Baltimore Regional Transportation Board

DRAFT CONFORMITY DETERMINATION OF THE 2020-2023 TRANSPORTATION IMPROVEMENT PROGRAM AND *MAXIMIZE 2045* - APPENDICES

Prepared by the Baltimore Regional Transportation Board

Appendix A: Conformity Requirement Matrix

Appendix A: Conformity Requirement Checklist

Section of 40 CFR Part 93	*Requirement*	*BRTB's Response*
§93.110	Is the conformity determination based upon the latest planning assumptions?	Yes
	(a) Is the conformity determination, with respect to all other applicable criteria in §93.111-§93.119, based upon the most recent planning assumptions in force at the time of the conformity determination?	(a) Yes. The conformity determination uses the most current planning assumptions in force and approved by the BRTB at the time of the determination. Vehicle fleet characteristics used reflect 2017 vehicle registration data for the Baltimore region.
	(b) Are the assumptions derived from the estimates of current and future population, employment, travel, and congestion most recently developed by the MPO or other designated agency? Is the conformity determination based upon the latest assumptions about current and future background concentrations?	(b) Yes. This conformity determination utilizes the most recent demographic and employment data; it uses Round 9 socioeconomic forecasts endorsed by the BRTB in June 2018. The travel demand model was validated to a 2012 base year.
	(c) Are any changes in the transit operating policies (including fares and service levels) and assumed transit ridership discussed in the determination?	(c) Yes. All existing and proposed transit systems and service for the planning horizons have been included in the conformity analysis.
	(d) The conformity determination must include reasonable assumptions about transit service and increases in transit fares and road and bridge tolls over time.	(d) See above. In addition, the Maryland Transportation Authority has indicated that there are no plans to increase road or bridge tolls in the future.
	(e) The conformity determination must use the latest existing information regarding the effectiveness of the transportation control measures (TCMs) and other implementation plan measures that have already been implemented.	(e) Currently, there are no adopted TCMs in the corresponding SIPs.
	(f) Key assumptions shall be specified and included in the draft documents and supporting materials used for the interagency and public consultation required by §93.105.	(f) Key assumptions are specified and other supporting documents are included in this conformity determination document, which is available to the public and the Interagency Consultation Group.

Appendix A: Conformity Requirement Checklist

Section of 40 CFR Part 93	*Requirement*	*BRTB's Response*
§93.111	Is the conformity determination based upon the latest emissions model?	Yes. EPA's latest emissions model, Motor Vehicle Emissions Simulator (MOVES) 2014a was used for this conformity determination.
§93.112	Did the MPO make the conformity determination according to the consultation procedures of the Conformity Rule or the state's conformity SIP?	Consultation procedures were followed in accordance with the Transportation Conformity Rule. Appropriate agencies were consulted. A scope of work was made available to FHWA, FTA and EPA.
§93.106(a) (1)	(1) Are the transportation plan horizon years correct?	Yes. The attainment years for the 1997 and 2008 ozone NAAQS are not within the timeframe of the TIP and Plan. The first three modeled horizon years are **2020, 2030 and 2040**, set so that there are no more than 10 years between horizon years. The fourth horizon year is **2045**, the date of full implementation of the Plan.
§93.106(a) (2)(i)	Does the plan quantify and document the demographic and employment factors influencing transportation demand?	Yes. Round 9 socioeconomic forecasts are available in the appendices of this document.
§93.106(a) (2)(ii)	Is the highway and transit system adequately described in terms of regionally significant additions or modifications to the existing transportation network which the transportation plan envisions to be operational in horizon years?	Yes. The regionally significant additions and modifications to the network utilized in this conformity analysis are listed in Appendix C. It provides a listing of projects from the 2020-2023 TIP and Maximize 2045, the region's long range transportation plan.
§93.108	Is the transportation plan fiscally constrained?	Yes. The transportation plan is fiscally constrained. See the Fiscal Constraint section.
§93.113(b)	Are TCMs being implemented in a timely manner?	There are no transportation control measures in the SIP.
§93.118	For Areas with SIP Budgets: Is the Transportation Plan, TIP, or Project consistent with the established motor vehicle emissions budget(s) in the applicable SIP?	Yes. The TIP and the Plan result in fewer emissions than the established budgets for all pollutants in each applicable analysis year.

Appendix B: Interagency Consultation

- This appendix will be completed as part of the final conformity document.

Appendices C-1 through C-4: Conformity Status of Projects from the 2020-2023 TIP and *Maximize 2045*

TIP ID	Project Title	Agency	Description	Exempt (Y/N)?
11-1103-13	Furnace Avenue Bridge over Deep Run	Anne Arundel County	Reconstruct existing bridge to correct existing deficiencies, substandard approach road and bridge deck geometry. Five foot shoulders planned on both sides of the road.	Y
11-1801-42	Hanover Road Corridor Improvement	Anne Arundel County	This project is to provide design, right-of-way acquisition and construction of a section of Hanover Road on a new alignment between Ridge Road and New Ridge Road in Hanover (0.4 miles). Engineering funds were programmed in FY 2017.	Y
11-1208-13	Harwood Road Bridge over Stocketts Run	Anne Arundel County	This project will replace the existing bridge over Stocketts Run. Three foot shoulders planned on both sides of the road.	Y
11-1402-13	Magothy Bridge Road Bridge over Magothy River	Anne Arundel County	Replace bridge deck and add shoulders to the bridge over the Magothy River. Five foot sidewalks and seven foot shoulders planned on both sides of the road.	Y
11-1601-19	McKendree Road Culvert over Lyons Creek	Anne Arundel County	This project is to remove and replace the culvert on McKendree Road over Lyons Creek to correct the structurally deficient condition of the existing multicell culvert. Three foot shoulders planned on both sides of the road.	Y
11-1403-13	O'Connor Road Bridge over Deep Run	Anne Arundel County	Replace bridge over Deep Run at O'Connor Road. Three foot shoulders planned on both sides of the road.	Y

TIP ID	Project Title	Agency	Description	Exempt (Y/N)?
11-1602-13	Polling House Road Bridge over Rock Branch	Anne Arundel County	This project will replace the existing bridge along Polling House Road over Rock Branch to correct the deteriorated structure and obsolete deck geometry. Three foot shoulders planned on both sides of the road.	Y
12-2001-11	25th Street Rehabilitation from Greenmount Avenue to Kirk Avenue	Baltimore City	Roadway rehabilitation work includes concrete roadway slab replacement, concrete type I and type II repair, full depth base repair, milling, paving, ADA compliant sidewalks, pedestrian ramps, crosswalks, drainage improvements, traffic signal replacement, signage, pavement markings, curb and gutter replacement, landscaping, trees, new street lights, and street light fixture upgrades. In addition to roadway rehabilitation, a mixed use trail to accommodate bicycles and pedestrians will be included in the project.	Y
12-2002-13	41st Street over I-83, MTA, and Jones Falls	Baltimore City	The 1,238-foot long bridge was originally built in 1930 and was rehabilitated in 1986, but severe deterioration is now evident throughout and the structure must be evaluated to determine whether the bridge should be rehabilitated or replaced. The existing sidewalks will be replaced with standard SHA and ADA compliant sidewalks. The existing lighting system will also be upgraded.	Y
12-1201-99	Baltimore City Locked Gate Interstate Access Point Approval (IAPA)	Baltimore City	This project would modify the North Charles Street on-ramp to I-83 to allow access to Amtrak property west of Penn Station. This would be a controlled access point with a locked gate. The construction phase of this project will be primarily funded by Amtrak Capital funds.	Y
12-2004-11	Baltimore Street from Howard Street to President Street	Baltimore City	Roadway rehabilitation work includes concrete roadway slab replacement, concrete type I and type II repair, full depth base repair, milling, paving, ADA compliant sidewalks, pedestrian ramps, crosswalks, drainage improvements, traffic signal replacement, signage, pavement markings, curb and gutter replacement, landscaping, trees, new street lights, and street light fixture upgrades. Project includes potential for improved transit facilities and improved pedestrian safety treatments.	Y

TIP ID	Project Title	Agency	Description	Exempt (Y/N)?
12-1404-11	Belair Road Complete Streets	Baltimore City	Design and construction for street, sidewalk, bike improvements and greening at key nodes on Belair Road, including Frankford Ave., Erdman Ave., and Fleetwood Ave. Project is a major implementation item from the Urban Land Institute Belair Road report and BCDOT traffic study. FY 2020 Eng and FY 2023 construction funds are for Phase II which includes the intersection of Belair Rd and Erdman Ave. FY 2021 Eng and FY 2024 construction funds are for Phase III which includes the intersection of Belair Rd and Fleetwood Ave.	Y
12-2005-13	Brehms Lane over Herring Run	Baltimore City	The 92-foot long bridge was originally built in 1963, but severe deterioration is now evident throughout and the structure must be replaced. The existing sidewalks will be replaced with standard SHA and ADA compliant sidewalks.	Y
12-1901-99	Capital Project Delivery Services	Baltimore City	The purpose of this project is to provide the technological and project management improvements needed to support the design and construction phases of CIP projects. The TIP funding will be used for project delivery services of capital federal-aid roadway projects. This program was initiated in FY 2019.	Y
12-2003-99	Citywide Asset Management	Baltimore City	This project is to deploy a Citywide asset management system for the maintenance, preservation, repair, rehabilitation and replacement of the agencys federal-aid eligible physical assets based on data-driven decisions to minimize the life-cycle cost of these infrastructure assets. Asset management focuses on improving asset life, utilization and performance.	Y
12-1217-25	Citywide Bicycle and Pedestrian Improvements	Baltimore City	The Citywide Bicycle and Pedestrian Group includes but is not limited to the Bicycle Master Plan, design, and construction of Baltimore City bicycle infrastructure and trails system. A citywide bicycle network will encourage alternative modes of transportation, reduce emissions, and reduce automobile trips.	Y

TIP ID	Project Title	Agency	Description	Exempt (Y/N)?
12-1414-11	Citywide System Preservation	Baltimore City	Citywide system preservation includes resurfacing, rehabilitation and maintenance, streetscapes, signals, and intersection improvements, as well as ADA ramps and sidewalk improvements on federal-aid roadways. Current projects include, but are not limited to: -Russell Street concrete pavement rehabilitation from Russell Street viaduct to Waterview Avenue -Clinton Street rehabilitation from Boston Street to Keith Avenue	Y
12-1218-07	Citywide Traffic Signals, Intelligent Transportation System and Safety Improvements	Baltimore City	Intelligent Transportation System (ITS) related work includes but is not limited to: traffic signal system integration, traffic surveillance camera expansion, traffic signal replacement and upgrade, fiber optic connections, variable message signs, and traffic detector upgrade, including geometric improvement of intersections. Projects included in this TIP ID are: CCTV and signal rewiring citywide, installation of fiber optic and copper communications citywide, ITS deployment and upgrades citywide, geometric improvements at multiple intersections, and traffic signal reconstruction.	Y
12-2006-99	Citywide Transportation Plan	Baltimore City	The Citywide transportation plan seeks to utilize previously approved and adopted transportation plans specific to areas and build on these with a comprehensive transportation master plan that will provide a transportation vision for the Department of Transportation to advance in future years.	Y
12-2014-99	Citywide Transportation Studies	Baltimore City	This project is to provide funding for transportation studies related to, but not limited to, crash studies, traffic circulation studies, bicycle and pedestrian studies, and safety studies.	Y
12-2007-11	Fremont Avenue Rehabilitation from Lafayette Avenue to Presstman Street	Baltimore City	Roadway rehabilitation work includes concrete roadway slab replacement, concrete type I and type II repair, full depth base repair, milling, paving, ADA compliant sidewalks, pedestrian ramps, crosswalks, drainage improvements, traffic signal replacement, signage, pavement markings, curb and gutter replacement, landscaping, trees, new street lights, and street light fixture upgrades. The project will also include pedestrian safety improvements.	Y

TIP ID	Project Title	Agency	Description	Exempt (Y/N)?
12-1419-13	Hanover Street Bridge Multimodal Corridor	Baltimore City	A Multimodal Corridor Plan established the framework for Baltimore Citys investment in the Hanover Street Bridge Corridor for transportation, education, recreation, regional competitiveness and economic development. This study will determine whether the Hanover Street Bridge should be rehabilitated, or a new bridge should be designed and constructed.	Y
12-2008-13	Hanover Street Over CSX	Baltimore City	The 367-foot long bridge was originally built in 1900 and was rehabilitated in 1975, but severe deterioration is now evident throughout and the structure must be replaced. The existing sidewalks will be replaced with standard SHA and ADA compliant sidewalks.	Y
12-2009-13	Howard Street over I-83, CSX, Amtrak, and Jones Falls	Baltimore City	Replacing the existing bridge which consists of two steel tied arch and six steel girder segments. These span over I-83, John Falls, MTA, AMTRAK, CSX, Falls Road and over a fenced in private lot. Improvements include enhanced bicycle and pedestrian facilities extending to the approaches of both sides of the bridge. No additional traffic capacity changes are being included as part of the project.	Y
12-1604-13	I-83 Concrete Deck Mill and Resurface	Baltimore City	This work will include but will not be limited to rehabilitating the deteriorating concrete decks of the bridges with new wearing surfaces that meet current standards. The limits of this project are between Exit 1 and Exit 10.	Y
12-2010-11	Madison Street Rehabilitation from North Milton Avenue to Edison Highway	Baltimore City	Roadway rehabilitation work includes concrete roadway slab replacement, concrete type I and type II repair, full depth base repair, milling, paving, ADA compliant sidewalks, pedestrian ramps, crosswalks, drainage improvements, traffic signal replacement, signage, pavement markings, curb and gutter replacement, landscaping, trees, new street lights, and street light fixture upgrades.	Y
12-1706-11	MLK Blvd. and Howard St. Intersection Improvements	Baltimore City	Martin Luther King Jr. Blvd. and Howard Street Intersection improvements will include roadway pavement rehabilitation and realignment, pedestrian ramp modifications, storm water drainage, stormwater management, signals, signing, roadway markings, street lighting and landscaping within the project limits.	Y

TIP ID	Project Title	Agency	Description	Exempt (Y/N)?
12-1605-13	Moravia Road Ramp Bridge over Pulaski Highway	Baltimore City	This work will include but will not be limited to rehabilitating the existing deteriorated bridge with new bridge components that meet current standards.	Y
12-1601-13	Orleans Street Bridge over I-83 and City Streets	Baltimore City	This work will include but will not be limited to rehabilitating the deteriorated bridge with structural improvements, cleaning and painting of the steel elements, replacing and reconfiguring the storm drain system and other repairs in order to correct the deteriorated components of the bridge. The sidewalk along the south side of the bridge will remain in place.	Y
12-2011-11	Park Heights Avenue from West Rogers Avenue to Strathmore Avenue	Baltimore City	Roadway rehabilitation work includes concrete roadway slab replacement, concrete type I and type II repair, full depth base repair, milling, paving, ADA compliant sidewalks, pedestrian ramps, crosswalks, drainage improvements, traffic signal replacement, signage, pavement markings, curb and gutter replacement, landscaping, trees, new street lights, and street light fixture upgrades.	Y
12-2013-11	Pennington Avenue Rehabilitation from Birch Street to East Ordnance Road	Baltimore City	Roadway rehabilitation work includes concrete roadway slab replacement, concrete type I and type II repair, full depth base repair, milling, paving, ADA compliant sidewalks, pedestrian ramps, crosswalks, drainage improvements, traffic signal replacement, signage, pavement markings, curb and gutter replacement, landscaping, trees, new street lights, and street light fixture upgrades.	Y
12-1215-13	Perring Parkway Ramp and Hillen Road Bridge	Baltimore City	Replace Perring Parkway Ramp over Herring Run and Hillen Road Bridge over Herring Run.	Y
12-1603-13	Radecke Avenue over Moores Run	Baltimore City	This work will include but will not be limited to replacing the deteriorated bridge with a new structure that will meet current standards. The existing sidewalks will be replaced with standard SHA and ADA compliant sidewalks. Engineering for this project was authorized in FY19.	Y

TIP ID	Project Title	Agency	Description	Exempt (Y/N)?
12-1602-13	Remington Avenue Bridge over Stony Run	Baltimore City	This work will include but will not be limited to replacing the deteriorating bridge with a new structure that will meet current standards. The existing sidewalks will be replaced with standard SHA and ADA compliant sidewalks.	Y
12-1216-13	Sisson Street Bridge over CSX Railroad	Baltimore City	The 133-foot long bridge was originally built in 1914 and was rehabilitated in 1950, but severe deterioration is now evident throughout and the structure must be replaced. The existing sidewalks will be replaced with standard SHA and ADA compliant sidewalks. CSX is providing 75% of the construction cost for the project.	Y
12-1701-04	Transportation Management Center Upgrade	Baltimore City	System integration and facility equipment upgrade citywide. The purpose of this project is to upgrade the central computer system or Advance Traffic Management System (ATMS) which controls and communicates with traffic signals in the field. The system includes software and computer hardware (servers and switches).	Y
12-2015-13	Waterview Avenue over Ramp to 295	Baltimore City	The 75-foot long bridge was originally built in 1950, but severe deterioration is now evident throughout and the structure must be evaluated to determine whether the bridge should be rehabilitated or replaced. The existing sidewalks will be replaced with standard SHA and ADA compliant sidewalks.	Y
12-1403-13	Wilkens Avenue Bridge Over Gwynns Falls	Baltimore City	This project involves replacement of the bridge, which has deteriorated beyond repair. The existing sidewalks will be replaced with standard SHA and ADA compliant sidewalks.	Y
13-8901-14	Bridge Inspection Program	Baltimore County	Countywide inspection of all bridges as federally mandated. Includes review of countywide bridge inspection reports and bridge replacement and/or rehabilitation federal aid capital projects.	Y

TIP ID	Project Title	Agency	Description	Exempt (Y/N)?
13-0001-13	Dogwood Road Bridge No. B-0072 Over Dogwood Run	Baltimore County	Replacement of existing bridge. New structure will have one 3 foot shoulder and one 6 foot shoulder.	Y
13-1210-13	Forest Park Avenue N. Bridge No. B-0097 over Dead Run and Dogwood Road	Baltimore County	Deck replacement and rehabilitation of Bridge No. B-97 on Ingleside Avenue over Dead Run and Dogwood Road. The proposed structure will have a 5 foot wide sidewalk along the north side of the deck. Shoulder and sidewalk widths to be determined during preliminary design.	Y
13-1208-13	Golden Ring Road Bridge No. B-0110 over Stemmers Run	Baltimore County	Replacement of Bridge No. B-110 on Golden Ring Road over Stemmers Run. Proposed bridge will have minimum 2 foot shoulders. Shoulder widths and sidewalks to be evaluated during preliminary design.	Y
13-1005-13	Gunpowder Road Bridge No. B-0409	Baltimore County	Replacement of the existing bridge. New bridge will have minimum 2 foot wide shoulders. Lane, shoulders and sidewalks to be evaluated during preliminary design.	Y
13-1012-13	Hammonds Ferry Road Bridge No. B-0100 over CSX Railroad	Baltimore County	Deck replacement and rehabilitation of Bridge No. B-100 on Hammonds Ferry Road over CSX railroad. The existing bridge has two 5 foot wide sidewalks and two 6 foot striped shoulders. The new structure will have sidewalks and shoulders of the same width.	Y
13-1105-13	Lansdowne Boulevard Bridge No. B-0113 over CSX Railroad	Baltimore County	Steel girder bridge carrying two lanes of traffic each way and two 5 foot sidewalks on Lansdowne Boulevard over CSX railroad tracks. The project is still in planning, but any proposed structure will maintain the existing cross section.	Y

TIP ID	Project Title	Agency	Description	Exempt (Y/N)?
13-0803-13	Mohrs Lane Bridge No. B-0143 over CSX Railroad	Baltimore County	Replacement of existing bridge to include sidewalks and wider lanes as well as the approaches to accommodate future Campbell Blvd. New structure will have 8 foot shoulders on both sides.	Y
13-1204-13	Old Court Road Bridge No. B-0237 over Bens Run	Baltimore County	Superstructure replacement for Bridge No. B-237 on Old Court Road over Bens Run. The existing bridge has two 5 foot sidewalks. The new superstructure will maintain the existing cross section.	Y
13-1202-13	Old Ingleside Avenue Bridge No. B-0096 over Dead Run	Baltimore County	Replacement of Bridge No. B-0096 on Old Ingleside Avenue over Dead Run. The existing bridge is a historic arch structure. Preliminary design will include evaluation of rehabilitation versus replacement. The proposed bridge will have at least one 5 foot wide sidewalk along the north side of the deck. Exact lane and sidewalk widths to be determined during preliminary design.	Y
13-1108-13	Peninsula Expressway Bridge No. B-0119 over CSX Railroad	Baltimore County	Replacement of Dual Bridge No. 119 on Peninsula Expressway over CSX railroad tracks. Both structures have 3 foot wide shoulders on both sides. The need for sidewalks will be evaluated during preliminary design.	Y
13-2001-13	Phoenix Road Bridge No. BC6507 over Gunpowder Falls & NCR Trail	Baltimore County	Replacement of Bridge No. BC6507 on Phoenix Road over the Gunpowder Falls and the NCR Trail. The old bridge provided 20 of clear roadway width for two lanes and no shoulders. The new bridge will provide 30 clear roadway width (between traffic barriers) for two 12 lanes and two 3 shoulders.	Y
13-1209-13	Rolling Road Bridge No. B-0358 over Branch of Dead Run	Baltimore County	Replacement of Bridge No. B-0358 on Rolling Road over Branch of Dead Run. The proposed structure will have 5 foot wide sidewalks along both sides of the road and tie into the existing conditions.	Y

TIP ID	Project Title	Agency	Description	Exempt (Y/N)?
13-1701-13	Rossville Blvd. Bridge No. B-0132 over Amtrak & Orems Rd.	Baltimore County	Rehabilitation of Bridge No. B-0132 on Rossville Boulevard over Amtrak Railroad & Orems Road. The proposed bridge will have 5 foot wide sidewalks along both sides of the deck.	Y
13-1206-13	Sparks Road Bridge No. B-0018 over Gunpowder Falls	Baltimore County	Cleaning and painting of Bridge No. B-18 on Sparks Road over Gunpowder Falls. The existing bridge is a historic truss structure. The project includes no structural modifications.	Y
14-1601-13	Babylon Road Bridge over Silver Run	Carroll County	Replacement of existing bridge to provide efficient access for local traffic and emergency service vehicles.	Y
14-1101-13	Bixler Church Road Bridge over Big Pipe Creek	Carroll County	Replace the existing 2-cell culvert with a new 2-cell concrete box culvert.	Y
14-9401-14	Bridge Inspection Program	Carroll County	This project includes a field inspection of 133 County-owned and maintained structures and completion and submittal of inspection reports to county and state agencies for each structure.	Y
14-1602-13	Gaither Road Bridge over South Branch Patapsco River	Carroll County	Rehabilitation of existing bridge with a new superstructure (type TBD) to provide efficient access for local traffic and emergency service vehicles.	Y

TIP ID	Project Title	Agency	Description	Exempt (Y/N)?
14-1802-13	Hughes Shop Road Bridge over Bear Branch	Carroll County	Replacement of existing bridge with a new structure (type TBD).	Y
14-1603-13	McKinstrys Mill Road Bridge over Sam's Creek	Carroll County	Replacement of existing bridge with a new structure (type TBD) to provide efficient access for local traffic and emergency service vehicles.	Y
14-1102-13	Shepherds Mill Road Bridge over Little Pipe Creek	Carroll County	Replace the existing 3-span bridge with a new structure, including piers and abutments.	Y
14-1103-13	Stone Chapel Road Bridge over Little Pipe Creek	Carroll County	Rehabilitation of existing bridge to provide efficient access for local truck traffic to MD 31.	Y
15-1001-13	Abingdon Road Bridge #169 over CSX Railroad	Harford County	Replace the bridge that carries Abingdon Road over the CSX Railroad tracks. Five foot sidewalk planned on one side of the road.	Y
15-9411-14	Bridge Inspection Program	Harford County	This federal program provides funding for the inspection of bridges in Harford County.	Y
15-2001-13	Grier Nursery Road Bridge #43	Harford County	The project is to replace the entire superstructure for the Grier Nursery Road bridge over Deer Creek. Bridge will include shoulders but not sidewalks.	Y

TIP ID	Project Title	Agency	Description	Exempt (Y/N)?
15-2002-13	Hookers Mill Road Bridge #13	Harford County	This project is to replace the entire bridge that carries Hookers Mill over Bynum Run. The design is anticipated to include a 30-foot clear roadway consisting of two 11-foot travel lanes and two 4-foot shoulders with a sidewalk on one side.	Y
15-1102-13	Phillips Mill Road Bridge #70 over East Branch Tributary	Harford County	This project is to replace the bridge that carries Phillips Mill Road over a tributary to East Branch. Three foot shoulders planned on both sides of the road.	Y
15-1501-13	Stafford Road Bridge #24 over Deer Creek	Harford County	This is a replacement of the entire bridge superstructure including bridge deck and steel beams. The project cost has increased from $1.8 million in the last TIP to $3.1 million due to a scope change to replace the entire bridge superstructure in lieu of only replacing the bridge deck. The current sufficiency rating is 52.3. A four foot shoulder is planned on the east side of the bridge.	Y
16-0436-13	Bridge Repairs and Deck Replacement	Howard County	This project is to repair/replace bridge decks at the following locations: River Road bridge over Rockburn Branch, Henryton Road bridge over a tributary to the Patapsco River (~2.5 foot shoulders), Pindell School Road bridge over Hammond Branch (~6 foot shoulders), Daisy Road bridge over Little Cattail Creek (~6 foot shoulders), Pfefferkorn Road bridge over Middle Patuxent River (shoulders TBD: in design), Carroll Mill Road bridge over Benson Branch (shoulders TBD: in design), and emergency structure reconstruction.	Y
16-2001-67	Bus Rapid Transit	Howard County	The implementation of the Bus Rapid Transit system would represent a significant investment for the County and the state of Maryland and should be pursued only where frequent bus service could be supported. In order to ensure that the BRT project is successful, Howard County is currently going through a planning/design phase primarily focusing along the US 29 Corridor. Funds are from the state of Maryland and will not take the project past 30% design.	Y

TIP ID	Project Title	Agency	Description	Exempt (Y/N)?
32-2001-83	Seagirt Marine Terminal Modernization: Berth Improvements	Maryland Port Administration	MDOT MPA received a BUILD discretionary grant from the US DOT to modernize Berth 3 at the Seagirt Marine Terminal. This public-private partnership will widen the turning basin and deepen the access channel to Seagirt Berth 3 to 50-foot deep. Ports America Chesapeake is a private partner and tenant with MDOT-MPA and will fund berth-side improvements to Seagirt Berth 3. These improvements include construction of a toe-wall, crane tie-downs, new fenders, pavement repairs and concrete RTG runways. The federal ($6.555 million) and state ($33.446 million) funds in the funding table are for the Berth improvements. Ports America will provide an additional $18.4 million for berth-side improvements.	Y
70-1503-55	MARC Facilities	MTA - Commuter Rail	1) Procure Riverside Maintenance Facility, which CSX has offered to sell to MTA. Maintenance activities for equipment on the MARC Camden Line would then be under direct control of MARC. MTA & CSX are jointly working with MDE to remediate hazardous material contamination. 2) Design and engineering for BWI MARC/Amtrak facility renovation and improvements. This work involves station improvements and new canopies. 3) MARC Martin State Airport - Purchase private property & construct 2 additional storage tracks. 4) Construction of Riverside Heavy Maintenance Facility.	Y
70-1502-54	MARC Improvements	MTA - Commuter Rail	This project provides funding to implement ongoing improvements derived from the MARC Master Plan and Amtrak/CSX Operating Agreements. Projects include: improvements to the Penn line, improvements to the Brunswick and Camden lines, system-wide parking lot improvements, the design, procurement, and installation of an ADA compliant public address system at all MARC stations on the Brunswick, Camden, and Penn lines, installation of an audio/visual warning system for approaching MARC trains, uninterruptible power supply and lighting protections, and the collaborative cost-sharing arrangement to advance development of the Northeast corridor infrastructure. In addition to the matching funds listed, MTA has committed $18.1 million in state dollars.	Y

TIP ID	Project Title	Agency	Description	Exempt (Y/N)?
70-1501-53	MARC Rolling Stock Overhauls and Replacement	MTA - Commuter Rail	This is an ongoing project for the overhaul and replacement of MARC rolling stock. The overhaul of MARC coaches and locomotives is performed in accordance with "10-year Minor" and "20-year Midlife" schedules and/or the manufacturer's schedule. MARC vehicles will be upgraded with federally-mandated Positive Train Control safety features. In addition to the matching funds listed, MTA has committed $10.5 million in state dollars.	Y
40-1801-64	Agencywide System Preservation and Improvement	MTA - Transit	This is an ongoing project to rehabilitate agency-wide facilities, systems, and infrastructure, including park-and-ride lots, roofing, bridge and subway inspection, a transit asset management system, a system network migration and upgrade, system-wide elevators and escalators, and a mobility CAD/AVL system replacement.	Y
40-1802-05	Bus and Paratransit Vehicle Overhaul and Replacement	MTA - Transit	This project provides for the routine replacement of buses past their useful service life. Planned purchases include 278 forty-foot clean diesel buses. MDOT MTA will also proactively repair and replace bus components at key points in the vehicles life, including the vehicle engine, battery, brakes, suspension, body, paint, and wheelchair/ADA, electrical, and pneumatic systems. Batteries in hybrid electric buses near the end of their useful life will be replaced. This project also covers the purchase of paratransit vehicles under MTA's Mobility program. Planned purchases include 25 small cutaway and 75 large cutaway vehicles purchased annually from FY20 through FY23.	Y
40-1204-64	Bus and Rail Preventive Maintenance	MTA - Transit	Provides preventative maintenance on the Bus, Light Rail and Metro systems to improve safety, reliability and passenger comfort.	Y
40-1803-64	Bus System Preservation and Improvement	MTA - Transit	This is an ongoing project to rehabilitate bus facilities and infrastructure, including operating division and MTA offices. Projects included are the replacement of Historic Gable Windows at Bush Division and a paint booth at Washington Boulevard.	Y

TIP ID	Project Title	Agency	Description	Exempt (Y/N)?
40-1203-65	Kirk Bus Facility Replacement - Phase 1 & 2	MTA - Transit	Phase I is the construction of a 100,000 square foot state-of-the-art, sustainable design, energy-efficient/green technology building that will house maintenance work to be performed in an enclosed environment, thereby enabling MTA to better control noise, exhaust fumes and visibility of the buses to the surrounding community. Phase II is the construction of a similar building to store buses overnight.	Y
40-1804-63	Metro and Light Rail Rolling Stock Overhauls and Replacement	MTA - Transit	The Metro Railcar fleet consists of 90 cars that have surpassed the 30-year design life. Replacement of the railcar fleet will provide passengers with enhanced comfort, conveniences, and ensure improved reliability. The Light Rail vehicle fleet will require the plan and design of maintenance objectives to perform a 15-year inspection of the major and sub-assemblies of the original 35-vehicle fleet. The inspections will identify and remedy all obsolete parts issues in order to overhaul the major and sub-assemblies according to manufacturer recommendations and facilitate any modifications deemed necessary by engineering or OEM for 15-year maintenance. The first vehicles were placed back in service in 2015, and the last vehicle will be placed back in service in 2022.	Y
40-1805-64	Metro and Light Rail System Preservation and Improvement	MTA - Transit	This is an ongoing project to rehabilitate Light Rail and Metro facilities, infrastructure, track, and equipment.	Y
40-9901-01	Ridesharing - Baltimore Region	MTA - Transit	The ridesharing project covers the activities of the ridesharing program in all jurisdictions in the Baltimore region, including the Guaranteed Ride Home (GRH) Program. Entities eligible to receive funding include Baltimore City, the Baltimore Metropolitan Council, and Anne Arundel, Howard, and Harford counties.	Y
40-9204-61	Rural Transit Systems - Operating Assistance	MTA - Transit	Operating assistance to transit systems located in the Baltimore region. Transit agencies eligible for funding include Baltimore County (Baltimore County Office of Aging) and Carroll Transit System. Costs generally associated with operating assistance can include utilities, miscellaneous equipment, fuel/oil, and driver, maintenance staff, and administrative salaries.	Y

TIP ID	Project Title	Agency	Description	Exempt (Y/N)?
40-1502-69	Seniors and Individuals with Disabilities	MTA - Transit	Capital and operating assistance to non-profit agencies who provide transportation services for the elderly and individuals with disabilities. Non-profit recipients are determined through a competitive selection process and based upon the Baltimore Area Coordinated Public Transit - Human Services Transportation Plan.	Y
40-9502-05	Small Urban Transit Systems - Capital Assistance	MTA - Transit	Capital assistance to small urban transit systems throughout the region to purchase vehicles, equipment, and facilities. The Baltimore region's small urban transit systems include Carroll Transit System, Anne Arundel County and Howard County.	Y
40-0104-61	Small Urban Transit Systems - Operating Assistance	MTA - Transit	Operating assistance to small urban transit systems throughout the Baltimore region. Transit agencies eligible for funding include Carroll Transit System. Costs generally associated with operating assistance can include utilities, miscellaneous equipment, fuel/oil, and driver, maintenance staff, and administrative salaries.	Y
40-1602-05	Urban Transit Systems - Capital Assistance	MTA - Transit	Capital assistance for the purchase of vehicles, equipment, and facilities for Harford County (Harford County Transportation Services).	Y
40-1603-61	Urban Transit Systems - Operating Assistance	MTA - Transit	Operating assistance to urban transit systems throughout the Aberdeen/Bel Air North/Bel Air South urbanized area. Transit agencies eligible for funding include Harford County. Costs generally associated with operating assistance can include utilities, miscellaneous equipment, fuel/oil, and driver, maintenance staff, and administrative salaries.	Y
90-1901-99	Baltimore-Washington Superconducting Maglev (SCMAGLEV) Project	Office of the Secretary	Baltimore-Washington Rapid Rail (BWRR), a private company based in Maryland, is proposing to construct an SCMAGLEV train system between Baltimore, Maryland and Washington, DC with an intermediate stop at BWI Marshall Airport. An Environmental Impact Statement (EIS) is being prepared to evaluate the potential impacts of the construction and operation of such a system.	Y

TIP ID	Project Title	Agency	Description	Exempt (Y/N)?
90-2001-99	DC-to-Baltimore Loop Tunnel Project	Office of the Secretary	The DC-to-Baltimore Loop Tunnel Project is 100% privately funded and a completely electric intercity passenger rail. It will provide electric, on-demand autonomous skates that will carry passengers from Washington, DC, to the City of Baltimore at speeds up to 150 mph through a pair of tunnels. The alignment of the project is approximately 30 feet beneath the alignment of the Baltimore Washington Parkway, between Washington, DC and the City of Baltimore, MD. The alignment includes part of New York Avenue, NE in the District of Columbia and Russell Avenue as far as S. Paca Street in Baltimore, MD. The only points of entry planned are at the two termini.	Y
92-1401-83	Port of Baltimore Enhancements	Office of the Secretary	MPAs TIGER project has three portions: provide rail access to Fairfield Marine Terminal; widening and straightening the navigation channel to Seagirt Marine Terminal; and filling the Fairfield Basin to develop seven acres of new land for cargo storage.	Y
90-1401-39	State Safety Oversight	Office of the Secretary	The Maryland Department of Transportation (MDOT) intends to use these Section 5329 Funds to provide administrative expenses for training, consultant services and miscellaneous equipment to oversee MTAs Light Rail and Metro systems and its operations in the Baltimore, Maryland metropolitan area.	Y
60-9310-13	Areawide Bridge Replacement And Rehabilitation	SHA	This is an ongoing program to provide major upgrades and maintenance of structures on State highways. These are non-capacity improvements which may include but are not limited to structural replacements, deck rehabilitation, superstructure replacements, parapet reconstruction, cleaning and painting, and general maintenance on various state-owned bridges.	Y

TIP ID	Project Title	Agency	Description	Exempt (Y/N)?
60-9504-04	Areawide Congestion Management	SHA	This is an ongoing program to provide traffic control, management, and monitoring on State highways. These improvements may include but are not limited to the employment of variable message signs, video for traffic management (CCTV), traffic management detectors, signal systemization and remote timing, permanent congestion monitoring systems employed by the CHART program, deployment of local jurisdiction ITS projects, and the development of park-and-ride facilities. This project also includes a program that replaces older drayage trucks serving the Port of Baltimore with newer trucks that meet or exceed 2007 EPA emissions certified engine standards.	Y
60-9506-38	Areawide Environmental Projects	SHA	This is an ongoing program to provide environmental and aesthetic improvements on State highways. These are non-capacity improvements which include, but are not limited to, projects dealing with noise abatement, wetlands, reforestation, landscape planting, scenic beautification, and pedestrian or bicycle facilities. This program also includes National Recreational Trails projects.	Y
60-9501-11	Areawide Resurfacing And Rehabilitation	SHA	This is an ongoing program to provide periodic resurfacing and upgrading of auxiliary features on State highways. These are non-capacity improvements which may include but are not limited to milling, patching, sealing, and resurfacing of existing deteriorated state roadways. Other improvements such as ADA or guardrail may be included incidental to other resurfacing and rehabilitation improvements.	Y
60-9508-19	Areawide Safety And Spot Improvements	SHA	This is an ongoing program to provide localized improvements to address safety and/or operational issues on State highways. These are highway improvements which may include but are not limited to projects dealing with bypass lanes, acceleration and deceleration lanes, turn lanes, rail crossings, intersection realignment, geometric improvements, safety improvements including bridge, bicycle, and pedestrian safety improvements, pavement markers, ADA improvements, guardrails, and roundabouts. Other improvements such as slope repairs, drainage improvements, and joint sealing may be included incidental to other safety improvements.	Y

TIP ID	Project Title	Agency	Description	Exempt (Y/N)?
60-9903-29	Areawide Transportation Alternatives Projects	SHA	This is an ongoing program to expand travel choices and enhance the transportation experience by improving the cultural, historic, and environmental aspects of our transportation infrastructure. These projects may include but are not limited to pedestrian/bicycle facilities; rehabilitation of historic transportation facilities, including railroad facilities and canals; conversion and use of abandoned railway corridors; archeological activities related to transportation impacts; and mitigation of water pollution due to highway runoff. This program also includes Safe Routes to School projects.	Y
60-9511-19	Areawide Urban Reconstruction	SHA	This is an ongoing program to provide roadway rehabilitation and streetscape improvements on State highways in towns and urban areas. These are non-capacity highway improvements which may include but are not limited to projects dealing with drainage, curb and gutter, pavement milling and resurfacing, sidewalks, streetscapes, signs, and markings and lighting improvements.	Y
63-1801-38	I-695 at Cromwell Bridge Road - Drainage Improvement	SHA	This project includes: restoration of the stream channel and repair of SHA drainage outfalls and outfall channels, construction of stormwater management facilities to provide water quality treatment, and relocation of the Baltimore County sewer line.	Y
63-1701-13	I-83: Bridge Replacement over Padonia Road	SHA	Replace bridge no. 03062 along I-83 over Padonia Road, which carries both northbound and southbound traffic.	Y
66-1801-41	I-95: Active Traffic Management	SHA	This project (formerly CTP# HONEW2) will construct facilities to accommodate peak hour shoulder use on I-95 between MD 32 and MD 100 in Howard County. This project is currently funded for partial preliminary engineering only and would result in part-time capacity improvements.	Y

TIP ID	Project Title	Agency	Description	Exempt (Y/N)?
63-1703-13	MD 137: Bridge Replacement over I-83	SHA	The project replaces bridge no. 03050 along MD 137 (Mount Carmel Road) over I-83. A 5 foot shoulder is included on both sides of the roadway. Construction and right-of-way acquisition are State funded. Construction is complete, with the remaining funding for this project completing right-of-way acquisition.	Y
63-2001-13	MD 151/MD151B: Bridge Replacements	SHA	This project will replace bridge 0309900 on MD 151 and bridge 0335000 on MD 151B. The replacement of the deck on bridge 0335100 on MD 151B is also included in this project.	Y
65-1601-12	MD 24: South of Stirrup Run Culvert to Deer Creek Bridge, Section G	SHA	MD 24 will be resurfaced and reconstructed including slope repair and guardrail replacement. This is the southern section (Section G) of MD 24, Rocks Road, from 900 feet south of Sharon Road to 1,700 feet north of Ferncliff Lane. The Estimated Total Cost includes estimated funding to complete construction of this project. A schedule and funding for construction have yet to be determined.	Y
64-1401-19	MD 30 Business: North Woods Trail to CSX Railroad (Hampstead Community Safety & Enhancement)	SHA	The purpose of this project is to provide improvements on MD 30 Business (Main Street in Hampstead) from North Woods Trail to CSX Railroad including reconstruction of the existing roadway with ADA compliant sidewalks on both sides of the street; curb and gutter; crosswalks; and driveway entrances. The project will also upgrade the drainage system, stormwater management facilities, landscaping, traffic signals, and relocate utilities. Because of the low speeds and constrained urban environment, bicycles will be accommodated in the travel lanes.	Y
63-1707-11	MD 45: Padonia Rd to Wight Ave	SHA	This project will replace a 24-inch water main and resurface the roadway within the project limits. The project also includes: reconstructing sidewalks, ramps, curbs and driveways; constructing drainage improvements, replacing damaged inlets and cleaning existing storm drains; installing new signage; and, upgrading intersection signal systems.	Y

TIP ID	Project Title	Agency	Description	Exempt (Y/N)?
64-1702-13	MD 496: Bridge Replacement over Big Pipe Creek	SHA	The project will replace bridge no. 06038 along MD 496 (Bachmans Valley Road) over Big Pipe Creek. A 5 foot minimum shoulder is planned on both sides of the roadway.	Y
64-1701-13	MD 86: Bridge Replacement over Gunpowder Falls	SHA	The project will replace bridge no. 06019 along MD 86 (Lineboro Road) over the South Branch of Gunpowder Falls. A 5 foot minimum shoulder is planned on both sides of the road. Construction was delayed to accommodate the relocation of utilities.	Y
60-0702-99	Morgan State University Transportation Research Program	SHA	Transportation research, education and technology transfer activities involving university faculty, staff and students.	Y
63-1704-13	US 1: Bridge Replacement over CSX	SHA	The project will replace bridge no. 03008 along US 1 (Washington Boulevard) over CSX railroad track and property. An 8 foot shoulder is planned on both sides of the roadway.	Y
63-1706-13	US 40: Bridge Replacements over Little & Big Gunpowder Falls	SHA	This project will replace and widen the superstructure on bridges #0303403 and #0303404 along eastbound and westbound US 40 over Little Gunpowder Falls and bridges #0303503 and #0303504 along eastbound and westbound US 40 over Big Gunpowder Falls. The new bridge superstructures will maintain two 12 foot lanes on each bridge, as well as 4 foot inside shoulders and 10 foot outside shoulders to match the approach roadways.	Y

TIP ID	Project Title	Agency	Description	Exempt (Y/N)?	Year of Op	Year for Model
12-2012-11	Patapsco Avenue from Magnolia Avenue to Patapsco River Bridge	Baltimore City	Roadway rehabilitation work includes concrete roadway slab replacement, concrete type I and type II repair, full depth base repair, milling, paving, ADA compliant sidewalks, pedestrian ramps, crosswalks, drainage improvements, traffic signal replacement, signage, pavement markings, curb and gutter replacement, landscaping, trees, new street lights, and street light fixture upgrades. (6 to 4 lanes)	N	2026	2030
13-1107-13	Piney Grove Road Bridge No. B-0140 over CSX railroad	Baltimore County	Existing timber bridge, 44' long, 16' wide carrying a single lane of traffic over CSX railroad tracks. There are no sidewalks on the approaches, but the need for sidewalks will be evaluated during preliminary design. (1 to 2 lanes)	N	2025	2030
15-1402-42	Bata Boulevard Access Road	Harford County	The project will construct an access road from MD 543 directly to Bata Boulevard. The project has been planned since the redevelopment of the Bata land site. Right of way to construct the road has been reserved and the alignment is rough graded. This project will relieve existing and anticipated delays at the existing US 40/MD 543 intersection by eliminating the left turns from MD 543 to westbound US 40. Increases in traffic from both Perryman and BRAC will necessitate the capacity improvements. This project will be multi-modal in that bicycle lanes and pedestrian access will be considered where possible and appropriate. (0 to 2 lanes, 700 ft)	N	2023	2030
15-1101-13	Chestnut Hill Bridge #40	Harford County	This project will replace the existing Chestnut Hill Road Bridge. Three foot shoulders planned on both sides of the road. (1 to 2 lanes)	N	2020	2020
15-1601-13	Glenville Road Bridge #30	Harford County	Replace the bridge that carries Glenville Road over Mill Brook. Three foot shoulders planned on both sides of the road. (1 to 2 lanes)	N	2023	2030
16-1403-41	Dorsey Run Road: MD 175 to CSX Railroad Spur	Howard County	This project is to study, design, and reconstruct Dorsey Run Road to four lanes from MD 175 south to the CSX railroad spur crossing; a distance of 6,000 linear feet. The project will incorporate sidewalks, and bike facilities (paved shoulders), to increase transportation alternatives. (2 to 4 lanes, 1.1 miles)	N	2023	2030
16-1405-41	Guilford Road: US 1 to Dorsey Run Road	Howard County	This project is to study, design, and reconstruct Guilford Road to three lanes from US 1 to Old Dorsey Run Road; a distance of 5,800 linear feet. The project will incorporate sidewalks to increase transportation alternatives. (2 to 3 lanes, 1 mile)	N	2023	2030

TIP ID	Project Title	Agency	Description	Exempt (Y/N)?	Year of Op	Year for Model
16-1407-46	MD 175 at Oakland Mills Rd Interchange	Howard County	Grade-separated bridge with ramps at MD 175/Oakland Mills Road extended. Will provide access to and from Howard County Blandair Park. The project will incorporate sidewalks and bike facilities to increase transportation alternatives. Phase I involved improvements in Blandair Park and was completed in 2018. Phase II is the grade-separated bridge with ramps at MD 175/Oakland Mills Road and will be complete in 2022. (full interchange)	N	2022	2030
16-1410-41	Snowden River Parkway: Broken Land Parkway to Oakland Mills Road	Howard County	A project to design and construct a widening of Snowden River Parkway by adding a third lane in each direction and shared-use paths from Broken Land Parkway to Oakland Mills Road. The project will incorporate shared use pathways to increase transportation alternatives to activity centers and public transit. (4 to 6 lanes, 6300 ft)	N	2023	2030
16-1901-42	US 29/Broken Land Parkway Interchange and North South Connector Road	Howard County	The project will provide new direct connections from the westbound US 29/Broken Land Parkway interchange ramp to a new road (Merriweather Drive) and to Little Patuxent Parkway. The project will also provide a direct connection from Merriweather Drive to Broken Land Parkway, including configuring the north and south bound US 29 ramps at Broken Land Parkway into a signalized intersection. The project will also remove an existing ramp from Broken Land Parkway to US 29 southbound. (3.1 miles of new lanes on ramps and new roadways)	N	2022	2030
25-1801-41	I-95 Express Toll Lanes Northbound Extension	Maryland Transportation Authority	The I-95 Express Toll Lanes (ETL) Northbound Extension project is the first phase of implementation of I-95 Section 200. The project is funded by MDTA toll revenues and includes the provision of two additional ETLs for more than 10 miles on I-95 from north of MD 43 in Baltimore County to north of MD 24 in Harford County. This section includes reconstruction of the I-95 interchanges at MD 152 and MD 24 to provide access from the northbound ETL as well as an ~3/4 mile auxiliary lane connecting the interchange ramps. The project also involves reconstruction of the overpasses at Raphel, Bradshaw, Old Joppa, Clayton, and Abingdon roads to accommodate the larger area needed for the ETLs. Additionally, the I-95 northbound bridges over the Big Gunpowder Falls, Little Gunpowder Falls and Winters Run will be widened and improved. Five new noise walls will also be installed along the corridor on both sides of I-95. (10.1 miles, 6 to 8 lanes) *Included in Maximize 2045 in Ch.7 - page 35.	N	2026	2030

TIP ID	Project Title	Agency	Description	Exempt (Y/N)?	Year of Op	Year for Model
22-1601-41	I-95 Fort McHenry Tunnel - Moravia Road to Tunnel Improvements	Maryland Transportation Authority	This project will reconfigure I-95 to provide four continuous mainline lanes in each direction. The specific limits are from north of the Fort McHenry Toll Plaza to the I-95 Express Toll Lanes (ETLs) in the northbound direction, and from north of the Fort McHenry Toll Plaza to north of ODonnell Street in the southbound direction. The total work within the limits extends for 3.7 miles in the northbound direction and 1.1 miles in the southbound direction. The project involves restriping I-95 to provide one additional lane of traffic including reconstruction of at-grade shoulders, replacement of at-grade median concrete traffic barriers, and reconstruction of portions of existing bridge decks and all concrete bridge parapets. Construction continues, but the project opened to traffic for beneficial use in 2018. The project is funded with MDTA toll revenues. (6 to 8 lanes, 3.7 miles)	N	2018	2020
22-1901-45	I-95 Fort McHenry Tunnel - Port Covington Access	Maryland Transportation Authority	The Maryland Transportation Authority (MDTA) and Baltimore City Department of Transportation (BCDOT) have developed a suite of improvements to Interstate 95 (I-95) ramps and other nearby transportation facilities to support ongoing and planned redevelopment of the Port Covington peninsula in South Baltimore and to address traffic needs in the Port Covington area. The study limits for these improvements are Caton Avenue to the Fort McHenry Tunnel, involving approximately seven miles of I-95 and sections of Hanover Street, McComas Street and Key Highway. (8 lanes, 7 miles) *Included in Maximize 2045 in Ch.7 - page 36.	N	2029	2030
63-1602-43	I-695: Bridge Replacements at Benson Ave and US 1	SHA	Replacement of Bridge 0311305 on the I-695 Inner Loop over Benson Ave and Bridge 0311405 on the I-695 Inner Loop over Leeds Avenue, US 1, AMTRAK and Herbert Run. The project also includes the realignment of the I-695 northbound on-ramp from Leeds Avenue to US 1. Both bridges will be widened to accommodate the future widening of I-695. US 1 will be narrowed to one lane in each direction extending approximately 2,400 feet north and south of I-695. The project is open to service, with the remaining funding for this project completing right-of-way acquisition.	N	2018	2020
63-1802-41	I-695: I-70 to MD 43	SHA	The purpose of this project is to utilize the inside shoulder to create a new travel lane on the inner and outer loops of I-695 during daily peak travel periods from I-70 to MD 43. This project includes reconfiguration of the I-695 and I-70 interchange and potential future adaptive ramp metering. The estimated total cost has increased from $251 million to $281.1 million due to the addition of dynamic lane controls to the project. (6 to 8 lanes, 19 miles) *Included in Maximize 2045 in Ch.7 - page 38.	N	2024	2030

TIP ID	Project Title	Agency	Description	Exempt (Y/N)?	Year of Op	Year for Model
63-1601-41	I-695: US 40 to MD 144	SHA	This project will widen the I-695 outer loop from US 40 to MD 144 from three to four through lanes. This project will also accommodate the final configuration of this section of the beltway. The noise barrier on the inner loop will be replaced and extended from Shady Nook to US 40 as part of this project. (3 to 4 lanes, 1.2 miles) *Included in Maximize 2045 in Ch.7 - page 37.	N	2021	2030
63-0803-46	I-795: Dolfield Boulevard Interchange	SHA	This study has identified a preferred alternative that constructs a new interchange at the existing Pleasant Hill Road overpass. The project also includes widening I-795 from 4 to 6 lanes between Owings Mills and Franklin Boulevards. Current funding will take engineering to the 30% stage, when phasing options will be evaluated. The Estimated Total Cost includes projected funding that will be required to construct this project. No schedule or funding for construction have been determined. (full interchange; 4 to 6 lanes) *Included in Maximize 2045 in Ch.7 - page 25.	N	2040	2040
63-1203-41	MD 140: Garrison View Road to Painters Mill Road - Phase 1	SHA	Improvements include widening northbound MD 140 to provide a third through lane (lane is 16-wide bicycle-compatible) and 5' raised median, constructing 5 ADA-compliant sidewalks, resurfacing the roadway, landscaping, and utility relocations. Southbound improvements are to be provided by a developer. The remaining funding for this project will complete right-of-way acquisition. (0.2 miles, 2 to 3 lanes) *Included in Maximize 2045 in Ch.7 - page 10. This is phase 1 of MD 140 construction. Phase 2 is the MD 140: North of Painters Mill Road to Owings Mills Boulevard project (TIP ID #63-0802-41).	N	2019	2020
63-0802-41	MD 140: Painters Mill Road to Owings Mills Boulevard - Phase 2	SHA	Capacity and safety improvements to MD 140 from north of Painters Mill Road to Owings Mills Boulevard including; an additional through lane on northbound and southbound MD 140, addition of left and right turn lanes, and added width for bicycle compatibility. This results in three through lanes on northbound MD 140 and three through lanes on southbound MD 140. The Estimated Total Cost includes projected funding that will be required to construct this project. No schedule or funding for construction have been identified. (0.4 miles, 4 to 6 lanes) *Included in Maximize 2045 in Ch.7 - page 10. This is phase 2 of the MD 140 corridor improvements. Phase I - MD 140: Garrison View Road to Painters Mill Road, including the intersection, has TIP ID #63-1203-41.	N	2025	2030

TIP ID	Project Title	Agency	Description	Exempt (Y/N)?	Year of Op	Year for Model
61-1601-41	MD 175: Disney Road to Reece Road	SHA	This project is Phase 2 of the MD 175: MD 295 to MD 170 corridor project, which had TIP ID #61-0605-41 in previous TIPs. It will widen MD 175 from Disney Road to Reece Road, from the existing two lane roadway to a six lane roadway. Bicycle and pedestrian facilities will be provided. (2 to 6 lanes, 1.13 miles) *Included in Maximize 2045 in Ch.7 - page 37.	N	2020	2020
61-1701-41	MD 175: National Business Parkway to McCarron Court	SHA	This project will widen MD 175 from National Business Parkway to McCarron Court from two lanes to six lanes, including through the MD 295 interchange. It also reconfigures ramps in the northeast and southwest quadrants of the MD 295 interchange to create signalized left turns at MD 175. Bicycle and pedestrian facilities will be provided. (2 to 6 lanes, 1.1 miles) *Included in Maximize 2045 in Ch.7 - page 37. This project is Phase 1 of the improvements identified in the MD 175: MD 295 to MD 170 corridor project, which has TIP ID # 61-0605-41.	N	2021	2030
61-1403-41	MD 198: MD 295 to MD 32	SHA	This project will address capacity needs on MD 198 from MD 295 to MD 32. The project will include a four-lane divided roadway with an off-road shared use path, sidewalks and a flyover ramp at the MD 198 interchange with MD 32. (2 to 4 lanes, 2.7 Miles) *Included in Maximize 2045 in Ch.7 - page 6. Phase I, the MD 198/MD 295 partial interchange project, is funded for preliminary engineering and is flowed under this TIP ID. The total cost includes projected funding that will be required to construct the remainder of the corridor improvements. No schedule or funding for the remaining segments has been identified.	N	2034	2040
66-1703-41	MD 32: Linden Church Road to I-70, Capacity & Safety Improvements	SHA	This project will widen MD 32 in both directions from a two lane to a four-lane divided roadway, from just north of the Linden Church Road interchange to just south of the I-70 interchange. The project also includes replacement of the Triadelphia Road bridge over MD 32. (2 to 4 Lanes, 6.6 Miles) *Included in Maximize 2045 in Ch.7 - page 38. This is a design build project and segment II of the MD 32: MD 108 to I-70 Corridor project improvements, which had TIP ID #66-1405-41 in previous TIPs. This is the final phase and contains the funding for the original corridor project planning. Phase 1, MD 108 to Linden Church Road, has TIP ID #66-1602-41. Road improvements are anticipated to be completed in 2022. The remaining funds in FY 2023 will complete right-of-way acquisition.	N	2022	2030

TIP ID	Project Title	Agency	Description	Exempt (Y/N)?	Year of Op	Year for Model
66-1602-41	MD 32: MD 108 to Linden Church Road	SHA	This project will widen MD 32 in both directions, from two lanes to a four lane divided roadway, from MD 108 to Linden Church Road. Right-of-way acquisition will be complete in fiscal year 2021. (2 to 4 lanes, 2.25 miles) This project is segment 1 of the MD 32: MD 108 to I-70 Corridor project that had TIP Reference #66-1405-41 in previous TIPs.	N	2019	2020
66-1406-41	US 29: Middle Patuxent River to Seneca Drive - Phase 2	SHA	Widen the northbound section of US 29 from the Middle Patuxent River to Seneca Drive (Phase 2) from 2 to 3 lanes (1.7 miles). This project includes intersection improvements at Rivers Edge Road. *Included in Maximize 2045 in Ch.7 - page 14.	N	2030	2030
65-1402-41	US 40: MD 7 & MD 159 Intersection Reconstruction - Phase 2	SHA	The project includes widening US 40 from two through lanes to three through lanes in each direction, plus added turn lanes. West bound US 40 widening will extend approximately 2,500 feet west of MD 7. East bound US 40 widening will extend approximately 3,000 feet east to tie into previous widening at the MD 715 interchange. MD 159 will be modified to tie into US 40 eastbound widening. The bridge over Cranberry Run will also be widened. The project is anticipated to be completed in calendar year 2019, fiscal year 2020. (Intersection, 4 to 6 Lanes)	N	2019	2020
61-1404-41	US 50: MD 70 to MD 2	SHA	Project to ease congestion on US 50 from MD 70 to MD 2 (northbound), by restriping lanes on the Severn River/Pearl Harbor Memorial Bridge to accommodate one additional eastbound travel lane for the length of the project. The remainder of the funding for this project will complete right-of-way acquisition. The improvements opened to traffic in May of 2018. (6 to 7 lanes, 1.66 miles)	N	2018	2020

Project Title	Organization	Description	Exempt (Y/N?)	Year of Op
Martin Luther King Jr. Re-Visioning	Baltimore City	Roadway reconstruction and construction of “Complete Street” elements.	Y	2024
Howard Street Bridge	Baltimore City	Replacing the existing bridge which consists of two steel tied arch and six steel girder segments. These span over I-83, John Falls, MTA, AMTRAK, CSX, Falls Road and over a fenced in private lot. Improvements include enhanced bicycle and pedestrian facilities extending to the approaches of both sides of the bridge. No additional traffic capacity changes are being included as part of the project.	Y	2026
Baltimore Street	Baltimore City	Roadway reconstruction using concrete, utility upgrades/replacements, sidewalk reconstruction, ADA improvements, curb and gutter reconstruction, signal upgrades, pavement markings and signing, SWM facilities, landscaping and streetscaping elements	Y	2040
MD 31	Carroll County	Infrastructure improvements and pavement rehabilitation; streetscaping	Y	2040
MD 851	Carroll County	Infrastructure improvements and pavement rehabilitation; streetscaping	Y	2040
Abingdon Road	Harford County	Capacity improvements, including turn lanes, bicycle lanes and sidewalks	Y	2035
MD 152	Harford County	Capacity improvements, including turn lanes and bicycle and pedestrian access where applicable. (2 to 2 lanes)	Y	2025

Project Title	Organization	Description	Exempt (Y/N?)	Year of Op
Transit Signal Priority	Harford County	Construct queue jump lanes along MD 22 and MD 924 and install equipment on the buses that syncs with traffic signals along these corridors	Y	2025
MD 24 (Section G)	Harford County	Resurfacing and reconstruction, including slope repair and guardrail replacement	Y	2032
Broken Land Parkway at Snowden River Parkway	Howard County	Capacity, operational and safety improvements at this signalized intersection as well as access improvements to MD 32 ramps. (Length of project: 0.25 miles)	Y	2030
New MARC Storage and Maintenance Facility	MTA	Alternate location to store MARC Penn Line trains following the implementation of Amtrak's Penn Station Re-development plans which do not accommodate the current storage and maintenance at Penn Station	Y	2035
Penn-Camden Connector	MTA	Provide access to Riverside Yard from Penn Line for locomotive repair and maintenance	Y	2034

Project Title	Jurisdiction/ Agency	Description	Exempt (Y/N?)	Year of Op	Horizon Year for Model
MD 713	Anne Arundel County	**Project:** Widen from 4 to 6 lanes; includes a new interchange at Hanover Road and an extension of Hanover Road from the CSX railroad tracks to MD 170. **Justification:** The project will support economic growth at the Baltimore Washington International Airport. It will relieve congestion and improve freight movement by adding one lane in both directions and develop a key component of the local network with the Hanover Road interchange and extension. **Widening:** 4 to 6 lanes, 2.6 miles	N	2036	2040
MD 175	Anne Arundel County	**Project:** Widen from 4 to 6 lanes; includes reconstruction of MD 175/MD 295 interchange, improvements at MD 32 interchange, and pedestrian/bicycle facilities. **Justification:** The project will support the growth of cyber-security activities at Fort Meade by relieving congestion with added travel lanes, improving traffic operations with access controls in the form of a center median, and supporting multi-modal access to this major employment hub with extensive pedestrian and bicycle facilities. **Widening:** 4 to 6 lanes, 5.2 miles	N	2034	2040
MD 198	Anne Arundel County	**Project:** Widen from 2 to 4 lanes and construct a continuous center median; includes ramp widening at MD 295 and pedestrian/bicycle facilities within project limits. **Justification:** The project will support economic growth at and around Fort Meade by constructing additional travel lanes to reduce congestion and a median that will improve safety. **Widening:** 2 to 4 lanes, 2.7 miles	N	2034	2040
U.S. 50	Anne Arundel County	**Project:** Widen from 6 to 8 lanes. **Justification:** Portions of facility, especially from MD 665 across Severn River Bridge to MD 2, experience recurring congestion. SHA has completed improvements at Severn River Bridge; remainder of funding should be used to address remainder of corridor. **Widening:** 6 to 8 lanes, 5.5 miles	N	2040	2040

Project Title	Jurisdiction/ Agency	Description	Exempt (Y/N?)	Year of Op	Horizon Year for Model
I-97	Anne Arundel County	**Project:** Add managed lanes (HOV lanes) to address capacity needs, investigate need for additional interchange access in Crownsville. **Justification:** I-97 provides a gateway to the City of Annapolis and the Eastern Shore. Bottlenecks occur on the roadway year-round. **Widening:** 4 to 6 lanes, 6.5 miles; full interchange	N	2045	2045
MD 100	Anne Arundel County	**Project:** Widen roadway to accommodate additional traffic and possible inclusion of managed lanes. **Justification:** The Yellow Line Light Rail Study utilized part of Median to run the train. This is a major route connecting Howard County, Anne Arundel County, Arundel Mills and the BWI Airport. It connects Anne Arundel and Howard counties. **Widening:** 4 to 6 lanes, 6.5 miles	N	2045	2045
MD 177	Anne Arundel County	**Project:** Roadway has numerous access points and is near capacity between Jumpers Hole Road and MD 648 which leads to congestion between Jumpers Hole Road and MD 607. **Justification:** The corridor serves local traffic in Pasadena and Glen Burnie as well as long distance commuters traveling to Baltimore and Annapolis. **Widening:** 2 to 4 lanes, MD 177 from MD 2 to Lake Shore Drive, 7.8 miles	N	2045	2045
MD 2	Anne Arundel County	**Project:** Roadway improvements, new premium transit service, new sidewalks, and permitting land use densities that support transit in select locations where redevelopment might occur. The primary road improvement would be to widen the 4 lane sections to 6 lanes throughout. **Justification:** The corridor serves both local traffic in the Annapolis, Severna Park, Pasadena and Glen Burnie areas, as well as long-distance commuter traffic destined for downtown Baltimore. **Widening:** 4 to 6 lanes, U.S. 50 to I-695, 17 miles	N	2045	2045
MD 214	Anne Arundel County	**Project:** Widening from 2 to 4 lanes for most of this corridor (from MD 424 to Selby Boulevard). 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. **Justification:** MD 214 provides an essential link between the Edgewater area to the rest of the County and the Washington D.C. region. It serves local traffic in Edgewater as well as commuters traveling to job centers in Washington D.C., Fort Meade, the NSA, and Annapolis. **Widening:** 2 to 4 lanes, 7.5 miles	N	2045	2045

Project Title	Jurisdiction/ Agency	Description	Exempt (Y/N?)	Year of Op	Horizon Year for Model
MD 3	Anne Arundel County	**Project:** Widen from 4 to 6 lanes from St Stephen Church Road to MD 175 and review upgrade roadway segments, bike/ped facilities (especially crossing) and improve intersection operations. **Justification:** Reduce congestion on MD 3 improving air quality and reducing greenhouse gases. Improves access to Prince George's County, Fort Meade and BWI. **Widening:** 4 to 6 lanes, 4 miles	N	2045	2045
MD 32	Anne Arundel County	**Project:** Widen to 8 lanes between I-95 and MD-295. Add additional HOV-2 lanes. **Justification:** Corridor serves a diverse traffic mix, including local traffic in Savage, Odenton, and Millersville areas, and commuter traffic destined for Ft. Meade, NSA job centers, as well as Annapolis. **Widening:** 6 to 8 lanes, 11 miles	N	2045	2045
MD 713 (Ridge Road)	Anne Arundel County	**Project:** Corridorwide road improvements that include reconstruction and widening, as well as intersection improvements and bike/ped accommodations. Primarily widening MD 713 from 2 to 4 lanes between MD 175 and Stoney Run Drive. **Justification:** The growth in employment and population from planned and future developments along or near MD 713 is expected to result in increased travel demand and recurring congestion. **Widening:** 2 to 4 lanes, 2.6 miles	N	2045	2045
U.S. 50 BRT	Anne Arundel County	Bus Rapid Transit between New Carrollton MARC/Metro station and Parole along U.S. 50. (21 miles)	N	2045	2045
Hanover Street Bridge over Middle Branch	Baltimore City	**Project:** Replace existing 1916 Hanover Street Bridge over Middle Branch **Justification:** This project will increase Quality of Life for the surrounding communities by providing improved accessibility, improved access to jobs, amenities and improved accessibility to wider range of transportation modes such as Transit, bicycle lanes, walking etc. This project spans disadvantaged communities and enhances access to Port Covington development. Signal timing will reduce emissions. **Widening:** 5 to 6 lanes, 0.5 miles	N	2030	2030

Project Title	Jurisdiction/ Agency	Description	Exempt (Y/N?)	Year of Op	Horizon Year for Model
U.S. 40 over Martin Luther King Jr. Boulevard Ramp Removal	Baltimore City	**Project:** Remove the two U.S. 40 bridges over Martin Luther King Jr. Boulevard, reconnecting N Freemont Avenue where it is currently bisected by U.S. 40. Intersection and streetscape improvements on Martin Luther King Jr. Boulevard. **Justification:** Reconnects the communities to the north and south of U.S. 40, while improving the local roadway connectivity. Intersection modifications along MLK Jr. Blvd will focus on safety improvements for pedestrians and cyclists, while increasing multimodal opportunities. **Widening:** Reconnecting N Freemont Ave., 0.5 miles	N	2025	2030
I-695 over U.S. 40 Bridge Replacement	Baltimore County	**Project:** Replace Bridge No. 0312400 on inner and outer loops of I-695 over US 40; reconfigure I-695/US 40 Interchange; widen main line of I-695; add noise and retaining walls. Add fourth lane of traffic over bridge to tie into I-695 – U.S. 40 to MD 144 outer loop widening. Fourth lane will terminate north of U.S. 40. **Justification:** This project will address safety and operations along I-695. The replacement of the I-695 over US 40 Bridge will preserve the existing structure which will be rated "poor" in the next five years. This bridge is a pinch point for capacity improvements along the corridor currently under construction. Improve traffic flow through the interchange. **Widening:** 3 to 4 lanes (one direction)	N	2026	2030
I-695, I-70 to MD 43	Baltimore County	**Project:** Create a new lane of traffic along outside shoulder of inner and outer loops during peak hours. Ramp metering and reconfiguration of I-695 / I-70 interchange. **Justification:** Support mobility and infrastructure stability for the adjacent communities and the greater Baltimore region. **Widening:** 8 to 10 lanes, 18.9 miles	N	2024	2030
MD 140	Baltimore County	**Project:** Widen from 4 to 6 lanes; raised median and outside bicycle lanes. **Justification:** The project will accommodate ongoing development in the area by adding capacity while the construction of a median will manage turning movements and increase safety. **Widening:** 4 to 6 lanes, 0.4 miles	N	2025	2030
MD 140 - Painters Mill Road	Baltimore County	**Project:** Intersection improvements, additional left turn lane, and parallel access roads. **Justification:** Improve mobility through the corridor and improve safety conditions. **Widening:** Additional left turn lane, parallel access roads	N	2025	2030

Project Title	Jurisdiction/ Agency	Description	Exempt (Y/N?)	Year of Op	Horizon Year for Model
MD 7	Baltimore County	**Project:** Capacity, congestion relief and safety (flooding) improvements. Raise existing road and bridge above 100-year floodplain. Provide 6-lane divided section, with 2 through lanes in each direction on MD 7 and double left turns at Mohrs Lane and Campbell Blvd. **Justification:** Improve accessibility and safety for all modes. Support growth in an existing community. **Widening**: 4 to 6 lanes, 0.4 miles	N	2030	2030
MD 7 / MD 43 Interchange	Baltimore County	**Project:** Upgrade from partial to full interchange, including two new ramps to accommodate full movements at interchange. **Justification:** Improve mobility through the corridor. **Widening:** Addition of interchange movements.	N	2030	2030
Paper Mill Road Extension	Baltimore County	**Project:** Extend Paper Mill Road to intersection of York and Shawan Roads. **Justification:** Improve accessibility and safety for all modes. (Road extension, 0.5 miles)	N	2030	2030
Broening Highway / I-695	Baltimore County	**Project:** Construct a full interchange at Exit 44 of I-695 to adequately support redevelopment at Sparrows Point. **Justification:** Improve access to a major activity center. **Capacity:** New interchange	N	2034	2040
I-795	Baltimore County	**Project:** Widen from 4 to 6 lanes. Construct interchange at Dolfield Boulevard. **Justification:** This project would improve access to an existing commercial hub. **Widening:** 4 to 6 lanes, 2.6 miles, full interchange	N	2040	2040
MD 140	Carroll County	**Project:** Widen from 6 to 8 lanes, full interchange at MD 97, Continuous Flow Intersections (CFI) at Center Street and Englar Road **Justification:** The project will widen through traffic lanes and construct intersection and interchange improvements at multiple locations. The project will construct an outside bicycle lane and sidewalk in both directions. **Widening:** 6 to 8 lanes, 2.5 miles, full interchange	N	2045	2045

Project Title	Jurisdiction/ Agency	Description	Exempt (Y/N?)	Year of Op	Horizon Year for Model
MD 140 at MD 91	Carroll County	**Project:** Divided highway with new interchange at MD 91 and intersection improvements, addition of pedestrian and bicycle facilities. **Justification:** This project will support the economic vitality of the community by making this busy intersection safer and more efficient with a grade-separated interchange. **Capacity:** New interchange, 1.9 miles	N	2045	2045
MD 26	Carroll County	**Project:** Widen from 4 to 6 lanes, including bike and pedestrian facilities **Justification:** The addition of a median and partial access controls will improve safety. Pedestrian and bicycle facilities will improve multi-modal access. **Widening:** 4 to 6 lanes, 2.6 miles	N	2044	2045
MD 32	Carroll County	**Project:** Widen from 2 to 4 lanes; addition of pedestrian and bicycle facilities. **Justification:** The addition of two lanes addresses anticipated traffic growth; the construction of a median and access controls will increase safety in the corridor; pedestrian and bicycle facilities will improve multi-modal connections. **Widening:** 2 to 4 lanes, 3.4 miles	N	2045	2045
MD 97	Carroll County	**Project:** Widen from 2 to 5 lanes, including interchange at Meadow Branch Road; construct pedestrian and bicycle facilities. **Justification:** It will support the economic vitality of the community by reducing congestion and improving operations. Regional access multi-modal mobility will be improved. **Widening:** 2 to 5 lanes, 4.7 miles, full interchange	N	2045	2045
MARC Service	Harford County	**Project:** Fill the Northeast Corridor Commuter Rail Gap by providing Commuter Rail Service to Delaware. In addition, provide additional service to Harford County, including reverse commute, late evening service, and weekend service	N	2025	2030
MTA Commuter Bus Service	Harford County	**Project:** Additional MTA Commuter Bus Service from Harford County to Downtown Baltimore, to Harbor East, and a reverse commute route from Baltimore that will serve Aberdeen Proving Ground. Project will also include installing shelters and extending the U.S. 40 Commuter service to connect with Harford Transit.	N	2030	2030

Project Title	Jurisdiction/ Agency	Description	Exempt (Y/N?)	Year of Op	Horizon Year for Model
Perryman East (Road A)	Harford County	**Project:** Construct new 2-lane road in Perryman to handle a bulk of the truck traffic accessing the distribution centers on the peninsula, including turn lanes and bicycle and pedestrian access. **Justification:** This project will improve access, mobility and safety in and out of the Perryman Peninsula for passenger and freight traffic as well as bicyclists and pedestrians. The roadway will be the main access for freight traffic accessing the distribution centers and warehouses on the peninsula. **Widening:** 0 to 2 lanes, 2 miles	N	2025	2030
Aberdeen MARC Station	Harford County	**Project:** Transit Oriented Development (TOD); new train station, additional parking, U.S. 40 "Green Boulevard," and Station Square Plaza - new pedestrian underpass and green, terraced plaza/amphitheater **Justification:** This project will improve service and mobility for current and future riders by addressing capacity, frequency and reliability. **Capacity:** New station	N	2040	2040
MD 22	Harford County	**Project:** Widening of existing 2- and 3-lane sections to 4 and 5 lanes; include an HOV lane from Old Post Road to APG gate, bicycle and pedestrian access, and transit queue jump lanes transit priority system where applicable. **Justification:** The MD 22 corridor is a major east-west arterial in Harford County connecting the municipalities of Bel Air and Aberdeen. The road has an interchange with I-95 and with U.S. 40 and currently has direct access to the main APG gate. **Widening:** 2 to 5 lanes, 7.9 miles	N	2034	2040
MD 24	Harford County	**Project:** Widening from 4 to 6 lanes; includes sidewalks and bicycle accommodations where appropriate **Justification:** Increased traffic volumes continue to stress the roadway network in and around the town of Bel Air. The MD 24 corridor links the Town of Bel Air, Forest Hill and communities in northern Harford County with I-95 and the U.S. 40 corridor. **Widening:** 4 to 6 lanes, 5.5 miles	N	2035	2040

Project Title	Jurisdiction/ Agency	Description	Exempt (Y/N?)	Year of Op	Horizon Year for Model
MD 24 (Rock Spring Road)	Harford County	**Project:** Add a travel lane in each direction, including turn lanes and completion of the shared-use path from Forest Valley Road to Red Pump Road adjacent to the roadway **Justification:** Increased traffic volumes continue to stress the roadway network in and around the Town of Bel Air. This section of roadway is the gateway into the County's growth area from the rural northern Harford County communities. **Widening:** 2 to 4 lanes, 1.8 miles	N	2040	2040
MD 24 at Singer Road Interchange	Harford County	**Project:** 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 as described in the MD 924 Study. **Justification:** The project will reduce congestion, improve safety and operations by transforming the at grade intersection into a grade separated intersection. **Capacity:** New interchange	N	2035	2040
MD 24 at Wheel Road Interchange	Harford County	**Project:** 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 as described in the MD 924 Study. **Justification:** High volume of through-traffic and opposing turns at this busy intersection. **Capacity:** New Interchange	N	2040	2040
MD 543	Harford County	**Project:** Widen from 2 to 4 lanes, including intersection upgrades at MD 136, turn lanes and bicycle and pedestrian access. Improvement includes capacity upgrades to the MD 543 @ I95 interchange. Improvement will fix the queuing problems on MD 543 through the intersection with MD 7. **Justification:** This project will relieve congestion and improve access, capacity, mobility and safety for passenger and freight traffic as well as bicyclists, pedestrians and transit riders. The interchange at I-95 experiences queuing issues which will be addressed with this project. **Widening:** 2 to 4 lanes, 2.2 miles	N	2040	2040

Project Title	Jurisdiction/ Agency	Description	Exempt (Y/N?)	Year of Op	Horizon Year for Model
Thomas Run Road	Harford County	**Project:** Streetscape and capacity improvements, including center turn lane, sidewalks and bicycle accessibility, pedestrian-scale lighting with banners, crosswalks, street furniture, and trash receptacles **Justification:** With the partnership with Towson University and the expected growth and planned expansion, this project will improve safety, mobility and access for passenger traffic, bicyclists and pedestrians in and around Harford Community College. **Widening:** 2 to 3 lanes, 0.8 miles	N	2035	2040
U.S. 40	Harford County	**Project:** Widen from 4 lanes to 6 lanes, including turn lanes and bicycle and pedestrian access. **Justification:** The U.S. 40 project may relieve some of the projected congestion on I-95 by providing local travelers an alternate route. Bicycle and pedestrian improvements are included. **Widening:** 4 to 6 lanes, 1.7 miles	N	2035	2040
U.S. 40 / MD 22 Interchange	Harford County	**Project:** Capacity and safety improvements. Interchange reconstruction (reconfigure existing partial interchange to full interchange to eliminate left turns along MD 22). **Justification:** This project will improve capacity and safety at this interchange for passenger, freight and transit traffic as well as bicyclists and pedestrians. **Capacity:** New interchange movements	N	2035	2040
U.S. 1	Harford County	**Project:** Widen from 4 to 6 lanes, including bicycle and pedestrian accommodations **Justification:** Increased traffic volumes continue to stress the roadway network in and around the Town of Bel Air. U.S. 1 is a major transportation corridor linking Bel Air with northeast Baltimore County. **Widening:** 4 to 6 lanes, 1.3 miles	N	2044	2045
U.S. 1 Bypass	Harford County	**Project:** Widen from 2 to 4 lanes and improve the U.S. 1 @ MD 24 and U.S. 1 @ MD 924 interchanges **Justification:** Increased traffic volumes continue to stress the roadway network in and around the Town of Bel Air. Project will reduce congestion with added capacity. Interchange improvements will improve safety and operations. **Widening:** 2 to 4 lanes, 4.6 miles, partial interchange	N	2044	2045

Project Title	Jurisdiction/ Agency	Description	Exempt (Y/N?)	Year of Op	Horizon Year for Model
MD 100	Howard County	**Project:** Widen MD 100 from I-95 to Anne Arundel County to 6 lanes with auxiliary merge/diverge lanes. **Justification:** MD 100 (east of I-95) daily, especially during peak periods, experiences congestion which negatively impacts commuting, freight/commercial and regional traffic. Negative air quality energy and financial impacts result. Local traffic diverts to the local road network with the commensurate negative impacts. Widening MD 100 east of I-95 will relieve these problems and accommodate progressively increasing demand for this highway. **Widening:** 4 to 6 lanes, 2 miles	N	2030	2030
MD 108	Howard County	**Project:** Implement improvements as articulated in 2014 Clarksville Pike Streetscape Plan and Design Guidelines / Traffic Study. Improvements will include selected road capacity improvements, resulting in a 4-lane section for most of the corridor, but not all, as well as sidewalks, shared-use paths, and traffic signal upgrades. **Justification:** The existing and newly developing commercial land uses along this segment of MD 108 are negatively impacted by the existing MD 108 road design characterized by lack of ped/bike access, congestion and multiple at-grade access points. **Widening:** 2 to 4 lanes, 1.5 miles	N	2035	2040
MD 175 / MD 108 Interchange	Howard County	**Project:** MD 175 @ MD 108-new partial grade separation to allow increased capacity and traffic flow to MD 175 and provide direct access to Gateway Dr and Columbia Gateway employment center. **Justification:** This project would mitigate and reduce impacts at a congested State intersection within the I-95 corridor which experiences a relatively high rate of rear end and sideswipe collisions. Direct access to I-95 as well as Regional Activity Center, Columbia Gateway, will be facilitated for commuters as well as freight. **Capacity:** New Partial Interchange, 0.25 miles	N	2030	2030
Snowden River Parkway	Howard County	**Project:** Design and construct widening of Snowden River Parkway from Oakland Mills Road to Broken Land Parkway, including auxiliary lanes, and pedestrian, bicycle and transit improvements on both sides of the road. **Justification:** This will enhance capacity and safety but will also include significant pedestrian, bicycle and transit improvements. This project will reduce diverted traffic using the local road network. **Widening:** 4 to 6 lanes, 1.1 miles	N	2023	2030

Project Title	Jurisdiction/ Agency	Description	Exempt (Y/N?)	Year of Op	Horizon Year for Model
U.S. 29	Howard County	**Project:** Widen from 2 to 3 lanes in the northbound direction; includes auxiliary lanes and a grade-separated interchange at the Rivers Edge community. **Justification:** The project will relieve congestion by adding one lane in the northbound direction, to match the southbound typical section. The project will improve safety by restricting direct access at the Rivers Edge community with a full grade-separated interchange. **Widening:** 2 to 3 lanes, 1.7 miles	N	2030	2030
Bus Rapid Transit - U.S. 1 Corridor	Howard County	**Project:** Bus Rapid Transit will emulate light rail operations at a lower cost, and is designed to link Howard County commuters from Dorsey MARC to Laurel MARC Station and Laurel and to College Park and Purple Line Light Rail. **Justification:** The project will provide an effective linkage among existing and planned communities along the U.S. 1 corridor. (19.5 miles)	N	2040	2040
Bus Rapid Transit to BWI	Howard County	**Project:** New bus rapid transit service: Dorsey MARC station to Arundel Mills to BWI consolidated rental car facility to BWI light rail station. **Justification:** The project will benefit the region by linking the Baltimore and Washington region more closely together and provide economic, housing, educational and cultural opportunities. (9.7 miles)	N	2040	2040
I-70	Howard County	**Project:** Widen from 4 to 6 lanes; includes reconstruction of I-70 / Marriottsville Road interchange and upgrading of I-70 / U.S. 29 interchange **Justification:** The project will relieve congestion and improve freight movement by adding one lane in both directions and constructing interchange improvements within project limits. **Widening:** 4 to 6 lanes, 6 miles	N	2034	2040
I-95	Howard County	**Project:** Create peak hour shoulder use, MD 32 to MD 100. **Justification:** The project will relieve congestion and improve freight movement. Creating additional merge area at MD 100 and MD 32 entrance ramps will increase safety. **Capacity:** Adding one outside lane in both directions during peak hours. 6 miles.	N	2034	2040
MD 175	Howard County	**Project:** Widening, bicycle, transit and pedestrian improvements consistent with Anne Arundel County widening proposals. **Justification:** This project will enable inter-jurisdictional traffic of all transport modes as well as improve housing, commuting and freight options (to /from Baltimore). **Widening:** 2 to 4 lanes, 1.6 miles	N	2040	2040

Project Title	Jurisdiction/ Agency	Description	Exempt (Y/N?)	Year of Op	Horizon Year for Model
MD 175 / I-95 Interchange	Howard County	**Project:** Design and construct needed improvements to interchange consistent with preferred options in MDOT-SHA MD 175 Improvement Study. **Justification:** Relieve congestion at this grade separation that currently experiences peak period unacceptable levels of service. Facilitate access to affordable housing in U.S. 1 corridor and Columbia. Augment freight movement, both local and regional. Leverage prior federal funding for I-95 and MD 175.. **Capacity:** 8 to 10 lanes, 1 mile, full interchange	N	2040	2040
MD 32	Howard County	**Project:** Safety, capacity, operational, and access improvements on MD 32 north of I-70 consistent with MD SHA Feasibility Study, MD SHA Access Control Study, and Carroll County proposal for widening MD 32 north of this project's limits. **Justification:** This will improve access to lower priced housing in Carroll County as well as commercial operations in both Howard and Carroll Counties. Improved access to jobs with this project will permit Carroll County PFA development to grow including major re-development projects like Springfield State Hospital. This project will be complementary to Carroll County MD 32 widening proposal. **Widening:** 2 to 4 lanes, 4 miles	N	2040	2040
U.S. 1 Revitalization Projects	Howard County	**Project:** U.S. 1 - MD 175 to Whiskey Bottom Road: widening, ped, bike, transit, streetscape and access improvements consistent with U.S. 1 Design Manual (to the extent possible); developer participation with SHA coordination and SHA/County MOU for U.S. 1 revitalization cross section. Breakout project. **Justification:** This project will enable alternate transport modes, provide access to affordable housing options (U.S. 1 Revitalization) and commuting options to employees throughout the region. **Widening:** 4 to 6 lanes	N	2040	2040
U.S. 29 Corridor Bus Rapid Transit	Howard County	**Project:** Bus Rapid Transit (BRT) Ellicott City / Downtown Columbia Transit Center Location (Mall Ring Road) to MD 198 in Montgomery County; Grade-separated facilities in median of U.S. 29. **Justification:** The project will benefit the region by linking the Baltimore and Washington region more closely together to allow greater economic, housing, educational, and cultural opportunities in each region, and address peak hour congestion. (16 miles)	N	2040	2040

Project Title	Jurisdiction/ Agency	Description	Exempt (Y/N?)	Year of Op	Horizon Year for Model
MD 32	Howard County	**Project:** Proposed widening to minimum 3 lanes in each direction (Feasibility and Needs Study required); increased capacity at grade-separations; feasibility of future HOV and/or HOT lanes; improved freight operations and access to Regional Activity Centers. **Justification:** Facilitate inter-county commuting and reduce inter-county congestion. Facilitate diversion of commuter traffic off local roads and reduce congestion-related emissions **Widening:** 4 to 6 lanes, 8 miles	N	2045	2045
U.S. 1	Howard County	**Project:** Widen from 4 to 6 lanes; construct typical section as defined in State/County MOU for U.S. 1 revitalization **Justification:** This project will support commercial revitalization of the U.S. 1 corridor by relieving congestion with additional travel lanes and constructing pedestrian/bicycle facilities that support commercial growth. **Widening:** 4 to 6 lanes, 11 miles	N	2045	2045
U.S. 1 / MD 175 Interchange	Howard County	**Project:** Construct a new grade-separated interchange **Justification:** This project will support commercial revitalization of the U.S. 1 corridor by relieving congestion with a grade separated interchange, which also improves safety by removing at grade turning movements. **Capacity:** New Interchange, 0.5 miles	N	2045	2045
I-95: Port Covington Access Improvements	MdTA	Improve I-95 ramps along approximately 7 miles of I-95 and sections of Hanover Street, McComas Street, and Key Highway. Improvements include new ramps, ramp removal, ramp realignment, reconstruction of Hanover Street, realignment of McComas Street; widening of Key Highway between McHenry Row and McComas Street, and pedestrian and bicycle connections.	N	2029	2030
I-95: Section 100	MdTA	Construct ramps for interchanges at I-695 and MD 43	N	2025	2030
I-95: Section 200	MdTA	Construct express toll lanes north of MD 43 to north of MD 22; and MD 152, MD 24, MD 543, MD 22 interchanges	N	2026	2030

Project Title	Jurisdiction/ Agency	Description	Exempt (Y/N?)	Year of Op	Horizon Year for Model
BaltimoreLink Bus Expansion Program - Phase 1	MTA	Purchase of buses to meet increasing ridership demands beyond replacement needs.	N	2034	2040
BaltimoreLink Bus Expansion Program - Phase 2	MTA	Purchase of buses to meet increasing ridership demands beyond replacement needs.	N	2045	2045
West Baltimore MARC Station Relocation	MTA	Relocate existing West Baltimore MARC Station farther south. This will be consistent with the construction of the new B&P Tunnel and much needed ADA accessibility improvements.	N	2045	2045
MD 18	Queen Anne's County	**Project:** Widen from 2 to 4 lanes, including ROW acquisition, utility relocation, new pedestrian improvements, and reconstruction of intersections to improve capacity, safety, and mobility on the only alternative route to U.S. 50/301 on the island. **Justification:** Widening MD 18 to add capacity, improve safety and maintain mobility as volumes and congestion on U.S. 50/301 increase is vital to the to the transportation system while MDOT is planning for additional capacity for crossing the Chesapeake Bay. **Widening:** 2 to 4 lanes, 5.0 miles	N	2025	2030
MD 8 / U.S. 50/301 Interchange and Service Roads	Queen Anne's County	**Project:** Widen from 2 to 4 lanes, convert MD 8 overpass to divergent diamond, interchange with U.S.50/301, and add Thompson Creek and Cox Creek service roads to improve traffic flow, add capacity and allow for alternative routes to services and residential areas. Provide for bike and pedestrian improvements along existing and new routes. **Justification:** MD 8 is predominately a 2 lane road that serves as the only access to a 10 mile residential peninsula on Southern Kent Island. The widening of the northern sections of Route 8 and reconstruction of the existing overpass will add capacity, improve safety, reduce congestion and allow for pedestrian and bike access in the corridor. **Widening:** 2 to 4 lanes; interchange conversion, Thompson Creek Service Road is 7.9 miles.	N	2025	2030

Appendix D: Round 9 Cooperative Forecasts

Attachment 1

Local Jurisdiction Submissions: Round 9
Cooperative Forecasts – Population, Household and Employment Controls

Table 1: Round 9 Population

Jurisdiction	2015	2020	2025	2030	2035	2040	2045
Anne Arundel Co	562,867	572,340	582,566	594,303	608,928	621,771	643,978
Baltimore City	615,813	617,018	626,989	627,904	636,723	648,033	647,127
Baltimore Co	827,758	840,644	846,323	864,974	879,955	893,540	907,126
Carroll Co	167,550	169,200	171,700	175,150	178,500	181,800	185,150
Harford Co	250,025	257,680	264,870	271,865	280,570	289,220	294,250
Howard Co	313,359	336,920	355,696	366,818	369,499	371,846	372,358
Queen Anne's Co	48,477	51,813	55,434	58,319	61,021	63,533	66,148
Baltimore Region	2,785,850	2,845,615	2,903,578	2,959,332	3,015,195	3,069,744	3,116,137

Round 9 Population Changes

Change				Percent Change			
2015-2025	2025-2035	2035-2045	2015-2045	2015-2025	2025-2035	2035-2045	2015-2045
19,698	26,362	35,051	81,111	3.5%	4.5%	5.8%	14.4%
11,176	9,733	10,405	31,314	1.8%	1.6%	1.6%	5.1%
18,565	33,632	27,171	79,368	2.2%	4.0%	3.1%	9.6%
4,150	6,800	6,650	17,600	2.5%	4.0%	3.7%	10.5%
14,844	15,700	13,680	44,224	5.9%	5.9%	4.9%	17.7%
42,337	13,803	2,859	58,999	13.5%	3.9%	0.8%	18.8%
6,957	5,588	5,127	17,671	14.4%	10.1%	8.4%	36.5%
117,728	111,617	100,942	330,287	4.2%	3.8%	3.3%	11.9%

Note: Anne Arundel County data include the City of Annapolis

Table 2: Round 9 Households

Jurisdiction	2015	2020	2025	2030	2035	2040	2045
Anne Arundel Co	207,338	210,959	217,565	224,575	231,253	237,951	244,998
Baltimore City	250,238	254,557	259,667	262,988	269,119	271,327	273,363
Baltimore Co	322,738	327,457	329,940	337,410	343,323	348,565	353,808
Carroll Co	61,045	62,667	64,394	66,522	67,975	69,118	70,332
Harford Co	93,362	97,241	101,021	104,801	108,590	112,380	114,752
Howard Co	111,753	121,499	130,432	136,125	138,782	139,686	139,851
Queen Anne's Co	18,645	20,355	22,068	23,413	24,705	25,735	26,807
Baltimore Region	1,065,119	1,094,736	1,125,087	1,155,835	1,183,748	1,204,762	1,223,910

Round 9 Household Changes

Change				Percent Change			
2015-2025	2025-2035	2035-2045	2015-2045	2015-2025	2025-2035	2035-2045	2015-2045
10,227	13,689	13,745	37,660	4.9%	6.3%	5.9%	18.2%
9,429	9,452	4,244	23,124	3.8%	3.6%	1.6%	9.2%
7,202	13,383	10,484	31,070	2.2%	4.1%	3.1%	9.6%
3,350	3,581	2,357	9,288	5.5%	5.6%	3.5%	15.2%
7,658	7,570	6,161	21,389	8.2%	7.5%	5.7%	22.9%
18,679	8,350	1,069	28,098	16.7%	6.4%	0.8%	25.1%
3,423	2,637	2,102	8,162	18.4%	11.9%	8.5%	43.8%
59,968	58,661	40,162	158,791	5.6%	5.2%	3.4%	14.9%

Note: Anne Arundel County data include the City of Annapolis

Table 3: Round 9 Total Employment

Jurisdiction	2015	2020	2025	2030	2035	2040	2045
Anne Arundel Co	369,580	382,795	397,236	413,039	431,305	451,373	474,511
Baltimore City	401,082	418,102	436,252	454,948	466,906	485,731	505,068
Baltimore Co	462,770	479,680	500,515	515,752	528,684	540,935	550,843
Carroll Co	74,313	77,411	79,760	82,268	84,419	86,815	89,281
Harford Co	115,560	125,454	136,745	147,685	158,761	170,668	183,468
Howard Co	204,050	219,050	234,050	249,050	259,050	269,050	279,050
Queen Anne's Co	20,748	22,454	24,251	24,790	25,778	26,406	27,050
Baltimore Region	1,648,103	1,724,946	1,808,811	1,887,531	1,954,902	2,030,979	2,109,271

Round 9 Total Employment Changes

Change				Percent Change			
2015-2025	2025-2035	2035-2045	2015-2045	2015-2025	2025-2035	2035-2045	2015-2045
27,657	34,069	43,206	104,931	7.5%	8.6%	10.0%	28.4%
35,170	30,654	38,162	103,986	8.8%	7.0%	8.2%	25.9%
37,745	28,168	22,159	88,073	8.2%	5.6%	4.2%	19.0%
5,447	4,658	4,862	14,968	7.3%	5.8%	5.8%	20.1%
21,185	22,015	24,707	67,908	18.3%	16.1%	15.6%	58.8%
30,000	25,000	20,000	75,000	14.7%	10.7%	7.7%	36.8%
3,503	1,527	1,273	6,303	16.9%	6.3%	4.9%	30.4%
160,708	146,092	154,369	461,168	9.8%	8.1%	7.9%	28.0%

Note: Anne Arundel County data include the City of Annapolis

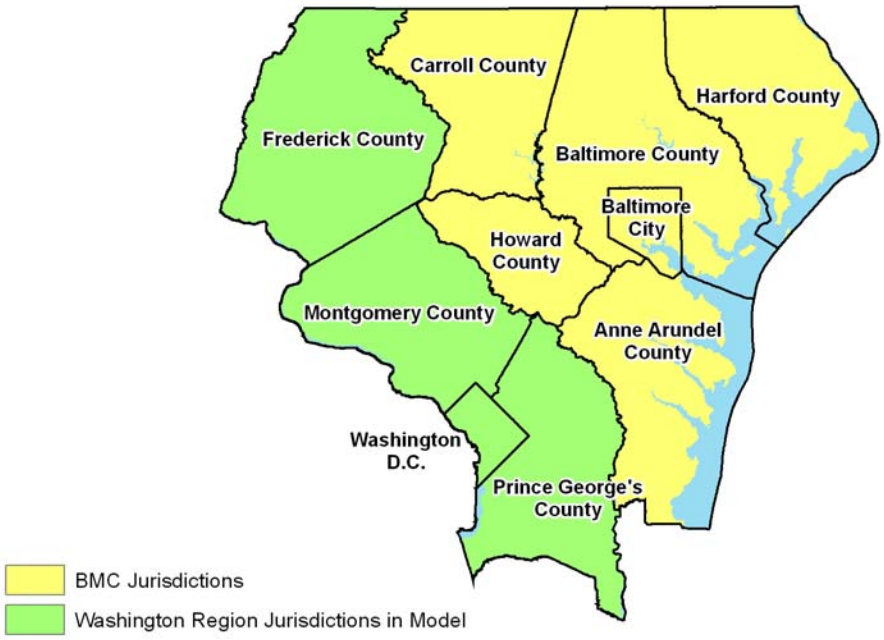
Appendix E: *Excerpt: Introduction, Baltimore Region Travel Demand Model Version 4.4 – Model Validation for 2010 Base Year*

1 Introduction

1.1 Model Overview

The Baltimore Metropolitan Council (BMC) had been charged by the Baltimore Regional Transportation Board (BRTB), the designated Metropolitan Planning Organization for the Baltimore region, to develop a computerized transportation model which can simulate person transportation demand and vehicle flows on the regional highway and transit system. The region consists of Baltimore City and the counties of Anne Arundel, Baltimore, Carroll, Harford, and Howard, all in the State of Maryland. Also included in the model, although in less detail, are the Maryland counties of Prince George's, Montgomery, and Frederick as well as the District of Columbia. See Exhibit I-1 for a map of the Baltimore region and the model area.

Exhibit I-1
The Baltimore Region and Model Region



This report documents the results of the completed model revalidation procedure. The updated model validation year is 2010 and is based on Version 4.4 Baltimore Region Travel Demand Model[1] with the validation year 2000.

The year 2010 was chosen as the validation base year because:

- Household Survey Data were available for year 2007-2008
- Transit on-board survey were available for year: 2008
- Traffic Counts were available for 2009-2011
- Decennial Census and American Community Survey data were available for 2010

The Baltimore region travel model is a "four step" trip-based model that utilizes demographic and travel data aggregated to the traffic analysis zone level. The model is applied using the Cube Voyager software package, specifically version 08/05/2014 [6.1.1] of Cube Voyager. The entire model is controlled by one setup file (a.k.a. "driver" or "script" file). A specific file naming convention and directory structure have been established to facilitate applying the model to different scenarios, and for creating new scenarios. A user interface has been created in Cube to assist the end user in starting and running the model.

1.2 Trip Purposes

To represent different travel characteristics throughout the model, trips are divided into various purposes. Table I-1 illustrates the trip purposes defined in the BMC model.

[1] *Travel Demand Model Calibration Report, Prepared for Maryland Transit Administration (MTA), Baltimore, MD, Prepared by William G. Allen, August 2006*

Table I-1
Trip Purposes

Purpose	Abbre-viation	Description
Home-based Work	HBW	Direct trips between home and work locations
Home-based School	SCH	Direct trips for students between home and school (grades K-12)
Home-based Shop	HBS	Direct trips between home and shopping locations
Home-based Other	HBO	All other trips having one end at the home location
Journey to Work	JTW	Trips with one end at the tripmaker's work location which is part of a chain of trips that start or end at a location other than the work location
Journey at Work	JAW	Trips with one end at the tripmaker's work location which is part of a chain of trips that start or end at the same work location
Other-based Other	OBO	Trips of a personal nature within the region not covered by the above categories
Commercial Vehicles	CV	Trips by passenger car, van, or pickup trip that are of a commercial or service nature, *e.g.*, plumbers, police cars, taxicabs, repair services
Medium Trucks	MT	Trips by vehicles with two axles and six tires
Heavy Trucks	HT	Trips by vehicles with more than two axles and six tires
Internal-External Work	IXW	HBW or JTW trips that originate within the model region and terminate outside it
External- Internal Work	XIW	HBW or JTW trips that originate outside the model region and terminate within it
Internal-External Non-Work	IXN	SCH, HBS, HBO, JAW, or OBO trips that originate within the model region and terminate outside it
External- Internal Non-Work	XIN	SCH, HBS, HBO, JAW, or OBO trips that originate outside the model region and terminate within it
Internal-External Commercial Vehicles	IXC	CV trips that originate within the model region and terminate outside it

Purpose	Abbre-viation	Description
External-Internal Commercial Vehicles	XIC	CV trips that originate outside the model region and terminate within it
Internal-External Medium Trucks	IXM	MT trips that originate within the model region and terminate outside it
External-Internal Medium Trucks	XIM	MT trips that originate outside the model region and terminate within it
Internal-External Heavy Trucks	IXH	HT trips that originate within the model region and terminate outside it
External-Internal Heavy Trucks	XIH	HT trips that originate outside the model region and terminate within it
Through Trips Passenger Cars	XXPC	Passenger car trips that simply pass through the region without stopping
Through Trips Commercial Vehicles	XXCV	CV trips that simply pass through the region without stopping
Through Trips Medium Trucks	XXMT	MT trips that simply pass through the region without stopping
Through Trips Heavy Trucks	XXHT	HT trips that simply pass through the region without stopping

Trip purposes are generated on the basis of Productions and Attractions (P&A). For home-based purposes, the home end is always the production end of the trip, while the attraction end is always the non-home location. Thus, for a round trip directly from home to work and then directly back home at the end of the work day, there are two trip productions at the home location and two trip attractions at the workplace, despite the different direction of travel between the two trips. These trip productions and attractions are "balanced" and converted to origins and destinations (O&D) only before the trips are assigned to the highway network in the Trip Assignment step. Transit trips remain in P&A format for transit assignment.

JTW, JAW, and OBO trips are often called Non-Home-Based (NHB) trips. While these trips are produced at the home end, that zone is often not where the trip starts

and stops. Trip attractions are scaled to match the productions, but then productions are set equal to the scaled attractions as these trips become O&D.

Persons who do not live in the model region but come to the region for work or other activities can make NHB trips within the region which are not reflected in the Household Travel Survey (HTS). The model has its own procedure for calculating these non-resident NHB trips.

1.3 Area Type

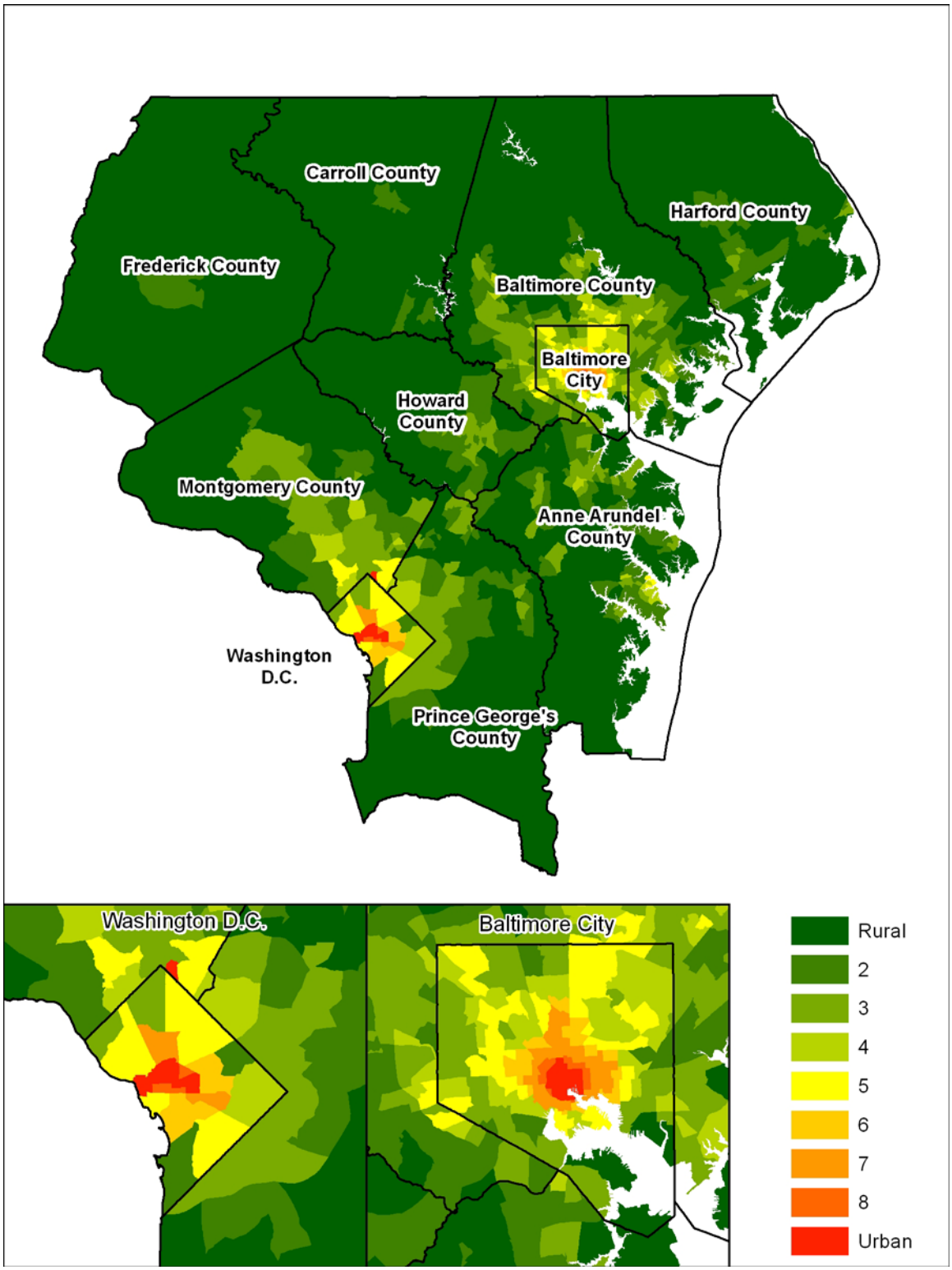
The area type model utilizes employment and household densities to develop a single density factor for each zone. The calculated area type indices are utilized to estimate non-motorized trips, to estimate Mode Choice and to estimate speed-capacity for highway network. To capture the effect of neighboring areas, for each zone, the number of households and employment for that zone plus zones with centroids within a mile of the centroid of the zone in question are aggregated. These totals are then divided by the corresponding number of acres to develop household and employment density. The lookup table shown in Table I-2 is used to develop an overall area type value, ranging from 1 as the most rural to 9 as the most urban.

Table I-2
Area Type Lookup Table

Empl/ Acre	Households/Acre									
	< 0.5	**0.5-1.0**	**1.0-1.5**	**1.5-2.25**	**2.25-3.0**	**3.0-4.0**	**4.0-5.0**	**5.0-7.5**	**7.5-11**	**> 11**
< 1.5	1	1	2	2	3	3	4	4	5	6
1.5-3.5	1	1	2	2	3	3	4	5	6	6
3.5-6.5	1	1	2	2	3	3	4	5	6	6
6.5-12	1	2	2	3	3	4	4	5	6	7
12-20	1	2	3	3	4	4	5	6	7	7
20-30	2	3	4	4	5	5	5	6	7	7
30-45	3	4	4	5	5	6	6	7	7	8
45-70	3	4	4	5	5	6	7	7	8	8
70-110	4	4	5	6	6	7	8	8	9	9
> 110	4	5	6	7	7	8	9	9	9	9

Exhibit I-2 shows the year 2008 area types by zone.

Exhibit I-2
2008 Area Types



1.4 Validation Methodology

When setting a new base year, a model can be validated by using the model's latest set of highway and transit networks and socioeconomic inputs for a particular year and comparing the results to real world data. BMC uses survey data to compare with the results at various stages in the running of the model, while comparisons with actual traffic counts at the end provide an additional check.

A second characteristic of a good model is the ability to forecast future year conditions, with appropriate elasticities, considering the types of policies and investments that will be evaluated using the model. Maintaining the appropriate sensitivities should not be sacrificed to the goal of achieving perfect replication of the base condition.

Model validation requires a thorough examination of model results to ensure travel model ability to replicate the base year travel condition as well as its transferability to forecast future travel scenarios. In general, model validation process is guided by the principle of a balancing act between calibrating model parameters to replicate base year conditions within acceptable range of error and maintaining the models flexibility of forecasting capability.

Once all data have been gathered and the model has been run successfully, the analysis of the results can determine the model's validity.

Appendix F: HPMS Adjustment Factors

HPMS Adjustment Factors by Jurisdiction

		Interstate	*Freeway*	*Principal Arterial*	*Minor Arterial*	*Collector*
Urban	Baltimore City	1.2543	1.5003	1.0245	1.2992	4.1867
	Anne Arundel	0.9288	1.1605	1.0125	1.1255	1.2142
	Baltimore	1.0474	1.2908	0.9324	1.3765	1.5086
	Carroll	0.6378	0.6378	1.0475	0.6198	0.6225
	Harford	1.0982	1.7763	1.2029	1.2831	1.3496
	Howard	0.8744	1.1399	0.8845	1.1818	0.9793
Rural	Baltimore City	1.2543		1.0245	1.2992	4.1867
	Anne Arundel	0.8623		1.1151	1.0529	1.0559
	Baltimore	0.8961		0.9142	0.7131	0.9988
	Carroll	0.6378		0.6055	0.9427	0.8544
	Harford	1.0773		0.9055	1.0038	1.1186
	Howard	0.6385		1.2202	0.5617	0.7479

Local to Non-local Ratios by Jurisdiction

Jurisdiction	*Urban*	*Rural*
Baltimore City	0.0774	0.0774
Anne Arundel	0.0768	0.1409
Baltimore	0.0774	0.1402
Carroll	0.0775	0.1265
Harford	0.0777	0.1364
Howard	0.0765	0.1394

Appendix G: Resolutions

Resolutions will be added to the final report.

Appendix H: Public Participation

[This appendix will be available in the Final Conformity Determination.]

Appendix I: Description of Emission Reduction Strategies

This appendix provides descriptions of the key categories of emission reduction strategies used in the Baltimore region and the status of implementation of those strategies. The categories of strategies covered in this appendix include Commuter Assistance Activities, Bicycle/Pedestrian Activities, Park-and-Ride Programs/Lots, Public Transit Services, Management and Operations Projects, Preferential Parking Management, and Clean Vehicles, Fuels and Technologies. These categories are used for organizational purposes and do not relate directly to any particular legislative or funding areas.

COMMUTER ASSISTANCE ACTIVITIES

Rideshare Program

The Rideshare Program, a continuing state-wide program since 1978, is administered by Maryland Department of Transportation Maryland Transit Administration that provides funding support to local rideshare programs in order to strengthen carpool/vanpool matching and Transportation Demand Management (TDM) services at the jurisdictional level. The Baltimore Metropolitan Council (BMC) provides ridesharing coordination services for Baltimore and Carroll Counties. Through the Rideshare program, the following rideshare services are provided:

- Carpooling/vanpool/trip matching to interested commuters via the Commuter Connections Database.
- TDM information to commuters and employers.
- Assistance with identifying opportunities for alternative commuting strategies such as transit, flexible work hours, and teleworking for both commuters and employers.
- Printed and electronic information is distributed to both public and private employers.
- Advertisements in newspapers, regional magazines, radio, television, and online to encourage ridesharing.
- Clean Commute activities, Bike to Work Day, and the MTA Commuter Choice discount transit fare program are both organized and promoted.
- The Regional Guaranteed Ride Home program is promoted to both employers and commuters.
- The Regional School Pool program is promoted, which matches students (through their parents' registration) for carpool, bike convoy and pedestrian group matching within member schools.

Commuter Choice Maryland and the Maryland Commuter Tax Credit

The Commuter Choice Maryland commuter benefits program is an incentive designed primarily to encourage Maryland employees who drive to work to switch to transit or vanpools. It has a membership of approximately 375 employers and 18,000 employees. The program provides employers with monthly pass distribution options which encourage employees to ride MTA Buses, Light Rail, Metro Subway, MARC trains or qualified vanpools to work for less than full fare.

Employers are also rewarded with special state tax deductions, state tax credits, and savings on certain payroll taxes.

The Maryland Commuter Tax Credit allows Maryland-based employers to claim a 50% state tax credit for providing tax-free commuter benefits to an employee and are eligible to receive a maximum tax credit of $50 per month per participating employee. Private, non-profit organizations are also able to participate in the program. Maryland employers are able to claim tax credits for providing transit passes and vouchers, as well as for setting up a Guaranteed Ride Home, Cash In Lieu of Parking, Bike Commute Benefits, or Vanpooling programs. Carpooling is not an eligible expense under the program. Employers must register annually to participate in the Maryland Commuter Tax Credit program. This feature of Maryland law has the potential to reduce single occupancy vehicle use, increase transit ridership, reduce traffic congestion, and improve air quality. Details are available at www.commuterchoicemaryland.com.

Clean Commuting Outreach

The BRTB teams up annually with state transportation and air quality agencies as well as private organizations to promote clean commuting during its Clean Commute Initiative. The program originally began as a weeklong initiative, expanded in 2003 to a month-long program, and now covers events throughout multiple months during the "clean commuting season" from May to September. Every year, BMC asks residents of the Baltimore region to try an alternative to driving alone for at least one day during "clean commuting season." In 2018, promotion began in early April with a number of outreach events throughout the region. Events continued through May, and included the 21st edition of Bike to Work Day on May 18th. Participation in Bike to Work Day has increased steadily in recent years; although, 2018 saw a dip in ridership—1866 vs. 2200 in 2017—attributed to unusually wet and cool spring weather. Many local businesses and organizations donate prizes for registered participants. Bike to Work Day, a true region-wide initiative, featured *pit stops* in Annapolis, Baltimore City, Baltimore County, Carroll County, Harford County, and Howard County.

The 2018 Clean Commute Initiative also featured a paid media campaign, sponsored by the BRTB, which supported Bike to Work Day with radio spots running in April and May on the *I Heart Radio* cluster of stations. In addition, a website, www.cleancommute.com, provided information about related events, Bike to Work Day, and other commuting issues.

In addition to the Clean Commute Initiative, MDE, MDOT, MTA, and other organizations reach out to employers to encourage voluntary participation in alternate commute options such as telework, flexible work arrangements, and guaranteed ride home.

Clean Air Partners - Episodic Control Program

The Clean Air Partners program is a public/private partnership, founded by BMC and MWCOG. Its goal is to improve air quality in both the Baltimore and Washington regions by motivating individuals and organizations to take voluntary actions to reduce emissions. BMC, in cooperation with MDE, MDOT, MWCOG, and numerous other public and private sector entities, works with area employers to develop voluntary programs that both help reduce emissions and educate their employees about the health effects of air pollution.

In FY 2018, Clean Air Partners conducted aggressive social media campaigns, as well as public relations efforts, in both the Baltimore and Washington markets. Clean Air Partners staff members conducted press interviews in both Baltimore and Washington. The Partnership has

worked hard to nurture a relationship with reporters in both markets. This effort has paid off with accurate and positive press coverage, raising awareness of both the problem and the Clean Air Partners organization.

Clean Air Partners produced updated educational materials, including information on $PM_{2.5}$, climate change, and ground-level ozone, for use in its middle school education program. That program reaches hundreds of students in Baltimore, DC, and Northern Virginia. Clean Air Partners also improved its web site, www.cleanairpartners.net, and worked to upgrade its air quality awareness efforts, by providing better communication with the people in the Baltimore/Washington air shed. Clean Air Partners has also worked with MDE, as well as agencies in DC and Northern Virginia, to improve both air quality forecasting and communicating those forecasts.

Clean Air Partners continues to be a sponsor of BMC's annual Clean Commute Initiative, especially Bike to Work Day, which raises awareness of the relationship between transportation choices and air quality and promotes alternatives to the use of single occupant vehicles.

Telework

The promotion of teleworking is a strategy to reduce traffic congestion and air pollution in the Baltimore region. BMC directs employers in the region—typically through the Clean Commute program—to a branded website, ***Teleworkbaltimore.com*****,** where they are able to download all of the information and materials needed to launch telework programs within their organizations. In return for gaining access to the information, BMC asks employers to register for tracking purposes.

Guaranteed Ride Home Program

In October 2010, the Washington D.C. metropolitan area Guaranteed Ride Home program was expanded to cover the Baltimore region, St. Mary's County, and Cecil County. This program, provided by Commuter Connections, MDOT, and MTA, provides a free ride home to commuters who carpool, vanpool, bike, walk or take transit to work at least twice a week. Those who register for this program can take advantage of it up to four times annually. It can be used for unexpected personal illness, sick children, household emergency, or employer-mandated unscheduled overtime. MDOT MTA and local rideshare coordinators provide marketing for Guaranteed Ride Home.

Reduced Fare Passes

Programs that reduce transit fares help to encourage greater usage of transit, thereby reducing pollution from private automobiles. One of these reduced transit fare programs is MTA's All Access College Transit Pass program. It reduces the cost of a regular monthly pass to $50 for college students in certain enrolled schools. There are 22 schools in the Baltimore area currently enrolled. Additional information on this program can be found at mta.maryland.gov/youth-innovation-all-access-college-transit-pass.

Another reduced fare program from MTA is the Reduced Fare CharmCard®, available to seniors and persons with disabilities. For more information, visit www.mta.maryland.gov.

Car Sharing

Car sharing availability in the Baltimore region includes multiple options, the largest of which is the Zipcar program in Baltimore City. Zipcar offers nearly 200 vehicles, including over 60 vehicles in parking spots allocated through an agreement with the Parking Authority of Baltimore City. Zipcar has a considerable presence in Charles Village, Fells Point, Mt. Vernon, the Central Business District, Station North, JHU Homewood, and other Baltimore neighborhoods. The cars can be reserved online, over the phone, or with a mobile app. Studies show that when people have the ability to rent a car just for the few hours they need it, they are more likely to eliminate one or more of their cars. This is especially the case if they have access to transit and live in bikeable and walkable neighborhoods.

A new car sharing service, started by GM in 2017, is Maven. This service has 40 cars that are available to rent at 20 different locations in Baltimore City. Because of the efficiency of shared car systems, members drive fewer miles on average and emit fewer airborne pollutants. They also tend to take advantage of other cleaner forms of transportation such as walking, biking, and riding mass transit. In a survey conducted by Zipcar in Baltimore during 2018, 74 percent of respondents do not own a car and 55% postponed purchasing a vehicle because of the availability of Zipcar.

BICYCLE/PEDESTRIAN ACTIVITIES

In each jurisdiction, local efforts continue to accommodate bicyclists and pedestrians. The Maryland Department of Transportation also continues similar efforts. The following governmental agencies in the Baltimore region have created bicycle and pedestrian master plans. Through these master plans, agencies can work to develop this key part of a multi-modal transportation network.

Agency	Plan Name	Status
Maryland Department of Transportation	*Maryland Twenty-Year Bicycle and Pedestrian Master Plan*	Completed in 2014 with a draft update finished in 2018
City of Annapolis	*Annapolis Bike Plan*	Adopted in 2012
Baltimore City	*Bicycle Master Plan*	Adopted in 2015
Baltimore County	*Phase I: Eastern County Bicycle & Pedestrian Plan*	Adopted in 2006
	Phase II: Western County Bicycle & Pedestrian Plan	Adopted in 2012
	Phase III: Rural County Pedestrian and Bicycle Access Plan	Future phase
Anne Arundel County	*Pedestrian & Bicycle Functional Master Plan*	Completed in 2013
Carroll County	*Freedom Area Bicycle and Pedestrian Master Plan*	Completed in 2013
	Bicycle-Pedestrian Master Plan	In process of developing
Harford County	*Bicycle & Pedestrian Master Plan*	Adopted in 2013
Howard County	*Pedestrian Master Plan*	Completed in 2007; Draft update completed in 2017
	Bicycle Master Plan	Adopted in 2016

In Baltimore City, efforts to improve bicycle access in the City have increased bike use. Bicycle counts indicate a 50% increase in bicycle commuter traffic in the past four years.

As policy, MDOT includes bicycling and walking accommodations in all of its projects, wherever possible. Several programs were recently launched that direct additional funding to walking and biking. In 2012, the Maryland Bikeways program was launched. $310,000 in projects that will benefit the Baltimore region were selected for funding in 2018, the sixth year of Bikeways funding. The bikeways program will provide needed funding to implement the Statewide Trails Plan and the 20 Year Bicycle and Pedestrian Master Plan. It will provide missing links in the statewide trails and bikeways network by connecting and extending on-road and off-road bicycle facilities.

MTA has had bicycle racks on all of its transit buses serving the Baltimore region since September 2008.

In addition, all MARC Penn Line weekend trains running between Baltimore and Washington D.C., and most weekday trains are equipped with a bike car which accommodates full size bicycles. (See Figure 1) These bike cars provide another option to driving solo. Combining bicycling with transit use may provide a reasonable alternative to driving, one that may not be possible if a traveler considers only bicycling or transit as a travel option.

In *Maximize 2040*, the long-range transportation plan for the Baltimore region, 21 of the 46 projects add pedestrian and bicycle improvements to either roadways or to new or existing transit stations. The BRTB has set aside $155 million for Complete Streets / bicycle-pedestrian projects.

The BMC, on behalf of the BRTB, promotes bicycling and walking through the following mechanisms:

- Bicycling and Pedestrian Advisory Group (BPAG) is hosted, staffed, and supported by BMC. Its members advise the BRTB's Technical Committee on important bicycle and pedestrian issues.
- Periodic articles in COG Quarterly, BMC's public newsletter, inform people in the region on bicycling and pedestrian matters.
- Annual Bike to Work Day, a BMC-coordinated region-wide event with approximately 2,000 registrants. Bike to Work Day "rallies" or "pit stops" are held in each jurisdiction, with additional employer-based events.

PARK-AND-RIDE PROGRAMS/LOTS

BMC completed the first comprehensive study of park-and-ride facilities in the Baltimore region in June 2002. This study quantified the utilization of the 105 lots throughout the region, and documented the travel behavior characteristics of lot users, including mode of travel as well as travel origins and destinations. The study also defined the service areas of individual lots.

Information gathered in the study has permitted the BMC to more accurately estimate the emission reduction potential of existing and planned park-and-ride facilities. Information from this study has also been used to further quantify elements of the regional travel demand model, and to assist in planning future park-and-ride lots.

State/Federal-funded

The Maryland State Highway Administration (SHA) has assessed their park-and-ride facilities. Usage of SHA park-and-ride facilities in 2017 is estimated at 44 percent across the region, compared with 46 percent in 2016. The most parking spaces are provided in Anne Arundel and Howard Counties. Howard County usage is slightly lower from 2016. The percentage drop from 50 to 48 percent. The table below displays information on these lots from 2017. A substantial amount of VMT is reduced every year as a result of park-and-ride lots in the Baltimore region. SHA lots only account for a portion of park-and-ride lots in the region.

SHA Park-and-Ride Facilities 2017

County	Lots	Spaces	Percent Use
Anne Arundel	8	2,060	55
Baltimore	9	1,133	34
Carroll	7	453	44
Harford	12	1,211	39
Howard	8	1,899	48
Regional Total	***44***	***6,756***	**44**

PUBLIC TRANSIT SERVICES

The Baltimore region is served by an array of bus and rail transportation services. This section addresses both bus and rail transportation in the Baltimore region.

Bus Transit

The MDOT MTA operates a far-reaching system of bus services. The size of MDOT MTA's bus fleet is constantly changing the delivery and retirement of buses, and is approximately 765 buses, including approximately 400- hybrid electric buses. Most of the bus routes serve areas within the Baltimore beltway, connecting the region's suburbs to downtown and neighborhoods within the downtown area. MDOT MTA's BaltimoreLink bus service has 65 bus routes, which include the following.

- **CityLink**: 12 color-coded, high-frequency bus routes connect with each other, as well as Metro SubwayLink, Light RailLink, MARC Train, Commuter Bus, and other services such as Greyhound, Amtrak, and university shuttles, creating a single integrated transit network.
- **LocalLink**: 44 local bus routes provide comprehensive crosstown connections and system-wide connectivity to neighborhoods and communities.
- **Express BusLink**: Express BusLink consists of 9 express bus routes that provide suburb-to-city and suburb-to-suburb connections. Typically, express bus routes have fewer stops, use higher speed roadways, and operate during peak hours.
- **Commuter Bus:** Commuter bus service provides an express transit connection from suburban, residential areas to the Baltimore and Washington, D.C. regions. Commuter bus

service uses coach vehicles and typically comprise longer trips than Express BusLink routes. 31 routes operate throughout Central and Southern Maryland and 7 routes operate in the Baltimore region.

- **Locally-Operated Transit Systems:** In addition to the transit services operated by MDOT MTA, seven locally-operated transit systems exist in the Baltimore region. Locally-operated transit systems are funded through a combination of federal, state, and local dollars. MDOT MTA provides financial support for both capital and operating projects as well as technical support for these services. These systems are shown below:

Service Name	Operated by	Service/ Service Area	Highlights
Annapolis Transit	Annapolis Department of Transportation	City of Annapolis and nearby portions of Anne Arundel County, including Parole, Edgewater, and Arnold	Bike racks, wheelchair accessible. Demand-response paratransit service also provided.
Anne Arundel Transit	Anne Arundel County Office of Transportation/RTA	Deviated and fixed route service serves outside the corporate limits of the City of Annapolis, in Maryland City and in the Odenton-Severn-Glen Burnie-Crofton area of Anne Arundel County. Van transportation for older adults and adults with disabilities.	Also, a taxi cab discount program available
Baltimore City Charm City Circulator	Baltimore City Department of Transportation	Four routes serving downtown Baltimore, including City Hall, Fells Point, Johns Hopkins, Penn Station, Federal Hill, Hollins Market, Harbor East, the Inner Harbor and Fort McHenry. The Harbor Connector is a free water taxi serving Maritime Park, Tide Point, Canton, Waterfront Park, Harbor view and Harbor East.	Free service; hybrid electric buses; GPS bus tracking; the Harbor Connector offers free water taxi service to five points along the waterfront
Baltimore County CountyRide	Baltimore County Department of Aging	Demand-response paratransit service throughout Baltimore County and to Baltimore City partnership hospitals. Destinations include medical appointments, shopping and other general-purpose trips.	Serves Baltimore County residents with disabilities or who are older or rural residents.
Carroll Transit System	Carroll County / Ride With Us	Four shuttles operate around the County, serving points of interest such as Westminster, South Carroll, Eldersburg, Hampstead, and Taneytown.	Demand-response paratransit service also provided.

Harford Transit LINK	Harford County	Six local routes link the primary towns and connect with Cecil County, MARC train, and MDOT MTA commuter bus service to downtown Baltimore.	Demand-response paratransit service also provided.
Regional Transportation Agency of Central Maryland	Howard County / RTA	Fifteen fixed routes and demand response serving Howard County, western Anne Arundel County, and northern Prince George's County.	Buses, including some inductive electric buses, provide service for residents in Howard County.

The Rabbit Express commuter bus operated by Rabbit Transit out of York, Pennsylvania has the I-83 South route with multiple weekday roundtrip service from York to Hunt Valley, Black and Decker, and Towson, Maryland. It connects with MDOT MTA Light Rail and the Towson University Shuttle. 83S buses will stop at any marked MDOT MTA bus stop along the designated route for alighting passengers, however, all boarding locations must be pre-approved by Rabbit Transit.

In addition to MDOT MTA bus service, local bus service, and Rabbit Express, there are private bus companies that offer intercity bus service to the region. The Greyhound bus station at 2110 Haines Street in the Carroll Camden Industrial Park provides a link between intercity and local public transportation. Additionally, numerous companies such as MegaBus and Bolt Bus, provide intercity service from Baltimore to regional destinations such as New York, Richmond, and Pittsburgh.

MDOT MTA launched an intercity bus program in January 2011 to connect rural communities in Maryland. The Western service operates from Grantsville to Baltimore via the Bay Runner Shuttle, the Central service operates from Elkton to Baltimore via Greyhound, and the Eastern service operates from Ocean City to Baltimore via Bay Runner Shuttle.

Rail Transit

Rail Transit in the Baltimore region is provided through MDOT MTA's Metro SubwayLink, Light RailLink, and Maryland Area Rail Commuter (MARC) service.

- **Metro SubwayLink -** MDOT MTA's Metro Subway system provides high-speed heavy rail transit service in a 15.5-mile corridor, with 14 stations from Owings Mills in western Baltimore County through downtown Baltimore to Johns Hopkins Hospital east of downtown. Connecting bus service is provided with MDOT MTA bus routes. Metro SubwayLink will be enhanced with the replacement of the Metro Cars and Train Control System with modern, reliable equipment that will enhance passenger comfort, ensure better reliability, and offer improved safety.
- **Light RailLink -** MDOT MTA's Light RailLink provides light rail service in a 30-mile north-south corridor from Baltimore County to Anne Arundel County. The main line runs between Hunt Valley and Glen Burnie with extensions to Penn Station in downtown Baltimore and

to Baltimore/Washington International Thurgood Marshall Airport in Anne Arundel County. Light RailLink serves the area by linking communities in the northern and southern suburbs with the downtown core and provides Baltimore City residents access to suburban job centers, such as those located at BWI Airport, the BWI Business District, and the Hunt Valley office park. Service runs every day of the week. There are 33 stations and free parking is provided at 12 of these stations.

All but 2.6 miles of the Light Rail are double-track, which makes service more reliable and increases ridership. The remaining 2.6 miles are single-track due to right-of-way issues. There are 10-minute headways through 75 percent of the system from Linthicum to Timonium during peak service (6 a.m. to 9 a.m. and 3 p.m. to 6 p.m.) and 15-minute headways during off-peak hours. The Penn Station-Camden Yards service operates on 20-minute peak and 30-minute base headways.

Light RailLink vehicles are undergoing upgrades to various systems to address parts obsolescence, improve vehicle performance and reliability, and enhance passenger comfort. The first delivery of refurbished Light RailLink vehicles were put into revenue service in April of 2018.

- **Maryland Area Rail Commuter (MARC) -** MDOT MTA's MARC service provides high-speed, medium frequency commuter rail service in the Baltimore region and beyond. The 202-mile system is a commuting option for residents of Central and Northeast Maryland, the Baltimore/Washington Corridor, and the Martinsburg, West Virginia/Brunswick/Frederick to Washington corridor. In the Baltimore region, MARC trains operate in two existing rail corridors totaling 112 miles with stations in all jurisdictions except Carroll County. The Penn Line runs between Perryville in Cecil County and Union Station in Washington D.C. and stops at eleven stations in the region. The Camden Line runs from Camden Station in Baltimore City to Union Station and stops at ten stations in the region.

  MARC commuter rail services is being enhanced through ongoing construction activities at the BWI MARC/Amtrak station. The project involves station improvements and the addition of new canopies. Construction is anticipated to be complete in 2019.

  MDOT MTA has completed installation of Positive Train Control (PTC) equipment for all MARC diesel locomotives and cab cars. PTC includes added safety features that aide in preventing train collisions, missed rail traffic signals, and ensure safe and proper spacing of mainline rail traffic.

  In addition, there are several MARC overhaul projects on the horizon that will improve passenger experience. Sixty-three multi-level MARC vehicles are being overhauled, which includes upgrades to HVAC, trucks, brakes, doors, and communications. Upgrades to HVAC and communications system are included to enhance passenger comfort. Another overhaul project will be the repower of six MARC diesel locomotives, which will reduce emissions, lower fuel costs, and extend the useful life of the locomotive by 15 years.

Finally, the overhaul of 26 MARC IIA vehicles will include safety, interior, and communication improvements.

TRANSPORTATION SYSTEMS MANAGEMENT AND OPERATIONS PROJECTS

Transportation systems management and operations (TSMO) projects improve the efficiency of the transportation system using strategies, techniques, and tools.

Traffic Flow Improvements

SHA continues its efforts to improve traffic flow, mitigate congestion, and reduce mobile source emissions in major travel corridors and at critical intersections throughout the region. These ongoing efforts include traffic signal retiming projects, roundabout construction, intersection reconstruction, park-and-ride facility construction, improved fixed message and variable message signage, corridor congestion relief projects, and other traffic management projects.

MDOT's TSMO efforts are led by the Office of CHART and ITS Development. The CHART (Coordinated Highways Action Response Team) program, operated jointly by MDOT, SHA, MDTA, and Maryland State Police, has as its mission to "strive to improve mobility and safety for the users of Maryland's highways through the application of intelligent transportation system technology and interagency teamwork." The goals of the CHART program are to:

1) Improve highway safety and efficiency by rapidly detecting and responding to hazardous highway conditions using traffic and roadway monitoring strategies;
2) Quickly and efficiently restore normal traffic flow after incidents using incident management strategies;
3) Provide timely and reliable mobility information to the traveling public through its traveler information systems;
4) Reduce congestion on highways by employing traffic management strategies;
5) Expand the CHART operating system and communications network to support sharing of transportation information, and inter-modal and inter-agency coordination and connectivity; and,
6) Deploy emergency response equipment and establish coordinated preparedness and response plans for large-scale natural and man-made disasters to establish a secure and safe transportation system.

These goals highlight the focus of CHART operations on non-recurring congestion, as caused by crashes, severe weather, and special events. To achieve its mission and goals, CHART has installed various ITS technologies, such as closed circuit television cameras, dynamic message signs, traffic speed detectors, roadway weather information systems, and highway advisory radio on interstate highways in the Baltimore region and other parts of the state using a combination of federal and state funds. The Statewide Operations Center, Authority Operations Center, and the two satellite Operations Centers in the region, use these technologies to monitor the state's roadways to quickly identify and clear crashes as well as manage traffic to reduce the impact of incidents. CHART also maintains roving rapid response teams (emergency traffic patrols) that operate 24 hours 7 days per week on many of the state highways in the region and provide assistance to disabled motorists, assist in clearing incidents from travel lanes, and reroute traffic around incidents. The state also has a 511 traveler information system (www.md511.org) to provide real-time transportation condition information to the public.

CHART operations save tens of millions of vehicle-hours of delay statewide, millions of gallons of fuel statewide, and reduce overall mobile source emissions.

Electronic Toll Collection

The use of electronic toll collection technology enables vehicles to move faster through the tolling process, reducing delay at tollbooths, thereby reducing traffic congestion and air pollution emissions. The Maryland Transportation Authority commenced operation of its electronic toll collection system, M-TAG, at the Authority's three harbor crossing facilities in 1999. By fall 2001, all toll facilities in the region were equipped with electronic toll collection equipment.

In 2001, MDTA joined the E-ZPass InterAgency Group, a coalition of 25 toll agencies in 15 states. At present, travelers in Maryland, as well as at most toll facilities in Delaware, Illinois, Indiana, Maine, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, Virginia, and West Virginia can pay tolls using one electronic device.

In 2018, 80 percent of vehicles using all MDTA facilities paid using electronic toll tags. The table below shows the portion of vehicles that use E-ZPass in the Baltimore region.

Facility	**Percent Using E-ZPass**
I-95 Express Toll Lanes	95%
William Preston Lane Jr. Memorial (Bay) Bridge	72%
Baltimore Harbor Tunnel	74%
Fort McHenry Tunnel	77%
Francis Scott Key Bridge	80%
Thomas J. Hatem Memorial Bridge	94%
John F. Kennedy Memorial Highway	75%

Starting in October 2019, MDTA will begin cashless toll collection at the Francis Scott Key Bridge and the Thomas J. Hatem Memorial Bridge, with tolls being collected by E-ZPass or video tolling. In the first phase of the transition, new gantries will be erected to collect tolls, but vehicles will still travel through the toll plazas; the existing toll plazas will be removed by spring 2021, enabling vehicles to maintain highway speeds during toll collection. Benefits of cashless tolling include less idling time resulting in increased fuel efficiency and reduced emissions as well as decreased congestion and increased driver and worker safety. MDTA estimates drivers at the Hatem and Key bridges will save $1 million in fuel and 44, 000 hours by not stopping at toll booths. Additional MDTA facilities will be converted in the future.

Traffic Signal Retiming

SHA has a program to review and retime its signals statewide every three years, including its 1,200 signals in the Baltimore region. In addition, signals in high profile corridors or corridors subject to significant traffic pattern change are evaluated on a more frequent schedule. This program results in smoother traffic flow as well as reduced emissions resulting from idling vehicles. *Synchro* software is used to develop new timing plans and to calculate benefits from the new timing plans. In CY 2016, SHA reviewed 107 signals in 23 systems in the Baltimore region. Timing changes were made in 20 systems containing 103 signals. Delay was reduced by 455,600 hours and fuel consumption was reduced by 147,000 gallons. It is estimated that NOx, VOC, and CO emissions were reduced 1.3%, 0.9%, and 1.1% respectively for the signal systems.

Traffic Incident Management for the Baltimore Region Committee

Launched in September 2000, the Traffic Incident Management for the Baltimore Region Committee (formerly called the Baltimore Regional Operations Coordination Committee) has worked to improve coordination of incident management activities to enhance the safety of responders and the traveling public, reduce traffic congestion and delay, and improve the quality of the environment. Participants on the TIMBR Committee include police, fire, transportation and emergency management agencies from the jurisdictions, MDOT and its business units, Maryland State Police, MDE, FHWA, and others. Since the inception of the TIMBR Committee, various projects have been undertaken to improve responder coordination, cooperation, and communication, leading to incidents being cleared more quickly and more safely.

PREFERENTIAL PARKING MANAGEMENT

Parking management is an important strategy for managing transportation demand and a complementary action to increase the effectiveness of the various rideshare programs. This strategy assumes several forms, with preferential parking management being the most basic.

Preferential parking for carpools/vanpools is a traditional emission reduction strategy in the Baltimore region. Carpoolers receive the most desirable parking spaces, usually those nearest to the building or in protective garages.

CLEAN VEHICLES, FUELS AND TECHNOLOGIES

Alternative Fuel Vehicle Incentives

All-electric and plug-in hybrid vehicles provide the ability for drivers to reduce the amount of fuel they burn, and reduce emissions as a result. Incentives are often provided by the state and federal government for the purchase of these clean vehicles and their supply equipment. Currently, the State of Maryland offers a state tax credit of 50% of the cost of electric vehicle charging equipment and installation (up to $900 for individuals, $5000 for commercial businesses, and $7500 for retail service stations). And, the federal government provides a tax credit of up to $7500 for all-electric or plug-in hybrid cars.

Dray Truck Replacement

An important program that MDOT, MDE, and the Maryland Port Administration work jointly on is the Dray Truck Replacement Program. Under this program, participating truck owners (either independent owner-operators or fleet owners) are provided with funding towards the purchase of a newer truck with an engine that meets more stringent emission standards. The Port's dray truck replacement program has been in place for number of years and to date has replaced hundreds of dray trucks.

Transit Bus Replacement

Replacement of older model transit buses with newer, cleaner models provides the opportunity to reduce emissions from the bus fleet operating on the region's roadways. The 2020-2023 TIP proposes a planned purchase of 278 forty-foot clean diesel buses.

Appendix J: MDOT Updated Revenue Projections – August 2017

Financially Constrained Long Range Plan

Year 2017 to 2045 Update

For The

Baltimore Metropolitan Area

Prepared by

Maryland Department of Transportation

August 2017

DOCUMENTATION OF ASSUMPTIONS

Date: August 2017

Subject: Methodology and Assumptions used to derive the 2017 – 2045 Constrained Long-range Transportation Plan

Total Program Revenues/Expenditures (operating and capital):

- FY 1981 to FY 2016 figures are actual expenditures from historical records. FY 2017 to FY 2022 are from the FY 2017 Transportation Trust Fund Financial Plan and Consolidated Transportation Plan (CTP).
- The federal funds received directly by WMATA are **not** included in this exercise.
- FY 2023 to FY 2045 projections of state funds use a historical annual average growth rate of 5.3%. Federal fund projections for the same period are based on an average growth rate of 3.0% for Highway and Transit program funds.

Operating Expenditures:

- FY 1981 to FY 2016 figures are actual expenditures from historical records. Expenditures for FY 2017 to FY 2022 are the operating budget projections contained in the current Trust Fund Forecast.
- FY 2023 to FY 2045 projections are derived by inflating the previous year with an estimate for the percentage change in CPI-U plus 2%. The Consumer Price Index is a generally accepted measure of inflation. The projected annual change in index figures is based on information received from two economic forecasting firms. Two percent (2%) is added to the forecasted rate to account for the additional operating costs associated with new capital expansions.

Capital - Systems Preservation:

- Department records were used to determine the split between systems preservation and expansion for FY 1981 to FY 2016. Amounts for FY 2017 to FY 2022 represent the current version of the capital program.
- For the period FY 2023 – FY 2045, an annual growth rate of 2.0% is assumed for systems preservation projects, not to exceed 70% of the total program.

Capital - Expansion:

- Expenditures for capital expansion were derived by subtracting both operating and systems preservation expenditures from the total program expenditures for each year.

Baltimore Area – Percentage of Capital Expansion:

- Total capital figures from FY 1981 to present were split into surface and non-surface. Surface included highway (SHA) and transit (MTA, MARC, and WMATA) costs. Non-surface included the Maryland Port, Aviation, and Motor Vehicle Administrations and the Secretary's Office expenses.

- The surface / non-surface data and the system preservation / expansion data were combined, analyzed, and evaluated to produce estimates of the percentage of Maryland expansion associated with surface transportation for the various time periods.

- Surface capital in the Baltimore Region was derived by adding the expenditures for all of MTA (excluding LOTS and non-Baltimore region Park and Ride expenditures), one-half of MARC and that portion of SHA that pertained to the region (Anne Arundel, Baltimore, Carroll, Harford, and Howard counties).

- These Baltimore specific figures were used to derive estimates of Baltimore surface expansion. These figures, when used with the above-mentioned projections, produce the estimates shown for Baltimore as a percent of Total Surface Expansion and as a percent of Total Maryland Expansion.

MDOT Operating & Capital Expenditures - Statewide

History, Program & Forecast

(Millions of Dollars)

Fiscal Year	Operating	Systems Preservation	Operating & Systems Pres.	Expansion	Statewide Total
1981	265	111	376	247	623
1982	287	136	423	236	659
1983	322	164	486	284	770
1984	352	167	519	246	765
1985	385	204	589	319	908
1986	428	234	662	403	1,065
1987	441	264	705	506	1,211
1988	478	260	738	615	1,353
1989	508	227	735	677	1,412
1990	551	270	821	760	1,581
1991	591	268	859	773	1,632
1992	577	187	764	542	1,306
1993	638	254	892	418	1,310
1994	689	279	968	393	1,361
1995	709	400	1,109	497	1,606
1996	784	391	1,175	465	1,640
1997	770	417	1,187	493	1,680
1998	808	451	1,259	411	1,670
1999	868	515	1,383	420	1,803
2000	913	476	1,389	455	1,844
2001	979	578	1,557	632	2,189
2002	1,045	612	1,657	772	2,429
2003	1,158	620	1,778	772	2,550
2004	1,178	619	1,797	762	2,559
2005	1,237	714	1,951	780	2,731
2006	1,303	729	2,032	793	2,825
2007	1,396	724	2,120	701	2,821
2008	1,488	766	2,254	680	2,934
2009	1,527	974	2,501	368	2,869
2010	1,583	957	2,540	275	2,815
2011	1,548	908	2,456	325	2,781
2012	1,572	1,096	2,668	366	3,034
2013	1,638	1,154	2,792	416	3,208
2014	1,843	1,324	3,167	477	3,644
2015	1,859	1,438	3,297	603	3,900
2016	1,917	1,389	3,306	806	4,112
2017	1,947	1,560	3,507	1,123	4,630
2018	2,030	1,580	3,610	1,071	4,681
2019	2,080	1,557	3,637	1,005	4,642
2020	2,131	1,475	3,606	687	4,293
2021	2,181	1,391	3,572	483	4,055
2022	2,264	1,449	3,713	400	4,113
2023	2,454	1,284	3,738	550	4,288
2024	2,592	1,259	3,851	540	4,391
2025	2,696	1,332	4,028	571	4,599
2026	2,811	1,408	4,219	603	4,822
2027	2,924	1,490	4,414	639	5,053
2028	3,043	1,576	4,619	676	5,295
2029	3,176	1,661	4,837	712	5,549
2030	3,313	1,698	5,011	805	5,816
2031	3,451	1,732	5,183	914	6,097
2032	3,597	1,766	5,363	1,030	6,393
2033	3,754	1,802	5,556	1,146	6,702
2034	3,911	1,838	5,749	1,279	7,028
2035	4,079	1,874	5,953	1,416	7,369
2036	4,257	1,912	6,169	1,559	7,728
2037	4,433	1,950	6,383	1,721	8,104
2038	4,633	1,989	6,622	1,879	8,501
2039	4,837	2,029	6,866	2,052	8,918
2040	5,042	2,070	7,112	2,242	9,354
2041	5,268	2,111	7,369	2,444	9,813
2042	5,475	2,153	7,628	2,667	10,295
2043	5,717	2,196	7,913	2,889	10,802
2044	5,963	2,240	8,203	3,131	11,334
2045	6,228	2,285	8,513	3,383	11,896

MDOT - Office of Finance

18-Aug-17

BALTIMORE METROPOLITAN AREA
Percentage of Capital Expansion

Surface Enhancement % of Maryland Enhancement:	
1981 - 2016	86.4%

Baltimore Enhancement % of Surface Enhancement:	
1981 - 2016	40.3%

Fiscal Year	Statewide Expansion Funds	Surface Percentage	Private Funds	Total Surface Available	Baltimore Percentage	Total Balto. Expansion Funds
2014	477					155
2015	603					192
2016	806					282
2017	1,123					90
2018	1,071					90
2019	1,005					107
2020	687					80
2021	483					83
2022	400					69
2023	550	475	23	498	201	201
2024	540	467	23	490	197	197
2025	571	493	23	516	208	208
2026	603	521	23	544	219	219
2027	639	552	23	575	232	232
2028	676	584	24	608	245	245
2029	712	615	24	639	258	258
2030	805	696	24	720	290	290
2031	914	790	24	814	328	328
2032	1,030	890	24	914	368	368
2033	1,146	990	25	1,015	409	409
2034	1,279	1,105	25	1,130	455	455
2035	1,416	1,224	25	1,249	503	503
2036	1,559	1,347	25	1,372	553	553
2037	1,721	1,487	25	1,512	609	609
2038	1,879	1,624	26	1,650	665	665
2039	2,052	1,773	26	1,799	725	725
2040	2,242	1,938	26	1,964	791	791
2041	2,444	2,112	26	2,138	861	861
2042	2,667	2,305	26	2,331	939	939
2043	2,889	2,497	27	2,524	1,017	1,017
2044	3,131	2,706	27	2,733	1,101	1,101
2045	3,383	2,924	27	2,951	1,189	1,189
Total '23-'45	34,848	30,116	571	30,687	12,363	12,363
Total '14-'45	41,503					13,511

MDOT - Office of Finance
18-Aug-17

MDOT Operating & Capital Expenditures - Statewide

History, Program & Forecast