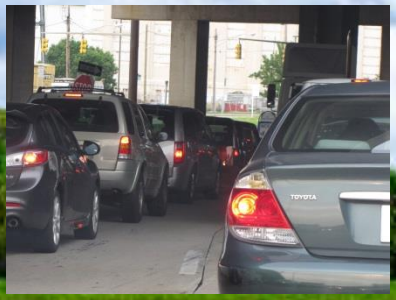
BRTB
Baltimore Regional Transportation Board

CONFORMITY DETERMINATION OF THE 2019-2022 TRANSPORTATION IMPROVEMENT PROGRAM AND THE AMENDED *MAXIMIZE2040* - 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 2014 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 2010 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.
	(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 two modeled horizon years are **2020 and 2030**, set so that there are no more than 10 years between horizon years. The third horizon year is **2040**, 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 2019-2022 TIP.
§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

The major steps of the Interagency Consultation Process regarding the Conformity Determination of the 2019-2022 Transportation Improvement Program and the Amended Maximize 2040 took place at the following meetings:

- May 16, 2018 Interagency Consultation Group – results presented with support to release for public review
- July 11, 2018 Interagency Consultation Group – recommend BRTB approval of the Conformity Determination
- July 11, 2018 Public Advisory Committee – review and comment opportunity on the Conformity Determination and TIP
- July 24, 2018 BRTB Meeting – approval of the Conformity Determination and TIP

Appendices C-1 through C-4: Conformity Status of Projects from the 2019-2022 TIP

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation	First Analysis Year
2018	I-95 Express Toll Lane Northbound Extension	25-1801-41	MdTA	Project: The proposed improvements will address capacity, operational, and safety concerns that exist today along northbound I-95 and are interim improvements toward the full Section 200 implementation. The interim solution will be funded with MDTA toll revenues and includes: a. A single lane Express Toll Lane (ETL) from north of MD 43 to 1 mile south of MD 152 (4.9 miles). The ETL will be separated by a 4 buffer. b. A 5th auxiliary lane to MD 152 (1.0 mile). The right most lane will be dropped at the MD 152 off-ramp. The on-ramp from MD 152 will be extended as an auxiliary lane to the MD 24 / MD 924 off-ramp. c. Minor modifications to the off-ramp to MD 24 / MD 924 d. Various corridor improvements including 4 noise walls and a new ITS system. Justification: Current traffic operations along northbound I-95 continue to have congestion, safety, and operational concerns. The proposed interim improvements will address these concerns as well as address quality of life by providing 4 noise walls. Finally, the project will provide a new ITS system that will allow MDTA to better operate the facility and address safety issues. Widening: 4 to 5 lanes, 7.75 miles	N	Harford County	2022	2030
2018	I-695: I-70 to MD 43	63-1802-41	SHA	Project: 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. Justification: This project will address capacity, safety, and operations concerns along I-695. Widening: 6 to 8 lanes, 19 miles	N	Baltimore County	2023	2030

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation	First Analysis Year
2017	MD 175: National Business Parkway to McCarron Court	61-1701-41	SHA	Project: 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. 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. Phase 2, widening MD 175 from Disney Road to Reece Road, has TIP ID# 61-1601-41. Justification: This project will improve safety and operation along MD 175 and ease growing congestion related to the BRAC expansion at Fort Meade. Widening: 2 to 6 lanes, 1.1 miles	N	Anne Arundel County	2021	2030
2017	MD 32: Linden Church Road to I-70, Capacity & Safety Improvements	66-1703-41	SHA	Project: 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. This is a design build project and segment II of the MD 32: MD 108 to I-70 Corridor project improvements. This is the final phase and contains the funding for the original corridor project planning. Replacement of the Triadelphia Road bridge over MD 32, TIP ID# 66-1702-13, is now included in the scope of this project. Justification: The project will address congestion and safety problems which have been experienced as a result of increasing traffic volumes on the existing two lane roadway. Widening: 2 to 4 lanes, 6.6 miles	N	Howard County	2021	2030

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation	First Analysis Year
2016	I-95: Moravia Road to Fort McHenry Tunnel	22-1601-41	MdTA	Project: 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. This project is funded with MDTA toll revenues. Justification: This project will provide lane continuity and additional capacity along I-95 between the Fort McHenry Tunnel and the I-95 ETLs. This is needed to address existing congestion and to accommodate diverted traffic from I-895 that will result from MDTAs Canton Viaduct Project. Widening: 6 to 8 lanes, 3.7 miles	N	Baltimore City	2018	2020

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation	First Analysis Year
2016	I-695: Bridge Replacements at Benson Ave and US 1	63-1602-43	SHA	Project: Replacement of Bridge 0311305 on I-695 Inner Loop over Benson Ave; Bridge 0311405 on 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 Ave. to US 1. Both bridges will be widened to accommodate the future widening of I-695 to improve safety. No additional lanes are being added at this time. US 1 will be narrowed to one lane in each direction extending approximately 2,400 feet north and south of I-695. This project is a breakout of the larger corridor project, I-695: I-95 to MD 122 (Southwest Beltway), which has TIP ID #63-0602-41 and is currently on hold. Justification: The bridges on I-695 Inner Loop over Benson and Leeds/US 1/ AMTRAK/ Herbert Run are nearing the end of their useful life and are structurally deficient. An existing ramp is being realigned as part of this project to provide a more direct connection from US 1 to the Inner Loop of I-695 and remove interstate traffic from residential areas.	N	Baltimore County	2018	2020
2016	I-695: US 40 to MD 144	63-1601-41	SHA	Project: This project will widen 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. This project is a breakout of the I-695: I-95 to MD 122 (Southwest Beltway) project which has TIP ID #63-0602-41 and is currently on hold. Justification: This project will provide additional capacity and improve safety and operations on this segment of I-695. Widening: 3 to 4 lanes, 1.2 miles	N	Baltimore County	2021	2030

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation	First Analysis Year
2016	MD 175: Disney Road to Reece Road	61-1601-41	SHA	Project: This project is Phase 2 of the MD 175: MD 295 to MD 170 corridor project, TIP ID #61-0605-41. 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. Justification: This project will improve safety and operations along MD 175 and ease growing congestion related to BRAC expansion at Fort Meade. Widening: 2 to 6 lanes, 1.13 miles	N	Anne Arundel County	2019	2020
2016	MD 32: MD 108 to Linden Church Road	66-1602-41	SHA	Project: 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. Howard County is contributing $16.5 million in funding for construction of this project. The remainder of the project is State funded. Improvements will be completed in fiscal year 2020. Right-of-way acquisition continues through fiscal year 2021. Justification: This project will address congestion and safety problems which have been experienced as a result of increasing traffic volumes on the existing two lane roadway. Widening: 2 to 4 lanes, 2.25 miles	Not Exempt	Howard County	2020	2020

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation	First Analysis Year
2014	MD 198: MD 295 to MD 32	61-1403-41	SHA	Project: This project will address capacity needs on MD 198 from MD 295 to MD 32. Bicycle and pedestrian access will be provided where appropriate. (BRAC related) Phase I, MD 198/MD 295 partial interchange project is funded for preliminary engineering. This phase will widen the roadway to add turning lanes. However, it does not add additional through lanes. No schedule or funding for remaining segments has been identified. Justification: MD 198 is a key link to Fort Meade from points south and west. The area in and around Fort Meade will experience substantial growth as a result of BRAC expansion. Widening: 2 to 4 lanes, 2.7 miles	N	Anne Arundel County	2030	2030
2014	US 29: Middle Patuxent River to Seneca Drive - Phase 2	66-1406-41	SHA	Project: 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. No schedule or funding for construction have been identified. Justification: This project will improve safety and reduce congestion by upgrading northbound US 29 to match the southbound section, which is currently 3 lanes in each direction. Widening: 5 to 6 lanes, 1.7 miles	N	Howard County	2030	2030

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation	First Analysis Year
2014	US 40: MD 7 & MD 159 Intersection Reconstruction - Phase 2	65-1402-41	SHA	Project: 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. Justification: Improved access to Aberdeen Proving Ground is a vital component needed to accommodate the increase of employment as a result of BRAC. The intersection improvements will improve safety, capacity and operations in the near-term. Widening: 4 to 6 lanes Intersection reconstruction	N	Harford County	2019	2020
2014	US 50: MD 70 to MD 2	61-1404-41	SHA	Project: 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. Justification: The approaches to the Severn River/Pearl Harbor Memorial Bridge experience severe congestion, particularly the eastbound direction during the evening peak period. Widening: 6 to 7 lanes, 1.66 miles	N	Anne Arundel County	2019	2020

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation	First Analysis Year
2012	MD 140: Garrison View Road to Painters Mill Road - Phase 1	63-1203-41	SHA	Project: 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 roadway, landscaping, and utility relocations. Southbound improvements to be provided by a developer. 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). Justification: The purpose of this project is to relieve current and anticipated traffic congestion based on background growth and proposed development, including Transit Oriented Development at the Owings Mills Metro Station. The project will address safety and operational concerns along MD 140. It will help reduce overall delays along the corridor and enhance vehicular and pedestrian safety. Widening: 2 to 3 lanes, 0.2 miles	N	Baltimore County	2019	2020
2008	I-795: Dolfield Boulevard Interchange	63-0803-46	SHA	Project: 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. Funding will take preliminary engineering to the 30% stage, when phasing options will be evaluated. No schedule or funding for construction have been determined. Justification: This project would provide improved access to the planned growth corridor along Red Run Boulevard in Owings Mills. Widening: full interchange; 4 to 6 lanes	N	Baltimore County	2026	2030

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation	First Analysis Year
2008	MD 140: Painters Mill Road to Owings Mills Boulevard - Phase 2	63-0802-41	SHA	Project: Capacity and safety improvements to MD 140 from north of Painters Mill Road to Owings Mills Boulevard including; an additional through lane on southbound MD 140, addition of left and right turn lanes, and added width for bicycle compatability. This results in two through lanes on northbound MD 140 and three through lanes on southbound MD 140. No schedule or funding for construction have been determined. This is phase 2 of MD 140 corridor improvements. Justification: This project will provide additional capacity and access to planned development in Owings Mills, including the Owings Mills Town Center, the Owings Mills Metro Station, and the MD 140 business corridor. It will improve safety and address operational concerns along MD 140, while reducing delays along the corridor and enhancing pedestrian safety. Widening: 2 to 3 lanes, 0.4 miles	N	Baltimore County	2025	2030

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation	First Analysis Year
2006	MD 175: MD 295 to MD 170	61-0605-41	SHA	Project: The purpose of this project is to improve access to Fort Meade. The section from MD 295 to MD 32 includes widening from 2 or 4 lanes to 6 lanes. The section from MD 32 to MD 170 includes interchange and intersection improvements. The entire corridor will see bicycle and pedestrian accommodations. Segment 1, MD 175/MD 295 interchange, from National Business Parkway to McCarron Court, has TIP ID# 61-1701-41. Segment 2, MD 175: Disney Road to Reece Road, has TIP ID# 61-1601-41. Engineering to widen the segment between Mapes Road and MD 32 is funded under this TIP ID. The estimated total cost includes projected funding that will be required to construct the remainder of the corridor improvements. No schedule or funding for remaining segments has been identified. Justification: This project will improve safety and operations along MD 175 and ease growing congestion related to BRAC expansion at Fort Meade. Widening: 2/4 lanes to 6-lane divided, 5.2 miles	N	Anne Arundel County	2025	2030

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation
2019	Mid-Atlantic Multimodal Transportation Hub	13-1901-83	Baltimore County	The project consists of rehabilitating the existing 2,200 linear foot east-west berth, including: *Installation of a full, new pile supported system with substantial batter piles to transfer the horizontal and vertical loads associated with ship docking and cargo transfer. *Recessed utility sections that will allow for the transfer of various liquid commodities. *Dredging of the turning basin and approach channel to a depth of at least 42 feet. *Security, lighting, paving, stormwater, and general site improvements. These upgrades will enhance the overall functionality of the berths, allowing the terminal to accommodate a wider variety of cargo and larger vessels.	Y	Baltimore County	2022
2019	Baltimore-Washington Superconducting Maglev (SCMAGLEV) Project	90-1901-99	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 Marshal Airport. An Environmental Impact Statement (EIS) is being prepared to evaluate the potential impacts of the construction and operation of such a system. This phase of the project is being funded by a grant from the Federal Railroad Administration with matching funds provided by BWRR. This project is represented in both the Baltimore Regional Transportation Board (BRTB) (50%) and National Capital Region Transportation Planning Board (TPB) (50%) TIPs.	Y	Regional	NA

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation
2018	Agencywide System Preservation and Improvement	40-1801-64	MTA - Transit	This is an ongoing project to rehabilitate agency-wide facilities, systems, and infrastructure, including elevator and escalator upgrades, roofing, park-and-ride lots, concrete bus loops, drainage corrections, bridge and subway inspections, signage improvements, a treasury fare collection system, and a transit asset management system.	Y	Regional	Ongoing
2018	Bus and Paratransit Vehicle Overhaul and Replacement	40-1802-05	MTA - Transit	This project provides for the routine replacement of buses past their useful service life. Planned purchases include 301 forty-foot clean diesel buses. 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. Mobility is a specialized door-to-door service for people with disabilities who are not able to ride fixed route public transportation, including lift equipped buses.	Y	Regional	Ongoing
2018	Bus System Preservation and Improvement	40-1803-64	MTA - Transit	This is an ongoing project to rehabilitate bus facilities and infrastructure, including operating division and MTA offices. This ongoing project also includes funding for the BaltimoreLink project to include Bus Link Transit Hubs and Bus Link Transit Signal Priority. In addition to the matching funds listed, MTA has committed $10.6 million in state dollars.	Y	Regional	Ongoing

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation
2018	Metro and Light Rail Rolling Stock Overhauls and Replacement	40-1804-63	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 2020.	Y	Regional	Ongoing
2018	Metro and Light Rail System Preservation and Improvement	40-1805-64	MTA - Transit	This is an ongoing project to rehabilitate Light Rail and Metro facilities, infrastructure, track, and equipment.	Y	Regional	Ongoing
2018	I-695 at Cromwell Bridge Road - Drainage Improvement	63-1801-38	SHA	This project involves the following improvements: 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	Baltimore County	2020

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation
2018	I-95: Active Traffic Management	66-1801-41	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	Howard County	TBD
2017	I-695: Bridge Replacement on Crosby Road	63-1702-43	SHA	The project will replace bridge no. 03125 along Crosby Road over I-695. The replacement bridge will accommodate future widening of I-695. No additional capacity is being provided at this time. 5 foot shoulders and 5 foot ADA compliant sidewalks are planned on both sides.	Y	Baltimore County	2019
2017	I-83: Bridge Replacement over Padonia Road	63-1701-13	SHA	Replace bridge no. 03062 along I-83 over Padonia Road, which carries both northbound and southbound traffic. The cost has increased to reflect recent bid prices.	Y	Baltimore County	2021
2017	MD 137: Bridge Replacement over I-83	63-1703-13	SHA	The project replaces bridge no. 03050 along MD 137 (Mount Carmel Road) over I-83. A 5 foot shoulder is planned on both sides of the roadway.	Y	Baltimore County	2018
2017	MD 45: Padonia Rd to Wight Ave	63-1707-11	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. Baltimore County is contributing $13.2 million for the utility replacement. NHPP matching funds are state funding.	Y	Baltimore County	2019

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation
2017	MD 496: Bridge Replacement over Big Pipe Creek	64-1702-13	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	Carroll County	2018
2017	MD 86: Bridge Replacement over Gunpowder Falls	64-1701-13	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.	Y	Carroll County	2019
2017	US 1: Bridge Replacement over CSX	63-1704-13	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	Baltimore County	2019
2017	US 40: Bridge Replacements over Little & Big Gunpowder Falls	63-1706-13	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	Baltimore County	2020
2016	Urban Transit Systems - Capital Assistance	40-1602-05	MTA - Transit	Capital assistance for the purchase of vehicles, equipment, and facilities for Harford County (Harford County Transportation Services).	Y	Regional	Ongoing

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation
2016	Urban Transit Systems - Operating Assistance	40-1603-61	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 Transportation Services. Costs generally associated with operating assistance can include utilities, miscellaneous equipment, fuel/oil, and driver, maintenance staff, and administrative salaries.	Y	Regional	Ongoing
2016	MD 24: South of Stirrup Run Culvert to Deer Creek Bridge, Section G	65-1601-12	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.	Y	Harford County	TBD
2015	MARC Facilities	70-1503-55	MTA - Commuter Rail	1) Procure Riverside Maintenance Facility, which CSXT 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) BWI Garage - Comprehensive structural inspection of garages 1 & 2, w/ design & construction of recommended structural repairs and repairs to mechanical, plumbing, fire protection and electrical systems & elevators. 3) MARC Martin State Airport Purchase private property & construct 2 additional storage tracks. 4) BWI Station Improvements - Renovation of BWI Station	Y	Regional	Ongoing

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation
2015	MARC Improvements	70-1502-54	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, implementation and development of Positive Train Control for MARC, implementation of an audio/visual warning system for approaching MARC trains, and the collaborative cost-sharing arrangement to advance development of the Northeast corridor infrastructure. In addition to the matching funds listed, MTA has committed $15.4 million in state dollars.	Y	Regional	Ongoing
2015	MARC Rolling Stock Overhauls and Replacement	70-1501-53	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 $13.2 million in state dollars.	Y	Regional	Ongoing
2015	Seniors and Individuals with Disabilities	40-1502-69	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	Regional	Ongoing

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation
2014	Port of Baltimore Enhancements	92-1401-83	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	Baltimore City	2018
2014	State Safety Oversight	90-1401-39	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	Regional	Ongoing
2014	MD 30 Business: North Woods Trail to CSX Railroad (Hampstead Community Safety & Enhancement)	64-1401-19	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 utility relocation as necessary. Because of the low speeds and constrained urban environment, bicycles will be accommodated in the travel lanes. The project is anticipated to be completed in calendar year 2020, fiscal year 2021.	Y	Carroll County	2020
2012	Bus and Rail Preventive Maintenance	40-1204-64	MTA - Transit	Provides preventative maintenance on the Bus, Light Rail and Metro systems to improve safety, reliability and passenger comfort.	Y	Regional	Ongoing

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation
2012	Kirk Bus Facility Replacement - Phase 1 & 2	40-1203-65	MTA - Transit	Approximately 163 buses are stored, operated and maintained at the Kirk Division Bus Facility. Operations include preventive bus maintenance, inspections, heavy repairs, fueling, washing, administration, operator support facilities and dispatching. 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	Regional	2021
2007	Morgan State University Transportation Research Program	60-0702-99	SHA	Transportation research, education and technology transfer activities involving university faculty, staff and students.	Y	Regional	Ongoing
2001	Small Urban Transit Systems - Operating Assistance	40-0104-61	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	Regional	Ongoing
1999	Ridesharing - Baltimore Region	40-9901-01	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, Baltimore Metropolitan Council, and Anne Arundel, Howard, and Harford counties.	Y	Regional	Ongoing

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation
1999	Areawide Transportation Alternatives Projects	60-9903-29	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	Regional	Ongoing
1995	Small Urban Transit Systems - Capital Assistance	40-9502-05	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 and Anne Arundel County.	Y	Regional	Ongoing
1995	Areawide Congestion Management	60-9504-04	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 intelligent transportation system (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	Regional	Ongoing

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation
1995	Areawide Environmental Projects	60-9506-38	SHA	This is an ongoing program to provide environmental and aesthetic improvements on State highways. These are non-capacity improvements, which may 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	Regional	Ongoing
1995	Areawide Resurfacing And Rehabilitation	60-9501-11	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	Regional	Ongoing
1995	Areawide Safety And Spot Improvements	60-9508-19	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	Regional	Ongoing

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation
1995	Areawide Urban Reconstruction	60-9511-19	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, streetscape, signs, and markings and lighting improvements.	Y	Regional	Ongoing
1993	Areawide Bridge Replacement And Rehabilitation	60-9310-13	SHA	This is an ongoing program to provide major upgrade 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	Regional	Ongoing
1992	Rural Transit Systems - Operating Assistance	40-9204-61	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	Regional	Ongoing

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation	First Analysis Year
2019	US 29/Broken Land Parkway Interchange and North South Connector Road	16-1901-42	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. Justification: Needed to increase vehicular and pedestrian mobility, address safety concerns, and provide adequate capacity to meet the future growth and development as outlined in Downtown Columbia. The project will address the future traffic demand along the Broken Land Parkway link from US 29 to downtown Columbia by providing an additional access and new central link to downtown Columbia for traffic from points southeast of Columbia and primarily for US 29 traffic to and from the south.	N	Howard County	2022	2030
2016	Glenville Road Bridge #30	15-1601-13	Harford County	Project: Replace the bridge that carries Glenville Road over Mill Brook. Three foot shoulders planned on both sides of the road. Justification: The existing bridge is a single lane, steel beam, concrete deck structure. The existing concrete deck, exterior beams, and wingwalls are severely deteriorated and there is evidence of scour under the western abutment. Widening: 1 to 2 lanes	N	Harford County	2023	2030

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation	First Analysis Year
2014	Dorsey Run Road: MD 175 to CSX Railroad Spur	16-1403-41	Howard County	Project: 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 potentially bike facilities, to increase transportation alternatives for the population. Once the design is finalized, more information will be provided. Justification: The existing road is substandard with varying width and limited capacity. Dorsey Run Road is classified in the Plan Howard 2030 as a major collector and four lanes are needed to accommodate the increasing volumes of traffic. Widening: 2 to 4 lanes, 1.1 miles	N	Howard County	2021	2030
2014	Guilford Road: US 1 to Dorsey Run Road	16-1405-41	Howard County	Project: 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 and bike facilities to increase transportation alternatives for the population. Once the design is finalized, more information will be provided. Justification: The existing road is sub-standard with varying width and limited capacity. Guilford Road is classified as a major collector in the Plan Howard 2030 and three lanes are needed to accommodate the increasing volume of commercial traffic. Widening: 2 to 4 lanes, 1 mile	N	Howard County	2021	2030

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation	First Analysis Year
2014	MD 175 at Oakland Mills Rd Interchange	16-1407-46	Howard County	Project: 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 for the population. Once the design is finalized, more information will be provided. Justification: MD 175, an 8-lane Principal Arterial from I-95 to US 29, has significant regional peak hour traffic. The proposed interchange with Oakland Mills Road will ensure future capacity, level of service, and acceptable operating conditions, as well as improved access to Blandair park. Full Interchange	N	Howard County	2020	2020
2014	Snowden River Parkway: Broken Land Parkway to Oakland Mills Road	16-1410-41	Howard County	Project: A project to design and construct a widening of Snowden River Parkway (intermediate arterial) by adding a third lane and sidewalks from Broken Land Parkway to Oakland Mills Road. The project will incorporate sidewalks and bike facilities to increase transportation alternatives for the population to activity centers and public transit. Once the design is finalized, more information will be provided. Justification: This project will develop the third lane on each side between these two intersections, will increase the capacity of the roadway and provide an improved level of service. Project requested by the Traffic Division. Widening: 4 to 6 lanes, 6300 Feet	N	Howard County	2023	2030

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation	First Analysis Year
2011	Piney Grove Road Bridge No. B-0140 over CSX railroad	13-1107-13	Baltimore County	Project: 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. Justification: Bridge is classified as structurally deficient and currently posted for 8 tons (SUV) and 13 tons (CVW). It is in need of total replacement. Widening: 1 to 2 lanes	N	Baltimore County	2025	2030
2011	Chestnut Hill Bridge #40	15-1101-13	Harford County	Project: This project will replace the existing Chestnut Hill Road Bridge. Three foot shoulders planned on both sides of the road. Justification: The current structure is a single-lane bridge with deteriorating superstructure and an inadequate waterway opening. Widening: 1 to 2 lanes	N	Harford County	2019	2020

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation
2019	Capital Project Delivery Services	12-1901-99	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 is being initiated in FY 2019.	Y	Baltimore City	Ongoing
2018	Hanover Road Corridor Improvement	11-1801-42	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.	Y	Anne Arundel County	2021
2018	Mountain Road Corridor Revitalization - Phase I	11-1802-19	Anne Arundel County	This project will provide improved vehicular, bicycle, and pedestrian facilities and enhancements along the MD 177 (Mountain Road) corridor between Solley Road and Edwin Raynor Boulevard. No additional through lanes are being added.	Y	Anne Arundel County	2022
2018	Monroe Street Ramp over CSX and Russell Street over CSX	12-1801-13	Baltimore City	The bridges carrying Russell street and the Monroe Street Ramp over CSX will be replaced (sufficiency ratings of 60.2 and 47.8). This replacement includes full depth concrete pavement replacement as well as water, conduit, and BGE. The Monroe Street Ramp bridge carries traffic from the southbound I-95 off-ramp onto southbound MD-295. The Russell Street bridge carries traffic northbound and southbound into and out of the City of Baltimore to MD 295. (2 to 2 lanes)	Y	Baltimore City	2022
2018	Bear Run Road Bridge over Bear Branch	14-1801-13	Carroll County	Replacement of the existing 3-cell pipe culvert with a new structure (type TBD). (2 to 2 lanes)	Y	Carroll County	2024

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation
2018	Hughes Shop Road Bridge over Bear Branch	14-1802-13	Carroll County	Replacement of existing bridge with a new structure (type TBD). (2 to 2 lanes)	Y	Carroll County	2022
2017	Hanover Street Bridge Deck Repair over Middle Branch	12-1705-13	Baltimore City	Hanover Street Bridge is a thirty-seven (37) span bridge built in 1916 and rehabilitated in 1970 and 1992. The structure consists of a two-leaf bascule span, sixteen (16) open spandrel arch spans, and twenty (20) arcade spans at the north end of the bridge. The bridge has an overall length of 2290'-2. The bridge carries five (5) lanes of traffic, two (2) in each direction with an alternating direction center lane. This work will include the design of the rehabilitation of the concrete bridge deck for the Hanover Street Bridge over the Middle Branch in FY19. The existing deteriorated bridge deck will be partially removed and a new concrete deck section will be poured in its place. Work may also include but will not be limited to the rehabilitation of the steel drawbridge span depending upon funding availability. The construction of the rehabilitation work is currently estimated to begin in FY20. (5 to 5 lanes)	Y	Baltimore City	2022
2017	MLK Blvd. and Howard St. Intersection Improvements	12-1706-11	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. This project was previously included in the TIP as Citywide Earmarks and Enhancements (12-1212-99).	Y	Baltimore City	2021

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation
2017	Transportation Management Center Upgrade	12-1701-04	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). The current system, known as an i2 System, is more than ten years old and the servers are old and replacement is not available since the vendor has discontinued the system. Replacement with a new system requires a complete upgrade of hardware and software, installation of communication equipment for fiber optics, and a copper cable network and camera control system to complete the functions of the ATMS.	Y	Baltimore City	2021
2017	Rossville Blvd. Bridge No. B-0132 over Amtrak & Orems Rd.	13-1701-13	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. (4 to 4 lanes)	Y	Baltimore County	2024
2016	McKendree Road Culvert over Lyons Creek	11-1601-19	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. (2 to 2 lanes)	Y	Anne Arundel County	2023
2016	Polling House Road Bridge over Rock Branch	11-1602-13	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. (2 to 2 lanes)	Y	Anne Arundel County	2022

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation
2016	Citywide Road Reconstruction	12-1607-12	Baltimore City	Reconstruction of various roadways on the Federal Aid system - Sectors 1-4 of 4. Work is to generally include full depth reconstruction of roadways. It may also include curb and sidewalk reconstruction, street and pedestrian lighting, traffic signals, landscaping, and other isolated roadway appurtenance modifications. Projects include but are not limited to: *Sinclair Lane/Cedonia Avenue from Frankford Avenue to Radecke Avenue *Liberty Heights Avenue from Eldorado Avenue to Oakfield Avenue *Hollins Ferry Road from Wicomico Street to Waterview Avenue *Washington Street from Pratt Street to Aliceanna Street *25th Street from Greenmount Avenue to Kirk Avenue *Druid Park Lake Drive from Lake View Avenue to Eutaw Place *Annapolis Road from MD 295 to Waterview Avenue *Eastern Avenue from President Street to Broadway Square	Y	Baltimore City	Ongoing
2016	I-83 Concrete Deck Mill and Resurface	12-1604-13	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	Baltimore City	2023
2016	Moravia Road Ramp Bridge over Pulaski Highway	12-1605-13	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. (4 to 4 lanes)	Y	Baltimore City	2023

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation
2016	Orleans Street Bridge over I-83 and City Streets	12-1601-13	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. (6 to 6 lanes)	Y	Baltimore City	2023
2016	Radecke Avenue over Moores Run	12-1603-13	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. (2 to 2 lanes)	Y	Baltimore City	2022
2016	Remington Avenue Bridge over Stony Run	12-1602-13	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. (2 to 2 lanes)	Y	Baltimore City	2022
2016	Babylon Road Bridge over Silver Run	14-1601-13	Carroll County	Replacement of existing bridge to provide efficient access for local traffic and emergency service vehicles. (2 to 2 lanes)	Y	Carroll County	2022
2016	Gaither Road Bridge over South Branch Patapsco River	14-1602-13	Carroll County	Rehabilitation of existing bridge with a new superstructure (type TBD) to provide efficient access for local traffic and emergency service vehicles. (2 to 2 lanes)	Y	Carroll County	2022
2016	McKinstrys Mill Road Bridge over Sam's Creek	14-1603-13	Carroll County	Replacement of existing bridge with a new structure (type TBD) to provide efficient access for local traffic and emergency service vehicles. (2 to 2 lanes)	Y	Carroll County	2021

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation
2015	Stafford Road Bridge #24 over Deer Creek	15-1501-13	Harford County	This is a bridge rehabilitation project to consist of repair and/or replacement of the bridge deck and repairs to the beam seats, abutments, wingwalls, piers, backwalls, rocker bearings, and railing posts. The current sufficiency rating is 52.3. A four foot shoulder is planned on the east side of the bridge. (2 to 2 lanes)	Y	Harford County	2021
2014	Magothy Bridge Road Bridge over Magothy River	11-1402-13	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. (2 to 2 lanes)	Y	Anne Arundel County	2020
2014	O'Connor Road Bridge over Deep Run	11-1403-13	Anne Arundel County	Replace bridge over Deep Run at O'Connor Road. Three foot shoulders planned on both sides of the road. (2 to 2 lanes)	Y	Anne Arundel County	2020
2014	Belair Road Complete Streets	12-1404-11	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 2019 construction is for Phase I which includes intersection improvements at Belair Rd and Frankford Ave. FY 2019 PE and FY 2020 construction funds are for Phase II which includes the intersection of Belair Rd and Erdman Ave. FY 2021 PE and FY 2022 construction funds are for Phase III which includes the intersection of Belair Rd and Fleetwood Ave. $300,000 for Phase I PE authorized in 2016.	Y	Baltimore City	2022

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation
2014	Citywide Concrete Roadway Slab Repairs	12-1416-11	Baltimore City	This project includes the repair of concrete roadways on federal routes within the city with the goal of extending the overall life cycle of these roadways. Current projects include but are not limited to: -West Patapsco Avenue from English Consul Avenue to the Patapsco River Bridge -Coldspring Lane from Roland Avenue to Tamarind Road	Y	Baltimore City	Ongoing
2014	Citywide System Preservation	12-1414-11	Baltimore City	Citywide system preservation includes resurfacing, rehabilitation and maintenance, streetscapes, signals, and intersection improvements, as well as ADA ramps and sidewalk improvements. 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 -North Avenue and Pennsylvania Avenue Intersection Improvements -Pennington Avenue rehabilitation from Aspen Street to Old Pennington Avenue	Y	Baltimore City	Ongoing
2014	Greenmount Avenue Reconstruction: 43rd Street to 29th Street	12-1408-12	Baltimore City	Reconstruction of Greenmount Avenue between 43rd and 29th street, including milling/repaving, lighting, landscaping, new sidewalks and traffic calming. Traffic calming measures include bump outs, imprinted asphalt crosswalks, a new median, and pedestrian signals.	Y	Baltimore City	2020
2014	Wilkens Avenue Bridge Over Gwynns Falls	12-1403-13	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 (4 to 4 lanes)	Y	Baltimore City	2021

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation
2014	Robinson Mill Road Bridge #154 over Broad Creek	15-1401-13	Harford County	This project is to replace the entire bridge that carries Robinson Mill Road over Broad Creek. The two-lane approach road on both ends of the bridge includes horizontal curves that restrict sight distance across the bridge. Three foot shoulders planned on both sides of the road. (2 to 2 lanes)	Y	Harford County	2018
2012	Harwood Road Bridge over Stocketts Run	11-1208-13	Anne Arundel County	This project will replace the existing bridge over Stocketts Run. Three foot shoulders planned on both sides of the road. (2 to 2 lanes)	Y	Anne Arundel County	2021
2012	Baltimore City Locked Gate Interstate Access Point Approval (IAPA)	12-1201-99	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	Baltimore City	2021
2012	Citywide Bicycle and Pedestrian Improvements	12-1217-25	Baltimore City	The Citywide Bicycle and Pedestrian Group includes but is not limited to the planning, 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. Projects include: *Eutaw Place from Druid Hill to Druid Park Lake (combination of protected bike lanes and bike lanes) *St Lo Drive from North Avenue to Harford Road (protected bike lanes) *University Parkway from Calvert Street to Roland Avenue (protected bike lanes) *West Pratt Street from MLK Boulevard to Light Street (protected bike lanes/off-street trail)	Y	Baltimore City	Ongoing

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation
2012	Citywide Guide Sign Replacement	12-1222-19	Baltimore City	Guide sign replacement including but not limited to signs on I-83, MD 295 and other major arterials.	Y	Baltimore City	Ongoing
2012	Citywide Traffic Signals, Intelligent Transportation System and Safety Improvements	12-1218-07	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, and geometric improvements at multiple intersections.	Y	Baltimore City	Ongoing
2012	Pavement Management System	12-1206-99	Baltimore City	This project will include but will not be limited to assessing the pavement condition of every publicly maintained street in Baltimore City so that DOT can understand the health of the transportation network and know how to best utilize the current budget for pavement maintenance projects. A final report will be used for CIP repaving projects.	Y	Baltimore City	2020
2012	Perring Parkway Ramp and Hillen Road Bridge	12-1215-13	Baltimore City	Replace Perring Parkway Ramp over Herring Run and Hillen Road Bridge over Herring Run. (4 to 4 lanes)	Y	Baltimore City	2022

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation
2012	Sisson Street Bridge over CSX Railroad	12-1216-13	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. (2 to 2 lanes)	Y	Baltimore City	2022
2012	Forest Park Avenue N. Bridge No. B-0097 over Dead Run and Dogwood Road	13-1210-13	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. (2 to 2 lanes)	Y	Baltimore County	2024
2012	Golden Ring Road Bridge No. B-0110 over Stemmers Run	13-1208-13	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. (2 to 2 lanes)	Y	Baltimore County	2025
2012	Old Court Road Bridge No. B-0237 over Bens Run	13-1204-13	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. (4 to 4 lanes)	Y	Baltimore County	2020
2012	Old Ingleside Avenue Bridge No. B-0096 over Dead Run	13-1202-13	Baltimore County	Replacement of Bridge No. B-96 on Old Ingleside Avenue over Dead Run. Existing bridge is a historic arch structure. Preliminary design will include evaluation of rehabilitation versus replacement study. 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. (2 to 2 lanes)	Y	Baltimore County	2023

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation
2012	Rolling Road Bridge No. B-0358 over Branch of Dead Run	13-1209-13	Baltimore County	Replacement of Bridge No. B-358 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. (4 to 4 lanes)	Y	Baltimore County	2023
2012	Sparks Road Bridge No. B-0018 over Gunpowder Falls	13-1206-13	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	Baltimore County	2021
2011	Furnace Avenue Bridge over Deep Run	11-1103-13	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. (2 to 2 lanes)	Y	Anne Arundel County	2020
2011	Lansdowne Boulevard Bridge No. B-0113 over CSX Railroad	13-1105-13	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. (4 to 4 lanes)	Y	Baltimore County	2026
2011	Peninsula Expressway Bridge No. B-0119 over CSX Railroad	13-1108-13	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. (4 to 4 lanes)	Y	Baltimore County	2024
2011	Bixler Church Road Bridge over Big Pipe Creek	14-1101-13	Carroll County	Replace the existing 2-cell culvert with a new 2-cell concrete box culvert. (2 to 2 lanes)	Y	Carroll County	2019

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation
2011	Shepherds Mill Road Bridge over Little Pipe Creek	14-1102-13	Carroll County	Replace the existing 3-span bridge with a new structure, including piers and abutments. (2 to 2 lanes)	Y	Carroll County	2020
2011	Stone Chapel Road Bridge over Little Pipe Creek	14-1103-13	Carroll County	Rehabilitation of existing bridge to provide efficient access for local truck traffic to MD 31. (2 to 2 lanes)	Y	Carroll County	2021
2011	Phillips Mill Road Bridge #70 over East Branch Tributary	15-1102-13	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. (2 to 2 lanes)	Y	Harford County	2020
2010	Gunpowder Road Bridge No. B-0409	13-1005-13	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. (2 to 2 lanes)	Y	Baltimore County	2025
2010	Hammonds Ferry Road Bridge No. B-0100 over CSX Railroad	13-1012-13	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. (4 to 4 lanes)	Y	Baltimore County	2021
2010	Abingdon Road Bridge #169 over CSX Railroad	15-1001-13	Harford County	Replace the bridge that carries Abingdon Road over the CSX Railroad tracks. Five foot sidewalk planned on one side of the road. (2 to 2 lanes)	Y	Harford County	2021

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation
2008	Mohrs Lane Bridge No. B-0143 over CSX Railroad	13-0803-13	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. (2 to 2 lanes)	Y	Baltimore County	2022
2004	Bridge Repairs and Deck Replacement	16-0436-13	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	Howard County	Ongoing
2002	Citywide Road Resurfacing - Federal Aid Program	12-0207-11	Baltimore City	Resurfacing or rehabilitation of various roadways on the Federal Aid system citywide. Work is to generally include the removal and replacement of existing asphalt surfaces. It may also include roadway base repairs, minor curb and sidewalk repairs, and other isolated roadway appurtenance modifications. Projects include but are not limited to: *East Monument Street from Washington Street to Edison Highway *Perring Parkway from East Belvedere Avenue to the City line *East Madison Street from the Fallsway to South Milton Avenue	Y	Baltimore City	Ongoing
2000	Dogwood Road Bridge No. B-0072 Over Dogwood Run	13-0001-13	Baltimore County	Replacement of existing bridge. New structure will have one 3 foot shoulder and one 6 foot shoulder. (2 to 2 lanes)	Y	Baltimore County	2021

TIP Year	Project Title	TIP ID#	Agency	Description	Exempt (Y/N?)	Jurisdiction	Year of Operation
1994	Bridge Inspection Program	14-9401-14	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	Carroll County	Ongoing
1994	Bridge Inspection Program	15-9411-14	Harford County	This federal program provides funding for the inspection of bridges in Harford County.	Y	Harford County	Ongoing
1989	Bridge Inspection Program	13-8901-14	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	Baltimore County	Ongoing

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

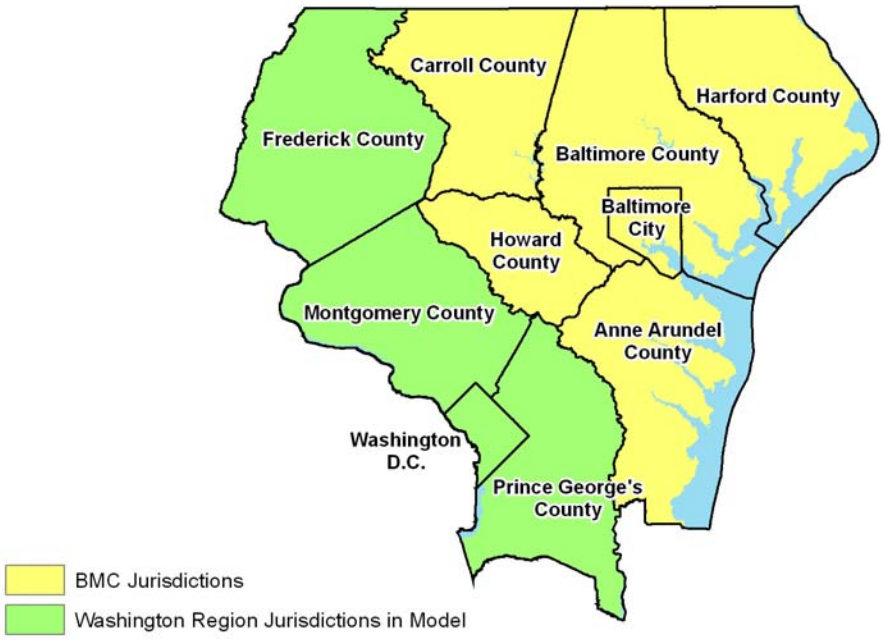
Appendix E: *Excerpt: Introduction, Baltimore Region Travel Demand Model Version 4.4 – Model Validation for 2010 Base Year*

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

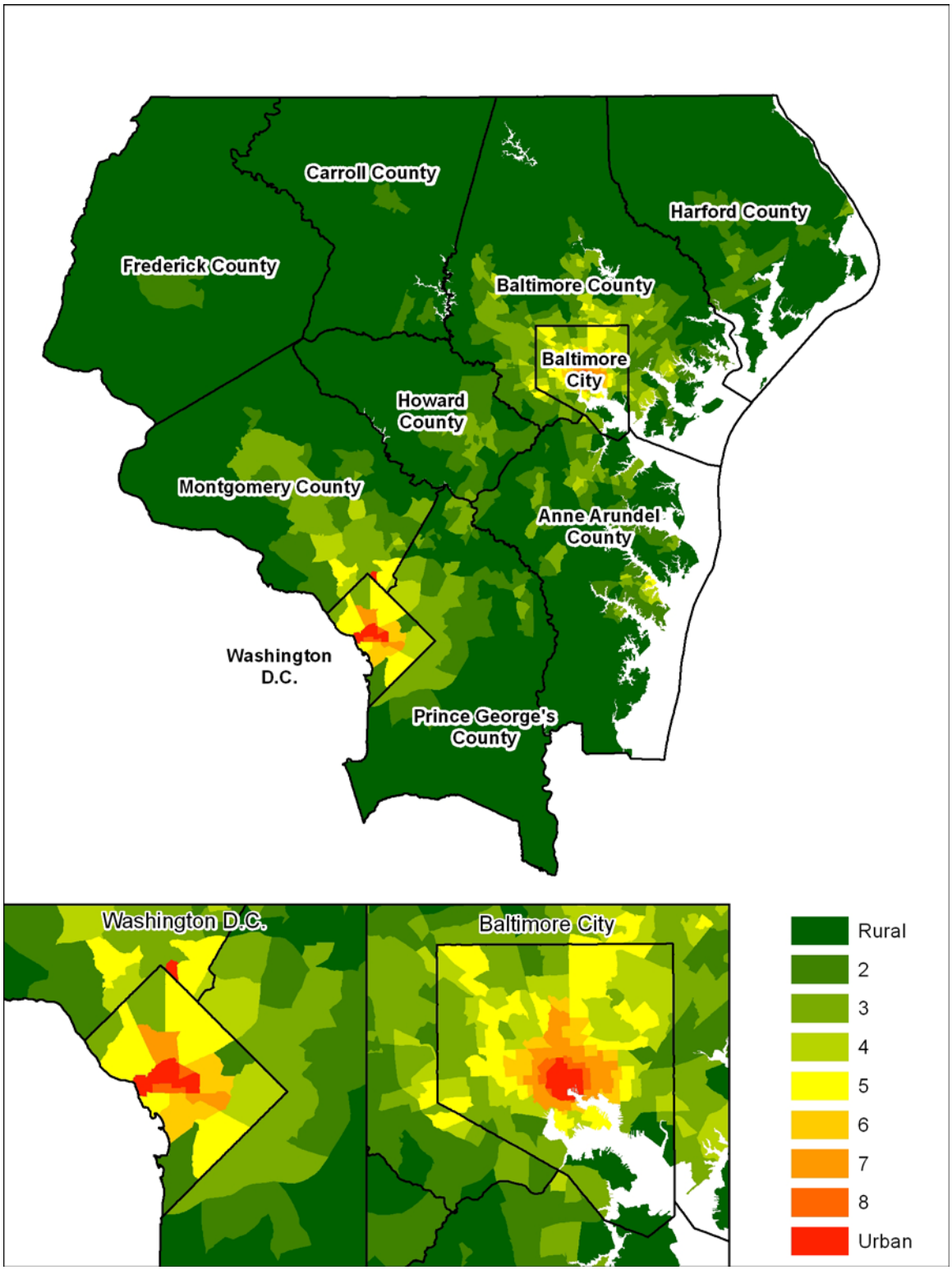
The area type model utilizes employment and household densities to develop a single density factor for each zone. The calculated area type indices are utilized to estimate non-motorized trips, to estimate Mode Choice and to estimate speed-capacity for highway network. To capture the effect of neighboring 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	1.2283	1.4357	0.9897	1.2555	3.997
	Anne Arundel	0.9055	1.113	0.9645	1.0785	1.1271
	Baltimore	1.0251	1.2608	0.9064	1.3805	1.291
	Carroll	0.6517	0.6517	1.004	0.6002	0.5797
	Harford	1.0806	1.257	1.2545	1.2451	1.3016
	Howard	0.8506	1.0986	0.8422	1.0894	0.9003
Rural	Baltimore City	1.2283		0.9897	1.2555	3.997
	Anne Arundel	0.8487		1.1582	0.9425	0.9199
	Baltimore	0.886		0.8921	0.7221	0.8994
	Carroll	0.6517		0.6326	0.9416	0.7423
	Harford	1.0745		0.889	0.8705	1.0374
	Howard	0.6256		1.1412	0.5563	0.652

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

BALTIMORE METROPOLITAN PLANNING ORGANIZATION

BALTIMORE REGIONAL TRANSPORTATION BOARD
RESOLUTION #19-2

APPROVAL OF THE CONFORMITY DETERMINATION FOR THE FY 2019-2022 BALTIMORE REGION TRANSPORTATION IMPROVEMENT PROGRAM AND THE AMENDED PLAN: *MAXIMIZE2040*

WHEREAS, the Baltimore Regional Transportation Board (BRTB) is the designated Metropolitan Planning Organization for the Baltimore region, encompassing the Baltimore Urbanized Area, and includes official representatives of the cities of Annapolis and Baltimore, the counties of Anne Arundel, Baltimore, Carroll, Harford, Howard, and Queen Anne's as well as representatives of the Maryland Department of Transportation, the Maryland Department of the Environment, the Maryland Department of Planning, the Maryland Transit Administration, and Harford Transit; and

WHEREAS, the Baltimore Regional Transportation Board, as the Metropolitan Planning Organization for the Baltimore region, is required under the Clean Air Act Amendments of 1990 and the U.S. Environmental Protection Agency's Transportation Conformity Rule to conduct analyses to ensure that the region's transportation plans and programs conform with state implementation plans (SIPs); and

WHEREAS, the FY 2019-2022 Baltimore Region Transportation Improvement Program is a prioritized program of transportation projects which are financially constrained by year and includes a financial plan that demonstrates that projects can be implemented using current revenue sources. The FY 2019-2022 Baltimore Region Transportation Improvement Program was prepared in accordance with 23 CFR Part 450 Subpart C Metropolitan Transportation Planning and Programming Requirements, and all projects and activities funded in this document have been developed in relationship to the regionally adopted *Maximize2040,* as amended; and

WHEREAS, the Interagency Consultation Group (ICG), which includes the Maryland Department of the Environment, the Maryland Department of Transportation and a local jurisdiction representative of the Baltimore Regional Transportation Board, reviewed and approved the air quality conformity methodology used as well as the results of the technical analysis; and

WHEREAS, The ICG has approved the conformity analysis as reported in the "Conformity Determination of FY 2019-2022 Baltimore Region Transportation Improvement Program and Amended *Maximize2040*," dated July 2018, which provides the basis for a finding of conformity (Attachment 1: Tables 1 and 2) to the latest EPA-deemed adequate/approved SIP motor vehicle emissions budgets for 8-hour ozone; and

WHEREAS, the results of the conformity analysis for the Baltimore nonattainment area indicate that the projected mobile source emissions are below the applicable motor vehicle emission budgets for the established analysis years of 2020, 2030 and 2040 (as attached); and

WHEREAS, a 30-day public comment period was provided, including a public meeting on project elements of the FY 2019-2022 Baltimore Region Transportation Improvement Program, the Amended Plan, and the results of the conformity analysis. No public comments were submitted on the Conformity Determination.

NOW, THEREFORE, BE IT RESOLVED that it is the conclusion of the Baltimore Regional Transportation Board, in its capacity as the Metropolitan Planning Organization for the Baltimore region, that the FY 2019-2022 Baltimore Region Transportation Improvement Program and the amended *Maximize2040* are found to be in conformity with the requirements of the Clean Air Act Amendments of 1990 and the relevant sections of the Final Transportation Conformity Regulations 40 CFR part 93.

I HEREBY CERTIFY that the Baltimore Regional Transportation Board, as the Metropolitan Planning Organization for the Baltimore region, approved the aforementioned resolution at its July 24, 2018 meeting.

July 24, 2018
Date

Valorie LaCour, Chair
Baltimore Regional Transportation Board

Attachment 1

Table 1. VOC Emissions Test Results (average summer weekday, tons/day)

	2020	2030	2040
Total Emissions Modeled	22.2	12.8	10.0
Conformity Budget[1]	40.2	40.2	40.2
Conformity Result	**Pass**	**Pass**	**Pass**

[1] 2012, 8-hour ozone Reasonable Further Progress (RFP) SIP budget for the Baltimore region (motor vehicle emission budgets determined adequate by EPA on February 22, 2016)

Table 2. Weekday NOx Emissions Test Results (average summer weekday, tons/day)

	2020	2030	2040
Total Emissions Modeled	49.1	22.8	18.7
Conformity Budget[1]	93.5	93.5	93.5
Conformity Result	**Pass**	**Pass**	**Pass**

[1] 2012, 8-hour ozone Reasonable Further Progress (RFP) SIP budget for the Baltimore region (motor vehicle emission budgets determined adequate by EPA on February 22, 2016)

Appendix H: Public Participation

WEB POSTING

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BALTIMORE METROPOLITAN COUNCIL

FOR IMMEDIATE RELEASE
CONTACT: Laura Van Wart
Communications Officer
(410) 732-9564

BRTB SEEKS PUBLIC COMMENTS ON $3.2 BILLION IN TRANSPORTATION PROJECTS

BALTIMORE, MD (May 23, 2018) – The Baltimore Regional Transportation Board (BRTB) as the metropolitan planning organization (MPO) for the Baltimore region seeks public comments through **Monday, June 25** on two transportation-related documents – the draft *2019-2022 Transportation Improvement Program (TIP)*, and the associated *Air Quality Conformity Determination* of the FY 2019-2022 TIP and amended *Maximize2040: A Performance-Based Transportation Plan*.

The BRTB is scheduled to vote on these documents on **Tuesday, July 24**.

2019-2022 Transportation Improvement Program (TIP)
The 2019-2022 TIP is the list of regional transportation projects requesting federal funding in the near term. It includes approximately **$3.2 billion** in proposed federal, state and local money for highway, transit, bicycle and pedestrian projects during the next four years. The funding goes toward maintaining, operating and expanding the transportation system. The TIP is fiscally constrained.

Comment on the 2019-2022 TIP

Air Quality Conformity Determination Report
The Baltimore region has been designated as **not meeting** National Ambient Air Quality Standards (NAAQS) and, as a result, the BRTB must review its current transportation plan and program to ensure conformity with the state plan to meet these standards, known as the State Implementation Plan (SIP). The Air Quality Conformity Determination report details a comprehensive analysis of effects that the draft 2019-2022 TIP and the amended Maximize2040: A Performance-Based Transportation Plan have on the Baltimore region. The report addresses ground-level ozone emissions.

The conformity results show that implementation of these projects will not worsen the region's air quality or delay the timely attainment of national air quality standards. The draft air quality conformity determination is available in PDF format for download.

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The Baltimore Metropolitan Council (BMC) works collaboratively with the chief elected officials in the region to create initiatives to improve the quality of life and economic vitality. BMC, as the Baltimore region's council of governments, hosts the Baltimore Regional Transportation Board (BRTB), the federal metropolitan planning organization (MPO), and supports local government by coordinating efforts in a range of policy areas including emergency preparedness, housing, cooperative purchasing, environmental planning and workforce development.

BMC's Board of Directors includes the executives of Anne Arundel, Baltimore, Harford and Howard counties, the mayor of the City of Baltimore, a member of the Carroll County and Queen Anne's County boards of commissioners, a member of the Maryland State Senate, a member of the Maryland House of Delegates, and a gubernatorial appointee from the private sector.

EVENT POSTER

CONFORMITY DETERMINATION REPORT ON

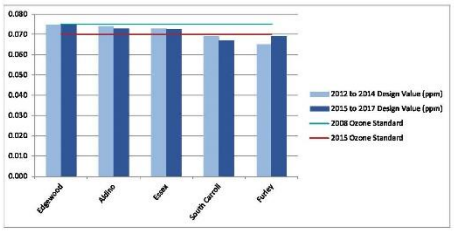
AIR QUALITY

What is Transportation Conformity?

- A process that ensures that federally funded transportation projects do not worsen the region's air quality.
- Required for areas designated "nonattainment" or "maintenance" for a National Ambient Air Quality Standard (NAAQS)
- The conformity results for the draft 2019-2022 TIP and the amended *Maximize2040* show that implementation of these projects will not worsen the region's air quality or delay the timely attainment of national air quality standards.

Ozone in the Baltimore Region

Ozone pollution in the region has descreased, as seen in the chart of monitoring stations below.



The region is meeting the 2008 National Ambient Air Quality Standard (NAAQS), but not the 2015 NAAQS of 70 ppb.

Ozone Pollution Sources

Ground-level ozone forms when nitrogen oxides (NOx) and volatile organic compounds (VOCs) undergo a chemical reaction under heat and sunlight.

NOx and VOCs come from a variety of sources, some of which are emissions from cars and trucks.

Despite growth in population and increases in the amount of miles people travel in their cars, NOx and VOC emissions from transportation are going down in the Baltimore region.

@BaltoMetroCo @BaltimoreMetropolitanCouncil @BaltoMetroCo @Baltimore Metropolitan Council

Appendix I: Status Report on Implementation of Emission Reduction Strategies in the Region

This Appendix includes the following sections:

- Appendix I-1: Description of Emission Reduction Strategies
- Appendix I-2: Tracking the Status of Emission Reduction Strategies

Appendix I-1: 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. In addition to the narrative provided here in Appendix I-1, Appendix I-2 provides data collected from tracking the status of "emission-friendly" projects in the region. 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 a program administered by the Maryland Transit Administration that provides funding support to local rideshare programs in order to strengthen ride 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 is provided to interested commuters via the Commuter Connections Database.
- TDM information is provided to commuters and employers.
- Commuters and employers are provided assistance with identifying opportunities for alternative commuting strategies such as transit, flexible work hours, and teleworking.
- Printed and electronic information is distributed to both public and private employers.
- Advertisements are placed 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 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 federal and 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, 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. Through the Clean Commute Initiative, BMC asks residents of the Baltimore region to try an alternative to driving alone for at least one day during "clean commuting season." In 2017, promotion began in early April with a number of outreach events throughout the region. Events continued through May, and included the 20th anniversary edition of Bike to Work Day on May 19th. Participation in Bike to Work Day has increased substantially in recent years—2017 saw 2200 riders—and 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 2017 Clean Commute Initiative also featured a paid media campaign, sponsored by the BRTB, with radio spots running in April, May, and June on the *I Heart Radio* cluster of stations. In addition, a web site, www.cleancommute.com, provided information about

related events, Bike to Work Day, and other commuting issues. The site remains live year-round and is a one-stop-shop for clean commuting information in the Baltimore region.

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 2017, 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, 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. Building on previous efforts at telework promotion in the region, BMC and MDOT launched ***Teleworkbaltimore.com*** in December 2009. Through the program, BMC directs employers in the region—typically through the Clean Commute program—to a branded web site 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 personal illness, sick children, or employer-mandated unscheduled overtime. 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 $39 for college students in certain enrolled schools, a savings of $25 off the regular monthly pass cost. 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 around 250 vehicles, including over 100 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 carshare service, started by GM in 2017, is Maven. This service has 40 cars that are available to rent at twenty 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 2016, 64 percent of respondents stated that they either got rid of their car or decided not to purchase 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 and in process of developing 2019 update
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 2017, the fifth 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.

Figure 1: MARC Bike Car

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 from Baltimore to Washington D.C. are now equipped with a bike car accommodating full size bicycles. (See Figure 1) This gives transportation users another option to driving solo as combining bicycling and transit use may provide a reasonable alternative to driving that may not be possible if considering 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:

- Informs members of the public on bicycling matters through periodic articles in COG Quarterly, a quarterly publication about BMC's work.
- Annual Bike to Work Day, a BMC-coordinated region-wide event with over 2,000 registrants. Bike to Work Day "rallies" or "pit stops" are held in each jurisdiction, with additional employer-based events.
- Baltimore Region Street Smart program - An education and enforcement campaign that promotes awareness of pedestrian and bicycle safety laws to both motorized and non-motorized travelers through media, visible street events, targeted police enforcement at high-profile pedestrian crossings, and direct door-to-door outreach in neighborhoods with high rates of pedestrian fatalities and injuries.

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 MTA operates a far-reaching system of bus services. The size of MTA's bus fleet is approximately 768 buses, including 405 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. MTA's BaltimoreLink bus service has 60 bus routes, which include the following.

CityLink: 12 high-frequency bus routes will connect with each other, as well as Metro SubwayLink, Light RailLink, MARC Train, Commuter Bus, Amtrak, and other services into one integrated transit network.

LocalLink: 43 local bus routes will provide comprehensive crosstown connections and system-wide connectivity to neighborhoods and communities.

Express BusLink: Express BusLink will consist of several existing Express Bus services that provide suburb-to-city connections, and the addition of the recently launched routes providing suburb-to-suburb connections. Typically, express bus routes have fewer stops and use higher speed roadways. There are currently 12 express buses in service.

Commuter BusLink: Commuter bus service provides an express transit connection from suburban, residential areas to the Baltimore and Washington, D.C. regions. Twenty-seven operate throughout Central and Southern Maryland and 10 lines operate in the Baltimore region.

Locally Operated Transit Services: In addition to the transit services operated by 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. 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 Dept. of Transportation	City of Annapolis and nearby portions of Anne Arundel County, including Parole, Edgewater, and Arnold	Bike racks, wheelchair accessible
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 Dept. 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 Dept. 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 that are elderly, disabled, 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, and Taneytown.	Demand-response service also provided.
Harford Transit LINK	Harford County	Eight local routes link the primary towns and connect with Cecil County, the MARC commuter train, and MTA's commuter bus service to downtown Baltimore.	Demand-response service also provided.
Howard Transit	RTA	Fifteen fixed routes and demand response serving Howard County, western Anne Arundel County, and northern Prince George's County.	Inductive electric buses provide service for residents in Howard County.

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

In addition to 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, the companies, MegaBus.com and Bolt Bus, provide intercity service from Baltimore to the New York City, with MegaBus.com offering service to additional cities in the Northeastern U.S. and Toronto.

To connect rural communities in Maryland, in January 2011 the Maryland Department of Transportation launched an Intercity Bus Program. 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 Greyhound.

Rail Transit

Rail Transit in the Baltimore region is provided through MTA's Metro Subway, Central Light Rail, and Maryland Rail Commuter (MARC) service.

Metro SubwayLink

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 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. The projected delivery of the first married pair of railcars is June 30, 2020.

Light RailLink

MTA's Central Light Rail Transit provides medium-speed transit 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 north of downtown Baltimore and to Baltimore/Washington International Thurgood Marshall Airport in Anne Arundel County. Light Rail 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. The projected delivery of the final refurbished car is March 2, 2022.

Maryland Rail Commuter (MARC)

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/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 nine stations in the region. The Camden Line runs from Camden Station in Baltimore City to Union Station and stops at six stations in the region.

MARC commuter rail services will be enhanced through 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 by the beginning of May 2019.

MTA is in the process of implementation and development of Positive Train Control (PTC) for all MARC diesel locomotives and all cab cars. PTC will prevent collisions, run thru signals, and ensure proper train spacing on tracks operated by MARC and will be in operation by the end of 2018.

In addition, there are several MARC overhaul projects on the horizon that will improve passenger experience. Sixty-three multi-level MARC vehicles will be overhauled, which includes upgrades to HVAC, trucks, brakes, doors, and communications. Upgrades to

HVAC and communications system are included to enhance passenger comfort. The 63 overhauled vehicles will be received in 2017 and 2018. 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 25-30 years. Finally, the overhaul of 26 MARC IIA vehicles will include safety, interior, and communication improvements.

MANAGEMENT AND OPERATIONS PROJECTS

Management and operations projects improve the efficiency of the transportation system through the use of 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, and other traffic management projects implemented in conjunction with the CHART program.

The Coordinated Highways Action Response Team program, operated jointly by MDOT, SHA, MDTA, and Maryland State Police, focuses its operations on non-recurring congestion, such as crashes. The Statewide Operations Center, Authority Operations Center, and the two satellite Operations Centers in the region, survey the state's roadways to quickly identify incidents. CHART also includes traffic patrols, which operate 24 hours 7 days per week on many of the state highways in the region. CHART operations save tens of millions of vehicle-hours of delay statewide, millions of gallons of fuel statewide, and reduces overall mobile source emissions.

The mission of CHART is 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." Its goals 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.

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. As noted above, CHART also provides roving rapid response teams (emergency traffic patrols) that 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.

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 26 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 2016, 76 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	96%
William Preston Lane Jr. Memorial (Bay) Bridge	68%
Baltimore Harbor Tunnel	72%
Fort McHenry Tunnel	73%
Francis Scott Key Bridge	78%
Thomas J. Hatem Memorial Bridge	93%
John F. Kennedy Memorial Highway	70%

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 reduce traffic congestion and delay, enhance the safety of responders and the traveling public, 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 which leads 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

The Maryland Port Administration (MPA) is working to reduce emissions from the Port sector. As part of this effort, in December 2015 the MPA signed the Green Port Initiative, with the Maryland Department of the Environment and Maryland Department of Transportation. The purpose of this initiative was for the agencies to work together towards funding and implementing projects that both promote growth and reduce emissions at the Port.

An important program under this initiative 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 (MY 2010 or newer) with an engine that meets more stringent emission standards. The Port's dray truck replacement program has been in place for several years and to date has replaced approximately 173 dray trucks. Funding for this program has largely been through EPA Grants such as DERA with some state funding.

In addition to this program, in 2016 and 2017 the Port received approximately $1 million dollars in EPA/DERA funding to continue implementing the dray truck program as well as implement a cargo handling equipment (CHE) program and a locomotive idling reduction project. The CHE Program will provide funding for tenants at the Port to upgrade their old CHE with new low emitting CHE. For the locomotive project, MPA will work with Canton Rail Road to install idle reduction technology to be used on several of their locomotives. Both of these projects began in the spring of 2017. The CHE Program is ongoing and expected to be completed in the fall of 2018. The Canton Railroad Idle Reduction Project was completed in the fall of 2017.

Planned Emission Reducing Projects

Project Type: *Bike/Ped/Greenway*

Implementing Agency	***Project Name***	***Project Description***
Carroll County	Westminster Veterans Memorial Park	This project provides funding for the design, engineering, and construction of a 32-acre parcel in the Westminster area into a new active park. Design includes three multi-purpose fields, playground, pavilion, one-mile walking trail, and parking areas.
Carroll County	Westminster Community Trail - Phase III	Westminster Community Trail Phase III is a state project, with State Highway Administration providing 100% of construction costs, estimated at $1.1M. Pedestrian walkway/bike trail is to be macadam from Hahn Road along Route 27 south to the MD Route 140 overpass. Included is a pre-engineered bridge to cross an existing drainage area.
Carroll County	Ramp and Sidewalk Upgrades	Upgrade or replace non-compliant sidewalk ramps for ADA accessibility. Non-compliant ramps and sidewalks are also addressed through the Pavement Management Program. As part of this process, a self-evaluation of pedestrian facilities within county rights-of-way has been completed and will be used to develop a prioritized plan to address deficiencies.
Carroll County	Johnsville Road Sidewalk	This project provides funding for construction of a sidewalk along Johnsville Road in Freedom. The project will provide sidewalk connection to Eldersburg Elementary School, Liberty High School, residential neighborhoods, and the commercial corridor along MD 32 (Sykesville Road) via Bartholow Road.
Carroll County	Little Pipe Creek Trail	This project provides planned funding for the development of a 10-foot wide, 4 mile macadam trail along MD Rte 75 corridor for walking, biking and in-line skating. From Union Bridge to New Windsor.
Carroll County	Sykesville to Piney Run Park Greenway	Construct a 4-mile greenway trail to link the Town of Sykesville to Piney Run Park. This project will interconnect parks and other high-user areas with surrounding residential and town development.

Project Type:	*Bike/Ped/Greenway*	
Implementing Agency	***Project Name***	***Project Description***
Carroll County	Washington Road (MD 32) Sidewalk	Length: Approximately 2,160 feet Limits: Kate Wagner Road to Washington Lane This project provides planned funding for construction of sidewalks along Washington Road (MD 32) in Westminster. The project will provide a continuous sidewalk connection with the residential neighborhoods south of Westminster and the facilities of Westminster High School, Carroll Community College, Robert Moton Elementary School, and Carroll County YMCA.
Carroll County	Bennett Cerf Bridge Replacement	This project provides planned funding for the design and replacement of a pedestrian bridge located at Bennet Cerf Park in Westminster.
Harford County	Bike Trails/Linear Park Development	Project to acquire and develop bike trails, greenways and linear parks. Trails can be constructed along existing roadways, in existing and proposed park sites and/or the Ma & Pa Railroad track bed.
Howard County	School Route Pathways or Sidewalks	Installation of sidewalks/pathways to provide safe walking route for school children.
Howard County	Guilford Rd Pedestrian/Bike Improvements	Project to design and construct a sidewalk on one or both sides of Guilford road between Oakland Mills Road and US1. Significant pedestrian and bicycle activity has been observed on Guilford Road.
Howard County	US 1 Corridor Revitalization	Plan, design, and implement a series of streetscape, pedestrian, bicycle, transportation and public green space improvement on public property in the US 1 Corridor.
Howard County	North Laurel Road Sidewalk	Design and construction of a sidewalk along the southwest side of North Laurel Road from Linville Ave. to US1.
Howard County	School Crosswalk Improvements	This project is for the installation or modification of crosswalks, raised crosswalks, chokers, sidewalks, raised shoulders, signs and/or other roadway retrofits to provide for an enhanced walking route for school children.
Howard County	Community Renewal / Enhancements	A project to design and implement a series of pedestrian improvements, streetscape enhancements and repair or enhancement of public green spaces.

Project Type:	*Bike/Ped/Greenway*	
Implementing Agency	***Project Name***	***Project Description***
Howard County	US 40 Corridor Enhancement	A project to plan, design and implement improvements (eg sidewalks, landscaping, street trees, median and gateway enhancements) within public right-of-way and to develop a corridor design manual to guide site design on adjacent properties.
Howard County	Sidewalk Repair Program	This project is for the repair of deteriorated sidewalks and driveway aprons that are in public rights-of-way.
Howard County	Clarksville - River Hill Streetscape Improvements	A project to plan, design and construct road and related improvements -- including streetscape, storm water management, pedestrian, bicycle, and public space enhancements -- in the Route 108 corridor.
Howard County	Ellicott City Improvements and Enhancements	Project to provide a variety of repairs and improvements to public infrastructure and address other community needs to improve the downtown and historic district.
Howard County	FY 2017 Savage Area Complete Streets	The project includes complete street improvements in Savage, Maryland to enhance multimodal travel for pedestrians, bicyclists, transit, and automobiles.
Howard County	Sanner Road Improvements	Project providing bicycle compatibility by widening the existing 10 feet lanes to 12 feet and filling in the missing shoulders along both sides of the road.
Howard County	Downtown Columbia Patuxent Branch Trail Extension - Phase I	Phase I of a project connecting Downtown Columbia at Lake Kittamaqundi and extending to the existing Patuxent Branch Trail. The complete project would provide a car-free connection to Downtown Columbia to Savage and will connect to the planned east-west Hospital to Blandair Park multi-use pathway.
Howard County	FY 2009 Pathway and Trail Rehab and Expansion	Rehabilitate and expand the existing Pathway System which currently extends from Savage Park through Columbia to Dorsey's Search.
Howard County	Oakland Mills Road Improvements	Project improving Oakland Mills Road from Guilford Road northward to Carters Lane.The improvements would include road widening, sidewalk, curb and gutter and bicycle compatibility.
Howard County	Intersection Improvement Program	Project for the study, design and construction of geometric and pedestrian modifications to improve the safety or increase capacity at various intersections.
Howard County	FY2014 Bicycle Plan Projects	A project for the implementation of the comprehensive Howard County Bicycle Master Plan.

Project Type:	*Bike/Ped/Greenway*	
Implementing Agency	***Project Name***	***Project Description***
Howard County	Doncaster Drive Sidewalk	A project to construct approximately 1200 LF of sidewalk along Doncaster Drive from Roundhill Road to Hale Haven Road.
Howard County	Mission Road Sidewalk	A project to install sidewalk along parts of Mission Road. Area 1 will install sidewalk from Pleasant Chase Road to the Ridgley's Run Community Center. Area 2 will address Mission Road from Guildford Road to Concord Drive.
Howard County	FY 2009 State Roads Sidewalk Retrofit Program	Design and construct improved pedestrian access along State roads.
Howard County	Elkridge Main Street Improvements	Project replacing the curb, gutter, and sidewalks along Main Street from Old Washington Road to Brumbaugh Street in Elkridge.
MDOT	Bike Racks on Weekday MARC Train	Bike racks will be added to the MARC train during weekday service. The MARC cars with the bike racks will be marked on the outside. Two bicycles would be able to be accommodated on these indicated MARC cars.

Project Type:	*Congestion Management*	
Implementing Agency	***Project Name***	***Project Description***
Carroll County	Lucabaugh Mill/Sullivan/Lemmon Roads Roundabout	This project provides funding for the design and construction of a roundabout at the intersection of Lucabaugh Mill, Sullivan, and Lemmon Roads to address safety concerns.
Howard County	Brighton Dam Road at Highland Road Roundabout	Project designing and constructing a roundabout at the intersection of Brighton Dam Road and Highland Road. The current intersection is a four way stop.

Project Type:	*ITS*	
Implementing Agency	***Project Name***	***Project Description***
Howard County	Signalization Program	Project designing and constructing various traffic signals when the MUTCD Warrants are met; also includes the modification and modernization of existing traffic signals.

Project Type:	*Public Transit Improvement*	
Implementing Agency	***Project Name***	***Project Description***
Howard County	FY 2014 Bus Stop Improvements	Project implementing a series of improvements to Howard Transit bus stops including installation of bus shelters, concrete pads, bus stop signs, connecting sidewalks, curb cuts (consistent with ADA requirements), crosswalks, route map holders and other improvements. The Office of Transportation will determine the location and extent of these improvements.
MDOT	MTA Bus Replacement	This project provides for the routine replacement of buses past their useful life.

Ongoing Emission Reducing Projects

Project Type: *Bike/Ped/Greenway*

Implementing Agency	***Project Name***	***Project Description***
Harford County	Sidewalks and Handicapped Ramps	Project to construct sidewalks to interconnect communities, schools, and commercial areas. The project will benefit air quality by encouraging local walking trips and will improve safety by separating pedestrians and motor vehicles.
Howard County	FY 2007 Pedestrian Plan Projects	Ongoing evaluation, design and construction of pedestrian improvements listed in the Howard County Pedestrian Master Plan. The candidate project list is updated annually by the Dept. of Planning and Zoning in coordination with the Dept. of Public Works.
Howard County	Routine Sidewalk and Walkway Extensions	A project to design and construct routine sidewalk and walkway extensions about 1,000 feet in length.

Project Type:	*Commute Alternatives Incentive*	
Implementing Agency	***Project Name***	***Project Description***
Harford County	Harford County Telework Policy	Harford County has a policy to allow authorized employees to work from a remote workplace to enable employees to be more productive and to reduce employee turnover. The program enhances the County's efforts to employ and accommodate people with disabilities. Air pollution emissions and traffic congestion are reduced as a result.
MDOT	Commuter Choice Tax Benefit Program	Conduct marketing efforts to promote use of state and federal commuter choice tax benefits.

Project Type:	*Congestion Management*	
Implementing Agency	***Project Name***	***Project Description***
Harford County	Traffic Calming, Bicycle and Road Safety Improvements	Project to construct various "traffic calming" devices aimed at speed reduction, community beautification, and increased safety. Funds are also being provided for bicycle and automobile related safety improvements.
Howard County	Residential Traffic Calming	Project to construct geometric roadway changes to reduce traffic speeding in residential areas.

Project Type: *ITS*		
Implementing Agency	***Project Name***	***Project Description***
MDOT	CHART - (Coordinated Highways Action Response Team)	Focuses on non-recurring congestion includes traffic patrols, video traffic management, variable message signs, permanent congestion monitoring systems and rapid response team.

Project Type:	*Land Use*	
Implementing Agency	***Project Name***	***Project Description***
Carroll County	Agricultural Land Preservation	This project provides funding for the Carroll County Agricultural Land Preservation program by providing an opportunity for landowners to make a longterm commitment to agriculture by offering financial incentives in exchange for their property development rights. Preserving farmland with permanent easements helps to maintain the rural character of Carroll County and enables agriculture to remain a viable industry.

Project Type:	*Outreach/Education*	
Implementing Agency	***Project Name***	***Project Description***
MDOT	Clean Air Partners	A public/private consortium that carries out a public education campaign in the Baltimore and Washington, D.C. regions, to encourage individuals and employers to take voluntary actions to reduce air emissions and protect their health from air pollution. The campaign involves an Air Quality Action Days component.

Project Type:	*Public Transit Improvement*	
Implementing Agency	***Project Name***	***Project Description***
MDOT	MTA All Access College Transit Pass Program	Reduced transit pass for area college students.
MDOT	MARC Coaches - Overhauls and Replacement	Overhaul MARC coaches in accordance with "10-year minor" and "20-year mid-life" schedules
MDOT	State Worker Free Transit Program	Provide free service to state employees for MTA bus, light rail, some commuter buses, and Metro subway systems.

Implemented Emission Reducing Projects

Project Type: *Bike/Ped/Greenway*

Implementing Agency	***Project Name***	***Project Description***
Anne Arundel County	Broadneck Peninsula Trail - Phase IA	This is part of a larger project to develop a multi-use trail to connect Bay Bridge and Sandy Point State Park with B&A Trail. Phase IA goes from Green Holly to Old Cape St. Claire.
Anne Arundel County	Ridge/Teague Rds RTL	This project will provide for increased capacity and operational efficiency along Ridge Road at its intersection with Teague Road. This project will also complete sidewalk along Ridge Chapel Rd to Harmans Elementary Rd.
Anne Arundel County	WB&A - West County Trail - Phase III	Construct new paved, multi-use trail from Conway Road to Patuxent River.
Anne Arundel County	Cape St. Claire Rd. Widening	Design and construct widening of road between Woodland Circle and Hilltop Dr., and provide sidewalks.
Baltimore City	Jones Falls Trail - Phase II	Creation of bike/ped trail from the Penn Station area south to the Maryland Science Center at the Inner Harbor.
Baltimore City	Jones Falls Trail - Phase IV	Phase IV of the Jones Falls Trail will extend the trail 1.5 miles north to the Coldspring Lane Light Rail Station along the stream. Location: Woodberry Light Rail Station to Coldspring Lane Light Rail
Baltimore City	Baltimore City Bike Share	Design and implementation of bicycle infrastructure to support Baltimore's Bike Share initiative.
Baltimore City	Herring Run Greenway (Sinclair Lane to Morgan State University)	Sinclair Lane to Morgan State University
Baltimore City	Roland Park Complete Streets	Pedestrian, bicycle and traffic calming safety improvements, resurfacing and aesthetic improvements on Roland Avenue from Coldspring Ln to Northern Pkwy and on Northern Pkwy from Roland Ave to Kemper Rd. Includes school access/egress improvements.
Carroll County	MacBeth Trail Connection	Construction of an 850 linear foot asphalt trail between the eastern and western sections of MacBeth Way in Eldersburg. This trail project is a part of the larger overall Governor Brown Trail project that will connect Eldersburg with Sykesville and include connections to Springfield Hospital Center, the Warfield Business Complex, and Freedom Park.

Project Type: *Bike/Ped/Greenway*

Implementing Agency	Project Name	Project Description
Harford County	Bel Air Area Transportation Study	Project performing a traffic and safety analysis on MD 22, US 1 (Business) and MD 24 between MD 543 and Tollgate Road to the east/west and MacPhail Road to US 1 Bypass to the north/south. The study will include an existing conditions analysis, a no-build analysis, and a future conditions analysis based on several scenarios designated to address improved vehicular mobility and safety, improved transit, bicycle and pedestrian facilities along the corridors including the ability and benefits of providing dedicated bicycle lanes and sidewalks. The study will assess Complete Streets and include a roadway safety audit and an origin/destination report.
Harford County	Site and Parking Lot Improvements (Harford Comm. College)	Replacement, installation, and/or repair of campus parking lots, roadways, and sidewalks.
Harford County	Churchville Complex Development	This project proposes the further development of the Churchville Recreation Complex in accordance with the Master Plan. Improvements will include additional parking, athletic facilities and nature trails.
Howard County	Hunt Club Sidewalk	Construction of approximately 4,000 LF of sidewalk along Hunt Club Rd. from US 1 to Bauman Dr.
Howard County	St. John's Lane Sidewalk	Project to construct sidewalk and pathway improvements along St. Johns Lane to link Mt. Hebron High School to US 40.
Howard County	Tower Drive Drainage and Sidewalks	A project to design and construct improved drainage and sidewalks along Tower Drive.
Howard County	Howard County Bikeshare Program	This project is to launch the Howard County's Bikeshare Program. Phase I of this project is to add 7 stations in Columbia. Phase II of this project will be adding stations in Ellicott City.
Howard County	Port Capital Sidewalks	A project for the construction of approximately 1,200 LF of sidewalk along Port Capital Drive from US1 to New Colony Boulevard.

Project Type: *Clean Technology*

Implementing Agency	Project Name	Project Description
Howard County	Howard County Electric Bus	Zero emission electrified bus transportation is coming to Howard County with the advent of fully electric buses powered by wireless charging technology.
Howard County	Howard County Hybrid Buses	This includes 11 hybrid-electric replacement buses for the Howard Transit fleet. (Three included in another entry.)
MDOT	MTA Hybrid Buses - FY 2013	57 new hybrid buses were put into service in the MTA fleet in FY 2013.
MDOT	MTA Hybrid Buses - FY 2014	50 new hybrid buses were put into service in the MTA fleet in FY 2014.
MDOT	MTA Hybrid Buses - FY 2015	41 hybrid buses were put into service in the MTA fleet in FY 2015.
MDOT	Dray Truck Replacement Program - 2016	This program provides an incentive for drayage truck owners to replace their existing truck with a newer, lower polluting truck that meets more recent engine emission standards. An EPA grant of $870,000 was awarded to Maryland Environmental Service (MES) on behalf of MPA for up to $30,000 per truck. 2006 model year and older trucks will be replaced with dray trucks having 2010 or newer EPA certified engines.
MDOT	Dray Truck Replacement Program - 2017	This program provides an incentive for drayage truck owners to replace their existing truck with a newer, lower polluting truck that meets more recent engine emission standards. An EPA grant was awarded to Maryland Environmental Service (MES) on behalf of MPA for up to $30,000 per truck. Older trucks will be replaced with dray trucks having 2010 or newer EPA certified engines.
MDOT	MTA Buses - FY 16/17	172 clean diesel buses will be purchased in FY 16/17.

Project Type:	*Commute Alternatives Incentive*	
Implementing Agency	***Project Name***	***Project Description***
MDOT	MARC Halethorpe Station Improvements	Phase I of the project provided an additional 428 surface parking spaces at the Halethorpe MARC Station. Phase II includes installation of high level platforms, a pedestrian bridge, new shelters, lighting, landscaping and improved ADA access.
MDOT	Telework Partnership with Employers/ Telework Baltimore	Baltimore region program to market the development of teleworking programs to employers.

Project Type:	*Congestion Management*	
Implementing Agency	***Project Name***	***Project Description***
Baltimore City	Infrastructure Upgrades: Russell, Bayard, Worchester, Warner	Reconstruct roadways and sidewalks, install traffic signals, signage, lighting and landscape and streetscape elements, and reconfigure utilities and communication lines to accommodate both current and future needs.

Project Type:	*ITS*	
Implementing Agency	***Project Name***	***Project Description***
MDOT	Signal Systemization - MD 151	Wise Avenue to Trappe Road

Project Type: *Land Use*		
Implementing Agency	***Project Name***	***Project Description***
Baltimore County	Owings Mills Transit Center	Build a town center that includes a square, main street, road and path network, hotel, library, education center. (Funding for infrastructure and parking needs at the Owings Mills Transit Center.)
Harford County	Tollgate Road and Plumtree Road Roundabout	Construction of a roundabout at South Tollgate Rd and Plumtree Rd.

Project Type:	*Public Transit Improvement*	
Implementing Agency	***Project Name***	***Project Description***
Carroll County	Westminster Evening Demand Response Pilot	This was a temporary pilot project to extend demand response transit service in Carroll County to have evening hours, Monday through Friday (5 to 8 PM). The pilot started December 5, 2016 for 6 months. Rides were available within a 5-mile radius of the Westminster branch of the Carroll County Public Library. Rides were scheduled at least 24 hours ahead of time.
Howard County	Transit Operation Repair Facility	A project for site selection, acquisition, design and construction of a multi-jurisdictional transit facility.

Appendix J: MDOT Updated Revenue Projections – July 2014

Financially Constrained Long Range Plan

Year 2010 to 2040 Update

For The

Baltimore Metropolitan Area

Prepared by

Maryland Department of Transportation

August 2013

(Extended to 2040 July 2014)

DOCUMENTATION OF ASSUMPTIONS

Date: August 2013 (Extended to 2040 July 2014)

Subject: Methodology and Assumptions used to derive the 2013 - 2040 Constrained Long-range Transportation Plan.

Total Program Revenues/Expenditures (Operating and Capital):

- FY 1981 to FY 2012 figures are actual expenditures from historical records. FY 2013 to FY 2018 figures are from the FY 2013 Trust Fund Forecast and Consolidated Transportation Plan (CTP).

- The federal funds received directly by WMATA are **not** included in this exercise.

- FY 2019 to FY 2040 projections of state funds use a historical annual average growth rate of 3.89%. A regression model was used to determine the appropriate starting point in FY 2019. Federal fund projections for the same period are based on an average growth rate of 2.75% for Highway and 4.7% for Transit program funds, but also assume an O. A. of 90%.

Operating Expenditures:

- FY 1981 to FY 2012 are actual expenditures from historical records. Expenditures for FY 2013 to FY 2018 are operating budget projections contained in the FY 2013 Trust Fund Forecast.

- FY 2019 to FY 2040 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 econometric firms, Global Insight and Moody's Analytics. A blended average of the forecasts received from the two firms is used. Two percent (2%) is added to the forecasted rate to account for the additional operating costs associated with new capital expansions. The size of this additional factor is decided based on testing to determine what amount, when added to CPI, best approximates the historical trend in operating expenditures.

Capital - Systems Preservation:

- Department records were used to determine the split between systems preservation and expansion for FY 1981 to FY 2012. FY 2013 to FY 2018

represents the current version of the capital program adjusted for the revenue increase passed during the 2013 legislative session.

- An annual growth rate of 2.2% is assumed for systems preservation for the FY 2019 – FY 2040 period. This growth rate is based on a regression analysis of historical system preservation expenditures.

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, & WMAT) costs. Non-surface included port, aviation, and motor vehicle administrations plus 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.

MDOT Operating & Capital Expenditures - Statewide

History, Program & Forecast

(Millions of Dollars)

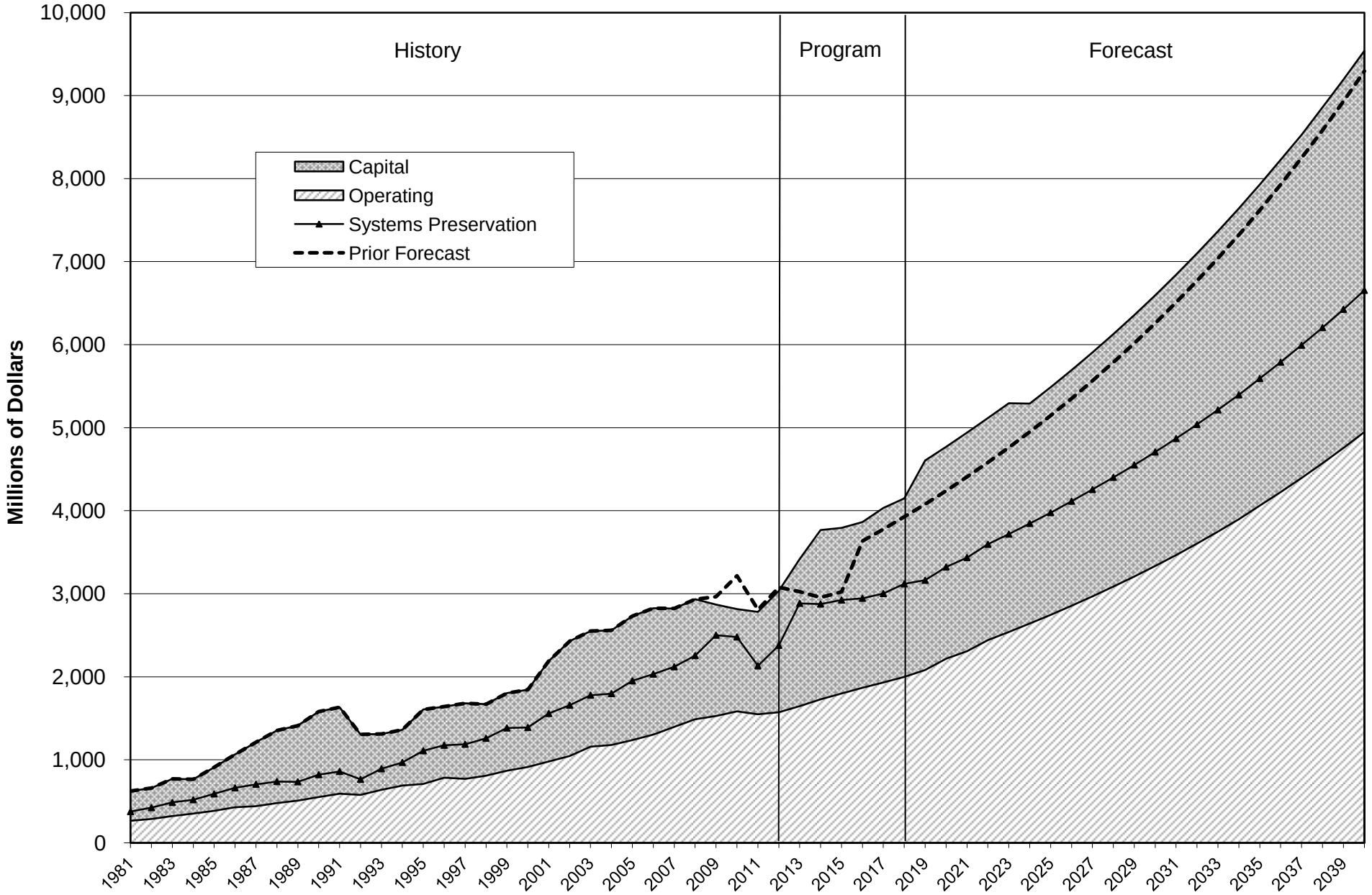
Fiscal Year	Operating	Systems Preservation	Operating & Systems Pres.	Expansion	Statewide Total
1981	265	111	376	247	623
1982	287	136	423	236	659
1983	322	164	486	284	770
1984	352	167	519	246	765
1985	385	204	589	319	908
1986	428	234	662	403	1,065
1987	441	264	705	506	1,211
1988	478	260	738	615	1,353
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	896	2,479	336	2,815
2011	1,548	583	2,131	650	2,781
2012	1,572	806	2,378	656	3,034
2013	1,646	1,238	2,884	534	3,418
2014	1,728	1,148	2,876	891	3,767
2015	1,798	1,126	2,924	869	3,793
2016	1,867	1,078	2,945	918	3,863
2017	1,931	1,071	3,002	1,031	4,033
2018	1,998	1,121	3,119	1,029	4,148
2019	2,081	1,081	3,162	1,443	4,605
2020	2,217	1,105	3,322	1,447	4,769
2021	2,307	1,129	3,436	1,504	4,940
2022	2,441	1,154	3,595	1,521	5,116
2023	2,539	1,179	3,718	1,576	5,294
2024	2,641	1,205	3,846	1,444	5,290
2025	2,745	1,232	3,977	1,510	5,487
2026	2,855	1,259	4,114	1,579	5,693
2027	2,968	1,287	4,255	1,651	5,906
2028	3,086	1,315	4,401	1,726	6,127
2029	3,207	1,344	4,551	1,805	6,356
2030	3,334	1,373	4,707	1,887	6,594
2031	3,465	1,404	4,869	1,973	6,842
2032	3,604	1,434	5,038	2,061	7,099
2033	3,748	1,466	5,214	2,151	7,365
2034	3,897	1,498	5,395	2,246	7,641
2035	4,061	1,531	5,592	2,336	7,928
2036	4,224	1,565	5,789	2,438	8,227
2037	4,394	1,599	5,993	2,534	8,527
2038	4,571	1,635	6,206	2,652	8,858
2039	4,755	1,670	6,425	2,767	9,192
2040	4,947	1,707	6,654	2,884	9,538

MDOT - Office of Finance

29-Jul-14

MDOT Operating & Capital Expenditures - Statewide

History, Program & Forecast



* Original MDOT Page

BALTIMORE METROPOLITAN AREA
Percentage of Capital Expansion

Surface Enhancement % of Maryland Enhancement	
1981 - 2012	87.7%

Baltimore Enhancement % of Surface Enhancement	
1981 - 2012	41.6%

Fiscal Year	Statewide Expansion Funds	Surface Percentage	Private Funds	Total Surface Available	Baltimore Percentage	Baltimore New Starts	Total Balto Expansion Funds
2010	336						192
2011	650						173
2012	656						229
2013	534						231
2014	891						426
2015	869						250
2016	918						231
2017	1,031						284
2018	1,029						576
2019	1,433	1,257	23	1,280	533	100	633
2020	1,447	1,269	23	1,292	538	100	638
2021	1,504	1,319	23	1,342	559	100	659
2022	1,521	1,334	23	1,357	565	100	665
2023	1,576	1,382	23	1,405	585	97	682
2024	1,444	1,266	24	1,290	537	0	537
2025	1,510	1,324	24	1,348	561	0	561
2026	1,579	1,385	24	1,409	587	0	587
2027	1,651	1,448	24	1,472	613	0	613
2028	1,726	1,514	24	1,538	640	0	640
2029	1,805	1,583	25	1,608	670	0	670
2030	1,887	1,654	25	1,679	699	0	699
2031	1,973	1,730	25	1,755	731	0	731
2032	2,061	1,807	25	1,832	763	0	763
2033	2,151	1,886	25	1,911	796	0	796
2034	2,246	1,969	26	1,995	831	0	831
2035	2,336	2,048	26	2,074	864	0	864
2036	2,438	2,138	26	2,164	901	0	901
2037	2,534	2,222	26	2,248	936	0	936
2038	2,652	2,326	26	2,352	979	0	979
2039	2,767	2,426	27	2,453	1,021	0	1,021
2040	2,884	2,529	27	2,556	1,064	0	1,064
Total 19-40	29,850	26,175	412	26,587	11,072	497	16,470
Total 10-40	36,764						19,062

* Revised Page – New Starts Funding Removed

BALTIMORE METROPOLITAN AREA
Percentage of Capital Expansion

Surface Enhancement % of Maryland Enhancement	
1981 - 2012	87.7%

Baltimore Enhancement % of Surface Enhancement	
1981 - 2012	41.6%

Fiscal Year	Statewide Expansion Funds	Surface Percentage	Private Funds	Total Surface Available	Baltimore Percentage	Baltimore New Starts	Total Balto Expansion Funds
2010	336						192
2011	650						173
2012	656						229
2013	534						231
2014	891						426
2015	869						250
2016	918						231
2017	1,031						284
2018	1,029						576
2019	1,433	1,257	23	1,280	533	0	533
2020	1,447	1,269	23	1,292	538	0	538
2021	1,504	1,319	23	1,342	559	0	559
2022	1,521	1,334	23	1,357	565	0	565
2023	1,576	1,382	23	1,405	585	0	585
2024	1,444	1,266	24	1,290	537	0	537
2025	1,510	1,324	24	1,348	561	0	561
2026	1,579	1,385	24	1,409	587	0	587
2027	1,651	1,448	24	1,472	613	0	613
2028	1,726	1,514	24	1,538	640	0	640
2029	1,805	1,583	25	1,608	670	0	670
2030	1,887	1,654	25	1,679	699	0	699
2031	1,973	1,730	25	1,755	731	0	731
2032	2,061	1,807	25	1,832	763	0	763
2033	2,151	1,886	25	1,911	796	0	796
2034	2,246	1,969	26	1,995	831	0	831
2035	2,336	2,048	26	2,074	864	0	864
2036	2,438	2,138	26	2,164	901	0	901
2037	2,534	2,222	26	2,248	936	0	936
2038	2,652	2,326	26	2,352	979	0	979
2039	2,767	2,426	27	2,453	1,021	0	1,021
2040	2,884	2,529	27	2,556	1,064	0	1,064
Total 19-40	29,850	26,175	412	26,587	11,072	0	15,973
Total 10-40	36,764						18,565