



Safety and Security Considerations for Freight Movement in the Maryland State Freight Plan Update

L’Kiesha Markley

Innovative Planning and Performance Division

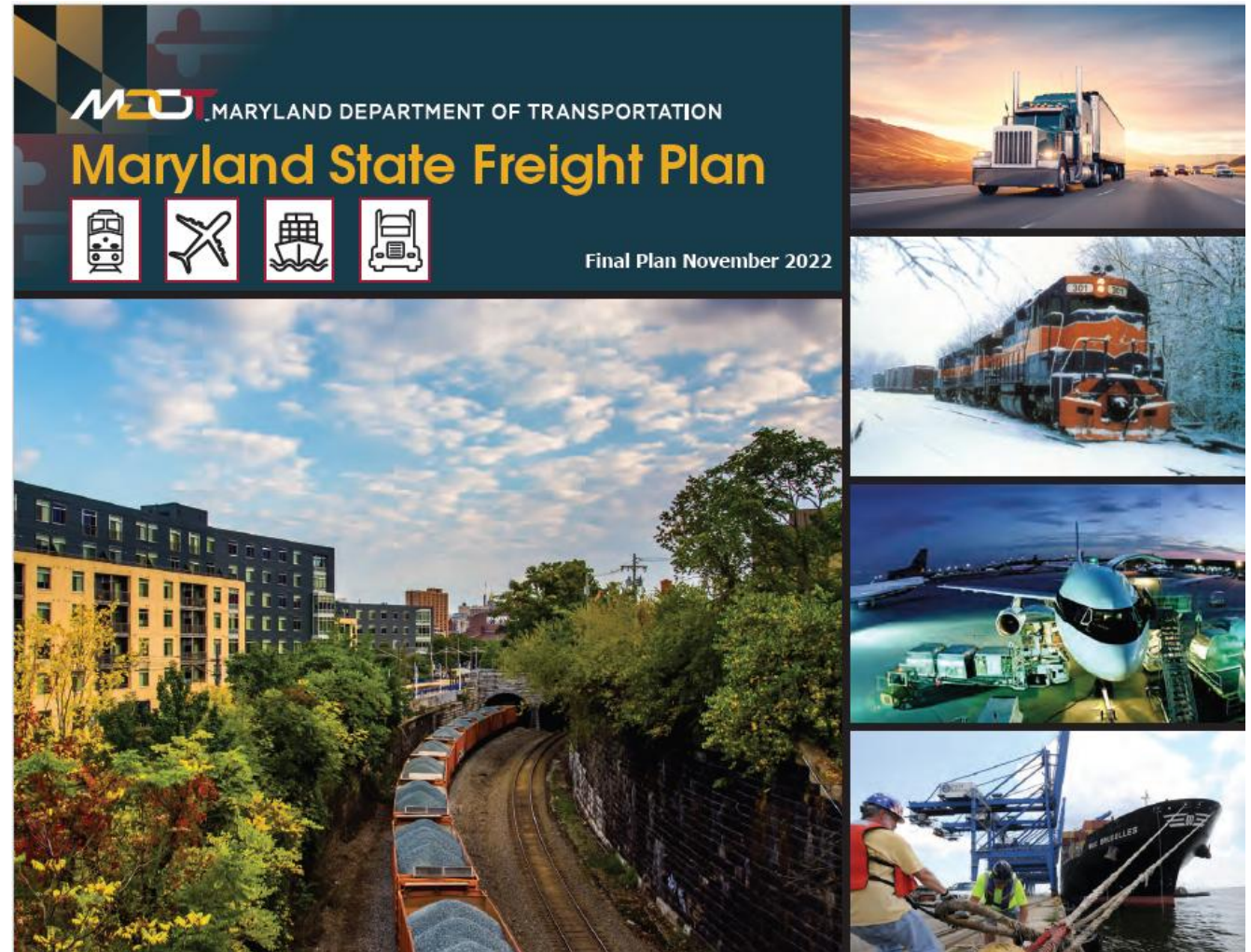
State Highway Administration

July 9, 2026



The 2022 Maryland State Freight Plan

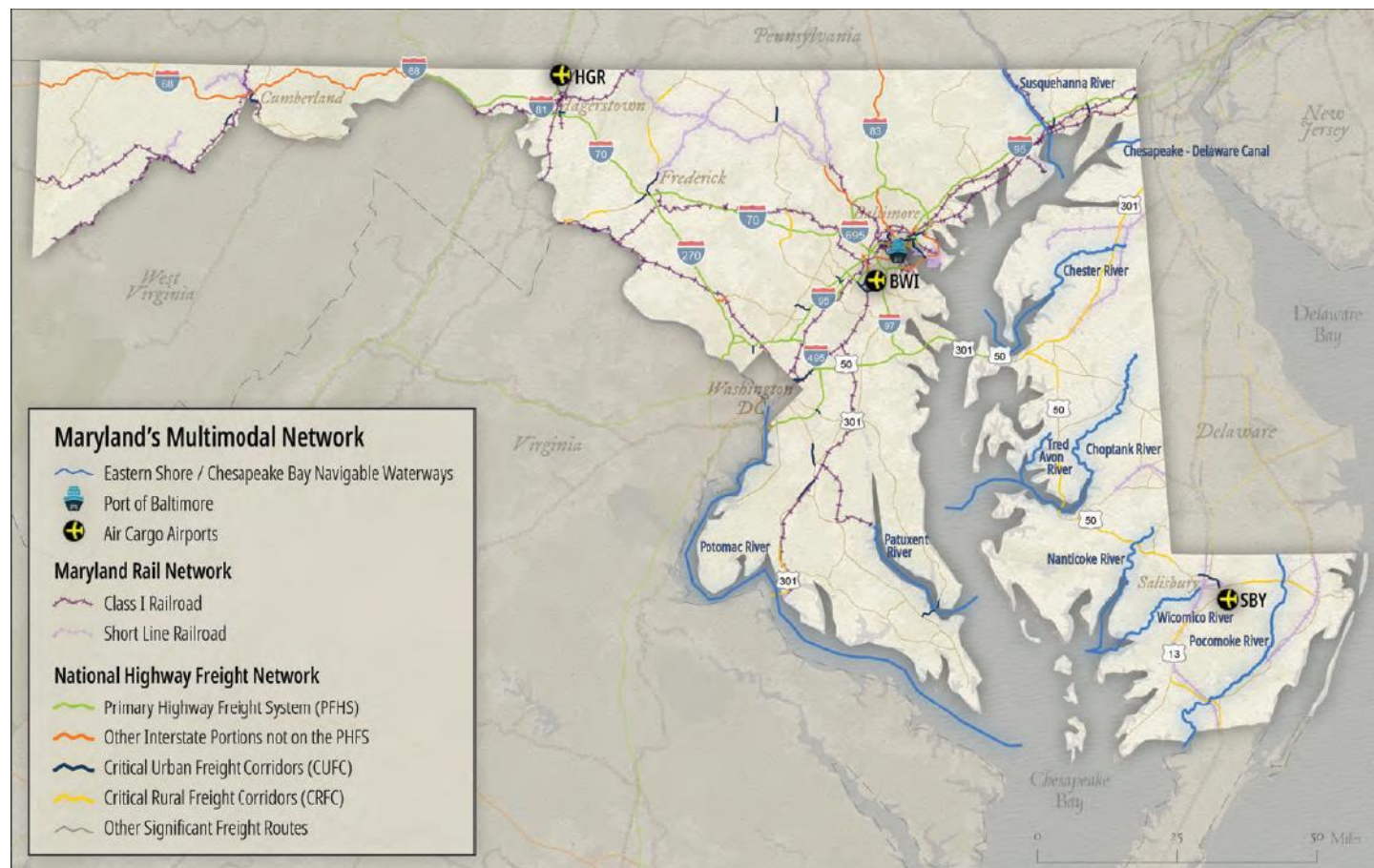
- The current Maryland State Freight Plan was approved by FHWA on December 5, 2022
- Work is underway to update the Maryland State Freight Plan for 2026
 - The MDOT team is working under an aggressive timeline to complete a draft State Freight Plan for submittal for FHWA review in early September 2026
 - Data analysis is ongoing
 - Anticipate FHWA approval in early December 2026



Freight Safety Concerns

The 2022 Maryland State Freight Plan Identified Four Freight Safety Concerns

- Highway safety
- Highway-Rail Crossings
- Hazardous Materials
- Freight Security Considerations



Freight Performance Measures in the 2022 Maryland State Freight Plan

FREIGHT PERFORMANCE MEASURE <i>(unit)</i>	LAST ESTIMATE <i>(year)</i>	LATEST ESTIMATE <i>(year)</i>	TREND
GOAL: SAFETY, SECURITY, AND RESILIENCE			
CRASHES INVOLVING HEAVY TRUCKS WITH FATALITIES (#)	60 (2016)	59 (2020)	
CRASHES INVOLVING HEAVY TRUCKS WITH INJURIES (% of all truck crashes)	9.2% (2016)	12.9% (2020)	
LANE CLOSURES DUE TO FATAL CRASHES INVOLVING HEAVY TRUCKS (total lane closure hours per year)	234 (2016)* 136 (2017)*	182 (2020)	
COMMERCIAL VEHICLE SAFETY INSPECTIONS (annual # performed)	107,211 (2016)	116,339 (2019)	
TRUCK PARKING SPACES/FACILITIES (PUBLIC) (# available)	492/20 (2015)	595/26 (2020)	
TRUCK PARKING SPACES/FACILITIES (PRIVATE) (# available)	2,544/49 (2015)	2,307/27 (2020)	—
CRASHES AT HIGHWAY-RAIL CROSSINGS(#)	20 (2016)	22 (2020)	—
CRASHES AT HIGHWAY-RAIL CROSSINGS WITH INJURIES OR FATALITIES (% of all highway-rail crossing crashes)	5.0% (2016)	9.1% (2020)	—
HAZARDOUS MATERIAL RELEASE INCIDENTS(#)	223 (2017)	346 (2019)* 173 (2020)*	—

LEGEND: Facing Challenges Steady or Making Progress On Track or Improving — Inconclusive

* Table Note: multiple data years imply notable one-year differences that may vary significantly from longer-term trends due to a potential change in data references, COVID-19 influences, or other isolated factors.



Impacts and Interaction with Local Jurisdictions and Regional Freight Movement

Impacts of Congestion Upon Safety and Security

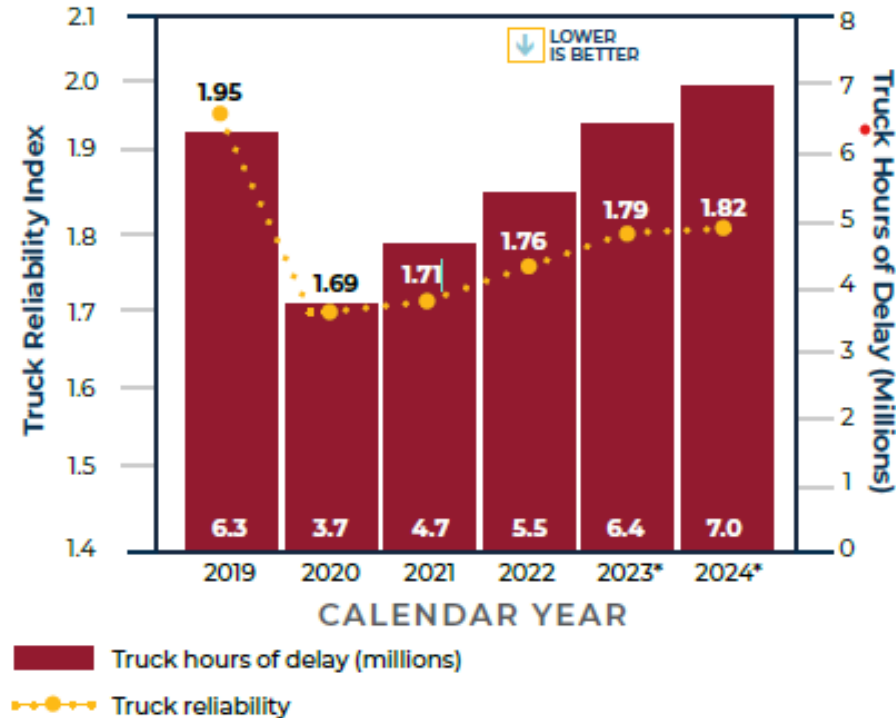
- Congestion increases the likelihood of accidents on highways
- Increased congestion impacts emergency response times and cleanup after accidents, exacerbating delay
- Reduced travel times due to roadway congestion can impact the need for additional truck parking along freight corridors due to Hours of Service requirements
- Congestion impacts residential communities and local businesses



Truck Hours of Delay and Reliability Trends

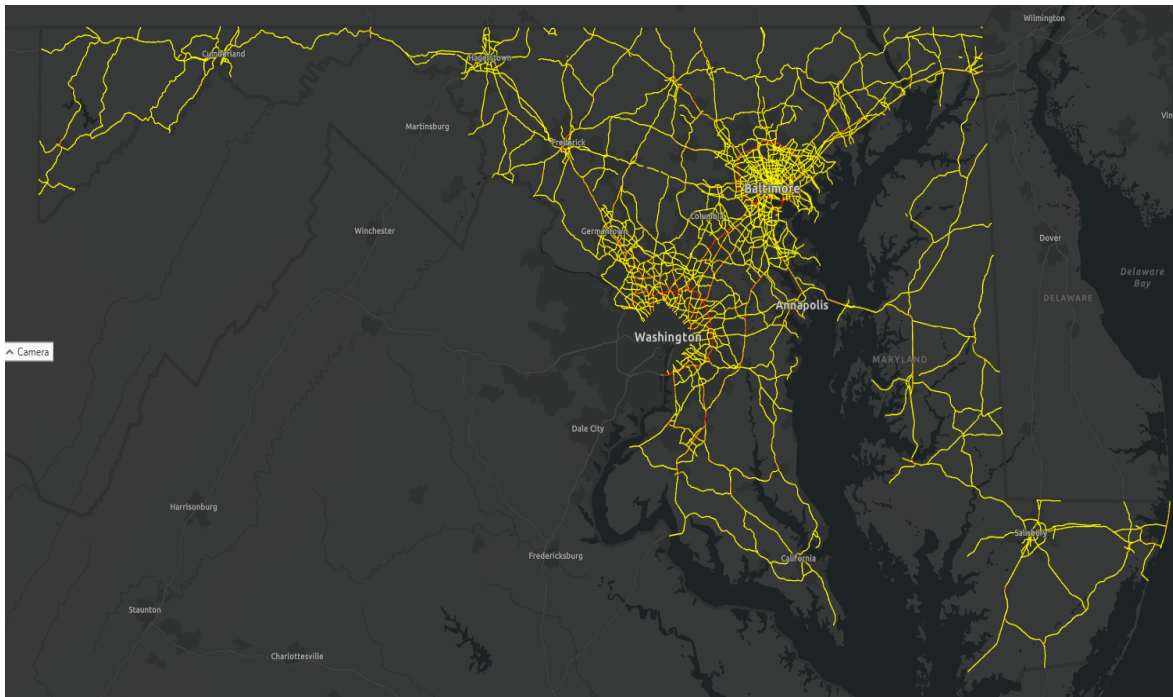
- Delay on Maryland roadways continues to increase from a low in 2020
- Total truck hours of delay increased by 0.6 Million from 2023 to 2024
- The Truck Reliability Index increased from 1.79 to 1.82

TRUCK HOURS OF DELAY AND TRUCK RELIABILITY ON THE MARYLAND PUBLIC ROADWAY NETWORK

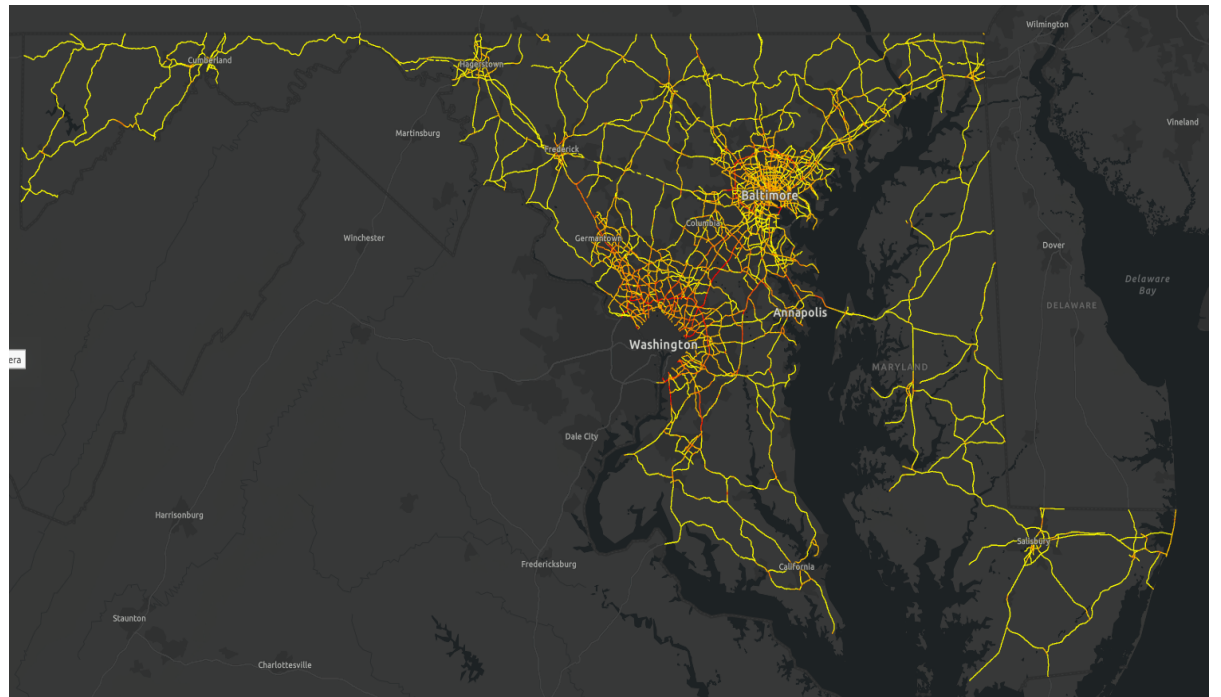


Congestion Trends in Maryland

Truck delay in 2024



Truck Reliability 2024

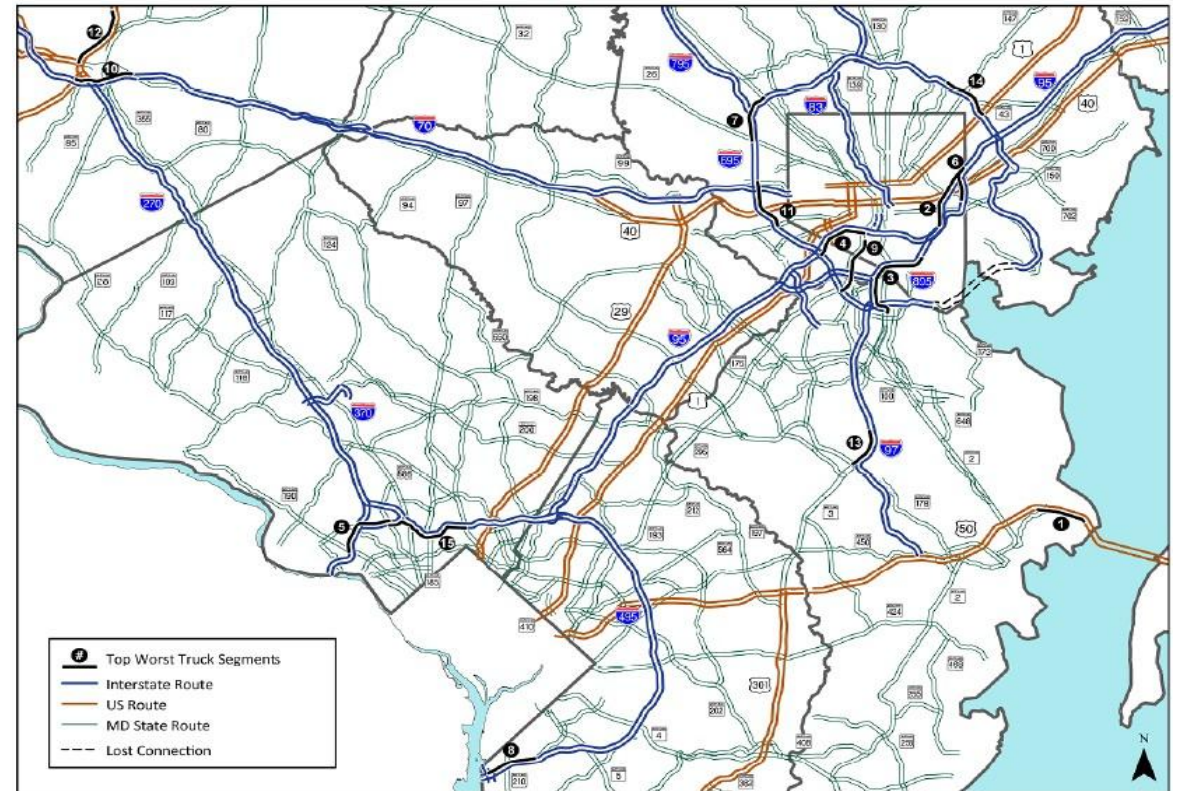


Worst Corridors for Freeway/Expressway Truck Travel in 2024

Top 15 Worst Corridors for Freeway/Expressway Truck Travel in 2024

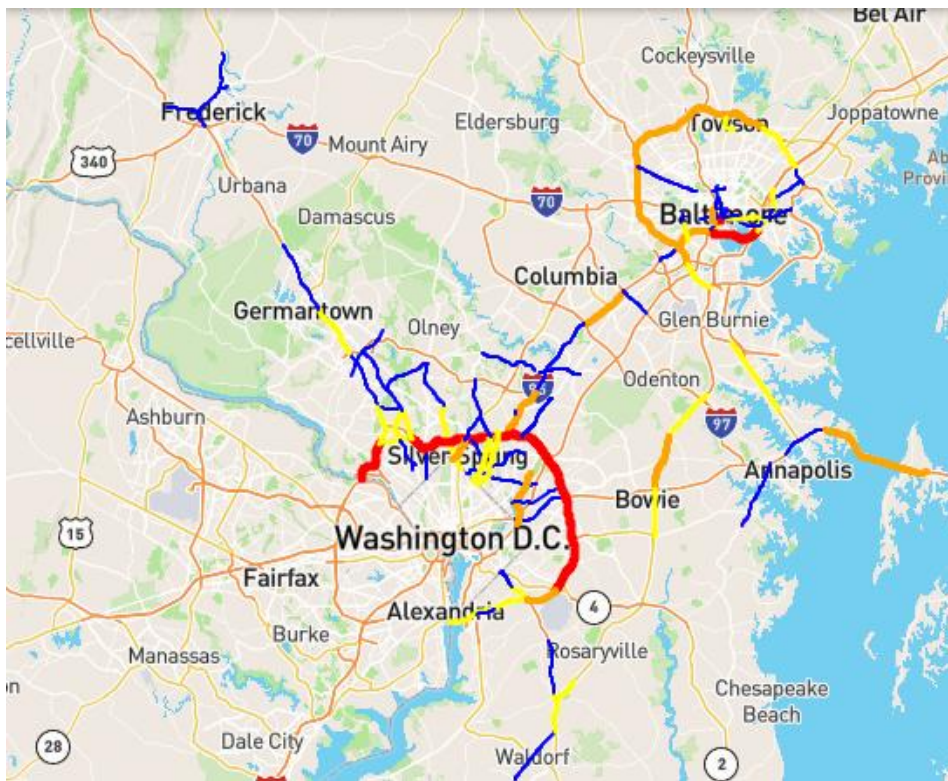
RANK	ROUTE/DIRECTION	LIMITS	COUNTY	MILEAGE	TTR MAX VALUE
1	US 50/US 301 Eastbound	Buschs Frontage Road to Oceanic Drive	Anne Arundel	3.09	7.97
2	I-895 Southbound	I-95 to Ponca Street Overpass	Baltimore City	3.06	7.92
3	I-895 Northbound	I-895B to Baltimore Harbor Tunnel	Baltimore City/Anne Arundel	3.14	6.86
4	I-95 Northbound	I-695 to MD 295	Baltimore City/Baltimore	3.20	5.67
5	I-495 Outer Loop	MD 187 to MD 190	Montgomery	3.19	5.45
6	I-95 Southbound	Baltimore County Line to Kane Street	Baltimore City	3.07	5.29
7	I-695 Outer Loop	MD 140 to MD 26	Baltimore	3.22	5.16
8	I-95/I-495 Local Inner Loop	MD 414 to I-295	Prince George's	3.38	4.70
9	MD 295 Northbound	I-695 to Waterview Avenue	Baltimore City/Baltimore	3.31	4.64
10	I-70 Westbound	MD 144 to US 15/US 340	Frederick	3.01	4.14
11	I-695 Inner Loop	MD 144 to MD 122	Baltimore	3.02	4.08
12	US 15 Southbound	Monocacy Boulevard to US 40	Frederick	3.34	3.99
13	I-97 Southbound	Benfield Blvd to MD 32/MD 3	Anne Arundel	3.38	3.95
14	I-695 Outer Loop	US 1 to MD 41	Baltimore	3.04	3.89
15	I-495 Inner Loop	MD 187 to MD 97	Montgomery	4.61	3.84

Locations of the Top 15 Worst Corridors for Freeway/Expressway Truck Travel in 2024

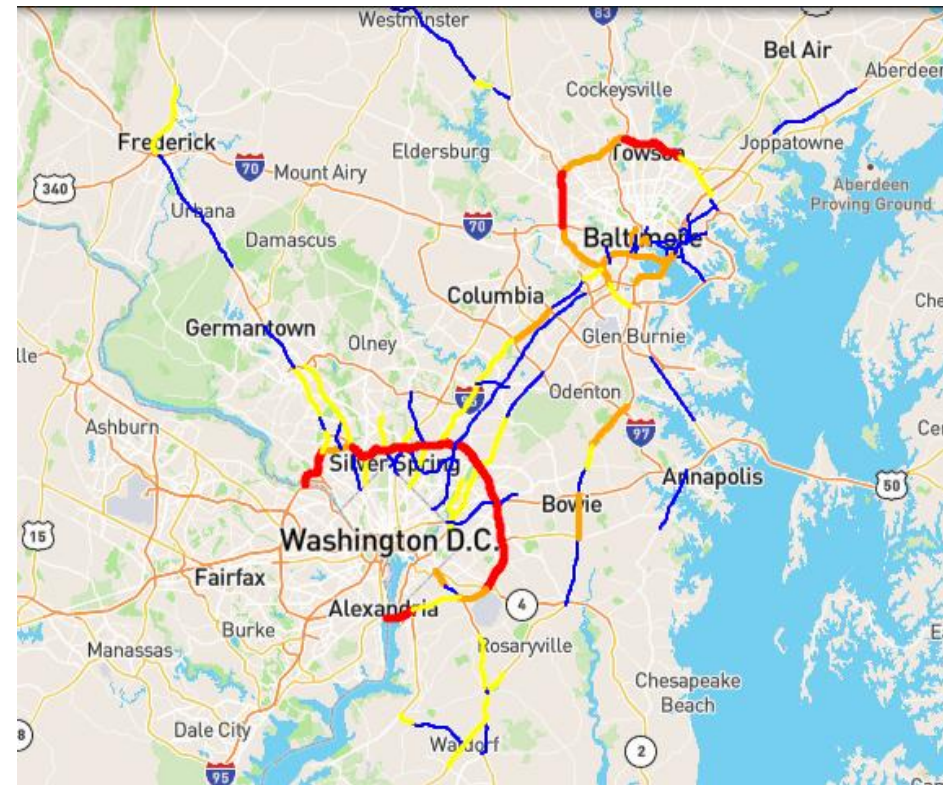


Top Truck Bottlenecks in Maryland

2019

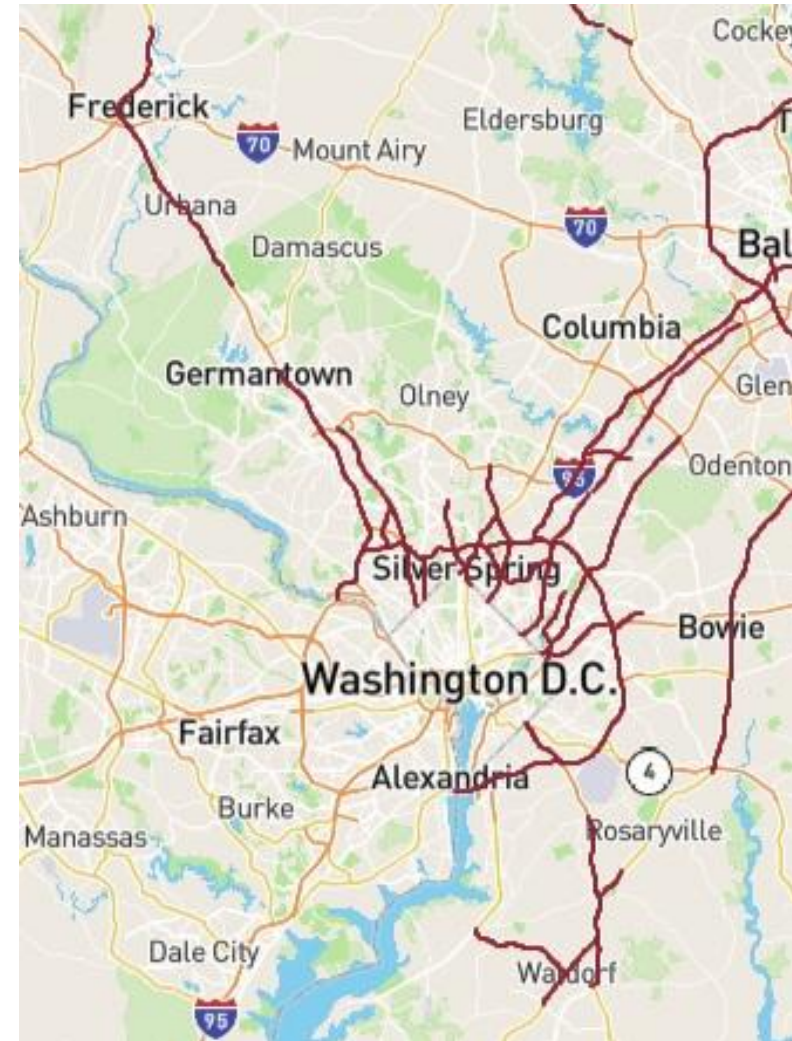


2024



Truck Bottlenecks in the Washington Region (2024)

- A snapshot of the roadways in the Washington Region included among the Top 100 Truck Bottlenecks in Maryland



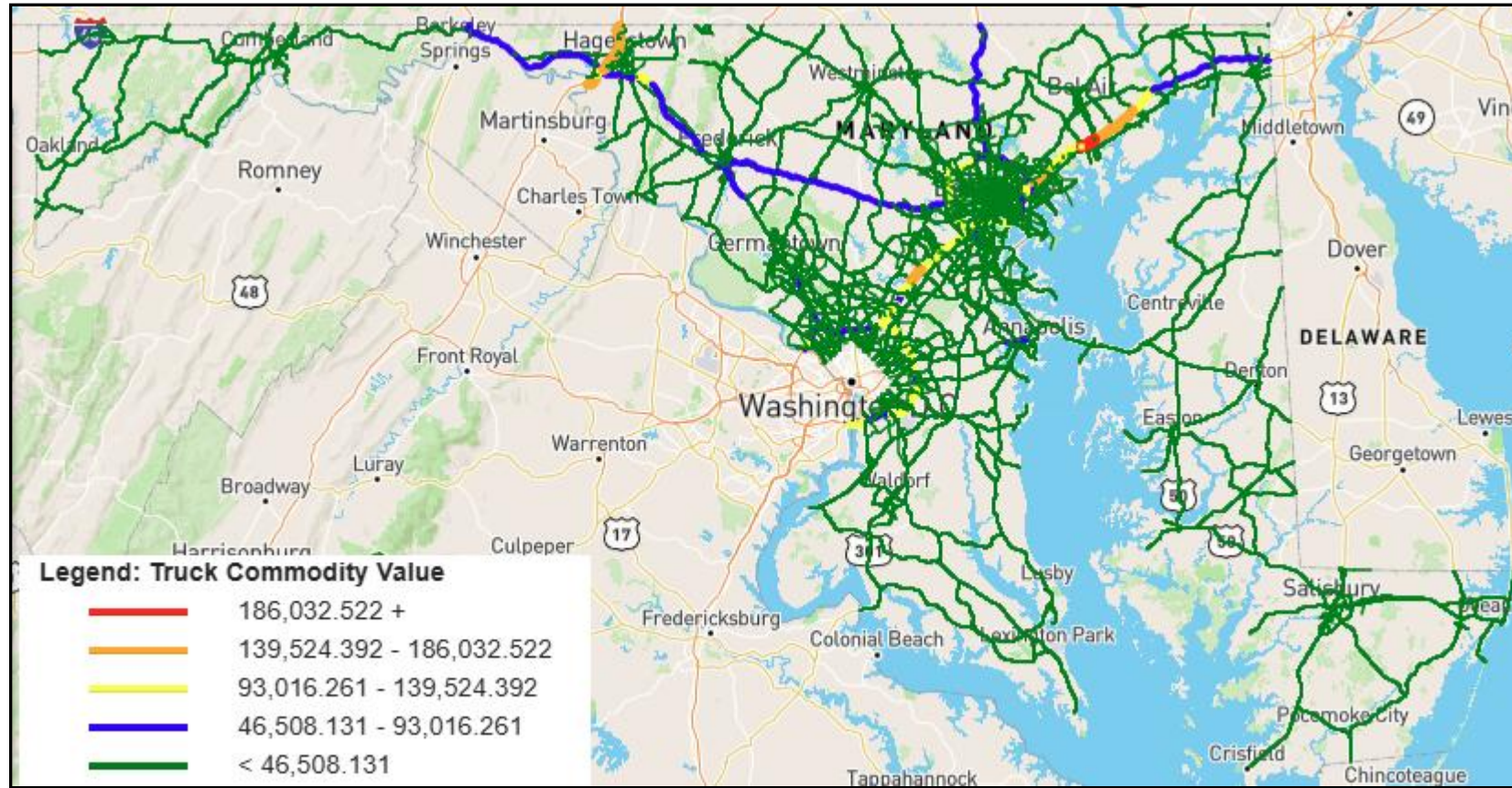
Top Commodities Moving in Maryland (Tonnage)

Top Rank	Within	Outbound	Inbound
1	Gravel	Natural gas and other fossil products	Natural gas and other fossil products
2	Nonmetal min. prods.	Nonmetal min. prods.	Coal
3	Coal	Cereal grains	Cereal grains
4	Natural gas and other fossil products	Other foodstuffs	Other ag prods.
5	Waste/scrap	Waste/scrap	Other foodstuffs
6	Gasoline	Mixed freight	Wood prods.
7	Other foodstuffs	Wood prods.	Mixed freight
8	Natural sands	Coal	Nonmetal min. prods.
9	Mixed freight	Motorized vehicles	Gravel
10	Wood prods.	Gravel	Animal feed

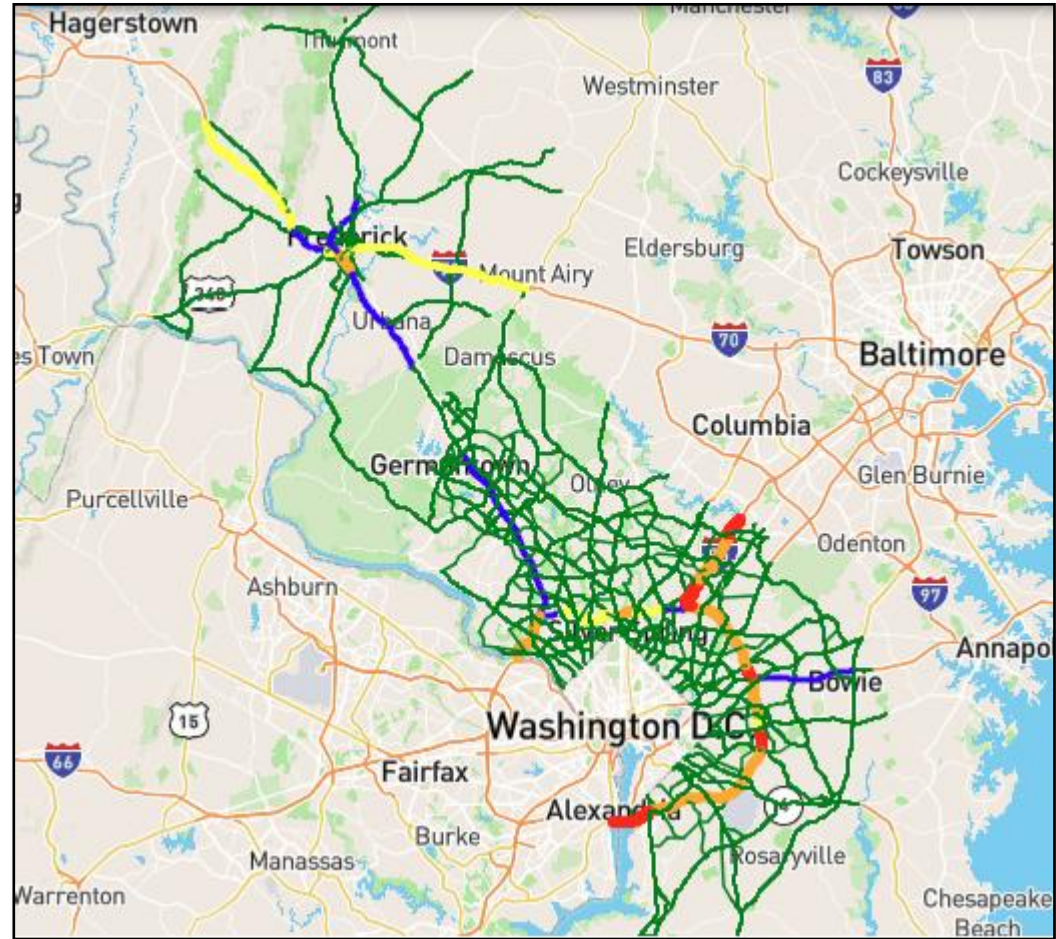
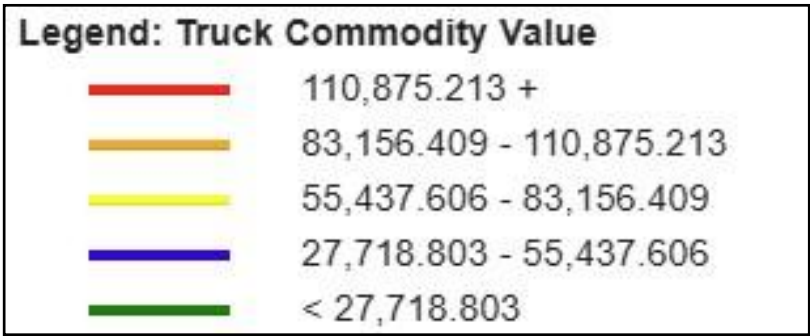
Top Commodities Moving in Maryland (Value)

Top Rank	Within	Outbound	Inbound
1	Motorized vehicles	Motorized vehicles	Pharmaceuticals
2	Mixed freight	Pharmaceuticals	Electronics
3	Electronics	Electronics	Motorized vehicles
4	Other foodstuffs	Mixed freight	Mixed freight
5	Gasoline	Machinery	Misc. mfg. prods.
6	Machinery	Other foodstuffs	Other foodstuffs
7	Pharmaceuticals	Natural gas and other fossil products	Machinery
8	Natural gas and other fossil products	Chemical prods.	Textiles/leather
9	Plastics/rubber	Misc. mfg. prods.	Natural gas and other fossil products
10	Base metals	Plastics/rubber	Plastics/rubber

Commodity Values for Trucks Traveling in Maryland (2024)



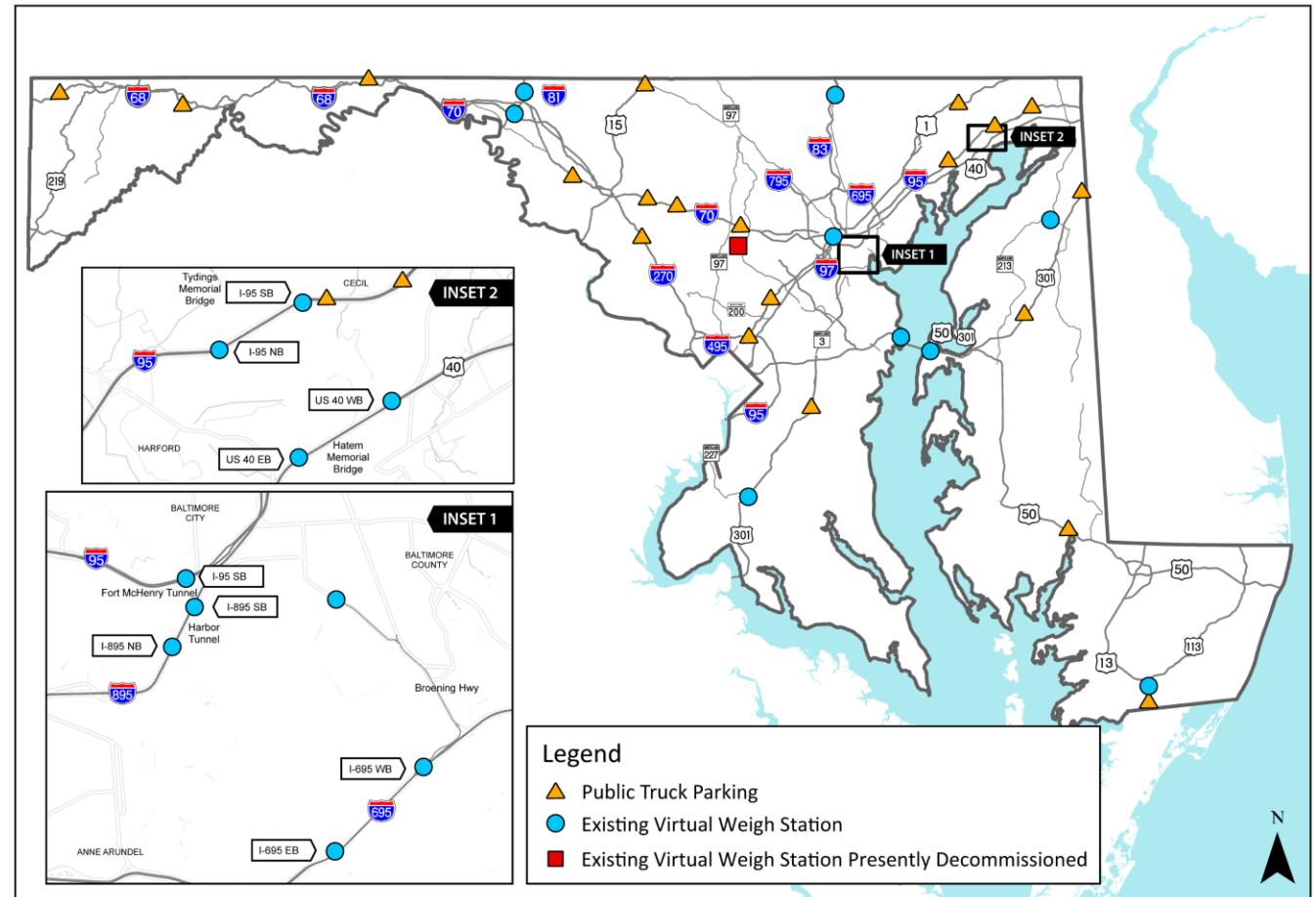
Commodity Values for Trucks Traveling in the Washington Region (2024)



Truck Parking

- FHWA guidance requires that states include truck parking as part of any State Freight Plan
- The shortage of safe, legal truck parking in Maryland has been documented in studies going back to 2012
- Maryland's current inventory of truck parking capacity is estimated at about 610 public spaces and 2,310 private
- Truck Parking studies since 2020 have identified 18 Priority Clusters of truck parking demand throughout Maryland

Public Truck Parking and Virtual Weigh Stations in Maryland (2024)



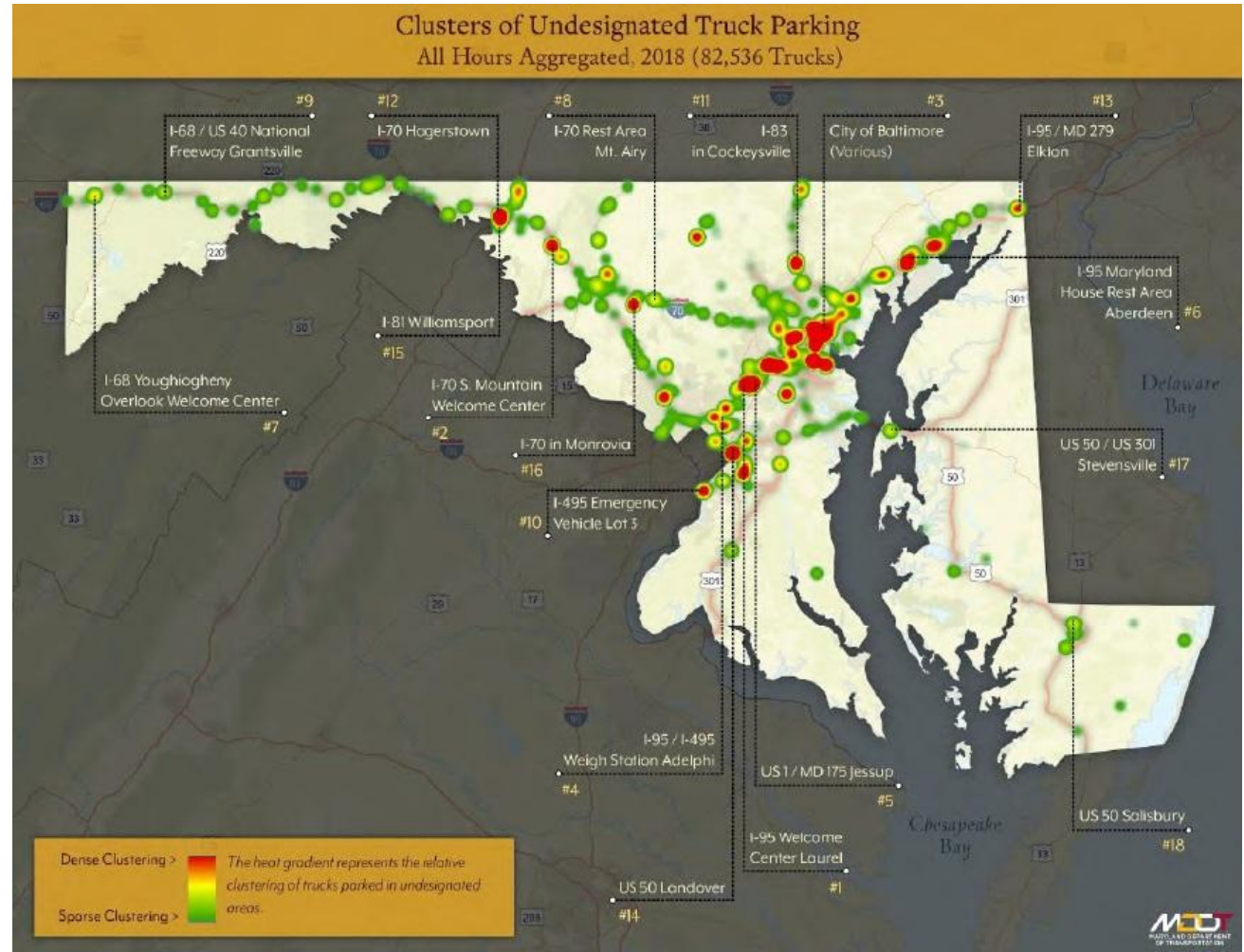
Truck Parking

- FHWA guidance requires that states include truck parking as part of any State Freight Plan
- The shortage of safe, legal truck parking in Maryland has been documented in studies going back to 2012
- Maryland's current inventory of truck parking capacity is estimated at about 610 public spaces and 2,310 private

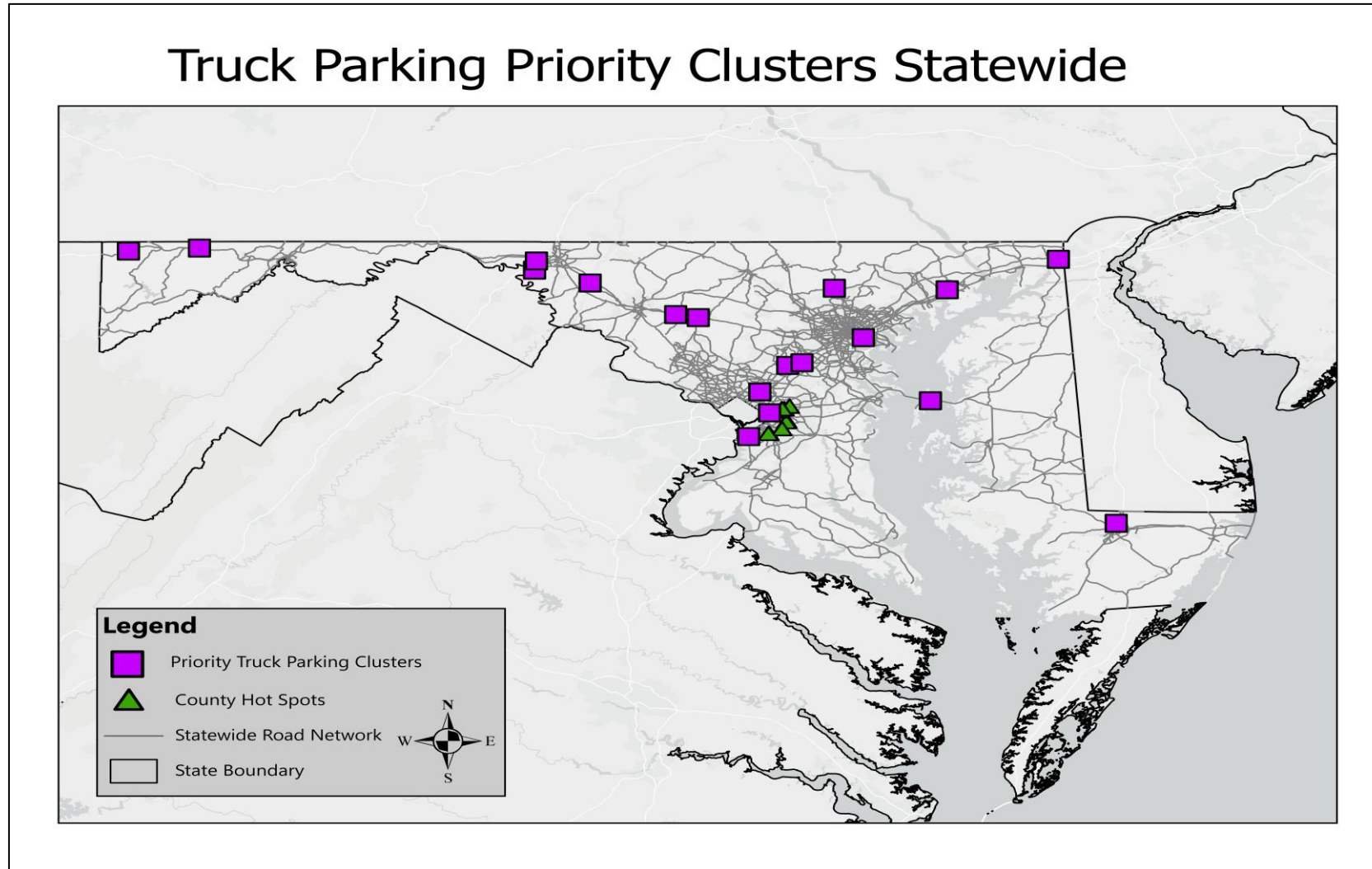


Truck Parking Priority Clusters

- Truck Parking assessments since 2020 have identified 18 Priority Clusters of truck parking demand throughout Maryland
- These locations have remained largely consistent over the years, although rankings may change over time



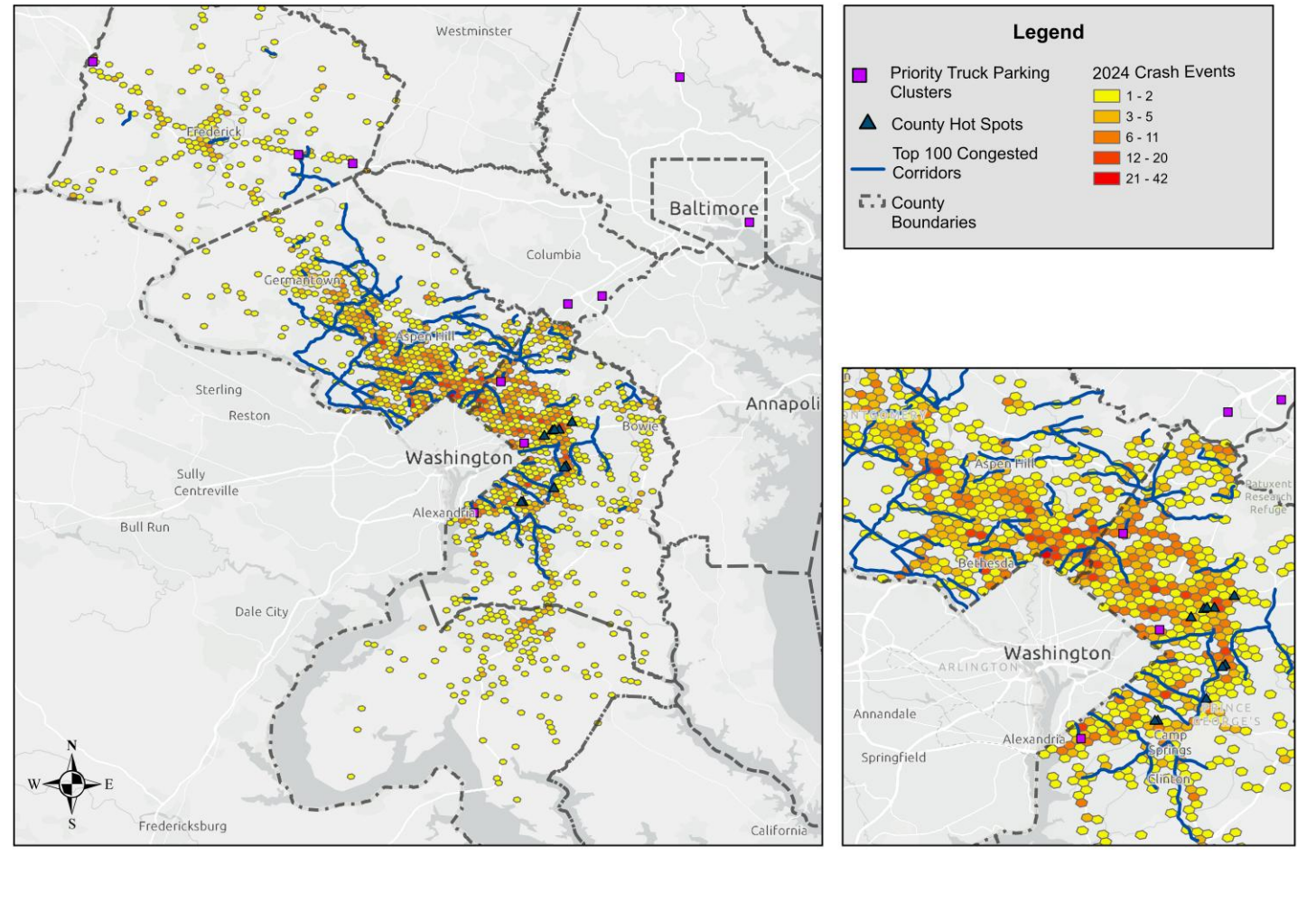
Current Truck Parking Priority Clusters



Truck Parking Safety Considerations in the Washington Region

- This map provides an overview of truck parking demand in relation to congested roadways and crash events in the Washington Region
- The densely developed area around Washington DC shows the highest congestion, parking demand, and truck crash activity

Washington Region Truck Parking Safety Considerations



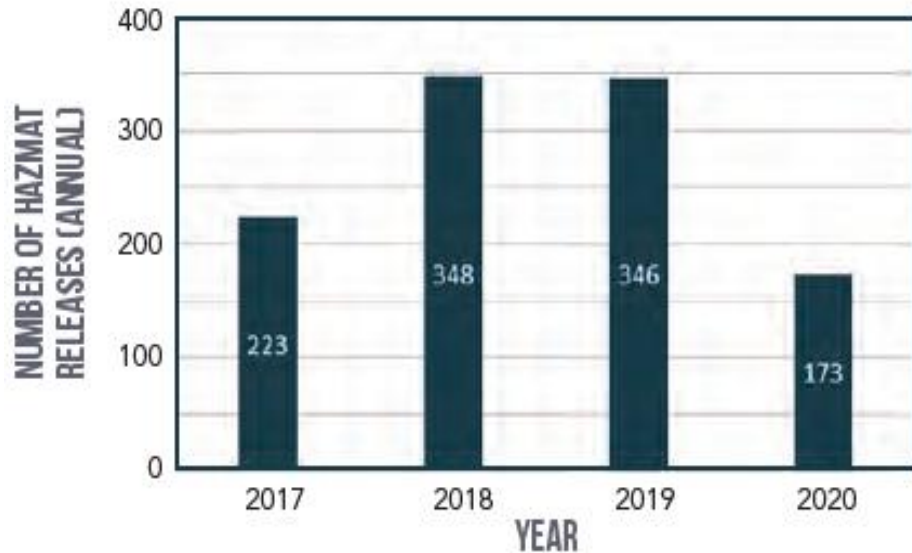
Highway-Rail Crossings

- The interaction of motor vehicles and trains at highway-rail grade crossings presents a safety concern
- The 2022 Maryland State Freight Plan notes:
 - The number of annual fatalities and injuries at highway-rail grade crossings remained low and had generally decreased since 2018
 - Identified 97 highway-rail crossing incidents in Maryland from 2016 to 2020
 - No consistent or readily apparent trends
 - The number of incidents and proportion of injuries and fatalities changed from year to year
 - 16% of all the incidents involved truck-trailer combinations



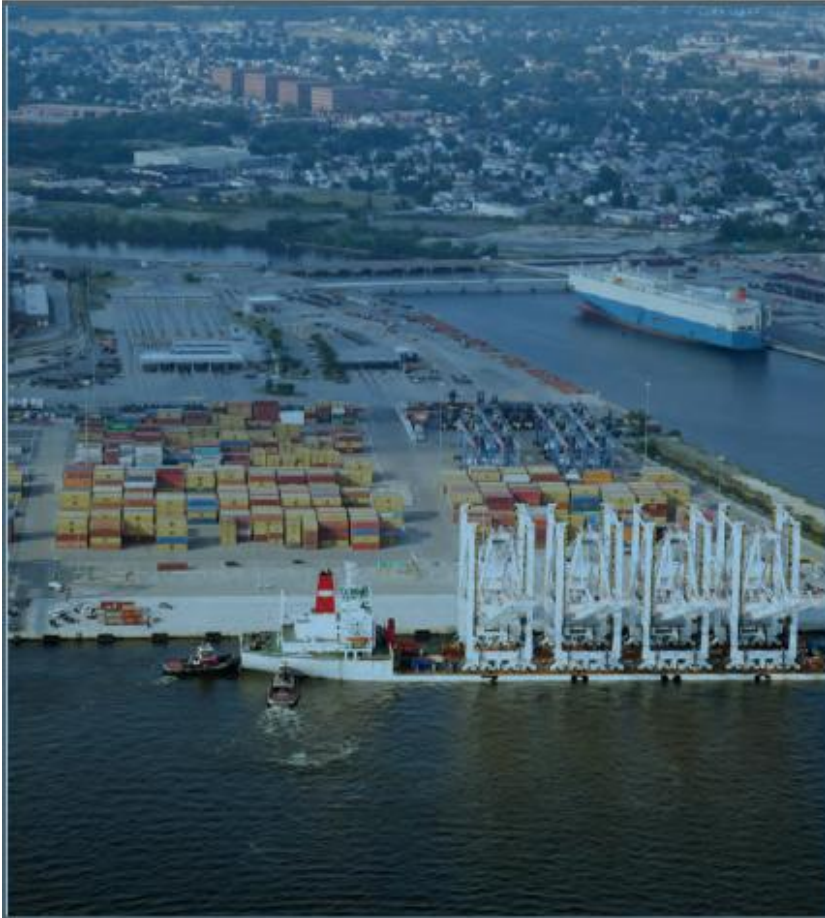
Hazardous Material Release Incidents

Maryland Hazardous Material Release Incidents (2017 – 2020)




- Hazardous material release incidents pose freight-related safety issues and environmental, community, or supply chain impacts.
- Available data for 2017-2020 identified 1,090 hazardous material release incidents over the four-year period.
- There were no consistent or readily apparent trends. The number of occurrences varied from year to year.
- The 2022 Maryland State Freight Plan anticipated continued monitoring and management of hazardous material movements, emergency response plans, contingency routing plans, or other efforts to ensure safe and secure transportation of potentially hazardous materials.

Freight Security Considerations

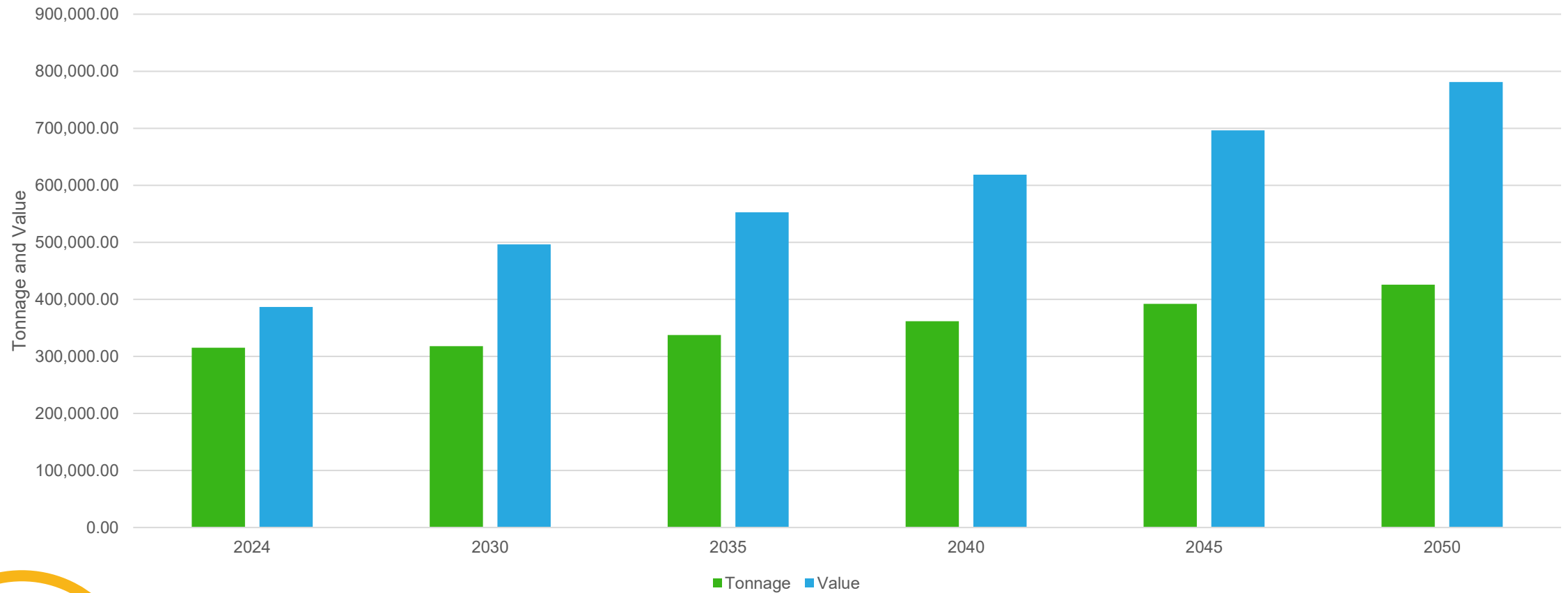


- Freight-related security continues to be important to Maryland's overall freight system and operations. Security considerations pertain to secure facilities, secure cargo, or broader cybersecurity issues, with examples as follows:
 - Secure facility examples (e.g., security clearances, entrance controls)
 - Secure cargo examples (e.g., physical security of cargo storage areas, screening/inspection of cargo at ports, rail yards, or other freight transfer sites)
 - Cybersecurity examples (e.g., technologies for defending against and recovering from cyberattacks)

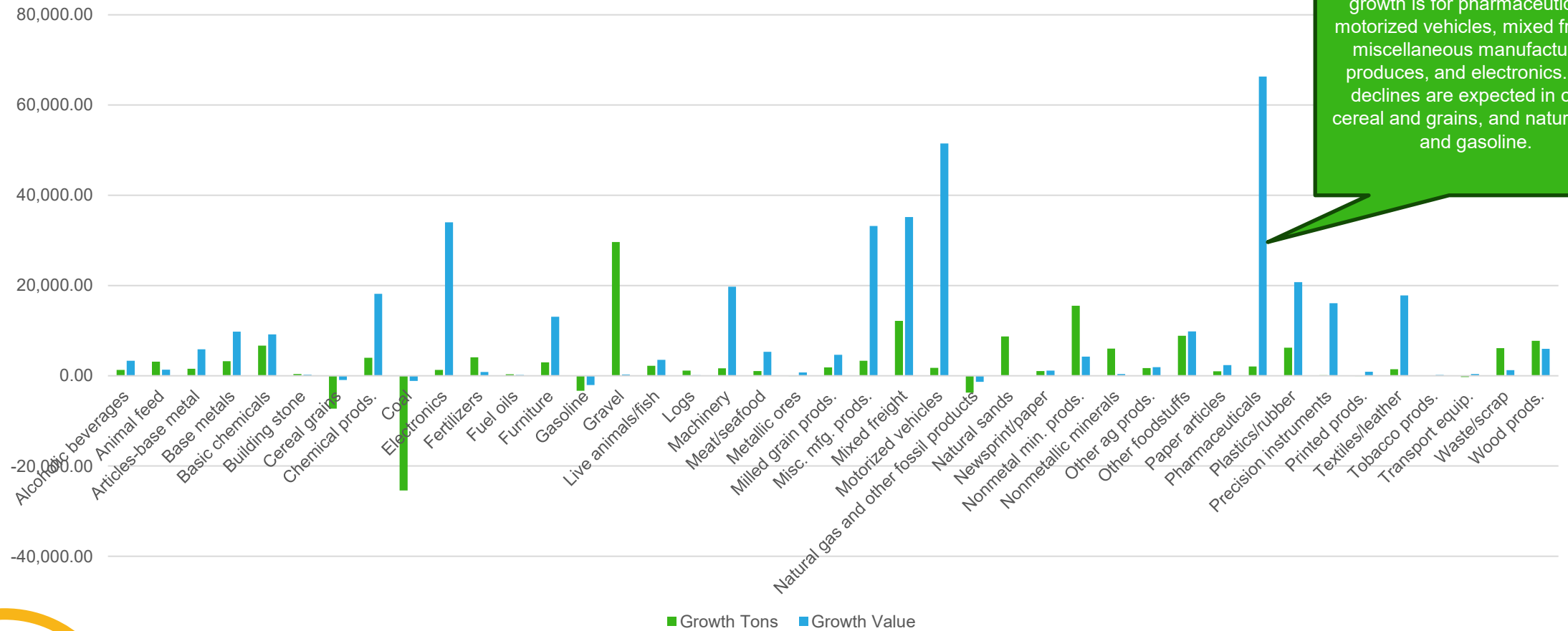


Notable Challenges, Tradeoffs, or Emerging Trends

Maryland's Freight Tonnage is Expected to Grow

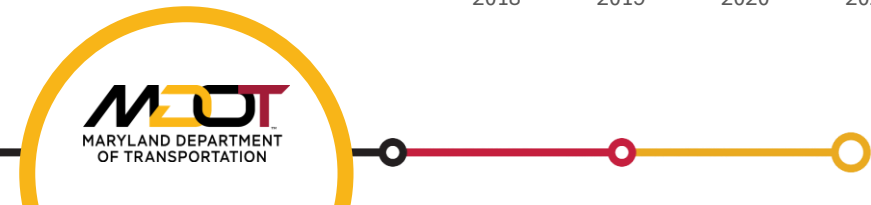
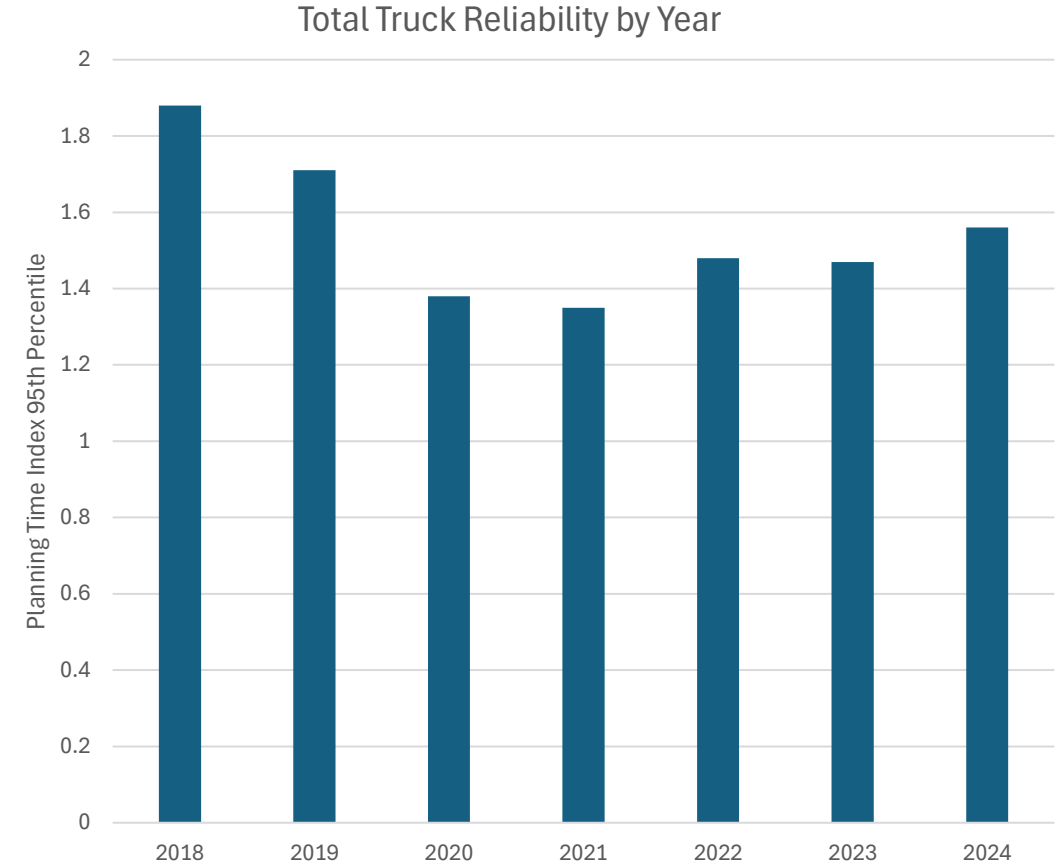
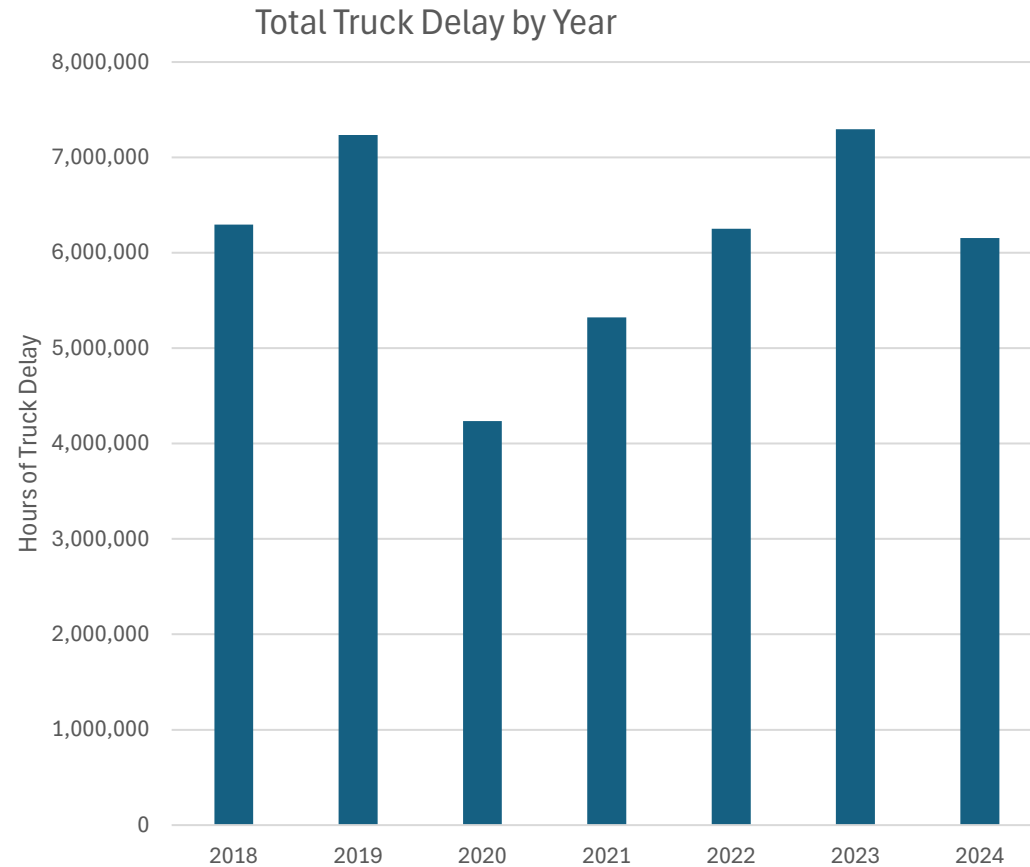


Commodity Tonnage and Value Growth and Decline from 2025 to 2050



Top commodity tonnage value growth is for pharmaceuticals, motorized vehicles, mixed freight, miscellaneous manufacturing produces, and electronics. Top declines are expected in coal, cereal and grains, and natural gas and gasoline.

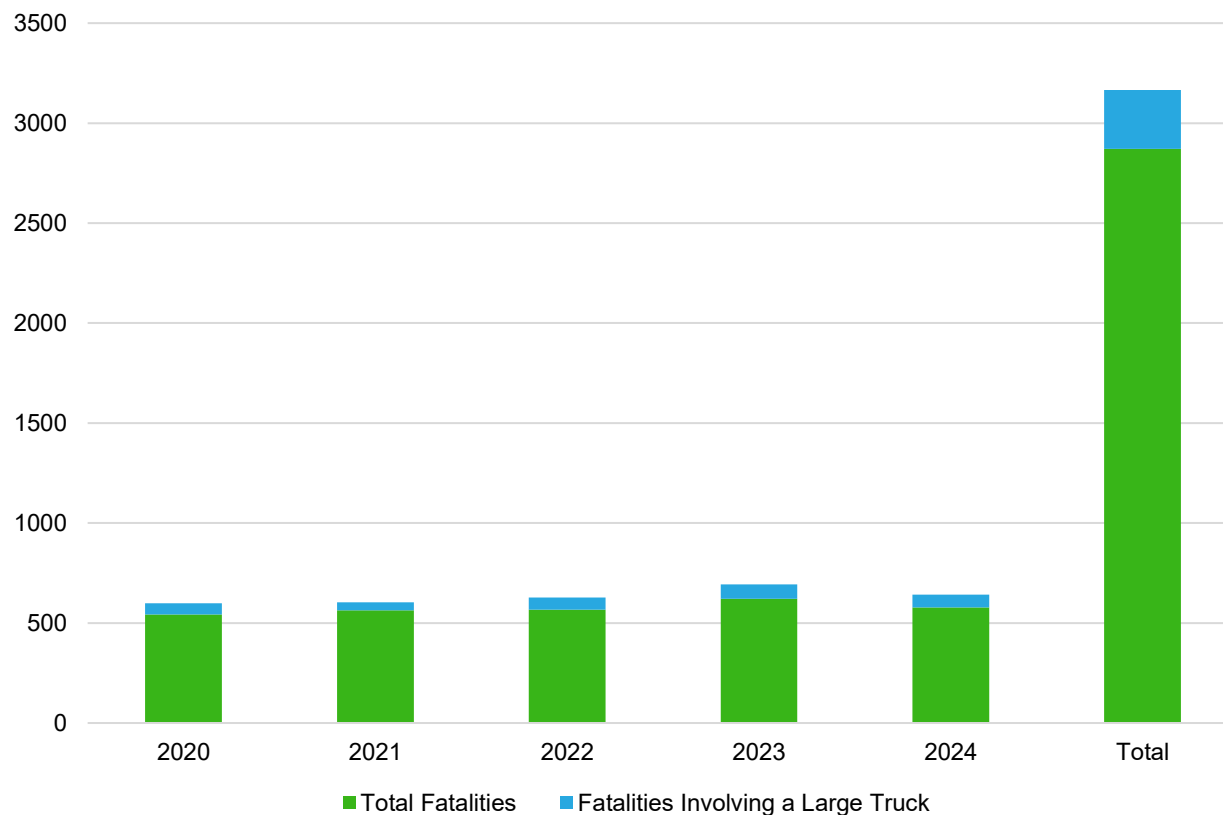
Truck Delay and Reliability Trends (2018 – 2024)



Crashes Involving Heavy Trucks With Fatalities (2020 – 2024)

- There were 2,871 total traffic fatalities in Maryland, averaging 574 per year
- There were 295 total traffic fatalities involving a large truck, averaging 59 per year

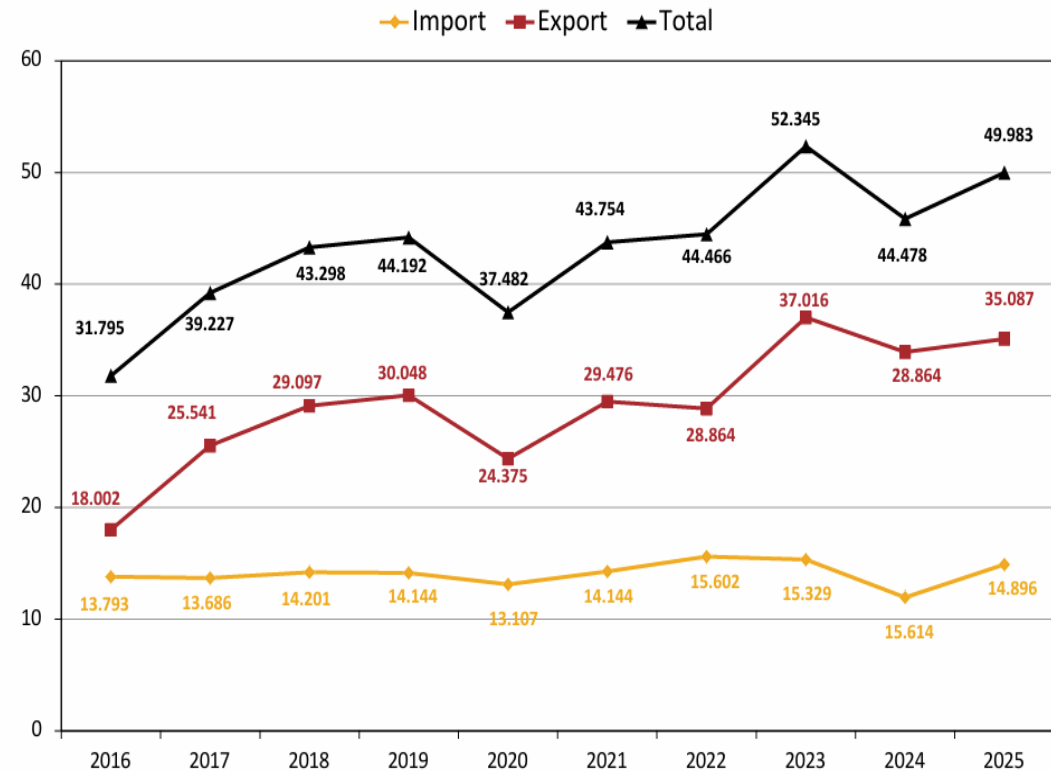
Highway Fatalities Involving a Large Truck in Maryland (2020 - 2024)



Total Tonnage of Foreign Waterborne Commerce at the Port of Baltimore

- Foreign trade at the Port of Baltimore is on an upward trend
- Tonnage increased from a drop in 2024

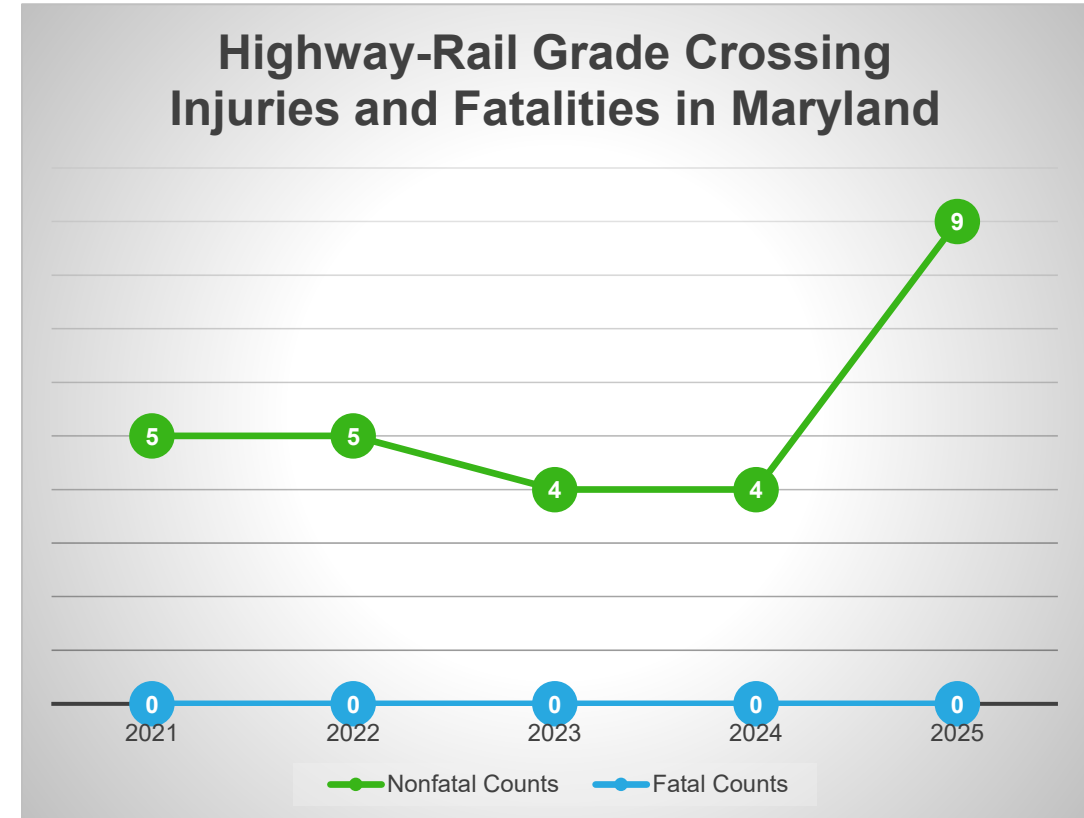
Port of Baltimore
Foreign Waterborne Commerce
(Millions of Tons)



Highway-Rail Crossings (2021 – 2025)

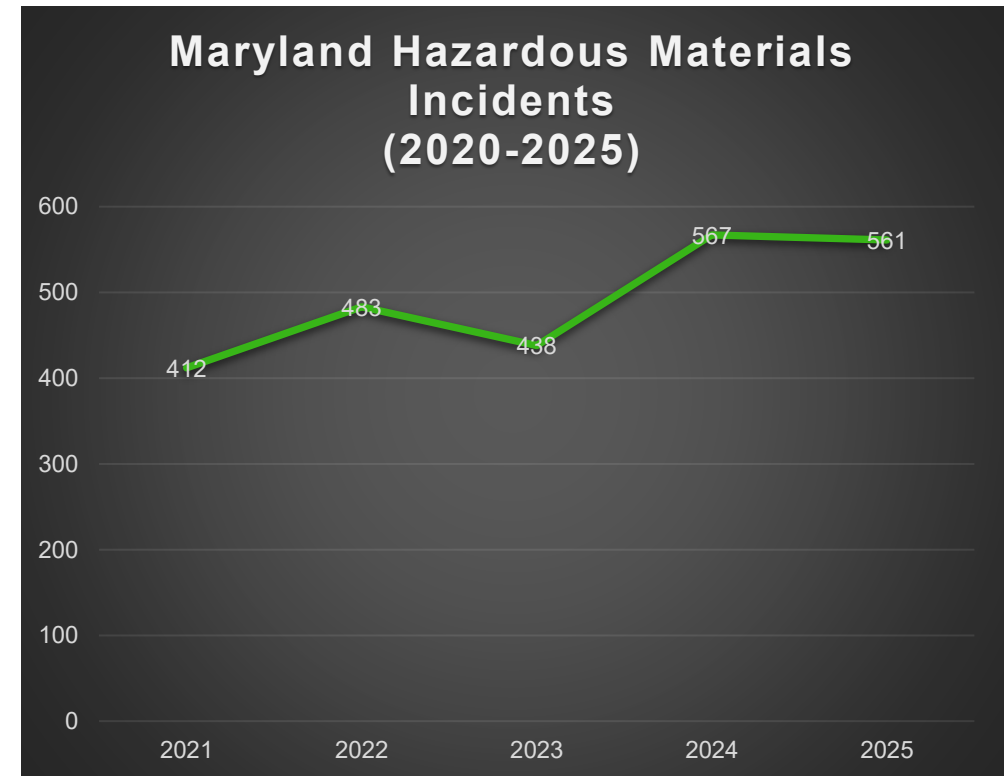
Trends

- According to FRA data there have been a total of 321 highway-rail grade crossing incidents in Maryland from 2021 – 2025
 - 18% involved a Truck-Trailer combination
- During the same period, there were no fatalities and 27 non-fatal injuries



Hazardous Materials Incidents (2020 – 2025)

- There were a total of 2,461 Hazardous Materials Incidents in Maryland from 2020 to 2025
- Total incidents varied year to year, but have been on an upward trend



Questions?



Thank You!

**L'Kiesha Markley, Assistant
Division Chief**

**Innovative Performance Planning
Division**

State Highway Administration

markley@mdot.maryland.gov

410-545-5656