

NATIONAL
ACADEMIES

Sciences
Engineering
Medicine

TRB TRANSPORTATION RESEARCH BOARD

TRB Webinar: Truck Parking Strategies, Technologies, and Partnerships

May 2, 2023

2:00 – 3:30 PM



PDH Certification Information

1.5 Professional Development Hours (PDH) – see follow-up email

You must attend the entire webinar.

Questions? Contact Andie Pitchford at TRBwebinar@nas.edu

The Transportation Research Board has met the standards and requirements of the Registered Continuing Education Program. Credit earned on completion of this program will be reported to RCEP at RCEP.net. A certificate of completion will be issued to each participant. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the RCEP.

ENGINEERING



REGISTERED CONTINUING EDUCATION PROGRAM

AICP Credit Information

1.5 American Institute of Certified Planners Certification Maintenance Credits

You must attend the entire webinar

Log into the American Planning Association website to claim your credits

Contact AICP, not TRB, with questions

CLE Credit Information

1.25 Continuing Legal Education Credits from the American Bar Association

You must attend the entire webinar

TRB did not seek approval for this workshop from the state board, we advise you contact your state board to see if credit would be accepted

See email following webinar for the certificate to provide to your board

Purpose Statement

This webinar will provide a better understanding of the process for developing a truck parking information system along with successful strategies employed by leading agencies, technologies that might be considered to support sharing parking availability, and case studies of systems that may be transferable to other agencies. Presenters will share potential strategies for monitoring, ITS design, overcoming legal barriers, and funding mechanisms.

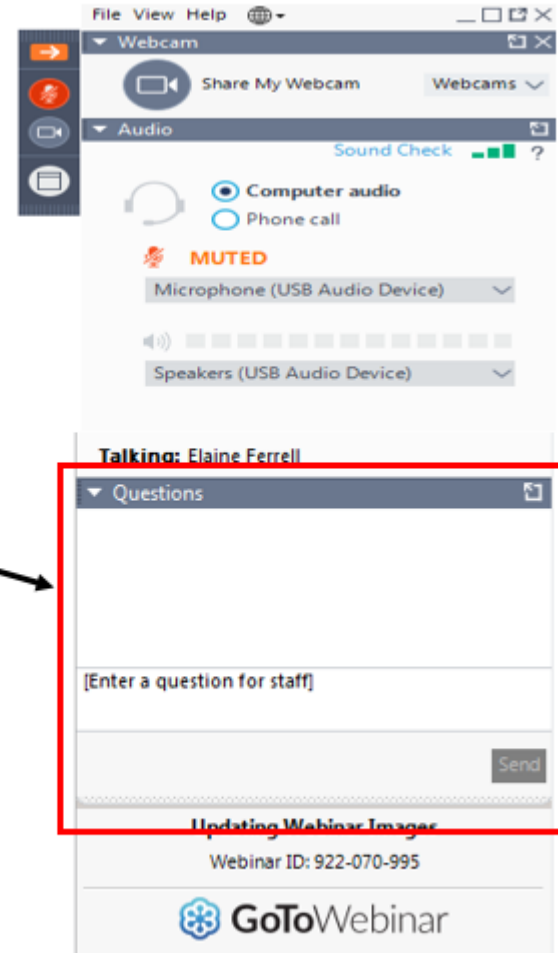
Learning Objectives

At the end of this webinar, you will be able to:

- Use resources for effective parking strategies and ensuring compatibility with adjacent land uses through local and regional policies
- Address current and future needs and challenges by working with local jurisdictions and understanding the government perspective
- Understand how truck parking providers give accurate, real-time availability information to facility users while gathering utilization data

Questions and Answers

- Please type your questions into your webinar control panel
- We will read your questions out loud, and answer as many as time allows



Today's Presenters



Erik Johnson
erik.johnson@vdot.virginia.gov
*Virginia Department of
Transportation*



Tiffany Julien
tiffany.julien@dot.gov
Federal Highway Administration

Craig Hurst
craig.hurst@state.co.us
*Colorado Department of
Transportation*



Scott Grenerth
sgrenerth@tsps.io
*Truck Specialized Information
Services*



U.S. Department of Transportation
Federal Highway Administration

Office of Operations

1200 New Jersey Avenue SE
Washington, D.C. 20590
<https://ops.fhwa.dot.gov/freight>

Over of the Truck Parking Development Handbook

Tiffany Julien, Transportation Specialist
FHWA Office of Freight Management and Operations

TRB Webinar
May 2, 2023



Disclaimer

The U.S. Government does not endorse products or manufacturers. Trademarks or manufacturers' names appear in this presentation only because they are considered essential to the objective of the presentation. They are included for informational purposes only and are not intended to reflect a preference, approval, or endorsement of any one product or entity.

This presentation was created and is being presented by the Federal Highway Administration (FHWA). The views and opinions expressed are those of the presenter and do not necessarily reflect those of FHWA or the United States Department of Transportation (USDOT). The contents do not necessarily reflect the official policy of the USDOT.



Overview of the Truck Parking Development Handbook



Why is Truck Parking Important?

Just as the trucking industry is critical to our Nation's economic success and way of life, **SAFE, ACCESSIBLE TRUCK PARKING** is critical to truck drivers



Long-haul

Long-haul drivers are on the road days and sometimes weeks at a time traveling across the country.



Staging

Truck drivers picking up and delivering freight at manufacturing plants, warehouses and distributions centers need a place to park to await their appointment time.



30-minute break

As part of the federally mandated 30-minute break, the driver must be off duty, meaning they are no longer working and will not have to move the truck for any reason.



Emergency

Drivers may be impacted by an incident that has either closed or severely congested the roadway, and they need a place to park.



Time off

Independent drivers don't have a company facility to provide parking during time off. They are done with their work week and need a place to park their truck while off-duty.

Jason's Law Truck Parking Survey and Assessment

- Truck parking shortages are still a major problem in every state and region.
- Major freight corridors and large metro areas have the most acute shortages.
- Shortages exist at all times of day, week and year, but mostly overnight and weekdays.
- Challenges exist in funding and maintaining truck parking for public and private sector.
- Truck stop operators need business models that incorporate parking profitably.
- Local government involvement and citizen awareness needed for effective discussions and realistic plans for truck parking.



Purpose of the Handbook

- Presents tools and strategies for local planners and officials to integrate truck parking with freight land uses
- Provides tools for estimating truck parking generation and needs
- Identifies public benefits of truck parking and benefit cost and economic impact analyses
- Discusses factors for identifying sites and designing truck parking
- Examines attributes that ensure truck parking areas are safe
- Provides case studies of successful truck parking developments



Truck Parking Demand

FACTORS DRIVING DEMAND FOR TRUCK PARKING

Federal Hours of Service (HOS) Regulations

Mandatory 10 hours of rest following 14 hours on duty

Required 30-minute breaks at prescribed intervals

Warehousing Logistics Inventory Management

Staging for pickup/delivery windows at factories and warehouses

Local parking for deliveries to replenish supplies and materials

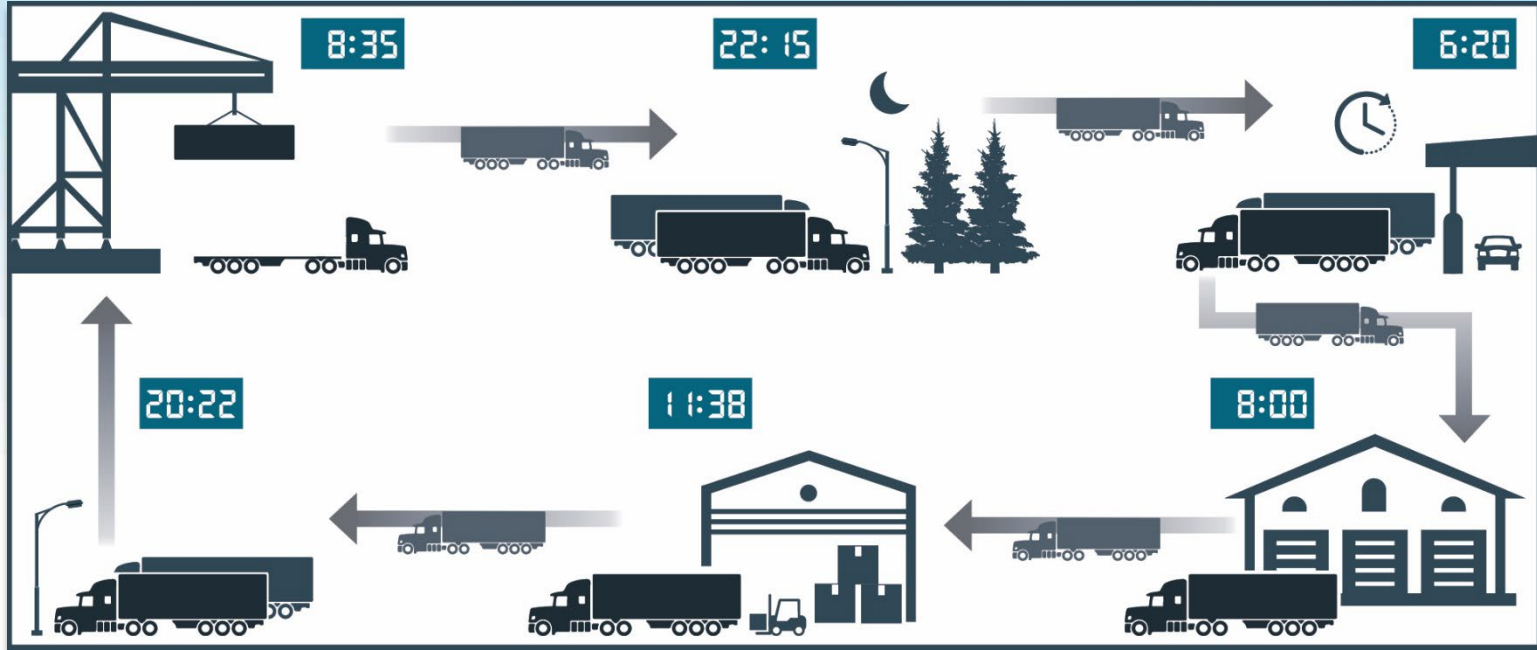
Other

Local parking for deliveries to replenish supplies and materials

Unplanned parking due to breakdowns, traffic incidents or weather-related closures



Illustrative Truck Trip with Stops



Source: Cambridge Systematics

Case Studies on Truck Parking Demand Estimation

- **National Cooperative Freight Research Program (NCFRP) Research Report 37: *Using Commodity Flow Survey Microdata and Other Establishment Data to Estimate the Generation of Freight, Freight Trips, and Service Trips: Guidebook*, 2016**
- **Maricopa County Association of Governments (MAG) Truck Parking Study, 2021**
- **Winston-Salem Innovations in Local Freight Data**
- **Texas A&M Transportation Institute (TTI) Truck Trip and Truck Parking Generation Study, 2021**
 - » Houston, Dallas and San Antonio, Texas
 - » Salisbury and Hagerstown, Maryland



A New Tool to Estimate Truck Parking

- Trip generation and truck parking studies were combined to estimate parking demand based on two inputs:
 - » North American Industrial Classification System (NAICS) code
 - » Number of employees
- Primary data sources:
 - » MAG Truck Parking Study
 - » TTI case studies in Texas and Maryland

Truck Parking Estimation Tool
 Green indicates fields that the user must populate, yellow fields can be changed by the user.
 Blue fields represent outputs or results of the estimation tool.

Linear Model Without Intercept

1 Estimate Daily Truck Stop Generation - 2 Digit NAICS Code

2-Digit NAICS

2- Digit NAICS Code	NAICS 31-33 Manufacturing
Coefficient	0.0077
Expansion Factor	4.67
Number of Employees	0

Daily Truck Stops Generated: 0

Estimate Distance of Truck Stops (for Industrial Facilities) - Prior to and after facility

First Stop Prior to Facility by Distance

Distance	Number of Stops
Less than 20 miles	0
20-50 miles	0
50-150 Miles	0
Longer Than 150 Miles	0

First Stop After Facility by Distance

Distance	Number of Stops
Less than 20 miles	0
20-50 miles	0
50-150 Miles	0
Longer Than 150 Miles	0

2 Estimate Peak Occupancy - 2-Digit NAICS Code

2-Digit NAICS

Estimation Tool | ReadMe | Parameters - Distance | Parameters - Linear Model 1 | +

Source: Cambridge Systematics

Discussion of Community Impacts of Truck Parking

BENEFITS

- » Enhances roadway and driver safety
- » Reduces unauthorized parking
- » Reduces roadway maintenance costs
- » Increases competitiveness

CONCERNS

- » Noise
- » Emissions
- » Community safety
- » Trash and litter
- » Low revenue generation
- » Community perception

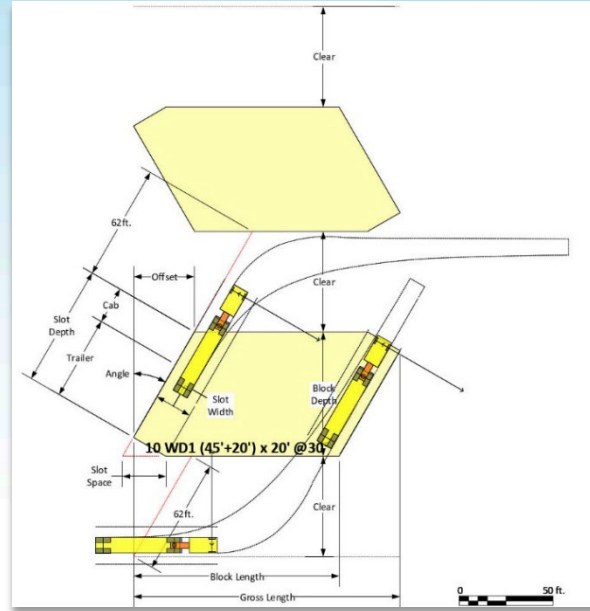
Mitigating Community Impacts of Freight Intensive Land Uses

- Avoid sites near residential land uses, schools, and other community amenities
- Co-locate with existing industrial developments
- Prioritize locations directly adjacent to major highways
- Assess the ability of access roadways to accommodate large trucks
- Consider how truck traffic may impact other critical transportation services
- Evaluate how siting choices will positively or negatively impact the equitable distribution of transportation externalities



Key Design Attributes

- Truck trip generation and parking demand
- Access, layout, and circulation
- Turning radius
- Parking stall design
- Parking slot type
- Swept path
- Slot density



- Roadway capacity and traffic congestion
- Roadway safety
- Air quality
- Noise emissions
- Light pollution
- Security at facilities

Improving Land Use and Zoning Policies

- Incorporate truck parking into Traffic Impact Assessments (TIA):
 - » Truck trips can generate parking near the site (staging) as well as farther away (staging or rest breaks)
 - » TIAs should include parking on-site and off-site to address changing demand for parking
- Revising Ordinances and Policies:
 - » Zoning code should require minimum truck parking on-site, similar to minimum parking requirements for residents, employees, or customers
 - » Handbook proposes language options based on square footage, employees, and loading docks
 - » Implemented by Township of Upper Macungie, Pennsylvania



Barriers and Benefits of On-Site Parking

- Barriers
 - » Not commonly required today
 - » May be limited to new or re-developments
 - » State and local zoning powers and policies vary throughout nation
- Benefits
 - » Concentrates parking supply at point of staging demand
 - » Improves driver conditions → potential to become a shipper of choice
 - » Site already generates truck traffic and associated externalities



Barriers and Benefits of Shared Parking Facilities

- Barriers
 - » Private businesses and property owners may have liability concerns
 - » Security policies at land, air, and water ports may limit when and where parking can occur
 - » Suitable publicly-owned sites often need to fulfill other purposes (inspection sites, chain-up lots, weigh scales, park-and-rides)
- Benefits
 - » Increases efficiency of parking in a concentrated area
 - » Sites can be located near existing centers of truck activity
 - » Security, wayfinding, waste, and maintenance are consolidated



Desired Safety Features of Truck Parking Facilities



**INGRESS AND EGRESS
RAMPS OF
SUFFICIENT LENGTH**



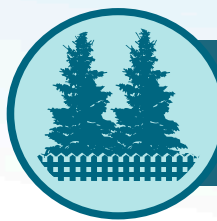
SUFFICIENT LIGHTING



**SECURITY CAMERAS
OR LOT
ATTENDANTS**



**SITE DESIGN
ALLOWING EFFICIENT
FLOW OF TRAFFIC**



**FENCING OR OTHER
BARRIER SURROUNDING
THE LOT**



SECURE BATHROOMS

Source: Cambridge Systematics





U.S. Department of Transportation
Federal Highway Administration

Office of Operations
1200 New Jersey Avenue SE
Washington, D.C. 20590
<https://ops.fhwa.dot.gov/freight>

For more information:

Jeff Purdy, Team Lead
Office of Freight Management and Operations
Federal Highway Administration Office of Operations
Jeffrey.purdy@dot.gov

Amber Reimnitz, Transportation Specialist
Office of Freight Management and Operations
Federal Highway Administration Office of Operations
Amber.Reimnitz@dot.gov





Planning and Local Partnerships for Implementation

Craig Hurst
CDOT Freight Mobility & Safety Branch Manager

Defining the Problem

- State DOT's are working with industry stakeholders to identify truck parking needs and potential solutions.
- Funding potential solutions can be challenging, but funding is not our only hurdle.
- Local land use and zoning laws can add major additional costs or even prohibit the development.
- Long term operations costs create similar challenges that many states face with their rest areas.
- Regulations and a shifting economy have highlighted or created new challenges in capacity needs.
- State DOT's are trying to solve problems with limited authority to do so.



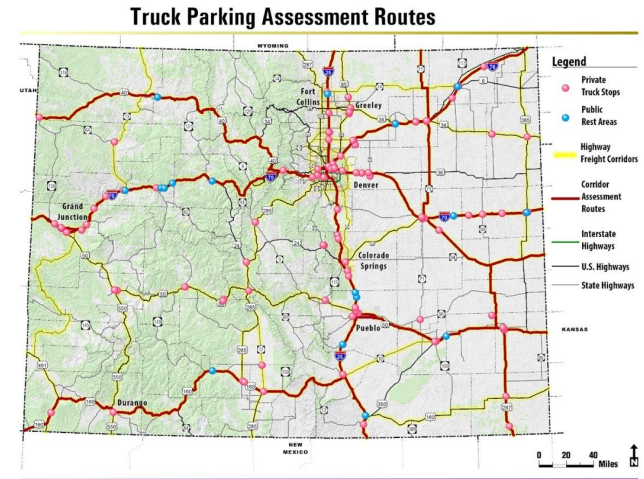
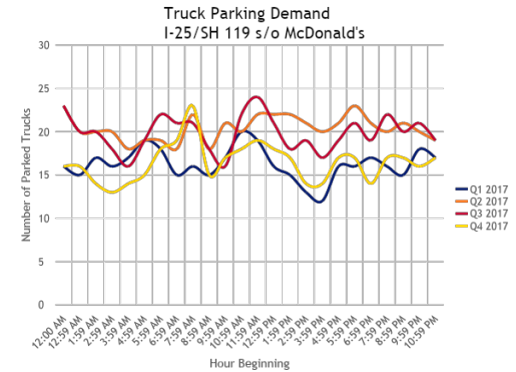


Needs Assessment

- Many states have been working on Truck Parking Needs Assessments
- FHWA has supported many workshops that bring the industry, state DOTs and state law enforcement together.
- These efforts go in detail by studying peak needs on freight corridors and identifying multiple need types in each region.
- Discussions around policy framework and implementation
- Data management and dissemination

Needs Assessment

- The needs assessment should produce data and strategies that can be utilized for decision making and educating local and regional planning partners.
- Use GIS tools to map the statewide inventory.
- Highlight amenities and use needs on freight corridors.
- Understand high demand locations and their busiest times of year.
- Develop a dissemination plan on how this information can be utilized by planning partners in MPOs and TPRs, or at the local level.



Funding



- There is a variety of funding strategies being implemented by state DOTs around the country.
- National Highway Freight Program is the most common source of funding.
- Finding unused right of way can help keep costs down,
- Remaining available real estate can be costly in a developed area.
- Funding is usually a solvable challenge, but there are other challenges to overcome.

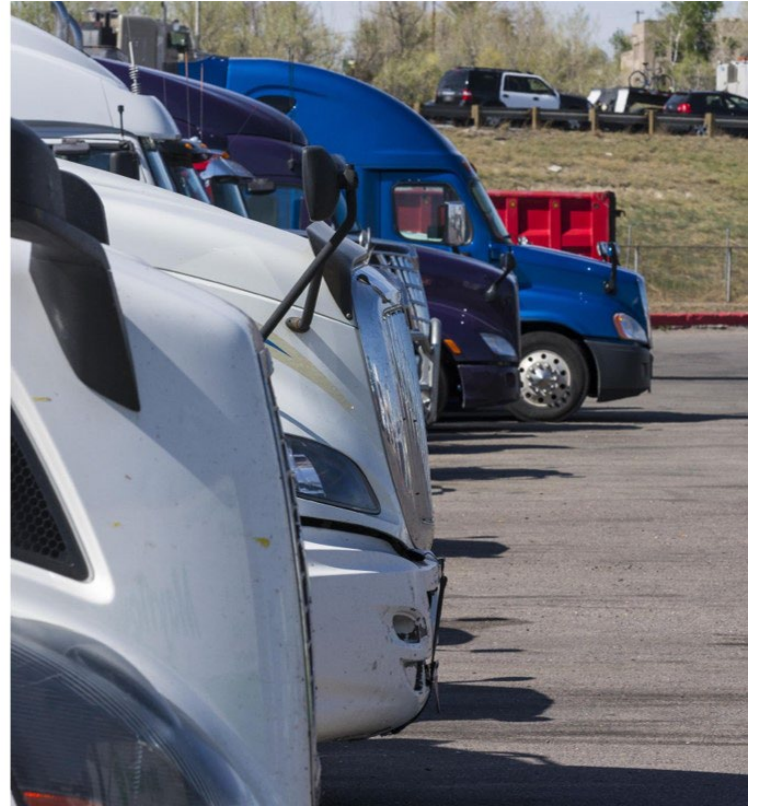


Local Land Use and Zoning

- Local land use and zoning regulations can be a significant challenge to implementation whether it is from the private or public sector.
- Most states do not have the land use authority to approve developments to override local regulation.
- Many times, the locations that make sense are unattainable for many reasons.
- Local community push back is common whether it is a private or public development.
- Mitigating the community's concerns without sacrificing safety or extreme location changes is the goal.

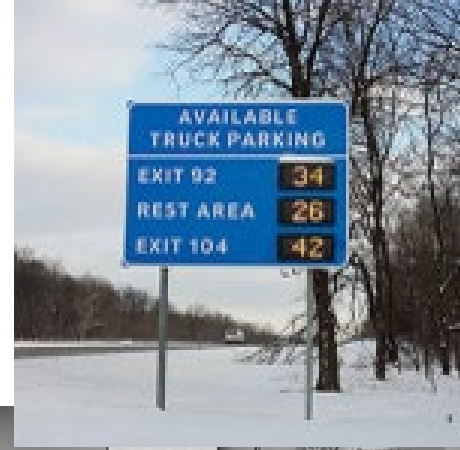
Challenges

- The states cannot sell good and services within the right of way, so there is a challenge to keep up on operational costs of any public facility that we manage.
- The US economy has been transitioning and the COVID pandemic accelerated those transitions. Middle mile operations can generate more demand for truck parking.
- We are not building solutions alongside new warehousing and distribution centers.



Mitigating and Overcoming

- States need to work to develop partnerships in areas of greatest needs.
- Work to incentivize private investment that will not be faced with the same operating challenges.
- Continue to educate local authorities and planning partners about the benefits their community we experience by developing a safe and cost-effective truck parking solution.
- Identify locations that expand or enhance current truck parking options.
- Future electrification charging needs often overlap and truck parking plans can begin to align with electrification plans.



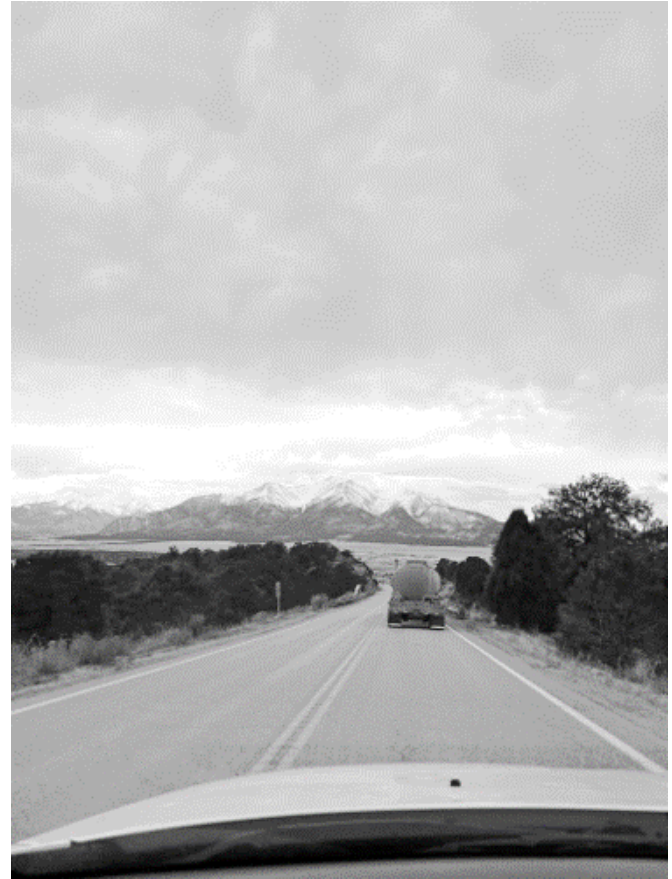
Building Partnerships



- Work to build incentives into the community development
- Calculate the value to the local community
- Develop partnerships that expand current locations
- Enhance unused state owned right of way
- Identify and develop emergency truck parking locations and plans.
- Work with economic development groups
- Develop policy framework that will bring the solutions alongside new development.

Craig Hurst - CDOT
Freight Mobility &
Safety Branch Manager

craig.hurst@state.co.us



Experience Deploying Truck Parking Information Management Systems



Scott Grenerth

Director of Engagement

sgrenerth@tsps.io

419.306.7575

May 2, 2023

Truck Specialized Information Services

Over 1 million
accident-free
over-the-road
miles



Approx ¼ million
pounds of grain
a year ago

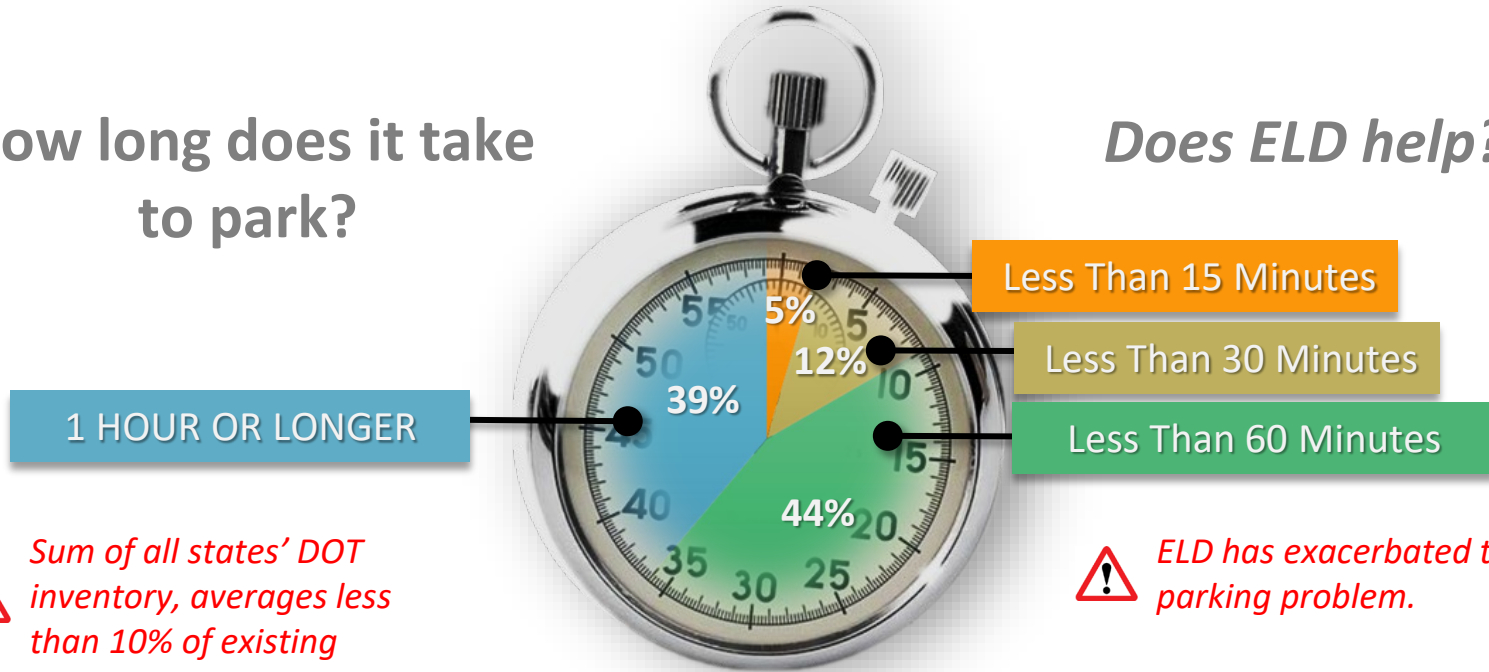
- Truck Parking: 30 second Overview
- Action, Big Picture
- Agnostic look at technology
- Funding options for TPIMS



Truckers face multiple challenges

How long does it take
to park?

Does ELD help?



Sum of all states' DOT inventory, averages less than 10% of existing inventory.



ELD has exacerbated the parking problem.

Not in control of time

- Shippers/receivers control loading/unloading times
 - “Plan A” can quickly become plan E or F or worse.
- No crystal ball on the dashboard of the truck

U.S. Department of Transportation
Federal Highway Administration

Office of the Administrator

1200 New Jersey Ave., SE
Washington, D.C. 20590**Notice of Enforcement Discretion****Operation of Commercial Food Trucks in Federally Funded Interstate Highway Rest Areas
During the Public Health Emergency (COVID-19)**

U.S. Department of Transportation

Federal Highway Administration

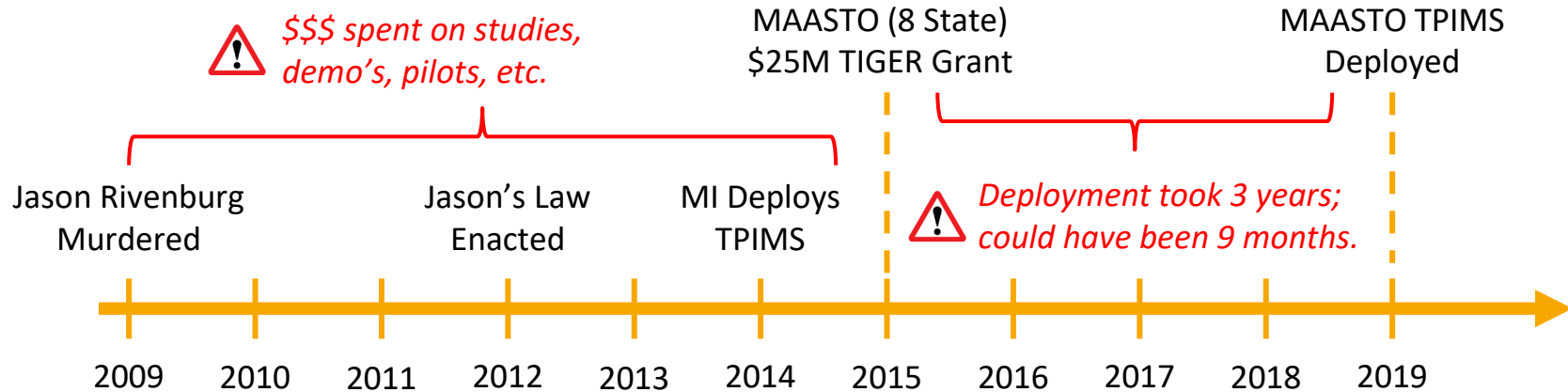
As a general matter, Federal law, codified at 23 U.S.C. 111, prohibits commercial activity in Interstate Highway rest areas as a condition of Federal funding. Nevertheless, in administering the Federal-aid highway funding program, the FHWA Administrator is given wide discretion under 23 CFR 1.36 to enforce the requirements of section 111 through compliance actions that the Administrator determines are appropriate under the circumstances.

The Nation is experiencing extraordinary and unprecedented circumstances due to the current COVID-19 national public health emergency, in which States have been forced to close restaurants and other available food service accommodations, including in Interstate Highway rest areas. FHWA recognizes that in those States food trucks may provide vital sustenance for interstate commercial truck drivers and others who are critical to the Nation's continued ability to deliver needed food and relief supplies to the communities impacted by the economic disruptions and healthcare strains caused by COVID-19. FHWA also recognizes that in such circumstances, vending machines may not be adequate to provide the necessary sustenance, and in many cases the vending machines may not be regularly stocked at the present time.

Accordingly, for the duration of the national emergency declared by the President on March 13, 2020, in response to the COVID-19 public health emergency, if a State determines that permitting food trucks to operate and sell food in any designated federally funded Interstate Highway rest areas is necessary to support interstate commercial truck drivers, FHWA will refrain from taking any remedial action under the Federal-aid highway program against that State. States must come back into compliance with the applicable restrictions of section 111 once the presidentially declared emergency ends. Any State that fails to come back into compliance after the end of the declared national emergency will be subject to potential remedial measures. Additionally, in accordance with 23 U.S.C. 156(b), for the limited purpose of permitting food trucks to operate as described in this notice, FHWA grants an exception during the COVID-19 emergency to the requirement to charge fair market value for the sale, use, lease, or lease renewal of any real property acquired with Federal assistance.



4 Years... MAASTO Deployed



Michael Boeglin
Murdered

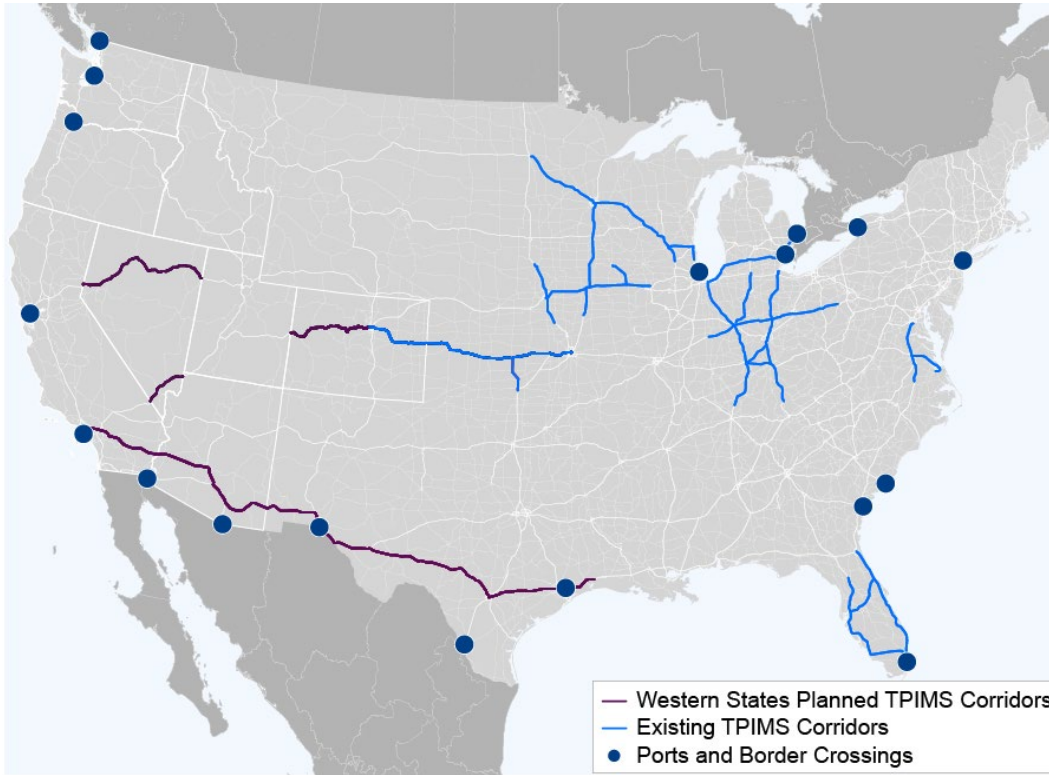


Remains of Michael Boeglin's Truck

A very incomplete network

Fill in the Gaps

Connect a
North American Truck
Parking Network



Complete the Network

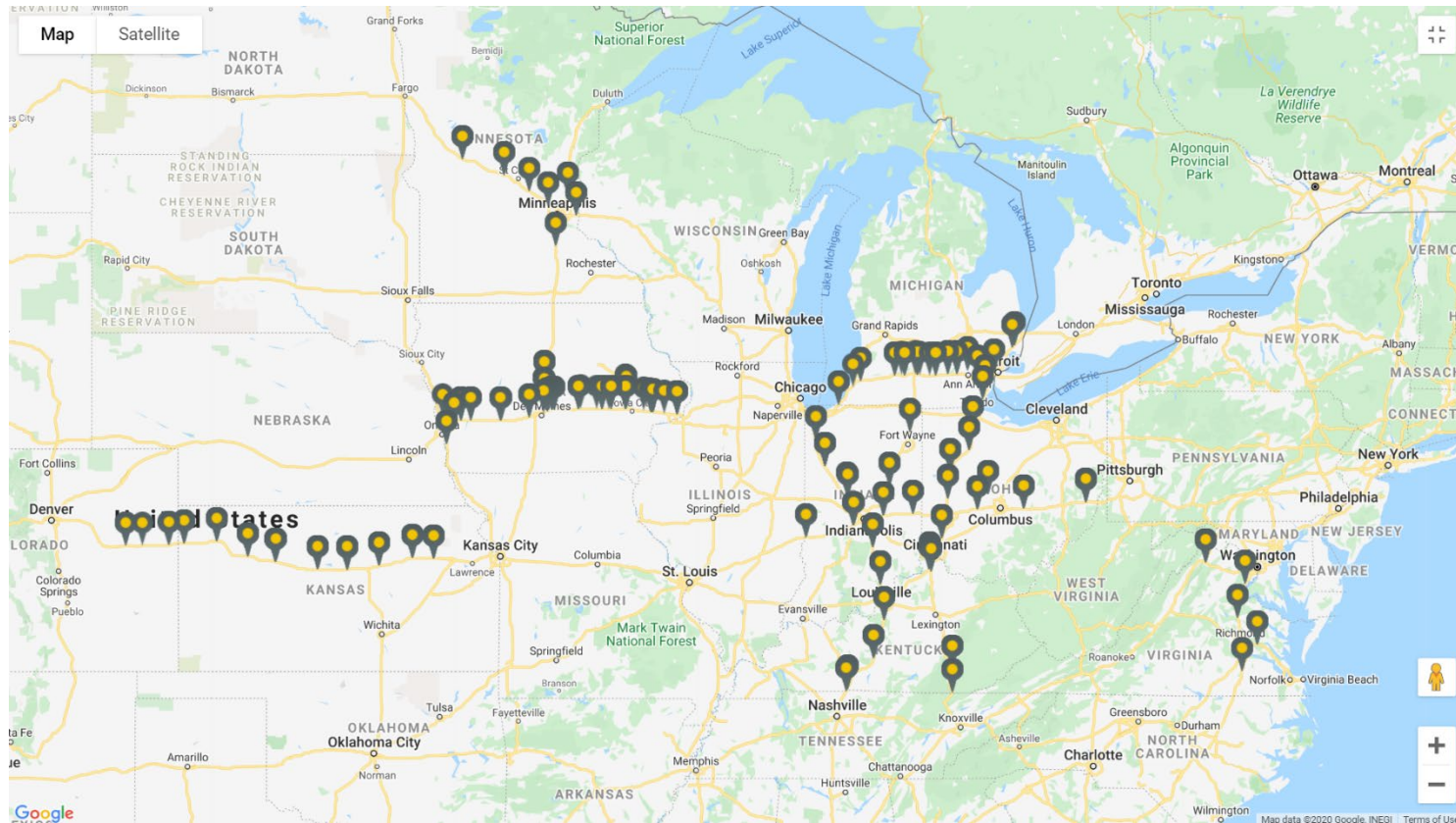
Successfully implement
private truck stops as
part of the network

(such as Michigan,
Iowa, Colorado already
have)

Not enough inventory!
At the time and place truckers need it.

Not enough information!
Not real-time to make decisions.

Multi-state, but large gaps



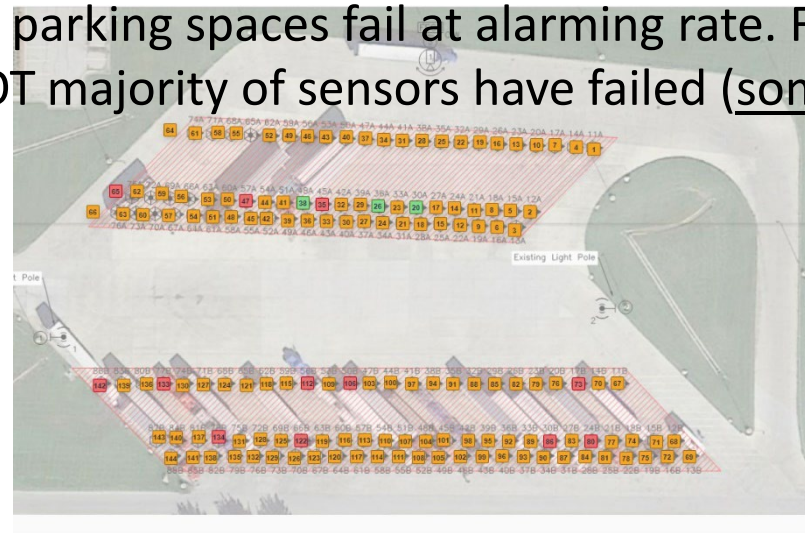
Gathering Information

- **Screenline** –Sensor at entrance/exit to facility.
 - This allows for a counting of every vehicle between the entry exit, including unauthorized parking.



Gathering Information

- Spot specific-** Pucks installed at each space allow for a minimal amount of extra data.
 - Puck in pavement within the parking spaces fail at alarming rate. FDOT, 30 days in 10% had failed. IA DOT majority of sensors have failed (some adjustments can be made).



Activated

22

Off

122

Key

- Sensor is Activated
- Sensor is Deactivated
- Sensor is Not Reporting

Options

Upgrade Overlay

Configure Sensors

Sensor types

- Magnetometer (puck)
 - Lowest upfront cost
 - Invasive install
 - Short lifespan (dramatically shorter than battery lifespan)
 - Minimal data (metal object above, or not)

Sensor types

- Video Analytics
 - Above ground install (not invasive)
 - Potential for additional data about vehicles
 - Can work well in good weather
 - Weather is not always good
 - ODOT internal system

Sensor types

- Modern High Frequency Radar
 - Above ground install (not invasive)
 - Accurate in all weather (Rain, Snow, Fog, Smoke, Low Light)
 - Additional data about vehicles (FHWA categories)
 - Sensor fusion with video analytics = more data (re-identification)

What data do you need/want?

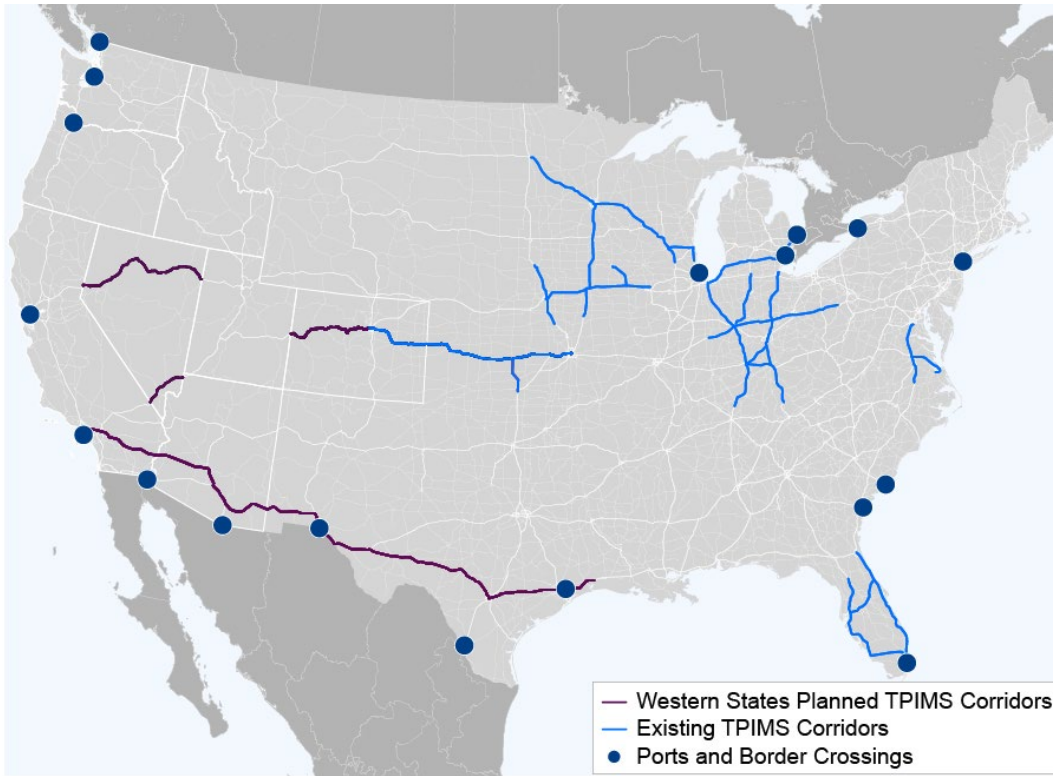
- Availability of spaces?
- Vehicle type (FHWA categorization)?
- More?
- Site complications? (Trees? There's an arm for that)

Recommendations

- Talk with other states, learn, act.
- Include private truck stops!!! (Showers, Hot food, Supplies)
- Vendor should have **effective** experience recruiting private truck stops.
- Include sign management, O&M.
 - Can this be from data budget?
- Demonstration opportunities with other states?
- Insist on standards compliance.
- Look at all funding options (FMCSA for technology solutions).

How can you be part of the solution?

A complete North American Truck Parking Network can happen



Complete the Network

Include private truck stops in the network

MI, IA, CO

Increase inventory!
Locate it where truckers need it.

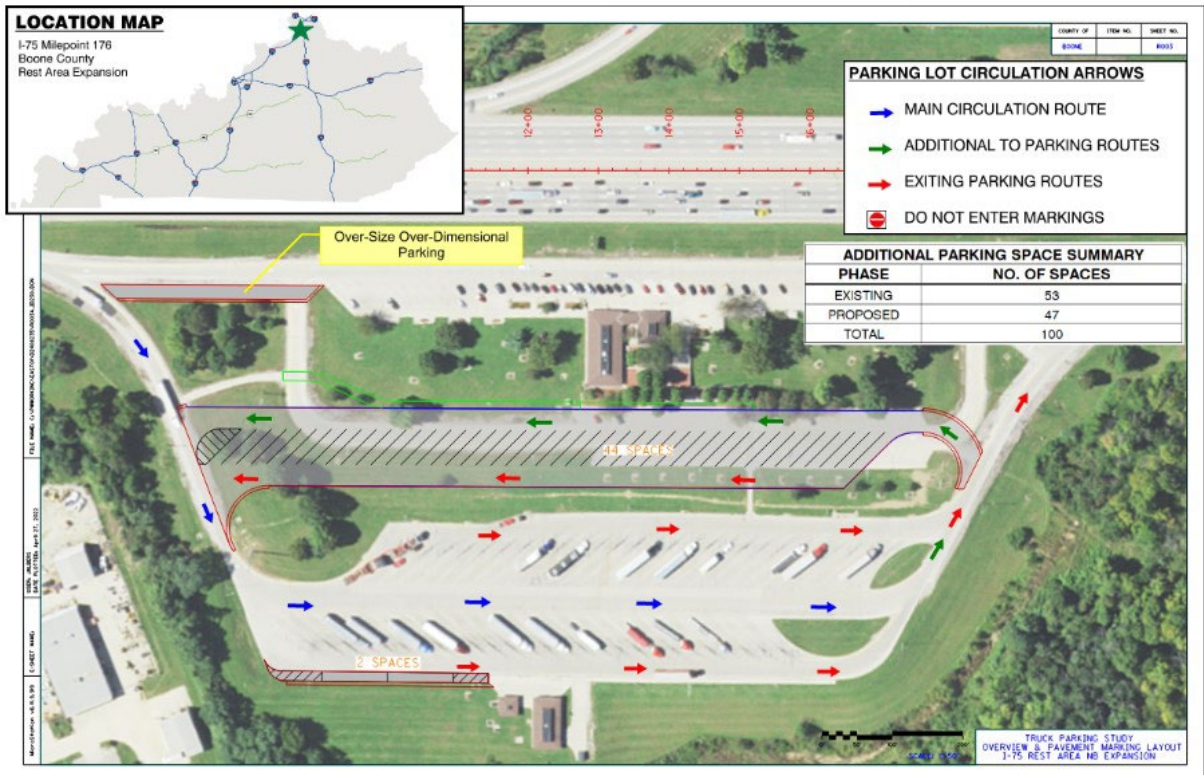
Provide real-time information!
Can bad news be “good news” (no spaces available)?



- What assets are available for capacity expansion?
 - Former weigh stations
 - Former rest areas (truck parking only)
 - Former construction staging areas
 - Any P3 opportunities?

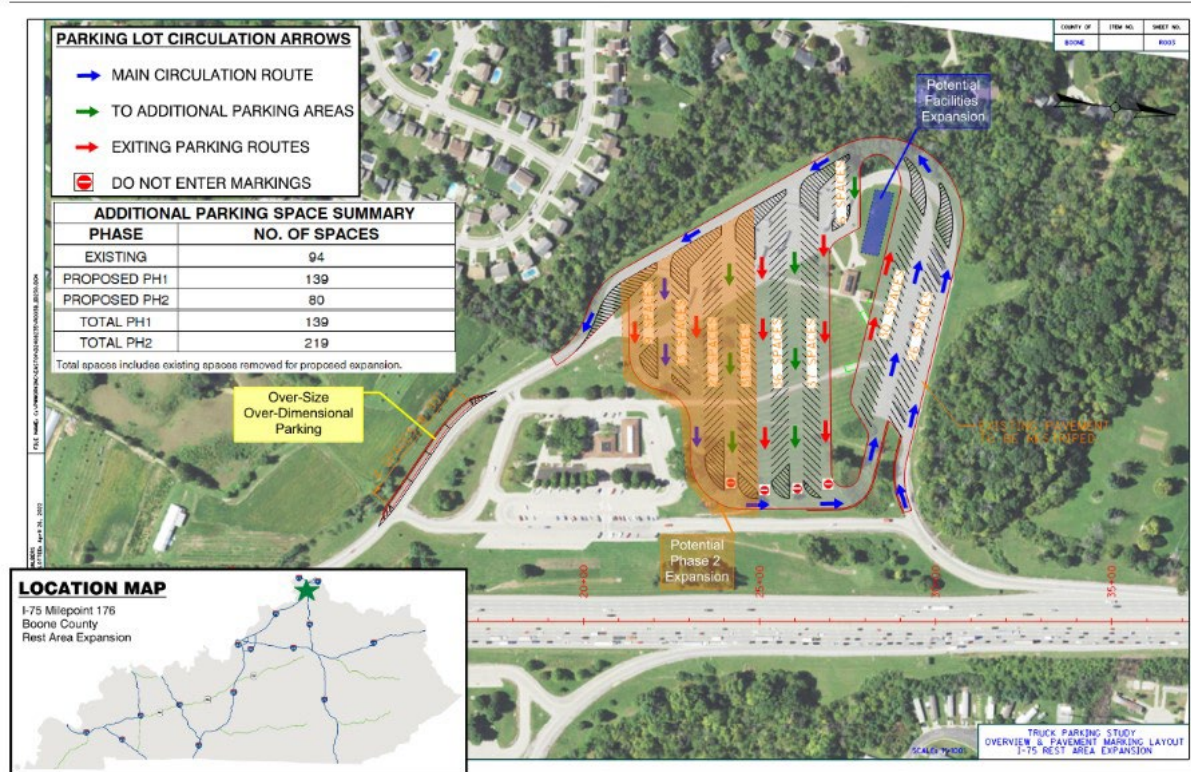
KY Transportation Cabinet

Project Layout Plan - I-75 - Boone County - Milepoint 176 NB Rest Area



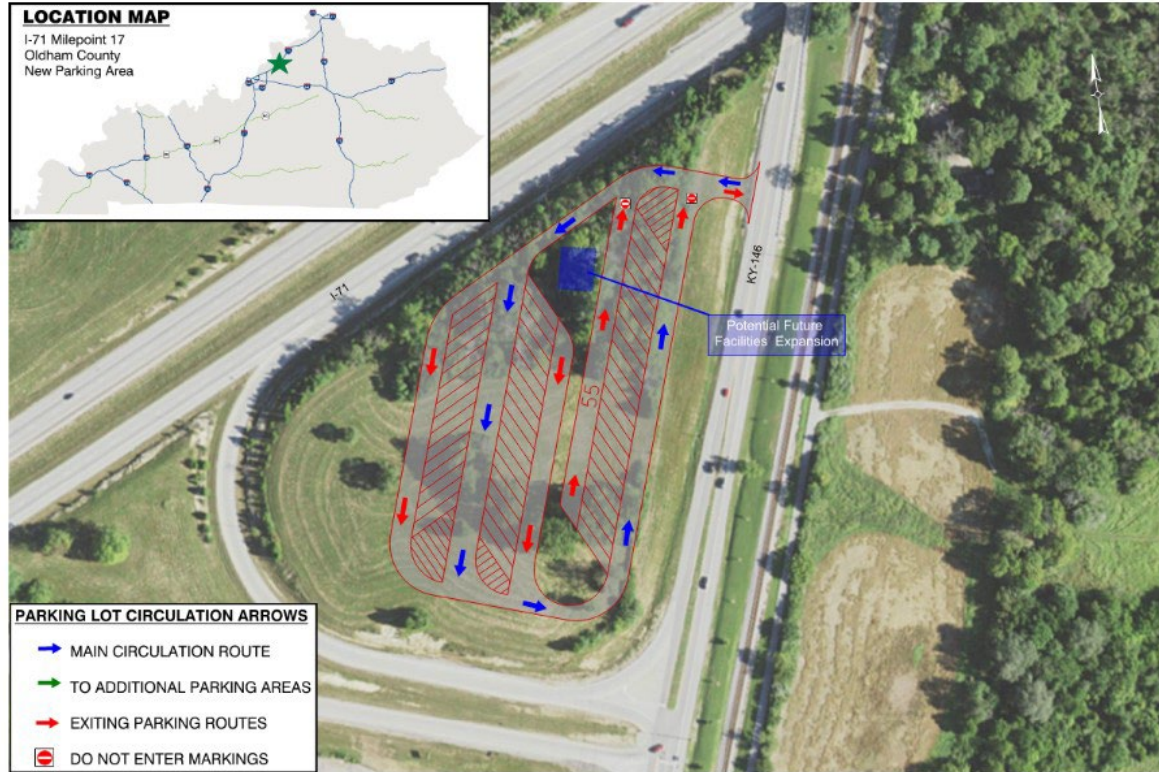
KY Transportation Cabinet

Project Layout Plan - I-75 - Boone County - Milepoint 176 SB Rest Area



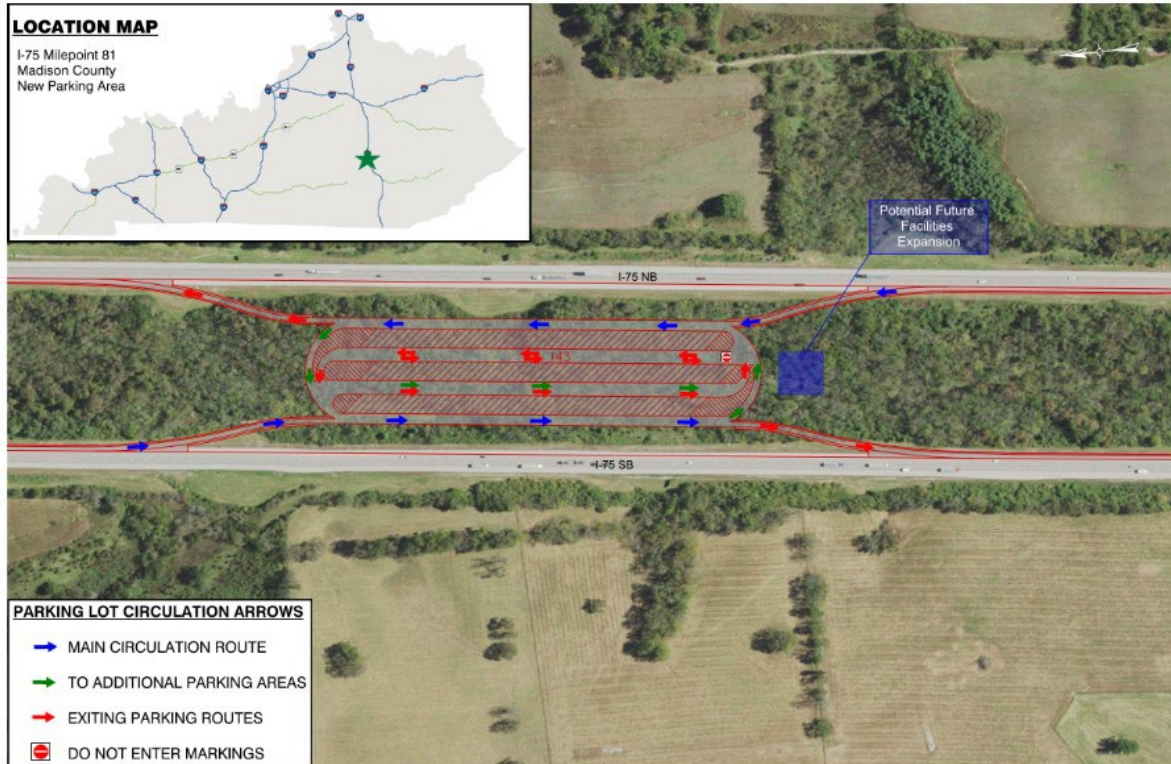
KY Transportation Cabinet

Project Layout Plan - I-71 - Oldham County - Milepoint 17 Infield



KY Transportation Cabinet

Project Layout Plan - I-75 - Madison County - Milepoint 81 Median





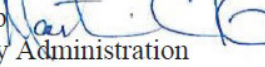
U.S. Department
of Transportation
Federal Highway
Administration

Federal Motor
Carrier Safety
Administration

Memorandum

Subject: **INFORMATION:** Eligibility of Title 23
and Title 49 Federal Funds for Commercial
Motor Vehicle Parking
(Updated)

Date: September 20, 2022

From: Martin C. Knopp 
Federal Highway Administration
Associate Administrator for Operations

In Reply Refer To:
HOFM-1

Tom Keane THOMAS P KEANE Digitally signed by THOMAS P KEANE
Date: 2022.09.16 22:47:43 -0400
Federal Motor Carrier Safety Administration
Associate Administrator for Research and
Registration

To: Division Administrators

The purpose of this memorandum is to provide information on funding eligibility for commercial motor vehicle parking projects and to highlight the new requirements for commercial motor vehicle parking assessments as part of State Freight Plans to support safe and efficient movement of freight on the National Highway System and other major roads.

**15 different silos
of funding
available for
truck parking
from FHWA and
FMCSA**

Questions

Scott Grenerth

sgrenerth@tsis.io

419.306.7575



Today's Presenters



Erik Johnson
erik.johnson@vdot.virginia.gov
*Virginia Department of
Transportation*



Tiffany Julien
tiffany.julien@dot.gov
Federal Highway Administration



Craig Hurst
craig.hurst@state.co.us
*Colorado Department of
Transportation*



Scott Grenerth
sgrenerth@tsps.io
*Truck Specialized Information
Services*



Upcoming events for you

May 9-10, 2023

TRB's International Conference on
Road Weather and Winter
Maintenance

July 8-11, 2023

TRB's National Conference on
Transportation Asset Management

[https://www.nationalacademies.org/trb/
events](https://www.nationalacademies.org/trb/events)

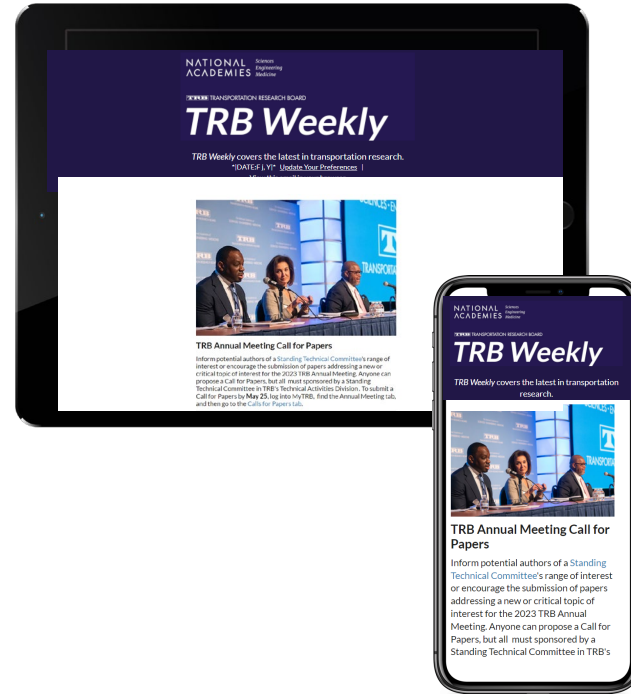


Subscribe to *TRB Weekly*

If your agency, university, or organization perform transportation research, you and your colleagues need the *TRB Weekly* newsletter in your inboxes!

Each Tuesday, we announce the latest:

- RFPs
- TRB's many industry-focused webinars and events
- 3-5 new TRB reports each week
- Top research across the industry



Spread the word and subscribe!

<https://bit.ly/ResubscribeTRBWeekly>

Discover new TRB Webinars weekly

Set your preferred topics to get the latest listed webinars and those coming up soon every Wednesday, curated especially for you!

<https://mailchi.mp/nas.edu/trbwebinars>

And follow #TRBwebinar on social media



Get involved

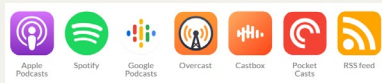
<https://www.nationalacademies.org/trb/get-involved>

- **Become a Friend of a Standing Technical Committee**

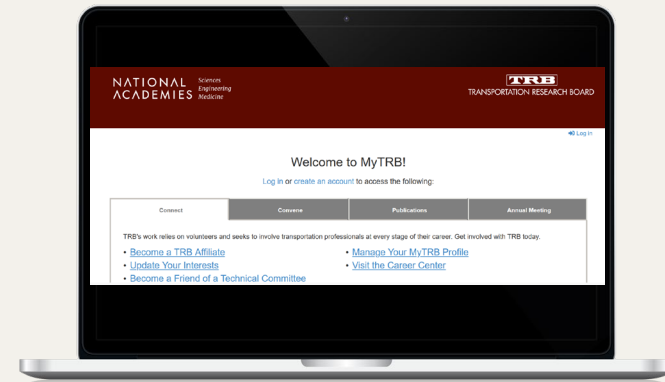
Network and pursue a path to Standing Committee membership

- **Work with a CRP**

- **Listen to our podcast**



<https://www.nationalacademies.org/podcasts/trb>



We want to hear from you

- Take our survey
- Tell us how you use TRB Webinars in your work at trbwebinar@nas.edu

