

MARYLAND STATEWIDE TRUCK PARKING STUDY

# EXECUTIVE SUMMARY

2020



## WHY TRUCK PARKING

Truck parking is of critical importance to the safe operation of Maryland's freight infrastructure, supply chains, and the state's economy. Truck parking facilities with available truck parking are essential to providing a safe place for truck drivers to get the rest they need to comply with federal Hours of Service (HOS) and stage their commercial vehicle for scheduled deliveries or pickups. Due to a lack of available parking when needed, many truck drivers resort to parking in undesignated truck parking locations along Maryland roadways, shoulders, and ramps.

### **Undesignated truck parking endangers truck drivers and other roadway users, damages infrastructure in areas not intended for truck weights and volumes, and impacts Maryland's economic competitiveness.**

Trucks parked on roadway shoulders were involved in two fatal crashes, one in 2011 and another in 2018, as well as numerous rear-end collisions over the last decade, demonstrating the potential risks posed by undesignated truck parking. Roadway shoulders are often not designed for truck parking, leading to premature roadway deterioration, and early rehabilitation or replacement. A study by the American Transportation Research Institute (ATRI) found that truck drivers stopped with a median of 56 minutes of drive time left at the end of their HOS, due in part to concern over finding truck parking. These 56 minutes translates to almost \$5,600 per year in lost wages or a total of \$130 million for Maryland's over 23,320 heavy truck drivers.<sup>1,2,3</sup> The MDOT State Highway Administration's (MDOT SHA) annual overnight truck parking survey found that the number of trucks parked along the surveyed routes **increased 20 percent from 2012 to 2017**<sup>4</sup>.

To further understand the impact of undesignated truck parking within and around the state, MDOT initiated the Maryland Statewide Truck Parking Study. The Study provides the data, context, and actionable solutions needed to advance priority projects, policies, and partnerships to improve truck parking statewide. The Study included a synthesis of methods to develop the assessment and provide recommendations for the advancement of truck parking solutions in Maryland. This approach 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 to address truck parking needs.



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<sup>1</sup> Boris, C. and R. M. Brewster, December 2016. "Managing Critical Truck Parking Case Study –Real World Insights from Truck Parking Diaries." American Transportation Research Institute.

<sup>2</sup> 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>.

<sup>3</sup> 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](https://www.bls.gov/oes/current/oes_md.htm).

<sup>4</sup> A. Morton Thomas and Associates, Inc., March 2018. "2017 Maryland Freight Network Truck Parking Survey." MDOT State Highway Administration.

## UNDESIGNATED TRUCK PARKING

Undesignated truck parking refers to trucks parked at locations, such as a highway shoulder or on/off ramp that are not designed or 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.

## MARYLAND TRUCK PARKING STAKEHOLDER ENGAGEMENT

Public and private sector freight stakeholders were engaged throughout the entire Maryland Statewide Truck Parking Study process. This engagement was important to help identify priorities, needs (including demand and gaps), and opportunities for truck parking in Maryland. Stakeholders were engaged through:



**INTERNAL WORKING GROUP (IWG) MEETINGS**



**INTERNAL AND EXTERNAL STAKEHOLDER TRUCK PARKING WORKSHOP**



**ONLINE SURVEYS TO COLLECT TRUCK PARKING NEEDS AND OPPORTUNITIES**



**PUBLIC AND PRIVATE SECTOR FOCUS GROUP MEETINGS**

**FIGURE 1:** Most Pressing Truck Parking Issues Identified by the Internal Working Group



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

MDOT solicited input from truck parking stakeholders on the top truck parking issues and needs throughout The Study. Figure 1 displays a word cloud of the top truck parking issues submitted by stakeholders during the first IWG meeting. The most frequently submitted issues (largest text in Figure 1) were consistently voiced issues throughout The Study: safety, capacity, perception of truck parking, and the cost of truck parking projects.

## 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

## MARYLAND'S TRUCK PARKING FACILITIES

Maryland has a total of 2,902 designated truck spaces, with 595 spaces at MDOT facilities and 2,307 spaces at private truck stops. MDOT's truck parking spaces are provided at 12 rest areas, travel plazas, and welcome centers (333 spaces) and 14 Truck Weigh and Inspection Stations (TWIS) [262 truck parking spaces].

The location of public and private truck parking facilities in and around Maryland is shown in Figure 2. Almost 72 percent of Maryland's truck parking spaces are along I-68, I-70, and I-95, with 53 percent located along I-95. The concentration of truck parking along these corridors reflects that 50 percent of the vehicle miles traveled (VMT) by truck are on I-68, I-70, and I-95. Comparing the locations of public and private truck parking facilities displays how the public sector often provides the only truck parking facilities for long stretches of roadway, such as I-70 from Baltimore to Hagerstown. Additionally, large gaps in truck parking facilities along major truck corridors such as I-83 from Baltimore to the Maryland/Pennsylvania border, I-695 around Baltimore, I-495 around Washington, D.C., and in Eastern Maryland are evident in Figure 2.



## DESIGNATED TRUCK SPACES IN MARYLAND

**333  
SPACES**

**AT 12**  
REST AREAS,  
TRAVEL PLAZAS &  
WELCOME CENTERS

**595 SPACES**  
AT MDOT FACILITIES

**262  
SPACES**

**AT 14**  
TRUCK WEIGH  
AND INSPECTION  
STATIONS (TWIS)

**2,307  
SPACES**

**AT** PRIVATE  
TRUCK STOPS

**2,902**   
**== TOTAL** DESIGNATED TRUCK  
SPACES IN MARYLAND



## IDENTIFYING & PRIORITIZING CLUSTERS OF UNDESIGNATED TRUCK PARKING

In order to identify all of the locations of undesignated truck parking, The Study analyzed four months of truck GPS data and found two types of clusters.

- **Clusters on heavy use corridors** – Undesignated truck parking often occurs on highway on/off ramps, shoulders, or other roadside facilities 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, typically State and local roads, 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 roadways and shoulders.

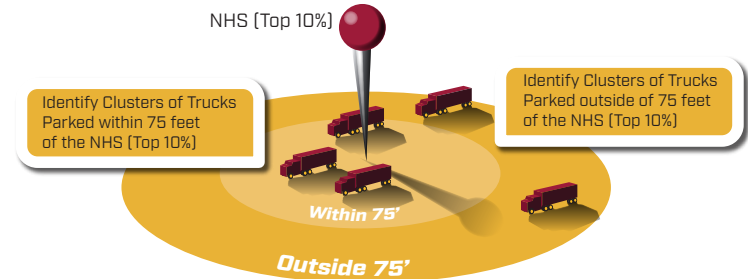
The location of undesignated truck parking relative to the National Highway System (NHS) was used to identify the densest clusters of undesignated truck parking. The clusters with the highest number of undesignated truck parking were then grouped into 26 distinct clusters and prioritized. The prioritization process (as shown in Figure 3) used safety, duration parked, and the total number of trucks parked as criteria. Priority Clusters were selected from the top 15 locations in Central Maryland with the highest prioritization score and three additional clusters were added to include locations in both Western Maryland and along the Eastern Shore.

The top 18 Priority Clusters are displayed in Figure 4. The rank of each Priority Cluster is shown within each marker and a red (higher priority) to green (lower priority) gradient is used to further differentiate the rank of the Priority Clusters. Overall, the top-ranked Priority Clusters are primarily within Central Maryland and located along I-95 and I-70, two major regional routes within the state. Additionally, many of the Priority Clusters occur at MDOT facilities, specifically along on/off ramps leading to designated truck parking facilities. Similarly, Priority Clusters coincide with corridors that have substantial freight traffic and industrial development, particularly around the Baltimore - Washington Metropolitan area, Jessup, Laurel, and Aberdeen in Central Maryland.

Figure 3: Prioritization Process

### 1. Undesignated Truck Parking

(Derived from Truck GPS Data)



### 2. PRIORITIZE TRUCK PARKING NEEDS

**Top 40** Clusters with the Most Undesignated Trucks + Clusters for Geographic Coverage

ASSESS WITH QUANTITATIVE CRITERIA



**Safety** Proximity to Major Roadways **[30pts]**



**Duration Parked**  
0.5-3 Hrs **[10pts]**  
3-8 Hrs **[15pts]**  
8+ Hrs **[25pts]**



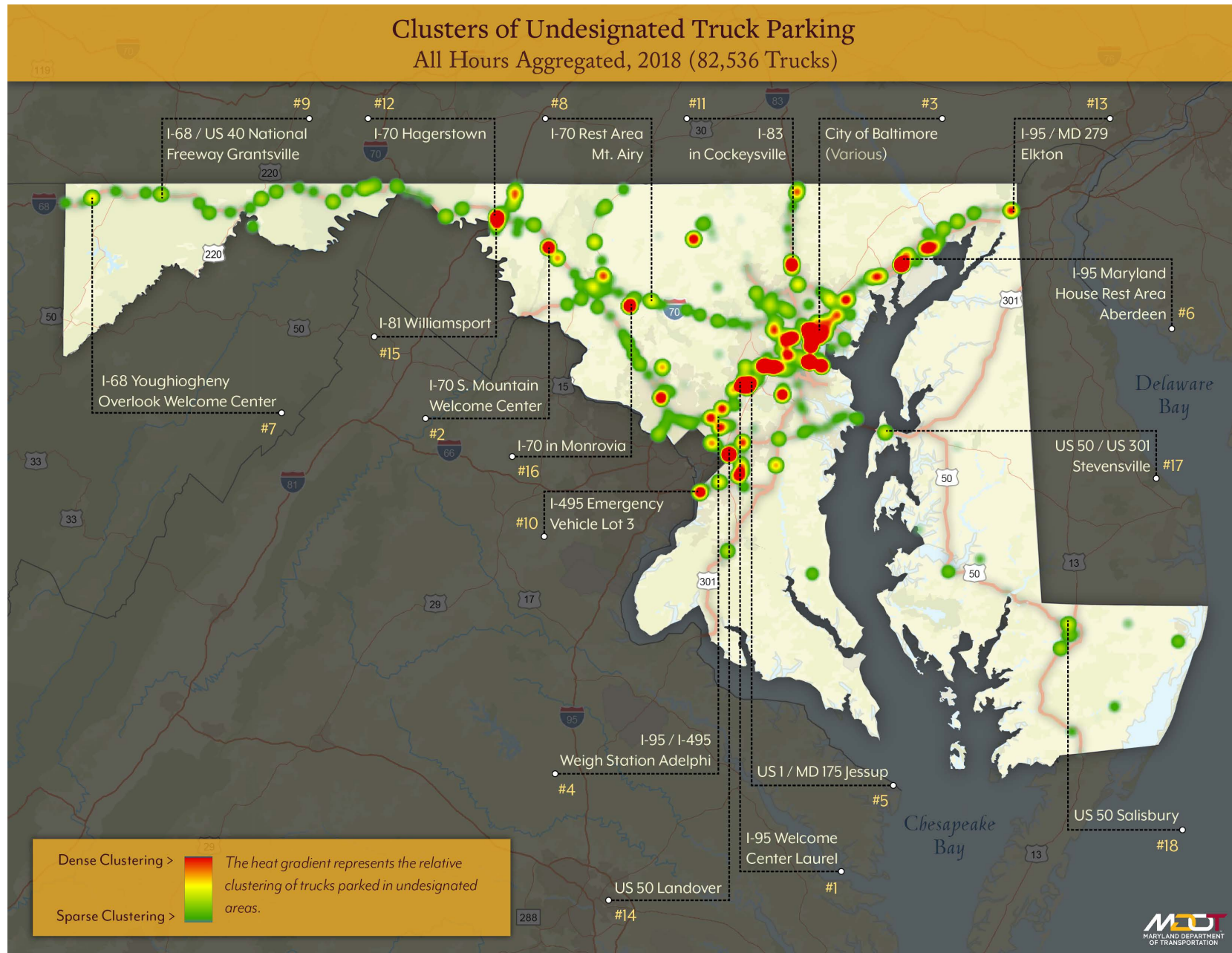
**Number of Parked Trucks** **[20pts]**



### 3. STAKEHOLDER VALIDATION

Validate Truck Parking Needs with Internal and External Stakeholders

**Figure 4:** Ranked Undesignated Truck Parking Clusters\*



\* Priority Clusters were selected from the top 15 locations in Central Maryland with the highest prioritization score and also three additional clusters were added to include locations in both Western Maryland and along the Eastern Shore.

# MARYLAND'S TRUCK PARKING OBSTACLES AND CHALLENGES

There were nine obstacles and challenges identified based on data analysis, stakeholder input, and research conducted throughout The Study.

## 1 Lack of Dedicated and Overall Limited 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 (Figure 4). 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 trucks park at other locations, such as the side of highways or along last-mile connectors (such as local roadways leading to warehouses/distribution centers).



## 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 Weigh & 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 these inspection facilities when asked during The Study Focus Group Meetings and Online Survey.

TRUCK WEIGH & INSPECTION STATIONS <i>(Parking Permitted when Station is Closed)</i>	
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



### 3

## Different Truck Parking Needs in Rural and Urban Areas

The mix of truck parking issues in urban and rural Maryland combined with 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, as well as 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.



### 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 in 2018, demonstrating the risk posed by undesignated truck parking.

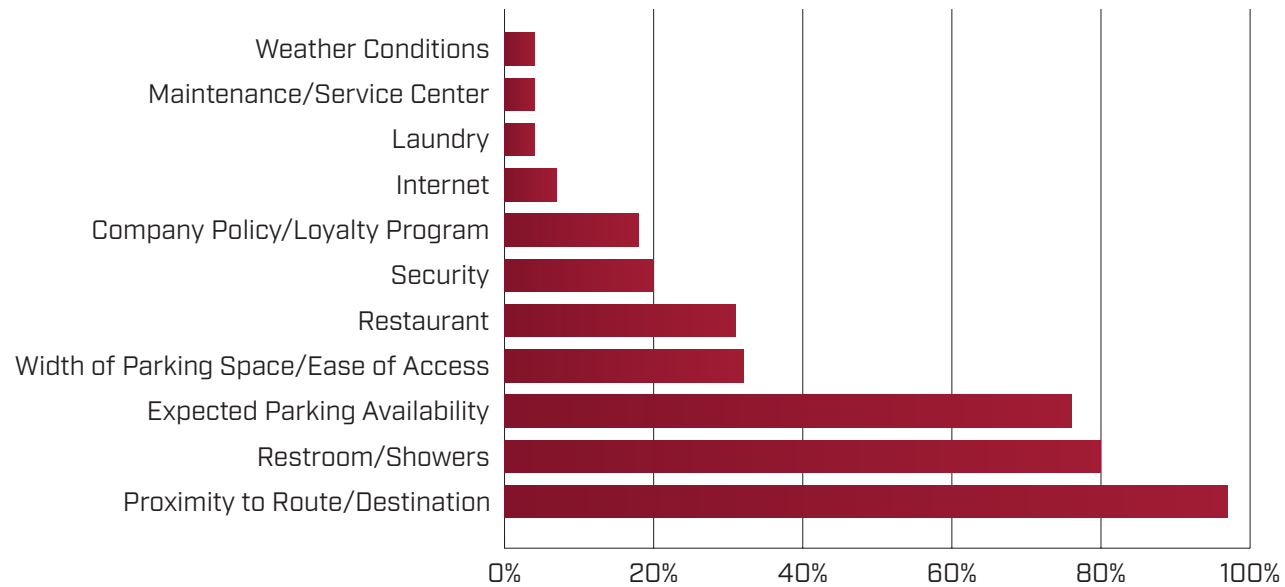
In addition to the safety impacts of undesignated truck parking, communities are often concerned over the real or perceived safety impacts of the development or expansion of truck parking facilities.



## 5

### Lack of Amenities at Truck Parking Facilities

**Figure 5:** 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

Figure 5 provides a summary of the factors affecting where a truck driver decides to park. Amenities are a consideration when developing new truck parking facilities or improving existing parking lots to make them attractive for truck drivers. Based on comments from the online survey, restrooms with showers are a critical factor for making truck parking more attractive to truck drivers.<sup>5</sup>

## 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. In addition to the livability impacts, 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.



<sup>5</sup> Boris, C. and R. M. Brewster, 2016. "Managing Critical Truck Parking Case Study –Real World Insights from Truck Parking Diaries." American Transportation Research Institute. American Transportation Research Institute.

## 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 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.



## 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.

## 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:



### Recommendation 1: Further Develop the Truck Parking Program

Formalize the truck parking program within MDT by establishing performance measures and the associated data needed to evaluate those performance measures. Based on the performance metrics, recommendations and priorities will be established to further improve existing truck parking capacity, identify new truck parking capacity and truck parking information projects/initiatives. Initial action items include but are not limited to the following recommendations:

- 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 lot.
- 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 MDT 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 ROW.

**Recommendation 2:** Convene a 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 of 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:
  - a. One-page summary of the report and recommendations.
  - b. Template for projects on truck parking needs.
  - c. Information on undesignated parking restrictions.
  - d. 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 our 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).

### 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, as well as, 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.

### 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.

## FUNDING AND GRANT OPPORTUNITIES

Identifying and allocating available funding resources is central to addressing the most critical truck parking needs. This section lists the federal funding programs that may be used to support truck parking capacity and real-time information projects. The full report provides examples of how funding programs have been successfully applied to truck parking projects to better clarify the types of projects eligible for each program.

### Federal Funding Programs

Congestion Mitigation and Air Quality Improvement (CMAQ) Program

National Highway Freight Program (NHFP)

Highway Safety Improvement Program (HSIP)

National Highway Performance Program (NHPP)

Surface Transportation Block Grant (STBG) Program

### Grant Opportunities

Infrastructure for Rebuilding America (INFRA)

Better Utilizing Investments to Leverage Development (BUILD)

Innovative Technology Deployment (ITD)

Accelerated Innovation Deployment (AID)

Diesel Emissions Reduction Act (DERA)

Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD)

### Examples of Successful Grant Funded Projects

#### **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 the state.

#### **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).

**MEDOT**  
MARYLAND DEPARTMENT  
OF TRANSPORTATION

