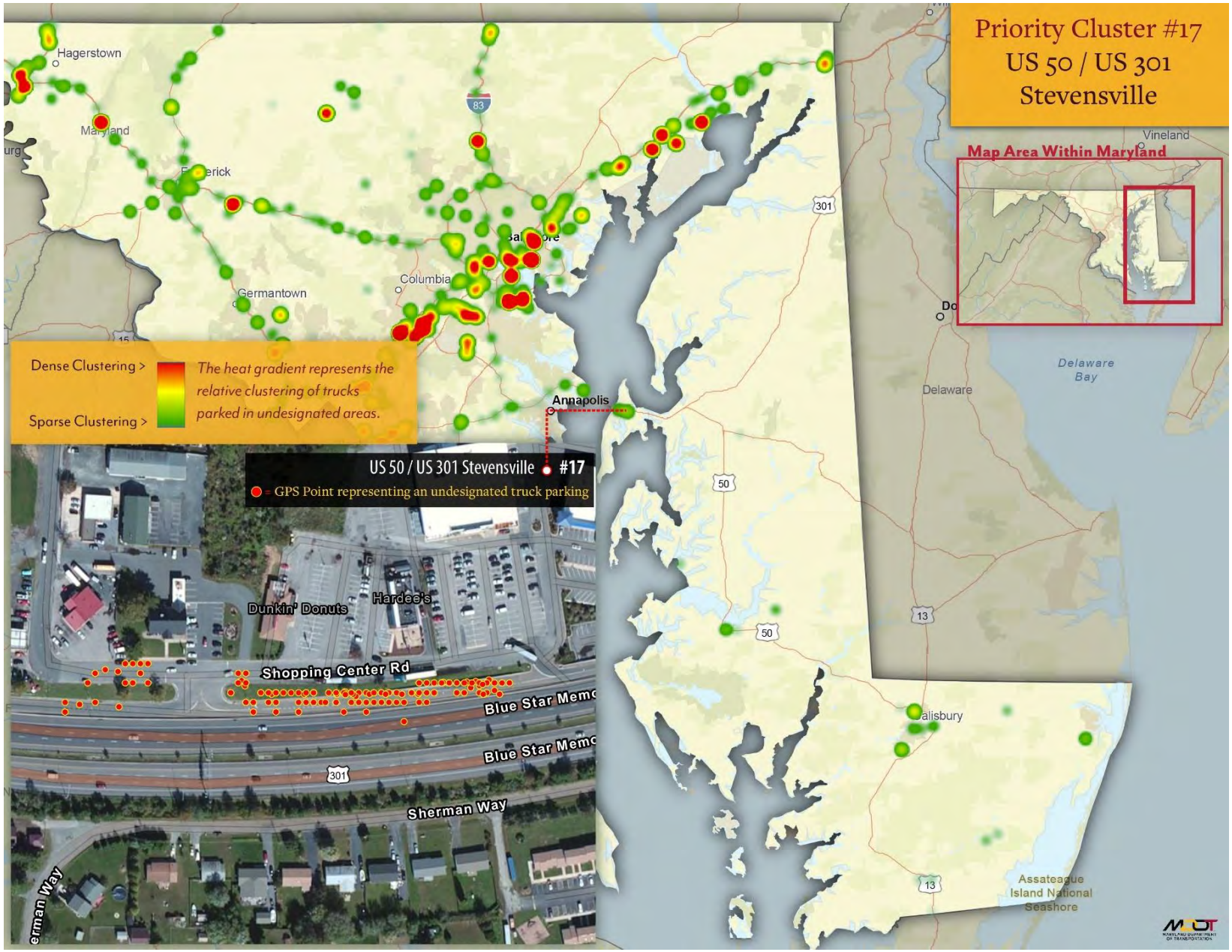


Figure F-17: Priority Cluster #18 US 50 Salisbury