

# I-95 Corridor Coalition Truck Parking Workshop

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Final Report – July 2018

*“Addressing Truck Parking Challenges Through  
Sharing of Innovative Strategies and Partnerships.”*

05/01/2018 – 05/02/2018



I-95 Corridor Coalition

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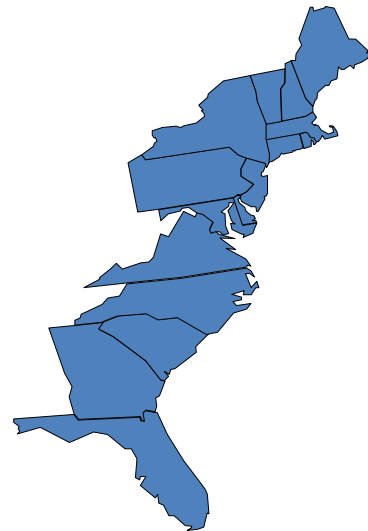
### Introduction

The I-95 corridor is home to 21% of the Nation’s road miles, 110 million people, and \$4.7 trillion in economic activity, which together generate 5.3 billion tons in freight shipments each year. Trucks are a key transportation mode throughout the corridor—the average annual daily truck volume throughout the entire corridor is above 10,000 with portions of the corridor above 31,000 trucks. These trucks need safe, secure locations to park, either for short periods of time while waiting for a business to open or congestion to subside, or for longer periods to meet Federally mandated hours of service (HOS) rest requirements.

In early May, 2018, the I-95 Corridor Coalition organized a workshop dedicated to better understand the unique issues and needs

“Trucks are not big cars.”

surrounding truck parking and discuss potential solutions. Representatives from the 17 state departments of transportation (DOTs) that comprise the Corridor Coalition were invited to the workshop to address four key objectives:



- Share recent activities to understand what is working and where
- Develop a list of truck parking attributes necessary to create viable solutions
- Understand the positive and negative aspects of various approaches to addressing truck parking needs; and
- Gain a better understanding of how changes in regulations and technology could affect truck parking.

The Truck Parking Workshop purpose was to build on related work in this area including the Coalition’s experience in developing and implementing a real time truck parking availability system and building on the work of the National Coalition on Truck Parking in examining best practices and strategies to address truck parking. By bringing together Coalition members exclusively, the workshop was an opportunity for participants to share experiences honestly and to ask and answer the “hard questions.” By focusing on DOTs with operating authority, the initial discussion could be focused on real-world approaches within the corridor. The I-95 Corridor Coalition has an important role to play to support their member agencies in this discussion. This includes coordinating and sharing data and best practices throughout the corridor and by providing a forum for the various agencies and stakeholders to interact to discuss truck parking challenges in general, while recognizing some of the unique challenges for truck parking along the East Coast.

The workshop also served as a preliminary discussion to identify additional stakeholders and topics of concern that will be addressed in a subsequent broader symposium setting.

Participants came from the Coalition’s member State DOTs, including staff from various levels and disciplines within each agency to bring a diverse set of perspectives into the discussions. In addition,



representatives from area Metropolitan Planning Organizations (MPO), other agencies such as the Pennsylvania Turnpike Authority and Port Authority of New York and New Jersey (PANYNJ) and Federal agencies including the Federal Highway Administration (FHWA) and Federal Motor Carrier Safety Administration (FMCSA) attended. The full list of participants is found in **Appendix B**.

The workshop spanned two days, beginning on Tuesday, May 1 2018. A welcome was provided by Dr. Patricia Hendren, Executive Director of the I-95 Corridor Coalition, and by Marygrace Parker who serves as the Director, Freight and Innovation in Transportation for the Coalition. Dr. Hendren stressed the critical need to address this topic as freight movement in the region is anticipated to grow by 40 percent in the next 30 years. Changes in supply chains and logistics practices, the continued growth of e-commerce and the need for reliable deliveries to every corner of the country, and the growth of connected/autonomous vehicle (CAV) technology are all factors that influence the current and future need for parking. From the public sector side, limited budgets and competing priorities can make truck parking projects a difficult “sell” to management and the public, especially when truck parking is often seen as a problem with a private-sector driven solution. Parker noted challenges in the Corridor including: high volumes of freight, real estate values for land acquisition/usage for truck parking capacity expansion challenge public and private entities, and a high volume of trucks “staging” to enter urban areas, ports and distribution and warehouse facilities, geographic proximity of Coalition states, which results in many truck trips crossing multiple agency jurisdictions. In addition, she provided an overview of the recently completed deployment of a Real Time Truck Parking Availability System by the I-95 Corridor Coalition, which was funded through an FHWA funded grant and which deployed a truck parking system in five rest areas in Virginia. The “TruckNPark” system is currently in operation and is now managed and maintained by Virginia DOT.

The remainder of the Workshop was divided into six sessions:

- **Session 1:** What’s Currently Going On With Truck Parking In The I-95 Corridor States;
- **Session 2:** What’s Currently Going On With Truck Parking Outside The Corridor;
- **Session 3:** Stepping Back – Attributes, Barriers And Solutions;
- **Session 4:** Key Changes On The Horizon And Implications To Truck Parking;
- **Session 5:** Zeroing In On What Agencies Can Do To Address Truck Parking Challenges (Breakout Groups); and
- **Session 6:** Bringing It Back To The Office.

“Without trucks, you would be homeless, hungry, and naked.”

The first two sessions focused on creating a common understanding of current challenges and best practices, both in the Corridor and nation-wide. The third session acted as a wrap-up on Day 1 to discuss common themes and highlight key lessons learned from the presentations. On Day 2, the fourth session provided an overview of anticipated future changes that will impact truck parking. Session 5 consisted of five breakout groups that focused on the following topics:

- Expanding Truck Parking Capacity;

- Truck Parking Design Options;
- Distribution of Info to Truckers: What and How;
- Making Decisions with Truck Parking Data; and
- Education / Outreach and Key Stakeholders.

Finally, Session 6 summarized key lessons that participants could bring back to the office and generated a list of topics and invitees for a future Truck Parking Symposium.

This report contains a brief overview of national truck parking initiatives and studies - efforts that the workshop was designed to build upon - followed by a summary of the Truck Parking Workshop and key themes that emerged from each session. Appendix A provides a list of common truck parking acronyms and Appendix B contains a list of workshop participants. Finally, presentations are available on the I-95 Corridor Coalition website at: [www.i95coalition.org](http://www.i95coalition.org).

## National Truck Parking Efforts

Since the early 2000s, there have been a handful of truck parking studies conducted at the Federal level. This section briefly summarizes three studies that examine truck parking needs and a fourth that looks at supply chain fluidity—a key factor in determining where truck parking is needed.

### *Study of Adequacy of Commercial Truck Parking Facilities – Technical Report, FHWA*

The Federal Highway Administration (FHWA) conducted the “Study of Adequacy of Commercial Truck Parking Facilities” in 2002 in response to the Transportation Equity Act for the 21<sup>st</sup> Century (TEA-21), Section 4027. This legislation required an investigation into the location and quantity of commercial truck stop parking facilities, travel plazas, and public rest areas. It also required an analysis of shortages, as well

**Figure 1:** Truck Parking on Pennsylvania Turnpike  
Photo Credit: Pennsylvania Turnpike Commission



as a plan to address the parking shortages. FHWA engaged a number of state-level private- and public-sector stakeholders throughout the study, and provided technical guidance throughout the research and documentation process. The Rest Area Forum, which was hosted in Atlanta, Georgia in June 1999, was the major stakeholder outreach event hosted by FHWA for the purpose of this study. At the Forum, more than 70 State Department of Transportation (DOT) and enforcement officials, industry representatives, truck stop operators, and other interested parties attended and participated.

The full report involved four major sections: 1) estimation of parking demand using a modeling approach, 2) inventory of public and commercial truck spaces, (3), identification of deficiencies, supply, and demand, and 4) recommendations. The major recommendations to address any current or future problems were identified in six major categories:

- **Expand or improve public rest areas.** Fifteen states had firm plans to provide additional spaces, and eleven of these states provided a specific number (1,600 over the next five years). Improving the geometric design of public rest areas would increase driver convenience.
- **Expand or improve commercial truck stops and travel plazas.** Consider an increase in yearly truck registration fees to help states pursue initiatives related to truck parking issues. Implement a program to allow states to close rest areas in locations that are already well served by private rest areas (thus allowing funds to be potentially utilized where capacity is needed).<sup>1</sup> Eliminate cost-prohibitive road improvement requirements imposed by state DOTs upon developers attempting to open new facilities.
- **Encourage the formation of public-private partnerships.** Provide low-interest loans or grants to commercial truck stops to help increase capacity. Construct state-owned lots adjacent to commercial

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<sup>1</sup> Florida, Michigan, Ohio, and South Dakota have all closed rest areas due to decreased use and the cost to maintain existing facilities. <http://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2017/03/31/old-fashioned-rest-stops-disappearing-in-some-states>

truck stops and plazas, and enter into agreements for owners to lease or maintain lots. Work with owners of commercial truck stops to help promote availability of parking.<sup>2</sup>

- **Educate or inform drivers about available spaces.** Development intelligent transportation system (ITS) deployments to provide drivers with real-time information on location and availability of truck parking spaces. Publish and distribute a “trucker’s map” that pinpoints parking facilities for drivers, including lot capacity and space availability.
- **Change parking enforcement rules.** Implement stricter enforcement of parking rules to remove vehicles from dangerous locations, such as interchange ramps. Change parking limits to permit trucks more time to park at public rest areas. Encourage local government and business support for truck stop and travel plaza facilities near industrial and business parks via land use regulations and zoning.
- **Conduct additional studies.** Refine study results to develop a more detailed assessment of strategies of specific highway locations. Establish a multi-state committee to evaluate alternatives and recommend solution to addressing truck staging and just-in-time deliveries. Conduct additional research to improve the truck parking demand model.

### *Dealing with Truck Parking Demands, NCHRP Synthesis 317*

“Dealing with Truck Parking Demands” was a result of National Cooperative Highway Research Program (NCHRP) Synthesis 317, which provided funding to assist transportation agency administrators in identifying solutions to manage increasing demand for commercial vehicle parking. The research plan involved distributing a comprehensive survey to highway maintenance engineers in all fifty states, District of Columbia, and Puerto Rico, and synthesizing the results. The outreach determined that legislative authority plays a significant role in managing commercial vehicle parking, and the development of parking spaces in the United States paralleled the development of the Interstate Highway System. However, as the motor vehicle carrier industry grew, the parking capacity at public rest areas has not been able to accommodate increase demand. At the time of the survey, a number of states of varying sizes and populations were experiencing extreme shortages of roadside commercial vehicle parking.

Although states have implemented a number of alternative approaches to manage the demand for commercial vehicle parking, no single entity is responsible for providing parking facilities. Nationwide, the study found a shortage of more than 100 percent in public parking places but an overabundance of private truck parking availability.

### *Commercial Motor Vehicle Parking Shortage, FHWA*

FHWA authored the “Commercial Motor Vehicle Parking Shortage” after the Consolidated and Further Continuing Appropriations Act of 2012, which requested that FHWA study commercial motor vehicle parking shortages as it related to compliance with Federal safety requirements. This report, which was produced after “Study of Adequacy of Commercial Truck Parking Facilities,” continued on these findings

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<sup>2</sup> Section 1305 of SAFETEA-LU established a pilot program to address truck parking on the NHS. Approximately \$30 million was made available between 2005 and 2012. The program was not continued under MAP-21. See: [https://ops.fhwa.dot.gov/freight/safetea\\_lu/1305\\_tpf.htm](https://ops.fhwa.dot.gov/freight/safetea_lu/1305_tpf.htm)

and provided updates on estimates and forecasts of long-distance trucking activity, information from the Truck Parking Pilot Grant Program, as well as observations from safety enforcement officers.

The data collected was largely anecdotal, but the study concluded that truck parking shortages remain widespread, particularly in certain geographic areas. Unless utilization of and investment in parking capacity is improved, shortages were expected to increase with growth in demand for the trucking industry. FHWA recommended that strategies from its prior report, such as creating public-private partnerships, are still relevant and necessary to provide additional parking capacity where needed.

### ***National Coalition on Truck Parking: Activity Report (2015-2016), FHWA***

To address truck parking problems across the country, the U.S. DOT convened the National Coalition on Truck Parking in August 2015. Stakeholders including the trucking industry, commercial vehicle safety officials, State Departments of Transportation, and the truck stop industry came together to conduct regional meetings to share ideas for improving truck parking through increased parking capacity, technology and data, funding, finance and regulations, and government coordination.

Meetings were led by FHWA with participation by FMCSA and the Maritime Administration (MARAD). There were five core Coalition partners:

- American Association of State Highway and Transportation Officials (AASHTO);
- American Trucking Associations;
- Owner-Operator Independent Driver Association;
- National Association of Truck Stop Operators; and
- Commercial Vehicle Safety Alliance.

Meetings were held in Maryland (with a number of I-95 Corridor Coalition member agency staff in attendance), Missouri, Utah, and Texas. Each meeting had between 20-50 participants and included breakout groups to develop approaches to the truck parking issues categories noted above. Key themes, heard at each of the meetings, are shown in the table on the following page. These largely echo themes found in the 2002 “Study of Adequacy of Commercial Truck Parking Facilities,” indicating that the issues surrounding truck parking are still largely the same.

**Figure 2:** Perryville Weigh Station, MD. Source: Google Maps



As part of this effort, FHWA has developed an online list of best practices that states are encouraged to update with new examples as they emerge. As of May 2018, one example located on I-95 has been added. Maryland notes that its Perryville weigh station on I-95 welcomes truck parking and provides a full restroom for drivers at the site.<sup>3</sup>

**Figure 3:** Key Themes from National Coalition on Truck Parking. Source: National Coalition on Truck Parking, 2017. <https://ops.fhwa.dot.gov/publications/fhwahop17026/index.htm>

Parking Capacity Expansion	Technology and Data	Funding, Finance, and Regulations	State, Regional, and Local Government Coordination
<ul style="list-style-type: none"> <li>• Use public land within highway right-of-way to develop additional truck parking capacity</li> <li>• Update the national standard for parking facilities, considering the needs of oversized trucks, security and lighting, and maximizing the capacity of a rest area</li> <li>• Integrate shippers/receivers into the conversation to address truck parking needs at industrial and port sites</li> <li>• Address truck parking needs in the context of improving efficiency of the entire supply chain</li> </ul>	<ul style="list-style-type: none"> <li>• Disseminate real-time information about parking availability at highway rest areas and private truck stops</li> <li>• Establish connectivity to existing technology commonly available to drivers, such as hands free smartphones</li> <li>• Use connected vehicle and vehicle-to-infrastructure (V2I) technology to guide drivers to available parking</li> </ul>	<ul style="list-style-type: none"> <li>• Provide a dedicated funding source for capital and maintenance funds for public rest areas and truck parking facilities on the national highway network</li> <li>• Promote "industrial park co-operatives" or industrial tax districts for pooled parking in areas with heavy concentrations of terminals, distribution centers and other industrial sites</li> <li>• Establish public-private partnerships to develop new and expanded parking facilities</li> <li>• Implement truck parking fees (potentially tied to reservation concept) to provide a source of capital and operating revenue for truck parking facilities</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct outreach through MPOs, regional councils, economic development authorities and national industry organizations to educate the public and elected officials, and promote creative solutions to meet truck parking and staging needs</li> <li>• Involve trucking and truck stop industries in State and MPO advisory committees to address truck parking needs</li> <li>• Encourage States and MPOs to address truck parking and similar issues in State and regional freight plans</li> <li>• Educate the public and elected officials about the importance of truck parking in freight transportation and industrial development</li> </ul>

<sup>3</sup> For General Information on the National Coalition on Truck Parking, see FHWA site:

<https://ops.fhwa.dot.gov/publications/fhwahop17026/index.htm>

To submit a best practice, see:

<https://docs.google.com/forms/d/e/1FAIpQLSdLvtr2ZsnwzvAsjBOS8iPSc6D1DuGzEx79jibNwfQbZgCgQ/viewform?fbzx=-1141804836166935000>

The compiled list of best practices is found at:

[https://docs.google.com/spreadsheets/d/1T\\_oTjSWoeEavaMlhRL7WilgwE-Z8FPelfWGrtSTvEY4/edit?usp=sharing](https://docs.google.com/spreadsheets/d/1T_oTjSWoeEavaMlhRL7WilgwE-Z8FPelfWGrtSTvEY4/edit?usp=sharing).



### *National Freight Fluidity Monitoring Program – FHWA*

Finally, The National Freight Fluidity Monitoring Program is an ongoing effort led by the I-95 Corridor Coalition focused on demonstrating and improving the measurement of freight transportation performance using a supply chain perspective. The effort aims to develop, test, implement, and measure freight transportation performance across an entire supply chain using travel time, travel-time reliability, transportation cost, and modal coverage as performance measures.

Although not specific to addressing truck parking, this project will help identify gaps or problem areas in the national transportation system that negatively impact multiple supply chains. That information could be used to identify locations where additional truck parking, whether for long-distance travel or staging to pickup and delivery goods, may be needed. Eliminating loss time for trucks searching for truck parking can improve the efficiency for supply chain end-to-end movements.

**Figure 4:** Example National Supply Chain. Source: FHWA National Freight Fluidity Monitoring Program. TRB Presentation – January 8, 2018.





## I-95 Corridor Coalition – Truck Parking Workshop Sessions Summary

### *Session 1: What's Currently Going on with Truck Parking in the I-95 Corridor States*

Representatives from four agencies gave presentations on truck-parking related challenges and activities in their respective area. Presenting agencies included:

- Virginia DOT;
- Florida DOT;
- Pennsylvania Turnpike Commission; and
- Lehigh Valley Planning Commission.

Each presenter was asked to provide an overview of truck parking conditions in their area and to highlight studies and/or projects that are improving truck parking outcomes.

All four presentations highlighted that at its simplest level, truck parking needs can be divided into two categories—a lack of supply and a lack of information. In some locations in the I-95 corridor, there are simply not enough authorized truck parking spaces to meet regularly occurring demand. This lack of supply can be difficult for public sector agencies to address for a number of reasons including:

- Limited available land and associated high land costs;
- Competition from investors and businesses that want to use available land for other uses; and
- Limited state resources and potential appearance of competition with the private sector.

A lack of information is also an issue throughout the corridor. When there are free spaces, drivers often do not know where to find them. If a lot is full, drivers need to know this before arriving in order to develop alternative plans. Knowing the number of spaces that are being utilized at any given time and communicating that information to drivers is a key need. In addition, collecting truck parking utilization information can help justify the need for additional capacity and make a compelling case to both public sector leaders and private sector businesses that the demand for additional parking exists.

All four presenters also touched on the negative public consequences associated with a lack of truck parking (either capacity or accurate information):

- Tired truck drivers and those approaching their Hours of Service limits may continue to drive illegally because they are unable to locate safe parking locations to rest, increasing risks to public safety;
- Truck drivers may choose to park at unsafe locations, such as the shoulder of the road and exit ramps, if they are unable to find available parking. In addition to the safety risk, this causes additional damage to publically owned infrastructure not designed to accommodate heavy trucks; and

**Figure 5:** Truck Parking in Florida



- Drivers searching for parking incur costs associated with increased trip miles, vehicle wear, and fuel consumption. This search also has negative impacts on highway infrastructure and increases vehicle emissions.

A brief description of each presentation is found below along with any feedback or questions from the group. Full presentations are available on the I-55 Corridor Coalition website ([www.i95coalition.org](http://www.i95coalition.org)).

### Virginia DOT “Statewide Truck Parking Solution”



Scott Cowherd, the Statewide Traveler Information Program Manager for the Virginia DOT discussed Virginia’s (ongoing) deployment of a Truck Parking Management System (TPMS). This implementation effort builds on several efforts: VDOT conducted a prior Truck Parking Study<sup>4</sup> completed in 2015 that identified gaps in parking supply in key corridors and created a prioritized list of key locations for deployment. After deploying a pilot project at a public rest area on I-66 in Front Royal to test detection and information dissemination technology, VDOT is continuing deployment requested by the Virginia Commonwealth Transportation Board (CTB) on a corridor-by-corridor approach with 14 additional locations on I-81 and I-95 identified for deployment in Phase I. In addition, in 2018, VDOT assumed operational and maintenance responsibility for the “TruckNPark” system deployed by the I-95 Corridor Coalition under a FHWA-funded grant for a Real Time Truck Parking Availability System. The TruckNPark system is fully operational at five VDOT operation public rest areas: New Kent East and New Kent West on I-64 and Ladysmith, Carson and Dale City on I-95. Real time truck parking for these locations is provided via dynamic message boards in advance of the rest areas. In addition, VDOT has incorporated truck parking information into the agency’s 511 system and their “SmarterRoads” system ([www.SmarterRoads.org](http://www.SmarterRoads.org)), a new cloud based data portal initiative that provides free, widespread raw data access that mobile developers (e.g., 3<sup>rd</sup> party Apps such as NATSO’s Park My Truck) and the general public can access.

Scott discussed a number of important considerations and lessons learned from this project, including:

- The need for on-site visits and surveys. VDOT staff spoke with truck drivers at the rest areas to get opinions about signage needs;
- Detailed site surveys to identify existing infrastructure, including power, water, and communications is critical to developing accurate cost estimates;
- Communication between the central office and regions or districts is needed for training and to coordinate and plan for operations and maintenance costs;
- The limited amenities at the sites does not prevent their use, and helps avoid any appearance of competition with private truck stops. Extensive outreach with private sector operators as the VDOT project began was also critical; and
- Understanding lot capacity vs much number of spaces, recognizing the challenges and implications for lots that are not currently designed or lined for today’s large trucks are important factors to help plan for and “sell” the need for truck parking.

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<sup>4</sup> [http://www.virginiadot.org/projects/resources/VirginiaTruckParkingStudy\\_FinalReport\\_July2015.pdf](http://www.virginiadot.org/projects/resources/VirginiaTruckParkingStudy_FinalReport_July2015.pdf)

**Figure 6:** Existing Rest Areas and Welcome Centers in Virginia  
Source: Virginia DOT



### Florida DOT “FDOT’s Truck Parking Availability System (TPAS)”



Marie Tucker, Commercial Vehicle Operations Manager and Holly Cohen, Freight and Rail Planning Administrator from the Florida DOT presented on Florida’s deployment of a Truck Parking Availability System (TPAS) along the I-4, I-10, I-75, and I-95 corridors at welcome centers, weigh stations, and rest areas. This deployment builds on information

collected from 15 studies at the state, district, and regional level since 2009. Florida is deploying two technologies to measure availability at its public truck parking facilities. The first is in-pavement sensors (also referred to as “pucks”) which detect when vehicles are actually occupying a space. The second approach is a microwave vehicle detection system (MVDS) which counts the number of vehicles entering and exiting a truck-only facility such as a weigh station and compares that count to the total number of spaces to calculate availability. Parking availability is collected by the Regional Transportation Management Center in each FDOT District and disseminated to truck drivers using roadside signs to display the number of available spaces as well as the state’s 511 system and third party data feeds.

**Figure 7:** Roadside Message Sign



The presentation also highlighted the critical need for an internal champion for truck parking projects as well as the involvement of a Motor Carrier Working Group that brought together people from Freight and Logistics, Commercial Vehicle Operations, Transportation Systems Management and Operations (TSM&O), Motor Carrier Size and Weight, Florida Trucking Association, Department of Highway Safety and Motor Vehicles, and FMCSA. Gathering a wide-ranging group that all play a role in truck parking allowed for early cross-business line and cross-agency discussions that smoothed implementation efforts later in the process. Similarly, creating links between this group and people who manage right-of-way (ROW) and rest area management provides an opportunity to re-use rest areas that are closing or surplus right-of-way (ROW) that may be declared surplus and sold for truck parking needs.

Four final points from the presentation also offer ideas for other states:

- FDOT used graduate students to collect primary data on truck parking capacity and use to create or supplement existing publically available sources;
- Florida is deploying a statewide fiber optic network that will support both truck parking and truck enforcement needs;
- Existing closed-circuit television cameras (CCTV) are a useful resource for verifying truck counts at truck parking locations and the information displayed on roadside signs; and
- Historical data to do predictive analysis can help with future planning. Tools such as “HEAT” maps may help determine long-term truck parking needs versus “staging” parking needs.

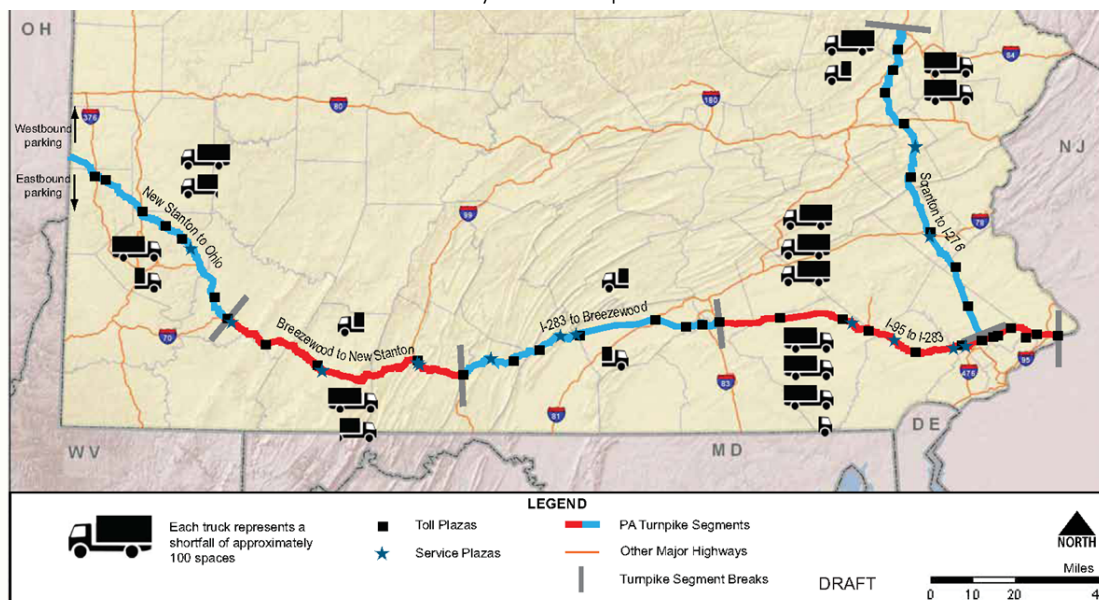
## Pennsylvania Turnpike Commission



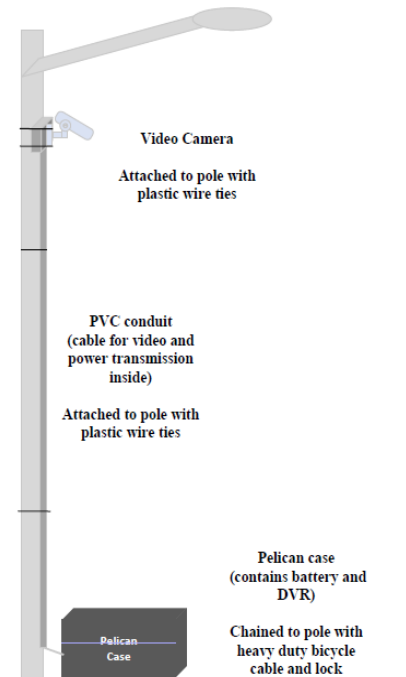
Amber Reimnitz, Senior Traffic Operations Project Manager for the Pennsylvania Turnpike Commission (PTC) presented on expansion and information dissemination activities occurring on the

Pennsylvania Turnpike. The Turnpike is an east-west toll highway through central and southern Pennsylvania connecting Pittsburgh, Harrisburg, and Philadelphia as shown below. A 2013 study of the Turnpike revealed a current shortfall of nearly 900 spaces, a number expected to increase to approximately 1,150 spaces by 2023. Through stakeholder outreach, the segment from I-83 east to the NJ border was identified as the most difficult in which to find parking.

**Figure 9: Pennsylvania Turnpike Truck Parking Needs**  
Source: Pennsylvania Turnpike Commission



**Figure 8: Closed Circuit Television Technical Specification**  
Source: FDOT





The PTC is utilizing two approaches to address this issue. Like many other states and regions, it plans to deploy a Truck Parking Management System (TPMS) to provide real time parking space information to truckers through roadside signs and online and smartphone applications. The initial TPMS deployment will be at six locations in the Turnpike segment from I-83 to NJ and cover approximately 90 spaces. Challenges mentioned in the presentation include:

- Large distances between interchanges and/or service areas – where should roadside signs be placed?
- Data reliability – how to determine occupancy (in/out volume count versus space detection)?<sup>5</sup>
- What information should be provided on the signs? These lots are relatively small, if signs always show “low” availability, will industry disregard the system if they know there is additional space for illicit parking?

The second approach is to expand the number of parking spaces at six locations spread throughout the Turnpike corridor by adding 321 additional spaces at existing service areas. Sites were chosen based on demand in the Turnpike segment, cost per space and total cost, and constructability factors including property ownership and zoning, ease of construction, and minimizing impacts to residential or environmentally sensitive areas. Funding for the expansion will come from both Federal sources and from Turnpike tolls. The Turnpike partners with 7-Eleven/HMS Host to operate the service centers—the Turnpike owns and leases the land, 7-Eleven maintains the pavement, HMS Host maintains the buildings and environment (cleaning, trash removal, etc.).

**Figure 10:** Truck Parking Expansion Site Design – Pennsylvania Turnpike Lawn Service Plaza  
Source: Pennsylvania Turnpike Commission



<sup>5</sup> For a comparison of detection technology, see slides 13 and 14 of the presentation on the I-95 Coalition website.

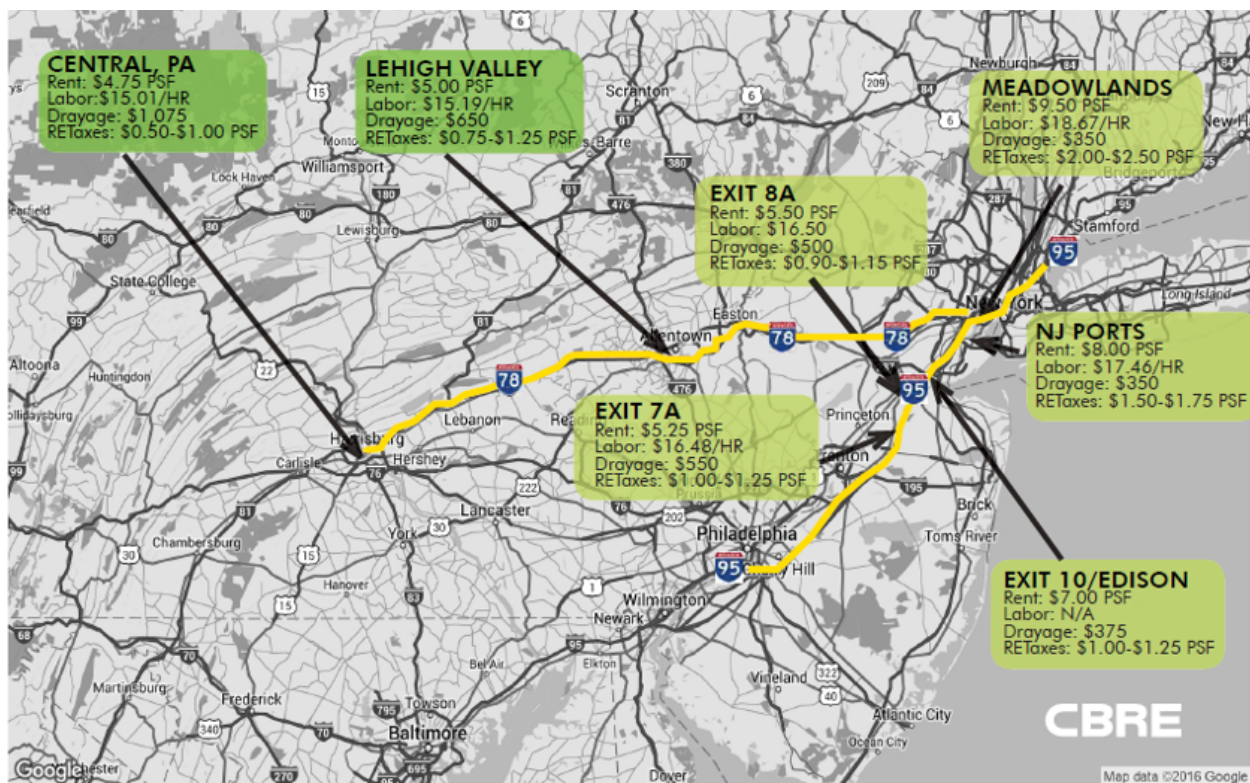
## Lehigh Valley Planning Commission “Transportation/Land Use Connection”



Becky Bradley, Executive Director of the Lehigh Valley Planning Commission (LVPC), the Metropolitan Planning Organization (MPO) for the Lehigh Valley, presented on the connection between land use and transportation using the growth of industrial/warehousing businesses in the Lehigh Valley and the need for truck parking as a focus point.

The Lehigh Valley is experiencing rapid industrial growth, adding nearly 20 million square feet of warehousing and logistics since 2013. Businesses are drawn by lower costs for rent, labor, and taxes compared to locations closer to the Port of New York/New Jersey while drayage costs (moving goods to/from the Port) remain competitive enough to maintain an overall advantage. The map on the following page compares rent, labor, drayage, and taxes for seven locations in the region. This combination of lower costs with relatively easy access to major consumer markets is driving growth. This analysis combined with other research on truck and rail commodity flows and bottlenecks informs LVPC’s approach to truck parking.

**Figure 11:** Freight-Related Rent, Labor, Drayage, and Tax Costs  
Source: Lehigh Valley Planning Commission



LVPC acts as a mediator and a reliable neutral agency in discussions between local municipalities in the MPO and developers. Particularly notable in the Lehigh Valley region, is that a number of communities have added requirements for truck facilities in new buildings and have changed their land use regulations to require truck parking areas for staging in a process similar to minimum parking requirements for new commercial or residential construction. Trucks arriving early at a facility are often not allowed to park on

property while waiting to make a pickup or delivery. By requiring truck parking in new warehousing/industrial areas, these trucks have a safe place to park while “staging.”<sup>6</sup>

The presentation also noted a number of key considerations that impact truck parking, including:

- The average lease for industrial buildings currently being constructed is seven years. How do planners and traffic engineers properly project traffic volumes or other land use issues when the use could change in a short amount of time?
- Plan properly for storm-water issues. Truck parking is impervious surface and may impact where and how truck parking can be built.
- If transit is available, make sure they are included in land use discussions to identify ways to reduce auto traffic by serving workers.

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<sup>6</sup> Upper Macungie Township passed an ordinance in June 2016 to this effect. See: <http://www.uppermac.org/wp-content/uploads/2014/11/2017-04.pdf>



### ***Session 2: What is Currently Going on with Truck Parking Outside the Corridor?***

The focus of Session 2 was on truck parking best practices from outside the I-95 Corridor Coalition states. This session consisted of presentations by Minnesota DOT, Missouri DOT, and brief program updates by the Federal Motor Carrier Administration (FMCSA) and Federal Highway Administration (FHWA).

#### **Minnesota DOT**



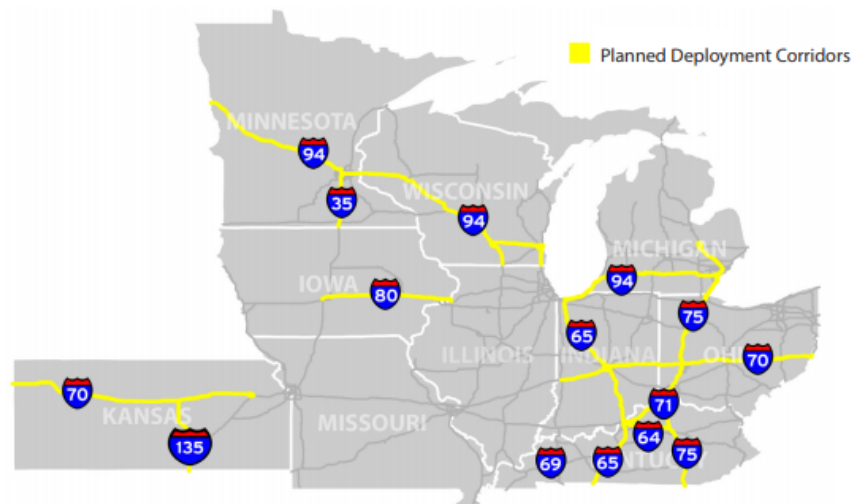
Andrew Andrusko, from the Minnesota DOT Office of Freight and Commercial Vehicle Operations, provided an overview of truck parking needs and solutions in Minnesota. Minnesota has the 5<sup>th</sup> largest roadway system in the U.S. by centerline miles and operates 52 Class I rest areas<sup>7</sup> with approximately 660 truck parking spaces, accounting for approximately 20% of the total statewide supply of truck parking.

A two-year truck parking study completed in 2010 provided the background information necessary to understand the truck parking issues in the state and brainstorm potential solutions. That study was updated in 2015 with truck probe data provided by the American Transportation Research Institute (ATRI) to better understand driver behavior at particular sites. This background provided Minnesota with the information and case needed to participate in a joint effort by eight Midwestern states through the Mid-America Freight Coalition (MAFC) to obtain a Transportation Investment Generating Economic Recovery (TIGER) Grant in 2015. This grant funded the development and deployment of a Truck Parking Information Management System (TPIMS).

In addition to the TPIMS, Minnesota DOT has increased truck parking capacity by 3% by building additional spaces. Programmed projects up to 2024 will add an additional 4-8% of capacity. These efforts include coordination with the private sector, specifically the state Trucking Association and Travel Plaza industry.

The presentation also highlighted a couple examples where private industry has increased the availability of truck parking on their facilities. Cambria Manufacturing in Le Sueur, Minnesota manufactures stone countertops for delivery across the country. They have a private parking plaza for drivers delivering or picking up material and finished product from their facility. Another parking facility pulled investment

**Figure 12:** MAASTO Regional TPIMS Planned Deployment



<sup>7</sup> These rest areas include physical buildings open 24 hours a day with a number of amenities. For details, see: <https://www.dot.state.mn.us/restareas/types.html>

from MnDOT, Minnesota Department of Natural Resources, the Brainerd City Chamber of Commerce, and Crow Wing County to build a multi-use facility that includes truck parking and Chamber of Commerce offices.

Finally, Andrusko stressed the importance of including freight voices in other areas to ensure those needs are addressed. Specifically, Minnesota DOT added a freight planner into the project management/area management office of the MnDOT Metropolitan District, and developed coordination meetings with project design offices throughout the state. They are also investigating revising design scoping worksheets to standardize collection of freight-specific comments on large projects.

**Figure 13:** Truck Parking in Minnesota Source: MnDOT



### Missouri DOT “Reducing Cost and Increasing Safety”

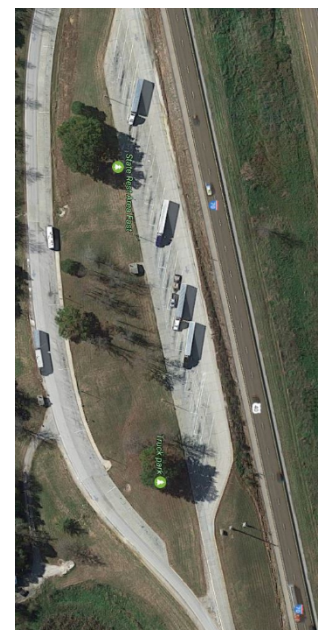


Cheryl Ball, the Missouri DOT (MoDOT) Freight and Waterways Administrator, presented on Missouri’s efforts to address truck parking issues in the state. Her presentation focused on low-cost solutions to try to add truck parking capacity or provide information to truck

drivers.

One of the biggest MoDOT successes is the conversion of 23 obsolete and expensive rest areas and weigh stations to parking spaces for trucks. These conversions supplement private parking locations in locations with high demand and insufficient capacity and allow MoDOT to focus their limited resources on welcome centers and locations that are more remote and where private industry cannot operate profitably. Converting these locations to truck-parking only sites costs approximately \$1 million per site with a \$2,000 per month operating cost. This saves MoDOT approximately \$16,000 per month in reduced operating costs (covering the initial conversion cost in just over 5 years) and provides needed truck parking capacity. While successful, the state is running out of conversion opportunities and is still facing growing demand and a need for parking/staging in urban areas and near major freight generators.

**Figure 14:** Rest Area to Truck Parking Conversion in Missouri



As with other states, MoDOT stressed the need to coordinate across many different groups including:

- Shippers and receivers – is there a possibility of shifting delivery hours;
- Economic Development groups – can truck parking be required in new development plans?
- Adjacent states – is anyone else developing parking?
- Law enforcement – where and how often are trucks parking illegally? Where are officers issuing citations?
- Oversize/Overweight operators – where are changes in regulations (time of day, escort requirements) causing large loads to park?
- Private truck parking operators – where are they looking to expand? What areas are not commercially viable for parking and may need a public sector approach?
- Fleet drivers – how do their needs differ from smaller operators?

Two final truck parking strategies are still in development by MoDOT. First, they are examining the potential to re-use brownfields in urban areas for truck parking. Old shopping centers or strip malls near industrial development may offer opportunities for truck parking with small up-front costs and provide the property owner with a small revenue stream for an otherwise vacant property. Second, MoDOT is working with the U.S. Army Core of Engineers to examine a new parking surface material. The Army Corps uses a material to build airstrips quickly in remote locations that could potentially be used for truck parking. This approach could offer a cheaper alternative to asphalt while still allowing stripping of truck parking spaces—a key concern with gravel lots where lack of stripping creates inefficient use of space.

### Federal Motor Carrier Safety Administration (FMCSA)

Quon Kwan, FMCSA Program Manager, Technology Division provided an update on the agency’s efforts related to truck parking. FMCSA’s SmartPark test deployment of truck parking technology was turned over to the State of Tennessee in 2016.<sup>8</sup> This program successfully demonstrated real-time dissemination of truck parking space availability information using:

- Dynamic Message Signs;
- Interactive Voice Recognition;
- Smartphone application; and
- SmartPark Research Project Website.

“We have to get outside the office to do real-world assessments and talk to people.”

In addition, the Innovative Technology Deployment (ITD) Program can now access funding for truck parking projects through the FMCSA High Priority – ITD Grant. Funding can be used for both installation and maintenance of relevant technology with FMCSA providing 85% of the funds with a 15% state match.

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<sup>8</sup> For more information on the SmartPark program, see: <https://www.fmcsa.dot.gov/research-and-analysis/technology/smartpark-real-time-parking-availability>

### Federal Highway Administration (FHWA)

Tom Kearney, FHWA Resource Center, introduced a University of California – Berkeley and Caltrans project to provide truck parking space availability information to truckers throughout the United States. A part of this effort, Caltrans and U-Berkeley have developed a resource website on truck parking which they are integrating with public and private sector real time truck parking data. The website is [here](#).<sup>9</sup>

He also noted the availability of Federal funding for truck parking projects. The FHWA Office of Freight Management maintains information on eligibility of funds for truck parking, including Title 23 funding, on the FHWA website.<sup>10</sup>

### *Session 3: Stepping Back – Attributes, Barriers, and Solutions*

Session 3 served as a conclusion to Day 1 of the Truck Parking Workshop and provided attendees a chance to synthesis what they had heard so far. Discussion was focused around answering three questions:

- 1) What attributes are critical to consider for truck parking?
- 2) What barriers exist for state DOTs to help provide truck parking?
- 3) What solutions have you heard today that you want to know more about?

Comments and outstanding questions to further explore in these areas are highlighted below.

#### Critical Attributes

- Signage placement is a bigger issue than initially thought. Signs placed too far in advance of parking may not be accurate by the time a driver arrives. Signs too close to parking do not provide enough time/distance to develop alternatives if lot is full. Placing signs in multiple locations raises costs.
- Amenities can be minimal and acceptable. Public truck parking lots cannot compete with private lots for amenities (in some states it is illegal to compete with private lots)
  - Vault toilet;
  - Lighting;
  - Fencing/security camera; and
  - Trash receptacles. Participants have heard comments both for and against having these on site.
- Reservation systems at public lots may be desirable, but can face difficulties to implement due to enforcement of reserved space. What happens if the initial driver cannot make it? How is the space held? Does the space go unutilized?
- Design specifications from state DOTs would be helpful—understanding cost is a key up-front need.

“Where do you place the signage? I never thought about that.”

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<sup>9</sup> [https://ops.fhwa.dot.gov/freight/infrastructure/truck\\_parking/title23funds/index.htm](https://ops.fhwa.dot.gov/freight/infrastructure/truck_parking/title23funds/index.htm)  
<http://www.americantruckparking.com/>

<sup>10</sup> [https://ops.fhwa.dot.gov/freight/infrastructure/truck\\_parking/title23funds/index.htm](https://ops.fhwa.dot.gov/freight/infrastructure/truck_parking/title23funds/index.htm)

- U.S. Army Corp of Engineers and MoDOT test (airfield paving) is intriguing. This may be a good middle ground between asphalt and gravel.
- Is Peer – to – Peer sharing of availability (crowd sourcing) accurate/reliable enough to be trusted?

### Barriers

- Decision-makers in the public sector often see truck parking as a purely private-sector issue. What role (if any) should the public sector play in what many think is a business decision? There is also a potential that too much development could be seen as the public sector competing with the private sector.
- High cost for land, especially in urban areas, and there are often competing interests or potential uses for the land. Developers may be in competition against international real-estate interests, especially in rapidly growing industrial/warehousing locations. “Not In My Back Yard” (NIMBY) is also an issue. Truck stops are more often seen as a negative in a community (more truck traffic) than a positive (economic development).
- If 80-90% of the parking is privately controlled, is providing real-time information on the 10-20% of publically controlled spaces a worthwhile investment?
- Truck parking projects directly compete with many other project types with (perceived) wider public benefits. Funding truck parking projects can be a difficult sell.
- There are multiple types of truck parking. Long-haul, long-term parking was the focus of this workshop. Staging or parking to support urban deliveries and last-mile needs are a related issue but may have different approaches. Tough to deal with everything at the same time.
- There is limited data available to understand the truck parking need in rural areas or for minor arterials and local roads. Most data and deployments are confined the Interstate system.
- Reluctance of municipalities to require truck parking in land use or zoning regulations. If there is not enough demand in the area, or if a region has a piecemeal approach, the fear is that business could locate elsewhere.

### Solutions

- Education/outreach – until the public and decision-makers understand the importance of freight and until shippers/receivers understand importance of parking, the issue will not end. Education is key.
- Approach truck parking needs as an economic development issue and utilize partnerships with state and local economic development groups. If truck parking is seen as a way to draw business to an area, there may be more support. There also may be a way to talk directly to business owners about the importance of having parking available near a facility.
- A funding set-aside for truck parking would help direct attention and money to the issue.
- Some solutions may be coming directly from the private sector. The driver shortage is giving trucking companies more power to select their customers. Amenities at key origins and destinations may become more common as shippers and receivers seek ways to ensure they can hire enough capacity to carry their loads.
- Connected and Autonomous vehicles (CAV) – initial truck deployments are mostly centered on Interstate travel. This may reduce the need for rest areas along the Interstate and focus need at interchange locations where human drivers are needed to make deliveries in urban areas.

“We need an elevator pitch for truck parking.”



### *Session 4: Key Changes on the Horizon and Implications to Truck Parking*

Day 2 of the I-95 Corridor Coalition began with a discussion of changes in technology and supply chain management that could future demand for truck parking. Two presentations, one by Darrin Roth of the American Trucking Associations (ATA) and one by Charles Edwards, Director of the NCDOT Logistics and Freight Division, provided an overview of these changes and an introduction to the break-out group sessions, which followed in Session 5.

#### **American Trucking Associations**

Darrin Roth, Vice President of Highway Policy for the ATA, discussed two key topics influencing truck drivers and truck parking. The first is the impact of the electronic logging device (ELD) mandate. Most commercial drivers were required to have an ELD by December 2017.<sup>11</sup> The lack of legal spaces has been exacerbated by the mandate. Since the ELD mandate took effect, more than 60% of drivers in a recent survey reported a “Much harder” time finding legal parking. Drivers are spending more time looking for parking or beginning their search for parking with more HOS remaining. This has economic costs, with drivers losing an estimated \$4,600 annually in opportunity costs because they must park on average 56 minutes before their HOS are up.

**Figure 15:** Unauthorized Truck Parking – Cumberland County, PA (January 2017)



<sup>11</sup> There are exceptions for drivers who do not meet an hours per month threshold, have a vehicle made before 2000, or drive a vehicle which is itself the commodity. In addition, an Automatic On-Board Recording Device (AOBRD) is sufficient to meet the ELD mandate until December 2019. See: <https://www.fmcsa.dot.gov/hours-service/elds/electronic-logging-devices>

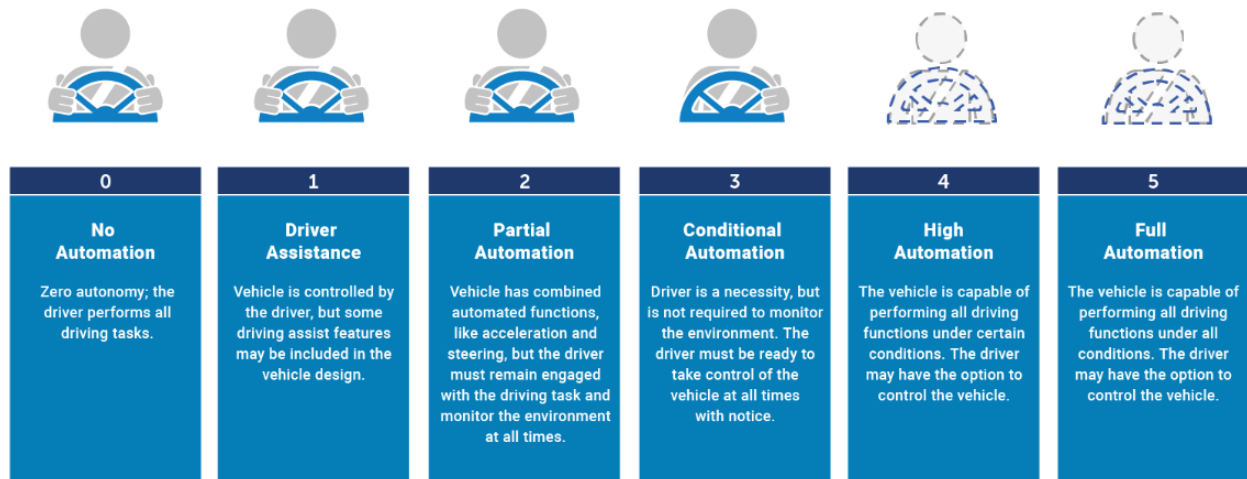
The second topic discussed was “CAVs” (Connected and Automated Vehicles), specifically commercial vehicles. CAVs deploy technology to reduce (and eventually eliminate) the need for human control. Automation is split into six levels. Level 0 (zero) is no automation, Level 5 is full automation. Level 2 is available on commercially deployed trucks today. Adaptive cruise control, active collision avoidance, and lane departure warnings are common features on new trucks. Level 3 automation is still in the pilot/test stage and full automation is likely many years away. However, CAV are not limited by HOS requirements and most initial deployments of CAV are focused on the highway system where there are fewer scenarios for a CAV to navigate. This could shift the need for truck parking away from long-term parking in highway corridors to a staging/last-mile need on the outskirts of urban areas and at highway interchanges where loads shift between a CAV and a human driver.

**Figure 16:** Future CAV Setup Source: ATA



**Figure 17:** CAV Automation Levels.

Source: <https://www.nhtsa.gov/technology-innovation/automated-vehicles-safety>



Finally, Roth highlighted four “easy” fixes that the public sector could implement to help with the existing shortage of parking spaces:

- Increase time limits at public rest area. Some rest areas limit vehicles to 8 hours of parking. This is not enough time to satisfy HOS rest requirements;
- Allow parking at weigh stations and other public facilities;
- Reduce legal obstacles (e.g., zoning laws) for private truck stop operators to open/expand facilities; and
- Introduce truck parking availability systems to provide drivers with better information.



### North Carolina DOT “Impact of e-commerce”



Charles Edwards, Director of the Logistics & Freight Division at North Carolina DOT (NCDOT), presented on the opportunities and challenges of electronic commerce (e-commerce) for freight planning in general. E-commerce is generally defined as the buying or selling of a good or service online.<sup>12</sup> This segment of the retail economy is

growing at a much faster rate than traditional “brick and mortar” retail driven in large part by the growth in direct-to-customer orders fueled by online retailers like Amazon and Alibaba. These businesses supply goods on a “pull” method (e.g., when requested by consumers) instead of a more traditional “push” method (e.g., where goods were put in front of a consumer at a store). This has implications for supply chains, which must be more flexible and reliable to meet consumer demands for delivery. They also must be able to reach residential or commercial locations to make deliveries instead of a set number of storefronts, increasing the number of trucks entering urban areas and residential areas. Finally, e-commerce generates a large numbers of returns—between 10 and 50% of all e-commerce, delivered goods are returned. All of these changes will likely increase the need for small package delivery and less-than-truckload shipments with an urban delivery component. This has different truck parking implications and needs than the long-haul corridor parking that was the focus for the majority of the Workshop.

“You have to speak their language. It is a ‘package car’ not a ‘delivery van.’”

**Figure 18:** Circular Economy Stakeholders and Steps



The presentation touched on the need for planning to “catch-up” with business cycles. A 30-year planning horizon does not integrate well with e-commerce business planning. Infrastructure projects take too long to plan, fund, and build (if they are built at all) for private industry to rely on the public process in making business choices. The presentation also stressed the need to understand and use e-commerce supply chain language in order to promote collaboration. Private industry has data and in some circumstances is willing to share it, but they want to know that the public sector understands their needs and issues.

<sup>12</sup> <https://www.gao.gov/new.items/d02404.pdf>

### Session 5: Breakout Sessions

Session 5 was a breakout session based around five topic areas:

- Expanding truck parking capacity;
- Truck parking design options;
- Truck parking information distribution;
- Truck parking data; and
- Truck parking education and outreach.

Participants were asked to select a group prior to arrival based on their interests and expertise. The group discussions lasted approximately 1 hour and was followed by a report-out session to the entire Workshop.

### Breakout Group 1 – Expanding Truck Parking Capacity

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#### *Expanding Truck Parking Capacity*



#### Questions to Address

- Brainstorm a list of potential options to expand parking (public, private, combination). Who needs to be engaged to accomplish this?
- When adding/expanding capacity, what are key considerations regarding the location?
- What regulatory barriers exist to expanding capacity and how do we address them?
- For private sector capacity solutions:
  - What is the role and responsibility of the private sector in adding capacity or reducing demand on highway network? Does it matter if the capacity is on the right-of-way, off the right-of-way and/or on industry property?
  - What are the advantages and disadvantages of these approaches
  - What is necessary to make this a viable option?
- What are the funding challenges and opportunities and how do we ensure the long term operating and capital costs of the solutions are provided for?
- What are other key challenges to and opportunities for expanding capacity?
- What are opportunities on the horizon that could help expand parking capacity?

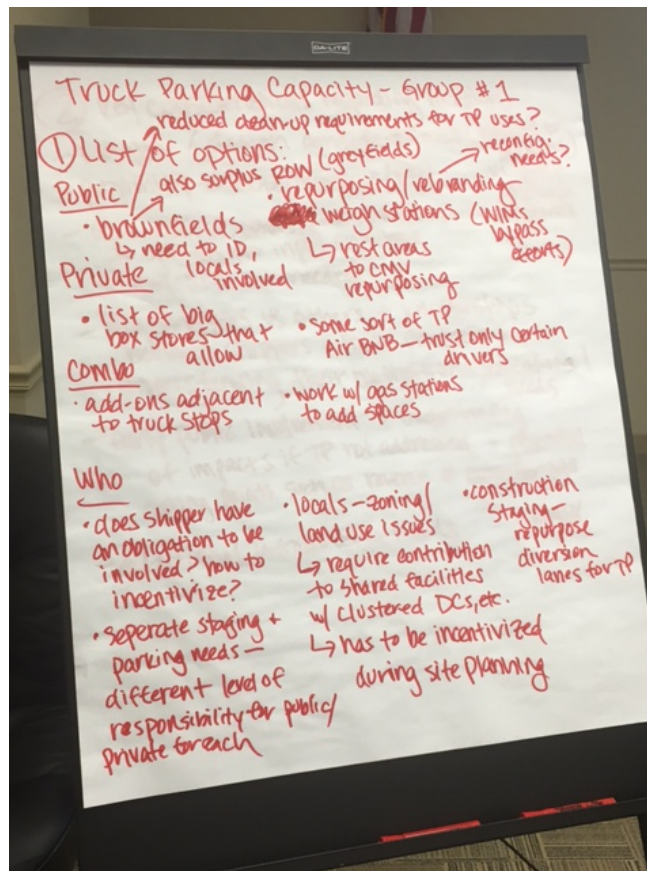
#### Discussion/Solutions

- Public options for expanding truck parking include brownfield sites, weigh stations during off-hours, industrial areas, old rest areas/welcome centers, construction staging areas, and park-and-ride lots during off-hours.
- Private options for expanding truck parking include industrial parks and underutilized or abandoned parking areas in big box retail or strip mall areas.
- Engagement on this issue needs to include anyone who touches freight: shippers/receivers, DOTs, local municipalities that control land use or make zoning decisions, truck drivers, trucking

associations, local Council of Supply Chain Management Professional (CSCMP) chapters, economic developers and industrial development agencies. In addition, reaching out to the public early and often may help reduce pushback—education is key.

- Locations for expanding truck parking must have a minimum amount of land to meet design standards (may be flexible in urban/rural areas) and be near key transportation routes. Specific design elements such as back-up/pull-through options should be discussed with stakeholders.
- Barriers to building more truck parking include zoning challenges, NIMBY issues, land costs and potential competing uses, and difficulty convincing leaders/public that this is an issue that requires public-sector attention. Early and sustained contact with stakeholders to allow dialogue is critical to overcoming these barriers. In addition, approaching truck parking as an economic development strategy may provide traction.
- The private sector has a role in providing truck parking—it is a business for them. The mix of public vs. private involvement is location dependent. In some areas, public incentives such as better zoning regulations, ROW acquisition help, competitive grants, or other approaches may be enough to encourage the private sector to add capacity. In other locations, the business case may be more difficult to make and require more public sector involvement. Public agencies must be careful not to unfairly help one provider over another when working with the private sector.
- Two key challenges to expanding capacity are land availability/cost, and the speed at which projects typically progress versus the “speed of business.”

Figure 19: Breakout Group 1 Notes



## Breakout Group 2 – Truck Parking Design Options

### Truck Parking Design Options



#### Questions to Address

- When drafting system requirements, what design elements/choices do you need to consider? What facility maintenance requirements are necessary and how will they be fulfilled?
- What considerations do you need to make with regard to data collection, storage, analytics, and dissemination?
- How do you bring in the perspective of the truckers?
- What approach can integrate your truck parking solution into a transportation management center (TMC) or advanced traffic management system (ATMS)? Is this necessary?
- What do third party agreements look like? What do they require?
- Who are the key stakeholders that need to be at the table during the design process? What considerations are there for a centralized versus decentralized environment?
- What funding sources are available to offset design costs?
- What are key challenges to getting the right truck parking design specifications drafted and implemented?
- Do you have good examples to share or know of good examples?

### Discussion/Solutions

- Reliability is the key system requirement. If data cannot be trusted, the system will not be used. The specific technology deployed (cameras, in-ground sensors, entry/exit counts, etc.) are site-specific—no consensus was reached on an overall “best” approach.
- Need further examination of site spacing/stripping requirements. Anecdotal evidence suggests private sector truck stops stripe spaces smaller/closer together and get a higher capacity than public areas.
- Minimal amenities include a bathroom (vault system such as MO DOT is utilizing), trash receptacle, and vending machines. Maintenance needs include waste collection (both bathroom and trash), potentially plowing and paving depending on site design and location.
- Potential partners include private sector operators (if located adjacent to a private site), tourism associations, Chambers of Commerce. Local contractors are preferable to DOT employees for maintenance. Agencies are low on staff and contracting out can save money.
- As much as possible, data should be available in the public realm, easy to access, and low-cost or free. Cloud-based systems appear to be working well.
- Providing information via roadside signs is popular but there are higher implementation and O&M costs. There is also a possibility for local transmission within a confined area (geo-fenced) to cell phones, similar to a storm or emergency warning broadcast.
- Guidance or standardization across a corridor would be helpful. For example, when calculating capacity, is the number of striped spaces the basis? What if there is additional unstriped areas (either meant for parking or not)? Additional space on shoulders?

“We can’t always make things perfect, but we can make them better.”

- To get drivers' perspectives, DOTs need to reach out and speak with them. Surveys at existing rest areas, discussions at Trucking Association meetings, and other direct-outreach approaches work well.
- Integration with existing TMC/ATMS systems is great for getting information out to other providers.
- 3<sup>rd</sup> party agreements vary considerably by state. Memorandum of Understanding (MOU) and Task Orders vary widely, and states often have different cost limits for contractual approaches. The responsible party (DOT, enforcement, DMV, etc.) also can vary.
- Implementation is a funding issue. There is not enough funding when parking projects are competing against paving/bridges/interchange
  - Even within freight-specific funding sources such as the National Highway Freight Program (NHFP) which has a multimodal component, getting funding is tough;
  - Internal DOT pushback – lack of parking is not seen as a DOT problem and should be up to industry to solve;
  - Need to do a better job of telling the story – why is truck parking a critical need? Why does the DOT have a role? Why do truck parking projects “tick” multiple boxes that help those projects be prioritized? The updated survey through Jason’s Law may help;
  - A specific set-aside might help, although the overall direction has been to consolidate programs. U.S.DOT Section 130 (at-grade rail crossing) funding was cited as a positive example of a set-aside allowing money to directly target the need;
  - Alternatively, more flexible funding from the Federal government that allows incentivizing private sector solutions may help. For example, some states have a competitive loan/grant program for freight railroads (especially short-line railroads); and
  - Existing Freight Performance Measures is based on movement (travel time) and reliability. That drives project selection. DOT’s have Asset Management Plans, Safety Plans, Congestion Management Plans, but most do not yet have Truck Parking Plans.

**Figure 20:** Truck Parking Workshop Participants  
Photo Credit: I-95 Corridor Coalition



### Breakout Group 3 – Truck Parking Information Distribution

#### Truck Parking Information Distribution



#### Questions to Address

- What are the best and worst approaches for getting information to drivers? Does there need to be a “product branding” that would be recognizable as the standardized information source for truck parking?
- What is the role of the private sector in providing truck parking information? Do they manage an entire system where all data goes through them or is the DOT involved?
- What do truck drivers want? What communication method(s) do they believe are effective? What information do they most urgently need to make parking decisions? How far in advance (time and distance) is necessary for truckers to receive information?
- How do we get parking availability out to the private third-party vendors like Apps, WAZE, and others?
- What data use agreements and data requirements are needed to ensure information is current and accurate? How is this done when data is coming from 3<sup>rd</sup> party providers? Are there proprietary data concerns? Should information be available regardless of the App or platform used? Should this be a single, standardized application that pulls from all data sources?
- What are key challenges to getting the right information safely to the truckers at the right time?
- What opportunities are on the horizon that could help?

#### Discussion/Solutions


- Getting information to the driver is dependent on user needs, not necessarily up to the DOT to determine. The challenge is to provide truck-specific information so that drivers do not have to sort through other unnecessary information.
  - 511 systems may work for some states, but may not be most efficient means of dissemination.
  - Dynamic Message Signs (DMS) or Dynamic Parking Capacity Signs (DPCS, also referred to as Dynamic Parking Message Signs –DPMS)) have been cited by drivers as a desired form of information dissemination. DMS can change their entire message to display information other than truck parking (weather alerts, traffic conditions, etc.). DPCS typically have a static component listing exits and the number of spaces available is dynamically updated. DPMS are usually less expensive than DMS but lack the ability to show other information or be used for multiple purposes.
    - » Design needs to rely on MUTCD for standardization;
    - » Information should be provided prior to a decision point, and minimize driver distractions. The “perfect” distance is very state/site dependent and based on a number of factors including distance between exits, the total parking supply, and the presence of private parking options;
    - » 20 miles provides advanced warning, but information may no longer be correct by the time the driver arrives; and
    - » 2-4 miles may not be far enough in advance to provide alternatives.
- Private firms will likely be involved in the collection/dissemination of information. How, how much, and any data sharing agreements may be up to the individual states. Private parking options may also



make a reservation system more viable – public parking spaces account for a small percent of the total supply.

- Getting parking information to third-party application vendors can be done via XML feeds (VDOT system, TRANSCOM in NYC Metro). Agencies must ensure accuracy and do routine calibration.
- Parking data is not a moneymaking activity for the DOT; however, it can be useful to agencies for truck parking research including analyzing demand, locations of high/low use, assessing capacity needs, and level of use by drivers of facilities/information systems.
- Opportunities on the horizon include CAV potentially reducing the overall need for long-term truck parking, potential for ELDs to provide two-way communication including truck parking availability, and data that can help smaller trucking companies be competitive when they do not have the same resources available as the larger players.

### Breakout Group 4 – Truck Parking Data

<p><i>Truck Parking Data</i></p> 	<p><b>Questions to Address</b></p> <ul style="list-style-type: none"> <li>• What kind of data do you need to determine truck parking needs? <ul style="list-style-type: none"> <li>• Are existing truck parking locations good sources of data or are there limitations on conclusions you can draw?</li> <li>• Is overcapacity data good data or do you need more information – i.e., is this staging vs HOS, utilized because it is the last/closest lot?</li> <li>• Is analysis needed that compares where capacity exists today versus where current freight flow dictate alternative needs/locations?</li> </ul> </li> <li>• What data do you need to make investment decisions (both capacity and real-time truck parking systems)?</li> <li>• How important is it for you to understand truck parking demand resulting for Hours of Service limits versus vehicles “staging” to enter distribution/warehouse/retail location/port? How can we get to this information?</li> <li>• Of the data identified above, what can be drawn from real-time truck parking information systems currently?</li> <li>• What are key challenges to having a clear understanding of truck parking needs and what types of investment are most effective?</li> </ul>
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### Discussion/Solutions

- Existing truck parking locations can provide good data, but more is needed to understand the magnitude of the overflow. Also, there needs to be a better understanding of why trucks are using the existing lots. Is it for long-term parking, staging, waiting for traffic congestion to clear, or some other need? Getting parking duration data (from in-ground “puck” sensors for example) would help. Truck class counts would also be a useful clue. Speaking directly with drivers is also useful if done in a way that does not interrupt their job.
- There is an issue across states of defining “capacity.” Is this lined spaces only? Is a lot at capacity if there is parking space that is unlined?
- How do DOTs get better information on parking at shippers/receivers? Some information can come from drivers. Can local economic development agencies assist in surveying shippers/receivers or local trucking companies that serve the facilities)? Will private companies be willing to share this?



- Department of Commerce in MO talks to all businesses to get a sense of their operations and has offered the opportunity to partner to get trucking data.
- For-profit rest stops – what data are they bringing in to the equation? What is the source? What information are they using to determine where to locate?
- NATSO has an app that allows facilities to enter space/use data. Someone at the private location is calling every few hours to update the availability. What opportunities are there for this or other private facility data to help assess opportunities/challenges to private sector parking?
- Partnering with Universities that have a transportation department might be one option to look at the issue as private entities commonly work with such entities as well as DOTs.
- Truck probe data – Can this be used more to assess needs. Arizona DOT was able to get probe data from ATRI and were able to see where trucks were parking, including locations that are not measured by in-ground sensors.
- Need forward-looking analysis that considers the impact of truck platooning, CAV, and electric vehicles. Electric vehicles are more likely to need short-term or staging parking than long-term parking (at least in the near future) as most electric vehicles run local deliveries and return to the same base every night to re-charge. Does charging/fueling infrastructure need to be incorporated into this parking? If so, how?
- Improve mechanism to share data/activities between the states – e.g. create listserv.
- Can DOTs work to encourage off-hour deliveries? Could creating more flexibility in delivery times solve some of the problem? A stronger role by shippers/receivers in addressing truck parking could lessen demand/create more capacity.
- Replication of the Meijer Bull Pen idea – use state owned land to create bull pens at/near shippers/receivers.
- Local land use regulations including zoning ordinances and site plan regulations. There is a need to incorporate truck parking provisions into the review of Site Plan/development plans, especially in areas with high demand.

**Figure 21:** Truck Parking Workshop Participants  
Photo Credit: I-95 Corridor Coalition



## Breakout Group 5 – Truck Parking Education and Outreach

### Truck Parking Education and Outreach



#### Questions to Address

- Discuss the DOT role in truck parking solutions. To what extent should a DOT be involved in truck parking solutions? Where should the role of the DOT be restricted?
- Who are the most important stakeholders (internal/external) to work with? Why? What is their role in truck parking?
- What has been the largest barrier to enhancing the understanding of truck parking needs and identifying a champion in your state?
- How and when should law enforcement be engaged in this discussion?
- What steps can be taken today to improve partnerships with private industry? Are there opportunities to work more closely with “freight generators” – such as distribution/warehouse/retail industry to mitigate truck parking demand?
- What are some ideas on how to improve the public’s understanding of truck parking needs? Whose role is that? Any examples of how public outreach/education has helped with NIMBY?

### Discussion/Solutions

- DOTs have a critical role to play in solving truck parking issues. They are a connection between local entities, private sector shippers/receivers/truckers, and the larger public. DOTs have a substantial role to play in helping educate others about the need for truck parking—MPOs, economic development and industrial development agencies, municipalities or others with land use authority. Potential activities include creating design templates and cost estimates, and providing input on land use ordinances. Create internal groups of public agency personnel who “touch/impact” truck parking.
- Barriers include:
  - Political apathy and limited recognition of truck parking as a problem outside of select individuals/groups;
  - Land cost and availability where parking is needed the most; and
  - Funding
- Law enforcement should be involved from the beginning. They can provide information about where unauthorized parking is occurring (identify need). They can provide input on capacity and can be part of dialogue on willingness of truckers to use weigh stations or other assets for parking.
- Underutilized parking lots at retail centers, strip malls, or other commercial/industrial sites provides an opportunity for public-private partnerships.
- Outreach could be modeled on U.S. DOT STEM program, which went to elementary schools to talk about the importance of transportation. Using social media and other efforts tied with freight plans<sup>13</sup> or other planning/engineering work could help. Working with local chapters of the CSCMP and economic development groups to talk directly to shippers/receivers also may help.

<sup>13</sup> Colorado DOT developed a “Freight Delivers” video as part of their Statewide Freight Plan. See: <https://www.youtube.com/watch?v=PSqYDfwFaYg>

### *Session 6: Bringing it Back to the Office*

The final session of the I-95 Corridor Coalition Truck Parking Workshop asked attendees to discuss two topics. The first was an idea heard during the Workshop that they would bring back to their agency. The second was to identify stakeholders or topics for a future I-95 Corridor Coalition Truck Parking Symposium.

#### **Ideas to Bring Back to the Office**

Workshop participants were asked to list key outcomes and some immediate ideas to explore that they would bring back to the office. These included:

- The need for a truck parking champion, both internally within DOT and externally. Ideas to support this included:
  - Internally, FDOT formed a Motor Carrier Working Group to tie all of the FDOT divisions that touch truck parking together with commercial vehicle enforcement agencies, drivers/trucking organizations, and economic development.
  - Enlist trucking representation. Are state trucking representatives on DOT freight advisory committees or oversight boards? (NCDOT does include this).
  - Do not give up on trying to “work” the truck parking problem – rotating decision-makers who often do not have any background/knowledge in truck parking can be challenging, need to continue to educate them.
  - Need to develop elevator pitch for why truck parking is important and why it is a DOT responsibility. This is an important in educating both the public sector and transportation officials that are not from a freight background about the importance of freight. As one commentator noted: “Without trucks, you will be homeless, hungry, and naked.”
  - Need to incorporate language and guidance on truck parking to input into Comprehensive Plans.
  - Engage more private sector. In addition to working with private sector in the National Coalition on Truck Parking, find out more about groups that work with freight related industry, such as the Department of Commerce Advisory Committee on Supply Chain Competitiveness.<sup>14</sup>
- Recognizing that there is a difference between parking for staging and parking for long-haul:
  - Need to coordinate staging needs with shipper/receivers. Shippers and receivers are dictating driving/delivery operations and DOTs do not have enough contact with them. There may be an opportunity to approach them directly through Industrial Development Agencies (IDA), Chambers of Commerce, or other Economic Development agencies. Treat truck parking as an economic development tool with new businesses.
- Ideas to potentially increase capacity:
  - Increase awareness of potential parking at existing public-owned facilities (weigh stations as an example, some commuter lots in off hours).


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<sup>14</sup> <https://www.trade.gov/td/services/oscpb/supplychain/acsccl/>

- Key to identified underutilized land (brownfields, old shopping malls/large box stores) to parking. Brownfield conversion may be specifically helpful for urban areas, is there a way to streamline approval?
- Potential to use underutilized existing parking lots (park and ride, commuter lots, State Parks, etc.). Parking times for passenger vehicles vs. trucks are typically different. There may be concern with design being appropriate to handle trucks.
- Understand that private sector is striping spaces with less space than public sector. Why and how might this influence public parking?
- A better understanding of the impact of new supply chain patterns (e-commerce) and how quickly the private sector moves vs. public sector (6-month horizon vs. 30-year horizon).
- A better understanding of the impact of different regulations on Oversize/Overweight (OSOW) operations. Varying restrictions on hours for movement, escorts, signage, etc. force trucks to park beyond Hours of Service issues.
- What might a truck parking Performance Measure look like? Would a PM help elevate the status of truck parking projects?

### Truck Parking Symposium


The second discussion topic was to brainstorm potential focus for a future I-95 Corridor Coalition Truck Parking Symposium. This would build on the strategies from the Coalition workshop as well as the National Coalition on Truck Parking. Continued emphasis on issues/challenges and focusing on implementing strategies, particularly those applicable to the East Coast States. Types of stakeholder and topics to consider are shown in the tables below.

<b>Stakeholders to Invite</b> 	<ul style="list-style-type: none"><li>• Shippers/receivers – possibly a keynote speaker: Amazon or other large, e-commerce company;</li><li>• Expanded group of state agencies including MPOs, Economic Development Agencies, Law Enforcement, Department of Motor Vehicles</li><li>• Traditional manufacturing/industrial/warehousing as well as e-commerce fulfillment centers;</li><li>• FHWA, FMCSA, MARAD and related agencies</li><li>• U.S. Dept. of Commerce Council on Supply Chain Competitiveness representative;</li><li>• Drivers/dispatchers – people who are actually on the road;</li><li>• Those with land-use control – local municipal leaders from areas that are growing quickly (or could be next); and</li><li>• Academia/research groups.</li></ul>
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<p><b>Topics to Consider</b></p> 	<ul style="list-style-type: none"> <li>• Specific examples of where land use requirements had a positive outcome on parking supply. Model ordinances if available;</li> <li>• More data on public/private partnerships (successful or not);</li> <li>• Better data on the negative impacts of unauthorized parking. To build a convincing case for the public or leadership, more information on crashes/injuries/deaths, lost productivity, cost to consumers, etc. is needed;</li> <li>• How best to include the key needs/opportunities of truck parking in larger planning documents (Freight Plans, Long-Range Transportation Plans, etc.); and</li> <li>• Freight-specific CAV technology. What is coming, what changes will it make to the existing freight/supply chain environment? (e.g., what would impacts of truck platooning be to truck parking?)</li> </ul>
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## I-95 Corridor Coalition Action Items

Finally, a number of action items emerged from the Truck Parking Workshop that the I-95 Corridor Coalition can pursue. The following contains suggested examples of action items, activities and resources, which can continue to be built upon by the Coalition to support members in furthering truck parking activities.

<p><b>Create a Data Repository – Collect Existing Studies</b></p> 	<ul style="list-style-type: none"> <li>• Any state or major corridor truck parking study from the I-95 states and any best practice documents from other states, including reports/white papers on need prioritization. Additional examples include:</li> <li>• FDOT: Parking Design Guidelines and FDOT: Metro Miami Truck Parking Feasibility Studies</li> <li>• Mid-America Freight Coalition: An Evaluation of Vacant Urban Land for Truck Parking</li> <li>• Institute for Trade and Transportation Studies: Thoughts on the Challenges Associated with Public Sector Planning for Truck Parking Facilities</li> <li>• ATRI: Driver Diary Study and related reports</li> <li>• Final report from this Truck Parking workshop and future Symposium</li> </ul>
<p><b>Continue the Communication – Intermodal Committee Work</b> <b>Create a listserv</b></p>	<ul style="list-style-type: none"> <li>• Continue promoting discussions on truck parking through member agency participation the I-95 Corridor Coalition Intermodal Committee and the Truck Parking Workshop participants. Share updates on agency initiatives, continue to exchange best practices, support Corridor and where applicable, regional discussions by members on truck parking challenges and solutions</li> <li>• Create a listserv of Coalition members interested specifically in truck parking (starting with participants in the Truck Parking Workshop - see <b>Appendix B</b>) to facilitate ongoing communication regarding truck parking in general, to engage on behalf of the I-95 Corridor Coalition Intermodal</li> </ul>



	<p>Committee in planning for the Symposium and exploring potential for collaborative efforts to advance implementation, including grants.</p>
<p><b>Monitor and Spread Best Practices</b></p> 	<ul style="list-style-type: none"><li>• Share Cost estimates on truck parking real time systems including O&amp;M and for capacity expansion costs so agencies understand short and long-term costs/commitment.</li><li>• Calculating capacity and utilization – it appears there is a need for a more consistent approach to calculating space utilization. Does it include only lined spaces or also unlined areas? Defining space utilization on a “consistent” basis can provide for more accurate understanding of current capacity or shortages.</li><li>• Share examples such as from Missouri DOT on low cost implementation strategies to provide truck parking – e.g., conversations with U.S. Army Corps of Engineers about using runway building material for truck parking lots; repurposing of closed/under-utilized lots, or those not sufficient for high demand all vehicle traffic but adequate for truck parking demands.</li></ul>

## Appendix A: Truck Parking Acronyms

Term	Definition
AASHTO	American Association of State Highway Transportation Officials
ATA	American Trucking Associations
ATMS	Advanced transportation management system
ATRI	American Transportation Research Institute
CAV	Connected and autonomous vehicles
CCTV	Closed-circuit television
CSCMP	Council of Supply Chain Management Professionals
DMS	Dynamic message signs
DOT	Department of Transportation
DPCS	Dynamic parking capacity signs
DPMS	Dynamic parking message signs
DSRC	Dedicated short range communications
E-commerce	Electronic commerce
ELD	Electronic logging device
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
HOS	Hours of service
I-	Interstate
IDA	Industrial development agency
IT	Information technology
ITD	Innovative Technology Deployment Program
ITS	Intelligent transportation systems
MARAD	U.S. Maritime Administration
MPO	Metropolitan Planning Organization
MVDS	Microwave vehicle detection system
MUTCD	Manual on Uniform Traffic Control Devices
NHFP	National Highway Freight Program
NIMBY	Not in my backyard
NOFO	Notice of Funding Opportunity
O&M	Operations and maintenance
OSOW	Oversize/Overweight

Term	Definition
ROW	Right-of-way
SAFETEA-LU	The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
STEM	Science, technology, engineering, and math
TEA-21	Transportation Equity Act for the 21 <sup>st</sup> Century
TIGER	Transportation Investment Generating Economic Recovery
TMC	Transportation management center
TPAS	Truck parking availability system
TPMS	Truck parking management system
TSM&O	Transportation Systems Management and Operations
USACE	United States Army Corps of Engineers
U.S. DOT	United States Department of Transportation

**Appendix B: Workshop Participants**

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