



METRO  
SUBWAY



# CORNERSTONE PLAN



# Administrator Overview

Dear Maryland Residents,

The Maryland Department of Transportation Maryland Transit Administration (MDOT MTA) has been providing transit services to the State since its inception as the Metropolitan Transit Authority, almost 50 years ago, in 1969. Today, MDOT MTA operates the 12th largest multimodal transit system in the country with over 250,000 daily riders, five transit modes, and paratransit service, while providing support to locally operated transit systems throughout Maryland. In our Metro SubwayLink operations, MDOT MTA operates 14 stations, 34 miles of track, 78 railcars, and approximately 300 dedicated employees. With nearly 11 million passenger trips a year, we know residents and visitors in our metropolitan area depend on us to transport them to life's opportunities. MDOT MTA is committed to improving the transit experience for our customers every day. To this end, MDOT has adopted the following mission statement:

*The Maryland Department of Transportation is a customer-driven leader that delivers safe, sustainable, intelligent, and exceptional transportation solutions in order to connect our customers to life's opportunities.*

MDOT MTA has adopted the following vision statement:

*To provide safe, efficient, and reliable transit across Maryland with world-class customer service.*

MDOT MTA's modal Cornerstone Plans translate this mission statement into strategic priorities, policies, programs, and initiatives for each of our transit modes. Each Cornerstone Plan synthesizes MTA plans, policies, and reports, with performance data, local and national trends, and stakeholder input. MDOT MTA comprehensively analyzes this information to create targeted recommendations for growth and investment in each mode that coordinate with the needs of the transit system overall. This Cornerstone Plan highlights MDOT MTA's long-term plans and priorities for Metro SubwayLink, which are divided into short term (through 2025), medium term (2025-2035) and long term (2035-2045).

Most importantly, the Cornerstone Plans are living documents; these plans and projects may continue to evolve as our team continues in its mission to continually improve our ability to deliver safe, efficient, and reliable transit with world-class customer service.

Sincerely,

**Kevin B. Quinn**  
**MDOT MTA Administrator**





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# Purpose of the Plan

Public transportation serves a critical role in Maryland, connecting residents to jobs and services and driving the state's economy. MDOT MTA is committed to safely, efficiently, and reliably connecting Maryland's residents, businesses, and visitors to life's opportunities through effective planning and responsible management.

## **MDOT Mission Statement**

*The Maryland Department of Transportation is a customer-driven leader that delivers safe, sustainable, intelligent, and exceptional transportation solutions in order to connect our customers to life's opportunities.*

The Metro SubwayLink Cornerstone Plan was developed, consistent with the goals of the MDOT Maryland Transportation Plan (MTP). These goals include:

- Ensure a Safe, Secure, and Resilient Transportation System
- Facilitate Economic Opportunity and Reduce Congestion in Maryland through Strategic System Expansion
- Maintain a High Standard and Modernize Maryland's Multimodal Transportation System
- Improve the Quality and Efficiency of the Transportation System to Enhance the Customer Experience
- Ensure Environmental Protection and Sensitivity
- Promote Fiscal Responsibility
- Provide Better Transportation Choices and Connections

The Cornerstone Plan is part of MDOT MTA's continuing commitment to achieve its goals through effective planning and management. This plan includes strategic priorities that support the four cornerstones of MDOT MTA service. Specific initiatives are also identified that provide recommended paths forward to implementation.

The Metro SubwayLink Cornerstone Plan (the Plan) provides the framework around which MDOT MTA will invest in Metro SubwayLink to deliver safe, efficient, and reliable transportation with world-class customer service. Derived from MDOT MTA's vision statement, these four cornerstones provide focus for the outcomes MDOT MTA seeks to achieve through its initiatives and investments. Looking ahead over the next 25 years, the Plan identifies strategic priorities and key investments for MDOT MTA to efficiently maintain Metro SubwayLink service, while leveraging many opportunities to introduce new technologies and amenities to improve the service.

**MDOT MTA is a Transportation Business Unit (TBU) of the Maryland Department of Transportation (MDOT). As the 12th largest multimodal transit system in the United States, MDOT MTA operates:**

- **Local Buses (CityLink, LocalLink, and Express BusLink)**
- **Commuter Buses**
- **Light RailLink**
- **Metro SubwayLink**
- **Maryland Area Regional Commuter (MARC) Train service**
- **MobilityLink (a comprehensive paratransit system)**

**Additionally, MDOT MTA manages the taxi access service within the MDOT MTA MobilityLink service area and directs funding and statewide assistance to Locally Operated Transit Systems (LOTS) in each of Maryland’s 23 counties, Baltimore City, Annapolis, and Ocean City.**



### **Safety**

Provide a safe and secure environment for every customer and employee. Ensure the transportation system is resilient to natural and man-made hazards.



### **Efficiency**

Preserve existing assets and maximize the efficient use of resources and infrastructure.



### **Reliability**

Deliver a reliable, frequent, convenient, and easy to use transit service for customers.



### **World Class Customer Service**

Improve communication and responsiveness with MDOT MTA customers and stakeholders in an effective and professional manner.



**MDOT MTA uses an iterative planning process to drive and monitor results. By continuing to develop this feedback loop, MDOT MTA will maintain a strong standard of excellence to serve its customers.**



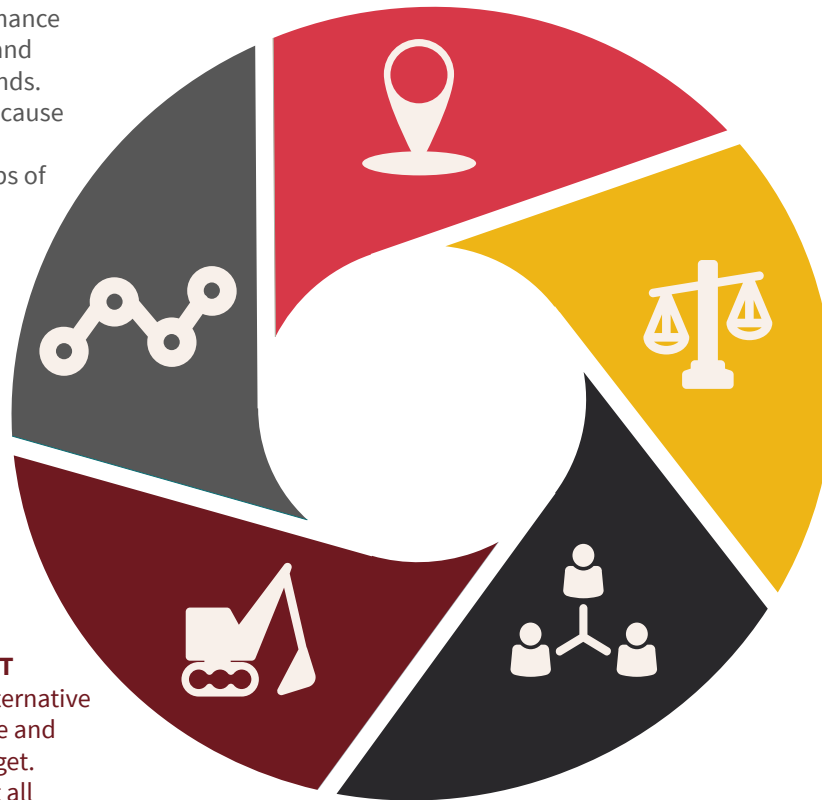
# ITERATIVE PLANNING PROCESS

## MONITOR

key performance indicators and analyze trends. Investigate cause and effect relationships of key trends.

## IDENTIFY

issues and needs and frame from a customer perspective. Identify key parties who have a stake in the issue.



## EVALUATE

alternative scenarios and project options, including no build scenario. Evaluate capacity to implement project.

## IMPLEMENT

selected alternative on schedule and within budget. Ensure that all potential projects threats are identified and accounted for.

## ENGAGE

key stakeholders and general public. Maximize participation in planning process and clearly define project.



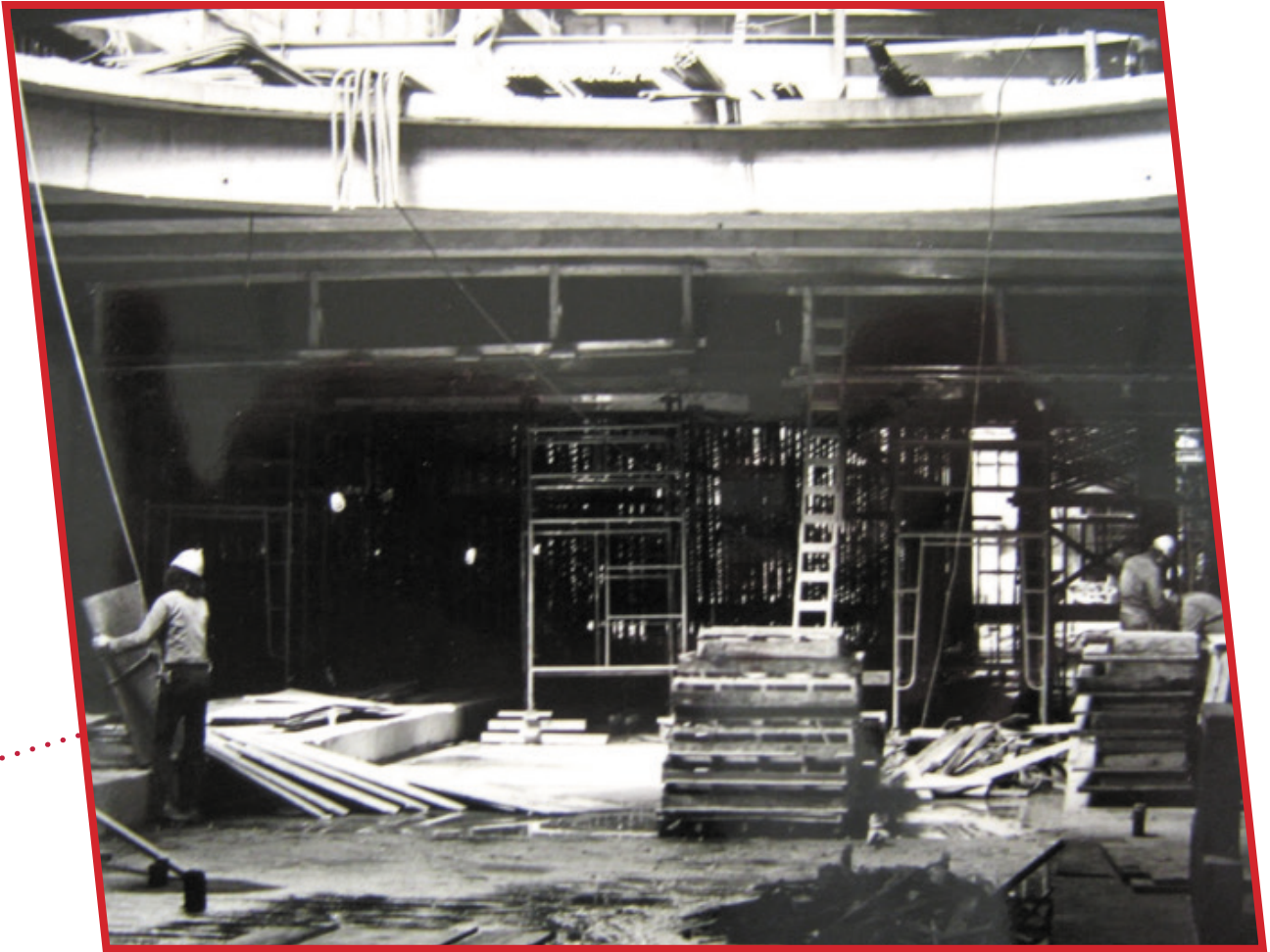
# Overview of Metro SubwayLink

## History

In 1965, the Baltimore Area Mass Transportation Plan proposed six rapid transit lines radiating out from a central city loop. Subsequent planning studies in 1968 proposed a rail transit system 71 miles long. As this initial vision was developed from concept to design, a Phase 1 plan emerged with two lines – a northwest line from Owings Mills to Downtown and a southern line from Downtown to Glen Burnie and the BWI Thurgood Marshall International Airport. Phase 1 was approved for funding by the Maryland General Assembly in 1972, and proceeded to construction.

The Baltimore Metro opened on November 21, 1983 with a 7.6-mile segment between Charles Center and Reisterstown Plaza. In 1987, a second segment opened, extending the line north to Owings Mills. The final segment from Charles Center to Johns Hopkins Hospital completed the project on May 31, 1995.







## Service

MDOT MTA operates one Metro SubwayLink line, which runs from Owings Mills in the northwest to Johns Hopkins Hospital in the southeast, passing through the core of downtown Baltimore, which includes 14 stations, 34 miles of track (approximately 15.5 miles from end to end), 100 railcars, and approximately 300 dedicated employees.

Metro SubwayLink, generally referred to as “heavy rail,” operates at higher speeds than light rail. Powered by an electrified “third rail,” heavy rail requires 100% dedicated tracks separated from other activities (i.e., it cannot operate in mixed traffic or near pedestrians). Metro SubwayLink trains have higher passenger capacities than light rail trains, but lower than MARC commuter rail trains.

Metro SubwayLink has a mix of aerial and underground infrastructure. The northwest section, comprising six stations from Owings Mills to West Cold Spring, is built on aerial structures. The downtown section,

comprising eight stations from West Cold Spring to Johns Hopkins Hospital, runs in underground tunnels. The six above-ground stations have MDOT MTA-owned Park & Ride lots. Mondawmin station is the only underground station with dedicated parking and has leased parking spots from Mondawmin Mall.

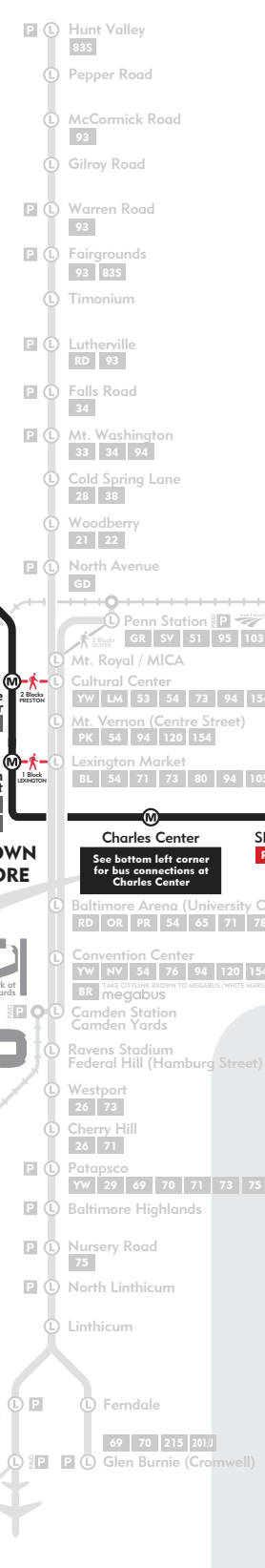
Metro SubwayLink service runs from 5am to midnight every weekday and from 6am to midnight on weekends and holidays. Headways (length of time between train arrivals) range from 8 minutes on weekday peaks to 15 minutes on weekends and holidays. The total scheduled travel time from end to end is approximately 30 minutes. Metro SubwayLink carries nearly 11 million passenger trips per year, accounting for approximately 12 percent of MDOT MTA’s total ridership.

Over 400,000 jobs are located within a 30-minute walk or transit ride of Metro SubwayLink stations, with over 240,000 of those within 15 minutes.



# Metro SubwayLink Connections Map

**Commuter Bus Connections**  
 in Downtown Baltimore and/or Johns Hopkins Hospital:  
 210 215 310 320 410 411 420



### Map Legend

**RAIL LINES:**

- M** Metro SubwayLink Line/Station  
Owings Mills to Johns Hopkins Hospital
- L** Light RailLink Line/Station  
BWI Airport or Glen Burnie to Fairgrounds or Hunt Valley
- L** Light RailLink Shuttle/Station  
Penn Station to Camden Station
- MARC Train Lines/Stations**  
Penn Line: Perryville or Penn Station to Washington DC  
Camden Line: Camden Station to Washington DC

**CONNECTING BUSES:**  
 Note that some connections may require crossing the street and/or walking a block or two.

**CityLink Routes**  
 Frequent Daily Service / 24 Hours  
 BR RD PK OR  
 GD YW LM GR

**LocalLink Routes**  
 Daily Service  
 BL NV PR SV

**Express BusLink Routes**  
 Weekday Peak Service  
 22 33 56 76

**Free Charm City Circulator Routes**  
 Frequent Daily Service  
 O G B P

**External Routes**  
 Operated by Other Transit Agencies  
 B30 835 201.1 501.5

**P** Park & Rides and Amtrak Stations

Charles Center is home to the **MTA TRANSIT STORE** at the corner of Baltimore and St. Paul Streets. You can get CharmCards here!

### Bus Connections at Charles Center

RD	OR	GR	PR	SV	51
65	67	71	76	78	95
103	105	120	150	160	164
56	TAKE LOCALINK 56 TO MEGABUS (WHITE MARK)				
BR megabus					

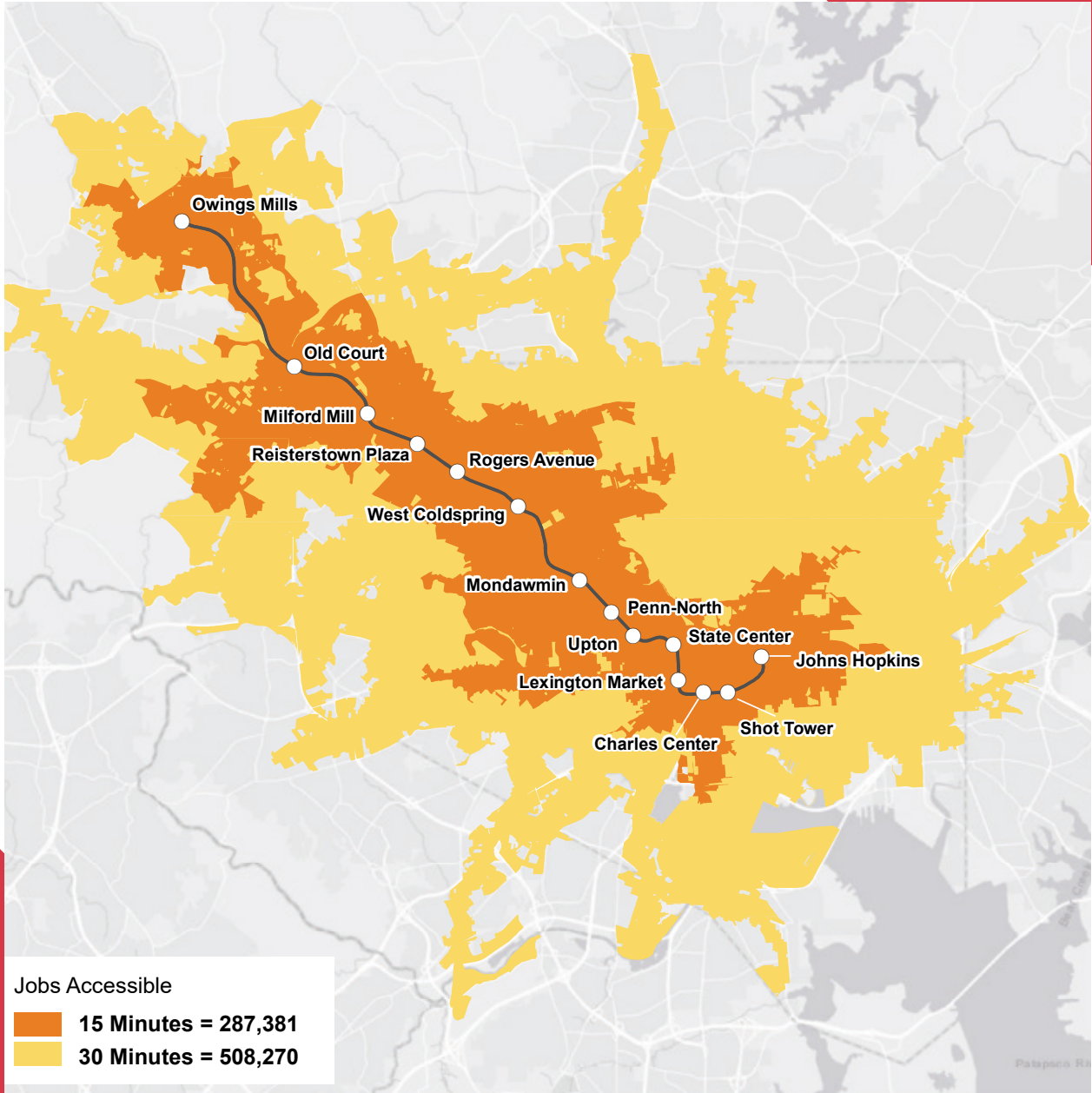
Chesapeake Bay

Schematic map - not to scale  
 Version 9.24.2018 / Marc Szarkowski

Overview of Metro SubwayLink



### Metro SubwayLink Access Map



## Metro SubwayLink Average Daily Ridership Map



Average weekday ridership from Fiscal Year 2017.



# Metro SubwayLink Milestones

**1983**

Section A, known as the Northwest Line, opened between Charles Center and Reisterstown Plaza. This section consists of 7.55 miles of underground and at-grade heavy rail.

**2002-05**

The Metro SubwayLink fleet received a complete overhaul. This overhaul, with a few exceptions, replaced all systems on the railcars, as well as passenger seating, railcar flooring, destination signs, and new audio-visual announcement and video surveillance systems.

**2013**

In 2013, the first apartment building in Metro Centre in Owings Mills opened. Today, Metro Centre is comprised of 1.2 million square feet of commercial office space; 300,000 square feet of complementary retail space; 1700 residential units; Baltimore County Community College & Baltimore County Library totaling 120,000 square feet and a 250 room Boutique Hotel<sup>1</sup>.

<sup>1</sup> davisbrown.com

**1965**

The *Baltimore Area Mass Transportation Plan* presented an initial concept plan for Metro SubwayLink

**1987**

Section B, six miles of at-grade heavy rail opened, extending the line northwest to Owings Mills.

**2006**

Vehicle mid-life overhaul completed, which included the addition of auto-announcement system, video surveillance, new flooring, and new seat cushions.

**2014**

In 2014, the Social Security Administration opened their 538,000 square foot office adjacent to the Reisterstown Plaza Metro SubwayLink station. This development will serve as the anchor for future transit-oriented development at Reisterstown Plaza Station

**1974**

Construction began at State Center station, originally named Bolton Hill Station.

**1994**

Section C further extended the line 1.5 miles below ground, opening the final segment from Charles Center to Johns Hopkins Hospital.

**2008**

MDOT MTA upgraded the Metro Fire and Security Management System, which improved facilities and systems operations and maintenance and MDOT MTA's ability to efficiently respond to emergency events.







# Strategic Priorities

Looking ahead, MDOT MTA has established five strategic priorities for Metro SubwayLink that support the four cornerstones of the agency’s mission. These priorities provide focus for future decisions and investments. The Metro SubwayLink Priorities are:

- 1. Safety and Security**
- 2. Operational Performance**
- 3. Asset Management**
- 4. Customer Experience**
- 5. Practical Design**

## Safety and Security

Ensuring the MDOT MTA systems are safe and secure for riders, employees, contractors, and the general public is MDOT MTA’s number one priority. Providing a safe and secure system involves a broad range of activities, from timely inspection and maintenance of vehicles, electrical systems, and guideway; to proper training and operating protocols and communication; to effective police enforcement and security equipment.



In 2014, 2015, and 2016, the MDOT MTA Police Force reported the lowest number of serious crime incidents among the top 12 transit agencies in the country<sup>2</sup>. MDOT MTA will continue to strategically deploy MDOT MTA Police Officers, public safety announcements, ad campaigns (e.g., “See something, Say Something,” and “Keep Your Smartphone Safe”), and technology (e.g., closed-circuits television and emergency blue light telephones) to ensure system safety.

MDOT MTA is committed to increasing its ability to proactively mitigate threats when possible and recovery quickly when events occur. The agency’s resiliency strategy prioritizes the safety of customers and employees. MDOT MTA resiliency strategies are critical to protect customers, employees, and physical assets from threats posed by natural and man-made threats such as fires, floods, extreme weather, burglary, theft, vandalism and terrorism.

<sup>1</sup> Lowest number of part 1 crime of the top 12 transit system agencies – APTA Bus Safety & Security Gold Excellence Award  
MARTA National Study



## Operational Performance

On-time performance of Metro SubwayLink was 95 percent in 2016. MDOT MTA is committed to maintaining strong operations management protocols and investing in reliable equipment to maintain high-quality service. Efficient and reliable operations involve systems, equipment, and personnel working effectively together.

Metro SubwayLink's operations personnel are the front-line staff who identify critical issues that may impact service. In addition to the operations personnel, continuing investments in technology and communications systems will be needed to maintain and improve MDOT MTA's ability to actively monitor and manage daily operations. Metro SubwayLink operations average \$60 million per year over the timeframe of the Plan.



### Metro SubwayLink operations support includes:

- The physical operation of Metro SubwayLink vehicles
- Station Attendants
- Dispatch
- Operations Control
- Field Supervision
- Call Center Management
- Maintenance Coordination
- Police Coordination

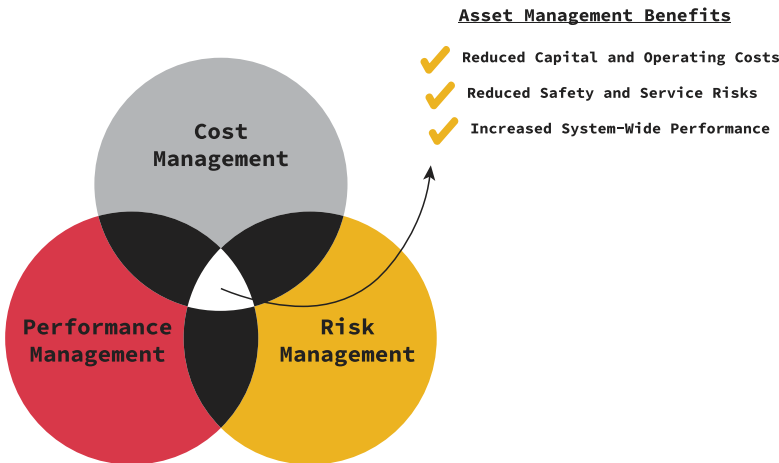


## Asset Management

MDOT MTA is committed to effectively managing its capital assets and maintaining its system in a State of Good Repair (SGR) to support safe, efficient, and reliable transit service. Transit Asset Management is a strategic approach to managing the agency’s fleet, infrastructure, equipment, and facilities to optimize performance, useful life, and minimize whole life cost. MDOT MTA will align its asset and safety management practices and proactively review and communicate safety-related issues.

MDOT MTA will employ historical data to better inform future investment decisions and accurately capture capital and operating costs to assess and optimize the total cost of asset ownership. Maintenance and capital programs will be assessed to improve operational performance, reduce asset related risks, and reduce SGR backlog. Through improved asset management, internal/external communication, service reliability, convenience, and accessibility, MDOT MTA will enhance customers’ experience.

### ASSET MANAGEMENT



Asset Management is a strategic approach to optimizing performance and minimizing lifecycle costs

Metro SubwayLink assets include vehicles, stations, guideways, facilities and systems. Maintaining the estimated \$3.8 billion portfolio of Metro SubwayLink assets in a state of good repair will cost approximately \$120 million per year over the timeframe of this Plan.

Asset Management will also help reduce the impact of our activities on the environment and develop ways to make our transit system more resilient. Lifecycle cost considerations and improved efficiencies of equipment in good repair will help reduce the financial, social, and environmental costs of the system, which supports MDOT MTA’s commitment to sustainability.

## Improved Customer Experience

MDOT MTA strives to provide our customers with world-class service at every stage of their trip, from beginning to end. MDOT MTA will seek opportunities to upgrade technology and amenities to make it easier, more efficient, and more convenient to access and use transit to access jobs, education, amenities, and services. Key focus areas for enhancing the Metro SubwayLink system include station access and technology improvements.

Ensuring that the public can safely, efficiently, and reliably access stations is a key focus for improving customer experience with the system. MDOT MTA is committed to ensuring our facilities and vehicles are accessible to all members of the public, including those with disabilities. Further, we continue to find ways to strengthen the connections for all those accessing our vehicles and stations, including those who arrive by:

- Wheelchairs and other mobility devices
- Foot
- Bicycle
- Bus or other transit
- Carpool
- Carshare
- Taxi
- Park & Ride

MDOT MTA is committed to developing strong relationships with partners and customers and using their input to deliver better service. MDOT MTA is committed to the following public engagement objectives to ensure a truly collaborative process with our stakeholders:

- Reach a meaningful cross-section of stakeholders across demographics, interests, and experiences of people who are affected by transit, including those who are often under-represented.
- Incorporate customer, community, and stakeholder input and insight into MDOT MTA decisions.
- Provide clear avenues for members of the public to receive information, provide input, and share concerns.
- Explain when and how public input is used.
- Provide interactive experiences across a variety of meeting formats, both in-person and online.





## Practical Design

Practical design guides all MDOT investments, applying the idea that the needs of the system are prioritized over the wants of a specific project. This approach enables MDOT MTA to complete more projects by ensuring that each individual project targets its core priorities and needs. Practical design also provides greater flexibility to address problems and improve the system through innovation.

MDOT MTA will apply Practical Design principles to achieve its mission with constrained resources. Practical design adheres to the following guidelines:

- **Every project will make the facility safer after its completion.**
- **The design solution shall be reached in a collaborative environment.**
- **The design solution shall match the project need(s).**
- **Designs shall use the flexibility that exists in current engineering specifications and guidance while ensuring the minimum design thresholds are achieved.**
- **The goal cannot be to shift investment costs to maintenance. Rather, the goal should be to obtain the best value for the least cost.**



**Lexington  
Market  
Station**







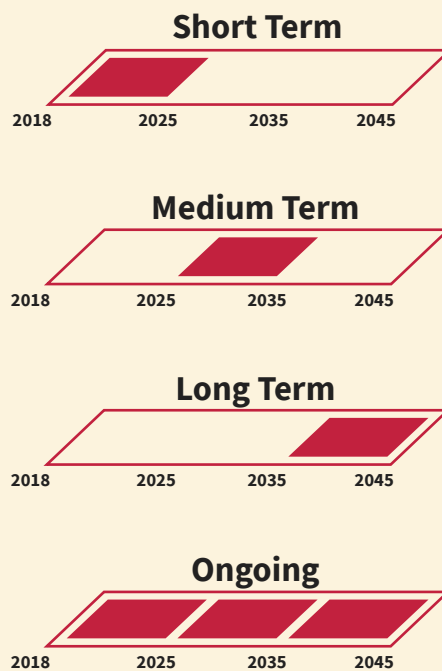
# Metro SubwayLink Investment Areas

This section of the Plan categorizes the initiatives needed to provide safe, efficient and reliable Metro SubwayLink service over the next 25 years in 5 investment areas:

- Vehicles
- Stations
- Guideway
- Facilities
- Systems

The five categories are consistent with MDOT MTA and the Federal Transit Administration asset types established for Transit Asset Management. MDOT MTA does not anticipate any significant changes to Metro SubwayLink service hours or frequency. Key initiatives in each investment area are identified. These initiatives highlight major investments and customer-facing changes that MDOT MTA anticipates. It is not an exhaustive list, as additional projects are anticipated in each investment area to maintain a state of good repair and improve customer experience.

## Project Timeline





Investment Areas	Timeframe	Initiative	Pg. #
Vehicles	Short term	Railcar Replacement	26
	Ongoing	Railcar Maintenance and Overhauls	27
Stations	Short term	Signage and Wayfinding Updates	28
		In-Station Variable Message Systems	29
		Rogers Avenue Transit Oriented Development	31
		Reisterstown Plaza Transit Oriented Development	31
		State Center Transit Oriented Development	31
	Medium term	Metro SubwayLink Flood Mitigation and Resiliency	29
	Ongoing	Lighting, Electrical and Fire Alarm Component Maintenance and Replacement	30
Structural Maintenance and Rehabilitation		30	
Guideways	Medium term	Wabash Yard Rail Replacement	34
	Ongoing	Tunnel Track Maintenance and Replacement	32
		Aerial Track Maintenance and Replacement	33
Facilities	Medium term	Metro SubwayLink Operations Control Center Upgrades	35
	Ongoing	Wabash Facility Rehabilitation	34
Systems	Short term	Underground Cellular Service	36
		Train Control Replacement	36
	Medium term	Ticket Vending Machine and Faregate Replacement	37
	Long term	Systems Automation	37



# Vehicles

The Metro SubwayLink fleet is comprised of 100 vehicles, which were procured in two batches. 78 vehicles will be replaced starting in 2019, and the remaining vehicles will be retired. Minor overhauls are completed every five years. MDOT MTA also maintains a non-revenue fleet of 63 vehicles. This fleet includes vehicles used for maintenance of Metro SubwayLink facilities and guideways as well as for supervision of Metro SubwayLink operations.

## Railcar Replacement



The current railcars are 35 years old and exceeding their useful life; operating these vehicles presents challenges in ongoing maintenance due to long lead times for spare or unavailable parts, which ultimately reduce the reliability of train service. Currently, MDOT MTA is repairing or completely replacing 78 railcars. The new railcars will be more reliable, more energy efficient, and provide enhanced passenger security and customer service capabilities. Further, the new railcar motors are more energy efficient, require less maintenance, and improve safety.

\$243 Million



## Railcar Maintenance & Overhauls



Once the Railcar fleet is delivered, each vehicle will need to undergo an overhaul every five years to replace vital components and systems. There will be five railcar overhauls over the course of this plan, as well as capital maintenance that is ongoing.

**\$315 Million**





# Stations

The Metro SubwayLink system is comprised of 14 stations, some of which are elevated (aerial) and the rest of which are underground as part of a tunnel design. Each station contains a traction power substation. Metro SubwayLink stations include elevators and escalators, lighting, electrical systems, fare collection equipment and turnstiles, station platforms, announcement systems and other components.

## Signage and Wayfinding Updates



MDOT MTA is establishing updated uniform architecture for station components, such as shelters, benches, signs, maps, fencing, railings, pylons, and lighting throughout the BaltimoreLink system, including Metro SubwayLink, Light RailLink, CityLink, LocalLink, and Express BusLink. As these components are replaced due to wear or damage, the updated station elements will make navigating the transit system simple and intuitive, refresh the look of the Metro SubwayLink stations, and reduce maintenance costs. Additional wayfinding components and signage will be added throughout the system to convey that BaltimoreLink is a single, unified system and help customers find and navigate stations.

The new modular design will accommodate stations' various sizes, configurations, site accessibility, and amenities (e.g., signs and benches). The signage and wayfinding upgrades will focus on:

**\$25 Million**



### NEXT STEPS

- Develop station-specific wayfinding plans
- Coordinate with signage & wayfinding projects throughout MDOT MTA

- Consistency with other MDOT MTA materials (built environment, print, and digital)
- Intuitive placement and comprehension
- Quality craftsmanship and longevity
- Modular design to reduce maintenance costs
- Going above and beyond ADA requirements for hearing or vision impaired customers.

## In-Station Variable Messaging System

\$6 Million



MDOT MTA has installed a variable messaging system into all 14 Metro SubwayLink stations. This system will be upgraded to include next train arrival information, schedule and real time arrival information about connecting services, information about local events, and emergency alerts. This system will be integrated with the existing public announcement and LED display system.

### NEXT STEPS

- Upgrade signaling system (included in railcar replacement initiative)
- Coordinate with BaltimoreLink themed signage & wayfinding.

## Metro SubwayLink Flood Mitigation and Resiliency

\$10 Million



The Shot Tower and Charles Center Metro SubwayLink stations are located underground in an area that is at risk of flooding during storm surge events, major rainfall events, and over the long term with sea-level rise. These two stations, along with the tunnels and ventilation systems that connect them, will be outfitted with upgrades that mitigate the risks associated with such events. These upgrades will ensure the safety of MDOT MTA's customers and employees while also protecting valuable assets from serious damage.



## Lighting, Electrical and Fire Alarm Component Maintenance and Replacement



**\$585 Million**



To maintain a state of good repair, MDOT MTA will upgrade and/or maintain lighting, electrical components, and fire alarm systems throughout the 14 stations as they reach the end of their useful life. These upgrades will coincide with upgrades of other station components and incorporate new technology and safety systems.

## Structural Maintenance and Rehabilitation

**\$370 Million**



The Metro SubwayLink system is made up of 6 above ground, or aerial stations, and 8 underground stations. Systematic repair and replacement of structural components is critical to maintaining stations in a state of good repair, and presents opportunities to update facades. Structural components include station exterior walls (above ground and underground), roofs, drainage systems, and platform canopies for above ground stations.

# Rogers Avenue Transit Oriented Development



**Cost Neutral**



MDOT promotes Transit Oriented Development (TOD) as a tool to support economic development, promote transit ridership, and maximize the efficient use of transportation infrastructure. MDOT currently owns several under-utilized parking lots at Roger's Avenue Station that could be developed to better serve the community. As one of the largest multimodal hubs in the BaltimoreLink transit system, Roger's Avenue Station is ideally situated to become a thriving activity center.

### NEXT STEPS

- Work with stakeholders and agencies to achieve MDOT MTA operational needs
- Facilitate effective design to support and leverage transit

# Reisterstown Plaza Transit Oriented Development

**Cost Neutral**



In 2014, the Social Security Administration opened their 538,000 square foot office adjacent to the Reisterstown Plaza Station. Using the Social Security Administration building as an anchor, MDOT will work with stakeholders to develop the remaining parcels under it's control in a manner that is consistent with TOD principals.

### NEXT STEPS

- Work with stakeholders and agencies to achieve MDOT MTA operational needs
- Facilitate effective design to support and leverage transit

# State Center Transit Oriented Development

**Cost Neutral**



MDOT MTA supports the redevelopment of the area around State Center Station to create a true transit-oriented development. Any development should prioritize pedestrian and bicycle movement and use the station headhouse as a focal point. The development should also feature a safe and intuitive connection between the State Center Metro SubwayLink Station and the Cultural Center Light RailLink Station.

### NEXT STEPS

- Next Steps: - Work with stakeholders and agencies to achieve MDOT MTA operational needs
- Facilitate effective design to support and leverage transit



# Guideways

The double-tracked mainline provides a service corridor totaling 34 waymiles. Along this corridor, the system depends on a series of tunnels and elevated structures. Since the system was built in three phases, the ages of these guideway assets generally differ accordingly.

## Tunnel Track Maintenance and Replacement



**\$190 Million**



The underground section of track extends from the tunnel portal near Mondawmin Station and the terminus at Johns Hopkins Hospital. This section of track is not subject to natural elements like the above ground section, but tracks are more difficult to access. Regular maintenance as well as periodic replacement of the rails and rehabilitation of tunnels is needed to maintain a state of good repair.



## Aerial Track Maintenance and Replacement

\$110 Million



The aerial section of track stretched from the tunnel portal near Mondawmin Station to the terminus at Owings Mills. This section of track is exposed to the elements, which can cause the rails to degrade. Regular maintenance as well as periodic replacement of the rails and supporting structures is needed to maintain a state of good repair.

## Wabash Yard Rail Replacement

\$80 Million



The rails in the Wabash Maintenance Yard will need to be replaced during the medium term timeframe. These rails provide access to the main storage and maintenance facility for Metro SubwayLink. Replacing these rails will prevent derailments and ensure reliable Metro SubwayLink service.



# Facilities

Metro SubwayLink conducts or coordinates maintenance on all its assets out of two major facilities: Wabash and Old Court. Wabash contains the main administrative offices and focuses on railcar and system maintenance, whereas Old Court focuses on maintenance-of-way and facility maintenance. In addition, Metro SubwayLink is responsible for the maintenance of the MDOT MTA Operations Control Center (OCC), located on Eutaw Street in the Central Business District.

## Wabash Facility Rehabilitation



MDOT MTA will rehabilitate components within the Wabash maintenance and storage facility, including communications systems, maintenance equipment, and the building structure. This facility will also need to be retrofitted to allow for service of the new Metro SubwayLink vehicles, which require roof-top access.

\$20 Million



## Metro SubwayLink Operations Control Center Upgrades

\$30 Million



The Metro SubwayLink Operations Control Center is where MDOT MTA monitors train locations and coordinates safe and efficient movement throughout the system. The Operations Control for Light RailLink and BaltimoreLink bus modes (CityLink, LocalLink, Express BusLink) are also housed in the same facility to enhance coordination between modes. The equipment in this building will need to be replaced with state-of-the-art equipment that helps MDOT MTA keep customers safe and ensure that they have the most integrated transit experience possible.





# Systems

Metro SubwayLink systems include electrification, traction power, signaling, train control, communications and revenue collection. The age of the systems correlates to the three phases of system construction.

## Underground Cellular Service



\$ Cost Neutral



MDOT MTA will explore partnerships with cellular providers to provide service to customers within underground stations and in tunnels. This initiative will allow customers to use MDOT MTA’s various online platforms, such as Rate-Your-Ride, mobile ticketing, and the MDOT MTA website. Most importantly, underground cellular service will allow customers to contact emergency services the event of an emergency. Customers will still be subject to their existing voice and data agreements with their cellular providers.

## Train Control Replacement

\$158 Million



Replacement of the train control/signaling system is being pursued in conjunction with the new railcar procurement. The new train control system will incorporate Communication-Based Train Control (CBTC) technology. The system allows precise automatic operation, allowing trains to operate at maximum allowable speeds under all conditions, providing for more consistent travel times. The system will provide MDOT MTA train dispatchers and maintainers with real-time performance and fault annunciation, reducing the time to restore normal operations during a system fault.

## Ticket Vending Machine & Faregate Replacement



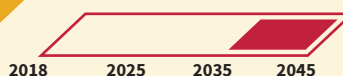
\$45 Million



MDOT MTA will replace all 88 Ticket Vending Machines (TVMs) and 193 faregates at Metro SubwayLink stations. This replacement provides MDOT MTA with the opportunity to provide customers with more purchase options, including Charm Cards, fares for MARC services, and Baltimore Bike Share passes.

## Systems Automation

\$ TBD



An increasing number of heavy-rail systems throughout the world are using automation technology to increase safety, efficiency, reliability and customer service. MDOT MTA will explore train automation options. Fully autonomous trains will allow operators to be deployed elsewhere throughout the train to assist customers and maintain safe operations. This initiative will be coordinated with future replacement of associated systems and equipment. This technology will not be incorporated into the Short Term Metro SubwayLink vehicle replacement initiative, but will be explored for long term implementation.



# Conclusion

This Plan lays a foundation for Metro SubwayLink to provide safe, efficient, reliable transit across Maryland with world class customer service. The strategic priorities and initiatives are built on this foundation. This plan serves as a guide to the public, as well as to MDOT MTA staff, of how MDOT MTA will improve the Metro SubwayLink system. Through understanding of the strategic paths and implications of these efforts, MDOT MTA is able to better prioritize initiatives using a data-driven approach. MDOT MTA staff can reference this document in combination with the best available data and planning practices to guide future decisions.

Many of the Metro SubwayLink initiatives discussed in this Plan are critical to maintaining assets in a state of good repair. Replacing the fleet and train control replacing ticket vending machines, phased station upgrades, and replacing the Wabash facility all work towards this end. These initiatives are scheduled to coincide with assets reaching the end of their useful lives, which will ensure the safety and reliability of the Metro SubwayLink system for years to come.

Other Metro SubwayLink initiatives are focused on enhancing the service and making the customer experience safer, more efficient or more enjoyable. Installation of variable messaging systems on the platforms, tunnel cellular service, and train automation are examples of such initiatives.

In addition to the initiatives, which have well-defined timeframes and scopes, the strategic priorities outline broader goals that may include ongoing programs, or policies. Strategic priorities and initiatives are often interrelated. For example, the “Metro Flood Mitigation and Resiliency” initiative is born out of the “Resiliency” Strategic Priority, and at the same time will incorporate the principals of the “Practical Design” Strategic Priority.

MDOT MTA strives every day to improve service to better serve the transit needs of Marylanders. This process includes monitoring the performance of Metro SubwayLink, identifying needs, evaluating alternative solutions, engaging stakeholders, implementing solutions and finally monitoring the performance of those solutions. By continuing to strengthen this feedback loop, MDOT MTA will ensure that Metro SubwayLink service is safe, efficient, reliable, and delivered with world class customer service.





# Glossary

## Acronyms

**ADA** (Americans with Disabilities Act of 1990): Civil rights legislation that prohibits discrimination and guarantees that people with disabilities have the same opportunities as everyone else to participate in the mainstream of American life.

**APTA** (American Public Transportation Association)

**BWI** (Baltimore/Washington International Thurgood Marshall Airport)

**CBD** (Central Business District): the commercial and business center of a city. Baltimore's CBD is roughly associated with the inner harbor area.

**CLRL** (Central Light Rail Line): Light RailLink's main north-south oriented track, which runs from Hunt Valley to Cromwell. There are two spurs, one to Baltimore Penn Station and one to Baltimore/Washington International Thurgood Marshall Airport.

**FTA** (Federal Transit Administration)

**LOTS** (Locally Operated Transit Systems): Transit systems operated by local jurisdictions in Maryland. These transit systems receive federal funding and technical support through MDOT MTA.

**LRV** (Light Rail Vehicle): Single vehicle unit that can be connected to other Light Rail vehicles to form a train. Light rail vehicles can be grouped in one, two or three vehicle consists, or trains.

**MARC** (Maryland Area Rail Commuter)

**MDOT** (Maryland Department of Transportation)

**MDOT MTA** (Maryland Department of Transportation: Maryland Transit Administration)

**MDOT SHA** (Maryland Department of Transportation: State Highway Administration)

**SGR** (State of Good Repair): Physical assets owned, operated and maintained by MDOT MTA are evaluated and given condition scores on a 1-5 scale. Assets with a score of at least 2.5 out of 5 are in a state of good repair.

**TOD** (Transit-Oriented Development): A place of relatively higher density that includes a mix of residential, employment, shopping, and civic uses designed to encourage multi-modal access to the station area.

**TVM** (Ticket Vending Machine): Machines used to purchase fares for use of Metro SubwayLink and other MDOT MTA operated transit modes.



# Glossary

## Relevant Terms

**CSX:** Freight railroad that operates in the Baltimore area. MDOT MTA must coordinate with CSX on certain matters.

**Headway:** The amount of time between transit trips at a given station. At a given station, if a train comes at 8:00am and the next comes at 8:15am, the headway is 15 minutes.

**Norfolk Southern:** Freight railroad that operates in the Baltimore area. MDOT MTA must coordinate with Norfolk Southern on certain matters.

**Pattern:** A variation of a transit route.

**Platform:** Paved area where Light RailLink customers board and alight (exit) trains.

**Short Turn:** A pattern that involves the transit vehicle turning around before the end of the line.

**Transit Asset:** A physical asset required to support transit service either directly or indirectly, including vehicles, stations, facilities, guideway and system assets.



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