
# Executive Summary

## Regional Long-Range Transportation Plan

Long-term planning for the transportation system is critical to ensuring that the Baltimore region grows and develops in a way that is consistent with regional goals and objectives. As conditions change, it is important to reevaluate and update long-range transportation plans. The Baltimore Regional Transportation Board (BRTB) updates a regional long-range transportation plan (LRTP) every four years, as required by federal regulations.

*Resilience 2050: Adapting to the Challenges of Tomorrow* is the latest LRTP for the Baltimore region. We deliberately selected the theme of resilience and adapting to the challenges of a changing tomorrow for this LRTP. The ability of our region to be resilient is necessary for the ongoing and effective performance of our transportation system, our environment, our economy and our livelihoods. It sets out to make the best use of the region's limited transportation resources to benefit all residents, visitors and businesses.

*Resilience 2050* includes a mix of projects that add to or enhance our region's transportation system and may receive federal funding in the years 2028-2050. These include transit, bicycle, pedestrian, roadway and interchange projects. Many of these projects expand roadway and transit capacity, while others help our transportation system to function more efficiently or seek to preserve existing transportation infrastructure. The plan also shows anticipated revenues for these projects as well as estimated project costs.



# Chapter 1: Federal Requirements and Policies

Chapter 1 focuses on the legal basis for development of the LRTP. This includes an overview of federal requirements for the planning process, fiscal requirements and civil rights laws.

Federal law requires every urbanized area in the U.S. with a population greater than 50,000 to have a metropolitan planning organization (MPO). An MPO is a regional policy making body consisting of representatives of local governments and related state transportation agencies. The purpose of an MPO is to ensure regional cooperation in transportation planning. The Baltimore Metropolitan Council provides technical staff to assist the BRTB and advisory committees.

Each MPO must develop an LRTP and a short-range Transportation Improvement Program (TIP) for its region. We select projects for the LRTP and TIP according to regional goals and policies in consultation with state agencies, transit providers and local jurisdictions. The anticipated costs of transportation projects and programs in *Resilience 2050* cannot exceed anticipated revenues. Other federal requirements covered in Chapter 1 include air quality analysis, congestion management, consultation with the public, Title VI and Environmental Justice.

## Baltimore Regional Transportation Board Members

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**Honorable Steuart Pittman**
*County Executive, Anne Arundel County*

**Honorable Brandon M. Scott**
*Mayor, City of Baltimore*

**Honorable John Olszewski, Jr.**
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**Honorable Ed Rothstein**
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**Honorable Bob Cassilly**
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**Honorable Calvin Ball**
*County Executive, Howard County – Vice Chair*

**Honorable James Moran**
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**Honorable Paul Wiedefeld**
*Secretary, Maryland Department of Transportation*

**Holly Arnold**
*Administrator, Maryland Transit Administration **

**Honorable Serena McIlwain**
*Secretary, Maryland Department of the Environment **

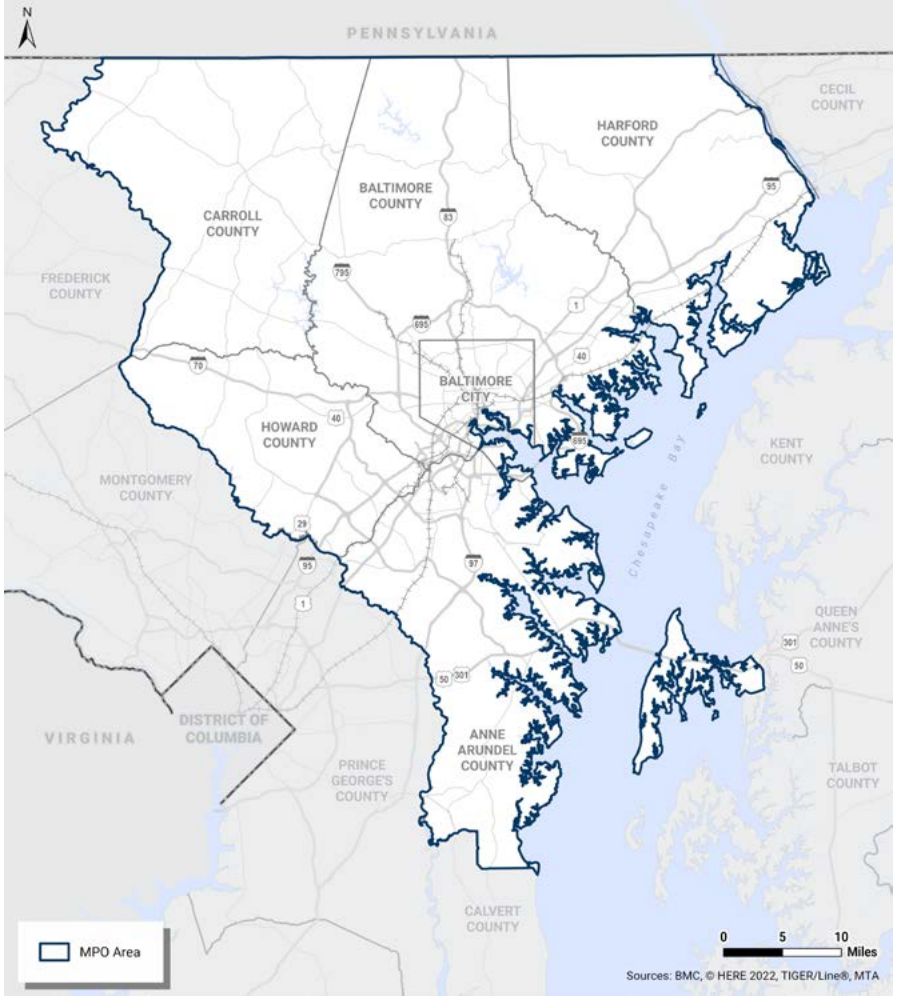
**Honorable Rebecca Flora**
*Secretary, Maryland Department of Planning **

**Jason Quan**
*Representative of Public Transportation, Regional Transportation Agency of Central Maryland*

*** Denotes non-voting members***

Members of the BRTB are listed in the box to the left. Map 1 shows the Baltimore Metropolitan Planning Area (MPA). The Baltimore MPA consists of the city of Baltimore, the counties of Anne Arundel, Baltimore, Carroll, Harford and Howard as well as a portion of Queen Anne's County.

Map 1 - Baltimore Metropolitan Planning Area



# Chapters 2 and 3: Future Factors and Trends

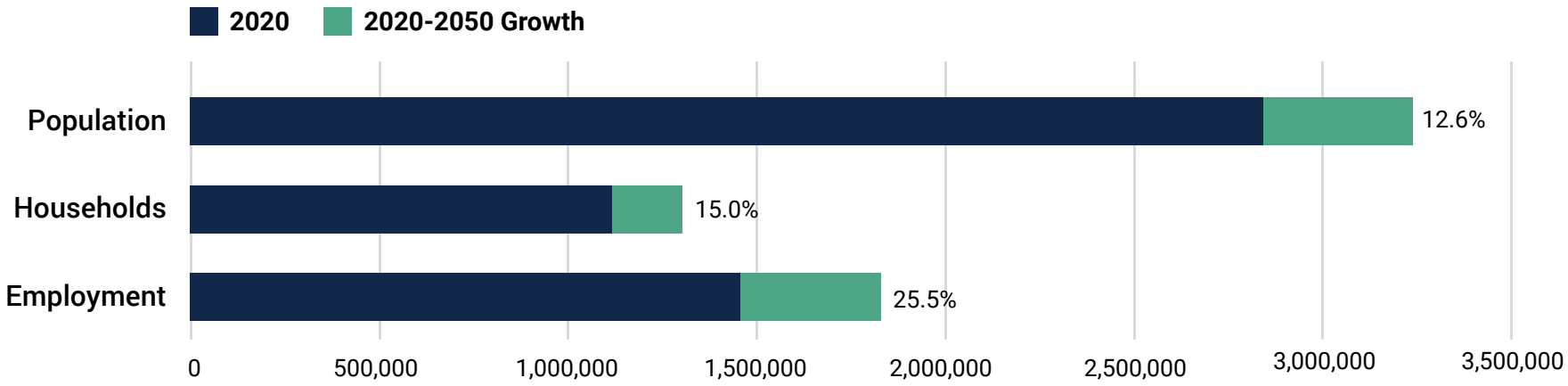
Chapters 2 and 3 provide additional context regarding how *Resilience 2050* might better prepare the region to respond to the uncertainties of the future.

How many people will call the Baltimore region home over the next 20+ years? Where will they live, work and play? How can we plan now for a transportation system that accommodates the future growth of the Baltimore region? Chapter 2 sets the stage for *Resilience 2050* by discussing planning for regional growth. It details how BRTB members work together to forecast future population, households and employment in the Baltimore region, and how these forecasts support the development of *Resilience 2050*. Figure 1 summarizes these forecasts.

Chapter 2 concludes with a discussion of the demographic trends likely to shape the future of the Baltimore region. Population growth due to natural increase (births minus deaths) is projected to decline throughout the planning period and the population is anticipated to age, mirroring national trends. The changing size and age composition of the population and shrinking size of the labor force will influence future travel patterns. For example, how can transportation adapt if the growing share of Baltimore region seniors choose to age in place? Work-from-home emerged as another trend during the COVID-19 pandemic and carries uncertain implications for travel, land use and home location choice.

Chapter 3 focuses on various factors and trends – some known, some anticipated and some unknown – that will affect the regional transportation network in the future for several transportation-related topics. These topics include:

**Figure 1- Forecast Population, Household, and Employment Growth for the Baltimore Region (2020-2050)**



- Environmental issues and challenges including greenhouse gas emissions, adapting to and mitigating measures for climate change and the health of the Chesapeake Bay,
- Creating connected, safe and equitable active transportation and transit networks that meet the daily needs of all users,
- Highway safety concerns including distracted and impaired driving, non-motorist safety and speeding,
- Supporting freight movement throughout the region and adapting freight delivery to accommodate changing technologies and consumer habits and
- Emerging and existing technologies including Mobility on Demand, micromobility, electric vehicles and connected and automated vehicles, ensuring that the implementation of these technologies supports regional goals and strategies.

We explored these and other issues related to the LRTP in a series of white papers released over the past year.

# Chapter 4: Regional Goals and Strategies

We adopted nine broad regional goals, with supporting implementation strategies. Together, these goals and strategies will help us guide transportation investments over the 2028-2050 period.

The goals are listed below. Chapter 4 provides more details on these goals, as well as the strategies adopted to help the region implement projects in support of these goals.

## Goals That Address the Basic Functions of Transportation

- **Improve Accessibility:** Identify and support multimodal options and systems that promote equity, are resilient and sustainable and enable all individuals to reach their destinations safely and seamlessly.
- **Increase Mobility:** Help people and freight to move reliably, equitably, efficiently and seamlessly.

## Goals That Address the Conditions or Effects of Transportation

- **Improve System Safety:** Reduce the number of crashes, injuries and fatalities experienced by all users of the transportation system toward meeting Zero Deaths Maryland.
- **Improve and Maintain the Existing Infrastructure:** Improve the conditions of existing transportation facilities; systematically maintain and replace transportation assets as needed.
- **Implement Environmentally Responsible Transportation Solutions:** Pass on to future generations the healthiest natural and human environment possible.
- **Improve System Security:** Provide a secure traveling environment for everyone; improve the region's ability to respond to natural and human-caused disasters.
- **Promote Prosperity and Economic Opportunity:** Support the vitality of communities and businesses, opportunities for workers and the movement of goods and services within and through the region.

## Goals That Address the Transportation Decision-Making Process

- **Foster Participation and Cooperation Among All Stakeholders:** Enable all interested and affected parties to participate and cooperate to find workable solutions.
- **Promote Informed Decision Making:** Ensure that adopted transportation policies and performance measures guide the regional decision making process.

# Chapter 5: Performance-Based Approach and System Performance Report

*Resilience 2050* includes a series of performance measures and targets consistent with the performance-based approach to planning and programming set in federal law and regulations. These will help us gauge the effectiveness of transportation investments relative to regional goals over the 2028-2050 period.

Compliant with requirements of the Infrastructure Investment and Jobs Act (IIJA), we coordinated with the

Maryland Department of Transportation (MDOT) and public transportation providers to develop and adopt a series of regional performance targets. The 25 federally required performance targets cover several broad categories related to how well the transportation system is functioning, including:

- transit asset management
- transit safety,
- highway safety,
- traffic congestion,
- on-road mobile source emissions,
- pavement and bridge condition and
- travel time reliability.

Chapter 5 summarizes each of the performance measures and targets, as well as regional progress thus far towards meeting the targets.

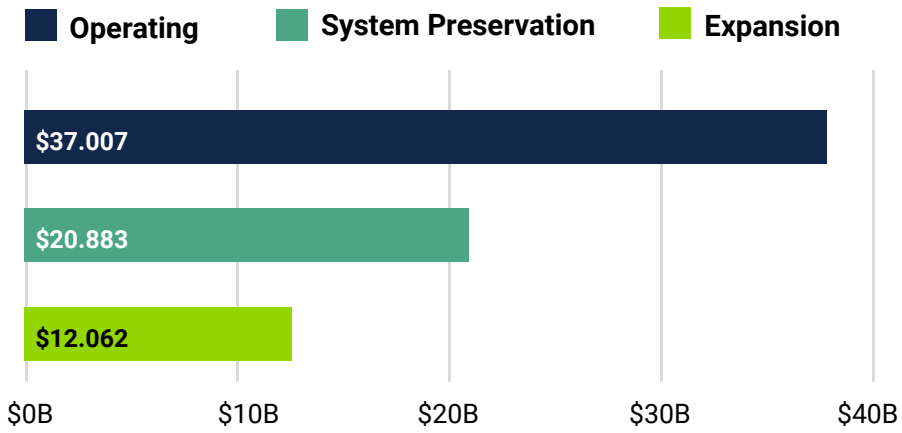
# Chapter 6: The Financial Plan

Federal law requires regional transportation plans and programs to be fiscally constrained. That is, estimated costs cannot exceed forecast revenues. The LRTP must include a financial plan showing how the region expects to pay for each project and program.

Chapter 6 includes a forecast of anticipated local, state and federal revenues associated with operating, preserving and expanding the transportation system through 2050. It also includes a summary of the project selection process for the LRTP, including project submittal, project scoring and cost estimation.

Local jurisdictions and state agencies submitted 98 candidate projects for *Resilience 2050*. Limited financial resources means that some projects will be too expensive to include in *Resilience 2050*, and the rigorous project scoring process helps guide decision-making on which projects make the cut. A project's total score consists of two parts. The policy score is based on how much of a priority the project is for the submitting agency and accounts for approximately 45 percent of the project score. The technical score is based on project consistency with regional goals such as access to key destinations, improving safety, and reducing environmental impacts. The technical score accounts for approximately 55 percent of the project score.

**Figure 2 - *Resilience 2050* State and Federal Financial Forecast by Category**




*Source: Maryland Department of Transportation*

The major capital projects in *Resilience 2050* are anticipated to use primarily state and federal funds. The financial forecast includes a total of $69.952 billion in state and federal revenues anticipated to be available for operating, system preservation and expansion in the Baltimore region from 2028-2050.

Figure 2 shows the state and federal financial forecast by category in the Baltimore region.

Most candidate projects are expansion projects that compete for the $12.062 billion in state and federal expansion funds anticipated to be available from 2028-2050. Table 1 shows a breakdown of forecast revenues versus total estimated Year of Expenditure (YOE) costs for expansion projects in *Resilience 2050*. Included in this breakdown are set-aside funds for small programs intended to improve air quality and for Locally Operated Transit Systems (LOTS). See Chapter 7 for further details on these programs. This breakdown demonstrates that the region expects to have sufficient funds to pay for expansion projects in *Resilience 2050* in the time periods in which we expect these projects to be implemented.

*Resilience 2050* also includes 13 large-scale system preservation projects along with an estimated breakdown of future system preservation expenditures by category provided by the MDOT Maryland Transit Administration (MTA) and MDOT State Highway Administration (SHA). The financial forecast for *Resilience 2050* includes estimated revenues of $20.883 billion in state and federal system preservation funds available from 2028-2050. Table 2 shows a breakdown of estimated YOE system preservation costs versus forecast revenues by project type, including YOE costs for the 13 system preservation projects included in *Resilience 2050.*

### Table 1 - Fiscal Constraint for Expansion Projects

| | Category | 2028-2039 | 2040-2050 | 2028-2050 |
|---|---|---|---|---|
| **Estimated Expansion YOE Costs** | Projects | $3,607,000,000 | $8,084,000,000 | $11,691,000,000 |
| | Small Program Set-Asides | $45,000,000 | $205,000,000 | $250,000,000 |
| | LOTS | $30,000,000 | | $30,000,000 |
| | **Total** | **$3,682,000,000** | **$8,289,000,000** | **$11,971,000,000** |
| **Forecast Expansion Revenues** | | **$3,706,000,000** | **$8,356,000,000** | **$12,062,000,000** |

The financial forecast for *Resilience 2050* includes estimated revenues of $20.883 billion in state and federal system preservation funds available from 2028-2050. Below is a breakdown of estimated YOE system preservation costs versus forecast revenues by project type.

**Table 2 - Fiscal Constraint for System Preservation Projects**

| | | 2028-2039 | 2040-2050 | 2028-2050 |
|---|---|---|---|---|
| **Roadway Estimated System Preservation YOE Costs** | Transportation Alternatives | $127,000,000 | $155,000,000 | $282,000,000 |
| | Environmental | $453,000,000 | $552,000,000 | $1,005,000,000 |
| | Congestion Management | $457,000,000 | $557,000,000 | $1,014,000,000 |
| | Bridge Replacement and Rehabilitation | $1,525,000,000 | $1,444,000,000 | $2,969,000,000 |
| | Resurfacing and Rehabilitation | $1,758,000,000 | $2,139,000,000 | $3,897,000,000 |
| | Safety and Spot | $1,043,000,000 | $1,270,000,000 | $2,313,000,000 |
| | Urban Reconstruction | $429,000,000 | $72,000,000 | $501,000,000 |
| | **Roadway Subtotal** | **$5,792,000,000** | **$6,189,000,000** | **$11,981,000,000** |
| **Transit Estimated System Preservation YOE Costs** | Guideway | $296,000,000 | $541,000,000 | $837,000,000 |
| | Facilities | $464,000,000 | $102,000,000 | $566,000,000 |
| | Systems | $291,000,000 | $501,000,000 | $792,000,000 |
| | Stations | $515,000,000 | $833,000,000 | $1,348,000,000 |
| | Vehicles | $1,804,000,000 | $3,555,000,000 | $5,359,000,000 |
| | **Transit Subtotal** | **$3,370,000,000** | **$5,532,000,000** | **$8,902,000,000** |
| **Total Estimated System Preservation YOE Costs** | | **$9,162,000,000** | **$11,721,000,000** | **$20,883,000,000** |
| **Forecast System Preservation Revenues** | | **$9,162,000,000** | **$11,721,000,000** | **$20,883,000,000** |

# Chapter 7: *Resilience 2050* Major Capital Projects

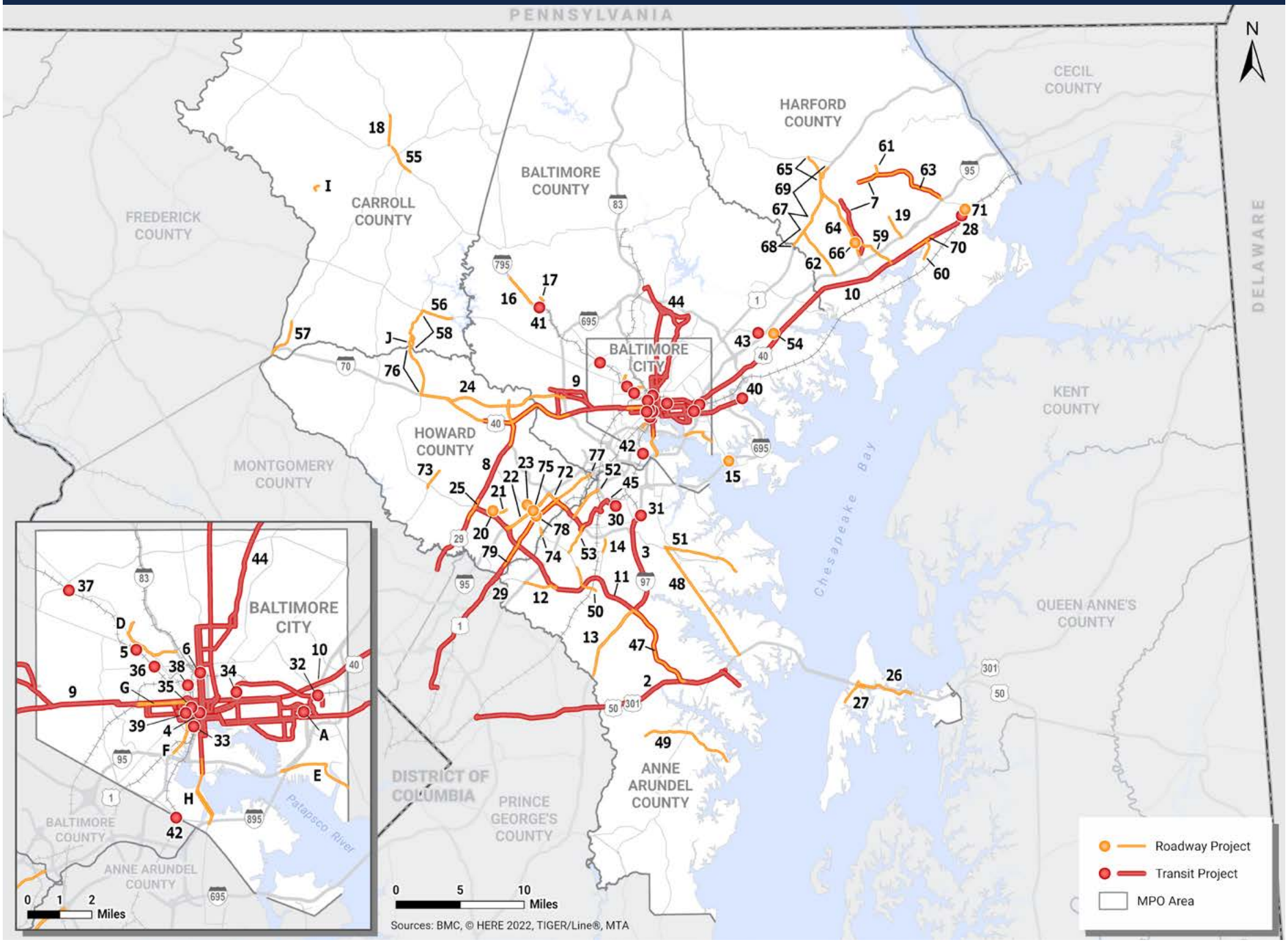
Working with local jurisdictions and state agencies, we developed a preferred alternative for the Baltimore region. This preferred alternative consists of funding allocated for operating, system preservation and expansion. Most of the 92 major capital projects in *Resilience 2050* are expansion projects that expand transit or roadway capacity, while others help our transportation system to function more efficiently or preserve existing transportation infrastructure. Projects were selected by applying the adopted evaluation and scoring criteria, consistent with federal laws and policies and the region's adopted transportation goals.


Most *Resilience 2050* projects have only generally defined scopes. Similarly, funds to cover the design, right-of-way and construction phases of these projects have, for the most part, not yet been committed. Such funds would come from forecast revenues the region expects to be available throughout the life of the plan. Project sponsors may or may not be able to commit these anticipated funds to specific projects during the life of the plan. Rather, the projects included in the preferred alternative represent our best judgment about what is desirable and what meets the federal requirement for fiscal constraint, all the while considering existing conditions and future expectations.

## *Resilience 2050* Major Capital Projects: 2028-2050

Map 2 on the next page shows the locations of major capital projects in *Resilience 2050*. Tables 3 through 9 show major capital expansion and system preservation projects in the timeframes within which they might be implemented along with YOE cost estimates. Chapter 7 provides additional details on these projects.

## Map 2 - Locations of Major Capital Expansion and System Preservation Projects: 2028-2050
## (See corresponding project numbers and letters in Tables 3-9)




*Projects marked with an asterisk in the following tables are not location specific and do not appear in this map

## Table 3 - Transit Expansion Projects: 2028-2039

| ID | Operating Agency (Jurisdiction) | Name | Limits (Length) | Description | Estimated Cost (YOE) |
|---|---|---|---|---|---|
| 1* | Anne Arundel | Anne Arundel Countywide Microtransit | Countywide | Expand microtransit service in Anne Arundel County from 1 zone in the south to 7 zones. | $3,000,000 |
| 2 | TBD (Anne Arundel) | Annapolis to New Carrollton Transit | New Carrollton to Parole (21.0 miles) | New Express Bus service between Parole and New Carrollton with stops at major communities along the way. | $3,000,000 |
| 3 | TBD (Anne Arundel) | Glen Burnie to Annapolis Transit | Cromwell / Glen Burnie to Annapolis / Parole (16.0 miles) | New Express Bus service between Annapolis / Parole and Glen Burnie along I-97. | $7,000,000 |
| • 4<br>• 5<br>• 6 | MDOT MTA<br><br>(3 Locations in Baltimore City) | MDOT MTA Transit Hubs:<br>• Charles Center<br>• Mondawmin<br>• Penn Station | Jurisdiction:<br><br>• Baltimore City<br>• Baltimore City<br>• Baltimore City | MDOT MTA has identified transit hub locations as part of the Regional Transit Plan. Typically, a transit hub includes enhanced amenities (shelters, benches, information). | • $14,000,000<br>• $7,000,000<br>• $19,000,000 |
| 7 | MDOT SHA (Harford) | Transit Signal Priority | MD 22 corridor from MD 543 to Long Drive / Technology Drive (7.4 miles)<br><br>MD 924 corridor from MacPhail Road to Woodsdale Road (4.7 miles) | Construct queue jump lanes along MD 22 and MD 924 and install equipment on buses that syncs with traffic signals along these corridors. | $2,000,000 |
| 8 | TBD (Howard) | US 29 Bus Rapid Transit | US 40 to MD 198 (16.0 miles) | Connect Ellicott City to Columbia, Maple Lawn and Burtonsville at MD 198 in Montgomery County, including separated facilities on US 29 to integrate with Montgomery County improvements and the development of a transit center in Downtown Columbia. | $20,000,000 |
| 9 | MDOT MTA (Regional) | East-West Transit Corridor *(Project now known as the Red Line)* | Ellicott City to Essex (17.0 miles) | New east-west transit service to connect major Baltimore region destinations like West Baltimore, Downtown, East Baltimore and the western suburbs as identified in the RTP. | $1,829,000,000 |
| 10 | MDOT MTA (Regional) | MDOT MTA Commuter Service | Harford County to Downtown Baltimore and Harbor East | Additional MDOT MTA commuter bus service from Harford County to Downtown Baltimore and Harbor East. | $2,000,000 |
| 11 | TBD (Regional) | Annapolis to Fort Meade to Columbia Transit | Annapolis / Parole to Fort Meade to Columbia (25.0 miles) | New Express Bus service between Parole and Columbia with primary service to Fort Meade and stops at major communities along the way. | $45,000,000 |

**Project does not appear in map*

## Table 4 - Roadway Expansion Projects: 2028-2039

| ID | Operating Agency (Jurisdiction) | Name | Limits (Length) | Description | Estimated Cost (YOE) |
|---|---|---|---|---|---|
| 12 | MDOT SHA (Anne Arundel) | MD 198 | MD 295 to MD 32 (2.7 miles) | Widen from 2 to 4 lanes and construct a continuous center median. Widen ramp at MD 295. Provide bicycle and pedestrian facilities within project limits. | $275,000,000 |
| 13 | MDOT SHA (Anne Arundel) | MD 3 | MD 450 to MD 32 (6.2 miles) | Targeted widening from 4 to 5 lanes, including intersection improvements, access controls to address safety, TSMO strategies to address congestion and bicycle and pedestrian improvements. | $95,000,000 |
| 14 | MDOT SHA (Anne Arundel) | MD 170 | Norcross Lane to Wieker Road (0.8 miles) | Widen from 2 to 4 lanes, resurface and restripe along MD 170 and along MD 174 to create new turn lanes and increased capacity at the MD 170 / MD 174 intersection, including sidewalks and bicycle compatible shoulders. | $23,000,000 |
| 15 | MDOT (Baltimore County) | I-695 at Broening Highway Interchange | | Construct a partial interchange at Exit 44 of I-695 to support redevelopment at Sparrows Point. | $147,000,000 |
| 16 | MDOT SHA (Baltimore County) | I-795 | Owings Mills Boulevard to Franklin Boulevard (2.6 miles) | Widen from 4 to 6 lanes and construct a full interchange at Dolfield Boulevard, including TSMO strategies. | $155,000,000 |
| 17 | MDOT SHA (Baltimore County) | MD 140 | Painters Mill Road to Owings Mills Boulevard (0.4 miles) | Widen from 4 to 6 lanes, including a raised median, bicycle accommodations and pedestrian facilities. | $33,000,000 |
| 18 | MDOT SHA (Carroll) | MD 97 | Bachmans Valley Road to MD 140 in Westminster (2.4 miles) | Widen from 3 to 5 lanes, with a full interchange at Meadow Branch Road and bicycle and pedestrian facilities. | $202,000,000 |
| 19 | MDOT SHA (Harford) | MD 543 | MD 136 to I-95 (1.9 miles) | Widen from 2 to 4 lanes, including intersection upgrades at MD 136, turn lanes, capacity upgrades to the MD 543 / I-95 interchange and bicycle and pedestrian access. | $140,000,000 |
| 20 | Howard | Broken Land Parkway at Snowden River Parkway | Broken Land Parkway from south of MD 32 to north of Snowden River Parkway; Snowden River Parkway from east of Minstrel Way to Patuxent Woods Drive (0.25 miles) | Capacity, operational and safety improvements at this signalized intersection as well as access improvements to the MD 32 / Broken Land Parkway interchange ramps. | $63,000,000 |

| ID | Operating Agency (Jurisdiction) | Name | Limits (Length) | Description | Estimated Cost (YOE) |
|---|---|---|---|---|---|
| 21 | Howard | Snowden River Parkway Widening | Broken Land Parkway to Oakland Mills Road (1.1 miles) | Widen from 4 to 6 lanes, including auxiliary lanes and pedestrian, bicycle and transit improvements on both sides of the road. | $21,000,000 |
| 22 | MDOT SHA (Howard) | I-95 | MD 32 to MD 100 (6.0 miles) | Create peak hour part-time shoulder use lanes. | $45,000,000 |
| 23 | MDOT SHA (Howard) | MD 175 / MD 108 Interchange | 0.25 miles in all directions from the current intersection and a direct connection of MD 108 to Columbia Gateway Drive (0.25 miles) | This T-intersection experiences significant congestion and a collision rate higher than almost all intersections in Howard County. A partial grade-separation with direct access into Columbia Gateway will improve intersection capacity and alleviate the high collision rate. | $102,000,000 |
| 24 | MDOT SHA (Howard) | TSMO System 1 | I-70 from I-695 to MD 32 (11.0 miles)<br><br>US 29 from MD 99 to MD 100 (4.0 miles)<br><br>US 40 from I-695 to I-70 (10.0 miles) | Implement a combination of information technology and geometric improvements to address safety and operations within TSMO System 1. | $48,000,000 |
| 25 | MDOT SHA (Howard) | US 29 | Patuxent River Bridge to Seneca Drive (1.7 miles) | Widen northbound US 29 from 2 to 3 lanes, including improvements at intersection with Rivers Edge Road. | $103,000,000 |
| 26 | MDOT SHA (Queen Anne's) | MD 18 | Kent Narrows to Bay Bridge – MD 18 and MD 835 on east side of Kent Narrows to MD 18 (5.0 miles) | Widen from 2 to 4 lanes, including utility relocation, new pedestrian improvements and reconstruction of intersections to improve capacity, safety and mobility on the only alternate route to US 50/301 on the island. | $114,000,000 |
| 27 | MDOT SHA (Queen Anne's) | MD 8 / US 50/301 Interchange and Service Roads | Skip Jack Parkway south to Davidson Drive; east to Thompson Creek service road (2.0 miles) | Widen from 2 to 4 lanes, convert MD 8 overpass to full divergent diamond interchange with US 50/301, and add Thompson Creek and Cox Creek service roads to improve traffic flow, add capacity and allow for alternate routes to services and residential areas. Provide for bike and pedestrian improvements along existing and new routes. | $90,000,000 |

## Table 5 - Transit Expansion Projects: 2040-2050

| ID | Operating Agency (Jurisdiction) | Name | Limits (Length) | Description | Estimated Cost (YOE) |
|---|---|---|---|---|---|
| 28 | TBD (Harford) | Aberdeen MARC Station | US 40 at MD 132 (Bel Air Avenue) | TOD, new train station, additional parking, US 40 "Green Boulevard" and remove pedestrian overpass and replace with a new pedestrian underpass and green, terraced plaza / amphitheater. | $126,000,000 |
| 29 | TBD (Howard) | US 1 Corridor Bus Rapid Transit | Dorsey MARC Station to College Park Purple Line Station (19.5 miles) | Emulate light rail operation at a lower cost. Link Howard County commuters from the Dorsey MARC to the Laurel MARC Station and the City of Laurel as well as to College Park and the Purple Line Light Rail. | $281,000,000 |
| • 30<br>• 31<br>• 32<br>• 33<br>• 34<br>• 35<br>• 36<br>• 37<br>• 38<br>• 39<br>• 40<br>• 41<br>• 42<br>• 43 | MDOT MTA<br><br>14 Locations throughout the region | MDOT MTA Transit Hubs:<br>• BWI Airport<br>• Glen Burnie<br>• Bayview Medical Center<br>• Camden Station<br>• Johns Hopkins Hospital<br>• Lexington Market<br>• Penn-North<br>• Rogers Avenue<br>• State / Cultural Center<br>• UM Medical Center<br>• Essex<br>• Owings Mills<br>• Patapsco<br>• White Marsh | Jurisdiction:<br>• Anne Arundel<br>• Anne Arundel<br>• Baltimore City<br>• Baltimore City<br>• Baltimore City<br>• Baltimore City<br>• Baltimore City<br>• Baltimore City<br>• Baltimore City<br>• Baltimore City<br>• Baltimore County<br>• Baltimore County<br>• Baltimore County<br>• Baltimore County | MDOT MTA has identified transit hub locations as part of the Regional Transit Plan. Typically, a transit hub includes enhanced amenities (shelters, benches, information). | • $9,000,000<br>• $9,000,000<br>• $9,000,000<br>• $9,000,000<br>• $9,000,000<br>• $9,000,000<br>• $9,000,000<br>• $9,000,000<br>• $9,000,000<br>• $9,000,000<br>• $9,000,000<br>• $9,000,000<br>• $9,000,000<br>• $9,000,000 |
| 44 | MDOT MTA (Regional) | North-South Transit Corridor | Towson to Downtown Baltimore (14.0 miles) | New North-South transit service to connect Towson to Downtown Baltimore (potentially Lutherville to Port Covington), with associated investments to improve the speed and reliability of transit service in this busy corridor. | $2,025,000,000 |

| ID | Operating Agency (Jurisdiction) | Name | Limits (Length) | Description | Estimated Cost (YOE) |
|---|---|---|---|---|---|
| 45 | TBD (Regional) | Bus Rapid Transit to BWI | Dorsey MARC Station to BWI Light Rail Station (9.7 miles) | New Bus Rapid Transit service from the Dorsey MARC station to Arundel Mills to BWI consolidated rental car facility to the BWI light rail station. | $240,000,000 |
| 46* | TBD (Regional) | Chesapeake Bay Ferry Service | | Establish a passenger ferry between numerous ports along the Chesapeake Bay. | $59,000,000 |

**Project does not appear in map*

## Table 6 - Roadway Expansion Projects: 2040-2050

| ID | Operating Agency (Jurisdiction) | Name | Limits (Length) | Description | Estimated Cost (YOE) |
|---|---|---|---|---|---|
| 47 | MDOT SHA (Anne Arundel) | I-97 | MD 32 to US 50/301 (6.5 miles) | Widen from 4 to 6 lanes, adding managed lanes (HOV lanes) to address capacity needs. Investigate need for additional interchange access in Crownsville. | $450,000,000 |
| 48 | MDOT SHA (Anne Arundel) | MD 2 | US 50 to MD 100 (10.0 miles) | Widen existing 4-lane sections to 6 lanes to create a continuous typical section throughout corridor, including intersection improvements and pedestrian facilities throughout to connect MD 2 to the B&A Trail at various locations. | $205,000,000 |
| 49 | MDOT SHA (Anne Arundel) | MD 214 | MD 424 to Shoreham Beach Road (7.5 miles) | Widen from 2 to 4 lanes east of MD 2, bicycle improvements throughout most of the corridor and pedestrian improvements in segments. Traffic signal warrant assessments recommended at MD 214 / Riva Road and MD 214 / Stepneys Lane intersections. | $236,000,000 |
| 50 | MDOT SHA (Anne Arundel) | MD 175 | Reece Road to MD 170 (2.7 miles) | Widen from 4 to 6 lanes, including improvements at the MD 32 interchange and bicycle and pedestrian facilities. | $277,000,000 |
| 51 | MDOT SHA (Anne Arundel) | MD 177 | MD 2 to Lake Shore Drive (6.1 miles) | Widen from 2 to 4 lanes, including intersection improvements and improved bicycle and pedestrian infrastructure. | $223,000,000 |
| 52 | MDOT SHA (Anne Arundel) | MD 295 | MD 100 to I-195 (3.3 miles) | Widen from 4 to 6 lanes, including a new full interchange at Hanover Road and an extension of Hanover Road from the CSX railroad tracks to MD 170. | $393,000,000 |

| ID | Operating Agency (Jurisdiction) | Name | Limits (Length) | Description | Estimated Cost (YOE) |
|---|---|---|---|---|---|
| 53 | MDOT SHA (Anne Arundel) | MD 713 | MD 175 to MD 176 (2.6 miles) | Construct corridorwide improvements including reconstruction and widening, intersection improvements and bicycle and pedestrian accommodations. Primary widening is from 2 to 4 lanes between MD 175 and Stoney Run Drive. | $68,000,000 |
| 54 | MDOT SHA (Baltimore County) | MD 7 at MD 43 Interchange | | Upgrade interchange from partial to full, including two new ramps to accommodate full movements at interchange. | $82,000,000 |
| 55 | MDOT SHA (Carroll) | MD 140 | Market Street to Sullivan Road (2.5 miles) | Widen from 6 to 8 lanes, with a full interchange at MD 97, continuous flow intersections at Center Street and Englar Road, and bicycle and pedestrian facilities. | $474,000,000 |
| 56 | MDOT SHA (Carroll) | MD 26 | MD 32 to the Liberty Reservoir (2.5 miles) | Widen from 4 to 6 lanes, including a raised median, intersection improvements and pedestrian facilities. | $120,000,000 |
| 57 | MDOT SHA (Carroll) | MD 27 Corridor Improvements | Carroll County Line to Leishear Road (3.2 miles) | Widen to a consistent four lanes, including dedicated turn lanes, signalized traffic control, boulevard separation of lanes and controlled intersections to allow pedestrian crossings. | $78,000,000 |
| 58 | MDOT SHA (Carroll) | MD 32 | Howard County Line to MD 26 (3.4 miles) | Widen from 2 to 4 lanes with pedestrian and bicycle facilities. | $66,000,000 |
| 59 | Harford | Abingdon Road | MD 924 to US 40 (3.0 miles) | Capacity improvements including turn lanes, bicycle lanes and sidewalks. | $87,000,000 |
| 60 | Harford | Perryman Access - Mitchell Lane | US 40 in the vicinity of Mitchell Lane to Canning House Road (2.0 miles) | Construct a new 2-lane road and bridge over Cranberry Run in Perryman, including turn lanes and bicycle and pedestrian access. | $62,000,000 |
| 61 | Harford | Thomas Run Road | MD 22 to West Medical Hall Road (0.8 miles) | Streetscape and capacity improvements, including center turn lane, sidewalks, bicycle accessibility, pedestrian-scale lighting with banners, crosswalks and street furniture. | $21,000,000 |
| 62 | MDOT SHA (Harford) | MD 152 | US 1 to I-95 (4.3 miles) | Capacity improvements including turn lanes and bicycle and pedestrian access where applicable. | $103,000,000 |

| ID | Operating Agency (Jurisdiction) | Name | Limits (Length) | Description | Estimated Cost (YOE) |
|---|---|---|---|---|---|
| 63 | MDOT SHA (Harford) | MD 22 | MD 543 to I-95 (7.9 miles) | Widen existing 2 and 3 lane sections to 4 and 5 lanes, including an HOV lane from Old Post Road to the Aberdeen Proving Ground (APG) gate, bicycle and pedestrian access and transit queue jump lanes and transit priority system where applicable. | $221,000,000 |
| 64 | MDOT SHA (Harford) | MD 24 | US 1 Bypass to south of Singer Road (5.0 miles) | Widen from 4 to 6 lanes, including sidewalks and bicycle accommodations where appropriate. | $128,000,000 |
| 65 | MDOT SHA (Harford) | MD 24 (Rock Spring Road) | US 1 Bypass to MD 23 (1.8 miles) | Widen from 2 to 4 lanes, including turn lanes and completion of shared use path adjacent to the roadway from Forest Valley Road to Red Pump Road. | $44,000,000 |
| 66 | MDOT SHA (Harford) | MD 24 at Singer Road Interchange | | Elevate grade of cross street through movement as well as left turn movements from all directions while allowing MD 24 through and right turn movements as well as side street right turn movements to operate with free-flowing movements. | $182,000,000 |
| 67 | MDOT SHA (Harford) | US 1 | MD 152 to MD 147 / US 1 Business (1.3 miles) | Widen from 4 to 6 lanes, including bicycle and pedestrian accommodations. | $212,000,000 |
| 68 | MDOT SHA (Harford) | US 1 | Baltimore County Line to MD 152 (1.4 miles) | Widen from 4 to 6 lanes, including turn lanes and bicycle and pedestrian access where applicable. | $35,000,000 |
| 69 | MDOT SHA (Harford) | US 1 Bypass | MD 147 / US 1 Business to Hickory Bypass (4.6 miles) | Widen from 2 to 4 lanes and improve US 1 / MD 24 and US 1 / MD 924 interchanges. | $354,000,000 |
| 70 | MDOT SHA (Harford) | US 40 | MD 543 to Loflin Road (1.7 miles) | Widen from 4 to 6 lanes, including turn lanes, a partial interchange reconstruction at MD 543 and bicycle and pedestrian access. | $93,000,000 |
| 71 | MDOT SHA (Harford) | US 40 at MD 22 Interchange | | Improve capacity, reconfigure existing interchange, restrict all left turn movements (allowing room for designated bike lanes) and relocate the existing signal from MD 22 to US 40. | $48,000,000 |

| ID | Operating Agency (Jurisdiction) | Name | Limits (Length) | Description | Estimated Cost (YOE) |
|---|---|---|---|---|---|
| 72 | MDOT SHA (Howard) | MD 100 Widening | I-95 to Anne Arundel County Line (2.0 miles) | Widen from 4 to 6 lanes with additional merge/ diverge lanes. | $47,000,000 |
| 73 | MDOT SHA (Howard) | MD 108 | Trotter Road to Guilford Road (1.7 miles) | Selected road capacity enhancements, improve sidewalks, add shared use paths and upgrade traffic signals. | $64,000,000 |
| 74 | MDOT SHA (Howard) | MD 175 | Oceano Avenue to Anne Arundel County Line (0.5 miles) | Widen from 2 to 4 lanes, including bicycle, transit and pedestrian improvements consistent with Anne Arundel County widening proposals. | $24,000,000 |
| 75 | MDOT SHA (Howard) | MD 175 at I-95 Interchange | 1.0 miles | Improve existing full interchange consistent with preferred options in the MDOT SHA MD 175 Improvement Study. | $196,000,000 |
| 76 | MDOT SHA (Howard) | MD 32 | North of I-70 to Carroll County Line (4.0 miles) | Widen from 2 to 4 lanes to provide safety, capacity, operational and access improvements on MD 32. | $79,000,000 |
| 77 | MDOT SHA (Howard) | US 1 | Baltimore County Line to MD 175 (5.5 miles) | Widen from 4 to 6 lanes and construct the revised typical section in the State / County MOU, including connecting community destinations to support safety and access as per the US 1 safety evaluation, functional plans and the regional active transportation priority project. | $205,000,000 |
| 78 | MDOT SHA (Howard) | US 1 at MD 175 Interchange | 0.5 miles | Construct a new grade-separated Single Point Urban Interchange, with MD 175 passing over US 1. | $184,000,000 |
| 79 | MDOT SHA (Howard) | US 1 Revitalization Breakout Projects | MD 175 to Whiskey Bottom Road (4.5 miles) | Widen from 4 to 6 lanes along with bicycle, pedestrian, transit, streetscape and access improvements consistent with the US 1 Design Manual. | $166,000,000 |

## Table 7 - Transit System Preservation Projects: 2028-2039

| ID | Operating Agency (Jurisdiction) | Name | Limits (Length) | Description | Estimated Cost (YOE) |
|---|---|---|---|---|---|
| A | MDOT MTA (Baltimore City) | Eastern Bus Division | | Reconstruct the Eastern Bus Division as an electric bus facility. | $464,000,000 |
| B* | MDOT MTA (Regional) | Zero-Emission Bus Transition Phase 1 | MDOT MTA's core service area in the Baltimore region | Transition 50% of MDOT MTA's 760-bus fleet to zero-emission by 2030. Includes procurement of over 350 Battery Electric Buses by 2030, training the transit workforce and retrofitting Kirk and Northwest bus divisions with charging infrastructure. | $1,594,000,000 |
| C* | MDOT MTA (Regional) | Light Rail Fleet Mid-life Overhaul | Hunt Valley to BWI/Glen Burnie | Overhaul the entire Light Rail fleet, extending the fleet's life by approximately 15 years. | $210,000,000 |

**Projects do not appear in map*

## Table 8 - Roadway System Preservation Projects: 2028-2039

| ID | Operating Agency (Jurisdiction) | Name | Limits (Length) | Description | Estimated Cost (YOE) |
|---|---|---|---|---|---|
| D | Baltimore City | Druid Park Lake Drive Complete Streets | Greenspring Avenue in the northeast to I-83 in the southeast along Druid Hill Park (2.2 miles) | Redesign Druid Park Lake Drive to implement guidelines and recommendations in the City's Complete Streets Manual. Reduce automobile traffic by removing travel lanes and adding or improving infrastructure and accessible connections for pedestrians, persons with disabilities, bicyclists, transit users and e-scooters. | $43,000,000 |
| E | Baltimore City | Keith Avenue / Broening Highway Improvements | Clinton Street to the Baltimore City Line Southeast of Ralls Avenue (2.5 miles) | Keith Avenue and Broening Highway are part of Baltimore City's critical freight route network, connecting I-95 and the Seagirt and Dundalk Terminal Port facilities. Upgrade roadway conditions, improve wayfinding and integrate Complete Streets amenities to better accommodate safety for transit, pedestrians and bicyclists. | $84,000,000 |

| ID | Operating Agency (Jurisdiction) | Name | Limits (Length) | Description | Estimated Cost (YOE) |
|---|---|---|---|---|---|
| F | Baltimore City | Russell Street Complete Streets Improvements | Annapolis Road to South Greene & South Paca Streets (1.0 miles) | Improve asset conditions and multimodal Complete Streets infrastructure for automobile traffic and pedestrian, transit and freight movement. Support safe mobility and economic development in the city's growing southern edge and Camden Yards. | $54,000,000 |
| G | Baltimore City | US 40 Highway Deconstruction | Smallwood Street to Greene Street (1.5 miles) | US 40 is a depressed expressway in West Baltimore. Building this fragment of an expressway has caused irreparable damage to community cohesion and economic stability. Deconstructing the highway will offer over 60 acres for redevelopment and improvements to adjacent streets. | $157,000,000 |
| H | Baltimore City | Vietnam Veterans Memorial Bridge and Hanover / Potee Street Corridor Improvements | Patapsco Avenue to Wells Street (2.2 miles) | Rehabilitate or replace the Vietnam Veterans Memorial Bridge and improve Complete Streets infrastructure along the Hanover / Potee Streets (MD 2) corridor in south Baltimore. Improve accommodations for pedestrians, bicycles, transit, freight and auto traffic to support safe mobility and economic development. | $339,000,000 |
| I | MDOT SHA (Carroll) | MD 31 Corridor Improvements | MD 31 from Church Street to High Street and High Street from Main Street to Coe Drive (0.7 miles) | Improve sidewalks, enhance bicycle and pedestrian accessibility and improve the roadway. | $16,000,000 |
| J | MDOT SHA (Carroll) | MD 851 Urban Reconstruction | Cooper Drive to South Branch of the Patapsco River (1.0 miles) | Roadway reconstruction and improvements to pedestrian and bicycle facilities, as well as streetscape amenities. | $16,000,000 |

### Table 9 - Transit System Preservation Projects: 2040-2050

| ID | Operating Agency (Jurisdiction) | Name | Limits (Length) | Description | Estimated Cost (YOE) |
|---|---|---|---|---|---|
| K* | MDOT MTA (Regional) | Fleet Replacement with Low-Floor Light Rail Vehicles | | Transition to low-floor Light Rail Vehicles when replacement is needed. This will require significant station retrofits, modifying maintenance facilities and amending standard operating practices. | $757,000,000 |
| L* | MDOT MTA (Regional) | Zero-Emission Bus Transition Phase 2 | MDOT MTA's core service area in the Baltimore region | Transition to a 95% zero-emission fleet by 2045. Capital costs for phase 2 are rough estimates and include retrofitting for Washington Boulevard, a 5th Division and Battery Electric Buses. | $2,228,000,000 |
| M* | MDOT MTA (Regional) | MARC Rolling Stock Overhauls and Replacements | Penn, Camden and Brunswick MARC Lines | Short-term, medium-term and long-term plans to replace and overhaul MARC locomotives and train sets. | $570,000,000** |

**Projects do not appear in map*
***Project benefits multiple MPO regions. Cost listed is 50% of total project cost of $1.14 billion.*

## Other Project Categories

Chapter 7 also includes details on other categories of programs and projects, including:

- **Set-aside Funds:** We set aside $250 million in anticipated expansion revenues for programs and initiatives that will improve air quality in the Baltimore region as well as $30 million for Locally Operated Transit Systems. These funds are part of the financially constrained LRTP.
- **Maryland Transportation Authority (MDTA) and Federal Railroad Administration (FRA) Projects:** The fiscally constrained LRTP includes projects that are anticipated to use funds from the Federal Highway Administration (FHWA) or the Federal Transit Administration (FTA). However, *Resilience 2050* must also account for projects funded by other sources that affect air quality and travel demand, funded by agencies such as MDTA (toll revenues) and the FRA.
- **Committed Funding:** *Resilience 2050* covers the timeframe from 2028-2050. To present a complete picture of planned future transportation investments, Chapter 7 lists the major committed projects within the 2024-2027 period of the current adopted TIP.
- **Illustrative Projects:** This list of projects could be included in the LRTP in the future if additional funds beyond those included in the financial plan were to become available.

# Appendices

## Appendix A: Glossary

This appendix provides definitions and examples of concepts and terms related to the transportation planning process.

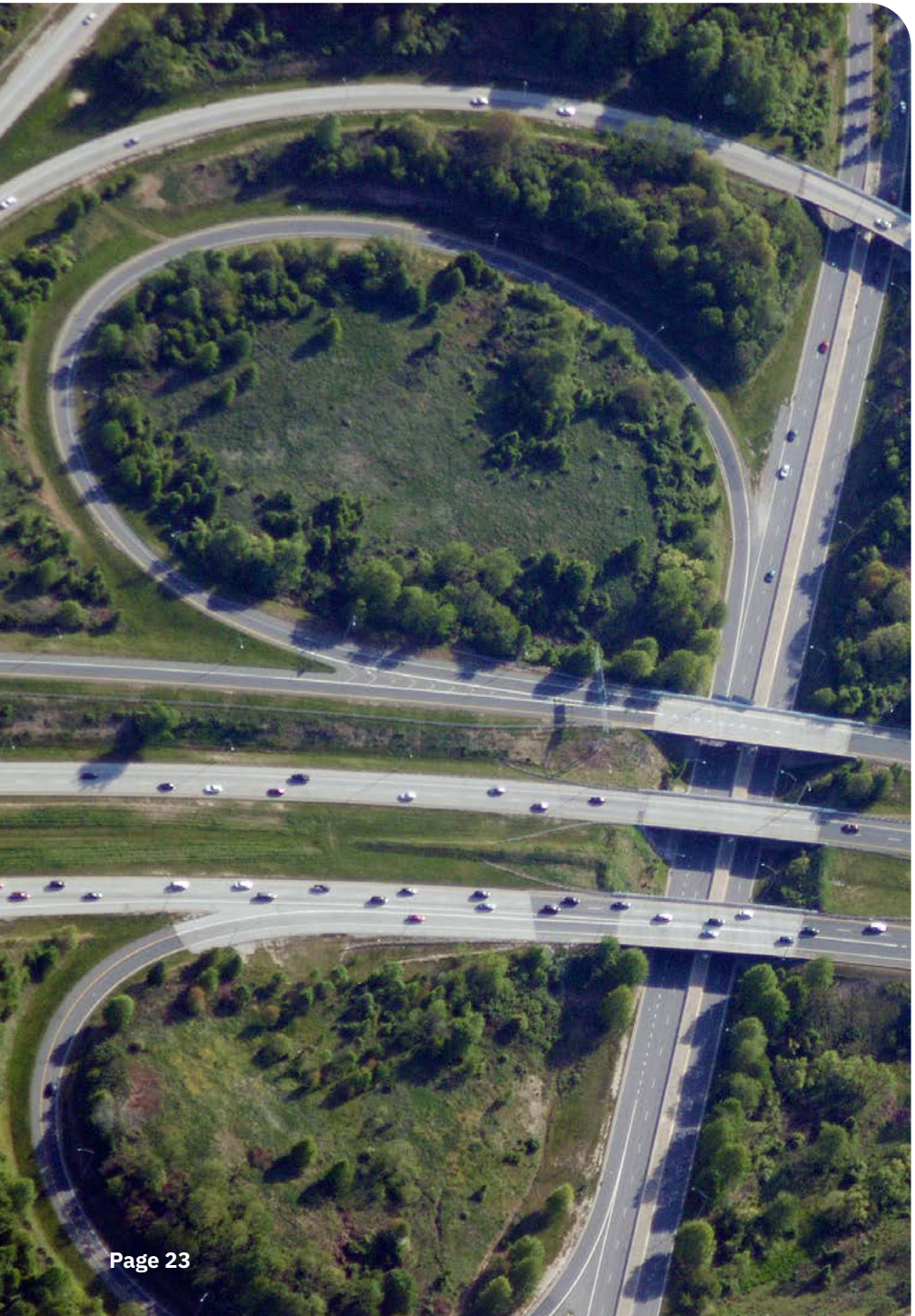
## Appendix B: Cost Estimation, Project Evaluation and Scoring

There are always more projects submitted than the region can afford to include in the LRTP. Deciding which projects to include requires a method of prioritizing candidate projects. Projects are scored based on the approved scoring methodology for projects. The number of projects included also depends on estimated project costs and the financial forecast for the region. This appendix includes details on cost estimating methodologies, project evaluation and project scores.

## Appendix C: Evaluating Potential Effects of Projects

This appendix contains details on the technical analysis we conducted during the development of *Resilience 2050*. We use our travel demand model, emissions model and socioeconomic forecasts to conduct a variety of analyses including:

- **Air Quality Conformity:** The Baltimore region does not meet the National Ambient Air Quality Standard for ground level ozone. As a result, the region must assess whether the projects in its transportation plans and programs conform to air quality goals. "Conformity" means that the projects in *Resilience 2050* will not cause or contribute to new air quality violations, worsen existing conditions or delay timely attainment of air quality standards. Based on the conformity analysis, we have concluded that implementation of the projects in *Resilience 2050* will not worsen the region's air quality or delay the timely attainment of air quality standards.
- **Travel Demand Effects:** We used a travel demand model to analyze the anticipated effects of *Resilience 2050* projects on various transportation measures including vehicle miles traveled, congestion, average auto occupancy, vehicle hours of delay, transit ridership and the share of persons using transit for trips.
- **Environmental Justice (EJ):** EJ analysis is intended to ensure that the benefits and burdens of transportation investments are shared as equitably as possible among all affected communities. The Executive Order addressing EJ reinforces the requirements of Title VI of the Civil Rights Act of 1964 that focus federal attention on environmental and human health conditions in minority and low-income communities. We analyzed the potential effects of this plan's major projects on EJ populations for a variety of accessibility and mobility measures such as access and travel times to jobs and shopping opportunities.



- **Natural and Cultural Resources:** We consulted with federal, state and local agencies responsible for land use management, natural resources, environmental protection, conservation and historic preservation to conduct a broad analysis comparing *Resilience 2050* projects with natural and cultural resources.
- **Strategic Highway Network (STRAHNET):** We conducted a review of projects in relation to the STRAHNET network.

## Appendix D: Congestion Management Process

Federal law requires all metropolitan areas with populations greater than 200,000 to have a Congestion Management Process (CMP). The CMP identifies actions and strategies to reduce traffic congestion and increase mobility. Appendix D includes technical details on the region's CMP and how the projects in *Resilience 2050* are consistent with the CMP.

## Appendix E: Public Outreach and Engagement

Federal law requires MPOs to consult with state and local officials, transit operators and the public when conducting transportation planning. Part of this requirement is developing a public participation plan that defines a process for providing the public and interested parties with reasonable opportunities to be involved in the planning process. Appendix E includes details on the public participation process and specific outreach efforts in developing *Resilience 2050* along with comments received during the public comment period and comment responses.