NATIONAL ACADEMIES Sciences Engineering Medicine

TRB TRANSPORTATION RESEARCH BOARD

TRB Webinar: Navigating Current and Future Freight Challenges

May 8, 2025

1:00 – 2:30 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.

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REGISTERED CONTINUING EDUCATION PROGRAM

Purpose Statement

This webinar will explore strategies and innovations addressing these pressing freight mobility challenges. Presenters will highlight innovative approaches to mobility during emergencies, freight trip generation dynamics in urban settings, and the economic and operational costs of inadequate truck parking infrastructure.

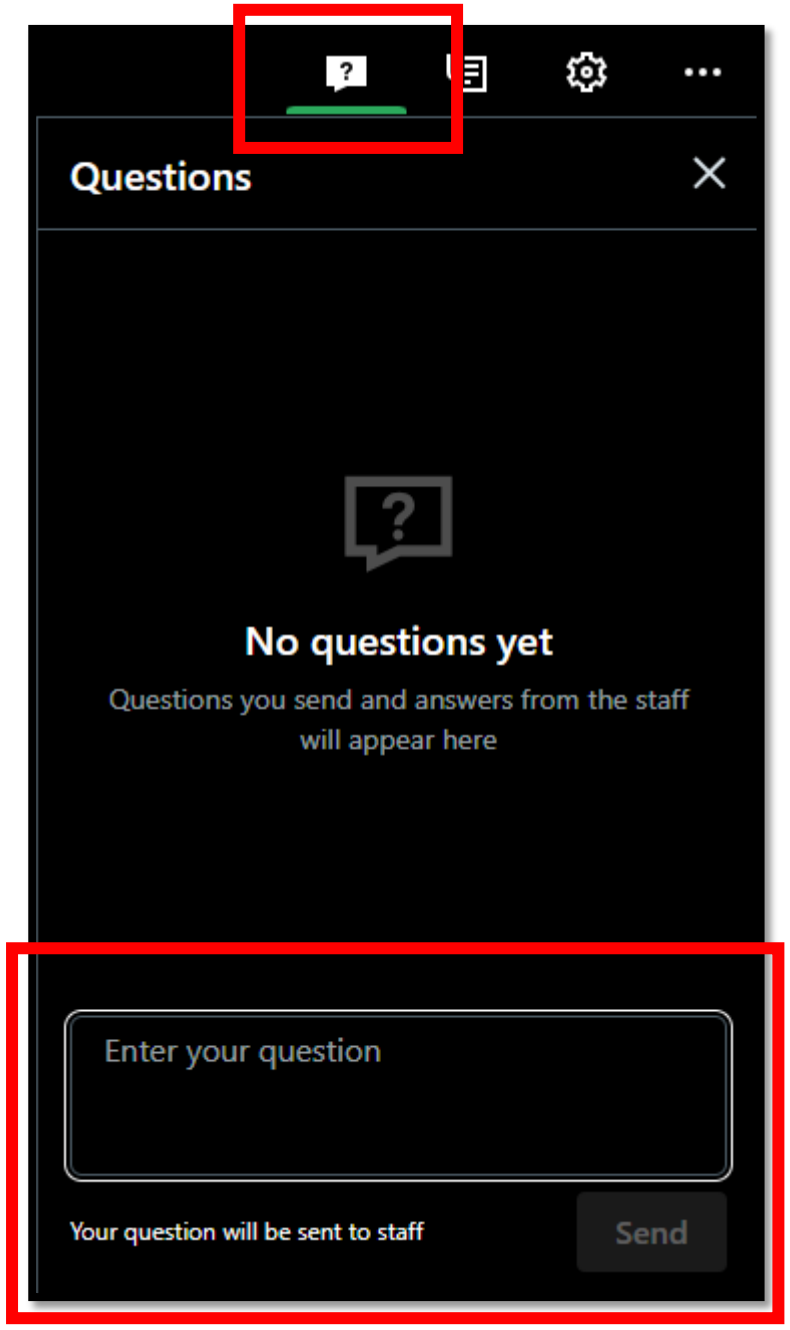
Learning Objectives

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

- Understand what works and does not work in emergencies in terms of freight mobility of overweight loads
- Apply actionable strategies for a more sustainable and resilient freight system

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

Sebastian Guerrero
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WSP

Janice Marino-Doyle
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New Jersey Department of Transportation

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Texas A&M Transportation Institute

NATIONAL ACADEMIES *Sciences Engineering Medicine*

TRB Webinar

Transporting Freight In Emergencies: Special Permits And Weight Requirements

Texas A&M Transportation Institute

Problem

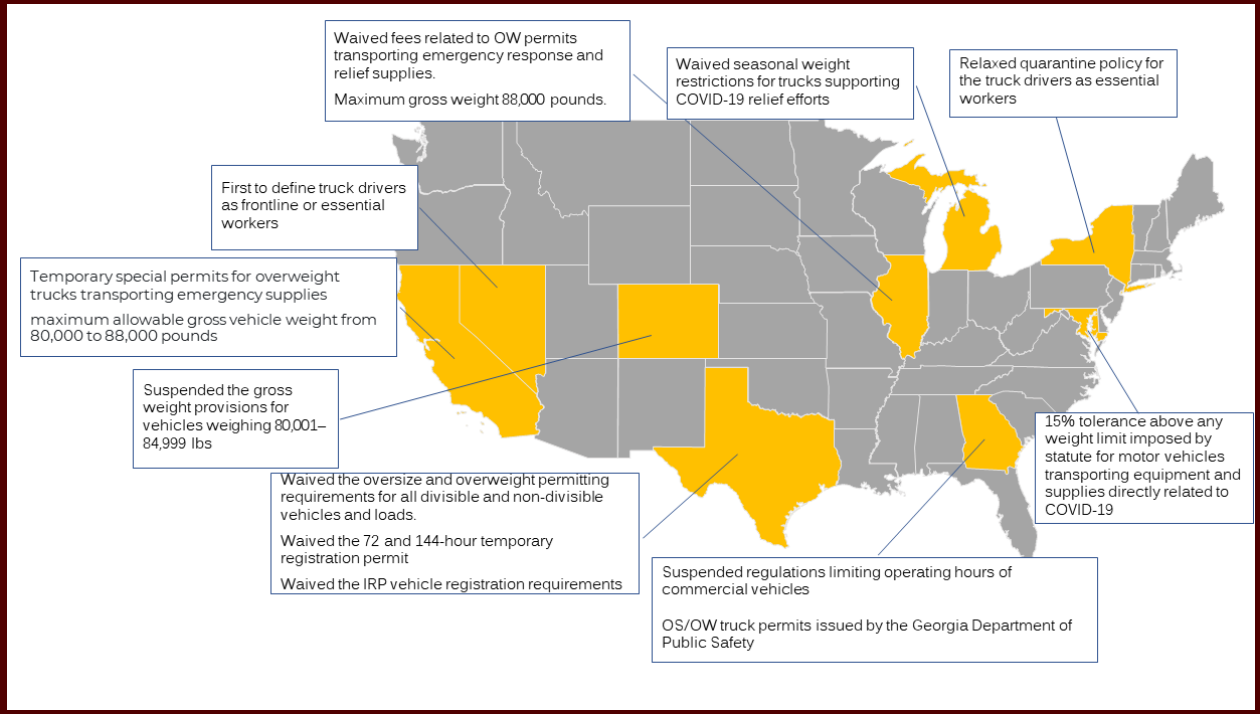
During COVID-19, states and federal agencies eased CMV weight limits to support emergency transport.

States adopted varying and sometimes conflicting regulatory approaches:

- **X-state** suspended gross weight provisions for 80,001–84,999 lbs.
- **Neighboring states** allowed CMV weights up to 90,000–100,000 lbs.
- **Other states** also implemented temporary relief measures.

These inconsistencies created **confusion and compliance challenges** for CMV operators crossing state lines.

Key Issue: Lack of consistency and harmonization across jurisdictions in OS/OW regulations.



RESEARCH PANEL & TEAM

NCHRP 23-13(05) : Regulatory Relief of Commercial Vehicle Weight Requirements for Emergency Transportation of Critical Commodities

Research Panel	Research Team [TTI]
Scott Singer (Chair) [Michigan DOT]	Sushant Sharma (PI)
Lisa Destro [Cambridge Systematics]	David Bierling
Evangelos Kaisar [Florida Atlantic University]	Curtis Morgan
Geno Koehler [Illinois DOT]	Brad Trefz
Jonathan Nicastro [New York DOT]	Jeff Warner
Diana Ramirez-Rios [University at Buffalo]	Michelle Benoit
Thomas Schriber [CALTRANS]	
John Berg [FHWA]	
Trey Wadsworth (SPO) & Mazen Alsharif (SPA) [TRB]	

Acknowledgement

Brad Marten,
Carla Phelps,
Chester Osborne,
Craig Hurst,
Dave Huft,
Douglas Briggs,
DuWayne Murdock,
Geno Koehler,
Jacqueline Darr,
Jake Elovirta,
Katrina Williams,
Laura McNeil,
Michael Spurlock,
Scott Greene,
Thomas Schriber,
Tina Sanders,
Tonya Barnes,
Veronica Martin,
Veronica Thomas,

AASHTO's Subcommittee on Freight Operations,

RESEARCH OBJECTIVES

1. Develop consistent definition of emergencies, emergency commodities (classification/type), and other concepts.

2. Identify successful practices, procedures, and processes for increasing weight limits during emergencies, including coordination and harmonization with neighboring jurisdictions.

3. Develop a decision framework that considers different emergency scenarios that are linked with successful practices, procedures, and processes.

4. Highlight successful communication practices and training opportunities to conduct before emergencies occur.

Information/Data Collection

Texas A&M Transportation Institute

Survey Introduction.

NCHRP Project: Regulatory Relief of Commercial Vehicle Weight Requirements for Emergency Transportation of Critical Commodities.

Dear Participant,

The Texas A&M Transportation Institute is leading an NCHRP project on regulatory relief of commercial vehicle weight requirements for emergency transportation of critical commodities.

The objectives of the research are to:
1) Develop consistent definitions of emergencies, emergency commodities
2) Identify successful practices, procedures, and processes for increasing weight limits during emergencies, including coordination and harmonization with neighboring jurisdictions
3) Develop a decision framework that considers different emergency scenarios that are linked with successful practices, procedures, and processes
4) Highlight successful communication practices and training opportunities to conduct before emergencies occur.

This survey will help state and federal agencies improve how State Departments of Transportation (DOT) coordinate and implement regulatory relief for commercial vehicles weight requirements during emergencies. Project report will not attribute specific information associated with you or your agency without your permission. Your participation is most appreciated.

You have been identified as the appropriate person at your DOT to complete this survey. The survey link that you received is unique to your DOT. If it would be more appropriate for someone else at your DOT to take this survey, please forward the email with the survey link to them or send their name and email address to Sushant Sharma (s-sharma@tti.tamu.edu).

Online Survey

Please complete this survey by **April 7, 2023**. It will take **around 10 minutes of your time**. Questions regarding the project or survey should be directed to the Principal Investigator, Sushant Sharma, at (817) 462-0508 or s-sharma@tti.tamu.edu. Any supporting materials may be sent by email to Sushant or uploaded in lieu of providing URLs. Thank you for participating in this survey!

SURVEY INSTRUCTIONS

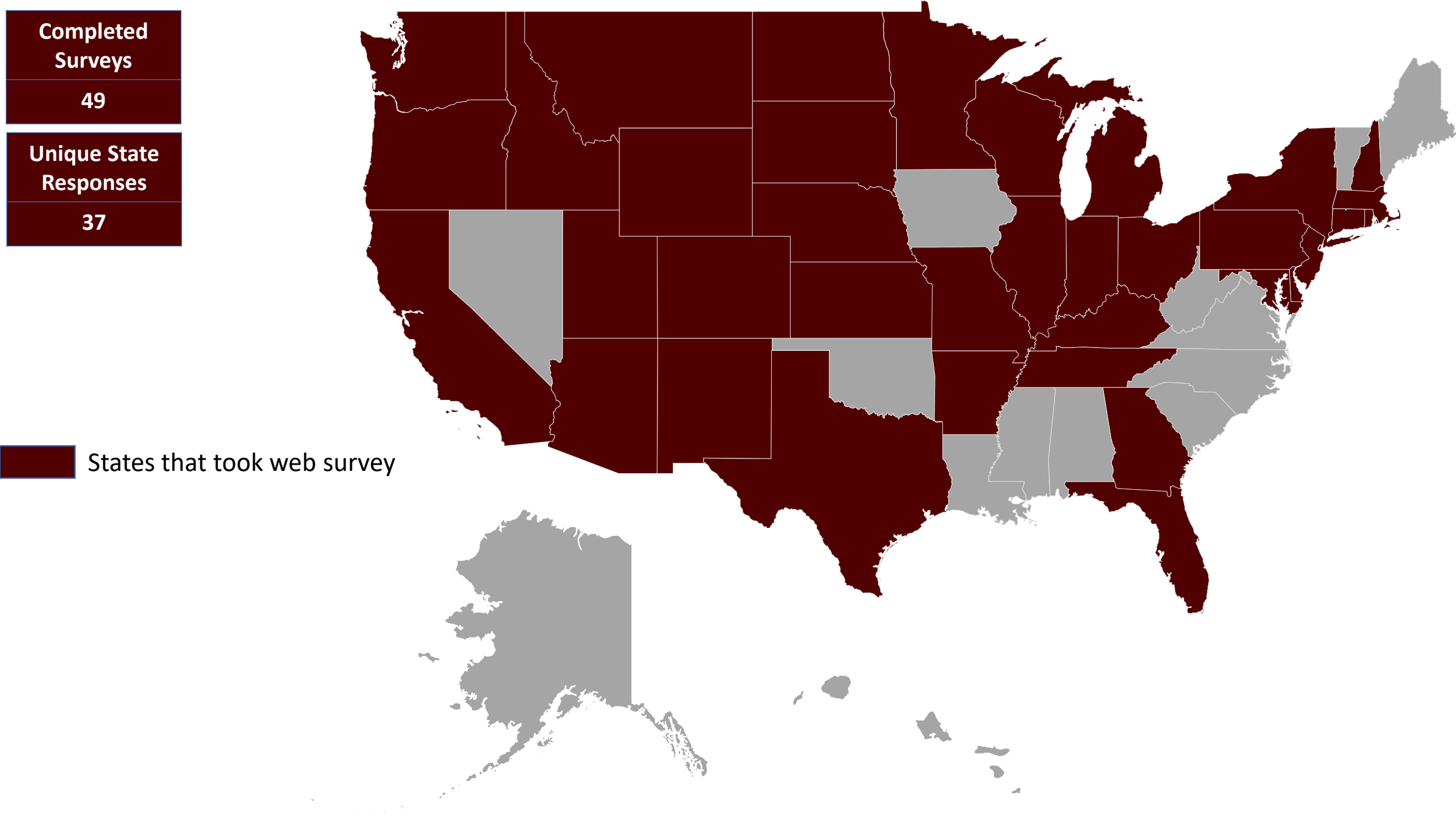
1. To begin the survey, click the **forward arrow** at the bottom of this page.
2. To view and print the entire survey for informational purposes, click on this survey link and download and print the document.
3. To submit the survey, click on "Submit" on the last page.

SURVEY TIPS

1. Survey navigation is conducted by selecting the forward and back arrows at the bottom of each page.
2. If you are unable to complete the survey, you can return to the survey at any time by reentering through the survey link.

Completed Surveys
49

Unique State Responses
37



Q1 - Do you work for state oversize/overweight (OS/OW) permitting office/authority and **are you knowledgeable** about permitting and policies for commercial vehicles during emergencies?

Answered	Yes (%)	No (%)
46	93%	7%

Q2 - Has your **state implemented special permitting** or waivers for commercial vehicles or OW vehicles for a prior major emergency or disaster (including COVID-19)?

Answered	Yes (%)	No (%)
39	90%	10%

Q2.1 – What was the **most-recent state-level emergency** or disaster where this was used?

Q2.2 – Was that action **coordinated with other states** or agencies?

Answered	Yes (%)	No (%)
34	53%	47%

Q3 - Has your state recently initiated changes to its overweight laws, regulations or policies based on prior experiences with emergencies or disasters?

Answered	Yes (%)	No (%)
36	25%	75%

Q4 - Has your state been **impacted** by emergency special permits or waivers for commercial vehicles that were issued in another state?

Answered	Yes (%)	No (%)
42	21%	79%

Q5 - Does your state conduct **outreach or education efforts with the trucking industry** about emergency overweight special permits or waivers?

Answered	Yes (%)	No (%)
41	61%	39%

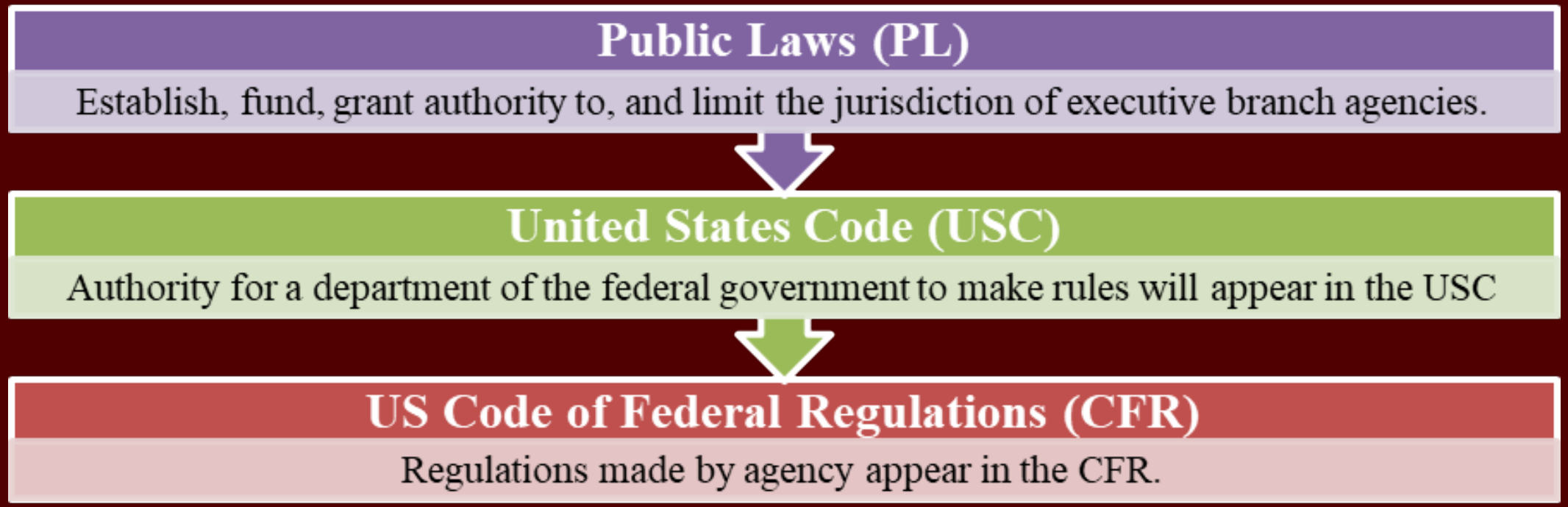
Interviews and Virtual Workshops

	State/Agency
1	Georgia
2	Florida
3	Illinois
4	Missouri
5	Montana
6	South Dakota
7	FHWA
8	TRANSCOM (DoD)
9	CVSA

	Participants	Average Attendance Time
1	26	1 hour 11 minutes
2	22	1 hour 9 minutes
3	30	1 hour 30 minutes

Findings, Challenges & Opportunities

Laws and Regulations



"Administrative codes contain regulations, while statutory code contains laws."

Inconsistency in Definitions of Permits

Special Permits are Not Waivers

"Waivers for OW vehicles are never allowed. Special permits are granted, which are not waivers"

- OW special permits for divisible and non-divisible loads under 23 USC 127 are "special permits."
- FMCSR exemptions are "waivers" or "relief" from regulations.
- State or federal declarations may refer to both special permits and FMCSR exemptions in an emergency declaration.

***FMCSR Federal Motor Carrier Safety Regulations**

Inconsistency in Definitions of Emergency

- The permitting agency's definition is based on either of these
  - the state Governor's executive order (as per state statute)
  - the President's emergency declaration
  - as stated by state/federal emergency management office
- For permitting offices, involvement in defining emergency/commodities varies.
- No single generic list of emergency commodities, it depends on the nature of the emergency.

Potential Solution: *Develop a generic list of emergency commodities that can be tailored and used by state permitting agencies and used for emergency declarations that affect some specific commodities*

Steps for Developing Emergency Commodity List

Commodity Specific Emergency

Language specifying specific commodities (grain, fuel, etc.) should appear in both the disaster declaration and on any special permit.

Diverse Commodity Emergency

Truck permit issuing offices and state emergency management should work with FEMA and other federal agencies to develop lists of affected commodities needed in major, well-known disasters.

List should be included with special permits and provided to Commercial Vehicle Enforcement agencies to ensure compliance.

Types of Commodity Lists (example)

Emergency Response Commodities

Relief Supplies

Medical supplies and equipment.

Equipment, supplies and persons necessary to establish and manage temporary housing or quarantine.

Highway maintenance materials (such as salt for roadways).

Construction materials required for emergency repairs.

Debris or Garbage or other waste.

Consumption Response Commodities

Supplies and equipment necessary for community safety, sanitation, and prevention of disease or viruses.

Food, drink, paper products and other groceries for emergency restocking of distribution centers or stores.

Food supply chain (including livestock, grain, and hay).

Immediate precursor raw materials such as paper, plastic or alcohol used to manufacture essential items.

Fuel.

Variation in Special Permit Issuance

- Depend on the State Permitting Office's available resources and staffing.
  - For instance, some state permitting offices have in-house permitting systems for emergencies.
  - Some utilize third-party vendor products, some have a customizable template form for emergencies, and a few others have a blanket template.

Potential Solution: *Some state permitting agencies developed applications and processes tailored to issuing special emergency permits (Illinois). These systems provide all necessary information to carriers and enforcement. Other states use blanket permit systems (like those mentioned above).*

Case studies of each may be required to develop models that fit specific state needs, as the state regulatory requirements and enforcement expectations associated with the different models may prevent a single "national model" for emergency permitting.

Different Enforcement Standards

- Commercial vehicle enforcement during emergencies may also depend on available resources. Some states have lenient mechanisms.

- For example,
  - a Governor's disaster declaration is a permit in some states.
  - other states require the carrier to carry a general permit and the current emergency declaration.

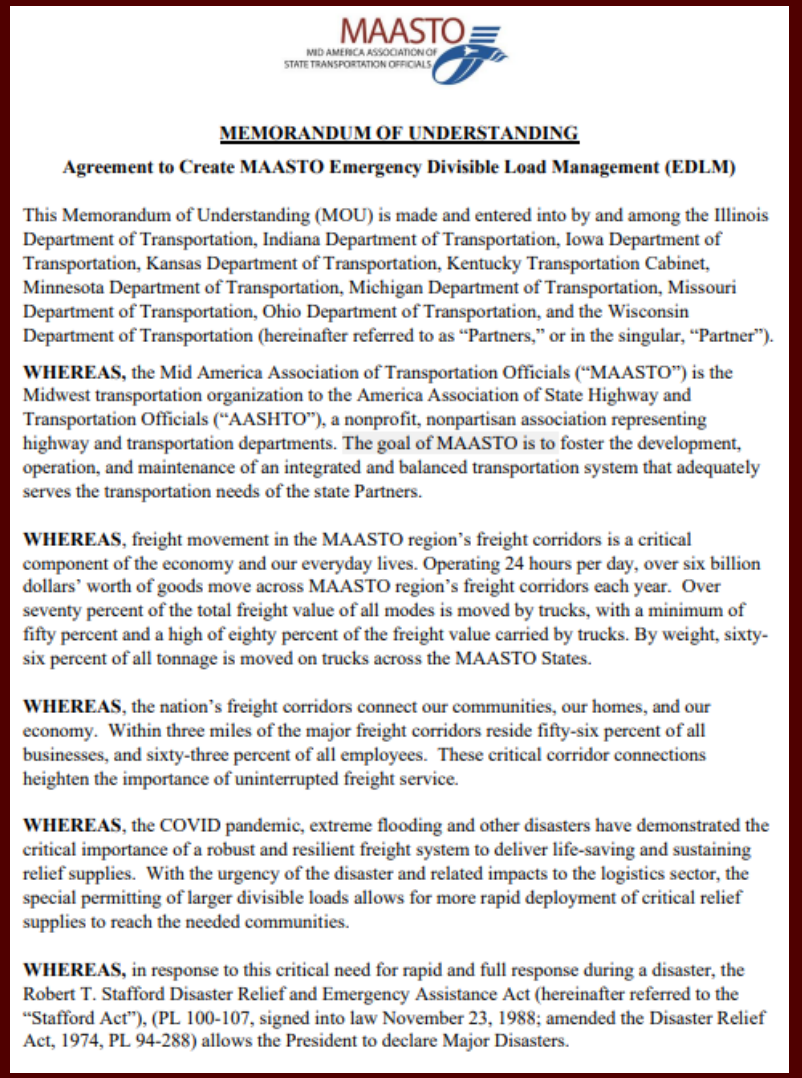
Different states have stricter issuance and enforcement requirements where a carrier needs to apply for a special permit in each emergency.

Potential Solution: *The impact of lenient mechanisms on neighboring states and the potential for safety issues require further study before making any recommendations. One model may not serve all states or regions in the United States.*

State implemented policies, procedures, or processes that had greatest impact

"By creating a multi-state standardized approach to divisible overweight loads during a declared emergency it allows shippers to know in advance that during an emergency they can move a load of 88,000 lbs. gross weight across member states confidently."

"No cost and up to 12'6" wide blanket permit or 14'0" wide for single trips and allowed for hauling during holiday periods and at night."



MAASTO
MID AMERICA ASSOCIATION OF STATE TRANSPORTATION OFFICIALS

MEMORANDUM OF UNDERSTANDING

Agreement to Create MAASTO Emergency Divisible Load Management (EDLM)

This Memorandum of Understanding (MOU) is made and entered into by and among the Illinois Department of Transportation, Indiana Department of Transportation, Iowa Department of Transportation, Kansas Department of Transportation, Kentucky Transportation Cabinet, Minnesota Department of Transportation, Michigan Department of Transportation, Missouri Department of Transportation, Ohio Department of Transportation, and the Wisconsin Department of Transportation (hereinafter referred to as "Partners," or in the singular, "Partner").

WHEREAS, the Mid America Association of Transportation Officials ("MAASTO") is the Midwest transportation organization to the America Association of State Highway and Transportation Officials ("AASHTO"), a nonprofit, nonpartisan association representing highway and transportation departments. The goal of MAASTO is to foster the development, operation, and maintenance of an integrated and balanced transportation system that adequately serves the transportation needs of the state Partners.

WHEREAS, freight movement in the MAASTO region's freight corridors is a critical component of the economy and our everyday lives. Operating 24 hours per day, over six billion dollars' worth of goods move across MAASTO region's freight corridors each year. Over seventy percent of the total freight value of all modes is moved by trucks, with a minimum of fifty percent and a high of eighty percent of the freight value carried by trucks. By weight, sixty-six percent of all tonnage is moved on trucks across the MAASTO States.

WHEREAS, the nation's freight corridors connect our communities, our homes, and our economy. Within three miles of the major freight corridors reside fifty-six percent of all businesses, and sixty-three percent of all employees. These critical corridor connections heighten the importance of uninterrupted freight service.

WHEREAS, the COVID pandemic, extreme flooding and other disasters have demonstrated the critical importance of a robust and resilient freight system to deliver life-saving and sustaining relief supplies. With the urgency of the disaster and related impacts to the logistics sector, the special permitting of larger divisible loads allows for more rapid deployment of critical relief supplies to reach the needed communities.

WHEREAS, in response to this critical need for rapid and full response during a disaster, the Robert T. Stafford Disaster Relief and Emergency Assistance Act (hereinafter referred to the "Stafford Act"), (PL 100-107, signed into law November 23, 1988; amended the Disaster Relief Act, 1974, PL 94-288) allows the President to declare Major Disasters.

Steps for Developing MOUs

1. Identify Champions and Convince Decisionmakers:

Identify champions who are passionate about the permit harmonization

Seek approvals from the top decisionmakers

2. Scope Definition and Engage Nearby Regional States:

Clearly define the scope of the MOU.

Engage with all nearby regional states to ensure everyone is aligned and in agreement.

3. Determine Maximum Overweight Allowance & Standards:

Decide on a common denominator regarding the maximum overweight allowance and standards and their acceptability.

4. Develop the MOU Document:

Based on the consensus and decisions, draft the MOU document.

Ensure all key points, roles, responsibilities, and terms of understanding are clearly mentioned.

5. Review & Feedback:

Circulate the draft MOU among all the stakeholders for feedback.

Make necessary revisions based on feedback received to ensure clarity and mutual understanding.

Confusion Regarding Types of Roads

The language in Governors' emergency declarations may confuse carriers and authorities.

States combine declarations waiving the FMCSRs (federal-only) and emergency OW special permitting, carriers may presume one or other when a declaration does not apply.

- For example,
  - States do not have the authority to issue special permits for the interstate highway system absent a Presidential Disaster Declaration.
  - Some declarations only affect specific state roads.
  - State may restrict overweight loads to the interstate system and not allow access to state roads for emergency loads transiting the state to another state where the disaster declaration applies.

Potential Solution: *AASHTO and CVSA's engagement with the National Governors Association may allow for the creation of standardized emergency declaration language agreements or sample orders*

Confusion About Restricted Loads and Routes

- Although regular OS/OW carriers understand the restricted load requirements, the carriers operating with OW loads during emergencies may not regularly carry loads and, therefore, may not understand the importance of restricted load requirements.
- State permitting agencies must provide the carriers with written instructions on routing and safety compliance.

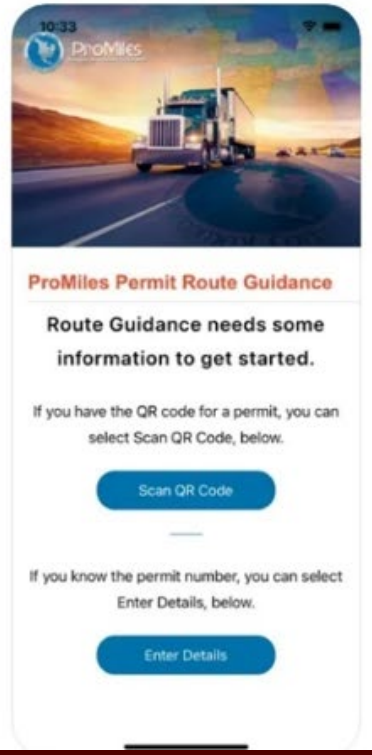
Potential Solution: *Developing special permit QR codes with routing and other information carriers and drivers need, especially those not used to operating with overweight loads frequently. The benefit of the QR code is that a digital copy becomes available for commercial vehicle enforcement officers and carriers to use, and enforcement officers can quickly verify the permit and route information and when the state issued the permit.*

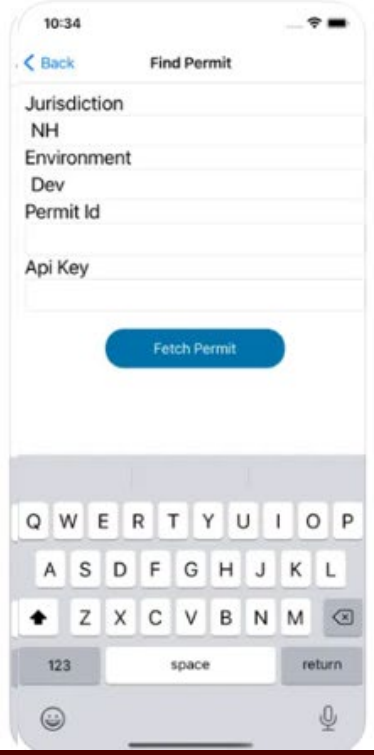
Standardized Communication Processes

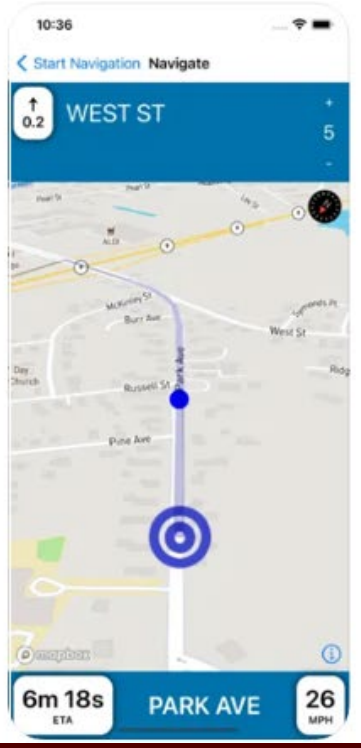
Route Information

Audible Route Guidance

ProMiles' Permit Guidance application can be downloaded from the Apple App Store or the Google Play Store from your mobile device.







Standardized Communication Processes

- Communication is vital during an emergency, and while informal communication channels offer some efficiencies, they may fail in a crisis.
- Interpersonal relationships form informal communication networks between neighboring states, agencies, and regular OS/OW carriers.
- In an emergency, personnel and carriers may come from many places, including out of state. No experience/connections with OW shipping or the state permitting office.

Potential Solution: *In addition to publicizing and educating emergency management officials, carriers, and state permitting offices on the efficacy of the CVSA emergency declaration portal and the importance of timely submissions to that system, state emergency management agencies, state departments of transportation, and state permitting offices should establish* ***uniform, formal communication, and organizing principles.***

Standardized Communication Processes

Step 1.	Step 2.	Step 3.
• Formalize communication networks • Align them with FEMA standards	• Educate officials, shippers, carriers, and truck permit issuing offices about the CVSA Emergency Declaration Portal	• Establish uniform, formal communication and organizing principles for emergencies and disasters

Intra-agency Communication	• Formal Processes • Regular Meetings
Inter-agency Communication	• Dedicated Staff • Collaboration with emergency offices
Regional Communication	• Dedicated Champions • Monthly meetings and follow ups
External Communication	• Multiple Communication channels • Redundancy in Communication

Definition of Divisible and Non-divisible loads

- The state issues special permits during emergencies with a clear understanding of divisible and non-divisible loads
- Divisible and non-divisible loads may not be as clear to non-traditional carriers applying for special permits.
- Shippers and carriers may not be aware of state-specific permitting requirements when the shippers or those requesting the shipments come from other states or organizations unfamiliar with special permitting.

Potential Solution: *AASHTO is already developing clear examples for divisible and non-divisible loads. The research project can incorporate AASHTO's findings.*

Definition of Divisible and Non-divisible loads

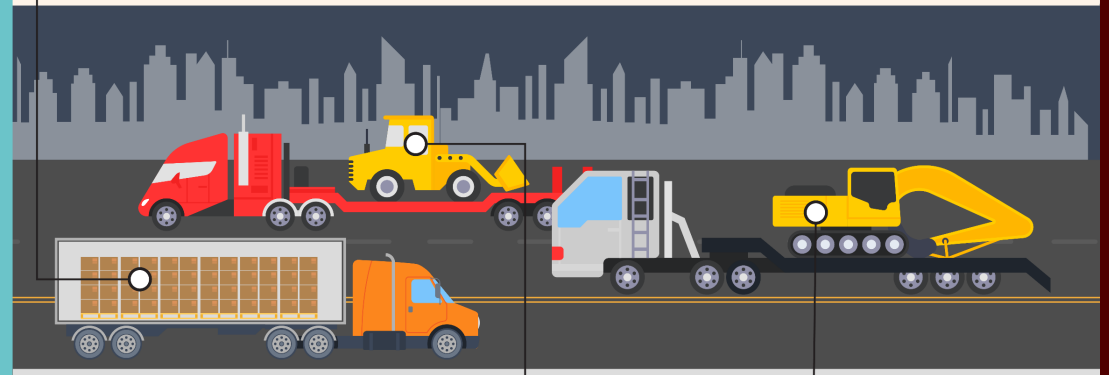
During an emergency response, load supplies can include:

Divisible Load or Vehicle

Divisible load is hauled trucking freight or cargo which can be separated into smaller units and legal weight for the configuration in the traveled jurisdiction.

Divisible loads can/may be multi-piece trucking freight or cargo that have been loaded in a way that increases one, or more, of the trucking configuration dimensions (height, width, length) or weight exceeding legal thresholds dependent on the jurisdiction.

Examples of divisible loads include medical supplies, building materials, food and drink, paper products, food supply chain (including livestock), and debris.



Non-Divisible Load or Vehicle

Any load or vehicle exceeding applicable length or weight limits which, if separated into smaller loads or vehicles, would:

1 **Compromise** the intended use of the vehicle, i.e., make it unable to perform the function for which it was intended;

NO → OR

2 **Destroy** the value of the load or vehicle, i.e., make it unusable for its intended purpose;

NO → OR

3 **Require more than 8 work hours** to dismantle using appropriate equipment. The applicant for a nonvisible load permit has the burden of proof as to the number of workhours required to dismantle the load.

YES (from 1) → ⚠ ← YES (from 2)

YES (from 3) → **Non-Divisible Load. Plan accordingly.**

NO → **Divisible Load**

Examples of non-divisible loads include cranes, wind turbines, some construction equipment and components, emergency response vehicles, and military vehicles.

Confusion about Safety Regulations

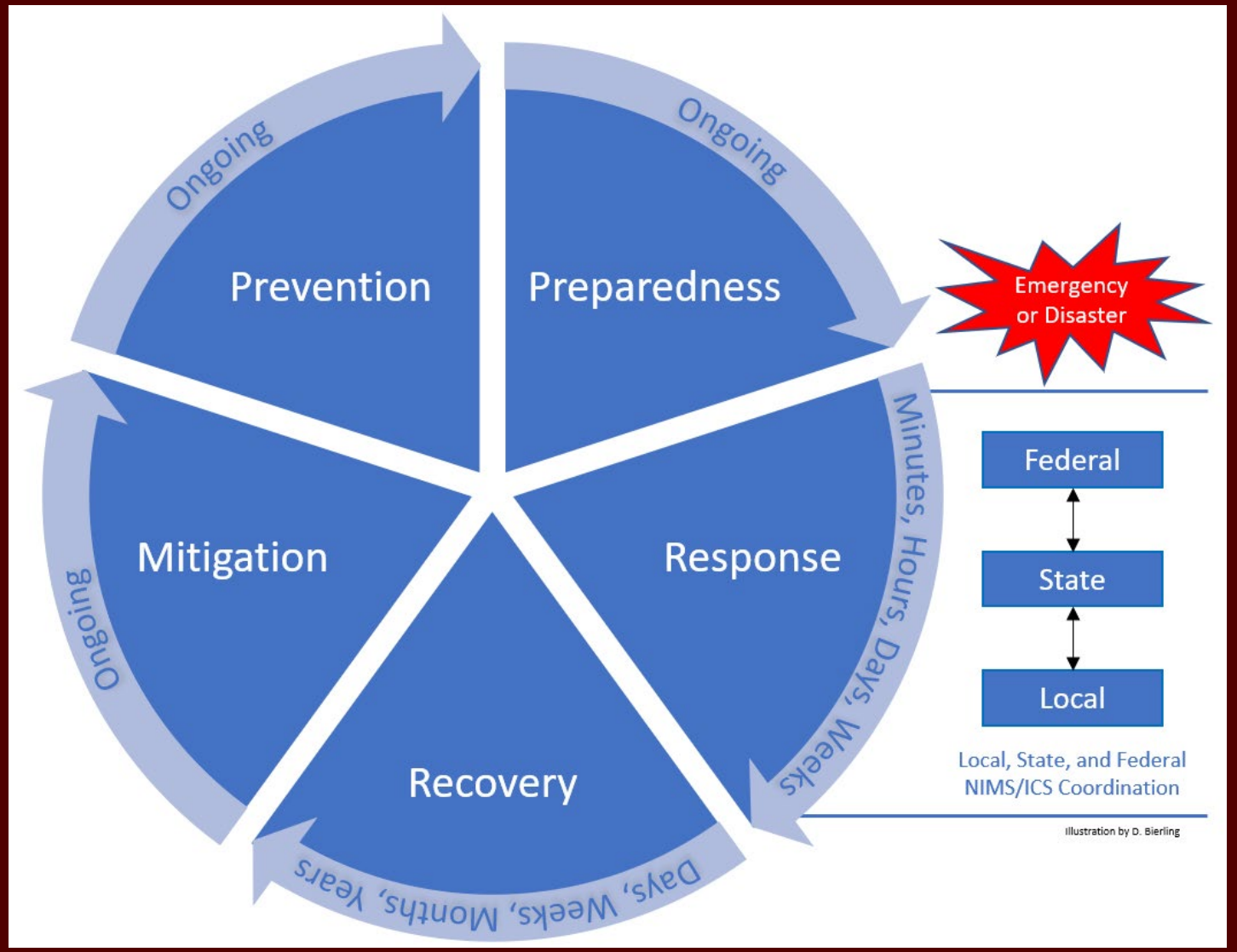
- There is confusion regarding special permits and FMCSR waivers for carriers and truck drivers.
- State permitting agencies seemed clear that safety regulations do not change irrespective of weight requirements during an emergency.

Potential Solution: *Recommend developing training and informational fliers and worksheets for the trucking industry.*

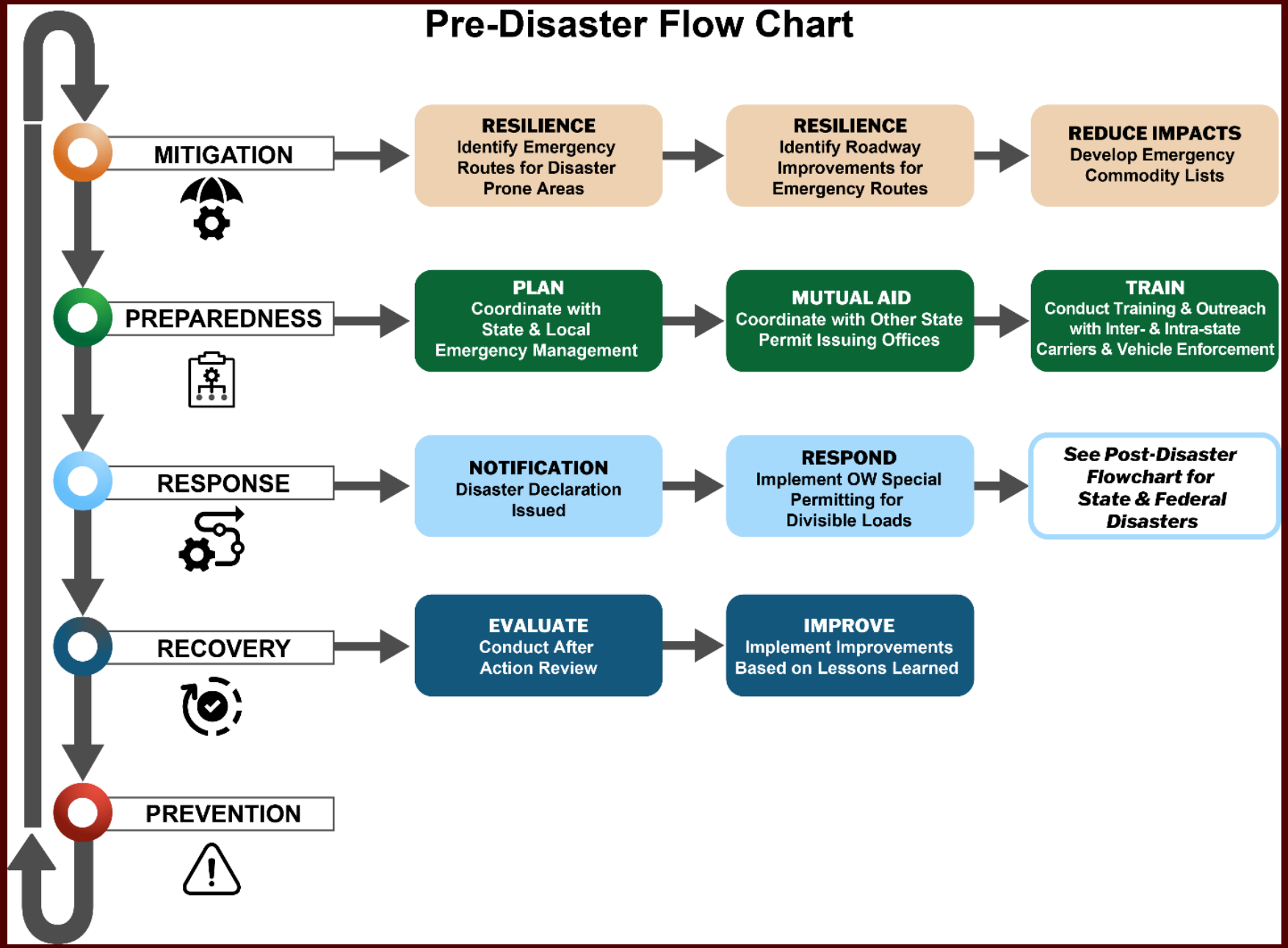
Roadmap for Success

1. Define Consistent Frameworks
2. Identify Promising Practices for Emergency CMV Weight Exemptions
3. Identify Successful Way

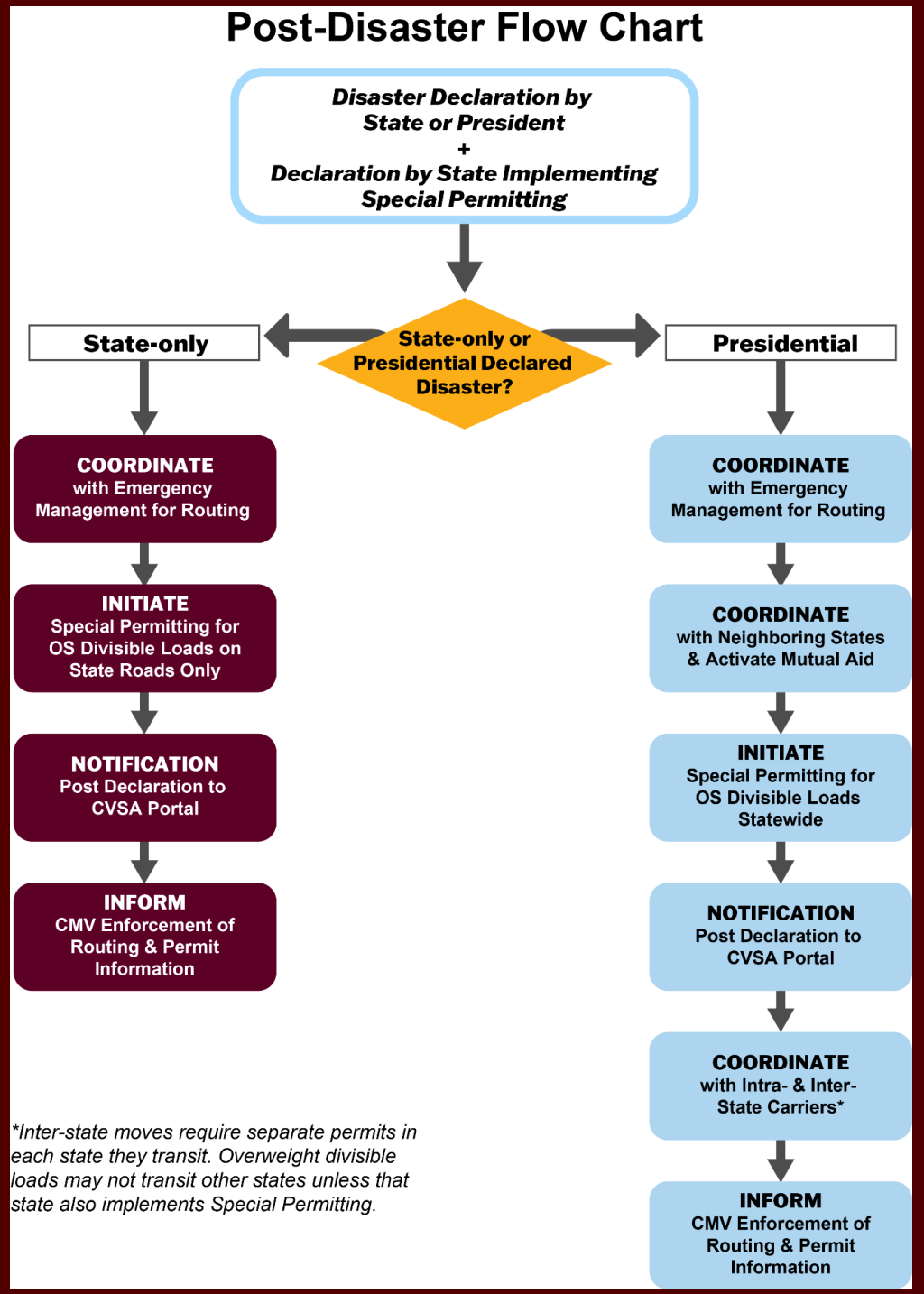
Emergency Management Cycle



Pre-Disaster Flowchart

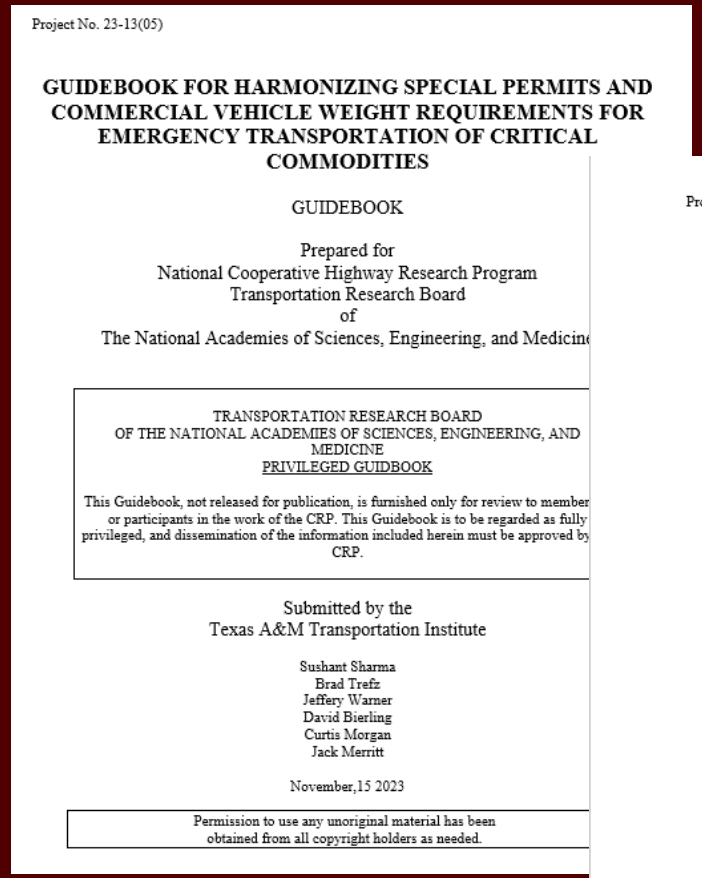


Post-Disaster Flow Chart



Deliverables

- Guidebook
- Final Report
- Implementation Plan



Project No. 23-13(05)

GUIDEBOOK FOR HARMONIZING SPECIAL PERMITS AND COMMERCIAL VEHICLE WEIGHT REQUIREMENTS FOR EMERGENCY TRANSPORTATION OF CRITICAL COMMODITIES

GUIDEBOOK

Prepared for
National Cooperative Highway Research Program
Transportation Research Board
of
The National Academies of Sciences, Engineering, and Medicine

TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES OF SCIENCES, ENGINEERING, AND MEDICINE
PRIVILEGED GUIDBOOK

This Guidebook, not released for publication, is furnished only for review to members or participants in the work of the CRP. This Guidebook is to be regarded as fully privileged, and dissemination of the information included herein must be approved by CRP.

Submitted by the
Texas A&M Transportation Institute

Sushant Sharma
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November,15 2023

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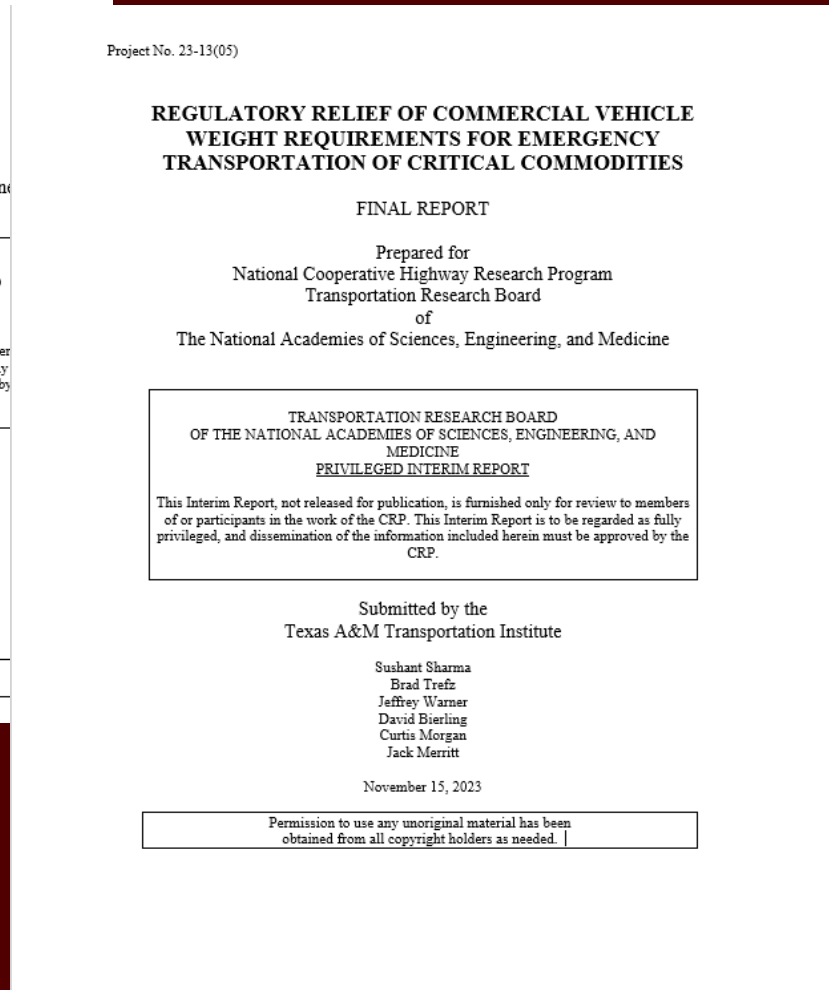

Project No. 23-13(05)

REGULATORY RELIEF OF COMMERCIAL VEHICLE WEIGHT REQUIREMENTS FOR EMERGENCY TRANSPORTATION OF CRITICAL COMMODITIES

FINAL REPORT

Prepared for
National Cooperative Highway Research Program
Transportation Research Board
of
The National Academies of Sciences, Engineering, and Medicine

TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES OF SCIENCES, ENGINEERING, AND MEDICINE
PRIVILEGED INTERIM REPORT

This Interim Report, not released for publication, is furnished only for review to members of or participants in the work of the CRP. This Interim Report is to be regarded as fully privileged, and dissemination of the information included herein must be approved by the CRP.

Submitted by the
Texas A&M Transportation Institute

Sushant Sharma
Brad Trefz
Jeffrey Warner
David Bierling
Curtis Morgan
Jack Merritt

November 15, 2023

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Guidebook

Part I—Introduction to Special Permitting for Overweight Divisible Loads in Disasters and Emergencies

- Chapter 1 introduces the Guidebook, its organization and purpose.
- Chapter 2 discusses emergencies and explains what constitutes an emergency and disaster declaration with explanation of rules and regulations.

Part II—Preparing for Emergency Overweight Special Permitting

- Chapter 3 introduces the steps involved in emergency preparedness and the role of state permitting offices within each phase of the emergency management cycle.
- Chapter 4—This chapter focuses steps decisionmakers and state permitting offices can take before an emergency or disaster declaration for effective harmonization and coordination.
- Chapter 5 —This chapter discusses best practices during and after an emergency that weaves in the findings of the case studies or interviews with stakeholders.

Part III—Tools and Resources

- Chapter 6 covers tools and other resources for implementation.

Final Report

- **Chapter 1—Introduction**.
- **Chapter 2—Literature Review**. Summarizes findings from the literature review (Task 2)
- **Chapter 3—State of Practice**. Details outcome of interviews conducted in Task 3.
- **Chapter 4—Final Deliverables**. Summarizes the approach towards developing the final deliverables based on the Task 4 and Task 5
- **References**. The reference list includes all cited studies, the laws, regulations, and codes.
- **Appendix A—** contains a summary of state disaster and emergency authorities.
- **Appendix B—** online survey and follow-up phone interview questions.
- **Appendix C—** summarizes responses to each survey question.

THANKS!

s-sharma@tti.tamu.edu

Texas A&M Transportation Institute

2025

Addressing the Impacts and Costs of Truck Parking Shortages

Janice Marino-Doyle, NJDOT
Sebastian E. Guerrero, WSP

TRB Webinar - Navigating Current and Future Freight
May 8th, 2025

Project Objective

Purpose

- Truck parking shortages are a critical issue facing drivers and the industry.
- Insufficient capacity results in unauthorized or unsafe parking and increased crashes.
- Inefficient locations result in additional miles of travel or lost productivity.
- Truck parking shortages impact communities.

Phase 1 Objectives

- Identify needs through qualitative and quantitative analyses.
- Understand operational deficiencies of current truck parking locations, including cost of delay and crashes.
- Develop Policy Framework for NJDOT to consider solutions for further study in Phase 2.

Phase 1: Truck Parking Profile

- Literature Review
- Outreach and Coordination
- System Inventory
- System Performance
- Needs Identification
- Policies/Strategies/Solutions

Today's Focus

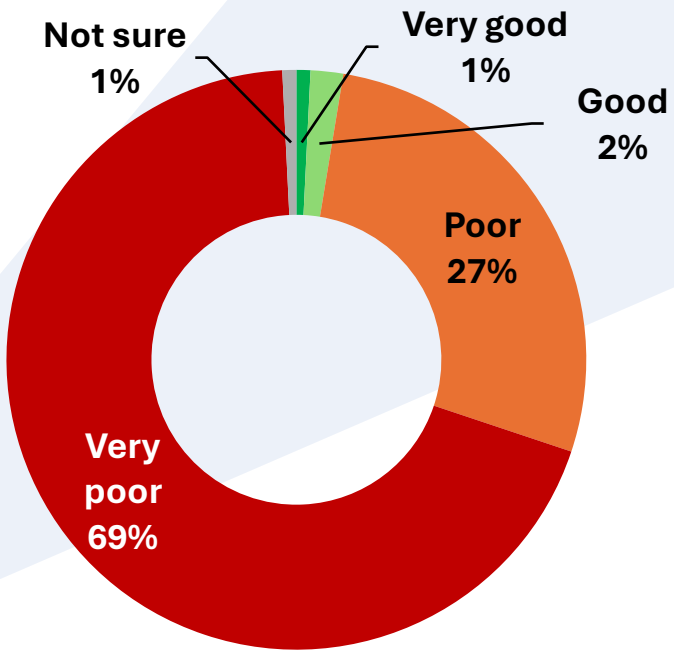
Phase 2: Action Plan

- Identification of Projects
- Conceptual Designs
- Funding Recommendations

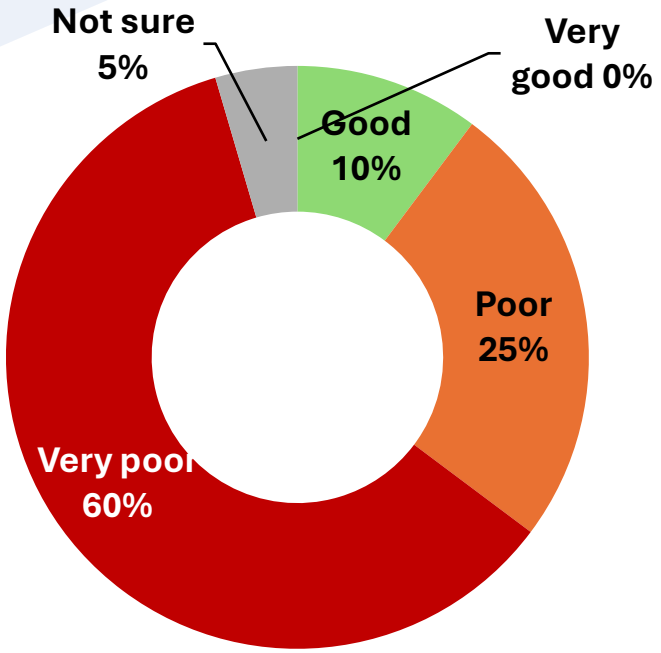
Driver survey showed that parking availability is very limited in New Jersey

- Conducted two truck driver-focused surveys:
  - Long-haul drivers/overnight parking (432 responses)
  - Short-haul drivers/daytime parking (117 responses)

Availability of **overnight** truck parking

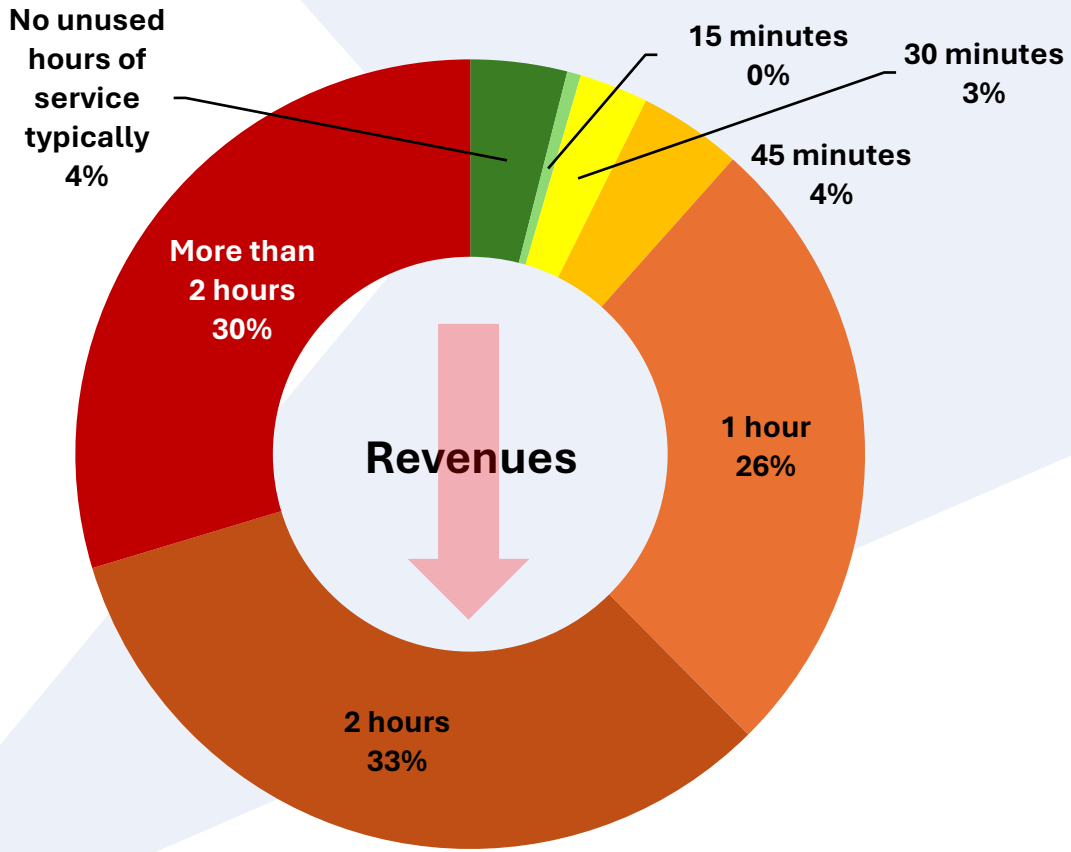


Availability of **daytime/staging** parking

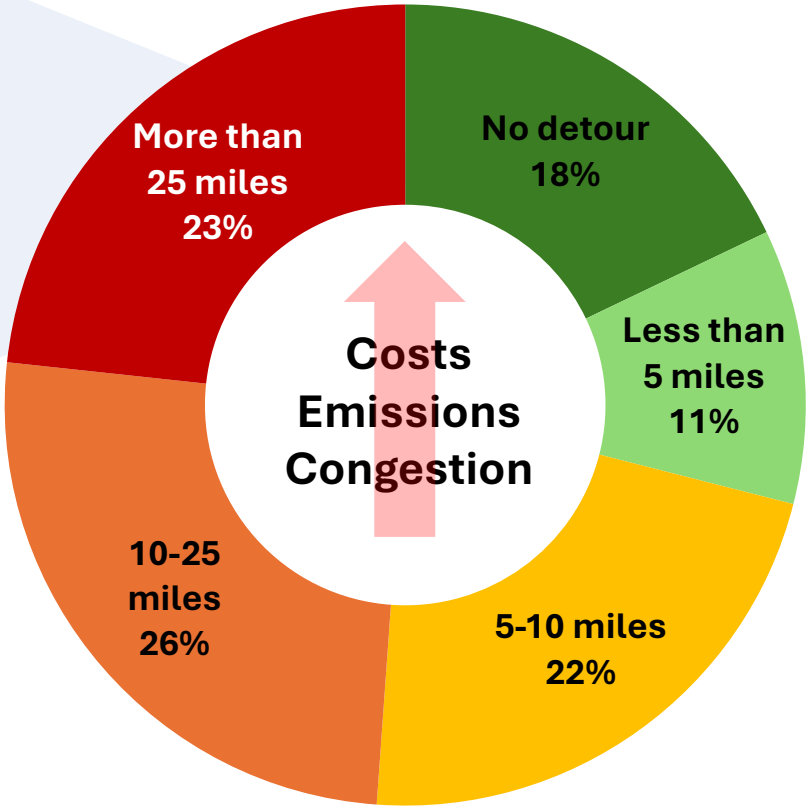


Parking shortages make trucking less efficient by reducing revenues and increasing costs

Average unused drive time (HOS) to secure a space



Typical detour to find parking



NJ Truck Parking Needs Analysis Framework

WSP DeepView Freight

GPS Data Processing
- GPS Data Warehousing
- Data Cleaning
- Stop Identification

Geospatial Data Fusion
- Parking Facility Inventory
- Parcel and Establishment Data
- Land Use Data
- BTS Freight Terminals
- Roadway Infrastructure

Truck Parking Interpretation
- Potential Undesignated Parking
- Parking Facilities
- Freight Establishments and Terminals

Truck Trip Interpretation
- Trips
- GPS Device Off

Analysis of Unsafe Undesignated Parking
- ROW Boundaries
- Clustering
- Manual Review
- Crash Data

Analysis of Parking Availability Statewide
- GPS Parking Occupancy
- Video Parking Counts
- Statewide ML Parking Model
- Parking Demand Forecasting

Analysis of Impacts & Costs of Parking Shortages
- Detours and Truck VMT
- Unused Drive Time
- Crash Analysis

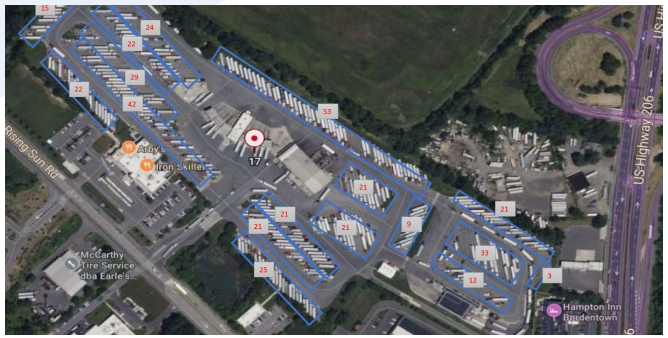
Truck Parking Need Metrics
- *Location and Severity of Unsafe Undesignated Parking*
- *Peak Parking Space Shortage by Corridor*
- *Increased Trucking Costs*
- *Increased Congestion and Emissions*
- *Increased Fatigued and Parked crashes*

Machine Learning Truck Parking Demand Model

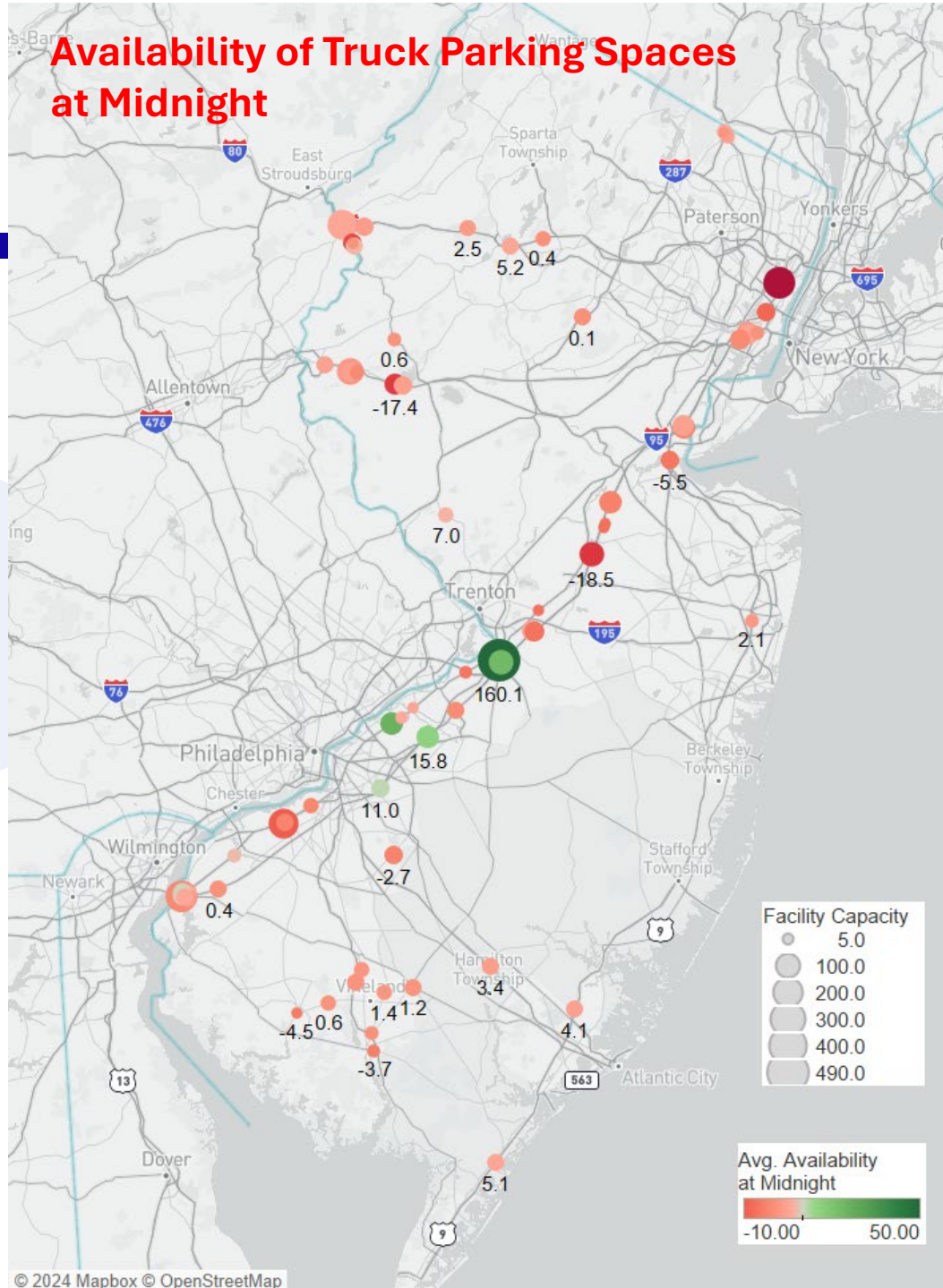
- Developed ML model that estimated the demand at all NJ truck parking facilities
  - Gradient Boosting Machine (sequential regression tree models)
- ML model considered:
  - Characteristics of all parking facilities
  - GPS data on where trucks are parking
  - Roadway characteristics and volumes
  - Parking counts at selected facilities

Timelapse Video Counts

Overnight Manual Counts

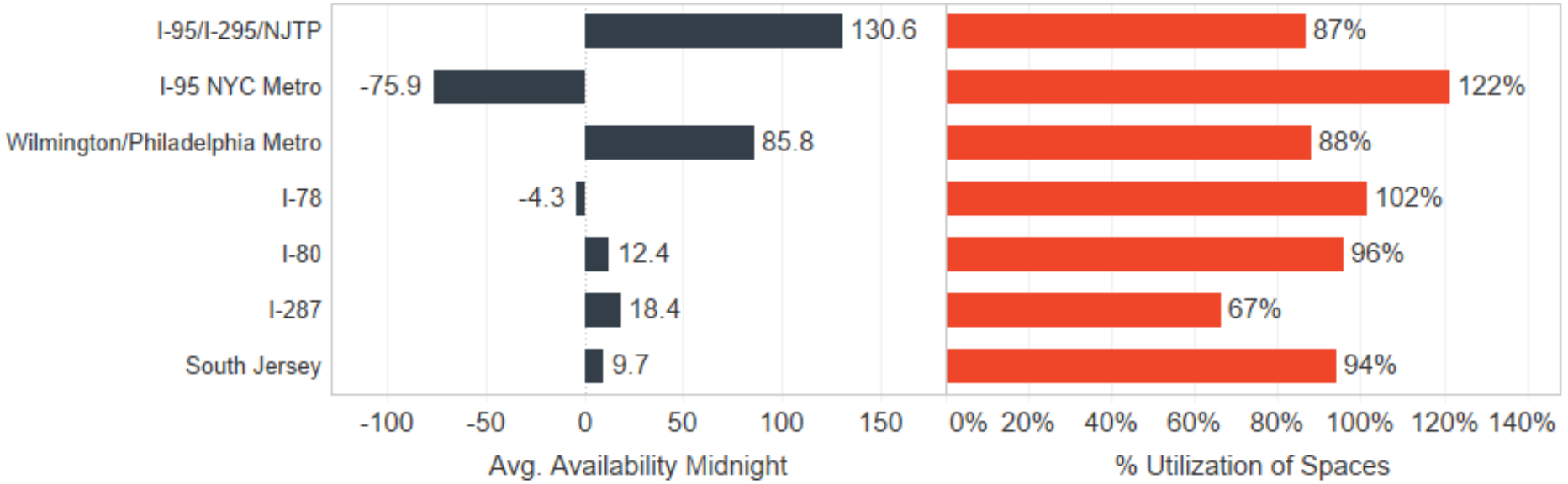


Availability of Truck Parking Spaces at Midnight



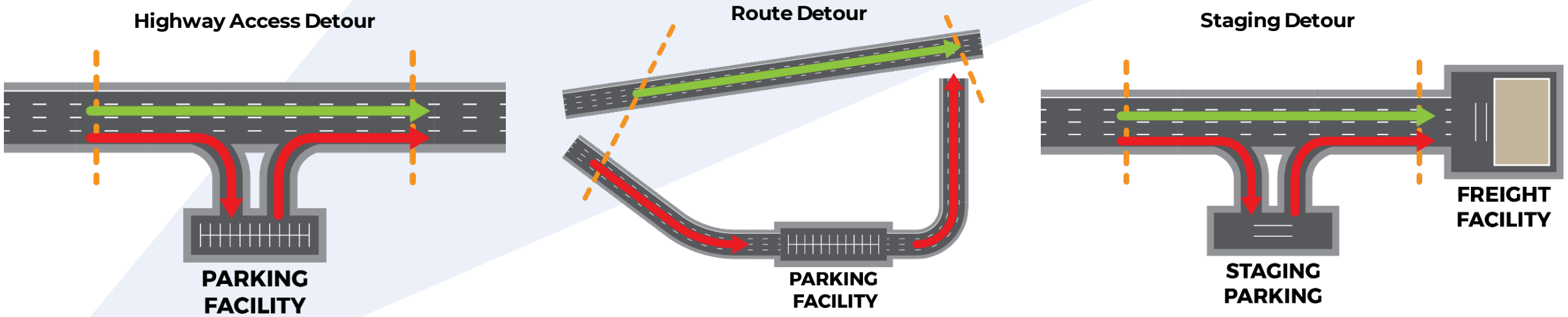
NJ Parking Demand Availability Analysis Results

- NJ truck parking facilities are generally operating at capacity, with **94%** of spaces statewide occupied during peak hours
- Availability is most limited in northeast NJ
- East-West corridors of I-78 and I-80 are operating at **102%** and **96%** capacity
- I-95 corridor has **75%** of all parking spaces in NJ, with the segment south of Trenton having mixed availability.



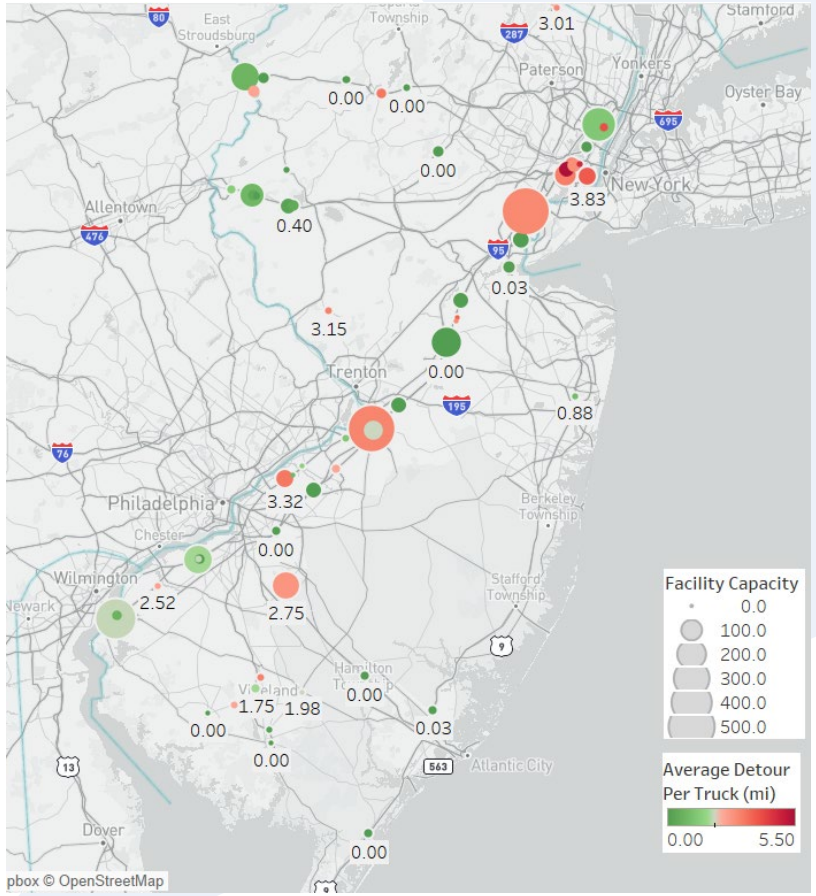
Detours to Find Parking

- Truck GPS data was processed and analyzed to identify how frequently truck drivers take the following three types of detours to find parking:

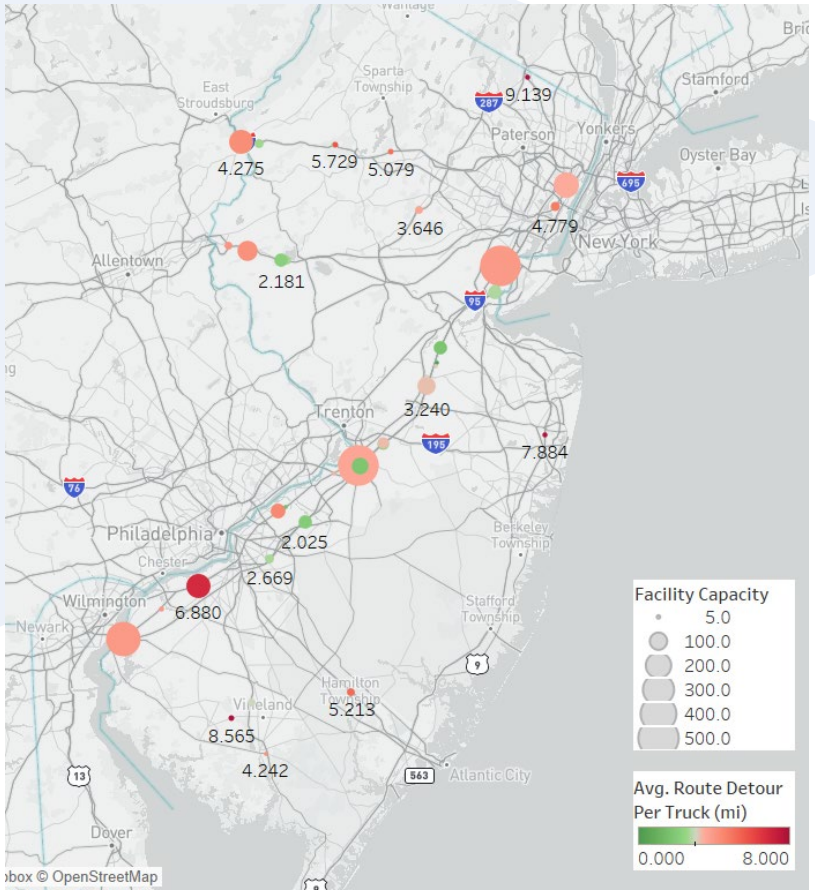


Detours to Find Parking

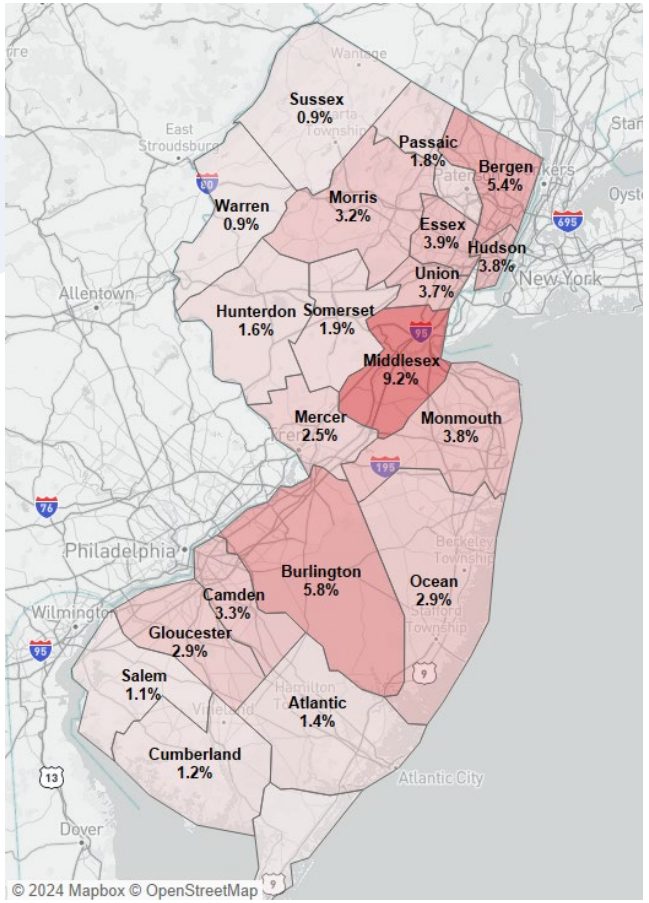
Highway Access Detours



Route Detours

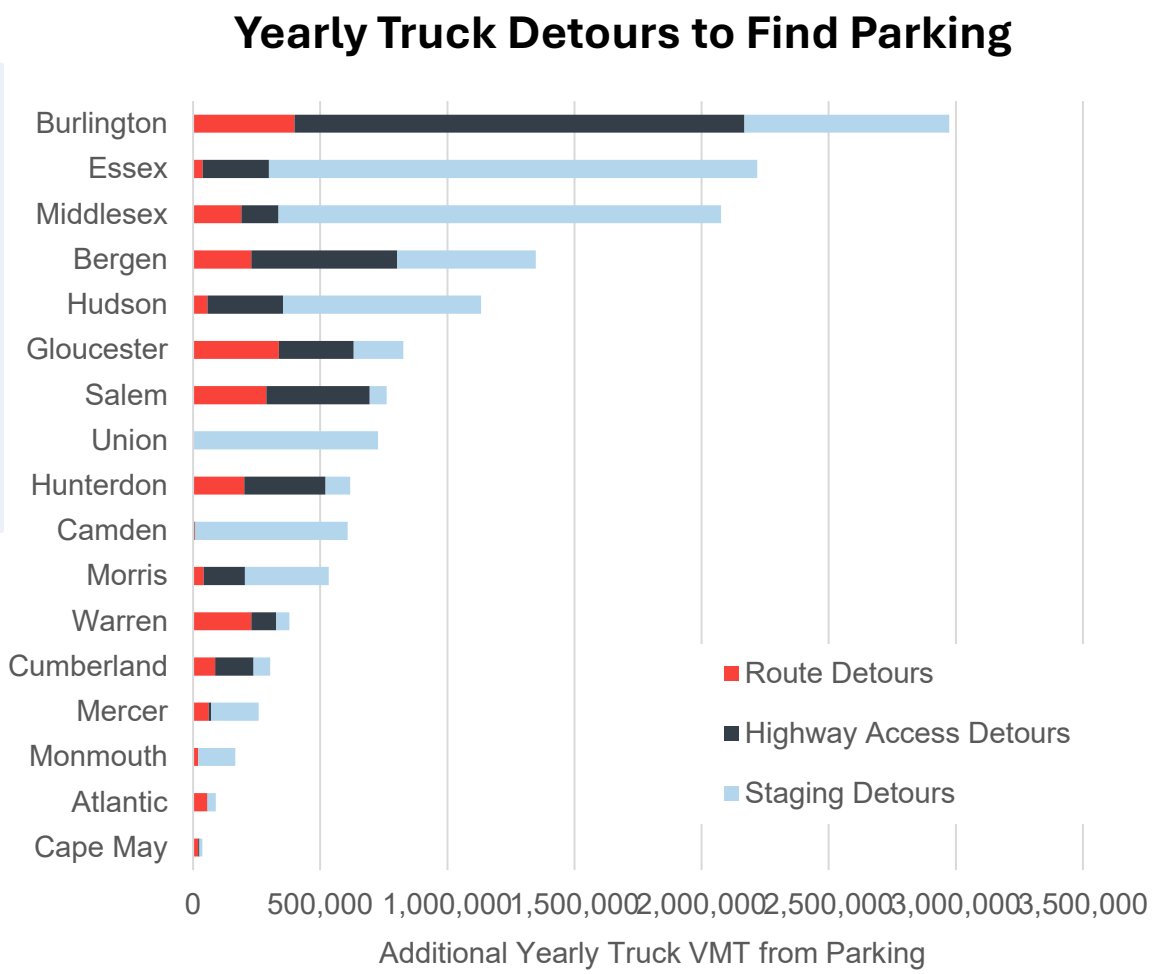


Staging Detours

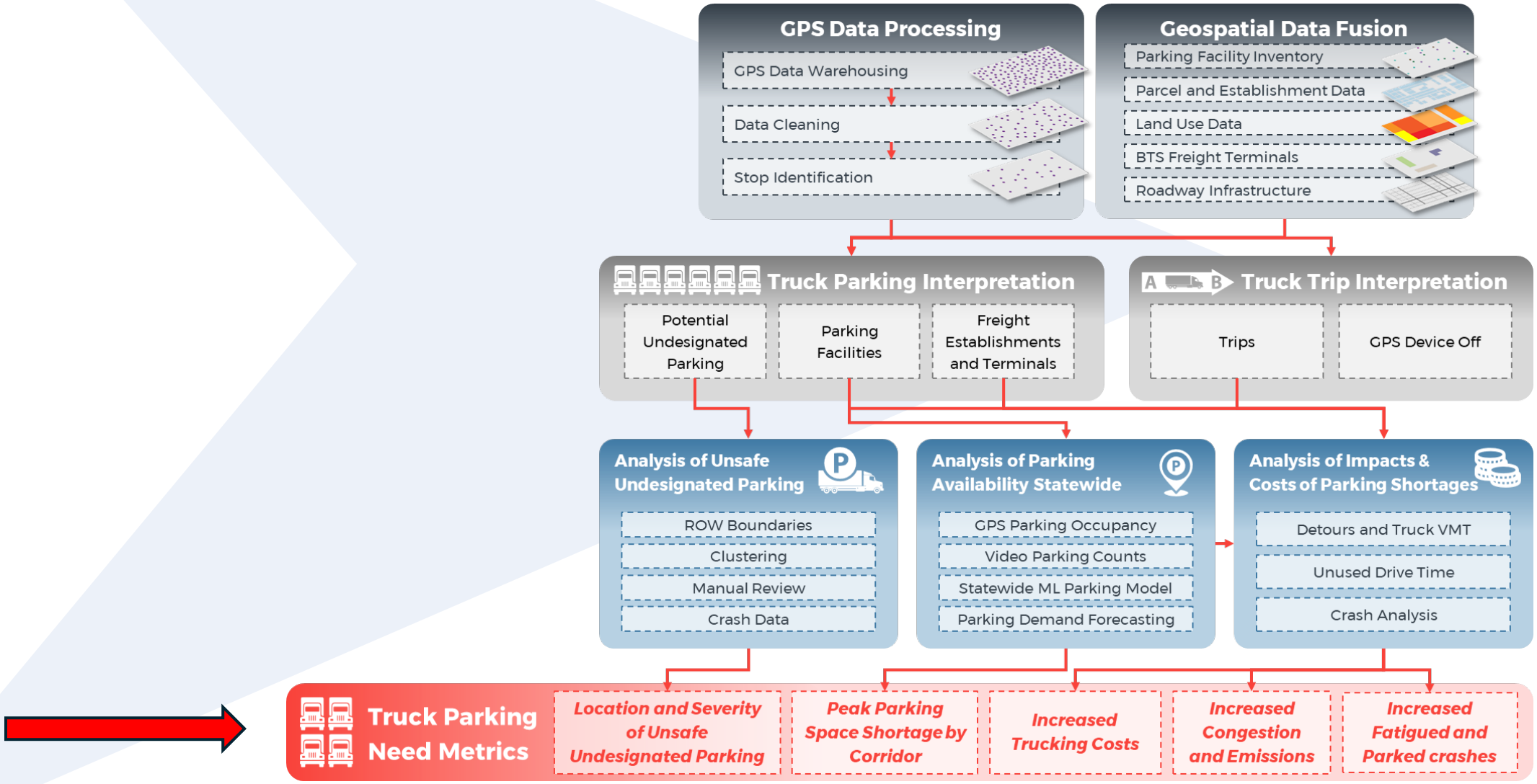


Detours to Find Parking

- Route parking detours lead to 2.3M mi/yr of truck VMT
  - 3.3 thousand MT of CO2 / yr
  - 11.9 MT of NOx/yr
  - 0.4 MT of PM10/yr
  - Social costs total $7.0M/yr, with $5.1M accruing to trucking companies
- Staging parking detours lead to 8.3M mi/yr of truck VMT
  - 12.2 thousand MT of CO2 / yr
  - 43.8 MT of NOx/yr
  - 1.4 MT of PM10/yr
  - Social costs total $25.8M/yr, with $18.8M accruing to trucking companies

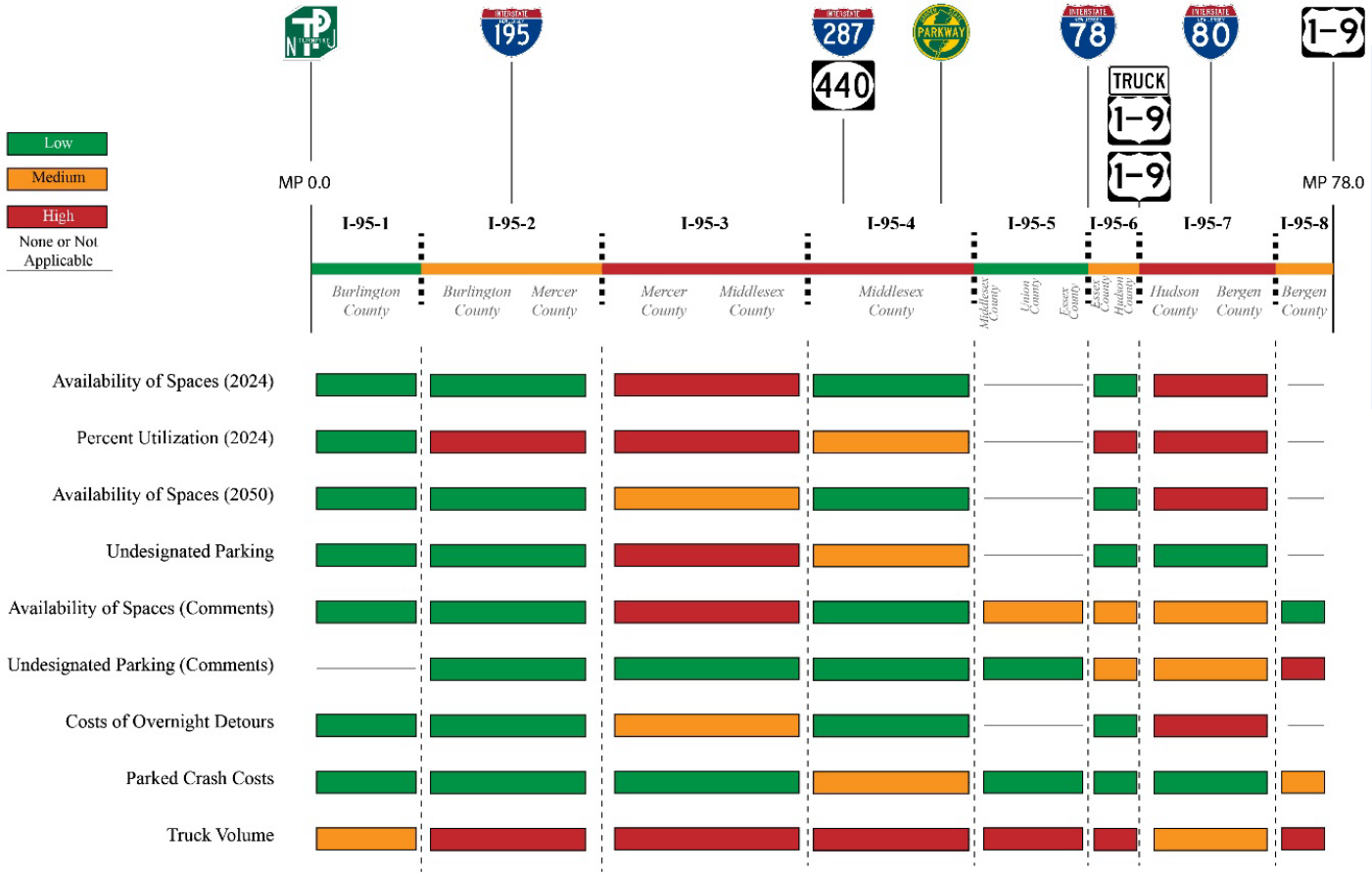


NJ Truck Parking Needs Analysis Framework

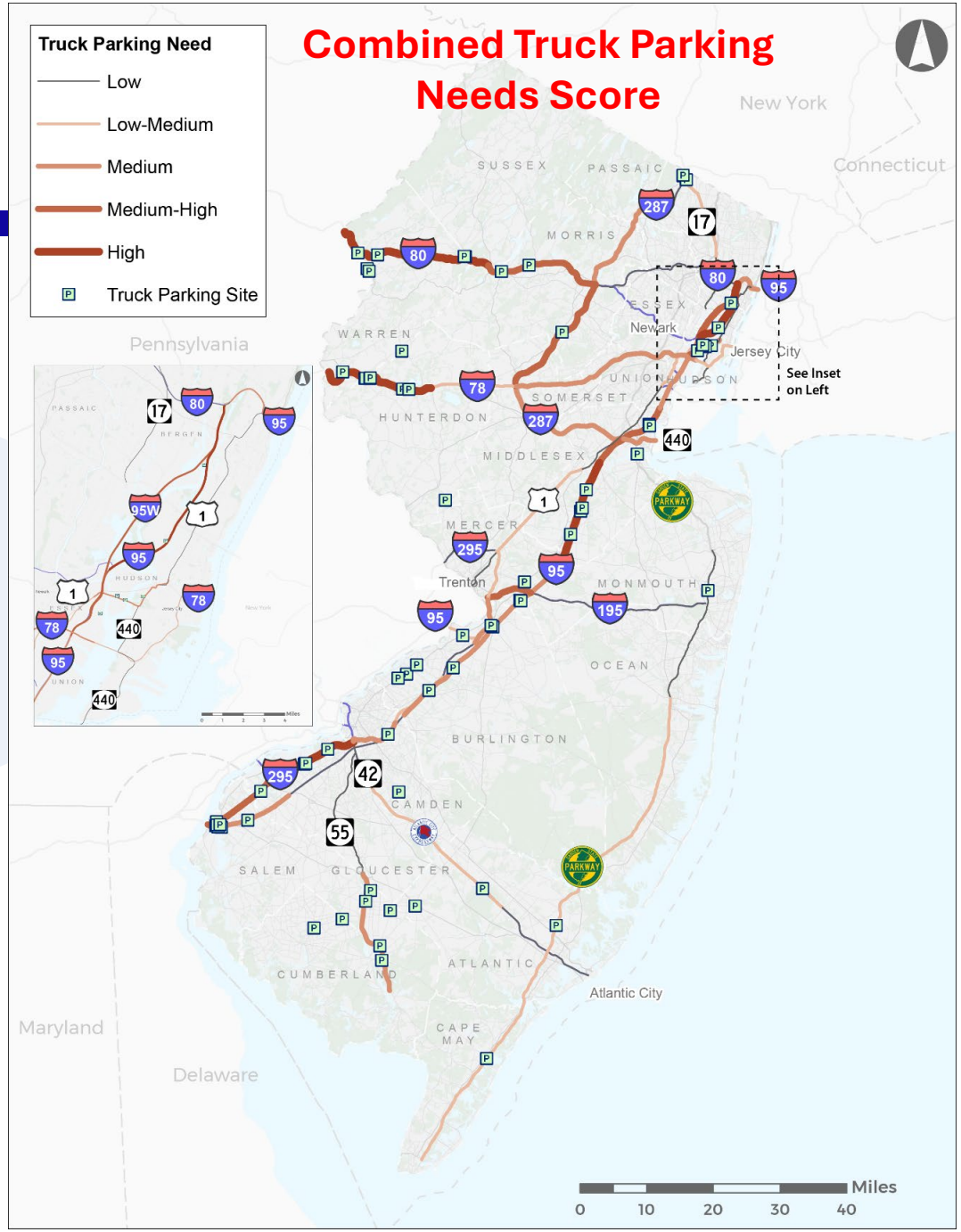


Truck Parking Needs Scoring

Truck Parking Needs Scoring for the NJ Turnpike



Combined Truck Parking Needs Score



Thank You

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Which is the Top Freight Trip Generator in Urban Areas? Deliveries to Households (B2C) or Deliveries to Commercial Establishments (B2B)?

José Holguín-Veras,

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Rensselaer Polytechnic Institute

Motivation

- Urban Freight Management should be based on rational considerations of:
  - The costs and benefits of the potential interventions
  - The impacts on communities, environment, and the private sector
  - Implication → Focus on the sectors that contribute the most to the "problem"
- Identifying which sectors create the "problem" is not always obvious:
  - Lack of data and tradition on freight demand modeling
  - The surge of ecommerce and the tsunami of parcels
- Anecdotal evidence and personal impressions may be misleading
- Identifying priorities for action requires the use of state-of-the-art models to quantify freight trip generation

The Legacy of the COVID-19 Pandemic

1.5 Million Packages a Day: The Internet Brings Chaos to N.Y. Streets

The push for convenience is having a stark impact on gridlock, roadway safety and pollution in New York City and urban areas around the world.

The New York Times

As Online Shopping Surged, Amazon Planned Its New York Takeover

The e-commerce giant added at least nine new warehouses in the city over the past year as 2.4 million packages a day strained the nation's largest urban delivery system.


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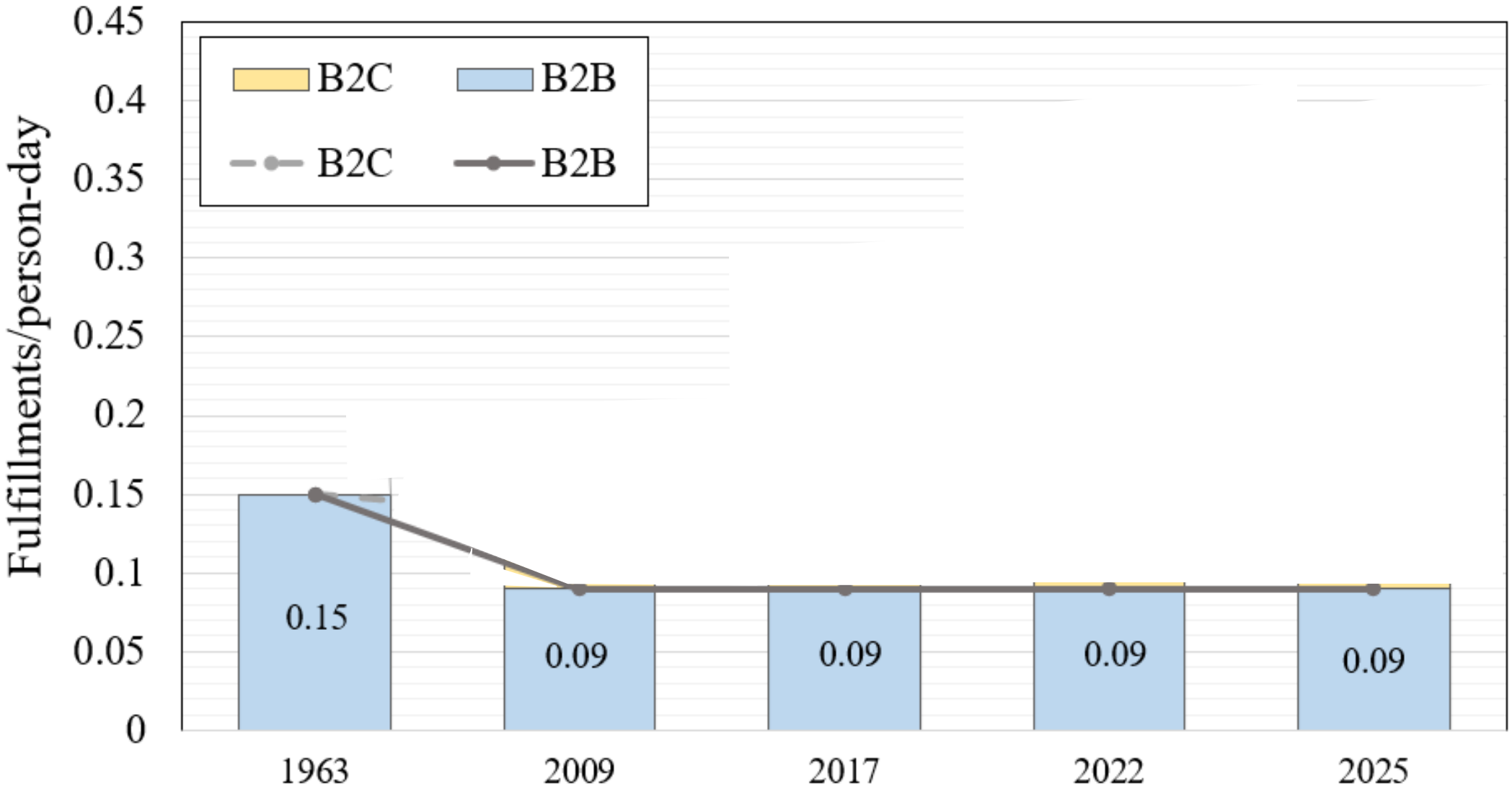
Objectives and Methodology

- Research Objective: To determine which sector—B2B or B2C—should be the top priority for city and transportation agencies
  - Key Question → Which Sector generate more freight trips?
- Methodology:
  - Analyze the temporal patterns of fulfillments (deliveries received, and shipments sent out) for both commercial establishments (B2B) and households (B2C)
  - Estimate the freight trip generation (attraction and production) at the level of ZIP code for Boston, Massachusetts, using the models developed at Rensselaer
  - Compare results for other cities
  - Analyze the results
  - Identify policy implications

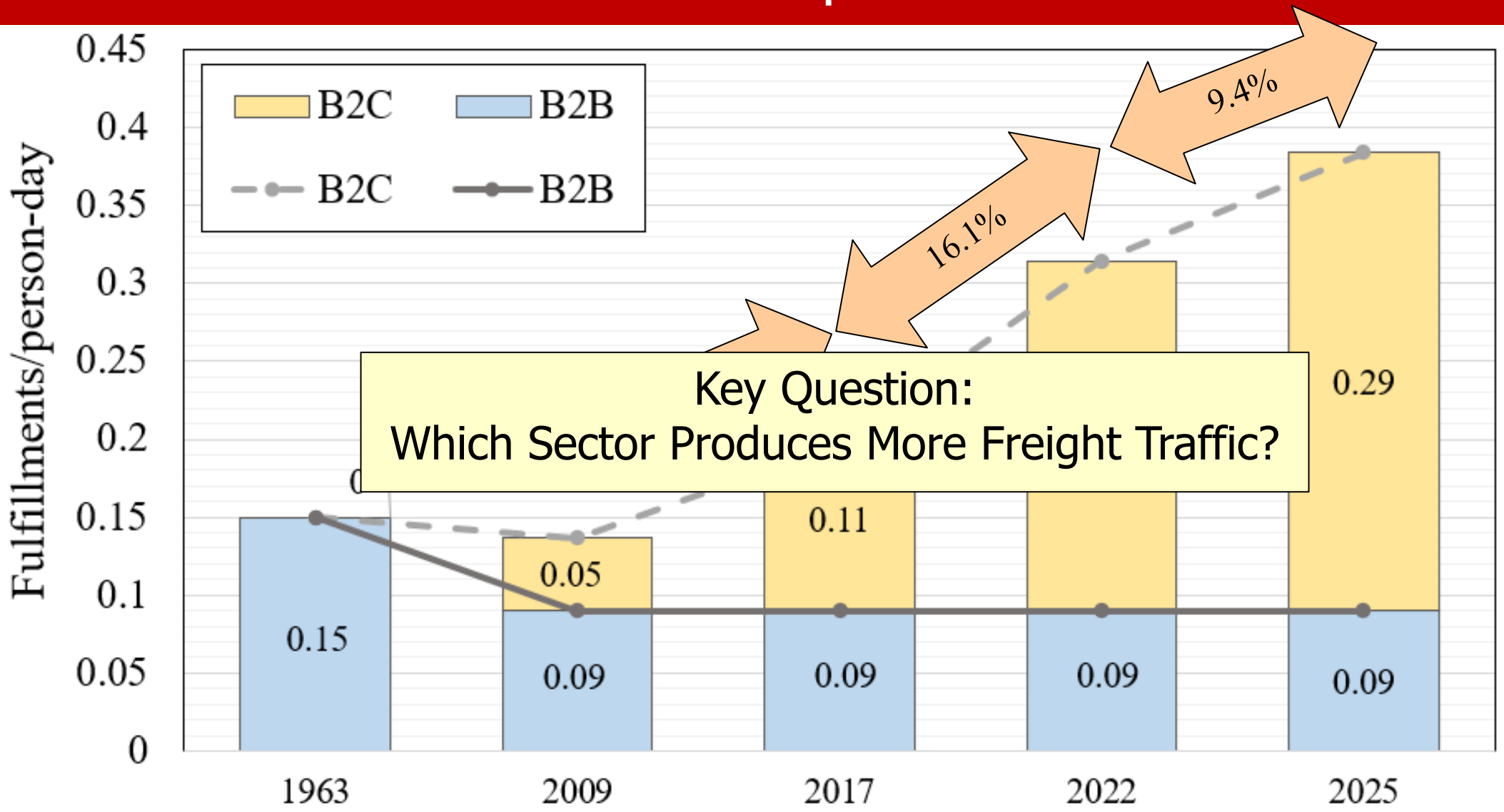
Temporal Patterns of Deliveries and Shipments (Fulfillments)

B2C vs B2B Fulltilment Rates



Note: The B2B rates assumed to be constant because we are not sure if the time-dependents effects we have measured are transient or permanent

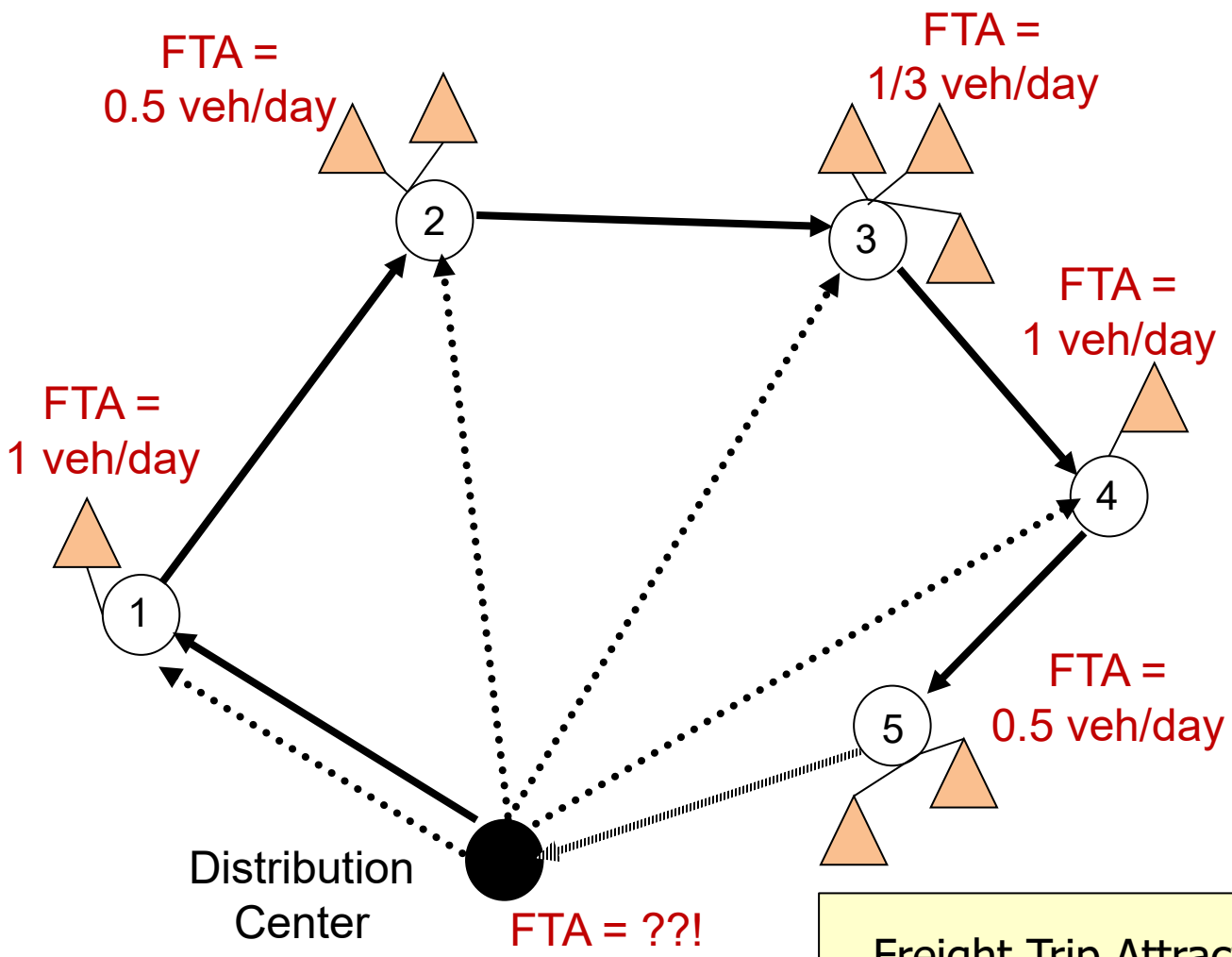
B2C vs B2B Fulfillment Rates: Compound Annual Growth Rates



Note: (1) The B2B rates assumed to be constant because we are not sure if the time-dependents effects were transient, (2) B2C Rate for 2025 was estimated

Number of Deliveries ≠ Freight Trip Attraction
Number of Shipments Sent Out ≠ Freight Trip Production

Deliveries (Orders) and Shipments vs. FTP and FTA



Notation:

Identical stores that get one delivery/day

Empty vehicle-trip

Loaded vehicle-trip

Commodity flow

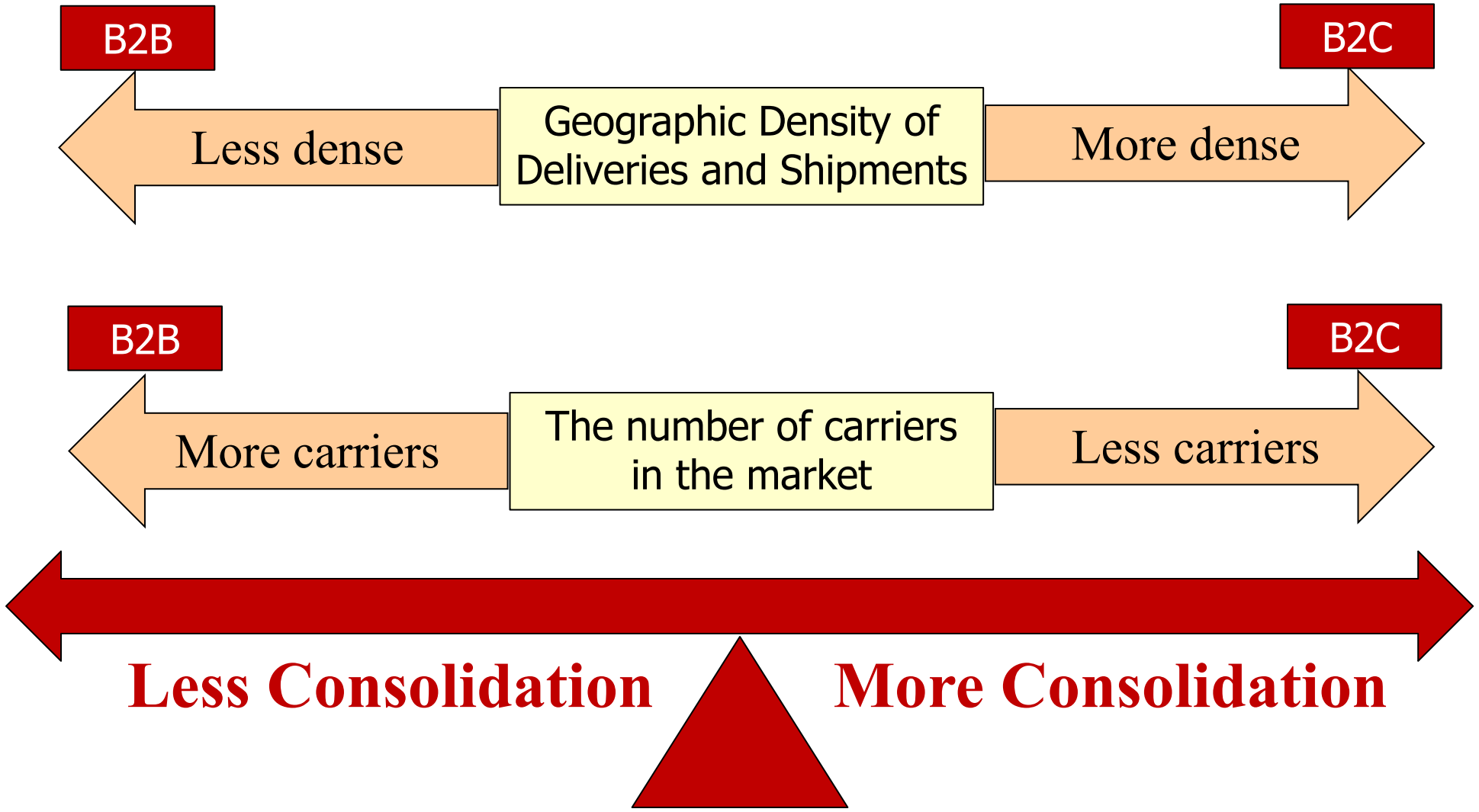
Key Insights:

- FTA changes from place to place, even if establishments are the same!
- In contrast, ordering and shipping practices are stable
- Using orders and shipments to estimate FTG is better than using FTG directly

$$\text{Freight Trip Attraction} = \frac{\text{(Number of deliveries)}}{\text{(Average number of deliveries per vehicle-trip)}}$$

$$\text{Freight Trip Production} = \frac{\text{(Number of shipments sent out)}}{\text{(Average number of shipments per vehicle-trip)}}$$

Key Market Factors Influencing Ability to Consolidate Fulfillments



Empirical Results:
Number of Fulfillments and Freight Trip Generation Estimates

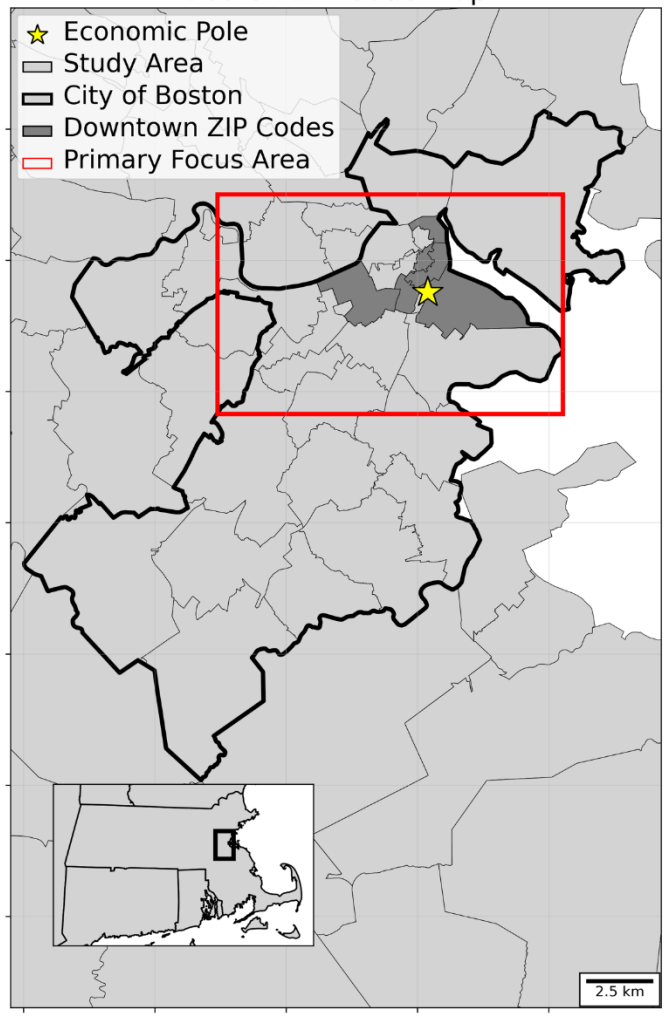
Numbers of Fulfillments

Methodology

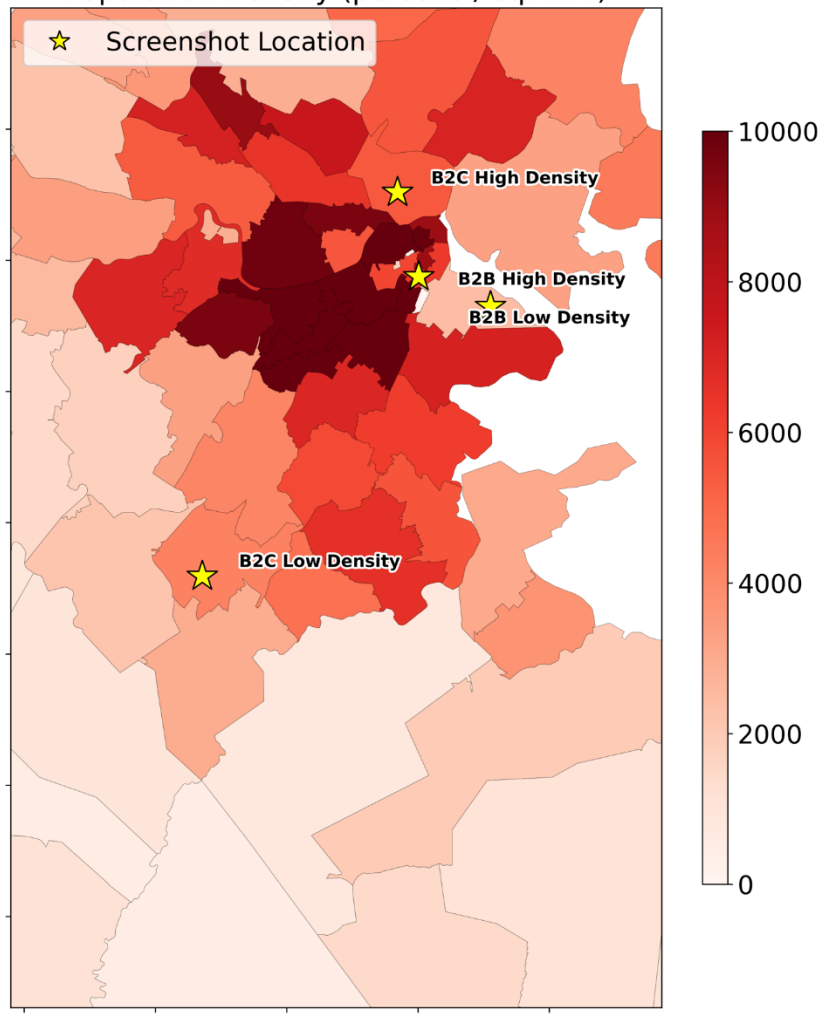
- Estimate number of deliveries and shipments (fulfillments)
  - B2B → Using RPI's Freight And Service Trip Generation System (FASTGS)
  - B2C → Using models based on the National Household Transportation Survey
- Estimate the freight trip attraction and production (generation)
  - Using the Amazon Last Mile Routing Dataset
  - Assuming values based on conversations with industry

Local Context

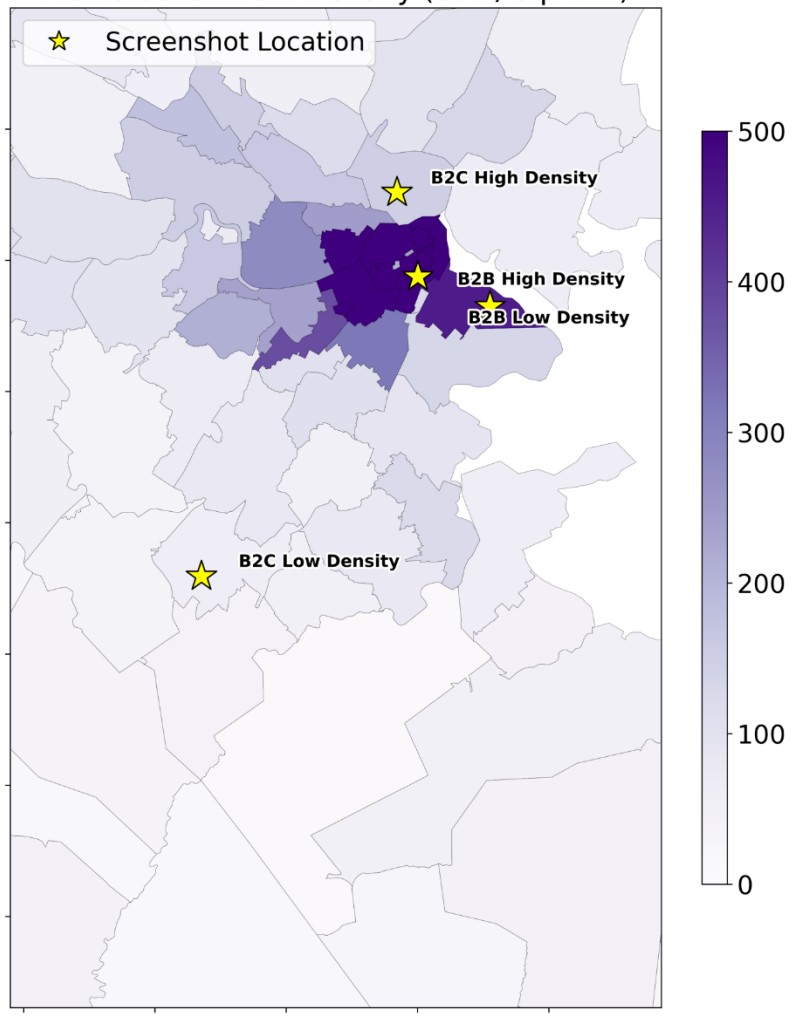
Boston ZIP Code Map



Population Density (persons / sq. km.)



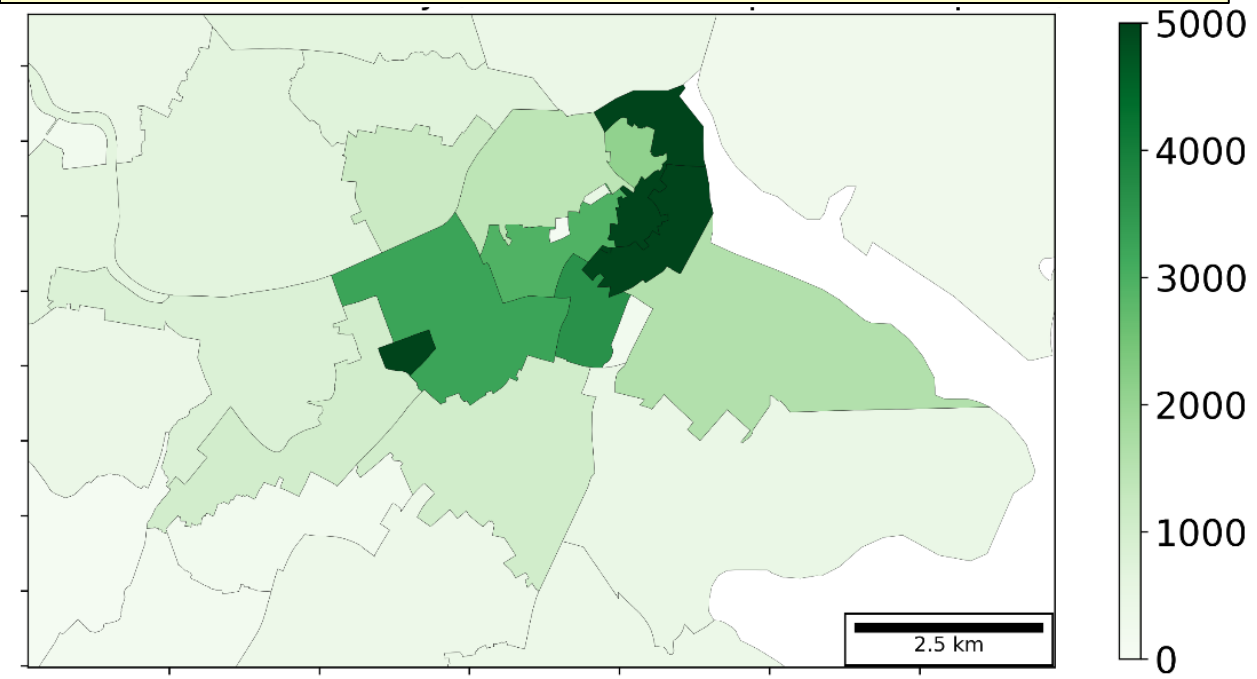
FIS Establishment Density (est. / sq. km.)



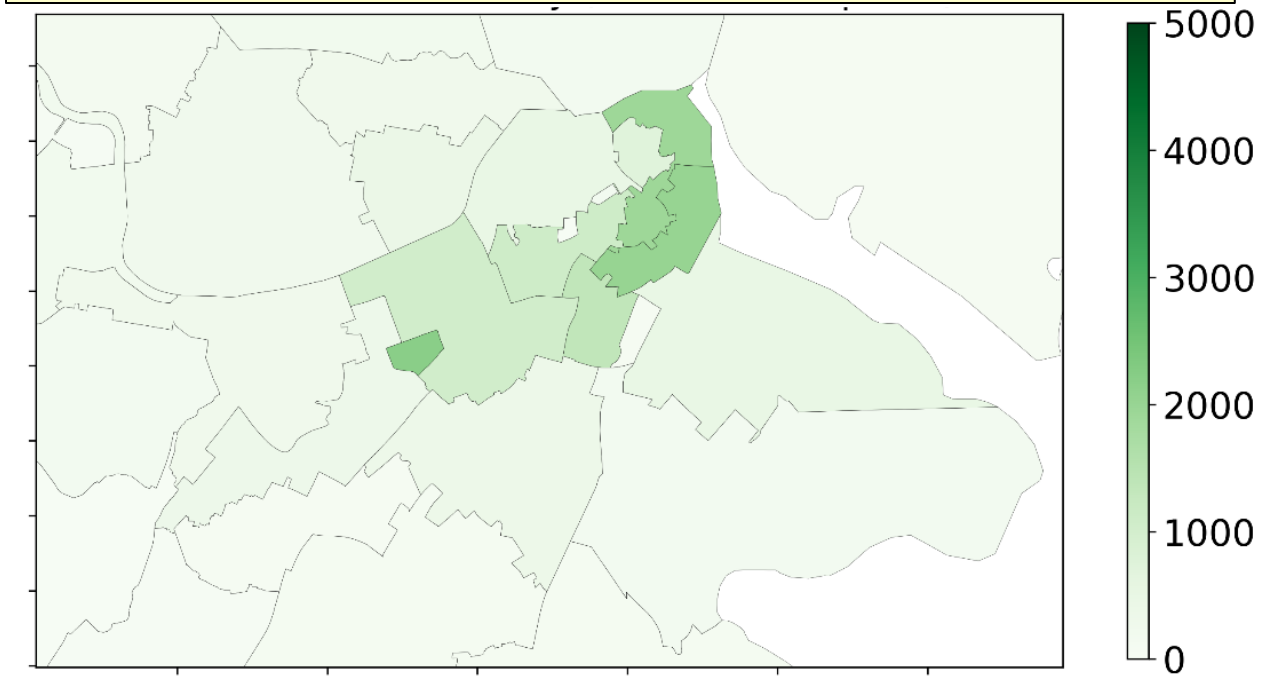
Estimation of B2B and B2C Fulfillments

- Fulfillments for both B2B and B2C were estimated using the FASTGS

B2B fulfillments (shipments and deliveries)



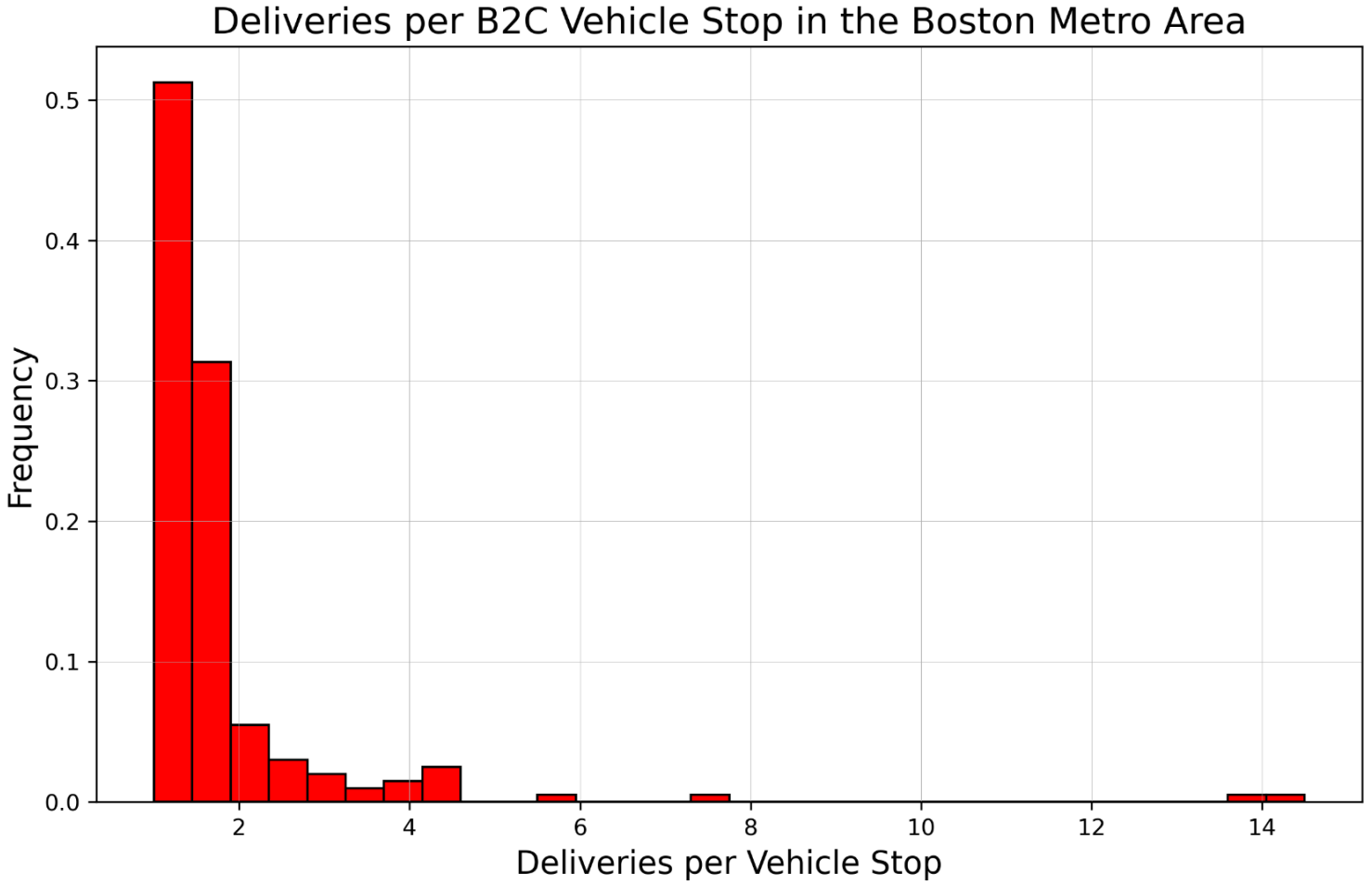
B2C fulfillments (only deliveries)



Estimates of Freight Trip Generation

Amazon Last Mile Routing Dataset

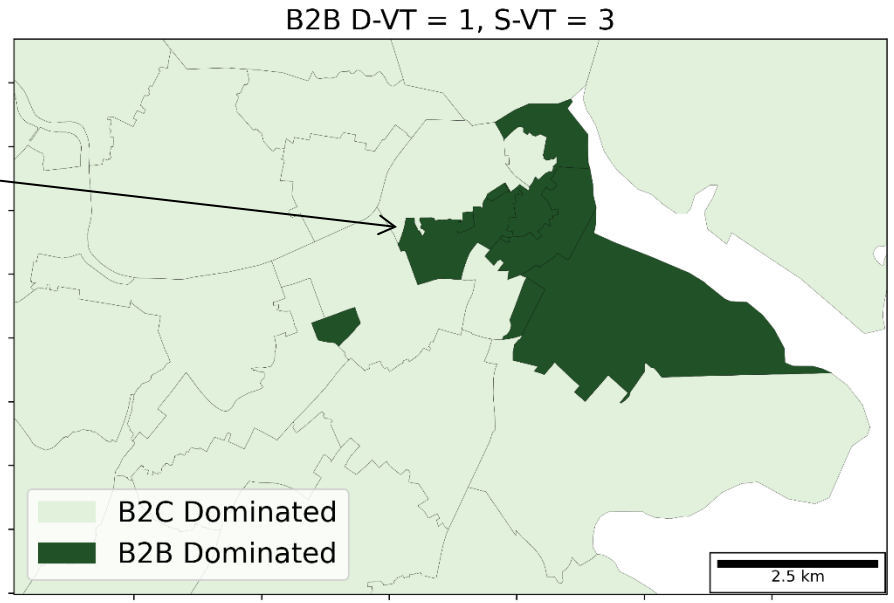
- Data from delivery routes executed in 2018 by Amazon Drivers
- 9,184 routes within
  - Los Angeles
  - Boston
  - Chicago
  - Austin
  - Seattle
- Processed to provide
  - The number of stops per route
  - The number of deliveries per stop
  - Socioeconomic data regarding the stop's ZIP code

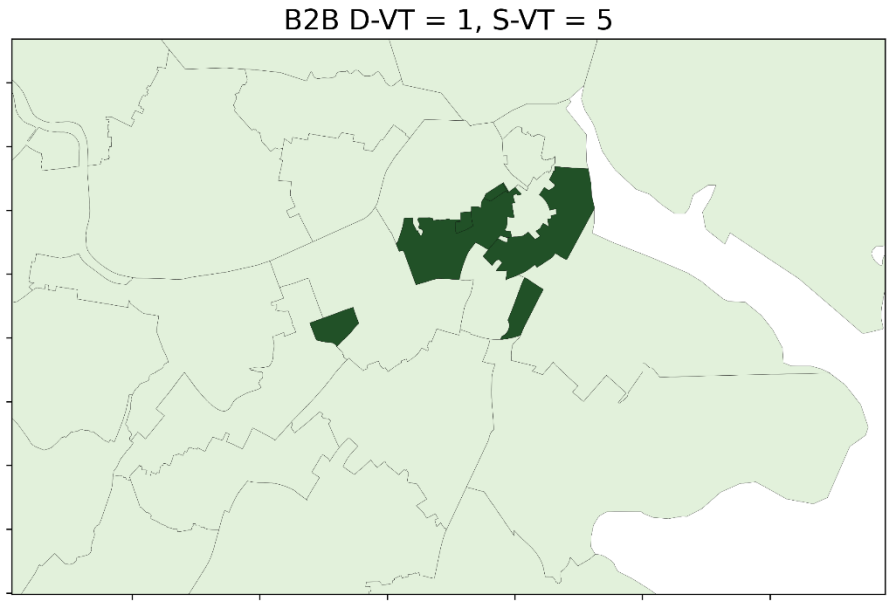


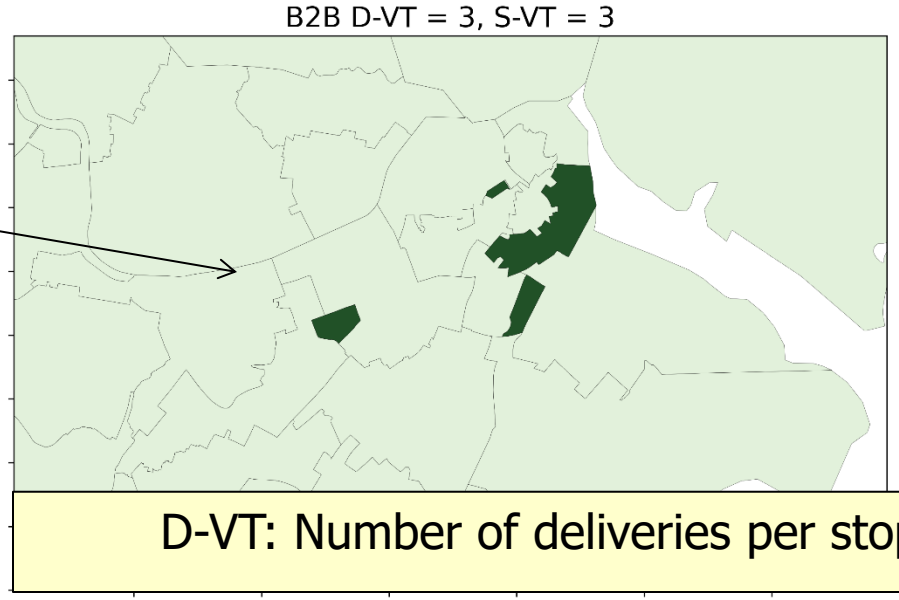
Results for Combinations of D-VT and S-VT

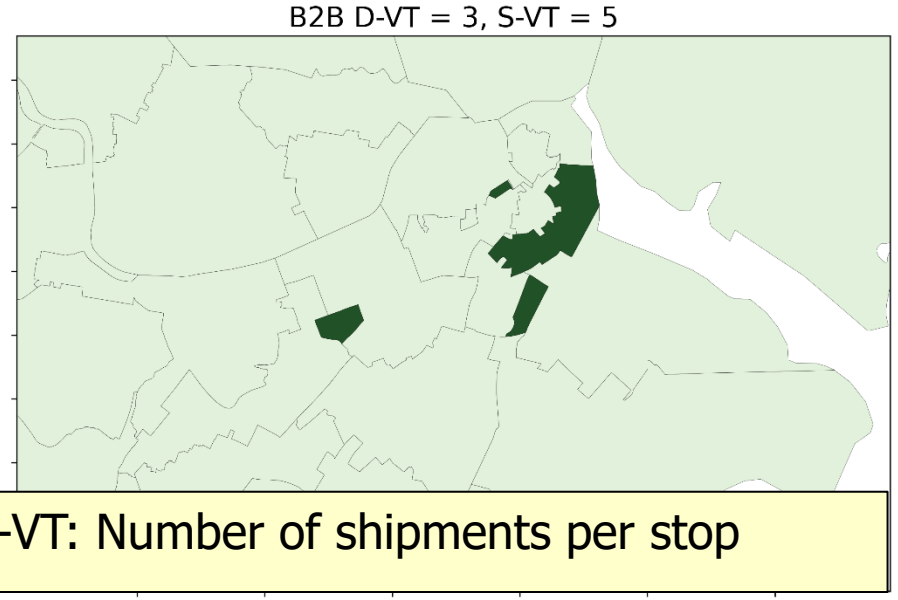
Dark green areas → B2B produce more traffic than B2C)

Light green areas → B2C produce more traffic than B2C)









D-VT: Number of deliveries per stop; S-VT: Number of shipments per stop

FTG Comparison: Google Street View Matrix

	B2B-Dominated	B2C-Dominated
High Density		
Low Density		

Higher density

Preliminary analyses indicate that the same pattern hold for other American cities

Policy Implications

Implications

- There may be reasons to focus on B2C
  - Successful experiences with B2C may encourage city leaders to engage B2B
- However, the bigger generator of freight trips is not B2C, **it is B2B**:
  - Moreover, the vehicles used for B2B tend to be older and less efficient than B2C's
  - Focusing on B2B is crucial to reduce freight externalities
- Potential actions:
  - Take steps to provide suitable parking allocation for freight vehicles
  - Freight demand management: Foster consolidation of orders, re-timing of deliveries including off-hour deliveries, etc.
  - Engaging the B2B sector could be challenging… that's the fun of life… ☺

Thanks!

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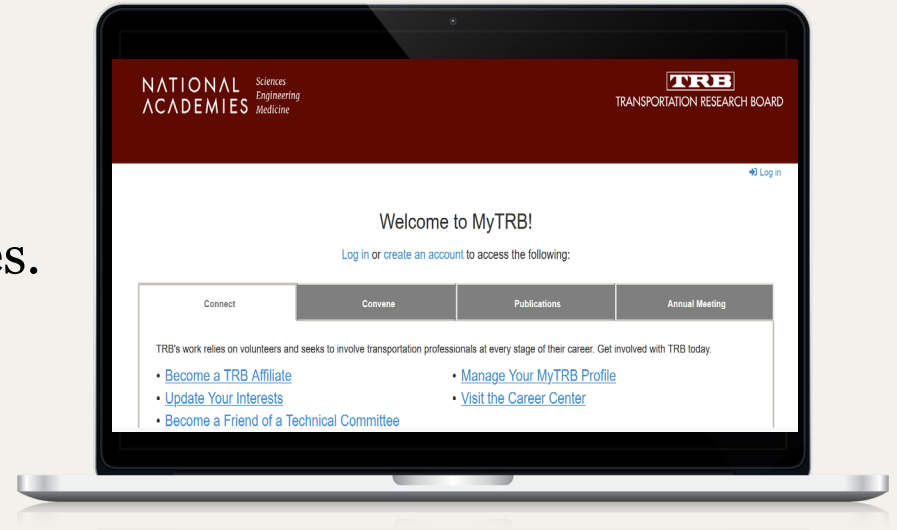

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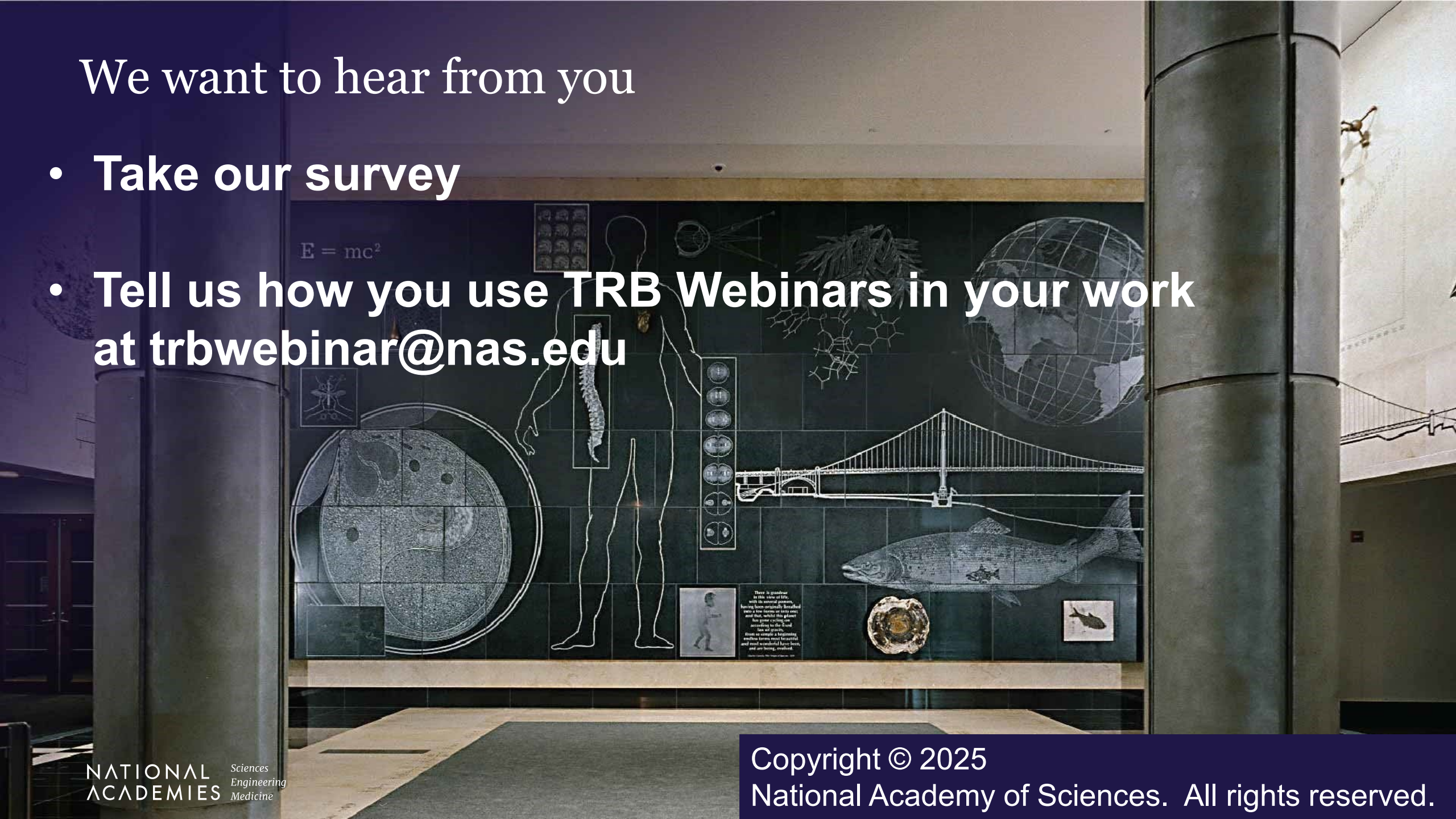

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