Goal Maintain a High Standard and Modernize Maryland's Multimodal Transportation System

Preserve, maintain, and modernize the state's existing transportation infrastructure and assets

OBJECTIVES:

- Preserve and maintain state-owned or funded roadways, bridges, public transit, rail, bicycle and pedestrian facilities, ports, airports, and other facilities in a state of good repair
- Strategically modernize infrastructure through new and innovative technology, enhanced partnerships, design standards, and practices to facilitate the movement of people and goods
- Use asset management to optimize public investment and ensure the sustainability of transportation infrastructure

Maintaining a multimodal transportation system is a top priority for MDOT. With every maintenance project, MDOT must decide between maintaining or upgrading an asset. In an unprecedented era of technology, there are many technological advances that can be incorporated into basic signal, paving, and transit fleet projects to improve communications between infrastructure and MDOT or MDOT and the customer.

In 2021, the Howard Street Tunnel expansion project made significant progress through the project development process. Double-stack capability from the Port of Baltimore has long been a priority for MDOT MPA. The primary obstacle to achieving that goal has been CSX's Howard Street Tunnel, a 126-year-old, 1.7-mile-long railroad tunnel through the heart of Baltimore City that is approximately 18 inches too short to accommodate double-stack intermodal trains. For years it was thought that improvements to the existing tunnel would cost billions of dollars and be highly disruptive to the surrounding communities. Using advances in engineering technology, MDOT MPA and CSX developed a solution that can be delivered at a fraction of the original cost estimate with limited impacts to the public. Construction is expected to begin in FY 2022 and be completed by the end of FY 2026. Once complete, the project will generate an additional 160,000 containers per year through the Port of Baltimore.

While COVID-19 impacted many aspects of life, it did not defer or prevent maintenance. In some cases, the decreased vehicle traffic allowed agencies to do more maintenance or more impactful construction while traffic volumes were low, ultimately affecting less people. MDOT MTA repaired 3,000 miles of track while ridership was 65% of pre-pandemic levels to minimize impacts to riders.

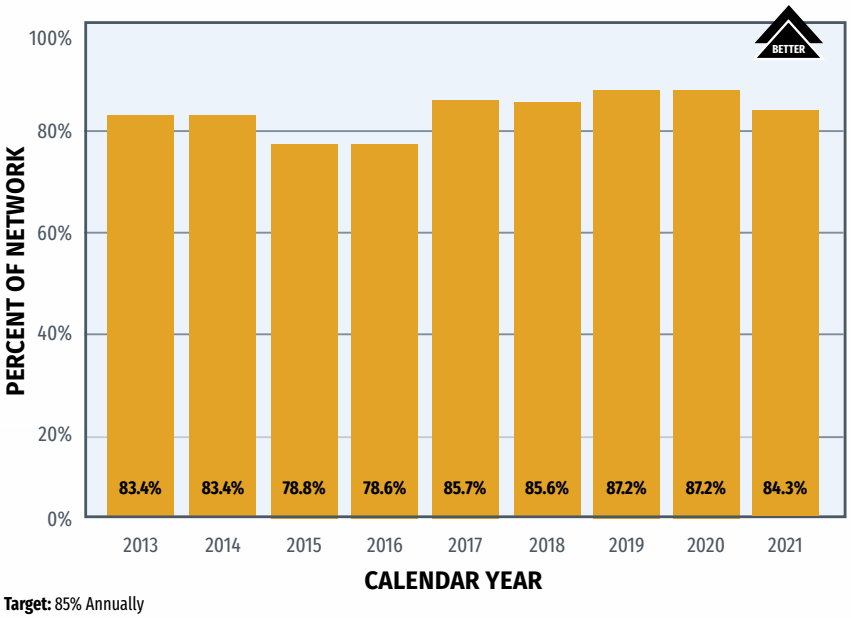
With the increasing demand for air cargo facilities, rehabilitation of the Midfield Cargo Complex taxiway was needed to provide reliable access from a growing cargo operator's new 200,000 square-foot (SF) high-use cargo building and apron to the main runways. This project rehabilitated over 95,000 square yards (SY) of existing asphalt taxiway and added 13,700 SY of new concrete taxiway providing direct access to the Runway 10 end. The Midfield Taxilane Rehabilitation Project at BWI Marshall Airport received multiple industry awards including the 2021 Construction Management Association of America (CMAA) Baltimore Chapter Project Achievement Award.

OBJECTIVE:

Preserve and maintain state-owned or funded roadways, bridges, public transit, rail, bicycle and pedestrian facilities, ports, airports, and other facilities in a state of good repair

PERCENTAGE OF THE MDOT SHA NETWORK IN OVERALL PREFERRED MAINTENANCE CONDITION

The overall condition of the network is indicative of the positive effect that asset management strategies have on existing highways. Effective asset management strategies ensure continued usability, quality, and safety along Maryland's roadways.



Target: 85% Annually

WHY DID PERFORMANCE CHANGE?

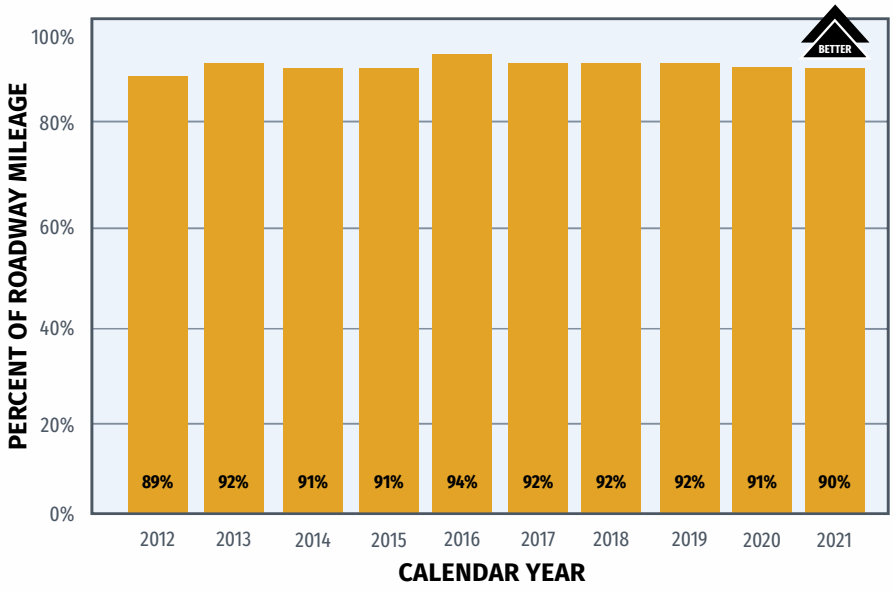
- MDOT SHA achieved a level of service of 84.3%, which is only slightly lower than the target of 85%
- Due to COVID-19, MDOT SHA maintenance shops were operating on staggered shifts, with half-staff working at any given time, for several months during FY 2021; employees had to maintain social distance, which made for some less efficient operations, and some deferral of work that required close proximity; additionally, MDOT SHA and contractors experienced workforce shortages that prevented planned work from being completed
- For a fourth straight year, the winter weather was relatively light or average, which minimized damage to assets

WHAT ARE FUTURE PERFORMANCE STRATEGIES?

- MDOT SHA will utilize new equipment and new processes to perform work more efficiently
- MDOT SHA will utilize the asset management program to strategically target right-sized improvements at the appropriate locations and times

OVERALL ACCEPTABLE PAVEMENT CONDITION

Overall pavement condition is based on remaining service life, which is a scale of 0 to 50 years to describe pavement condition. Ride quality, functional cracking, structural cracking, and rutting data are collected utilizing Automated Road Analyzer (ARAN) vehicles; friction data is collected using skid trucks. Pavement condition can affect safety, efficiency, mobility, and accessibility to services and goods throughout Maryland. MDOT conducts yearly roadway inspections to ensure safety, efficiency, mobility, and accessibility in the movement of people and goods.



Target: 90% Annually

** 2021 data is preliminary and subject to change.*

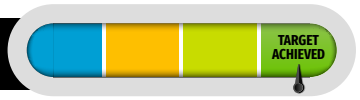
WHY DID PERFORMANCE CHANGE?

- MDOT SHA resurfaced approximately 2.5% of its pavement network in 2020, which is lower than the 5% reported in 2019; preventative maintenance covered an additional 6.5% of the network, which is lower compared to 16% in 2019, these reductions in maintenance were a direct result of budget cuts caused by COVID-19
- MDOT anticipates that the "percent acceptable" conditions will generally remain steady during the next one to two years despite the gap between the reasonably available funding and the objective funding needed to maintain a state of good repair long-term

WHAT ARE FUTURE PERFORMANCE STRATEGIES?

- MDOT SHA will focus on improving roadways with deficient cracking and continue the increased use of pavement preservation treatments, where appropriate, to extend the service of MDOT SHA roadways at the lowest possible cost
- To proactively address friction improvement needs across its roadway network, MDOT SHA is planning to advertise two statewide friction contracts for high friction surface treatment, surface abrasion, and diamond grinding

NUMBER OF BRIDGES AND PERCENT THAT ARE IN POOR CONDITION



The poor condition rating (also previously referred to as structurally deficient) is an indicator for engineers to initiate the rehabilitation or replacement process and is used when prioritizing and recommending system preservation funding. A bridge is not considered unsafe if it is poor rated; unsafe bridges are closed. The rating applies to the three structural components of the bridge (deck, superstructure, and substructure), and is scaled from 0 (closed to traffic) to 9 (relatively new) per the National Bridge Inventory (NBI) requirements. All bridges are inspected at least once every two years. If any of these elements are rated as a four or less, the bridge is considered to be in poor condition per federal standards. Bridge repair projects remain high priorities due to the inconvenience and traffic re-rerouting problems that can occur when bridges close.

CALENDAR YEAR	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Number of MDTA Bridges in Poor Condition	4	1	1	1	1	1	1	1	1	0
Number of MDOT SHA Bridges in Poor Condition	97	87	81	69	69	67	62	52	36	29
Total Number of Bridges in Poor Condition	101	88	82	70	70	68	63	53	37	29
Percent of Bridges in Poor Condition	3.5%	3.0%	2.8%	2.4%	2.4%	2.4%	2.2%	1.8%	1.3%	1.0%

WHY DID PERFORMANCE CHANGE?

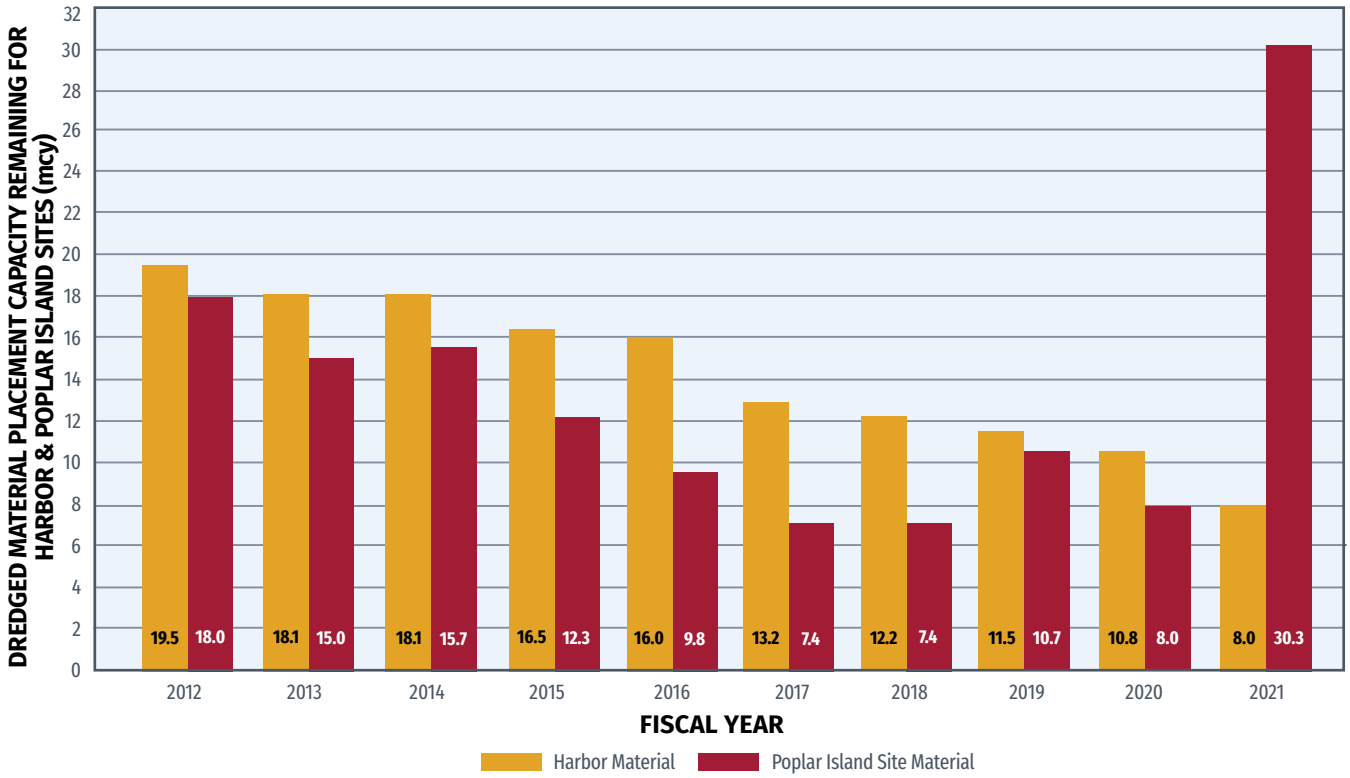
- MDOT SHA recorded 29 poor rated bridges during their annual condition submission to the Federal Highway Administration (FHWA) in March 2021; this reduction can be attributed to the efficient use of federal funds for current bridge replacement projects and the successful bridge rehabilitation and preservation program; MDOT SHA continues to develop plans for bridges with a poor rating that cannot be repaired under the preservation program
- MDOT SHA continued the bridge rehabilitation and preservation program in which on-call construction crews, working full-time year-round, address bridges rated as poor or fair to bring them into a state of good repair and minimize the number of bridges that would deteriorate to a poor rating without rehabilitation; the number of active on-call construction crews was reduced from 30 to 9 due to a decline in available state funds requiring a new approach to funding this program; to preserve state funds for emergencies, MDOT SHA advertised four FHWA Special Experimental Project No. 14 (SEP-14) Contracts that use the Indefinite Delivery and Indefinite Quantity (ID/IQ) scopes of work that use federal funds to support the bridge rehabilitation and preservation program
- MDTA delivered the I-895 Bridge Project which replaced the 60-year-old Canton Viaduct and rehabilitated the Baltimore Harbor Tunnel. The bridge was MDTA's only structurally deficient bridge

WHAT ARE FUTURE PERFORMANCE STRATEGIES?

- MDOT SHA and MDTA have developed criticality framework to evaluate bridges on a risk-based approach combining criticality (consequence of failure) and condition (good, fair, poor); this framework will be reviewed and refined to be included in future asset management programming
- MDOT SHA is exploring the use of the National Bridge Element (NBE) data collected during inspections in combination with the NBI data to verify and target bridges to be evaluated for inclusion in the replacement or rehabilitation programs; the NBE data provides more detailed element level information

DREDGED MATERIAL PLACEMENT CAPACITY REMAINING FOR HARBOR SITES AND POPLAR ISLAND

MDOT MPA is responsible for ensuring the Port remains safe and accessible and maintains shipping channels by obtaining and managing dredged material placement sites.



Harbor Target: Maintain a rolling 20-year plan for adequate dredged material placement capacity

Poplar Island Target: Maintain a rolling 20-year plan for adequate dredged material placement capacity

WHY DID PERFORMANCE CHANGE?

- In January 2021, MDOT MPA and the U.S. Army Corps of Engineers completed the Poplar Island Ecosystem Restoration Project lateral expansion; this will provide 575 additional acres of dredged material placement, adding storage capacity of 28 million cubic yards (mcy) of material

WHAT ARE FUTURE PERFORMANCE STRATEGIES?

- Poplar Island will continue to receive dredged materials through 2032
- MDOT MPA and the U.S. Army Corps of Engineers are now designing the Mid-Chesapeake Bay Island Ecosystem Restoration project; focused on James and Barren islands, they will replace Poplar Island as the state's primary receiving site for Bay channel dredged sediment
- Future planned work includes maintaining maximum depth for the approach channel at the mouth of the Chesapeake Bay where ultra-sized, neo-Panamax vessels enter on their way to the Port of Baltimore

TRANSIT ROLLING STOCK WITHIN USEFUL LIFE BENCHMARK

Useful life is a metric that gauges the condition of transit vehicles. Each asset type has a unique useful life. An asset reaching its useful life will need to be replaced or repaired. This measurement tells agencies when to expect repairs and replacement.

TRANSIT VEHICLES	2021 PERCENT OF VEHICLE STOCK WITHIN USEFUL LIFE	TARGETS
Baltimore Metro	0%*	**0%**
MARC	100%	**100%**
Light Rail	100%	**100%**
Paratransit	83%	**99%**
Local Bus	100%	**98%**

**78 new rail cars will be delivered beginning in 2022.*

WHY DID PERFORMANCE CHANGE?

- MDOT MTA opened the $148 million Kirk Avenue Bus Division project; the new facility will increase efficiency for maintenance operations and reduce impacts for neighbors; at the facility 175 buses are fueled, washed, and stored; there are some dispatching functions at the new facility
- MDOT MTA regularly purchases new fleet to continue modernizing agency operations and improve the customer experience

WHAT ARE FUTURE PERFORMANCE STRATEGIES?

- MDOT MTA is transitioning to a zero-emission bus fleet; in 2021, MDOT MTA released an Request for Information (RFI) related to installing, operating, and maintaining electric bus charging infrastructure and microgrids
- MDOT MTA broke ground on the MARC Riverside Heavy Maintenance Facility in Baltimore; the new 35,000 square-foot facility will allow MARC Train to conduct maintenance activities, improve fleet reliability, and reduce maintenance costs and time spent on maintenance
- MDOT MTA will procure new vehicles and assets to meet asset management targets, these planned purchases include $400 million on replacing the Metro SubwayLink railcars and signal system, $160 million to overhaul major systems on light rail trains to ensure reliable service, and $54 million to overhaul 63 MARC III passenger coaches

OBJECTIVE:

Strategically modernize infrastructure through new and innovative technology, enhanced partnerships, design standards, and practices to facilitate the movement of people and goods

AVERAGE TRUCK TURN TIME AT SEAGIRT MARINE TERMINAL

Keeping the Port of Baltimore economically viable includes constant dredging; improvements to the infrastructure that connects the Port to businesses and logistics hubs across the country; and improvements within the Port to ensure seamless movement of goods to and from ships.

Measuring truck turnaround times at Seagirt Marine Terminal is important for Port officials to have so they can measure the internal efficiency of the Port. The less time it takes a truck to turn around, the less money it costs to move those goods. In 2021, the average truck turnaround time was 72 minutes, down significantly from 89 minutes in 2018, but only slightly quicker than the average of 73 minutes in 2020.

WHY DID PERFORMANCE CHANGE?

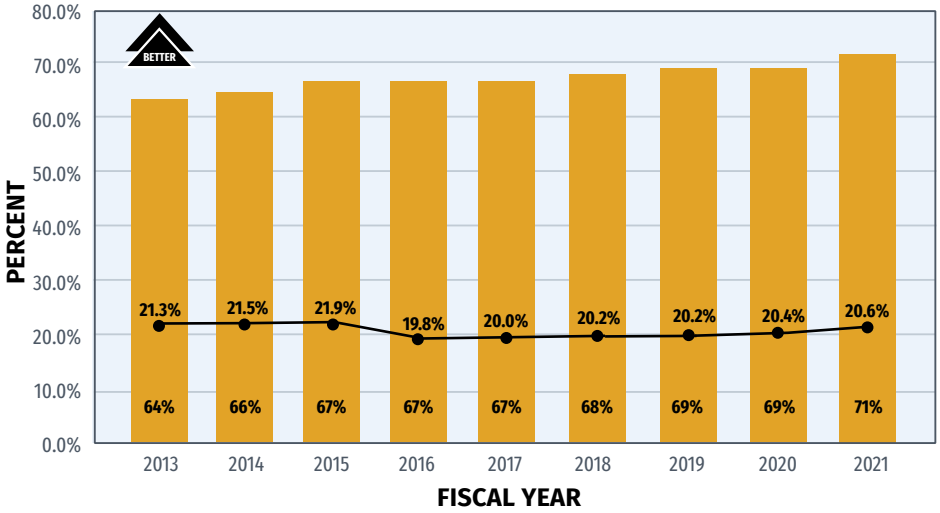
- In 2021, the Port implemented parts of the Seagirt Berth 3 Modernization project; including, four new neo-Panamax container cranes, additional yard equipment and dredging to widen the entrance channel and turning basin, upgrades to the terminal infrastructure, hardware, and cargo handling equipment are also planned to service the larger vessels
- Installation of radiation monitors as the next phase of development for Seagirt's back gate, which will allow inbound and outbound access for trucks with loaded containers
- Additional inbound lanes to address volume increases
- Reconfiguration of outbound lanes to add capacity, increase safety, and add speed
- Berth 3 construction is well on its way, with new ship-to-shore cranes arriving in September 2021; the project will be completed in the first quarter of CY 2022
- New, more efficient rubber-tired gantry (RTG) cranes to augment and replace older units

WHAT ARE FUTURE PERFORMANCE STRATEGIES?

- Weigh in motion scales and additional optical character recognition portals are currently under construction to increase the speed of truck processing
- MDOT MPA and PAC will continue to apply for additional federal funding from the U.S. Department of Transportation (U.S. DOT) including the Rebuilding American Infrastructure with Sustainability and Equity (RAISE) grant and Port Infrastructure Development Program (PIDP) grant for improvements at Berths 1 & 2 to allow the servicing of three ULCVs simultaneously at Seagirt

PERCENTAGE OF STATE-OWNED ROADWAY DIRECTIONAL MILES WITHIN URBAN AREAS THAT HAVE SIDEWALKS AND PERCENT OF SIDEWALKS THAT MEET AMERICANS WITH DISABILITIES ACT (ADA) COMPLIANCE

Sidewalks facilitate pedestrian movement and general accessibility. ADA-compliant sidewalks expand accessibility to all and are federally required.



Target: Increase sidewalks in urban areas by 0.5% and ADA compliance by 2% per year

WHY DID PERFORMANCE CHANGE?

- MDOT invested $2.7 million in FY 2021 to design and construct new sidewalks, including the construction of new directional miles of sidewalk along MD 424 in Anne Arundel County
- MDOT invested $2.5 million in FY 2020 to design and construct sidewalk improvements to address ADA accessibility, including the reconstruction of sidewalk along MD 26 in Baltimore County and MD 22 in Harford County

WHAT ARE FUTURE PERFORMANCE STRATEGIES?

- To improve program performance in FY 2022, MDOT SHA is partnering with local jurisdictions to fund additional projects leveraging local government funds as a match to secure additional federal funding for design and construction of new sidewalk projects
- Build new partnerships with locals to strategically identify gaps in the sidewalk network and collaborate to fund and implement the projects
- Work with recipients of highway safety grants to share data and best practices to ensure an optimized outcome for their safety initiatives
- Implement the 2021-2025 Strategic Highway Safety Plan (SHSP), specifically the infrastructure emphasis area that includes this strategy: improve roadway environments related to pedestrians and bicyclists by influencing the implementation of system-wide countermeasures, engineering treatments, and land-use planning

OBJECTIVE:

Use asset management to optimize public investment and ensure the sustainability of transportation infrastructure

The majority of transportation funding is used for maintenance. As a result, MDOT places significant emphasis on asset management plans and life cycle management plans that formalize data collection on all assets and project the useful life of assets. The plans also inform decision making on when to do maintenance on assets and when to improve assets to ensure they meet the latest safety regulations and best practices. Asset management efforts span multiple departments with dozens of MDOT staffers working together to best utilize limited funding to ensure the transportation system is maintained to remain safe, efficient, and reliable.

MDOT asset management efforts include commonly known assets like pavement and bridges, but also lesser known assets like culverts, buses, signs, lighting, and signals.

To protect and extend the useable lifespan of Martin State Airport's specialized airfield snow-removal equipment, MDOT MAA constructed a 12,000 square-foot (SF) storage building. Prior to this, equipment was stored outside, uncovered, and exposed to the elements. The building provides pull-through access to optimize the site and operational efficiency. This building is considered the first phase of an equipment storage facility with future building expansion of 5,600 SF and a separate 9,900 SF critical equipment storage building planned into the site design.