MARYLAND DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY ADMINISTRATION

2024 MARYLAND STATE HIGHWAY MOBILITY REPORT

EXECUTIVE SUMMARY

2024

MARYLAND STATE HIGHWAY MOBILITY REPORT

Thirteenth Edition

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MESSAGE FROM THE ADMINISTRATOR

Maryland citizens rely on a safe and reliable transportation network that provides mobility choices and multimodal connectivity. Our highway system supports the safe and efficient movement of people and goods, facilitating freight movement, transit services, airport facilities, sidewalks, bicycle lanes and motor vehicle travel.

To improve travel reliability and minimize travel delays for road users, transit providers and freight operators, the Maryland State Highway Administration (SHA) incorporates a data driven decision making approach utilizing both Big Data and time proven methods to evaluate travel trends and behaviors. This analysis allows SHA to prioritize needs to address changes that impact travel patterns across the transportation network, including traffic diversions, peak period impacts, increases in travel time, reductions in system connectivity and accessibility, and multi-modal transportation across the entire state.

A major resource to address existing needs and proactively plan is SHA's annual mobility report that analyzes performance and mobility. Our most recent edition, the 2024 Maryland Mobility Report provides an in-depth overview of Maryland transportation trends over the past year (2023) with comparisons to previous years. The report also provides an overview of significant accomplishments over the past year and outlines remaining challenges that still need to be addressed. The accomplishments in 2023 include:

- CHART emergency response technicians responded to over 70,000 incidents and disabled vehicles saving an estimated $2.3 billion in reduced congestion costs and crashes.
- SHA constructed approximately seven miles of new sidewalks and reconstructed five miles of sidewalks.
- Bicyclists were able to cycle on an additional 85 miles of directional bike lanes.
- Seven capital projects were completed that included intersection improvements, multi-modal enhancements and freeway/expressway upgrades to improve mobility.
- The timing on eleven signal systems was upgraded resulting in motorists saving approximately $34 million from reduced congestion and delay.

Some continuing transportation mobility challenges that Maryland faces include:

- Vehicle Miles Travelled (VMT) on Maryland roadways has increased from 56.78 billion in 2022 to 57.54 billion in 2023. This was a 1.3% increase in one year.
- Congestion costs on Maryland roadways are estimated to cost Marylanders $5.35 billion annually with freight operations accounting for over $440 million of this amount in 2023. Congestion costs rose by 1% over 2022.
- Local planning and zoning practices lack transportation planning, ordinances, and/or development impact fees and excise taxes to support ongoing and historical growth and defray costs for necessary public transportation facilities and services to mitigate development impacts to state roads.
- Motorists along sections of I-495 and I-695 routinely experience peak period travel times greater than three times the rate of non-peak periods.
- Park and ride lot occupancy continues to be about half of the usage in 2019, while truck parking is a significant challenge for communities.

Putting people first, SHA is working every day to provide the best customer experience for all road users. The data and findings in the 2024 Maryland Mobility Report will serve as a great resource as we continue to develop strategic approaches to address transportation challenges in Maryland.

William Pines PE, PMP, CCM

MDOT SHA Administrator

EXECUTIVE SUMMARY

The ability to travel throughout Maryland requires a multimodal transportation system that facilitates the movement of people and goods through seamless connections that enable the necessary trip. To support this need, the Maryland State Highway Administration (SHA) maintains and operates a network of roadways, sidewalks, bike lanes and shared use paths. Maintaining and expanding this system requires an understanding of the current conditions and travel patterns to strategically allocate resources. Ensuring the network is safe and well-maintained encourages its use and supports efficient movement across the state. Facilities in poor shape are less likely to be used, which in turn impacts mobility and increases congestion.

At the same time, travel patterns change every day. A new job, a different place to live or different appointments can modify pedestrian, bicycle, and automobile volumes as well as the type of facilities that are needed for users to reach their destinations. In addition, events such as the loss of the I-695 connection over the Patapsco River require SHA to remain flexible and make adjustments to projects, programs, and policies to better meet the changing needs of its citizens and the traveling public. This flexibility allows SHA to establish short and long-term strategies to adapt to change, develop system improvements, and enhance organizational excellence.

SHA continues to use a performance-based approach to monitor and address critical and shifting mobility trends. These shifts create a need for progressive, cost-effective and context sensitive approaches in operations, engineering, and design to ensure a transportation system that is safe, equitable and sustainable. At the same time, it is of paramount importance to minimize delays in implementing infrastructure improvements and maintaining the system.

The 2024 Maryland Mobility Report summarizes our performance, successes, opportunities, and future strategies based on the events that transpired, data collected, and lessons learned over the 2023 calendar year.

YEARLY PERFORMANCE COMPARISON			
METRIC	2023	2022	2021
Traffic volumes	57.5 billion VMT	56.8 billion VMT	56.6 billion VMT
Interstates carrying over 200,000 vehicles per day	4 interstates	4 interstates	4 interstates
Total mileage on freeway system experiencing heavy to severe congestion	143 miles AM 252 miles PM	118 miles AM 232 miles PM	51 miles AM 164 miles PM
Statewide congestion costs	$5.67 billion	$5.29 billion	$4.48 billion
CHART incidents and stranded motorists	70,000 responses	76,000 responses	66,000 responses
New sidewalks	7 miles in 11 counties	7 miles in 13 counties	8 miles in 14 counties
Capacity improvement projects completed	7 capacity improvement projects	11 capacity improvement projects	12 capacity improvement projects
Signal systems improved	11 systems improved	15 systems improved	7 systems improved

CONGESTION AND RELIABILITY TRENDS

The challenge of effectively moving people and goods throughout the state becomes more difficult due to changing patterns such as back to work trends, rise in e-commerce and disruptions to the transportation network. To ensure funding and personnel resources are addressing the proper areas, it is important to first understand congestion trends and how they affect travelers and freight movement in terms of cost, time, and efficiency. This includes both recurring congestion along over-capacity roadway sections and non-recurring congestion due to incidents or events. The following summarizes the mobility and reliability trends on the Maryland multi-modal system in 2023.

Vehicle Miles Traveled (VMT):

- The VMT along Maryland roadways increased by 1.3% to 57.5 billion in 2023 from 56.8 billion in 2022. This increase occurred in both urban and rural areas.
- MDOT facility roadways are the most used in the state accounting for 72% of the VMT.
- Countywide VMT increased in 21 of the 23 counties and Baltimore City. The remaining two counties stayed approximately the same. The greatest increases occurred in Montgomery, Frederick, and Baltimore Counties.

Annual Average Daily Traffic (AADT):

The highest daily volume locations for freeway/expressway and arterial roadway sections include:

HIGHEST ANNUAL AVERAGE DAILY TRAFFIC (AADT) FREEWAY/EXPRESSWAY SECTIONS

ROUTE	LIMITS	2023 AADT (veh/day)
I-95/I-495	Virginia State Line (Woodrow Wilson Bridge)	243,000
I-495	Virginia State Line (American Legion Bridge) to I-270 West Spur	213,000-229,000
I-270	I-270 Split to MD 124	186,000-225,000
I-95/I-495	MD 5 to MD 201	193,000-219,000
I-495	I-270 East Spur to US 1	196,000-218,000

HIGHEST ANNUAL AVERAGE DAILY TRAFFIC (AADT) ARTERIAL SECTIONS

ROUTE	LIMITS	2023 AADT (veh/day)
MD 5	US 301 to MD 223	67,000 – 83,000
MD 210	Old Fort Rd to I-95/I-495	61,000-81,000
MD 3	Prince George's County Line to I-97	70,000-80,000
US 301/MD 5	MD 5 (South) to MD 5 (North)	76,000
MD 650	Adelphi Rd to Lockwood Dr	56,000-72,000

FREEWAYS

Traffic congestion for the poorest levels (heavy and severe) increased statewide by 2% in the AM peak hour and PM peak hour from 2022 to 2023. This amounts to 9% AM and 16% PM of the network statewide. These levels occurred for 143 miles of the freeway/expressway system in the AM peak hour and 252 miles in the PM peak hour of the 1,626 miles analyzed. This was an increase of approximately 25 miles and 20 miles respectively in the AM and PM peak hour.

The locations with higher volumes and greater VMT on the freeway/expressway system experienced greater congestion. In 2023, 18% of the AM peak hour and 29% of the PM peak hour statewide VMT occurred in congested conditions. These values were 15% and 26% in the AM and PM peak hours, respectively, in 2022.

MAJOR ARTERIALS

Along major arterial roadways, motorists experienced heavy to severe congestion in the AM peak hour on 123 miles or 21% of the system. This was an increase of 19 miles and by 4% from 2022 to 2023. The percentage of major arterial miles that drivers experienced heavy to severe congestion in the PM peak hour increased from 39% (230 miles) to 41% (240 miles) of the major arterial system in 2023.

COST OF CONGESTION

Congestion along roadways cost motorists approximately $5.35 billion in 2023 which is an increase of $60 million or over 1% from 2022. This cost includes delays experienced by motorists and truck drivers and wasted fuel. The majority of the cost associated with congestion is incurred by drivers along arterial roadways, amounting to approximately 73% of the total.

INTERSECTIONS

Traffic data analysis at intersections that have been counted in the last five years showed that 20 state highway intersections operated at a failing level of service (LOS F), including four intersections that failed during both the AM and PM peak hours. The MD 202 at Brightseat Rd intersection also failed during a football game at Northwest Stadium.

MOST CONGESTED LOCATIONS

The most congested freeway/expressway (three to eight miles) and arterial (two to five miles) corridor sections for weekday AM and PM peak hours (in descending order) are as follows:

2023 MOST CONGESTED FREEWAY/EXPRESSWAY SECTIONS (AVERAGE WEEKDAY)	
AM PEAK HOUR (8-9 AM)	PM PEAK HOUR (5-6 PM)
I-495 Outer Loop – I-95 to US 29	I-695 Inner Loop – MD 139 to Providence Rd
I-695 Outer Loop – MD 43 to Cromwell Bridge Rd	I-495 Inner Loop – MD 355 to MD 97
I-270 West Spur Southbound – I-270 Split to I-495	I-495 Inner Loop – Virginia State Line to I-270 West Spur
I-95/I-495 Local Inner Loop – MD 414 to I-295	MD 295 Southbound – MD 175 to MD 198
I-495 Outer Loop – MD 187 to MD 190	I-695 Inner Loop – US 1 to MD 144
I-97 Southbound – Benfield Blvd to MD 178 Off Ramp	I-95/I-495 Inner Loop – US 1 to MD 144
I-695 Inner Loop – MD 129 to I-83 South	MD 295 Northbound – MD 450 to I-95/I-495
US 50 Westbound – MD 410 to MD 295	I-95/I-495 Outer Loop – MD 450 to MD 201
I-270 Southbound – MD 121 to MD 118	I-495 Outer Loop – I-270 West Spur to Clara Barton Pkwy
I-95/I-495 Mainline Inner Loop – I-95/I-495 Local Lane Split to Virginia State Line	I-270 Mainline Northbound – MD 198 to MD 175
I-695 Outer Loop – I-795 to I-70	MD 295 Northbound – Explorer Rd (NASA Entrance) to MD 197
I-95/I-495 Inner Loop – I-95 to MD 201	I-95/I-495 Inner Loop – MD 202 to Ritchie-Marlboro Rd
MD 295 Southbound – Arundel Mills Blvd to MD 197	I-695 Outer Loop – US 1 to MD 295
I-270 Mainline Southbound – I-370 to MD 28	MD 295 Northbound – MD 198 to MD 175
MD 32 Westbound – MD 170 to MD 198	I-270 Northbound – MD 121 to MD 109

2023 MOST CONGESTED ARTERIAL SECTIONS (AVERAGE WEEKDAY)	
AM PEAK HOUR (8-9 AM)	PM PEAK HOUR (5-6 PM)
US 29 Southbound – MD 650 to I-495	MD 210 Southbound – MD 414 Ramps to Old Fort Rd/Oxen Hill Rd
MD 5 Northbound – MD 381 to Burch Hill/Earnshaw Rd	MD 3 Southbound – I-97 to St Stephen's Church Rd
MD 185 Southbound – I-495 to MD 191	US 301 Southbound – MD 381 to McKendree Rd/ Cedarville Rd
MD 210 Northbound – Livingston Rd/ Swan Creek Rd to Palmer Rd	MD 3 Northbound – MD 450 to MD 424
MD 3 Southbound – Anne Arundel County Line to Belair Dr	MD 5 Southbound – MD 223 to Burch Hill Rd/Earnshaw Rd
MD 97 Southbound – MD 586 to 16th St/MD 390	MD 2 Northbound – College Parkway to Robinson Rd
MD 355 Southbound – I-495 to MD 410	MD 355 Northbound – MD 191 to Cedar Ln
MD 2 Southbound – MD 648/Whites Rd to College Parkway	MD 185 Northbound – Washington D.C. Line to Jones Bridge Rd
MD 212 Westbound – Beltsville Dr to Riggs Rd	MD 178 Northbound – Old Generals Highway to I-97
MD 189 Southbound – Wootton Pkwy to Glen Rd	MD 28 Eastbound – MD 586 to Bel Pre Rd
MD 28 Westbound – MD 97 to Baltimore Rd	MD 5 Southbound – Burch Hill/Earnshaw Rd to US 301
MD 2 Southbound – College Parkway to US 50	MD 45 Southbound – Ridgely Rd to Joppa Rd
MD 3 Southbound – St. Stephens Church Rd to MD 424	MD 97 Northbound – 16th St/MD 390 to MD 586
MD 2 Northbound – College Parkway to MD 648/ Whites Rd	MD 2 Southbound – MD 665 to MD 253
MD 424 Southbound – MD 3 to MD 450	MD 140 Eastbound – McDonough Rd to Sudbrook Ln

In addition to morning and afternoon congestion, several areas experience poor operations on summer weekends as motorists travel to the Atlantic Ocean, mountains, or along the I-95 corridor. For the Friday 4-5 PM, Saturday 1-2 PM, and Sunday 2-3 PM hours, the following locations were identified as some of the most congested freeway or arterial sections that only occur on a summer weekend:

- I-70 WB from South St to MD 180
- US 50 EB from US 13 to Walston Switch Rd
- US 50/US 301 WB from Chester Station Ln to Chesapeake Bay Bridge
- US 50 EB from MD 589 to MD 528
- US 50/US 301 EB from Buschs Frontage Rd to Chesapeake Bay Bridge
- US 50/US 301 WB from Wye Mills Rd to US 301

CONGESTION REDUCTION ACCOMPLISHMENTS

To improve mobility and reliability, SHA has established policies, administered programs, and constructed projects throughout the state. The benefits of these actions include additional facilities for pedestrians and bicyclists, delay reductions, improved travel time, safety improvements, decreased fuel consumption, and decreased emissions for all multi-modal system users. These have provided approximately $2.3 billion in estimated annual user cost savings.

CHART

Emergency response technicians in the Coordinated Highways Action Response Team (CHART) program cleared almost 30,000 incidents and assisted more than 40,000 stranded motorists on Maryland roadways. This is accomplished through more than 40 full-time emergency traffic patrols that operate 24 hours a day, seven days a week. Incident duration has been reduced to 25.4 minutes thereby significantly decreasing delays and safety risks for motorists. CHART services delivered a record annual benefit of $2.23 billion in 2023.

SIGNAL SYSTEMS

In 2023, SHA upgraded traffic signal timings for 102 signals in 11 systems to improve travel time. The retiming of these signals reduced delay by over 730,000 hours and provided an annual user savings of $34 million. SMART/ Adaptive signal systems that allow for real-time adjustments to signal timings continued to provide benefits on twenty of SHA's most congested corridors throughout the state.

CAPITAL PROJECTS

There were six intersections and one freeway/expressway capital project completed to relieve congestion, improve safety, and enhance multi-modal traffic operations. These projects were:

- MD 43 at Honeygo Blvd in Baltimore County
- US 1 at Clarke Blvd in Baltimore County
- MD 4 at W Harmony Rd in Calvert County
- MD 140 at Mayberry Rd in Carroll County
- US 15 from Willow Rd to Monocacy Blvd in Frederick County
- MD 108 at Centennial Ln in Howard County
- MD 5 at Abell St/Moakley St in St. Mary's County

These capital projects resulted in $4 million in annual user savings.

2023 ANNUAL USER SAVINGS DUE TO MDOT CONGESTION MANAGEMENT	
CHART	$2,230 million
Traffic Signal Timing Improvements[1]	$34 million
Capital Projects[1]	$4 million
Park and Ride Program	$42 million
TOTAL	$2,310 million

MAJOR MOBILITY IMPROVEMENT PROJECTS UNDER CONSTRUCTION OR RECENTLY COMPLETED
I-695 TSMO Widening
I-95 Express Toll Lanes from MD 43 to North of MD 24
MD 97 Brookeville Bypass
MD 175 from Sellner Road to McCarron Court Widening

HIGHLIGHTED IMPROVED MOBILITY ACCOMPLISHMENTS

- More than 7 miles of new sidewalks were constructed in 11 Counties. In addition, 5 miles of sidewalks were reconstructed.
- Approximately 72% of all sidewalks are ADA-compliant in 2023.
- Statewide, marked bike facilities increased by approximately 85 directional miles through SHA efforts.
- Drivers are afforded the opportunity to park at 105 SHA and MDTA park and ride lots located in 21 counties. Surveys of the lots showed that on an average weekday approximately 3,400 motorists use SHA or MDTA lots to connect to transit or ride with other commuters. These commuter connections provide an annual user savings of approximately $42 million.
- In 2023, on average, 25,000 vehicles per day used the I-95 express toll lanes with over 2,000 motorists using them in one hour in one direction.
- Traffic volumes grew by approximately 9% on the Intercounty Connector (MD 200) Managed Facility AADT between I-370 and I-95. This amounts to approximately 58,500 vehicles per day in 2023 which is the highest ever volume.

FREIGHT MOVEMENT

- SHA ensures safety of freight operations through technology such as virtual weigh stations (VWS). There are 20 VWS statewide. In 2023, VWS were commissioned at two new locations along US 301 Thomas "Mac" Middleton Bridge, and two sites were decommissioned at MD 32 and US 50 westbound at the Chesapeake Bay Bridge, bringing the statewide total to 20 operational sites. Additionally, an evaluation is underway to construct the first high-speed direct enforcement VWS site along I-83 near Middleton Road with USDOT using license plate recognition technology.
- The National Highway Freight Network through the FAST ACT Freight Formula Fund allows for support for the reconstruction of crucial locations along designated truck routes. Bridge reconstruction is a major emphasis in the use of these funds, including ongoing projects at I-695 at Putty Hill Road and I-70 over Crystal Falls Drive.
- Safety improvements were constructed at two at-grade railroad crossings. This included Cash Valley Road in Allegany County and Devilbiss Bridge Road in Frederick County. In addition, MDOT continued to manage the Maryland Operation Lifesaver Program that provides free rail safety education to reduce injuries and fatalities at train crossings.

TRANSPORTATION SYSTEMS MANAGEMENT & OPERATIONS (TSMO)

- Established the Maryland State Police Traffic Incident Management (TIM) unit and created a CHART law enforcement liaison group to coordinate ongoing events and traffic incident management.
- Received a $12 million Advanced Transportation Technology and Innovation (ATTAIN) grant award to dynamically manage traffic along the US 50 corridor between the Baltimore-Washington metropolitan area and Atlantic Ocean resort areas.
- Developed draft traffic incident timing plans for TSMO System 1, including Active Traffic Management (ATM) strategies along multiple routes (I-70, US 29, US 40, and MD 99).
- Continued construction of the I-695 part-time shoulder use project.