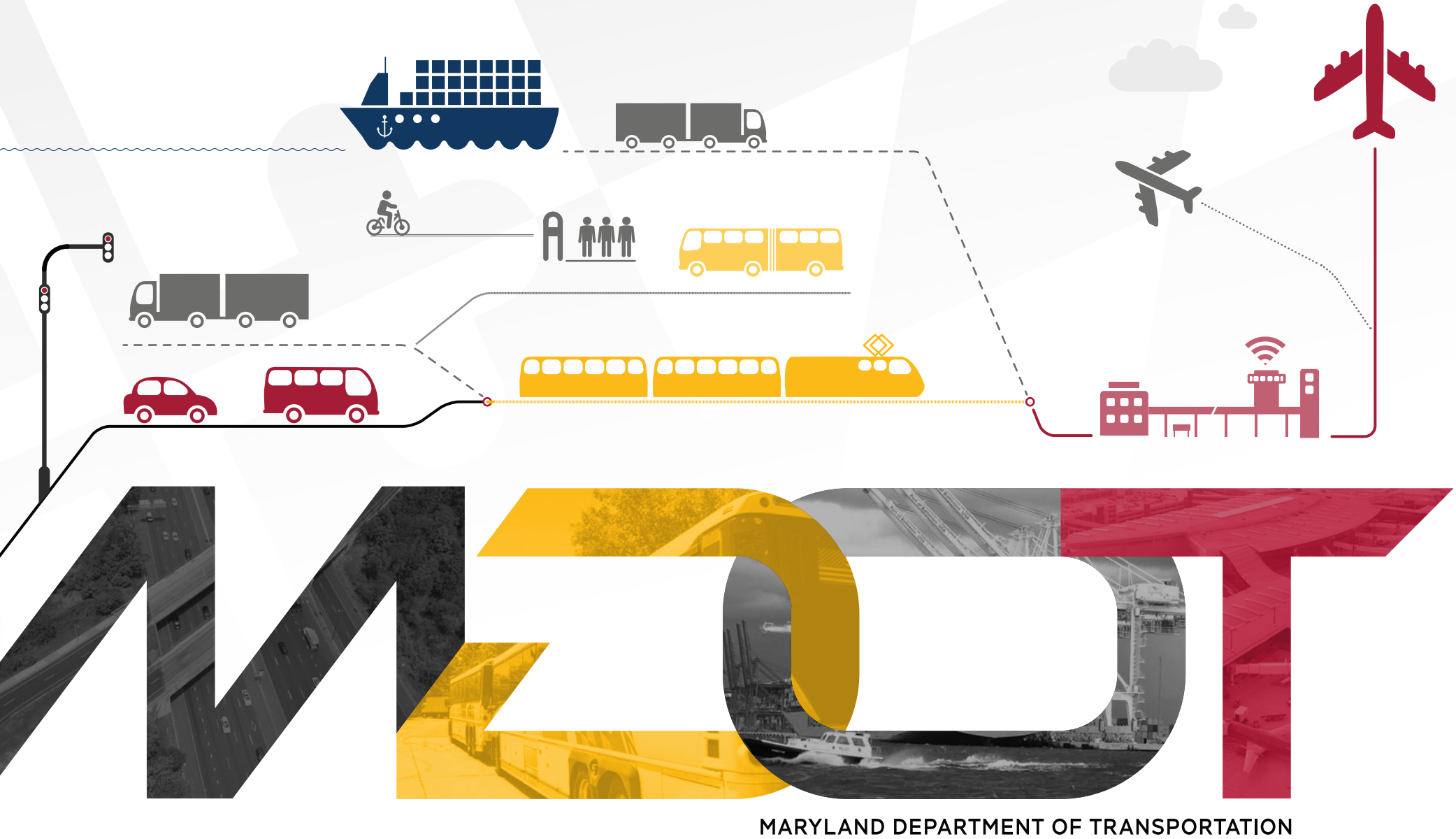


MARYLAND DEPARTMENT OF TRANSPORTATION

Strategic Asset Management Plan

January 2025

MESSAGE FROM THE **TRANSPORTATION SECRETARY**

Embracing asset management to optimize the lifecycle performance of our assets and drive sound transportation investment decisions

The Maryland Department of Transportation (MDOT) is a multimodal agency that operates and maintains a complex and interconnected system of assets that support the public and the statewide economy. Through the asset management program, we strive to deliver safe, equitable, sustainable, and reliable infrastructure that operates efficiently and delivers on our community needs and priorities. Asset management defines the policies and standards for how we effectively onboard, monitor, inspect, maintain, and renew our infrastructure. These strategies are essential for MDOT, with many of our most critical assets serving the public for 50+ years. A focus on proactive maintenance and preservation allows us to cost-effectively maintain condition and performance over the life of our assets and proactively manage risks.

MDOT's asset management program supports the evaluation of long-term investments and guides strategic lifecycle decisions, resource allocation, and delivery of service level commitments. The entire MDOT organization is involved in ongoing efforts including planning, engineering, operations, maintenance, and information technology. Collaboration is encouraged across modes to enhance our culture and work practices, share institutional knowledge, and bring innovative solutions.

The program focuses on risk-based and data-driven decisions and proactive planning for maintenance and system preservation needs to meet our state of good repair (SGR) commitments.

Asset management is not new to MDOT, and the program continues to mature with a consistent focus on enhancing systems and asset knowledge, and encouraging cross-modal decisions that consider system, corridor, and neighborhood impacts. As we continuously improve our asset data, MDOT is proactively addressing priority condition issues where they exist, mitigating our largest risks, and leveraging information to maintain or improve system reliability and performance.

This Strategic Asset Management Plan (SAMP) provides an overview of the principles and priorities that will guide our efforts over the next five years and allow MDOT to achieve its wider infrastructure goals and guiding principles aligned with the strategic MTP 2050 Playbook, MDOT's long-range transportation plan.

01

INTRODUCTION AND ASSET MANAGEMENT CONTEXT

Asset management is about understanding our infrastructure portfolio needs to align investments with the strategic goals and organizational priorities embedded within the 2050 Playbook.

MDOT's asset management program has four guiding principles established through ongoing efforts. These principles underpin our program and provide a foundation for the more detailed objectives presented in Section 4. Our program has been in place for many years, and we continue to evolve our state of practice and advance our program – making objective decisions and instilling ownership and consistency of practice across all modals.

The asset management program embeds data-driven lifecycle management strategies that allow us to understand the assets we have, monitor their performance and condition, and make strategic decisions about their maintenance, renewal, and replacement – so we can optimize our investments and deliver on our level of service commitments. MDOT has established itself as an industry leader in asset management strategy and implementation. We are focused on getting even better by advancing our state of practice across strategy, work processes, tools, and systems. Our asset management program embeds wider MDOT and Statewide goals into asset class lifecycle strategies. We evaluate asset and project needs through a resiliency and equity lens and implement tactical programs such as fleet electrification as part of our sustainability and climate goals.

Enhance Understanding of our Most Critical Assets

01

Enhance asset knowledge through data governance, improve scope and quality, and strengthen reporting capability through robust information

Advance Data-Driven and Risk-Based Decision Making

02

Apply triple bottom line (social, financial, and environmental) analysis to **quantify risks, and focus on cost-effective monitoring, evaluation, adaptation, and mitigation strategies**

Prioritize Needs and Efficiently Allocate System Preservation Funding

03

Build a strong business case to fully fund our long-term lifecycle needs, meet level of service commitments, and allocate our resources where they have the biggest impact

Support Workforce Collaboration, Training, and Development

04

Make asset management MDOT's way of doing business, **embrace change, and empower staff** through new tools and technologies that enhance capabilities

Asset management is a transformational program for MDOT, and we have embedded leaders and champions throughout our organization to bring innovative approaches to asset planning and analysis at every stage of the asset lifecycle, from planning and delivery through operations and maintenance. Our program is collaborative and supports our overall commitment to proactive and cost-effective management of our infrastructure.

PROACTIVELY MANAGING ASSETS AND PRIORITIZING SYSTEM PRESERVATION NEEDS TO ACHIEVE SGR

Maintaining Maryland's diverse infrastructure in SGR requires ongoing investment in inspection and preventive maintenance programs to keep our transportation systems operating reliably and efficiently. We gather and analyze extensive data to make informed decisions about the best interventions that maintain performance and minimize long-term lifecycle costs. MDOT uses asset data collection, monitoring, testing, and condition analysis technologies to identify appropriate maintenance strategies across our diverse portfolio of transportation assets. Our program includes ongoing analysis of factors such as age, condition, and risk as part of our annual Consolidated Transportation Program (CTP) funding process, and we guide investments towards areas of greatest impact and potential risk.

EVOLVING PROGRAM WITH ONGOING IMPACT

This 2025-2030 SAMP will guide the MDOT team for the next five years as we continue to build upon our progress, successes, and milestones. Since our initial 2019 SAMP we have made significant progress improving baseline data, strengthening analysis capabilities, and embracing risk-based prioritization. All modals have enhanced their understanding of SGR needs invested in proactive maintenance and inspection, and addressed some of our most critical maintenance backlogs. This is delivering greater confidence in our long-term funding projections and ensuring resources are targeted towards investments with the largest impact and benefits. We continue to use enhanced information to better formalize our asset lifecycle strategies and plans and improve cross-modal consistency, collaboration, and outcomes. Looking forward, we will elevate our approach and further align resiliency, sustainability, and asset management goals together. In addition, our asset management knowledge is helping us to better leverage and secure federal funding and build trust with our federal, state, local, and business partners.

Key MDOT Achievements Since 2019 SAMP

2019

2020

- **Created Risk-Based Decision Frameworks to Prioritize Needs**
- **Enhanced Asset Data Quality and Transparency and Investments in Information Systems, and Mobile Workforce Tools**
- **Data-Driven Funding Allocation Decisions Across Modals and Assets Classes**
- **Advanced Asset Condition Assessments Tools and Technologies**
- **Significantly Enhanced Accuracy of SGR Backlog for Critical Asset Classes**

2022

- **Established Lifecycle Management Plans for Pavement and Structure Assets**
- **Allocated Funding for Asset Inspections for Critical Asset Classes**
- **Enhanced Consistency in SGR Reporting and Gap Analysis Across Modals**
- **Facilitated Communication, Collaboration, and Training Across Modals**

2025

02

ASSET MANAGEMENT POLICY AND PROGRAM

MDOT leadership and management team(s) have developed foundational documentation to formalize the program and embed asset management throughout the organization – from high level strategy down through detailed asset lifecycle plans. These documents were developed with extensive input through collaborative work teams and align with existing strategies including the 2050 Playbook[1].

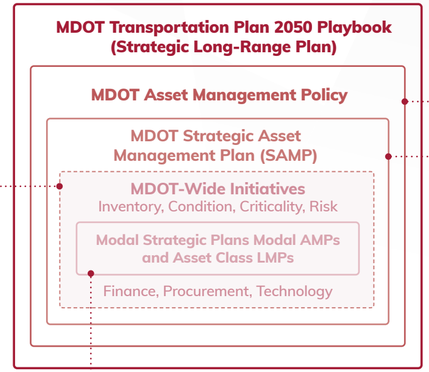
MDOT's asset management program is driven by cross-modal collaboration with a strong underlying governance structure including committees, work teams, and initiatives. The 2050 Playbook serves as the guidance document to establish strategic goals and priorities for MDOT's policy and infrastructure priorities. **The MDOT-wide policies and strategies encourage ongoing collaboration and focus on network and system based planning, prioritization, and decision making**. At the MDOT level, The Office of Planning, Programming, and Project Delivery (OPPPD) facilitates the strategic elements of the asset management program and has established a Senior Asset Management Steering Committee with executive leadership representation across all modes. This committee is the originator and owner of many of MDOT's foundational asset management policy documents including the Asset Management Policy (605) and this SAMP document. The 2024 Asset Management Steering Committee developed the mission statement below to guide the development of this 2025 SAMP.

ASSET MANAGEMENT MISSION

Support MDOT to continue to advance the state of practice in asset management aligned with policy goals of data-driven decision making, information transparency, and cost-effective delivery of service. Provide a vision and roadmap for the asset management program through 2029.

[1] https://www.mdot.maryland.gov/OPCP/MTP_Playbook_web.pdf

MDOT-Wide Initiatives:
Include a continued focus on asset inventory, condition, and risk assessment to support system preservation planning while also establishing work teams to tackle evolving priorities across human capital, procurement and finance, and information technology.



MDOT Asset Management Policy:
Establishes the program scope, commitment, guiding principles, and baseline requirements across all modes including staffing, reporting, and communication requirements.

The current (Policy 605) highlights data-driven decision making, transparency, continuous improvement, and management and infrastructure decision making processes, resulting in cost-effective delivery of service level goals.

MDOT SAMP:
Strategic document that established program strategy, objectives, and milestones updated every 4-5 years (this document).

Modal Strategies and Initiatives:
The modals are tasked with ongoing implementation of asset management programs and initiatives that are aligned with the overarching MDOT strategy and reflect the unique needs, drivers, constraints, and requirements of their own asset portfolios. Each modal has developed their own Asset Management Plan (AMPs), Asset Class Lifecycle Management Plans (LMPs), and other strategic documents that guide ongoing initiatives and priorities. MDOT has established asset working teams to collaborate and exchange knowledge and lessons learned between the modals and encourage consistency of practice as appropriate while allowing flexibility to respond to unique business drivers and infrastructure challenges.

03

ASSET PORTFOLIO

MDOT manages a large and complex portfolio of infrastructure assets with a goal of managing our portfolio through an integrated transportation system approach that supports statewide goals. The information below highlights our seven most critical asset classes that are the focus of our asset management program while the modes continue to embed asset management practice across their wider portfolios.

LEGEND

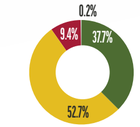
State of Good Repair (SGR): Good · Fair · Poor · Unrated

Modal Focus: SHA · MVA · MAA · MTA · MPA · MDTA

Bar charts indicate total annual investment required to maintain SGR for each asset class (out of total 2.024M total).

PAVEMENT

Highway, Roadway, Runway, Parking Lots

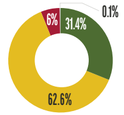


$552M Approx Total Annual Investment

$0M — $2.024M

STRUCTURES

Bridges, Aerial Structures, Special (Small) Structures, Noise Barriers, Sign Structures, Shipping Berths (Waterfront)

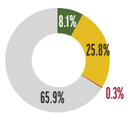


$431M Approx Total Annual Investment

$0M — $2.024M

FACILITIES

Administrative, Maintenance, and Customer Sites / Buildings / Systems / Terminals

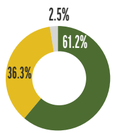


$491M Approx Total Annual Investment

$0M — $2.024M

TUNNELS

Vehicle and Rail Tunnels and Major Subsystems

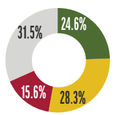


$6M Approx Total Annual Investment

$0M — $2.024M

RAIL

Light Rail, Subway, Heavy Rail (Passenger and Freight) including Track, Ties, Ballast

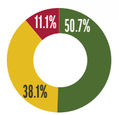


$91M Approx Total Annual Investment

$0M — $2.024M

FLEET AND EQUIPMENT

Passenger/Light Duty Vehicles, Construction, Dump Trucks, Agriculture, Police, and Revenue (Bus and Rail)

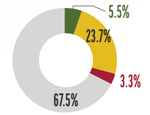


$355M Approx Total Annual Investment

$0M — $2.024M

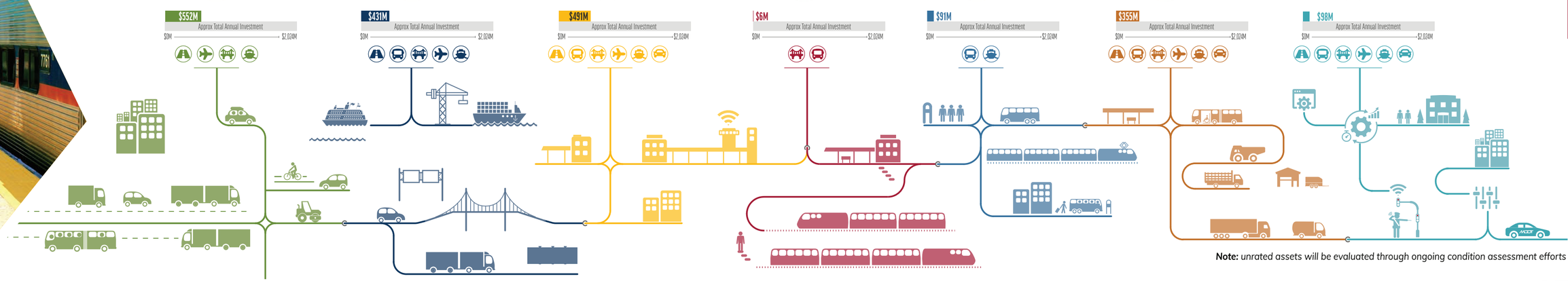
MAJOR IT SYSTEMS

Software and Hardware for Operations, Asset Management, Customer Service, Performance, and Finance



$98M Approx Total Annual Investment

$0M — $2.024M



Note: *unrated assets will be evaluated through ongoing condition assessment efforts*

04

GOALS

MDOT's asset management goals are focused on applying best practices that deliver improvements to asset knowledge, enhance system reliability and service, and promote financial stewardship. We create aspirational goals that connect to day-to-day decisions from our workforce and encourage us to drive the program forward.

We have established seven core goals that are aligned with the guiding principles and will drive our program over the next five years. We will continue to advance the program, have meaningful impacts, and deliver outcomes that benefit our system users.

GOALS	SCOPE	IMPACT	OUTCOMES
Enhance Asset Knowledge and Understanding *through data quality assurance and governance*	Enhance inventory and attribute scope and quality through continued improvements to hierarchy and data structures and strengthen data ownership and validation processes.	Improved understanding of systems and assets with timely and accurate information for field staff and analysts.	Enhanced staff productivity, greater asset understanding and knowledge, and the ability to record, track, and make real-time maintenance and lifecycle decisions.
Understand the Lifecycle Performance and Condition of our Assets *including cross-modal interdependence*	Evaluate and document lifecycle strategies for key asset classes including robust methodologies for asset inspection, condition assessment, and renewal activities.	Improved and informed intervention decisions across a wide portfolio of assets to optimize both cost and performance.	Better investment decisions and resource allocations that consider cross-modal and multi-asset projects through cost-benefit analysis and quantified outcomes.
Prioritize and Plan for System Preservation Needs *incorporating system, corridor, and neighborhood impacts*	Build a consistent understanding of cross-modal system preservation needs across all seven critical asset classes through risk-based prioritization methodologies.	Geographically visualize system preservation needs across asset classes and modals to understand how they collectively impact target neighborhoods, corridors, and systems.	Enhanced understanding of how our statewide assets work together to deliver service and improved capability to efficiently bundle combined projects into the CTP. Strong stakeholder business case to support sustainable levels of funding.
Educate, Train, and Embed Asset Management Across the Organization *to support staff development and enhance institutional knowledge*	Develop and facilitate training and communication sessions across a wide scope of MDOT employees and departments.	Greater awareness, understanding, and support of asset management and improved skillsets, knowledge, and career development opportunities among staff.	Enhanced employee satisfaction and engagement with positive impact on retention and recruitment.
Enhance and Integrate Information Systems and Data *and embrace advanced technologies and innovation*	Strengthen the functionality, usability, and integration of enterprise asset management systems and mobile workforce tools and ensure appropriate training and staffing.	Enhanced usability of core systems to support work management and decision making with wider and more consistent ownership and greater technical and functional knowledge.	Improved staff productivity and information availability with consistent levels of training and support for core systems and tools and stronger workforce capabilities.
Apply Risk-Based and Data-Driven Decision-Making *including lifecycle analysis and maintenance and staff optimization*	Continue to enhance approaches to condition, criticality, and risk to make better decisions, prioritize investments, manage largest risks, and improve system performance.	Information is more usable for maintenance and capital planning for both field staff and analysts and can be used for program optimization and resource allocation.	Targeting of funds to most critical needs, improved focus on preventive activities, and maintenance program sophistication including renewal and replacement decisions.
Communicate Funding Needs and Priorities to Stakeholders *to tell the story of our assets and secure long-term financial commitments needed*	Develop enhanced data and visualization to communicate and promote realistic need and benefit of system preservation investments with long-term benefits and impacts.	Greater transparency and stakeholder understanding of ongoing needs and implications of funding decisions.	Significant public and stakeholder support and championing for infrastructure investment and funding mechanisms and long-term commitments.

Achieving these outcomes requires steadfast commitment and will take time and dedication from the MDOT leadership and workforce as well as support from public and elected officials. Long-term outcomes and benefits from continued investments in the asset management program are many and will have a substantial positive impact on Maryland's transportation infrastructure.

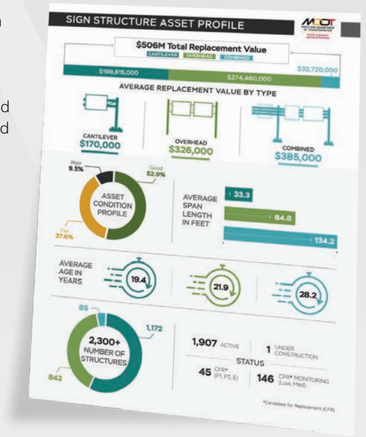
EXPECTED BENEFITS

- Greater visibility and forecasting of system preservation needs with formal SGR targets
- Increased asset and system/ service reliability/ redundancy
- Improved cross-modal performance
- Improved information availability and data sharing
- Optimized investment allocation across modes and asset classes
- Reduced (and better managed) risk
- Enhanced workforce and resource allocation
- Sustainable levels of (additional) funding

MDOT Asset Management Case Studies and Success Stories. MDOT has already achieved significant impacts and outcomes from our ongoing efforts. Below are some examples of where modals have successfully applied the principles of our seven key goals.

CASE STUDY 1: SHA Development of LMPs for ancillary Assets and Asset Class AMPs for to Promote Federal Funding of Stormwater and Geotechnical Assets

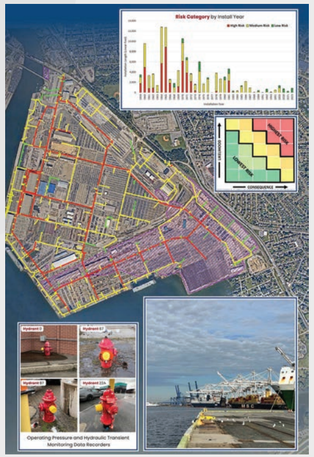
SHA has focused on developing LMPs and AMPs across its diverse portfolio of assets including pavement, structures, facilities, and fleet. These plans were used to build a strong business case for additional funding for inspections and preventive maintenance to preserve asset life and improve performance. Stormwater and geotechnical assets were appended to the Federal TAMP submission in 2023 to increase stakeholder visibility and understanding at the Federal Highway Administration (FHWA) and build a business case for allowing federal funds to be used for these asset classes.
Additional investments in these assets will allow MDOT to better address critical maintenance and replacement backlogs and improve sustainability and resiliency performance.



- Understand the Lifecycle Performance and Condition of our Assets
- Apply Risk-Based and Data-Driven Decision Making
- Communicate Funding Needs and Priorities to Stakeholders

CASE STUDY 2: MPA Development of a Water System Risk Prioritization and Renewal Plan to Proactively Address Customer Service Levels and Environmental Impacts

MPA has significantly improved core asset inventory and condition data to better assess the long-term needs of water system assets including water mains, fire hydrants, and appurtenances. These are critical systems for the port from a customer service, safety, and regulatory perspective. Significant investments in GIS data and condition analysis supported the development of a comprehensive renewal plan to proactively address aging assets over the long-term. Projects implemented through this plan will have significant positive impacts including reduced water loss (leakage)and proactive renewal or replacement of water lines to maintain the performance of the ports water distribution system.



- Enhanced understanding of water system performance, needs, and priorities
- Proactive planning for long-term capital needs linked to service levels and reliability
- Risk-based approach to build a strong business case and optimize impacts

CASE STUDY 3: MTA Using Mobile LiDAR to Provide Enhanced and Innovative Asset Condition Assessment Approaches

MTA conducted a pilot project in collaboration with USDOT FTA to collect asset inventory and condition data for track assets utilizing mobile Light Detection and Ranging (LiDAR) technology. The project and technology generated an electronic inventory and condition assessment for approximately 57 miles of track assets within the light rail corridor, along with ancillary assets including retaining walls. Asset information is being used to populate and update MTAs existing datasets and decision analysis tools and will be used to validate and assess long term SGR needs. LiDAR provides a more advanced and efficient method to evaluate, detect, monitor, and track deficiencies and defects and allow MTA to improve its lifecycle management and preventive maintenance programs.

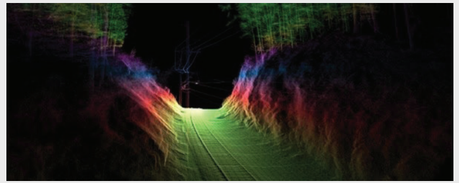


Figure: Example Point Cloud Data Produced from a LiDAR Survey

- More efficient and effective approaches to data collection and SGR analysis
- Enhanced ability to evaluate condition trends, identify issues, and proactively address needs
- Data will support long-term inspection, renewal, and replacement strategies and improved system reliability

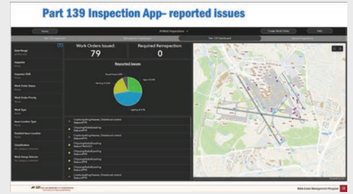
CASE STUDY 4: MAA Using Mobile Tablets to Streamline Inspections and Provide Real-Time O&M Dashboards

MAA has developed a comprehensive mobile inspection application to manage several critical programs including roof inspections and Part 139 inspections required by FAA regulations. This has allowed O&M staff to move beyond pen and paper and automate critical work management and reporting activities. The application uses a seamless GIS and Maximo EAM integration that enables MAA field crews to input data through tablet-based forms. When issues are found, crews can create follow up work orders with more detailed defect information including photos and geospatial location information and track their progress through completion. This application aligns with the broader asset management program by tracking historic inspection and corrective maintenance data, providing comprehensive history linked to specific assets to support long-term lifecycle planning.

The application is being used for a diverse set of airside and landside assets including buildings, signs, lights, and markings and will continue to expand to other assets in the future.

- Integrated work management tools to ensure regulatory and maintenance program compliance
- Proactive and efficient response from field staff through integration of GIS and Maximo EAM technologies
- Real-time visibility into data through performance dashboards

Figure: Sample 138 Inspection Dashboard



05 MANAGING PERFORMANCE

MDOT is advancing its performance management approach to drive measurable and quantified outcomes and tracking impacts with clearly defined targets. As the program continues to mature, information will be presented to stakeholders through dashboards and annual reports that formally track our progress and milestones.

Future SAMP and AMP documents will detail our progress and milestones. The asset management steering team is working with modal leadership to establish appropriate measures and targets aligned with our seven core goals. Our impact is focused on equitable asset investments that deliver reliable, safe infrastructure by inspecting and maintaining the overall condition of our portfolio.

MEASURING PERFORMANCE AND MONITORING OUTCOMES

As the program matures, MDOT will define clear performance targets for each asset class and begin to identify cross-modal needs and priorities across systems, neighborhoods, and corridors. This will help us to guide investments where they are most needed and have direct, visible, and positive impact on Maryland residents, our transportation network, and the economy.

TACTICAL METRICS (Near-Term)	GOALS	ASPIRATIONAL METRICS (Future)
☑ Asset data scope, quality, and confidence level for seven critical asset classes	**ENHANCE ASSET KNOWLEDGE AND UNDERSTANDING**	☑ Asset data scope, quality, and confidence level (annual) for ALL modal asset classes
☑ Critical asset classes with finalized LMPs ☑ Number of fully funded and implemented PM and inspection programs for priority assets	**UNDERSTAND THE LIFECYCLE PERFORMANCE AND CONDITION OF OUR ASSETS**	☑ Percent improvement in SGR (annually) ☑ Work order PM/CM ratios (and spending) by asset class ☑ Percent compliance with PM and inspection programs ☑ Modal and asset class reliability metrics (MTBF and MTTR)
☑ Percentage of assets in SGR with a score of good or fair (for seven critical asset classes)	**PRIORITIZE AND PLAN FOR SGR NEEDS**	☑ Percent annual trends in SGR ☑ Percentage of critical assets in SGR and annual trends ☑ Percent of assets in SGR by geography/neighborhood (equity measure)
☑ Development of baseline asset management training for all MDOT staff ☑ Asset management training matrix developed for key staff within each mode	**EDUCATE, TRAIN, AND EMBED ASSET MANAGEMENT ACROSS THE ORGANIZATION**	☑ Annual asset management training budget and spend ☑ Number of staff with defined training and certifications
☑ Measurement of core system (EAM, GIS, and Mobile) functionality and usability (through user survey) *EAM = Enterprise Asset Management System* *GIS = Geographic Information System*	**ENHANCE AND INTEGRATE INFORMATION SYSTEMS AND DATA**	☑ Number of asset classes fully managed in EAM with performance available through dashboards
☑ Percentage of annual system preservation needs (overall and highest criticality) funded through CTP	**APPLY RISK-BASED AND DATA-DRIVEN DECISION-MAKING**	☑ Annual asset renewal and replacement investment rates ☑ Percentage of annual CTP investments which restore poor condition assets to good or fair condition
☑ Stakeholder understanding and awareness of asset management (inclusion in documents and public presentation mentions)	**COMMUNICATE FUNDING NEEDS AND PRIORITIES TO STAKEHOLDERS**	☑ Successful long-term funding mechanism in place for annual system preservation needs

06

ORGANIZATION AND GOVERNANCE

MDOT has implemented an organization and governance structure that successfully drives the asset management program forward. It embraces collaboration and knowledge sharing between the modes while promoting common strategies, structures, and outcomes.

MDOT has established an asset management ecosystem that encourages collaboration, alignment, and continuous improvement – emphasizing a team approach and strengthening our collective skills and knowledge. The **Asset Management Senior Steering Committee** has executive-level participation from each mode and is responsible for establishing overall program direction and monitoring program progress through formal quarterly meetings. **Asset Management Work Teams** focus on tactical planning and knowledge sharing for major asset classes including pavement, structures, facilities, and fleet and have developed standardized approaches to condition, criticality, risk assessment, and lifecycle planning. These work teams encourage collaboration and consistency while allowing enough flexibility for individual modes to respond to their unique asset portfolios, regulatory drivers, and operational needs. Each mode has also assigned an **Asset Management Coordinator** responsible for managing and delivering the program. Our coordinators meet on a regular basis to exchange ideas across modes and discuss common successes and challenges. **Asset management champions or ambassadors** are embedded throughout the organization and communicate more informally to inform staff of updates and process, solicit input, and maintain touchpoints at every level of the organization.

MDOT DRIVEN

- *Governance*
- *Strategy*
- *Policy Standards*
- *Methodology*
- *Coordination*
- *Funding Allocations*

MODAL DRIVEN

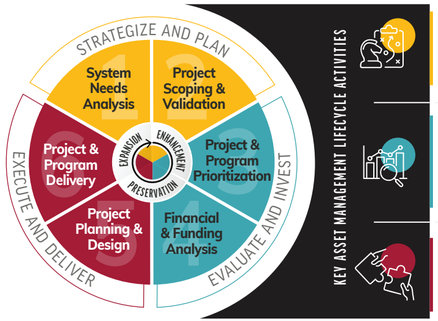
- *Planning*
- *Implementation*
- *Lifecycle Strategies*
- *SGR Analysis*
- *Performance Management*
- *Work Management*

07

INFRASTRUCTURE PLANNING AND FUNDING

MDOT's Office of Planning, Programming and Project Delivery (OPPPD) is responsible for developing and delivering the Six-Year Consolidated Transportation Program (CTP) and aligning investments with asset management priorities. It is a collaborative approach that balances the SGR needs of the existing transportation system with expansion and enhancements.

Asset management and SGR is a critical component of our annual CTP planning, which continues to evolve and improve along with our asset knowledge and understanding. It is a multi-step process that utilizes asset management processes and data, with an emphasis on planning, analysis, and prioritization. During the **strategize and plan** phases, asset inventory and condition data are essential for determining prioritized SGR needs across MDOT's critical asset classes. During the **evaluate and invest** phases, needs are prioritized to ensure that available funding is directed toward the most impactful projects and programs that maintain the performance and integrity of our systems and directly align with wider infrastructure goals. During the **execute and deliver** phases, we are embedding updated requirements including digital data submittals that align with our governance standards and allow us to manage with a lifecycle approach from day one. Every year this process is repeated and continually improved, and our asset management and capital planning teams coordinate and collaborate with modals to monitor program processes and outcomes systemwide.



Analyze asset condition, criticality, and risk assessment data to determine highest priority preservation needs with a goal of achieving SGR targets and **bundle projects to achieve efficiencies and wider outcomes including resiliency and sustainability**.

Develop project summaries and business cases to demonstrate needs, benefits, and outcomes using asset management data. Review financial and funding constraints, priorities and risks and optimize available funds to greatest needs and impacts across MDOT asset classes and programs.

Incorporate asset data standards into project design submittals to readily populate EAM systems and establish lifecycle maintenance plans for new assets as they are commissioned. **Apply maintenance lessons learned** into design and construction standards.

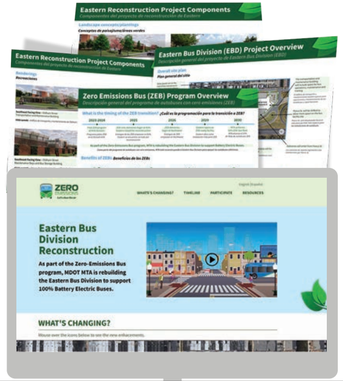
USING ASSET MANAGEMENT TO ACHIEVE OUR BROADER STRATEGIC PRIORITIES

In addition to visual condition, modals are enhancing asset assessments to incorporate an evaluation of overall performance including functionality (does it meet current demand, is it aligned with current technical standards, and are spare parts and expertise readily available to keep the asset in service), resiliency (can it withstand and/or adapt to changing conditions and recover rapidly from disruptions), and sustainability (does it minimize impacts to environment and minimize resource use). Through the CTP process, MDOT seeks to balance multiple objectives including equity, resiliency, and modernization through SGR as well as growth, capacity, and/or enhancement projects. In addition, modals are moving towards risk-based prioritization to evaluate SGR needs and understand our most critical points of failure throughout the system. This allows us to better prevent the most impactful failures that can have widespread impacts across the system for extended periods of time.

As part of the annual funding process, asset management allows us to truly understand our backlog of SGR needs and build the case for consistent and sustainable levels of funding that allow MDOT to maintain or improve the condition of our assets each year. While we seek to balance the near-term impacts on MD residents and businesses, we also are providing a transparent picture to ensure we do not leave greater liabilities for future generations. **This information is a vitally important input for the Commission on Transportation Revenue and Infrastructure Needs.**

APPLYING ASSET MANAGEMENT APPROACHES TO PROJECT DECISIONS

MDOT MTA used a recent asset management assessment report to help build the business case for replacement or a full reconstruction of the Eastern Bus Division. A comprehensive condition assessment performed in 2020 identified significant condition and functional obsolescence issues with recommendations for an extensive reconstruction or replacement of this facility. As part of the Zero-Emissions Bus (ZEB) program, MDOT MTA identified and prioritized a project to rebuild the Eastern Bus Division to support 100% Battery Electric Buses. This project was deferred in the latest CTP and MDOT expects to proceed in the future as funds are available. This project will not only address critical SGR needs, but the enhanced approach will align with MDOT's wider sustainability efforts while delivering significant neighborhood equity impacts and improvements including air quality, neighborhood and pedestrian infrastructure, and enhanced employee work facilities.



ENSURING WE MAINTAIN WHAT WE HAVE FOR CURRENT AND FUTURE GENERATIONS

Data from our asset management program has supported an overall shift toward maintaining what we have, while taking a closer look at expansion and enhancement projects - ensuring that they do not simply add capacity but align with our broader social and environmental goals. When we make investments in growth and capacity (or even replace aging assets) we must also plan for future lifecycle needs including ongoing operations, inspection, maintenance, and renewal to ensure that all needs are accounted for and the assets and system can sustain their intended performance over time.

OPTIMIZING AVAILABLE FUNDING SOURCES

Our CTP funding relies on a diverse range of state and federal funding and revenue sources including taxes, user fees, and grants. While some of these sources can fluctuate year to year our goal is to provide consistent funding to avoid spikes and ensure that we can address our backlog of infrastructure needs in a planned, steady, and controlled way – which restrains the significant expense of deferred maintenance and delivers lower lifecycle cost in the long run. Asset management provides critical data to support this effort, and our teams are also heavily focused on using federal funding and grants whenever possible. Part of recent efforts has been aligning our projects with sustainability and resiliency goals embedded within recent IIJA (Infrastructure Investment and Jobs Act) legislation. While state funding is more generally used for SGR, we continue to work with our federal partners to promote and expand eligibility for federal funds that allow us to balance impacts on MD residents.

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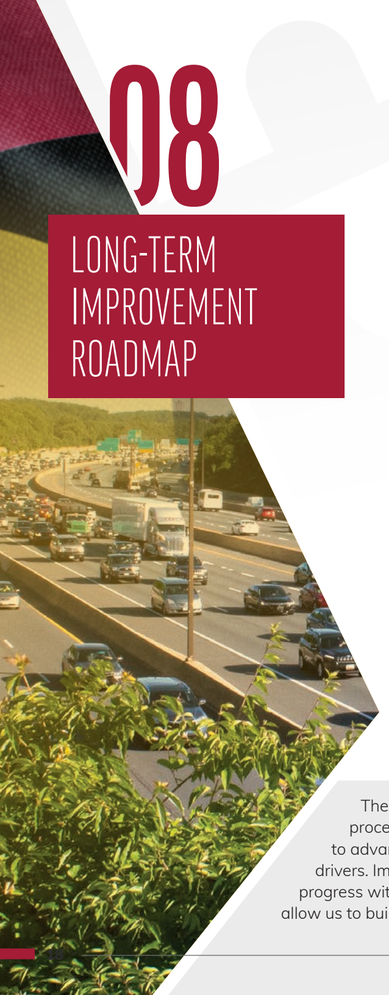
LONG-TERM IMPROVEMENT ROADMAP

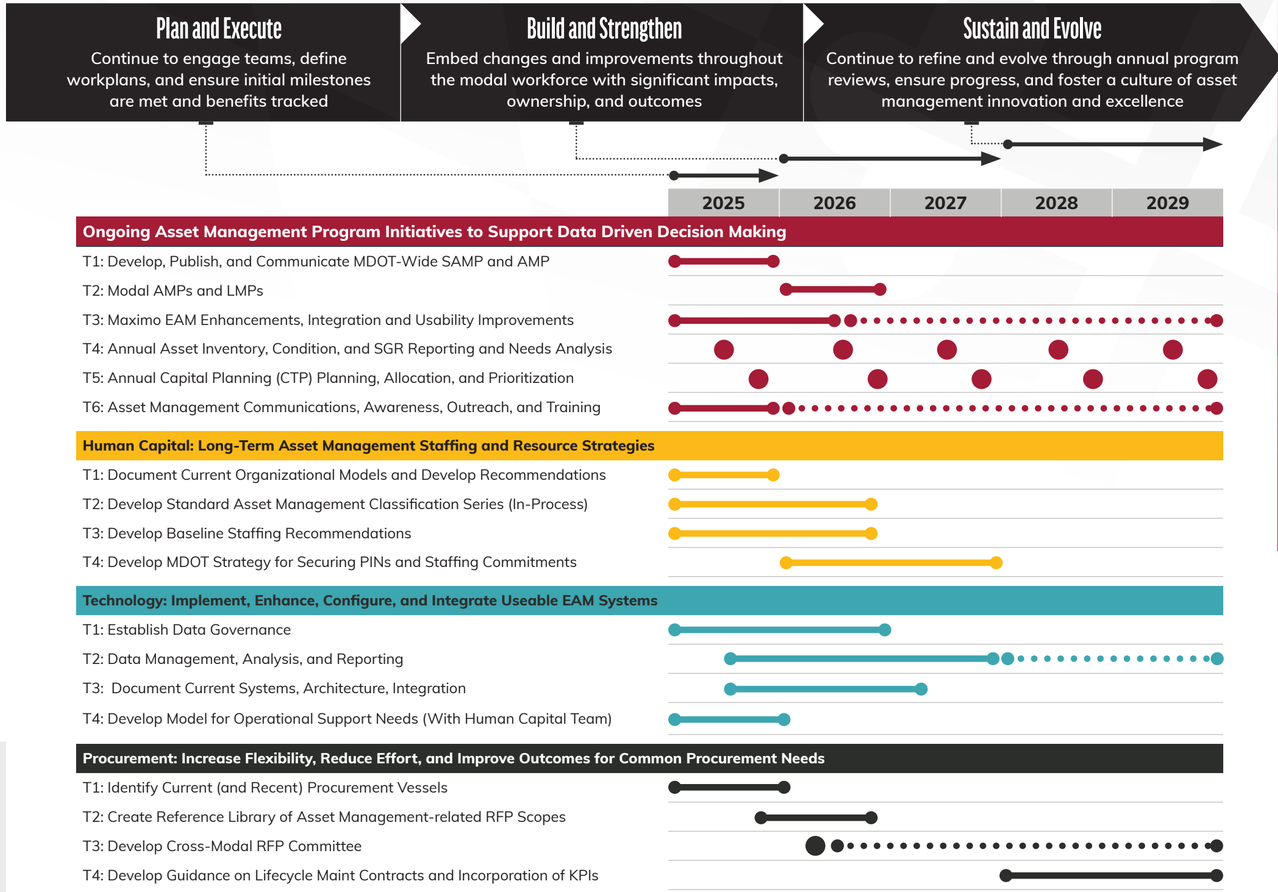


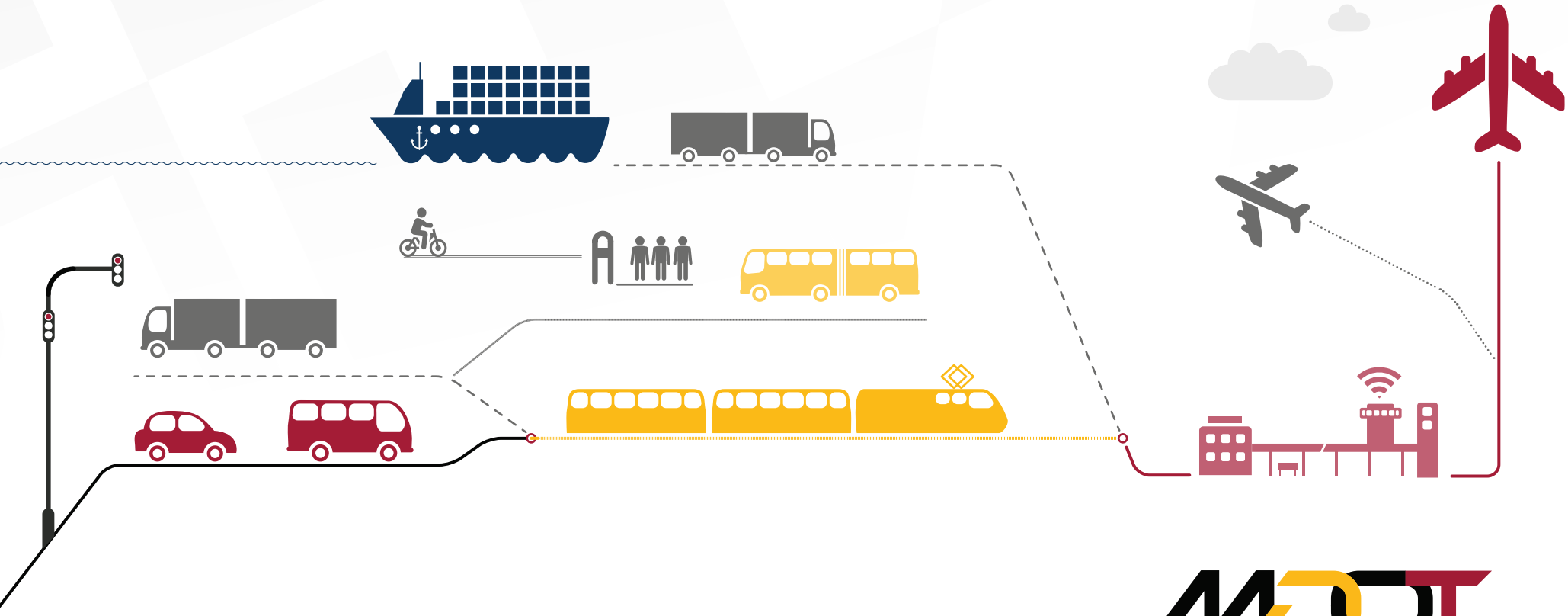
We are tackling some of MDOT's toughest challenges through our long-term roadmap for asset management. The program will drive ongoing improvements that enhance our systems, data, resources, and financial planning practices and deliver on our strategic commitments.

Four ongoing improvement streams lie at the core of our asset management program. Data-driven decision making has long been our priority and, in 2023, we launched three additional cross-modal work teams to focus on additional priorities: human capital, technology, and procurement. These efforts are all ongoing and our team charters, strategy documents, and implementation plans continue to propel the program forward.

1. **The Asset Management team will continue to focus on data-driven decision making** delivered through ongoing improvements to core asset data and information systems supporting SGR analysis and reporting and CTP prioritization. This will continue to drive culture change through communication and coordination across MDOT.
2. **The Human Capital work team aims to achieve the organization's highest priority goals,** meet MDOT expectations, and continue progress. This will be delivered through consistency in organizational approach and structure across modes with process enhancements to reduce lead-times for position approval, posting, recruiting, and placement.
3. **The Technology work team aims to enhance enterprise asset management (EAM) systems** that support risk-based and business-driven decisions. These will be delivered through improved data governance, enhanced system capabilities, and investments in technical support and expertise.
4. **The Procurement work team aims to improve outcomes for common procurement needs** including streamlined processes for high priority asset management contracts. These will be delivered through increased consistency and collaboration and expanded use of lifecycle maintenance contracts with embedded service level performance tracking and accountability.

The teams will continue to foster innovation and deploy appropriate technology to improve performance, streamline processes, and equip staff with timely and accurate information for decision making. Each work team will continue to advance the state of the practice and allow the modes flexibility to respond to their unique business and regulatory drivers. Improvements will be driven through realistic workplans that are adaptable and flexible. MDOT strives for ongoing progress with milestones and benefits achieved along the way. This five year SAMP presents a realistic roadmap that will allow us to build and strengthen our capabilities and establish a sustainable and flexible program.





MARYLAND DEPARTMENT
OF TRANSPORTATION