

**Conformity Determination of the 2004
Baltimore Regional Transportation Plan and
the FY 2006-2010 Transportation
Improvement Program:
*Fine Particulate Matter***

*Prepared by the Baltimore Regional Transportation Board,
the Metropolitan Planning Organization
for the Baltimore Region*

December 2005

CONFORMITY DETERMINATION OF THE
2004 BALTIMORE REGIONAL TRANSPORTATION PLAN AND THE
FY 2006-2010 TRANSPORTATION IMPROVEMENT PROGRAM:
FINE PARTICULATE MATTER

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Produced under the auspices of the Baltimore Regional Transportation Board,
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EXECUTIVE SUMMARY

Under the Clean Air Act Amendments of 1990, areas designated as nonattainment for air quality standards are required to review their current transportation plans and programs to ensure conformity with the applicable state air quality implementation plan. Air quality in the Baltimore region exceeds the National Ambient Air Quality Standard for 8-hour ozone and fine particulate matter (PM_{2.5}). Air quality in the Baltimore region exceeds the NAAQS for 1-hour ozone; however, this standard was revoked on June 15, 2005. The Baltimore region is currently in a maintenance phase with respect to the Carbon Monoxide (CO) standard.

On April 15, 2004, EPA designated the Baltimore region as nonattainment for the 8-hour ozone standard which became effective on June 15, 2004. Conformity analyses for the 8-hour ozone standard have been completed under the methodology provided in the Conformity Rule Amendments released by EPA on July 1, 2004, and in concert with supplementary guidance released in July 2004. The 1-hour ozone State Implementation Plan, prepared by the Maryland Department of the Environment, contains emissions budgets for volatile organic compounds and nitrogen oxides (NO_x). The mobile emission budgets established in the most recent revised version of this plan have been found adequate for use in conformity determinations by EPA.

Earlier this year, the Baltimore Regional Transportation Board conducted a conformity analysis of the 2004 Baltimore Regional Transportation Plan and the federal Fiscal Year 2006-2010 TIP for the Baltimore region, for the 8-hour ozone standard, and for the CO standard. At this time, the BRTB is transitioning into including PM_{2.5} in conformity determinations. Since a conformity determination has already been performed on the FY 2006-2010 TIP and the Plan to address the 8-hour ozone standard and the CO standard, this supplemental conformity determination will only address the PM_{2.5} standard. This conformity determination uses the same inputs as the 8-hour ozone and CO conformity determination of the Plan and the FY 2006-2010 TIP; however, the transit network has been updated due to bus route changes. The PM_{2.5} standard is a 24-hour standard as well as an annual standard; however, the Baltimore region is only violating the annual standard. Therefore, a regional emissions analysis was performed for the annual standard.

Conformity analysis approval by US DOT for the new PM_{2.5} standard is required by April 5, 2006. MDE is required to submit an attainment plan for the new PM_{2.5} standard to EPA by April 5, 2008. This supplemental document covers the PM_{2.5} conformity determination of the FY 2006-2010 TIP and the Plan. Because there are currently no adequate or approved State Implementation Plan budgets for PM_{2.5}, an interim emissions test was applied in this conformity determination. There are two options for implementing the interim emissions test for PM_{2.5} nonattainment areas: 1)“build ≤ no build” or, 2)“no-greater-than-2002 baseline” tests. This conformity analysis used the no-greater-than-2002 baseline interim emissions test. Conformity was tested against the 2010 attainment date for the PM_{2.5} standard as well as against the other horizon years of 2020 and 2030.

This conformity determination is undertaken by the BRTB, in its capacity as the Metropolitan Planning Organization for the Baltimore metropolitan area. The BRTB, assisted by the Baltimore Metropolitan Council and in conjunction with the Maryland Departments of the Environment and Transportation, conducted a comprehensive analysis of conformity of the Plan and the TIP for the Baltimore region. The approach to conformity has been developed in concert with the final transportation conformity rule issued by EPA on November 24, 1993 (58 FR 62187) and subsequent amendments. Consideration was also given to federal guidance in response to negotiated settlements between federal agencies and interested environmental groups.

Section I. Transportation and Air Quality Planning Process

The first section of this conformity document reviews the transportation planning process in relation to air quality goals and objectives. This section also reviews air quality and public participation processes and long-term planning efforts, particularly related to air quality/emission reduction strategies.

Section II. Quantitative Assessment of the Plan and TIP with Air Quality Goals

The second section of this conformity document details the technical and quantitative analyses undertaken during the conformity determination process. The technical analysis of the Plan and TIP uses computer model applications to estimate emissions of direct PM_{2.5} (from exhaust, brake wear and tire wear) as well as emissions of the PM_{2.5} precursor NO_x, which are associated with the implementation of projects in the Plan and TIP. A determination of conformity with the interim emissions tests was based on MOBILE6.2 model results, as well as reductions from the various emission reduction strategies provided from the application of procedures assessed outside of modeling, or “off-model.”

The net result of the MOBILE6.2 and off-model analyses indicates that emissions of mobile source air pollutants are consistent with §93.109 and §93.119 of the Final Transportation Conformity Rule Amendments of July 1, 2004, which state that PM_{2.5} nonattainment areas with no approved or adequate motor vehicle emissions budget from an applicable implementation plan must satisfy the interim emissions test. **The emissions predicted in the “Action” scenarios are no greater than 2002 emissions.**

Section III. Status Report on Implementation of Emission Reduction Strategies (ERS) in the Baltimore Region

The third section of this document presents an updated status report on emission reduction strategies in the Baltimore region. After a thorough examination of specific actions either already taken, currently underway, or planned, it was determined that the Baltimore region has been successful in progressing toward full implementation of the previously-funded ERSs and has implemented innovative ERS-type strategies aimed at reducing vehicle use and associated emissions.

Section IV. Conclusions

This final section of the document identifies key conclusions reached in determining the air quality conformity of the FY 2006-2010 Transportation Improvement Program and 2004 Baltimore Regional Transportation Plan for PM_{2.5}.

CONCLUSIONS

The analysis presented in this report documents the applicable procedures that were followed and the criteria that were satisfied to determine that the 2004 Baltimore Regional Transportation Plan and 2006-2010 Transportation Improvement Program conform with the requirements of the Clean Air Act Amendments of 1990. This analysis evaluates emissions of PM_{2.5} and the PM_{2.5} precursor NO_x.

Based on this analysis, the Baltimore Regional Transportation Board believes that the following major criteria are hereby satisfied:

- *The projects in the 2006-2010 TIP come from a conforming transportation plan that has been developed in concert with the spirit of the metropolitan planning requirements of the Transportation Equity Act for the 21st Century;*
- *The Plan and TIP are consistent with the interim emissions tests for direct PM_{2.5} and the PM_{2.5} precursor NO_x;*
- *The TIP provides for the expeditious implementation of emission reduction strategies that attempt to reduce mobile source emissions by reducing vehicle trips, cold start emissions, vehicle miles of travel and highway congestion.*

Therefore, it is the conclusion of the Baltimore Regional Transportation Board, in its capacity as the Metropolitan Planning Organization for the Baltimore region, that implementation of the projects in the 2004 Plan and the 2006-2010 TIP does not worsen the region's air quality or delay the timely attainment of national ambient air quality standards.

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I. TRANSPORTATION PLANNING AND AIR QUALITY CONFORMITY PROCESS

A. MPO MISSION AND PLANNING FACTORS

As mandated by the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and its successor, the Transportation Equity Act for the 21st Century (TEA-21), the Baltimore Regional Transportation Board works to carry out the metropolitan transportation planning process. The transportation laws call for the metropolitan planning organization to provide a “continuing, cooperative, and comprehensive transportation planning process that results in plans and programs that consider all transportation modes and supports the metropolitan community development and social goals.” [23 CFR Part 450, Metropolitan Planning Rule, October 28, 1993] The BRTB acknowledges the most recent federal transportation legislation, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, that was signed into law on August 10, 2005.

Consistent with the direction provided by federal transportation law and regional policy priorities, the mission of the BRTB is to develop, promote and ensure implementation of a regional transportation plan that:

- (A) Supports the economic vitality of the metropolitan area;*
- (B) Increases the safety and security of the transportation system for motorized and nonmotorized users;*
- (C) Increases the accessibility and mobility options available for people and freight;*
- (D) Protects the environment, promotes energy conservation, and improves quality of life;*
- (E) Enhances the integration and connectivity of the transportation system across and between modes for people and freight;*
- (F) Promotes efficient transportation system management and operation;*
- (G) Emphasizes the preservation of the existing transportation system; and*
- (H) Promotes an efficient relationship between land-use and transportation that maximizes the use of existing and future public programs and infrastructure.*

These planning factors represent the spirit of the MPO’s commitment to develop a transportation network that is responsive to regional needs.

B. CONSISTENCY WITH BALTIMORE REGIONAL TRANSPORTATION PLAN

In the process of formulating the 2006-2010 TIP, the Plan was reviewed to ensure that programmed projects were consistent with the initiatives, policies, and goals of the Plan. This analysis determined that regionally significant capacity expansion projects were included in the evaluation.

C. PROCESS FOR AMENDING THE BALTIMORE REGIONAL TRANSPORTATION PLAN

In response to federal law and regulations, the BRTB developed a dynamic process for amending the Plan that meets federal requirements and involves participation from MPO members and from the public. The process also requires that proposed projects be subjected to a formal air quality conformity analysis to ensure that the Plan retains its conformity status under the Clean Air Act Amendments of 1990. In

addition, the proposed projects must be affordable under the federal fiscal reasonableness requirement for transportation plans. Projects are subject to a public review and comment process.

D. INTERAGENCY CONSULTATION

Under Section 93.105 of the conformity regulations, each State Implementation Plan revision must include procedures for interagency consultation before making conformity determinations, and also procedures to be undertaken by air quality agencies and transportation agencies before developing applicable implementation plans. Final procedures for consultation were prepared and formally endorsed by consultation members (TSC Resolution 96-12). After public review and comment, the ICG process was codified by 1997 Maryland state regulations (26.11.26).

The final consultation procedures were developed through a cooperative effort involving the MPO staff, MDOT and MDE staffs, and FHWA representatives. These procedures provide the framework that the MPO follows in making conformity determinations.

The ICG meets formally to discuss and recommend appropriate procedures for determining conformity of the Plan and TIP. These meetings are critical to the findings reported in this document, as well as to the development of the consultation procedures that will govern future conformity determinations. ICG meetings provide an additional forum for public participation and input to the process, including comments on technical methodologies. Meetings are advertised on the Internet. Mailings (including agendas, minutes, and any necessary materials) are sent to all interested parties. Please see Appendix A for more information on the ICG and how to participate.

ICG Meetings Specifically Addressing this Conformity Analysis

August 10, 2005	Discussion of methodology/assumptions
September 13, 2005	Review and approval of methodology/assumptions
October 12, 2005	Review of draft conformity results (approved by email on November 2, 2005)
November 9, 2005	Review and approval of conformity document

E. PUBLIC PARTICIPATION

The MPO approved formal public participation procedures in September 1994. In the spirit of providing increased opportunities for public participation in the metropolitan transportation planning process, a new Public Involvement Plan was created in March 2001 in coordination with stakeholders and revised in April 2004. The public involvement procedures provide an expanded framework and methodology for involving the public in all metropolitan planning activities. This update includes a commitment to review the procedures annually. Please see Appendix A for more information on obtaining a copy of the Public Involvement Plan.

Specific opportunities for public participation during the development of the TIP included the following:

April 19-May 19, 2005 – First Draft TIP project list available for review and comment by public.

May 19, 2005 – First opportunity for public meeting on the draft 2006-2010 TIP.

June 1, 2005 – Draft TIP available for formal public review.

June 7, 2005 – Opportunity for public comment to regional elected officials.

June 30, 2005 – Second and final public meeting.

August 23, 2005 – Opportunity for public comment before final approval by BRTB.

Specific opportunities for public participation during the development of the Conformity Determination of the Plan and TIP for Fine Particulate Matter included the following:

September 13, October 12, November 9, 2005 – ICG reviews stages of conformity analysis, including determination of planning assumptions, modeling approach, and draft results, at open meetings.

October 11, 2005 – Status of conformity analysis presented at Technical Committee meeting.

November 2, 2005 – Draft Conformity Determination available for formal public review.

December 13, 2005 – Opportunity for public comment before final approval by BRTB.

[Public notice displayed in Appendix B.]

An opportunity was made available for a public meeting on the final draft conformity determination of the Plan and TIP for fine particulate matter.

F. ONGOING RELATED PLANNING ACTIVITIES

F.1. Transportation and Land Use

The region is engaged in a number of activities that are aimed at better understanding and coordinating the interaction between transportation and land use. Such activities include research into the links between land use and travel behavior, enhancements to analytic tools to better incorporate the effects of land use, and an increased dialogue on land use-planning policy and planning issues with BMC members.

The Baltimore Region Transit Plan by the Maryland Transit Administration was completed in 2002. The plan recommends construction of a complete rail system to connect the region, comprised of six lines – some completely new and some extensions of existing rail services. When completed, the system would expand coverage from 43 miles and 54 stations to 109 miles and 122 stations. In addition to interconnecting the city with the surrounding suburban jurisdictions and emerging growth centers, this expansion will transform the existing Metro and Central Light Rail lines from independent services into a connected regional system. Such a connection may assist the City's role in the regional marketplace, and stimulate new employment and housing opportunities.

In conjunction with the initial MTA Red Line planning and design effort which includes both alignment, and station workgroup planning for the corridor between the Social Security Administration and Canton, the Maryland Department of Planning has focused on Transit Oriented Development prospects. A series of TOD visioning activities was held – first considering the State Center Metro station area, and then considering 4 possible Red Line station areas in Baltimore City and Baltimore County.

The Owings Mills station on the existing Metro line, an additional TOD land use initiative, has been under consideration for years but has failed to gain momentum. In 2002, with assistance from an EPA Clean Air Transportation Communities grant, Baltimore County, the State, and the Maryland Department

of Planning participated in a study to examine the transportation and air quality benefits associated with a TOD at Owings Mills. A joint decision was made to review a much broader set of development concepts for the entire Owings Mills Growth District. Based on favorable results from the EPA study, the proceedings are focused on potential for implementation, and the development is included in the TIP as a regionally significant initiative. If successful, a TOD at Owings Mills could serve as a model for focusing development around transit region wide, particularly in conjunction with the Baltimore Region Transit Plan investigations.

F.2. Bicycle and Pedestrian Planning Activities

In 2002, the Maryland Department of Transportation completed a twenty-year Bicycle and Pedestrian Access Master Plan. Since then, MDOT has focused on not only engineering, but also education and enforcement. Through the Maryland Highway Safety Office, MDOT funded an effort to develop a state-wide bicycle education program. The pilot program included a trainer, curriculum and a secure trailer stocked with youth bicycles and helmets. The pilot program was launched in Montgomery County, and was deemed a success. The program reached the Baltimore region in 2005, with the addition of a new secure trailer, and with a “Train the Trainer” program designed to prepare educators and others to deliver the curriculum.

The Maryland Bicycle and Pedestrian Advisory Committee with assistance by MDOT completed a legislatively mandated Safe Routes to Schools demonstration project at two Maryland elementary schools, one of which was Montebello Elementary School in Baltimore. A report was submitted to the Governor and General Assembly in July, 2003. The program seeks to encourage students to walk and bike to school rather than be driven in school buses or by parents. One benefit of the program is a reduction in motor vehicle trips and the associated tailpipe emissions. On September 23, 2004 FHWA presented a pilot workshop in the Baltimore region. The event at Cross Country Elementary School in Baltimore City provided participants with the opportunity to understand the implementation of a Safe Routes to Schools initiative.

On March 15-18, 2005 the Walkable Community Workshop program was presented by the National Center for Bicycling and Walking; coordinated by the Baltimore Metropolitan Council, Anne Arundel County, Baltimore City, Baltimore County and Carroll County; and funded with a grant from the Governor’s Highway Safety Office. The workshop gathered community leaders, elected officials, pedestrian and bicycle advocates, local, regional, state and federal employees, business owners, business association representatives and leaders of faith-based communities to discuss real-world pedestrian problems in communities and develop strategies for solutions to improve the walking environment.

For the program, the National Center of Bicycling and Walking provided a team of two trainers to present eight four-hour workshops over a five-day period. During each workshop, the trainers delivered a presentation on the elements of a walkable community and solutions to common problems. The trainers then led participants on an interpretive walking tour (called a “walkabout” or “ped audit”) of a pre-determined study area. During the walkabout, trainers emphasized the perspective of the pedestrian in the community. Following the walkabout, participants gathered in small groups to identify both general and specific measures to improve conditions for pedestrians. The trainers compiled the measures identified, and lead discussion to build consensus and prioritize the measures.

On April 15, 2005, the BRTB in conjunction with the U.S. Access Board presented the *Designing Accessible Public Rights-of-Way* workshop. The event provided participants with current information on requirements for public agencies to comply with the Americans with Disabilities Act provisions in the design and construction of pedestrian facilities within public rights-of-way. This session covered details of Title II of the ADA which applies to state and local government services, as well as information regarding the 2002 Draft Guidelines for Accessible Public Rights of Way.

Outreach efforts included Bike-to-Work Day 2005. The BRTB directed region-wide event planning activities, as well as co-directed the Baltimore City event. Efforts included overall planning, partner coordination, sponsorship development, collateral material development including website and print media as well as wearables, media relations, how-to-clinic planning and presentation. Both momentum and attendance reached an all-time high for the regional event, with over 400 registrants.

Also through the MHSO, MDOT continued to fund the Pedestrian Safety Enforcement Initiative, a two-day enforcement training for police officers, as well as provided additional funding to cover overtime expenditures in jurisdictions implementing pedestrian stings. The pedestrian sting has become popular in the region and state as a tool for both education and enforcement.

Engineering improvements for pedestrian and bicycle facilities include the introduction of countdown pedestrian traffic signals, which inform pedestrians as to the amount of time available to cross a roadway, and SHA's stated goal of providing 200 miles of marked bicycle lanes throughout Maryland by December 31, 2006.

Each jurisdiction in the Baltimore region continued efforts to improve bicycle and pedestrian accommodations. Planning efforts include Baltimore County, where the Office of Planning recently completed the Eastern Baltimore County Pedestrian and Bicycle Access Plan, and will soon commence work on the Western Baltimore County Bicycle and Pedestrian Plan. When the final plan is approved by the Baltimore County Council it is expected to serve as a model for preparing pedestrian and bicycle plans throughout the County. The Baltimore City Bicycle Master Plan is now underway. Public participation at the initial public involvement session exceeded 100 people.

F.3. Planning Studies

MARC Master Plan

Update to the 1994 MARC Master Plan, including system preservation, need analysis, patronage forecast, potential extension and capacity analysis for existing lines. Project should be completed in early FY 2006. This federal-aid amount is \$1,500,000 and is funded through the Section 5307 funding program under the direction of the Office of Planning.

Red and Green Line Transit Corridor Study

Prepare Alternatives Analysis/Draft Environmental Impact Statements, which will evaluate transit improvements in the Baltimore Region Transit Plan's recommended, Phase 1 priority, Red and Green line corridors. The Red Line corridor extends from approximately Woodlawn to Patterson Park and the Green Line extension corridor continues from Johns Hopkins Hospital Medical Campus to approximately Morgan State University. Both studies are being conducted as part of EPA and FTA requirements for Federal funding eligibility to engage in detailed design and construction. The purpose of the DEIS is to examine the engineering feasibility, potential benefits, costs, and social, cultural economic, built, and natural environmental impacts of feasible alternatives that will improve transit mobility in the Baltimore metropolitan area. The DEIS will examine and evaluate new rail alignments, bus service improvements, transportation systems management/ transportation demand management strategies, and a no-build alternative. The federal-aid amount is \$385,000 and is funded through the Section 5307 funding program.

Kirk Division Expansion Study

A planning study to develop an expansion plan for the Kirk Bus Division (Kirk Avenue at Bonaparte Avenue). This work will entail site selection, site analysis and development of conceptual plans and cost estimates for the division. The study will include the feasibility of replacing the Kirk Division Buildings. Based on the study, a plan will be developed to show the impact on manpower levels, productivity,

operations and maintenance. This study is currently underway and is expected to be completed in FY 2006. The federal-aid amount is \$515,000 and is funded through the Section 5307 funding program.

MARC Odenton Parking Expansion D & E

This project entails project-planning activities for expanding parking at the Odenton MARC Station. This phase of the project includes site selection, preparation of environmental document, design plans and development of short-term solutions to overflow parking. It also includes long-term parking expansion study to assess a garage or parking deck. This project should be completed by February 2006. The federal-aid amount is \$500,000 and is funded through the Section 5309 Fixed Guideway funding program under the direction of the Office of Planning.

Bus Facility Master Plan Study – (New)

Develop a system-wide master plan that presents a sequence of projects that can be phased over time that will lead to a more efficient and safer operating environment for the bus mode. The Master Plan will examine previous facility plans, existing bus facilities, projected operations, new technologies, worker safety, and ridership demand to develop recommended capital projects for rehabilitation and improvements to bus facilities to meet future needs. The master plan is intended to serve as a guide to promote a logical progression in programming, planning, and completing projects within the context of a system-wide approach to managing improvements to bus facilities over a ten to twenty year time horizon. The total amount budgeted for the study is \$400,000 of state funds and it is expected to be completed in the summer/fall of 2005 under the direction of the Office of Planning.

Lexington Market Transit Improvements

Develop a phased-in master plan with cost estimates for Lexington Market Transit Improvements. Elements to be included are relocation of the southbound LTR station, weatherization treatments, relocation of escalators, the addition of a second set of elevators at the southern entrance/exit, landscape improvements, uniform shelters at bus stops, signage, enhancements to the plaza, improvements to the Operations Control Center building for the Metro Rail Subway, and coordination with joint development initiatives. Budget is \$250,000 and is funded by the state. Responsibility by the Office of Planning is complete and now the Office of Engineering is directing work activities.

Central Maryland Transit Operations and Maintenance Facility

Planning for storage and maintenance facility for use by Connect-A-Ride and Howard Transit with potential for future Anne Arundel program. Includes site selection, environmental documentation and preliminary engineering. Locally operated transit services in Central Maryland are administered by Corridor Transportation Corporation and contracted to Yellow Transportation, crossing three jurisdictions: Howard County, Anne Arundel County, and a small portion of Prince George's County. MTA conducted a needs analysis that warrants a centrally located transit operations and maintenance facility. The proposed facility includes storage, maintenance, training, operations and administrative areas. Budget is \$1,100,000 and is funded from state and local sources. Site selection is ongoing.

Automated People Mover System at BWI Airport

The intent of this effort is to develop a concept definition for an automated people mover system at Baltimore/Washington International Airport. This two-phased project includes a Ground Transportation Demand Analysis and Alternatives Development and Analysis. The Ground Transportation Demand Analysis will focus on examining the overall ground transportation network serving the Airport and defining the need for improved ground transportation considering an APM as a solution. Specific tasks will include analyzing existing conditions, projecting future ground transportation demand, and determining how an APM will impact future requirements for ground transportation and customer

service. Even more importantly, the analysis will consider the overall transportation network linking the Consolidated Rental Car Facility, the BWI Rail Station, Daily Parking Garage, future Airport Administration Office Building, and the existing and future Terminal Building.

Essential to this exercise is the collection of existing data and preparation of environmental resource inventory maps to be used in future analysis of the APM corridor. Once the need for an APM solution is verified, future task assignments will include preparation of alternative APM alignments and recommendations on facility requirements and operating scenarios. After a preferred development program has been identified, capital costs and financing options will be identified. This will result in a final concept definition study that will be coordinated with and integrated into the upcoming Airport Master Plan.

BWI Master Plan and Environmental Analysis

A study to identify long-term projection, location and extent of facility improvements to meet future aviation demand. Study will require in-depth evaluations of many factors, including future air service, runway and terminal capacities, environmental and community impact considerations. Phase I of the master plan, which will develop forecasts of aviation demand and assess the demand/capacity of the existing facilities, will start in FY06 and conclude in FY07. (Maryland Aviation Administration - \$3.8 million - AIP funds)."

Task Force on Traffic Capacity Across the Chesapeake Bay

The purpose of the Task Force is to provide a statewide and public perspective on the needs associated with crossing the Chesapeake Bay and the scope of future initiatives to address the needs. The Task Force process will take 8 to 12 months to complete and will begin in spring 2005. There are no Federal funds being used for this effort. The Maryland Transportation Authority funds this effort. (\$350,000)

I-95: Section 200, north of MD 43 to north of MD 22

Project planning study to investigate improvements to address capacity and safety needs on I-95 from south of MD 43 to north of MD 22 and thereby improve access, mobility and safety for local, regional and inter-regional traffic, including passenger, freight, and transit vehicles. Project planning will begin in FY 2005 and extend into FY 2007. There are no Federal funds being used for this study. The Maryland Transportation Authority funds this study. (\$5 million)

Dredged Material Management Program

The Dredged Material Management Program of the Maryland Port Administration provides the structure for decision-making that enables the Port of Baltimore to compete as a world-class seaport with an excellent channel system, and as a vital part of Maryland's economy. The goal of this program is to identify management strategies for the material dredged from Port of Baltimore navigation channels for at least the next 20 years. The budget for this project is \$3 million and interim reports are expected in spring of 2006.

Statewide Freight Study

MDOT's Office of Planning and Capital Programming is considering a planning study to supplement the 2001 Maryland Freight Mobility Plan. An area of particular interest is obtaining reliable freight data to better implement strategies identified in the Freight Mobility Plan. Other areas to consider are the physical and operational chokepoints in the freight movement system and economic effects of freight transportation services. OPCP is currently evaluating a study scope of service.

Port of Baltimore Landside Access Study

Report on a transportation landside access to Maryland's Port of Baltimore is underway and expected to be complete in the fall of 2005. The overall goal of this regional transportation vision is to determine what regional land transportation improvements are necessary to benefit access to and mobility to, from, and around Maryland's Port of Baltimore over a 20-year timeframe. The consultant team has conducted well over 600 surveys at public and private terminals (Seagirt, Dundalk, North Locust Point, Rukert and C. Steinweg) to understand travel patterns and has received an excellent 60% response rate. The project is using State funding sources (\$210,000).

MD 295, Baltimore Washington Parkway

A study to widen MD 295 from 4 to 6 lanes from MD 100 to I-195, including an interchange at Hanover Road (3.27 miles). This study will also consider Hanover Road from the CSX railroad tracks in Howard County to MD 100. This project would help ease congestion and improve access to one of the State's economic engines, the Baltimore-Washington International Airport. Project Planning is to begin during FY 2005 and funded from state and federal (NHS) sources. (\$2.2 million)

MD 140, Baltimore Boulevard

A study to consider capacity improvements along MD 140 between Market Street and Sullivan Road through Westminster. Bicycle and pedestrian facilities will be provided (2.46 miles) as part of the improvements. This project is intended to relieve existing congestion and provide additional capacity for planned growth and economic development within the Priority Funding Area. Project planning is underway using State funds. (\$654,000)

MD 32, Patuxent Freeway

A study to upgrade existing MD 32 from MD 108 to I-70 to address safety concerns (9.06 miles). This project would address safety problems, which have been experienced as a result of increasing traffic volumes on the existing two-lane roadway. Project planning is underway (\$700,000 using State funds). Protective right-of-way funding will be used as properties become available.

II. QUANTITATIVE ASSESSMENT OF THE PLAN AND TIP CONFORMITY WITH AIR QUALITY GOALS

The Clean Air Act Amendments of 1990 require metropolitan areas in nonattainment of air quality standards to perform technical studies on the conformity of the region's long-range transportation plan and program with state air quality goals. Since the passage of the CAAA, EPA released a final rule on November 24, 1993 outlining methods for nonattainment areas to conduct conformity analyses of plans and programs. EPA has amended the final rule on the following occasions: August 7, 1995, November 14, 1995, August 15, 1997, July 1, 2004, and May 6, 2005.

In 2004, EPA amended the Conformity Rule to reflect the new PM_{2.5} standard. According to the July 1, 2004 final rule, conformity applies for PM_{2.5} nonattainment areas after a one year grace period following nonattainment area designations. Therefore, conformity analysis approval by federal agencies for the new PM_{2.5} standard is required by April 5, 2006. PM_{2.5} nonattainment areas that do not have approved or adequate motor vehicle emissions budgets must use an interim emissions test. For this conformity determination, the no-greater-than-2002 baseline interim emissions test was used.

On May 6, 2005, EPA amended the Conformity Rule to add the PM_{2.5} precursors: nitrogen oxides (NO_x), volatile organic compounds (VOCs), sulfur oxides (SO_x), and ammonia (NH₃). Before SIP budgets are established, there must be a regional emissions analysis for NO_x *unless* it is found to *not* be a significant contributor. Regional emissions analyses are *not* required for VOCs, SO_x, and NH₃ *unless* any of them are found to be significant contributors. For the Baltimore region nonattainment area, VOCs, SO_x, and NH₃ have not been found to be significant contributors; therefore, the only PM_{2.5} precursor addressed in this conformity analysis was NO_x. Direct emissions of PM_{2.5} from exhaust, and brake and tire wear were also addressed. Re-entrained road dust has not been found to be a significant contributor to date and therefore was not addressed. Construction dust does not need to be addressed before SIP budgets exist.

Conformity analysis of plans and programs in the Baltimore region is performed by the BRTB, in its role as the designated MPO for the Baltimore region. Technical assistance is provided by the staff of the Transportation Planning Division of the BMC. BMC staff applies the travel forecasting model to horizon year scenarios to assess highway and transit system travel and speed impacts of implementing the region's proposed transportation plan and program. Upon completion of travel forecasting, MDE uses the MOBILE6.2 computer model to estimate the emission effects of the projected transportation system usage and performance characteristics.

A determination of conformity of the Plan and TIP, for PM_{2.5}, was made using the no-greater-than-2002 baseline interim emissions test. This test involved a series of computer model runs analyzing emissions from the implementation scenarios associated with projects contained in the Plan and TIP compared with 2002 baseline emissions. The conformity determination was based upon technical analyses indicating that:

- (1) *Emissions of the PM_{2.5} precursor NO_x associated with the implementation scenario would be no greater than 2002 emissions.*
- (2) *Emissions of direct PM_{2.5} from exhaust and brake and tire wear associated with the implementation scenario would be no greater than 2002 emissions.*

A. TECHNICAL METHODOLOGY

A.1. Conformity Determination

In early 2005, a comprehensive analysis was conducted for conformity of the Plan and TIP with motor vehicle emissions budgets for VOC, NO_x, and CO, as a pre-condition of its acceptance by federal funding agencies. A supplementary analysis conducted for conformity purposes, and demonstrated in this report, evaluated motor vehicle emissions of PM_{2.5} using an interim emissions test. A summary of the methods and assumptions used to carefully evaluate the PM_{2.5} air quality impact of the projects in the Plan and TIP was submitted to EPA, FHWA, and FTA in September 2005 for review and comment. Those methods are explained below. Projects included in the Plan and TIP were assessed with a conformity determination consistent with regional air quality standards. The overall conformity determination of TIP projects was analyzed by the ICG. The ICG also reviewed some individual projects that were difficult to categorize based upon the project description to see if they merited a conformity analysis. Exhibit II-1 displays an overview of the conformity process.

All projects were reviewed and categorized. Each project, depending on the horizon year of review, underwent scrutiny to determine the level of analysis necessary for conformity.

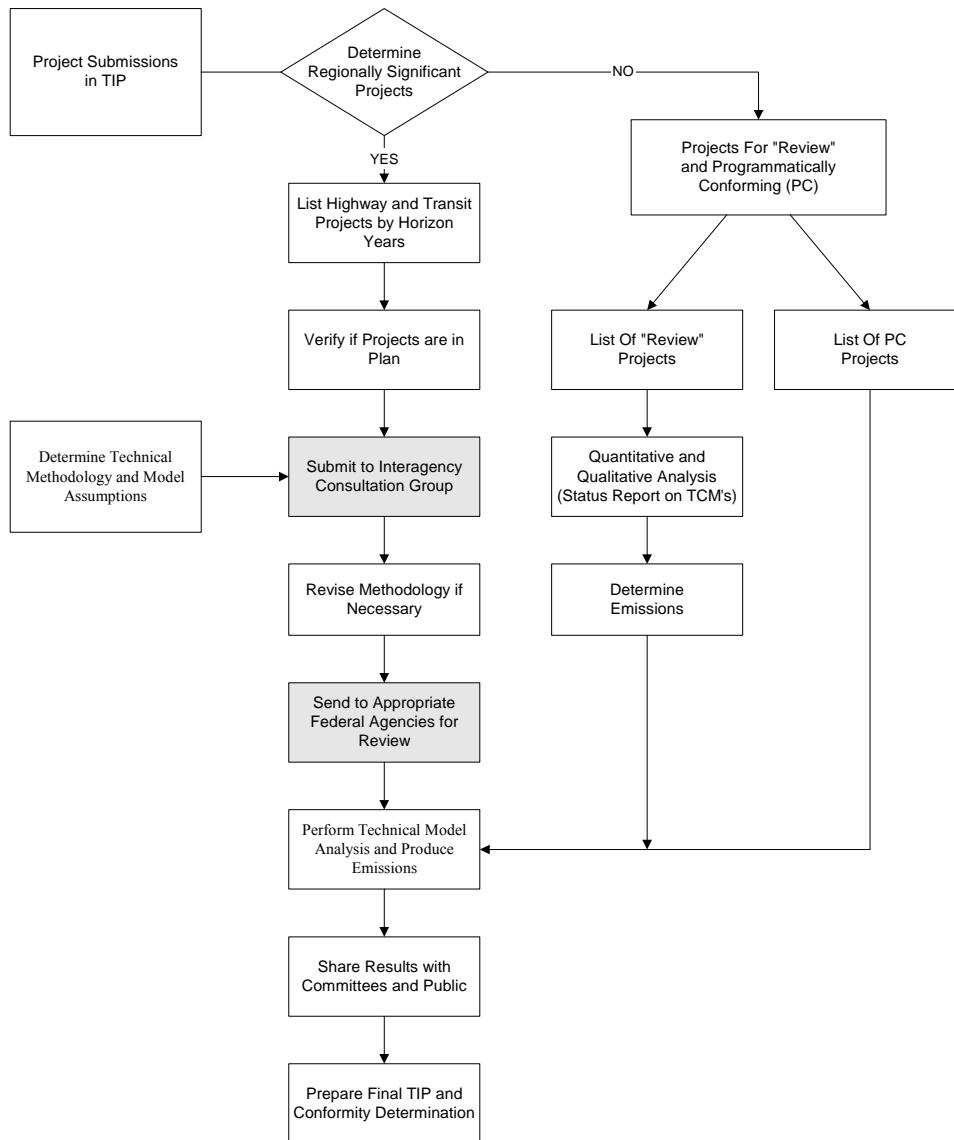
Conformity determination classification falls under one of three options: (1) programmatically conforming (PC), (2) review, or (3) test. Classification of programmatically conforming refers to "neutral" projects that, because of the project's characteristics, do not affect the outcome of any regional emissions analyses. These projects do not impact regional air quality emissions and do not require a separate analysis. These projects usually have an approved categorical exclusion through the National Environmental Policy Act (NEPA). The types of projects that qualify under classification of programmatically conforming are listed in §93.126 of the conformity rule issued by EPA.

TIP projects designated as "review" conformity status by the requesting agency or local jurisdiction were qualitatively and quantitatively analyzed by BMC staff using accepted professional practice to assess conformity to regional air quality standards. These projects are traditionally non-capacity enhancing improvements or transit and rail improvements/services, and because of their local perspective do not qualify for air quality emission consideration in the regional network model. Emission decreases and increases for direct PM_{2.5} and NO_x for "review" projects were considered in making the conformity determination.

The third "test" conformity classification refers to those projects that are major capacity improvements and require inclusion in the regional highway and transit networks. Examples of this type of project include new or expanded transit services, highway construction (new roads), highway widening (adding at least one travel lane), highway realignment which increases capacity, interchange construction, or new bridge construction (adding at least one travel lane). Bridge repair and deck replacement are not included. A list of these "test" projects, both federally and non-federally funded, is included in Appendix C.

Appendix C lists the projects from the 2006-2010 TIP and 2004 Plan and each associated conformity classification.

EXHIBIT II-I Overview of Conformity Process



A.2. Planning Assumptions

Selection of Horizon Years

In order to perform the technical analysis for the Plan and TIP, three horizon years were chosen in consultation with representatives from MDOT, MDE, BRTB, FHWA, FTA, and EPA to analyze emission results. The first modeled horizon year is 2010, a near-term year and the year of the attainment date for the PM2.5 standard. The second horizon year is 2020, which is a test scenario no greater than 10 years from the previous horizon year. The final horizon year is 2030, the year of completion of the Plan. The years of analysis have been determined in keeping with federal requirements and were reviewed by the ICG.

Latest Planning Assumptions

Socio-economic Data

Estimates of travel on horizon year networks are based on the completed Round 6-B Cooperative Forecasts. These forecasts were endorsed by the MPO at their August 2005 meeting. The Cooperative Forecasting Group, responsible for the development of regional socio-economic projections that are used in travel demand forecasting, meets periodically to discuss possible modifications and to set the groundwork for future estimates of land use activity. These agreed-upon regional forecasts represent a planning scenario created to extend through 2030. The forecasts estimate the number of households, population, labor force, retail employment, non-retail employment, and median household income by transportation analysis zone for the horizon years of 2010, 2020, and 2030. Appendix D displays jurisdictional totals for the major socio-economic data.

Transit Systems

Since the conformity determination of the 2005-2009 TIP, no changes have occurred in transit operating policies. However, the MTA is performing a comprehensive bus study with the purposes of simplifying routes, improving core frequencies and connectivity to other MTA services, addressing changing transportation trends in the area, improving accessibility and trip speeds through better placements of bus stops, and improving schedules. As part of this study, MTA undertook a comprehensive ridecheck project to gather ridership data on all of its routes and conducted an origin-destination survey. The first phase of changes to local bus routes will take place in October 2005. These modifications were included in this conformity analysis of PM2.5. The next round of changes will occur around June 2006. It is anticipated that in the next conformity document, major changes will be addressed.

Selection of Network Facilities

A series of highway and transit networks was prepared and tested for each modeled horizon year (2010, 2020 and 2030). Criteria for inclusion of highway and transit improvements in the implementation scenarios were reviewed by the ICG, including representatives from MDOT and MDE. (Please see Appendix A for more information on MPO committees.) Computerized highway and transit networks were developed for each horizon year. Projects in implementation horizon years were developed from the Plan and TIP, which were developed in accordance with Code of Federal Regulation (CFR) §450.322. The implementation scenario is the future transportation system that will result from the goals and policies proposed in the TIP and Plan in given horizon years. The following were included:

- (1) *All in-place regionally significant highway and transit facilities, services, and activities;*
- (2) *All ongoing travel demand management or transportation system management activities;*
- (3) *Completion of all Emission Reduction Strategies and regionally significant projects (including facilities, services, and activities) included in the proposed TIP;*
- (4) *All travel demand management programs and transportation system management activities known to the MPO, but not included in the applicable implementation plan or utilizing any federal funding or approval, which have been fully adopted and/or funded by the enforcing jurisdiction or sponsoring agency since the last conformity determination on the TIP;*

- (5) *The incremental effects of any travel demand management programs and transportation system management activities known to the MPO, but not included in the applicable implementation plan or utilizing any federal funding or approval, which were adopted and/or funded prior to the date of the last conformity determination on the TIP, but which have been modified since then to be more stringent or effective;*
- (6) *Completion of all expected regionally significant highway and transit projects which are not from a conforming transportation plan and TIP; and*
- (7) *Completion of all expected regionally significant non-FHWA/FTA highway and transit projects that have clear funding sources and commitments leading toward their implementation and completion by the analysis year.*

The 2010, 2020, and 2030 highway and transit networks were developed from projects included in the financially constrained Plan and TIP. The staging of Plan projects was also endorsed by the MPO. Specifications for Plan projects were based on the latest estimates of local and state transportation planners and engineers. Member jurisdictions also provided highway and transit project specifications for all regionally significant non-federally funded highway and transit projects that had committed funding sources and could reasonably be expected to be completed by the appropriate analysis year.

A.3. Travel Model Applications

Travel Forecasting Process

BMC staff, serving as technical support to the BRTB, maintains a sophisticated four-step travel demand forecasting model. The model incorporates economic and demographic data to assist in simulating the transportation modeling process: trip generation, trip distribution, mode choice, and trip assignment. Significant changes have been made to the regional travel demand model that have provided a more reliable model for future year projections. With these changes, the model is better positioned to analyze and produce conformity results. The latest model update is documented in Task Report 04-01, and is available upon request. (The Executive Summary and Introduction of Task Report 04-01 are included in Appendix E of this conformity report. Please see Appendix A for more information on obtaining the entire report.)

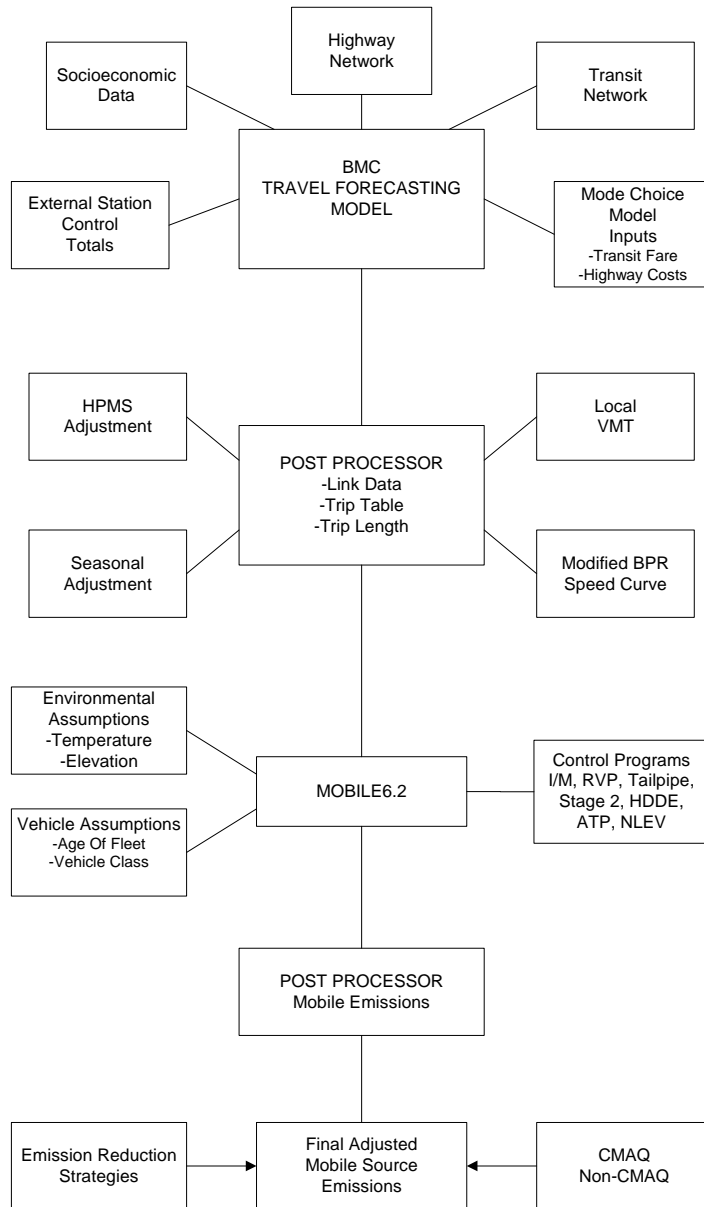
The software package of TP+ and Viper serves as the technical basis for the quantitative analysis. Representative highway and transit networks and trip tables were developed to correspond with conditions found in 2000 and 2002, and expected in the horizon years of 2010, 2020, and 2030. Major modifications to the travel demand model, as referenced in Task Report 04-01, include:

- Maintenance of master highway network within the ESRI geographic information system;
- Network assignment of HOV restricted lanes and Electronic Toll Lanes;
- Enhanced zonal structure (compatible with 2000 Census Geography);
- Assignment of simulated drive access transit trips, thus capturing additional vehicle travel; and
- Use of equilibrium traffic assignment method.

Update of the Baltimore Region Travel Demand Model

While the enhanced model was developed to estimate conditions expected in 2005 and beyond, the output of the model is verified, or validated, with observed data from the year 2000. An overview of the entire BMC air quality modeling process is shown in Exhibit II-2.

EXHIBIT II-2 Air Quality Modeling Process



Trip Generation

The latest planning assumptions by regional transportation analysis zone were used as inputs to the trip generation model. The output of this module is the number of trip productions and attractions by each of the model's zones and external stations for each of the following purposes:

• Home-Based Work (HBW)	• Work-Based Other (WBO)
• Home-Based Shop (HBSh)	• Other-Based Other (OBO)
• Home-Based Other (HBO)	• Commercial Vehicle (CV)
• Home-Based School (HBSch)	• Medium Truck (MT)
• Heavy Truck (HT)	

Trip productions for the non-truck purposes are based on the 1993 Household Travel Survey, using per household rates for each cell of a four dimensional matrix of trip purpose, number of persons per household, vehicles per household, and area type. For the home-based purposes, total motorized and non-motorized trips are generated and then put through a logit process (based on autos per person and the land use density of a zone) to determine the motorized (auto and transit) trips. See below for a discussion of trip generation for the non-home-based trips (WBO and OBO).

Trip attractions were calculated based on the 1993 Household Travel Survey. Regression equations were developed for HBW, HBSh, HBO, and HBSch:

$$\text{HBW: } 1.73E_R + 0.71E_N$$

$$\text{HBSh: } 2.21E_R + 0.36H$$

$$\text{HBO: } 3.6E_R + 1.19H$$

$$\text{HBSch: } 5.17E_S + 0.54H$$

where E_R = Retail Employment E_N = Non-Retail Employment

E_S = School Employment H = Households

These attractions are then multiplied by scaling factors to account for differences in land use density. Work-Based Other and Other-Based Other, the two non-home-based purposes, have special treatment. It is assumed that these trips are produced by the zone in which the tripmaker dwells, but the trip is likely to have either or both ends in another zone. In order to simulate this, motorized productions were calculated based on the rates, but an allocation methodology was then used to turn these trips into origins and destinations. Regression equations with inputs of households, retail employment, and non-retail employment are used to generate origins and destinations, which are then scaled to match productions separately in the Baltimore and Washington regions.

Truck and commercial vehicle productions and attractions were updated based on a method called adaptive assignment. [Allen, W.G. *Adaptable Assignment, presented at the Sixth TRB Conference on the Application of Transportation Planning Methods, May 1997*] Documentation on the procedure and calibration is available on request. Below is a summary of the steps used to develop the new truck and commercial vehicle models:

1. Obtain and enter classified vehicle truck counts at 600+ locations on travel model highway links (medium trucks = 2 axle, 6 tire and heavy trucks = 3+ axles).
2. Obtain commercial vehicle counts by conducting roadside surveys at 113 classification count locations to estimate a share of observed commercial vehicles. Create a lookup

table from data to estimate commercial vehicle counts at all 600+ classified count locations.

3. For each of the three trip purposes, develop a trip table that best matches the observed traffic counts.
4. The Quick Response Freight Manual Approach – with Phoenix, AZ trip rates – was used as an initial starting point. Modifications were made to this model using models from other areas to create an interim set of models. This interim set of models was compared with the trip tables derived from the traffic counts and iteratively improved using the adaptable assignment methodology. Improvements to the models were added, including sensitivity to jurisdiction, land use, truck prohibitions, and truck special generators.
5. After adaptable assignment had achieved the best match for each of the three truck purposes, the difference between the trip table observed from the traffic counts and that estimated from the model, was a small calibration matrix called the delta table. The consultant did some analysis and found that a multiplicative delta would be better than an additive delta table in future year forecasting. As a result, the delta table is a ratio table of the base year model trip table to the base year count trip table that is applied to all forecast years.

Productions and attractions for the region's external stations were developed from traffic projections by the SHA which are split by purpose and factored to person trips. External trips are generated for all purposes except Home-Based School.

Trip Distribution

Trip distribution was based on a combination of free flow and peak period travel speeds. HBW, HBO, HBSh, and WBO trips are concentrated in the peak periods. These trips were distributed based on a congested a.m. peak (6:00 a.m. – 10:00 a.m.) highway network. The remaining trip purposes were distributed on a free flow network. Following trip distribution, HBW, HBSh, and HBO trips are stratified into three income levels (\$0-10,000, \$10,000-30,000, and \$30,000 and above).

Mode Choice

The mode choice module creates automobile and transit trip tables. Transit networks were developed to be compatible with the highway network scenarios. These networks are skimmed and, with various other input data, a logit model is used to calculate the number of person trips using the following modes:

- Single Occupant Vehicle
- 2-Person Vehicles (HOV-2)
- 3-Person Vehicles (HOV-3)
- 4-Person or more Vehicles (HOV-4+)
- Walk to Bus
- Walk to Rail (Metro, Light Rail)
- Walk to MARC
- Drive to Bus
- Drive to Rail (Metro, Light Rail)
- Drive to MARC

The first four trip tables (the driver and passengers) are converted to a vehicle trip table and passed to the assignment stage of the model. The data used in the logit model include:

- Auto In-Vehicle Time
- Transit In-Vehicle Time
- Out of Vehicle Time
- Initial Wait Time
- Number of Transfers
- Auto Cost
- Transit Cost
- Drive Access Time
- Autos per Person
- Destination Land Use Density
- Employment Density
- Population Density

Home-Based School trips are not run through the logit model. Instead, jurisdiction-to-jurisdiction shares are used to calculate the four auto modes and three walk to transit modes. Drive to transit access is not assumed for HBSch.

Drive to transit trips are now used to develop a trip table of origin zones and transit stations. These trips are then assigned to the highway network for all but the first time period. No drive to transit trips are assumed for the period between midnight and 6 a.m.

Trip Assignment

The trip assignment module uses an equilibrium assignment technique. Two speed-delay curves are employed:

<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: left;">Freeways/Expressways:</div> $T = T_0 \left(1 + 0.2 \left(\frac{V}{C_E} \right)^{10} \right)$ </div>
<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: left;">Other Roads:</div> $T = T_0 \left(1 + 0.05 \left(\frac{V}{C_E} \right)^{10} \right)$ </div>
<p>Where</p> <p>T=Congested time</p> <p>T_0=Free flow time</p> <p>V=Link volume</p> <p>C_E=Level of Service "E" Capacity</p>

During the capacity restraint calculation that estimates a new travel speed for the next highway loading increment, a Passenger Car Equivalence is applied. A PCE of 1.5 for medium and 2.0 for heavy truck link volumes is applied. These factors simulate the greater capacity utilized by trucks compared to

passenger cars due to size and operating characteristics (example being slower truck speeds when climbing hills). Volume delay is not applied to centroid connectors.

Simulated Time Periods

Traditionally, travel forecasting for the Baltimore region has been done on a 24-hour basis. Previous transportation studies have evaluated an HOV system with highway lane occupancy restrictions that would operate in the a.m. and p.m. peak periods. In order to simulate the changes in highway capacity on a facility with occupancy restrictions during the peak periods only, BMC staff developed a process to segment the 24-hour trip table by purpose into five discrete time periods:

- midnight to 6:00 a.m.;
- 6:00 a.m. to 10:00 a.m.;
- 10:00 a.m. to 3:00 p.m.;
- 3:00 p.m. to 7:00 p.m.; and
- 7:00 p.m. to midnight

Trips were also split into directional orientation for HBW (e.g., home to work, work to home) and HBNW (i.e., home to shop, shop to home). This segmentation occurs during the balancing process, when HBW, HBSh, HBO, HBSch, MT, HT, and CV trips are converted from production/attraction to origin/destination format.

The factors used for dividing the daily trip table were developed primarily from the 1993 Household Travel Survey with data from the *Traffic Trends* report produced by the State Highway Administration denoting hour of day factors used as a control to "smooth" data by purpose. The 1993 Household Travel Survey information was extracted to update the time of day factors. Appendix F displays the factors that were then applied to the 24-hour vehicle trip table to obtain trips for five distinct periods.

Transit Operating Assumptions

Horizon year transit networks consist of the existing transit system plus expansion and new service proposed in the Plan and TIP. All horizon transit networks consist of existing service provided by the MTA along with local transit service provided in the City of Annapolis and Harford, Anne Arundel, and Howard counties. Modifications to the existing transit system and fare matrix were made to reflect service reductions and fare changes made by the MTA in July 2003. As part of the new mode choice model, BMC staff has developed a parking cost model. The model was developed from information obtained in the 1993 Household Travel Survey, off street parking location survey, and local knowledge. The model uses regression analysis, relating employment density to an average hourly parking charge for a TAZ for HBW, HBSh, and HBO. Using the Round 6B cooperative forecast projections of employment density, an expected average hourly parking cost can be estimated for each horizon year. The logit equations use hourly parking cost to estimate rideshare and transit. The conformity analysis of the TIP and Plan incorporates the parking cost model.

In September 2005, the transit network was updated to reflect Phase I of the Greater Baltimore Bus Initiative, which went into effect in October 2005. Table II-1 contains the transit ridership projections used for conformity determination.

**TABLE II-1
Transit Ridership Projections**

	2010	2020	2030
HBW	119,200	137,700	140,400
HBSH	7,800	8,200	8,900
HBO	70,300	78,600	79,000
HBSch	12,800	13,100	13,300
WBO	16,800	18,700	17,500
OBO	10,700	11,600	11,100
Total	237,600	267,900	270,200

Electronic Toll Lanes

The Maryland Transportation Authority will be constructing additional capacity on I-95 north of Baltimore. Users of the added capacity regardless of occupancy or vehicle type would electronically pay a per mile toll currently estimated for modeling purposes at 5¢ off peak and 15¢ peak. The effects of toll cost are reflected in trip distribution, mode choice, and route assignment. The toll cost is converted to travel time using \$14.00 an hour as the value of time and is added to the ETLs calculated travel time based on the travel speed. The travel cost (time) is fed into trip distribution. During mode choice, the dollar cost of traveling on the ETL is calculated and added to the auto operating cost for the utility of SOV and shared ride. Route choice travel time for all links is based on the travel time to traverse the link, including the toll time where applicable. The assignment algorithm chooses the path that minimizes travel time. During periods of high congestion, the ETLs become the preferred choice over the general purpose lanes due to their time (cost) savings.

B. Procedures for Determining Regional Transportation-Related Emissions

The amended Final Transportation Conformity Rule §93.122 issued by EPA on July 1, 2004 contains transportation-related emissions determination procedures that must be implemented in non-attainment areas. The Baltimore region has maintained a process for a number of years that meets the modeling requirements under §93.122(b)(1)(i) through (vi) for designated severe ozone nonattainment areas. Since the revocation of the 1-hour ozone standard on June 15, 2005, the Baltimore region is no longer a severe nonattainment area for 1-hour ozone. It is now a moderate nonattainment area for the 8-hour ozone standard, a nonattainment area for PM_{2.5}, and a maintenance area for CO. However, due to persistent air quality issues in the Baltimore region, the region still follows the same procedures and meets the requirements. BMC staff, on behalf of the BRTB, runs transportation (travel demand) modeling activities associated with conformity and mobile model changes. MDE is responsible for all emissions modeling. BMC continues to contract with various consultants to evaluate technical capabilities and suggest future work program items. This effort has enabled BMC to take advantage of national expertise in improving technical capabilities to a sophisticated level. In addition, the BMC participates in a peer review process, in which a national panel of experts reviews the region's travel demand model. Appendix G outlines how BMC addresses the requirements in §93.122(b)(1)(i) through (vi) of the Final Transportation Conformity Rule.

B.1. Adjusting Network Based Vehicle Miles of Travel

With EPA's release of MOBILE6, the Baltimore region re-evaluated the technical process used in converting travel demand modeling results into a format for mobile emissions estimates. With MOBILE5b, a post processor was necessary to combine information generated from the travel demand model with the MOBILE emissions model, since the MOBILE5b emissions model was not directly

connected to simulated transportation characteristics. EPA developed MOBILE6 to provide the connection between travel demand models and emission models using several files containing transportation characteristics (such as VMT by speed and hour of the day for each vehicle type) in estimating gram per mile emissions for mobile source pollutants, including NO_x, VOC, CO, and direct PM2.5. (MOBILE has the ability to also estimate emissions from refueling. In the Baltimore region, refueling emissions are considered a stationary source and not mobile.)

The Baltimore region is now using EPA's updated MOBILE6.2 model. For MOBILE6.2 application, a commercially-available software package (entitled PPSUITE) was used to manage the process of connecting output from the travel model to the MOBILE6.2 model used to estimate mobile emissions. The PPSUITE package takes travel demand model output and generates the needed MOBILE6.2 transportation files. It then executes MOBILE6.2, and summarizes the mobile emissions.

The following general steps summarize the mobile emission estimation process:

- ⇒ Output travel demand model estimates of daily-, a.m.-, and p.m. peak-period link totals and truck volumes
- ⇒ Convert travel demand model estimates of daily link total and truck volume to seasonal/monthly HPMS adjusted hourly estimates
- ⇒ Estimate link volume by vehicle class (motorcycle, 2 axle, bus, and 2 axle 6 tire and 3+ axles)
- ⇒ Calculate new travel speed
- ⇒ Prepare MOBILE6.2 transportation related files
- ⇒ Prepare MOBILE6.2 input scripts including transportation assumptions, environmental assumptions, control program specification files, and MOBILE6.2 operating parameters
- ⇒ Execute MOBILE6.2 estimating mobile gram per mile composite emissions for each pollutant and VMT fractional shares for 28 vehicle types
- ⇒ Apply MOBILE6.2 VMT fractional shares for 28 vehicle types by accumulated facility type VMT summaries multiplied by composite gram per mile emission factors
- ⇒ Summaries showing estimated MOBILE source emissions by 28 vehicle types for each pollutant and converted to tons per day
- ⇒ For estimates of annual PM2.5 emissions, apply weekday gram per mile emission factor to estimated monthly VMT. Sum monthly VMT for annual estimate.

A more detailed, albeit brief, explanation of the process follows below. Task Report 03-3 contains a more in-depth documentation of the process for the Baltimore region and is available upon request. (Please see Appendix A for information on obtaining this report.) EPA has posted substantial information on MOBILE6.2 on the internet for additional reference (www.epa.gov/otaq/m6.htm).

Travel information within a database format (dBase) is used in exchanging link characteristics between the travel demand modeling software TP+ and PPSUITE. Estimated link volume is adjusted using jurisdiction Highway Performance Monitoring System factors and seasonal/monthly (Table II-2) factors (1.04 percent for average summer weekday and 0.938 percent for average winter weekday) by facility type and area type. The HPMS factors are derived from the 2000 travel demand model validation. The 2000 HPMS adjustment factors used are contained in Table II-3 below. The 2000 HPMS factors are closer to one on the upper class facilities and are greater as the facility class decreases due to less representation of the highway network within the travel demand model. The travel model includes all interstates but only skeleton representation of the lower class facilities especially in the more developed counties. Factoring by the HPMS factors compensates for differences between simulated volume (from the travel model) and estimated observed volume. During the adjustment process, an estimate of local (off-network) VMT is made using the ratio of local to non-local 2000 HPMS estimates applied to the adjusted model estimates. These ratios are contained in Table II-4. These three steps, (1) applying the HPMS factors; (2) applying the seasonal/monthly factors; and (3) estimating local VMT, reconcile the

travel demand model with 2000 estimated observed volume. The HPMS and seasonal/monthly factors are also applied to horizon year estimates of VMT; thereby reconciling horizon year estimates with the ratio of unexplained volume in the base year 2000. This reconciliation ultimately allows the travel model to provide an estimate for all regional VMT.

**TABLE II-2
HPMS Monthly Adjustment Factors**

Month	Adjustment for 2002 PEI	Adjustment for Horizon Years
January	0.940	0.908
February	0.951	0.947
March	0.978	0.988
April	1.023	1.020
May	1.038	1.030
June	1.026	1.044
July	1.031	1.029
August	1.048	1.052
September	0.998	0.985
October	1.001	1.027
November	0.983	1.006
December	0.983	0.964

**TABLE II-3
HPMS Adjustment Factors by Jurisdiction**

		Interstate	Freeway	Principal Arterial	Minor Arterial	Collector
Urban	Baltimore City	1.0382	1.3342	1.2531	1.9602	2.6877
	Anne Arundel	1.0027	1.1277	1.2808	1.3454	2.0611
	Baltimore	0.9984	1.4738	1.2033	1.4748	1.5257
	Carroll	0.9793	0.9793	1.2899	1.9483	0.8083
	Harford	0.7684	1.8108	1.3834	1.3813	1.2400
	Howard	0.9452	1.2114	1.2705	1.4281	1.0509
Rural	Baltimore City	1.0382		1.2531	1.9602	2.6877
	Anne Arundel	1.0522		1.1398	0.9883	2.4571
	Baltimore	0.8695		0.9307	0.9256	1.1291
	Carroll	0.9793		0.8811	1.3678	0.9216
	Harford	0.9501		0.9170	1.2981	1.2510
	Howard	0.8405		1.5568	1.0642	1.5709

TABLE II-4
Local to Non-local Ratios by Jurisdiction

	Urban	Rural
Baltimore City	0.1087	0.1087
Anne Arundel	0.0743	0.0482
Baltimore	0.0617	0.0928
Carroll	0.0457	0.1501
Harford	0.1226	0.0831
Howard	0.0475	0.0703

Travel demand model outputs simulate volume in five time periods, while the MOBILE6.2 utilizes hourly inputs. Therefore, *vehicle type pattern files* are used to convert simulated period volume into hourly volume. The *vehicle type pattern files* are broken into four vehicle classes (motorcycle, 2-axle 4-tire, bus, and 2-axle 6-tire/3+ axle). These files are developed using two types of counts: observed counts taken hourly for all vehicles; and hourly classified counts (FHWA F-13 scheme), summarized by facility and area type (urban/rural). The counts are used to develop estimates of the share of the volume per hour. These estimates are applied against the simulated link time period volume (a.m. and p.m. peak and daily) by facility and area type.

Each link hourly vehicle type volume is compared against the modification to the Bureau of Public Roads curve used in the travel demand model. As with the travel demand model, Passenger Car Equivalence is used for the estimated truck volume. Each hourly volume is also subject to peak spreading where individual hourly volume that exceeds 30% of the maximum volume is spread to other hours within the peak period. The final estimate is a new travel time and speed estimated on each HPMS adjusted link volume considering peak spreading.

Standard MOBILE6.2 input files of VMT by facility, VMT by hour, and VMT by speed class are developed using information from the travel model and air quality post-processor. Exact description of the data estimated can be found in the User's Guide to MOBILE6.2 Mobile Source Emission Factor Model developed by EPA. The fraction of VMT for 16 vehicle types is calculated from the HPMS adjusted link volume. Using the four vehicle types and MOBILE6.2 defaults, the two-axle vehicles are divided into five classes (LDV, LDT1, LDT2, LDT3, and LDT4). Likewise, the multi-axle estimates are converted into eight heavy truck types. Motorcycle and bus volume estimated from the pattern files are in the correct vehicle type format.

PPSUITE then assembles the MOBILE6.2 scripts using information such as registration data for the Baltimore region, environmental conditions (such as temperature), control programs, and transportation information described in the above steps. National defaults are used for the more complex and data intensive inputs into MOBILE6.2. MOBILE6.2 scripts are built for each area type (urban or rural) and facility type within each jurisdiction (only for the assembly of the transportation information, since neither environmental conditions nor control programs vary across the non-attainment area).

The assembled MOBILE6.2 script is submitted to the MOBILE6.2 software, which generates the database output (ASCII database) and the report. The output gives the gram per mile emission factors for each pollutant, for each of the 28 vehicle types. The gram per mile factor is a composite factor based on the age distribution, transportation characteristics, environmental conditions, and control program applicable for that vehicle type. MOBILE6.2 generates a VMT fraction share for all 28 vehicle types based on supplied information (registration data, diesel sales fractions, and mileage accumulation rates). This

fraction share can be used to generate a composite emission factor that can be applied to the estimated VMT or can be used to convert regional VMT into an estimate of VMT for each 28 vehicle types and then factored by the gram per mile emission factor for that particular vehicle. Both methods would produce the same estimate of VMT. The later method is used in order to generate more specific reports about emissions and VMT for the region.

The final step is to accumulate the estimate of VMT and emissions for the various vehicle types and facility types.

B.2. Updates to MOBILE6.2 Modeling Assumptions

In cooperation between BMC and MDE staff, assumptions used within the MOBILE emission model are reviewed and validated with the latest information on environmental conditions and MOBILE commands representing control strategies and other policies.

The monthly analysis of mobile source emission required the development of average hourly monthly temperatures and humidity along with daily estimate of barometric pressure. The BWI weather reporting station observations were analyzed to develop the required input. The BWI weather reporting station was also the source for hour of sun rise and sun set and the percent cloud cover. Other monthly assumptions in fuel composition and volatility were estimated and or used the MOBILE6.2 default for that month.

The MOBILE script that reflects the Inspection and Maintenance program was also reviewed and compared against policies and procedures in use at various locations within the region. At the testing facilities, I/M technicians are testing OBD vehicles for gas caps starting with the 2002 model year vehicles. The MOBILE script was modified reflecting the in-place procedure. The effectiveness of the method used during the I/M test against the assumptions contained within the MOBILE script were evaluated. Changes were required to the cut point file in order to reflect procedures in place at the testing facilities.

C. ANALYSIS OF EMISSION REDUCTION STRATEGIES USED FOR CONFORMITY OF THE PLAN AND THE TIP

This section reviews the approach for technical analysis of ERSs used for conformity of the Plan and TIP. Calculations are provided in Appendix H. For conformity, ERSs are separated into three categories:

Implemented: Projects and strategies implemented between calendar years 2000 and 2004 that have continued, quantifiable emissions benefits.

Programmed: Projects and strategies with allocated funding that provide emissions benefits in the TIP, Consolidated Transportation Program (state), and Capital Improvement Programs (local).

Planned: Projects and strategies in the Plan that provide emissions benefits.

C.1. Implemented

Since calendar year 2000, the region has implemented projects and strategies that have worked to improve transportation services, reduce congestion, and provide alternative transportation options, which result in improved air quality. These strategies are captured in this category. (All projects prior to 2000 are assumed to be in the validated 2000 travel demand model or captured in the adjustment factors using HPMS data and are therefore not captured off-model.)

Projects and strategies included in this category of ERSs can be found in the Tracking Table, contained in Appendix H. While the tracking table contains numerous ERSs, those considered “implemented” for

conformity purposes are those that are completed and continue to provide emission benefits. This Appendix also contains methodologies and calculations for all ERSs used for conformity of the 2006-2010 TIP (implemented, programmed, and planned strategies).

C.2. Programmed

Programmed projects and strategies that have emission reduction benefits may be funded primarily in two ways: with Congestion Mitigation and Air Quality (CMAQ) funds and non-CMAQ funds. CMAQ funds are provided by the federal government and specifically target air quality and congestion management endeavors. Non-CMAQ projects are those funded with non-CMAQ federal funds, state, local, or private funds. Note that quantifiable changes in mobile emissions are not provided for all CMAQ projects due either to their nature or a calculated benefit cannot be subtracted from the network based analysis that does not contain the mobile emissions prior to implementation of the project.

Programmed ERSs scheduled for funding include rideshare assistance, bus replacement, areawide congestion management, areawide CHART program, additional park-and-ride lots and/or spaces, bicycle and pedestrian improvements, and transit enhancements. Appendix H contains the air quality analysis performed for those with quantifiable benefits used for conformity. This analysis is provided to indicate what strategies the region is selecting for implementation and what one might expect in mobile source emission changes. The methodology used to evaluate these projects assumed a change in travel behavior either from a reduction in VMT and/or elimination of motor vehicle trips.

C.3. Planned (In the Plan)

Beyond programmed initiatives in the TIP, the Plan includes strategies to implement an array of emission reduction strategies. The section of the Plan that outlines transportation emission reduction strategies lists several programs, including a Commuter Assistance program, a home-based telecommuting strategy, transit intensification, development of additional park-and-ride lots, intelligent transportation system projects, and implementation of the bicycle/pedestrian element of the Plan. Newer categories include Clean Technology and Land Use/Smart Growth (although credits are not calculated for these). The Plan allocates financial resources to implement selected strategies as appropriate within the mandated fiscal constraints. These emission reduction strategies are described in more detail in the Plan. Planned strategies used for conformity credit are briefly described below.

- The Commuter Assistance program relies primarily on voluntary participation by large employers, and to a lesser degree on participation by smaller employers. The program is a regional programmatic overlay to supplement traditional commuter-related programs.
- Home-based telecommuting strategy relies primarily on voluntary participation by large employers, and to a lesser degree on participation by smaller employers. For a description of the telecommuting strategy used in this report, see Section III (for technical assumptions, methodology, and emission reduction analysis, see Appendix H).
- Build New Park-and-Ride Spaces/Lots the emission reduction credited from this strategy assumes a portion of the park-and-ride lots outlined in the Plan will be implemented by the respective horizon year.
- Bicycle Element of the Plan the emission reductions credited from this strategy assumes implementation of planned bicycle facilities in the Plan by the horizon year of 2020.

D. EMISSIONS RESULTS

D.1. Network-based/Model

Upon completion of the travel forecasting task, MDE used the MOBILE6.2 computer model, developed by EPA, to estimate the emission effects of the projected transportation system usage. Simulated VMT for an average weekday and monthly is located in Table II-5 for the baseline (2002) and horizon years 2010, 2020, and 2030.

TABLE II-5
Average Weekday and Monthly VMT
(in thousands)

	2002		2010		2020		2030	
	Monthly	Average Weekday	Monthly	Average Weekday	Monthly	Average Weekday	Monthly	Average Weekday
January	1,907,500	65,800	1,972,400	68,000	2,164,600	74,600	2,325,200	80,100
February	1,743,000	66,500	1,924,400	70,900	2,111,900	77,800	2,268,600	83,600
March	1,984,600	68,400	2,146,200	74,000	2,355,300	81,200	2,530,100	87,200
April	2,008,900	71,600	2,144,200	76,400	2,353,100	83,800	2,527,800	90,000
May	2,106,300	72,600	2,237,400	77,100	2,455,400	84,600	2,637,600	90,900
June	2,014,800	71,800	2,194,700	78,200	2,408,500	85,800	2,587,200	92,200
July	2,092,200	72,100	2,235,300	77,000	2,453,000	84,600	2,635,100	90,800
August	2,126,600	73,300	2,285,200	78,800	2,507,900	86,400	2,693,900	92,900
September	1,959,800	69,800	2,070,700	73,800	2,272,400	80,900	2,441,000	86,900
October	2,031,200	70,000	2,230,900	76,900	2,448,300	84,400	2,629,900	90,700
November	1,930,400	68,800	2,114,800	75,300	2,320,800	82,700	2,493,000	88,800
December	1,994,700	68,800	2,094,100	72,200	2,298,100	79,200	2,468,600	85,100
Annual	23,900,000	839,500	25,650,300	898,600	28,149,300	986,000	30,238,000	1,059,200

Emission factors utilized for the analyses were generated using the MOBILE6.2 model with Baltimore region-specific inputs. With the exception of control program descriptions and vehicle-type VMT fractions, which were varied with each evaluation year in accordance with anticipated highway vehicle emission controls and MOBILE6.2 fleet turnover projections respectively, all inputs were held constant for each horizon year modeled. Constant inputs include Baltimore region-specific light duty 2002 vehicle registration distribution and Baltimore-specific meteorology. Evaluation year-specific vehicle emissions

inspection/maintenance, vehicle tampering inspection (ATP), Heavy Duty Diesel Engine rule, evaporative emission controls (RVP and Stage II) and National Low Emission Vehicles were utilized. All year-specific inputs were based on MDE's "best estimates" of program specifications for future years. The 2002, 2010, 2020, and 2030 evaluations reflect "enhanced I/M," "enhanced ATP," gasoline volatility control at reformatted gasoline stringency (7.0 psi RVP), and Stage II refueling control. Since the emissions analyses exclude refueling emissions, the Stage II volatility control assumption has no impact on emission levels. Appendix I includes correspondence from MDE in reference to the emissions estimation process. Network-based daily emissions of direct PM_{2.5} and NO_x were calculated for the scenarios presented by jurisdiction area (urban/rural) and functional type basis and aggregated for a regionwide statistic. Table II-6 shows the network-based annual mobile source emissions of direct PM_{2.5} and NO_x.

The analysis of the implementation of the Plan and TIP, for PM_{2.5}, was performed by comparing horizon year-specific estimates of mobile source emissions with 2002 baseline year emissions, using MOBILE6.2.

The network-based results, shown in Table II-6, indicate that mobile source emissions of direct PM_{2.5} and the PM_{2.5} precursor NO_x, associated with the implementation of projects contained in the Plan and TIP, meet the interim emissions test. Emissions associated with all horizon years under consideration are no greater than emissions from the 2002 baseline year.

TABLE II-6
Plan and TIP PM_{2.5} Conformity Mobile Source Emissions Results –
Network Based Analysis (tons/year)

	Implementation		2002 Baseline Emissions		Difference	
	Direct PM _{2.5}	NO _x	Direct PM _{2.5}	NO _x	Direct PM _{2.5}	NO _x
2010	563.62	30,052.81	1,043.51	63,759.38	479.89	33,706.57
2020	427.26	9,997.09	1,043.51	63,759.38	616.25	53,762.29
2030	435.04	7,015.55	1,043.51	63,759.38	608.47	56,743.83

D.2. Off-model

An off-model approach evaluating ERSs implemented, programmed, and planned is used to address projects that are not able to be modeled in the travel demand model. These projects are evaluated for emissions impacts. A model called MAQONE (Maryland Air Quality Off Network Estimator) provides results for projects where sufficient data existed, found in Appendix H. The majority of the applications of the Air Quality Off Network Estimator model (adapted for Maryland) have been used and documented in other nonattainment areas. A detailed description of the model and its methodology is available in the report *MAQONE: Maryland Air Quality Off-Network Estimator: Version 3.2 User's Guide and Reference Manual* (Michael Baker Jr. Inc., 2003).

The combination of network-based results and off-model ERSs provide the final emissions results for the selected horizon years of 2010, 2020, and 2030. These results are illustrated in Table II-7. The table contains the 2002 baseline year emissions of direct PM_{2.5} and NO_x, estimated emissions from the network-based analysis, implemented, programmed, and planned ERSs, and the final comparison of

mobile emissions associated with implementation compared with the 2002 baseline year emissions. The implementation total is estimated by adding together the network and off-network emission estimates. The PM2.5 conformity determination is based upon the comparison of the implementation to the 2002 baseline year emissions. This is the interim emissions test.

TABLE II-7
Final Emissions Results
(tons/year)

		2010 Emissions		2020 Emissions		2030 Emissions		
		Direct PM2.5	NO _x	Direct PM2.5	NO _x	Direct PM2.5	NO _x	
2002 Baseline Year Emissions		1,043.51	63,759.38	1,043.51	63,759.38	1,043.51	63,759.38	
NETWORK BASED ANALYSIS		563.62	30,052.81	427.26	9,997.09	435.04	7,015.55	
Emission Reduction Strategies	IMPLEMENTED	-0.90	-172.98	-0.90	-154.22	-0.09	-0.60	
	PROGRAMMED - TIP, CTP, & CIP	Rideshare	-0.29	-10.11	-0.28	-3.77	-0.28	-2.93
		Bus Replacement		-99.57		-106.61		0.00
		CHART (Areawide Congestion Management)		-72.23				
		Pathways/Bicycle trails	0.00	0.00	0.00	-0.20	0.00	-0.31
		Sidewalks/Pedestrian Improvements	0.00	-0.10	0.00	0.00	0.00	0.00
		Park-&-Ride Programmed	-0.01	-0.37	-0.01	-0.14	-0.10	-0.11
		Transit Enhancements	0.00	-0.01	0.00	0.00	0.00	0.00
		Arterial Improvements (System Signalization)						
	PLANNED	Regional Commuter Assistance	See qualitative description of planned emission reduction strategies in Appendix H. The methodology for determining emission reductions is currently being reviewed. As a result, no credit has been taken in this conformity analysis for these emission reduction strategies.					
		Home-Based Telecommuting						
		Planned Park-&-Ride lots						
		Bicycle Element of the Plan						
	Off-Network Analysis Total		-1.20	-355.37	-1.19	-264.94	-0.47	-3.95
IMPLEMENTATION TOTAL		562.42	29,697.44	426.07	9,732.15	434.57	7,011.60	
2002 Baseline vs. Implementation		-481.09	-34,061.94	-617.44	-54,027.23	-608.94	-56,747.78	

III. STATUS REPORT ON IMPLEMENTATION OF EMISSIONS REDUCTION STRATEGIES IN THE BALTIMORE REGION

The Clean Air Act Amendments of 1990 require metropolitan areas in nonattainment of the NAAQS to submit evidence of expeditious implementation of ERSs as an attachment to the TIP. Since the Baltimore region has been classified a nonattainment area for PM_{2.5}, a moderate nonattainment area for 8-hour ozone and a severe nonattainment area for 1-hour ozone, this section provides descriptions of the various strategies used in the Baltimore region and the status of implementation of those strategies. This section also serves as a tracking mechanism for assessing the progress of effectively implementing ERSs in the Baltimore region.

For simplicity, this section reviews the various strategies in the Baltimore region by category. The categories are Commuter Choice Activities, Employer-Based Programs, Improved Public Transit, Park-and-Ride Programs/Lots, ITS Projects, Bicycle/Pedestrian Activities, Parking Management, and Clean and Efficient Strategies. These categories are used for organizational purposes and do not relate directly to any particular legislative or funding areas.

MDE has submitted numerous SIP revisions to the EPA that have included aggressive and cost effective ozone control strategies and air quality modeling demonstrations to help the Baltimore region achieve clean air goals for the 1-hour ozone standard. A general conformity SIP revision and transportation conformity SIP revision have also been submitted to EPA. MDE is now in the process of preparing SIPs to meet the new 8-hour ozone and PM_{2.5} standards. These plans will likely include additional emission control measures that will be implemented within the 2010 timeframe.

A. COMMUTER CHOICE ACTIVITIES

A.1. Rideshare Program

The Baltimore region's original rideshare program began in 1974 as a joint effort of Baltimore City, the Regional Planning Council (now the Baltimore Metropolitan Council), and MDOT. Efforts to encourage ridesharing were expanded to cover the entire state in 1978 when the Maryland Ridesharing Office of the Maryland Transit Administration was established. Since it was formed, the MTA has enhanced and expanded its activities to include both commuters and their employers. A continuing program administered by the MTA provides funding support to local rideshare coordinators in order to strengthen ridematching and rideshare-support services at the jurisdictional level. The BMC provides ridesharing coordination services for Baltimore and Carroll Counties. Local rideshare coordinators have provided ridesharing information that has helped in the development of more effective regional emission reduction strategies. They have also assisted employers and employees in identifying opportunities for other ERSs such as transit, flexible work hours, and telecommuting.

The MTA and local rideshare coordinators are continuing to conduct annual surveys, seminars, and workshops to determine employer and employee attitudes toward alternative commute strategies. They have distributed rideshare information in printed and electronic formats to both public and private employers, and have placed rideshare advertisements in daily and weekly newspapers and regional magazines. Radio and television commercials have been used to encourage ridesharing. They have assisted in promoting Clean Commute Month and increased use of the MTA Commuter Choice discount transit fare program. Rideshare coordinators have also assisted with the establishment of new commuter shuttles and routes. In addition to printed maps showing local Park-&-Ride lots published by individual jurisdictions, an updated electronic map of the 100+ Park-&-Ride lots throughout the Baltimore region is available on the BMC website.

The Howard County “Commuter Solutions” program is an example of a local ridesharing service. This locally operated program includes arranging free car- and van-pool matching for commuters traveling into and out of Howard County. They also monitor parking availability and other conditions at park-and-ride lots, and provide service and schedule information for local and commuter transit options including MARC and MTA services.

A.2. Maryland Commuter Tax Credit

As of January 2000, a tax credit went into effect statewide that allows employers to claim a 50% state tax credit for providing transit benefits (subsidy) to an employee of up to \$50 per month, which an employer may provide to an employee without tax consequences under the Federal tax law. It is expected that the state benefit will be even more attractive to employers as a benefit to offer employees than the Federal law (a direct tax credit as opposed to an allowable business expense). This feature of the Maryland law also has the potential to encourage increased transit use by low and moderate-income employees. Under provisions of both the 1999 and 2000 Maryland laws, private non-profit organizations will also be able to participate in the program. Employers will be able to claim tax credits for providing transit passes and vouchers, guaranteed ride home, and parking cash-out programs. Similar to the IRS benefits, the Maryland Commuter Tax Benefit program does not provide financial assistance to carpoolers. Information is also provided online and employers are able to register to participate in the program over the internet.

A.3. Other

Clean Commute Month

For many years, the BRTB has teamed with state transportation and air quality agencies as well as private organizations to promote Clean Commute Week. The program has now been greatly expanded and is now known as Clean Commute Month. For Clean Commute Month, citizens in the Baltimore region are asked to try an alternative commute option at least one day during the month-long period. Clean Commute Month was promoted again in 2005, from May 1-31. To kick off CCM 2005, bicycle commuters and other bicycle enthusiasts met to celebrate Bike-to-Work Day. Participation in Bike-to-Work Day has increased substantially in recent years, and many local businesses and organizations donated prizes for participants. Bike-to-Work Day has truly become a region wide initiative, with rallies in Annapolis, Baltimore City, Baltimore County, and Harford County. CCM 2005 included a coordinated media campaign, with radio spots running several weeks before the event. In addition, a web site, **www.cleancommute.com**, provides information about Clean Commute Month, 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. The site also highlights employers who promote clean commuting and hosts information on commuter tax benefits. It is expected that these types of activities will lead to ongoing use of alternative transportation choices.

B. EMPLOYER-BASED PROGRAMS

Employer-based ERS programs include alternate commute options such as telecommuting, regional commuter assistance, flexible work arrangements, and guaranteed ride home. Employer outreach efforts by the BRTB, MDE, MDOT, MTA, and other organizations are focused on encouraging voluntary participation in more employer-friendly and employee-friendly ERS measures.

Other activities related to voluntary employer-based programs are underway in the Baltimore region, including a number of public sector employers such as Baltimore County, Carroll County and the BMC that have initiated pilot programs of flexible work arrangements.

B.1. Telecommuting

Home-based telecommuting is a voluntary region-wide strategy for reducing Single Occupant Vehicle use by employees who work for large and small organizations.

In September 1999, BMC completed its first telecommuting baseline study for the Baltimore region. This study surveyed employees and employers (both large and small) to determine the current level of telecommuting activity in the region, and to document employer attitudes and expectations which will affect future telecommuting growth in the region. The study found that 3.6 percent of employees in the region (approximately 50,000 employees) telecommute (primarily from home). This magnitude of telecommuting is almost double the level previously used in air quality analysis. This study also documented employer interest in participating in voluntary employer-based programs such as MDOT's Telework Partnership with Employers program. The study, which was one of the first of its type in the U.S., was selected for presentation at the 2001 annual conference of the Transportation Research Board.

At the direction of the General Assembly, MDOT has implemented a telecommuting program for its employees. The General Assembly passed legislation establishing pilot telecommuting programs for state employees. The goal of this program is to recruit 10% of eligible state employees as telecommuters.

Telework Partnership with Employers

BMC and MWCOC are now participating in a bi-regional program to assist large and small employers to establish home-based telecommuting programs for their employees. This program, known as the "Telework Partnership with Employers," is sponsored and funded by the MDOT. In addition to the traffic and emission reduction benefits of the TPE program, it will assist in perfecting marketing, outreach procedures, and administrative methods that may be used in other alternate commute programs.

Since its kickoff in October 1999, over 25 large and small private sector employers as well as two non-profit organizations have been recruited to participate in the bi-regional TPE program. In the Baltimore region, eight employers have begun telecommuting programs and two more are initiating consultant services. Employers have been recruited through a series of TPE outreach events. Employers that have signed up to participate in year-long pilot telecommuting programs can choose from a list of qualified regional and national telecommuting consultants whose services are paid for by MDOT.

B.2. Guaranteed Ride Home Program

The first Guaranteed Ride Home program in the Baltimore region was initiated by the BWI Business Partnership. This program encourages ridesharing among the member employers of the BWI Business Partnership. Individuals that drive to work only one or two days per week are eligible to participate in the program. If an emergency occurs or an employee needs to work late, the GRH program provides a ride home at no cost to the registered participant. This GRH program has been well received by both employers and employees. Initially, over 500 employees registered for the service.

Information from the post-demonstration assessment of this program has been used by the BMC to estimate the emission reduction potential of other GRH programs and related emission reduction strategies in the Baltimore region. Based on the results of this assessment and further survey data, the BMC assisted the Annapolis Regional Transportation Management Association in establishing a Guaranteed Ride Home program.

B.3. Commuter Choice

In support of voluntary employer-based programs, the MTA has developed a reduced fare program known as Commuter Choice. This MTA program, which was previously known as TransitPlus and TransitPlus 2000, permits participating employees and employers to receive increased federal tax benefits along with reduced transit fares and reduced vanpool commute costs. Specifically, employees can save

up to 42% of their annual commuting cost by purchasing Commuter Choice monthly passes with pre-tax dollars. Employers benefit by saving approximately 10% on payroll taxes. During the 1999 session, the Maryland General Assembly passed legislation (SB 390 and HB 636) which made state tax reductions available to employers that provide commuter benefits such as Commuter Choice to their employees. The availability of federal and state tax benefits, combined with aggressive marketing, are expected to substantially increase employee participation in the Commuter Choice program and other qualifying commute options. MTA seeks to enroll at least two new employers each month in its Commuter Choice program.

C. IMPROVED PUBLIC TRANSIT

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.

C.1. Bus

The MTA operates a far-reaching system of bus services. Currently, there are 49 “core” bus lines serving Baltimore City as well as Anne Arundel and Baltimore counties. The majority of these routes serve areas within the Baltimore beltway, connecting regional suburbs to downtown, and neighborhoods within the downtown area. Fourteen routes are feeders into Light Rail, Metro Subway, and MARC stations.

The size of MTA’s bus fleet is approximately 756 buses, with ongoing replacement programs to ensure the safety, emission reduction, and reliability of the fleet. In its short-term transit improvement program, MTA is considering a number of innovative service options, including neighborhood transit routes using smaller buses, circumferential services linking suburban activity centers, transit centers, and reverse commute service aimed at providing access to suburban employment opportunities.

Commuter bus service is provided on 22 lines, which operate throughout the state, 7 of which operate in the Baltimore region. Private contract service providers under the Maryland Private Commuter Bus program provide these important peak period commuter services to MTA.

The MTA also operates local, neighborhood shuttles within the Baltimore region. The neighborhood shuttle program has been very well received. Its first route, the Hampden Shuttle Bug, began service in December 2000 and draws about 500 riders per day. Another neighborhood shuttle service, the Mondawmin Shuttle Bug, was started in 2002. The MTA also maintains a program of enhancements to the bus system, including rehabilitation of park-and-ride lots and other selected facilities. MTA and other local bus systems, such as Annapolis Transit, Harford Transit, and Howard Transit, have an ongoing vehicle replacement program aimed at acquiring more efficient, lift-equipped buses.

The MTA is working to develop a system-wide bus master plan that presents a sequence of bus projects that can be phased over time that will lead to a more efficient and safer operating environment for the mode. The Master Plan will examine previous facility plans, existing bus facilities, projected operations, new technologies, worker safety, and ridership demand to develop recommended capital projects for rehabilitation and improvements to bus facilities to meet future needs. The master plan is intended to serve as a guide to promote a logical progression in programming, planning, and completing projects within the context of a system-wide approach to managing improvements to bus facilities over a ten to twenty year time horizon. The total amount budgeted for the study is \$400,000 state funds and it is expected to be completed in the fall of 2005.

In 2005, the purchase of 10 hybrid electric buses, which would be used as part of the MTA fleet, was approved by MDOT. Not only do hybrid electric buses have better fuel efficiency than conventional diesel buses, they produce fewer pollutants. In addition, MDE and MTA are proposing a pilot project that would involve the installation of Clever Devices BusLink Switches on 100 MTA buses, between October

1, 2005 and October 1, 2006. The BusLink Switches activate an auxiliary heater that heats the coolant in the engine, thereby eliminating the need to idle the buses in the mornings to maintain an adequate operating temperature. MTA will have the ability to remotely operate the BusLink switches from the bus depot.

Job Access and Reverse Commute (JARC) Services

MTA is continuing its efforts to identify cost effective opportunities to expand its Job Access and Reverse Commute program. This program provides transit-dependent residents with transportation to jobs in areas that are not conveniently served by existing MTA transit routes. Since 2000, MDOT has been receiving funding from the FTA, the State, local jurisdictions, and non-profit organizations to provide transit services. The Baltimore region received over \$9.3 million in federal funds in total for FY 2004 and 2005, for the region's JARC programs. New JARC initiatives in the Baltimore region include fixed-route bus service; ride brokering, and employee shuttle services for interviews, job fairs, and daily commutes. Some of the most recently funded locally operated fixed-route services are Annapolis Transit Gold Route Extension/Late Night GR Service, Howard Transit Career caravan and Red Express, Corridor Transportation Corporation's (CTC) West Anne Arundel County service and Sojourner Douglass College WTRC. The bus routes connect with MTA services, and were designed to provide Baltimore's low-income workers access to job sites in outlying suburban areas.

The feature of the JARC Program that encourages collaboration has been valuable to the State's coordination efforts. The MTA works closely with the Maryland Department of Human Resources (DHR) on the State's JARC Program. DHR administers the State's Temporary Assistance for Needy Families (TANF) funds, and has provided over \$10.6 million in matching funding both directly from the State level and through local Departments of Social Services.

To ensure continuation of the program independent of federal reauthorization issues, in April 2001 the Maryland General Assembly established a Job Access Program within the MDOT budget. This legislation outlined the application procedures and established local matching fund requirements of at least 25% for proposed operating projects and at least 20% of the total cost for proposed capital expenditures.

MTA's JARC Program has been recognized nationally. In July 2002, information on the State's program was presented to the U.S. Senate Committee on Banking, Housing and Urban Affairs, and the Community Transportation Association of America highlighted Maryland's JARC program on their web site and in their magazine focusing on employment transportation.

The program was also a major factor in Maryland being recognized by the federal government with a *United We Ride State Leadership Award* during the recent *National Leadership Forum on Human Service Transportation*, part of a new initiative to improve the coordination of federally supported transportation services.

Greyhound Bus Service

The Greyhound bus station on West Fayette Street was relocated to an interim facility near Russell Street until an adjacent intermodal transportation center (which is in planning stages) is completed in 2007. The new intermodal center will be a 15,000 square foot facility located at 2110 Haines Street in the Carroll Camden Industrial Park. The cost is projected to be \$2.1 million. The facility will provide a convenient link between intercity and local public transportation.

Changes on an existing MTA bus route that will provide scheduled bus service to the new temporary Greyhound bus facility in the Camden Industrial Park were introduced in July 2004. The MTA's #27 bus line has been modified to serve the temporary station.

Locally Operated Transit Systems

In addition to the transit services operated by MTA, four public transit systems are operated locally in the Baltimore region. These systems, Annapolis Transit, Carroll Transit System, Harford Transit, and Howard Transit, provide bus and paratransit services primarily within the local areas in which they operate. Locally operated transit systems are funded through a combination of federal, state, and local dollars. MTA provides financial, technical, and operating support for these services. MTA passes are accepted for these bus services, except Carroll County services which do not connect with MTA routes.

Annapolis Transit is a bus service operated by the Annapolis Department of Transportation. Carrying customers every day except major holidays, its routes serve the City of Annapolis and nearby portions of Anne Arundel County, including Parole, Edgewater, Shady Side, Deale, Galesville and Arnold. A weekday commuter shuttle also links Annapolis with Kent Island. Two free routes circulate between the park and ride lot at the Navy-Marine Corps Memorial Stadium and downtown Annapolis and West Annapolis. Base fare is only \$.75.

Some routes connect with MTA's local bus service, which provide access to Baltimore and Light Rail, and commuter bus service to Washington, New Carrollton and Bethesda. The City of Annapolis' Transit Operations Facility also serves as a station for Greyhound/Trailways inter-urban service. Additional bus services are provided for special events. New lighted shelters are located at many of the over 200 bus stops. Buses, raised-roof vans and one of the three trolleys are wheelchair accessible. All vehicles except for trolleys are equipped with bike racks.

Carroll County provides local paratransit service through a contract with an operator known as Carroll Area Transit System. CATS is a private, non-profit corporation with a primary mission of providing efficient, safe, and demand-responsive transportation to older adults, persons with disabilities, emotionally disadvantaged, and transportation-disadvantaged citizens of Carroll County. CATS's fares are \$2.00 every 5 miles for general transportation. For seniors going to senior centers, the fare is \$1.00 each way. For the Westminster Shopper Shuttle and the South Carroll Shuttle, the fare is \$1.00 each way. The Westminster/Eldersburg Shuttle, \$2.00 each way.

The demand-response transportation is available to seniors and the disabled population on a primary-service basis and to the general population on a space-available basis. Demand-response service provides door-to-door service for all passengers. The system operates Monday through Friday from 7 a.m. to 5 p.m. Sunday service is provided in the Westminster area on a limited basis for individuals needing transportation to churches in the Westminster area. Persons requiring transportation are requested to call 24 hours in advance to schedule their rides.

Harford Transit, formerly Harford County Transportation Service before August 2004, provides fixed-route and demand-response bus services to the general public and the elderly and disabled populations of Harford County. Nine local routes link the primary towns and connect with MARC commuter train, and MTA's commuter bus service to downtown Baltimore. The fare structure for Harford Transit fixed routes is: \$0.50 for seniors and Handicapped Persons, \$1.00 for the General Public. The hours of operation for the local fixed routes varies, the first starting at 5:34 AM and ending at 6:39 PM Monday thru Friday except for County observed Holidays. There is one long-distance Job Access fixed-route reverse commute from Baltimore City to employment centers in Harford County along the I-95/US 40 corridor.

The demand response bus service works on a call and prescription service, persons requesting a ride need to call no later than 48 hours in advance. The charge for demand response is \$2.00 each way except for persons going to Senior Centers who are charged \$1.00 each way.

Howard Transit, formerly Howard Area Transit Service, is the general public transportation service for Howard County. Howard Transit provides eight fixed-routes serving Columbia and surrounding areas including Clarksville, Ellicott City, Elkridge, Jessup, Laurel and BWI International Airport with connections to MTA bus, MARC, and Light Rail. The base fare is \$1.50 each way. Reduced fares are available for senior citizens, students and individuals with disabilities. A liberal transfer policy is available and multi-ride passes are offered.

There are two transit services in the region operated by nonprofit corporations. They are Connect-A-Ride, and The Link. Both initiatives grew out of a need to provide affordable and efficient connections to places of employment. Connect-A-Ride is funded through a combination of private, federal, state, and local dollars. Employers in the service area fund the Link services. For more information visit Howard Transit at www.howardtransit.com.

Corridor Transit Corporation operates Connect-A-Ride, is the transit manager for Howard Transit, and provides limited service to Anne Arundel County. Connect-A-Ride, through its 12 routes, serves the Laurel area of Prince Georges County but also provides service in Western Anne Arundel County and connects with Washington Metropolitan area transit services and destinations. In the Baltimore region, it provides service to Columbia, Glen Burnie and Odenton, with connections to MTA bus, Light Rail, and MARC service. Connect-A-Ride honors MTA passes.

The BWI Business Partnership, Inc., a non-profit economic development and transportation management association, manages a bus route called The Link. The Link shuttle bus connects MTA's BWI Business District Light Rail station with BWI MARC/Amtrak Rail station, with continuing service to the National Security Agency's office location. With five different stops, the service makes 19 to 20 rounds a day utilizing two vehicles. Service hours are Monday through Friday, from 5:45 am to 5:55 pm.

Bus Replacement

MTA Fleet: MDOT has included in its Consolidated Transportation Program the funds to purchase 100 buses in FY 2003, 100 buses in FY 2004, 125 buses in FY 2005, 105 buses in FY 2006 and 100 buses in FY 2007. The new buses will replace older units in the fleet that have exceeded their useful service life, and which also have much higher levels of NO_x emissions. This replacement program will serve to reduce the average age of the bus fleet from nine to six years.

MTA also used CMAQ funds to purchase a portion of the transit vehicles to retire 68 1982/83 model year vehicles. In addition, funds were spent to upgrade bus engines of approximately 175 buses per year, which decreases particulate matter. This program will continue until all 1992 and earlier engines have been replaced or the last of the buses have been retired. As of Fall 2004, 21 engines remain to be upgraded.

Local Fleet: MTA also provides funds to local transit systems to replace older vehicles. In FY 2002, 3 new buses were purchased for Harford County and another 3 for Howard County. Harford County received MTA funding for 6 new vehicles in FY 2003 and 3 more in FY 2004. Carroll County received 3 buses in FY 2003 and 1 bus in FY 2004. Annapolis Transit received 2 buses in FY 2003 and 1 bus in FY 2004.

C.2. Rail

Metro Subway

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. Free parking is available at Metro stations at Owings Mills, Mondawmin, and all stations in between.

Light Rail

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 recent extensions to Penn Station north of downtown Baltimore and to Baltimore/Washington International Airport (BWI) in Anne Arundel County. In 1992, MTA opened the first and second sections of the Central Light Rail system through Baltimore, and the final extensions of the system to Hunt Valley, BWI Airport, and Penn Station were opened in 1997. 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 the BWI Airport, the BWI Business District, and the Hunt Valley office park. Service runs every day of the week. There are 32 Light Rail stations, and parking is provided at 12 of these stations totaling 3,200 parking spaces. Parking is free. Two stations have designated overnight parking areas to accommodate travelers to BWI Airport and Penn Station.

Construction on the MTA's Light Rail Double Track Project is currently underway. The Light Rail Double Track Project includes 9.4 miles of the existing rail line, therefore making service along the line more reliable and help increase ridership. Only 2.6 miles will remain single track, due to right-of-way issues. Service from Camden Yards to North Linthicum re-opened on June 27, 2004. The remainder of the southern alignment reopened in December 2004. Construction to add the second set of tracks on the single-track sections of the northern alignment began in January 2005. Shuttle bus service is in place for customers during the service outage. The northern alignment will be reopened in early 2006.

Maryland Rail Commuter (MARC)

MTA's Maryland Rail Commuter (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 9 stations in the region. The Camden Line runs from Camden Station in Baltimore City to Union Station, and stops at 6 stations in the region. MARC passengers are able to make free transfers to other transit services operated by the MTA. Parking is available at most MARC stations; some at no cost.

MARC commuter rail services have been enhanced through construction activities at several locations throughout the region. On the MARC Penn Line, a 1,360 space parking deck was opened at the BWI Airport Station in June 1996 and 700 additional parking spaces were later opened at the Odenton Station. A feasibility study is underway for a structured parking (garage or parking deck) at Odenton Station for 2500 spaces on MTA owned property. Expansion of the Halethorpe MARC Station Park-&-Ride lot – Phase I, is complete with 428 parking spaces added. The scope of the work includes high level platforms, new shelters, and improved accessibility for persons with disabilities, lighting and streetscaping. Phase II, which includes a pedestrian bridge and high level platforms is in the project initiation stage.

In September 2005, construction began on a parking lot expansion at the Martin State Airport MARC station, located on the Penn Line. This expansion will increase the number of parking spaces from 171 to 326.

MARC operates on tracks owned by CSX and Amtrak. CSX Transportation owns the Camden line between Washington and Baltimore, and the Brunswick line between Washington and Martinsburg, while Amtrak owns the Penn line which operates between Washington and Perryville in Cecil County. MARC service on the Camden line has been negatively affected by unexpected increases in freight traffic since CSX took over part of CONRAIL in June 1999. MTA recently completed negotiations with CSX Transportation in efforts to ensure acceptable levels of commuter rail service. Through operational agreement with CSX and Amtrak, an ongoing program of improvements is underway to ensure safety and quality of service to riders. Maryland invested \$30 million in state and federal money for track and signal improvements.

C.3. Other (bus and rail)

The MTA is continuously striving to provide improved services to support the stated goals of: commerce, health and the environment, education, public safety and fiscal responsibility. System/service expansion, system/service operational improvements, and inducements to potential transit users are three main components of the additional efforts implemented by MTA to provide a safe, reliable and efficient network of transit services to the citizens of Maryland. Each of these areas targets different aspects of the transit system, and most importantly, different areas that can be targeted to improve the system and increase ridership. The types of issues under each category are as follows:

- System/service expansion: New rail service, expanded bus service, express bus service.
- System/service operational improvements: Geographic coverage, scheduling changes, facilitating/eliminating transfers (i.e., car/transit, pedestrian/transit), reliability (including maintenance).
- Inducements to potential transit users: Improvements in fare structure/policies, marketing programs, passenger amenities (aesthetics, comfort, etc.), fare simplification, customer service, marketing.

Text in each of these sections addresses the types of issues under each category. (For more information, please see EPA's Transportation Control Measures Program Information Directory.)

System/service Expansion

MTA began its first neighborhood shuttle route, the Hampden Shuttle Bug, in December 2000. Currently, it draws about 500 riders per day. The shuttle operates seven days a week on 17-minute headways and costs \$1.00 per ride. The program has been very well received. Small 30-foot low-floor buses are used. The Mondawmin Metro Shuttle Bug was started in 2002. It runs seven days a week and costs \$1.00 per ride.

FY 2005, grant funding was approved for 24 new vehicles (mini-vans, vans, and small buses) that will be used by non-profit organizations in Maryland. Out of these, five of the vehicles are awarded to organizations in the Baltimore region that transport disabled and elderly citizens. The fund is available through the FTA Section 5310 Grant program, which provides qualified, private, non-profit organizations with small transport vehicles and equipment.

MTA's Mobility paratransit program operates 214 vehicles, which consist of 112 buses and 102 sedans to provide more capacity and flexibility in meeting peak demand, improving reliability and on-time performance. All of the vehicles have smart card technology, two-way radios and Automatic Vehicle Location (AVL) system. On July 1, 2004, MV Transportation, a nation-wide paratransit provider, officially joined the MTA in providing paratransit service for customers in Baltimore City and selected areas of Baltimore and Anne Arundel counties. MV Transportation will provide one half of the contracted portion of the Mobility service. Yellow/Connex will continue to provide the other half of the contracted portion of the Mobility service as MTA continues to implement its new service model.

The new Service Model was designed to improve MTA's ability to provide reliable, on-time service. Under the new Model, all trips will be scheduled and dispatched by MTA. All new vehicles will be identified with the MTA logos. All drivers will be in uniform. All vehicles will be equipped with a global positioning device allowing the MTA to know exactly where each vehicle is at all times.

In addition, MTA Mobility has launched a new pilot program to improve individual transportation needs and provide quicker and more reliable service. The new Premium Service pilot Program will provide service to MTA Mobility eligible patrons. This is a new program that will deliver prompt and efficient taxi service. Customers can be transported, anytime, in the MTA Mobility service area for \$3.00 per trip by presenting the Taxi Access Card. Taxi Access trips will serve the present MTA Mobility service areas in the Greater Baltimore Metropolitan area.

System/service Operational Improvements

MARC Camden line schedule was adjusted to improve on-time performance. The new schedules avoid as much as possible two MARC trains meeting each other where freight congestion tends to be heaviest, including the area between Dorsey and Camden station. The new schedules will reduce delays in these areas when freight trains are using one of the two main line tracks. In addition, the new Camden line schedule is designed to improve the reliability of the first morning arrival in Baltimore.

MTA has several renovation and enhancement projects planned for the Metro Subway system. In 2000, a \$34 million system-wide project was launched to rehabilitate all of the 81 escalator units in the Metro system to improve safety features. Regular wear and weather had damaged many of the escalators. The rehabilitation is expected to decrease, if not eliminate, the frequency of escalator breakdown. Project completion is expected by Fall 2007. In the interim, a user-friendly "Metro Guy" character/sign will help users navigate through construction areas. The Metro Railcar Midlife Overhaul is underway with 100 cars manufactured between 1982 and 1986 to be overhauled. Overhaul of 20 married pairs (40 railcars) is completed. Project will be completed in 2005. Construction of a Metro Maintenance Facility directly adjacent to the Existing Old court road Metro Facility is underway. The completion date for this \$10 million project is April 2005.

An Automatic Vehicle Location system, being implemented by MTA, will permit better management of transit operations and will assist in improving service. Dispatchers are able to detect the location of buses, monitor on-time performance, and direct service changes to make buses more responsive to changing local traffic conditions. As of July 2004, 442 buses and 35 Light Rail vehicles have been equipped with AVL equipment. Two hundred forty additional buses will be equipped by July 2005 and the remaining buses will be equipped by July 2006. This equipment is also being installed on all new buses and light railcars purchased by MTA.

In 2002, Howard Transit added AVL technology to their fleet of buses to provide better quality service for Howard County's local bus system. It includes the capability for riders to view transit maps and vehicle movement through wireless Internet hardware such as computers and palm pilots, and to receive related information on digital cellular phones with text messaging.

Inducements to Potential Transit Users

In 1999, MTA introduced a new College Pass program that reduced the cost of a regular monthly pass to \$39 for college students whose schools were enrolled in the program. The program was aggressively marketed, and results were immediate. There are 22 schools in the Baltimore area currently enrolled; sales continue to rise at a rapid rate as more students become aware of the program.

MTA has been effectively marketing its transit services to tourists. Since 1995, the agency has distributed its "Visitors Ride Guide" system map and schedules at several welcome center information racks around Baltimore and the state of Maryland. Over 30,000 brochures are distributed every month. Every year, they have seen an increase in the number of hits and amount of time visitors spends on MTA screens. The MTA customer service transit information center is being upgraded by adding telephone capabilities, incorporating MARC and Mobility information, integrating AVL to provide real-time travel information, and providing additional kiosks with schedule information.

Features have recently been added to MTA's web site. MTA has launched the MTA On-Line Transit Pass Store. Through MTA's web site, a variety of transit passes can be purchased online, including Metro Subway, Light Rail and Commuter Express Monthly and ten-trip passes. There is also a new email service that sends notice to registered customers about disruptions on bus or train lines. E-mails may also include announcements for public meetings, hearings, and other events. In addition, the service provides a method for riders to register complaints, concerns, and comments immediately. It is anticipated that this mechanism may also provide a means to distribute surveys.

MTA continues to air its talk show "In Touch With the MTA." The show, launched in February 1999, is viewed in more than a million homes in Maryland. The 30-minute talk show addresses transit and transit-related information as well as "behind the scenes" issues and interviews. MTA addresses similar issues on its radio show "This Week With the MTA."

For rider convenience, ATM machines (Chevy Chase Bank) have been installed at three Metro stations. The machines include an extra feature to dispense bills as low as five dollars.

During the next two years the MTA will be moving forward with some exciting projects. The hope is that these projects will achieve the goal of improved services to the transit community.

The top projects are:

1. Implement Transportation Security System components by October of 2006.
2. Complete Light Rail improvements.
3. Paratransit - Renew MTA's commitment to its Mobility Customers.
4. Complete Bus Operational Analysis & Service Planning Study and implement service adjustments to the MTA Service areas along with replacing MTA Bus Stop Signs.
5. Introduce new MTA neighborhood (20-Foot) shuttles.
6. Complete Study for Red & Green Lines.
7. Implement Southern Maryland Commuter Bus Initiative.
8. Introduction of Dedicated Bus lanes.
9. Study and Implement a Comprehensive BRT System including integration of BRT into the ICC.
10. Reroute or revise train service on MARC, PENN or Camden lines so that trains run every 20 to 30 minutes in peak hours. (Shuttle Bus Option)
11. Institute a Performance Management Program.

D. PARK-&-RIDE PROGRAMS/LOTS

The BMC completed the first comprehensive study of Park-&-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-&-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-&-Ride lots.

D.1. State/Federal-funded

Expansion of the Halethorpe MARC Station Park-&-Ride lot (Phase I) is complete with 428 parking spaces added. The scope of the proposed work included high level platforms, new shelters, improved accessibility for persons with disabilities, lighting and streetscaping. Phase II, which includes a pedestrian bridge and high level platforms, is in the project initiation stage.

Construction of a new 300-space Park-&-Ride facility at the Cold Spring Lane Light Rail Station is delayed. Negotiation is underway for property acquisition.

Project planning activities are underway for expansion of parking at the Odenton MARC station to construct a 700-space parking lot with pedestrian access under MD 175 to the station platform. A feasibility study is also underway for a structured parking (garage or parking deck) for 2500 spaces on MTA owned property.

MTA is preparing conceptual plans, cost estimates, and environmental documentation for the expansion of parking from 96 to 221 at the Falls Road Light Rail station.

Harford County added a new lot at I-95 and Old Philadelphia Road, as well as one in Havre de Grace at Juanita and Otsego Roads.

D.2. Local

	Local	SHA	MTA	Private	Other
Anne Arundel County	3	9	7	2	6
Baltimore City	2		6	1	2
Baltimore County	5	10	13	1	2
Carroll County		6			1
Harford County	5	6		1	11
Howard County	1	9	3	1	1

E. INTELLIGENT TRANSPORTATION SYSTEM PROJECTS

E.1. Traffic Flow Improvements (CHART)

The Coordinated Highways Action Response Team program, operated by MDOT and Maryland State Police, focuses its operations on non-recurring congestion, such as crashes. The Statewide Operations Center, and the three satellite Operations Centers in the region, survey the state's roadways to quickly identify incidents. CHART also includes traffic patrols, which have been operating during peak periods

on many of the state highways in the region since the early 1990s. Based on 2002 data, it has been estimated that CHART operations saved 29.98 million vehicle hours of delay statewide (11.3 million in the Baltimore region), 5.06 million gallons of fuel, and reduced overall mobile source emissions, particularly CO emissions.

The mission of the Maryland CHART program is to improve the mobility and safety of highway users through the application of ITS technology and inter-agency 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; and (5) expand the CHART operating system and communications network to support sharing of transportation information, and inter-modal and inter-agency coordination and connectivity.

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 the interstate highways in the Baltimore region and other parts of the state using a combination of federal and state funds. 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.

Efforts are continuing by the SHA 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 systemization projects, roundabout construction, bus-activated signal preemption projects, intersection reconstruction, park-and-ride facility construction, improved fixed message and variable message signage, and other traffic management projects implemented in conjunction with the continuing CHART program.

E.2. Electronic Toll Collection

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. As of January 2004, 45 percent of vehicles using MdTA facilities used electronic toll tags.

MdTA is a member of the E-Z Pass InterAgency Group, a coalition of Northeast Toll Authorities. MdTA established reciprocity with the E-Z Pass system in 2001, enabling travelers in Maryland, as well as at most toll facilities in New York, New Jersey, Delaware, Pennsylvania, Massachusetts, Virginia, and West Virginia to pay tolls using one electronic device.

E.3. Traffic Signal System Retiming

SHA has instituted a statewide program to review and retime its 1,200 traffic signals in 200 signal systems. The timing of each traffic signal system is reviewed and updated every three years. In addition, systems 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. This program has resulted in the following average annual benefits for the Baltimore region: 11.8 percent reduction in network delay; 8.5 percent reduction in arterial delay; 8.7 percent reduction in arterial stops; and 1.9 percent reduction in fuel consumption.

E.4. Multi-Modal Traveler Information System

Efforts are also underway to develop a Multi-Modal Traveler Information System for the region. Providing multi-modal information to travelers will enable them to make more informed travel decisions, such as what route to take, what mode to take, when to leave, or even whether to make the trip at all. This information will enable travelers to reduce travel time delays and stabilize travel speeds, both of which will reduce mobile source emissions. A public-private partnership to complete this project was agreed to by MDOT and the Maryland Board of Public Works in September 2004. Region-wide availability of the traveler information system is expected by the end of 2006.

E.5 Baltimore Regional Operations Coordination Committee

Launched in September 2000, 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 the traveling public, and improve the quality of the environment. Participants on the B-ROC Committee include police, fire, and transportation agencies from the jurisdictions, MDOT and its modal administrations, Maryland State Police, MDE, FHWA, National Park Service Police, Maryland Medical Examiner's office, and others. Since the inception of the B-ROC Committee, various projects have been undertaken to improve responder coordination, cooperation, and communication which leads to incidents being cleared more quickly and safely.

F. BICYCLE/PEDESTRIAN ACTIVITIES

Through MDOT, SHA has worked to engineer and implement new and improved bicycle and pedestrian facilities. While fund-source programs such as the Bike Retrofit, Sidewalk Retrofit and Smart Growth Transit Program have been eliminated or zeroed out, SHA continues to work toward improving and expanding the network of bicycle and pedestrian facilities. An example of such an effort includes a recent improvement effort on Harford Road in Parkville, Baltimore County. The roadway section was reconfigured to include striped bicycle lanes through a central business district in an effort to provide routine accommodation. SHA has a stated goal of providing 200 miles of marked bicycle lanes throughout Maryland by December 31, 2006.

In the region, the BRTB continues to provide a foundation for bicycle and pedestrian facility implementation. For example, BMC undertook a detailed analysis of the advanced bicycle stop bar pavement marking treatment. BMC undertook this research at the request of the Baltimore City Department of Transportation; the DOT sought to provide a safe entrance to the City from points south via the Potee Street Bridge.

In each jurisdiction, efforts continue to accommodate bicycles and pedestrians. With \$5000 donated by the Baltimore Bicycle Club and earmarked for installation of bicycle rack in Baltimore, Baltimore City DPW began installation of inverted U racks across the city in 2003/2004. Locations were chosen by a cooperative composed of the City, the Mayors Bicycle Committee (on which the BRTB is represented) and BBC. Locations include transportation hubs such as Penn Station, as well as recreational/cultural destinations such as the Patterson Theatre. Almost all installation activities were completed in 2004.

Howard County continues to utilize the results of a recent GIS inventory of transit facilities to undertake improvements to provide pedestrian access to across the county. Construction has been completed in several locations, while additional activities are planned and/or underway.

G. 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 ERS in the Baltimore region. Carpoolers receive the most desirable parking spaces, usually those nearest to the building or in protective garages.

H. CLEAN AND EFFICIENT STRATEGIES

In Fall 2003, MDE received a grant from EPA to convert one of MTA's facilities from regular diesel to ultra-low sulfur diesel, thereby reducing emissions from approximately 165 buses. The project also allows the State to test other emissions-reducing technologies and test the effects of the low-sulfur diesel before it is required for use in 2006.

MDE is also working with Baltimore City to retrofit some heavy-duty vehicles such as trash haulers and school buses with diesel oxidation catalysts to help reduce emissions.

In early 2005, MDE received a Clean Diesel Campaign grant from EPA to retrofit ambulances and fire trucks. This project involves a partnership between MDE and the Baltimore City Fire Department. The grant will allow for the installation of diesel oxidation catalysts and crankcase ventilation filtration systems.

Also in early 2005, BMC received a grant from the Maryland Energy Administration for the demonstration of hybrid bus technologies to local transit operators. BMC arranged a tour of several hybrid buses to transit providers in the region. Providers were given an opportunity to evaluate the vehicles under actual operating conditions. Findings from this demonstration will be published in a report in late 2005. It is hoped that the project will encourage transit providers to purchase hybrids as they replace aging components of their fleets.

I. EPISODIC CONTROL PROGRAMS — CLEAN AIR PARTNERS PROGRAM

The Clean Air Partners program is a public/private partnership working to improve air quality in both the Baltimore and Washington regions by motivating individuals to take voluntary actions that reduce emissions. BMC, in cooperation with MDE, MDOT, and numerous other public and private sector entities, works with area employers to develop voluntary programs to reduce both operational and employee related emissions. Each participating organization develops an Air Quality Action Days, formerly Ozone Action Days, plan. At the basic level, plans include public education while the more ambitious plans may take costly actions to reduce emissions such as shutting down incinerators. Organizations put their plans into action on days of the year when air quality is expected to exceed the EPA health standards.

In 2005, Clean Air Partners conducted dozens of outreach events throughout the Baltimore/Washington regions. These events included on-site visits to large employers, schools, and appearances at community events. Clean Air Partners conducted a media campaign in both the Baltimore and Washington markets, which included drive-time radio spots. Clean Air Partners staff members conducted press interviews in both Baltimore and Washington. The Partnership has worked hard to nurture a relationship with the media 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 partnership.

The partners produced updated educational materials including new information on PM2.5 as well as ground-level ozone, improved its website, cleanairpartners.net, and worked to upgrade the Air Quality

Action Days Program, by providing training and better communication with the over 400 AQAD participants in the Baltimore/Washington air shed. Clean Air Partners has also worked with MDE, Metropolitan Washington Council of Governments, and BMC on improving air quality forecasting, as well as the communication of those forecasts.

Clean Air Partners continues to be a major sponsor of BMC's annual Clean Commute Month initiative. Held each May, Clean Commute Month activities raise awareness of the relationship between transportation choices and air quality and promote alternatives to single occupant vehicles.

IV. CONCLUSIONS

The BRTB conducted a comprehensive analysis of conformity of the Plan and TIP for the Baltimore region, for fine particulate matter (PM2.5). This conformity analysis was conducted through a quantitative and qualitative review of the projects in the Plan and TIP. The conformity determination process ensures that long-range transportation plans and short-term programs contribute to air quality improvement objectives delineated in the State Implementation Plan. Because there is currently no SIP for PM2.5, for the Baltimore region, an interim emissions test was used to determine conformity. In determining PM2.5 conformity using the interim emissions test, MPO officials estimate the future PM2.5 emissions produced by the planned transportation system. These emission projections are then compared with 2002 baseline year emission levels to determine whether the Plan and TIP are, or are not, in conformity. If PM2.5 emissions levels in applicable horizon years are no greater than PM2.5 emissions levels in the 2002 baseline year, then the Plan and TIP are in conformity for the PM2.5 standard.

The technical analysis of the Plan and TIP involved computer model applications to forecast the emissions of direct PM2.5 and NO_x associated with the implementation scenarios of these planning analyses. A determination of conformity with an interim emissions test was made based upon MOBILE6.2 model results and reductions provided from the application of off-model analyses for various emission reduction strategies.

Based on the quantitative assessment of the Plan and TIP displayed in Section II, it has been determined that the project elements and programmatic strategies of the Plan and TIP meet the goal of conformity determination. Emissions associated with these projects and initiatives pass the interim emissions test required by §93.109 (i)(2) of the Final Transportation Conformity Rule Amendments of July 1, 2004 under the 2010, 2020 and 2030 implementation scenarios for the Plan and TIP.

**Conformity Determination of the 2004
Baltimore Regional Transportation Plan and
the FY 2006-2010 Transportation
Improvement Program:
*Fine Particulate Matter***

*Prepared by the Baltimore Regional Transportation Board,
the Metropolitan Planning Organization
for the Baltimore Region*

APPENDICES

December 2005

APPENDIX A

Additional Information

Additional Information

Reports

Access 2000: Bicycle and Pedestrian Access to Rail Transit Stations in Maryland. Prepared for the Maryland Mass Transit Administration, Maryland Department of Transportation by Rummel, Klepper and Kahl, LLP Consulting Engineers. June 1997.

Implementation of the BMC HOV Model. Prepared for the Baltimore Metropolitan Council by URS Consultants, Inc. June 1993.

Baltimore Region Travel Demand Model 1996 Validation – Mode Choice Model. Baltimore Metropolitan Council, Task Report 02-1. August 2001.

Documentation of Air Quality Process and Assumptions in Estimating 1990 and 2005 Mobile Source Emissions for the Baltimore Region. Baltimore Metropolitan Council, Task Report 03-3. June 2003.

Public Involvement Plan and Strategy Guide – Plan and Strategies for Enhancing Public Involvement in the Transportation Planning Process for the Baltimore Region. Baltimore Metropolitan Council, April 2004. Please contact Monica Haines for more information, mhaines@baltometro.org or 410-732-0500 ext. 1047.

The Baltimore Regional Bicycle, Pedestrian and Greenways Transportation Plan. Prepared for the Baltimore Metropolitan Council by Sprinkle Consulting, Inc. October 2001

Baltimore Region Travel Demand Model for Base Year 2000. Baltimore Metropolitan Council, Task Report 04-01. November 2003. Contact Gene Bandy, 410-732-9573, or gbandy@baltometro.org.

MAQONE: Maryland Air Quality Off-Network Estimator. User's Guide & Reference Manual. Volume 1, User's Guide. Volume 2, Appendices. Prepared for MDOT by Michael Baker Jr. Inc., September 2003.

These reports can be obtained by contacting the Regional Information Center, see below.

Regional Information Center

The Regional Information Center (RIC) is a library operated as a partnership between the Baltimore Metropolitan Council and the Enoch Pratt Free Library (Baltimore City's public library system). The collection includes regional and urban planning materials with a focus on local demographic information, economic development, transportation planning, land use and

environmental issues. For more detail on the collection, visit the Center's Pratt Website at www.pratt.lib.md.us/branches/ric

The Center is open to the public *by appointment only* between 8:30 a.m. and 4:30 p.m. on weekdays. Call 410-732-9570, fax 410-732-9488, or e-mail mlogan@baltometro.org for an appointment. Frequent users include small and large businesses; non-profit organizations and community groups; government agencies; students; and the media.

A telephone reference service is available for readily retrievable data. In many cases, an experienced librarian will have the information you need at hand, or be able to direct you to the proper source. It may take a day or two to research some inquiries and get back to you. For more extensive projects, we ask that you make an appointment to come in and use the materials yourself.

The use of the library and the help of the librarian is without cost, although there are charges for photocopying, faxing and mailing materials, as well as book rental fees and overdue fines when applicable. Fees are also charged to recover costs of customized demographic reports and for accessing some electronic sources.

MPO Committees

Please find below a short description of relevant MPO committees. For more information on any of these committees, or to have your name placed on the mailing list (includes agendas), please contact Joan Gorsuch at 410-732-0500 ext. 1043 or email jgorsuch@baltometro.org. For a regularly updated schedule of meetings, please visit the Calendar of Events on the BMC website (www.baltometro.org, also see below).

Technical Committee

The Technical Committee (TC) of the Board works on a variety of issues. For air quality, the TC is responsible for reviewing all technical analyses associated with conformity such as modeling assumptions, data collection and accuracy. The TC meets monthly.

Interagency Consultation Group

Interagency coordination is required by the Clean Air Act Amendments of 1990 and the Interagency Consultation Group (ICG) is the group that focuses on air quality issues in the Baltimore region. This group works to promote coordination among the transportation and air quality agencies for the region. Voting membership in the group includes the Maryland Department of the Environment, the Maryland Department of Transportation, and the Board. Additional non-voting membership includes the Federal Highway Administration, the Maryland Department of Planning, the Maryland State Highway Administration, and the U.S. Environmental Protection Agency. ICG meets monthly; typical agenda items include:

- Changes to the mobile source emission budgets
- Presentation of new road projects to determine conformity status
- Commuter choice initiatives & funding
- 8-hour ozone and particulate matter designation

- MOBILE modeling
- Potential amendments to the long-range plan
- Technical inputs to conformity determinations.

ICG meetings are open to the public; participation by citizens and local advocacy groups is steadily increasing. The ICG is another forum for public participation, particularly for comments on issues of methodology for conformity.

Websites

For more information on the Baltimore Regional Transportation Board or the Baltimore Metropolitan Council, please visit the BMC's website at www.baltometro.org.

For information on clean commuting activities for the Baltimore region, visit CLEAN COMMUTE, at www.cleancommute.com.

For information on bicycle commuting in the Baltimore region, visit www.bike2workcentralmd.com.

For information on telecommuting in the Baltimore region, visit www.teleworkbaltimore.com.

Clean Commute Month

For more information on the annual Clean Commute Month outreach activity, or on participating/sponsoring, please call 410-732-9575 or email rulrich@baltometro.org, or visit www.cleancommute.com.

APPENDIX B

Public Participation

FINAL DRAFT CONFORMITY DETERMINATION FOR FINE PARTICULATE MATTER NOW AVAILABLE

The final draft of the Conformity Determination of the FY 2006-2010 Transportation Improvement Program and the 2004 Baltimore Regional Transportation Plan, for Fine Particulate Matter is now available for public review. This is the first conformity determination for fine particulate matter in the Baltimore region. View the Tasks and Assumptions for this work online at www.baltometro.org.

BMC staff will hold a public meeting on this conformity analysis if there is interest expressed. If you have comments, please contact Sara Tomlinson at the Baltimore Metropolitan Council at 410-732-0500 x1035 or e-mail at stomlinson@baltometro.org.

The public comment period is open from November 2 to December 6. Please submit your comments by December 6 either by phone or e-mail, or by mail to:

Sara Tomlinson
Baltimore Metropolitan Council
2700 Lighthouse Point E, Suite 310
Baltimore, MD 21224

View the Conformity Determination for Fine Particulate Matter online at www.baltometro.org.

Overview of Fine Particulate Matter

**Public Meeting for First PM_{2.5} Conformity
November 30, 2005**

1

What is Fine Particulate Matter?

- Fine particulate matter (PM_{2.5}) is made up of small particles and liquid droplets that are less than or equal to 2.5 micrometers in diameter. This is about 1/30th the diameter of a human hair. Fine particulate matter is not just one thing – it can be in the form of dust, ash, mist, soot, smoke, fumes, or liquid droplets.

2

How is PM2.5 formed?

Directly from:

- power plants, factories, automobile exhaust, construction sites, unpaved roads, wood burning

Indirectly from:

- the chemical transformation that occurs when gases from burning fuels react with sunlight and water vapor

3

PM2.5 Standards

Annual Standard: 15 micrograms per cubic meter (averaged over 3 years)

24-hour Standard: 65 micrograms per cubic meter (98th percentile averaged over 3 years)

* **The Baltimore region is only violating the annual standard.**

4

“History” of PM2.5

1997	PM2.5 standard adopted by EPA
July 2004	Final rule published on conformity for PM2.5 and 8-hr ozone standards
December 2004	EPA finalizes designations – Baltimore region nonattainment for PM2.5
April 5, 2005	PM2.5 designation becomes effective
May 2005	Final rule published on PM2.5 precursors
August 2005	EPA issues guidance for creating on-road PM2.5 inventories for SIPs and conformity
Early 2006	EPA to issue final rule (on PM2.5 hotspots)
April 5, 2006	Deadline to have initial PM2.5 conformity analysis approved (Baltimore must have a conforming plan and TIP)
April 2008	PM2.5 State Implementation Plan due
April 2010	PM2.5 Attainment Deadline

5

PM2.5 Compared with Ozone Pollution

Similarities

- Both pollutants are formed under similar atmospheric conditions by gases emitted from the same type of sources, which tend to be located in the same geographic areas
- Both remain in the air for days and can travel hundreds of miles from their origins.
- Both can cause respiratory symptoms and other serious health problems in sensitive populations.

6

PM2.5 Compared with Ozone Pollution

Differences

- PM2.5 is an annual pollutant, while ozone is a seasonal pollutant.
- PM2.5 can aggravate cardiovascular illness and may cause premature death.

7

Transportation-Related PM2.5 Emissions

Direct Sources:

- Exhaust*, brake and tire wear*, road dust, construction dust

Precursors:

- Nitrogen oxides (NO_x)*
- Volatile organic compounds (VOCs)
- Sulfur oxides (SO_x)
- Ammonia (NH₃)

* These sources will be included in the region's first PM2.5 conformity determination.

8

PM2.5 Conformity of the TIP and Plan

Public Meeting for First PM2.5 Conformity
November 30, 2005

1

Conformity of TIP & Plan for PM2.5

- What are the budgets?
 - No PM2.5 SIP budget yet, so an interim emissions test was performed:

No-greater-than-2002 baseline test
Emissions from 2010, 2020, and 2030 were compared with emissions from 2002 to make sure they are not greater.

- What direct emissions and precursors of PM2.5 were assessed for this conformity determination?
 - Direct PM2.5:
 - Exhaust
 - Brake and tire wear
 - Precursors of PM2.5:
 - Nitrogen oxides (NO_x)

2

Timeline for PM2.5 Conformity

Work Task	Timeframe for completion
Prepare 2002 emissions estimates	September 2005
Prepare 2010, 2020, and 2030 TIP and/or Plan Action scenario travel and emissions estimates	September 2005
Identify and assess emission reductions associated with off-model activities	September 2005
Assess analytical results; present to Technical Committee and ICG	October 11, 2005; October 12, 2005
Assess and document conformity results	September/October 2005
Public Review	Nov 2 to Dec 6, 2005
BRTB Approval	December 13, 2005

3

Emissions Results

	2010 Emissions		2020 Emissions		2030 Emissions	
	Direct PM2.5	NO _x	Direct PM2.5	NO _x	Direct PM2.5	NO _x
2002 Baseline Year Emissions	1,043.51	63,759.38	1,043.51	63,759.38	1,043.51	63,759.38
NETWORK BASED ANALYSIS	563.62	30,052.81	427.26	9,987.09	436.04	7,015.56
IMPLEMENTED	-0.90	-172.98	-0.90	-154.22	-0.09	-0.60
Rideshare	-0.29	-10.11	-0.28	-3.77	-0.28	-2.93
Bus Replacement		-99.57		-106.61		0.00
CHART (Areawide Congestion Management)		-72.23				
Pathways/Bicycle trails	0.00	0.00	0.00	-0.20	0.00	-0.31
Sidewalks/Pedestrian Improvements	0.00	-0.10	0.00	0.00	0.00	0.00
Park-&-Ride Programmed	-0.01	-0.37	-0.01	-0.14	-0.10	-0.11
Transit Enhancements	0.00	-0.01	0.00	0.00	0.00	0.00
Arterial Improvements (System Signalization)						
PLANNED						
Regional Commuter Assistance						
Home-Based Telecommuting						
Planned Park & Ride lots						
Bicycle Element of the Plan						
Off-Network Analysis Total	-1.20	-355.37	-1.19	-264.94	-0.47	-3.95
IMPLEMENTATION TOTAL	562.42	29,697.44	426.07	9,732.15	434.57	7,011.60
2002 Baseline vs. Implementation	-481.09	-34,061.94	-617.44	-54,027.23	-608.94	-56,747.78

See qualitative description of planned emission reduction strategies in Appendix H. The methodology for determining emission reductions is currently being reviewed. As a result, no credit has been taken in this conformity analysis for these emission reduction strategies.

4

Conclusion

Based on the conformity analysis:

- The projects in the 2006-2010 TIP come from a conforming transportation plan that has been developed in concert with the spirit of the metropolitan planning requirements of the Transportation Equity Act for the 21st Century;
 - The Plan and TIP are consistent with the interim emissions tests for direct PM2.5 and the PM2.5 precursor NOx;
 - The TIP provides for the expeditious implementation of emission reduction strategies that attempt to reduce mobile source emissions by reducing vehicle trips, cold start emissions, vehicle miles of travel and highway congestion.
-

5

Conclusion

- **So... implementation of the projects in the 2004 Plan and the 2006-2010 TIP does not worsen the region's air quality or delay the timely attainment of national ambient air quality standards.**
-

6

APPENDIX C

Review, Test, and Programmatically Conforming
Projects from the 2006-2010 TIP & 2004 BRTP

Appendix C:

2006-2010 Transportation Improvement Program: List of Projects Conformity Status

Tip Year	Project Title	Tip ID #	Agency	Description	Conformity Status	Jurisdiction	Year of Operation	First Analysis Year
2006 - NEW	Dundalk Avenue Streetscape	12-0601-11	Local Project	Dundalk Avenue from Eastern Avenue to the City Line will be resurfaced and enhanced with trees, tree grates, benches, sidewalks and pedestrian lighting.	Programmatically Conforming	Baltimore City	2009	na
2006 - NEW	Reisterstown Road Streetscape	12-0602-11	Local Project	Reisterstown Road will be resurfaced from Northern Parkway to the Baltimore City/County Line. It will be enhanced with trees, tree grates, benches, sidewalks and pedestrian lighting.	Programmatically Conforming	Baltimore City	2010	na
2006 - NEW	Cross Country Boulevard	12-0603-11	Local Project	Cross Country Boulevard from Greenspring Avenue to Falstaff Road will be resurfaced with minor curb and sidewalk repair. Improvements may include an on-street bicycle facility in conformance with Baltimore's Bicycle Master Plan currently under development.	Programmatically Conforming	Baltimore City	2007	na
2006 - NEW	Sinclair Avenue Bridge at CSX	12-0604-13	Local Project	The existing superstructure will be replaced and the substructure will be repaired of the Sinclair Avenue Bridge over the CSX railroad tracks in the vicinity of Sinclair Lane and Edison Highway.	Programmatically Conforming	Baltimore City	2008	na
2006 - NEW	Edmondson Avenue Rehabilitation	12-0605-11	Local Project	Edmondson Avenue will be rehabilitated/reconstructed as needed between Warwick Avenue and Baltimore City/County Line. Work may include new curbs and sidewalks, road paving, utility adjustments, lighting, signage and lane markings.	Programmatically Conforming	Baltimore City	2008	na
2006 - NEW	York Road Rehabilitation	12-0606-11	Local Project	York Road is in need of rehabilitation/reconstruction between Woodbourne Avenue and 33rd Street. Work may include new curbs and sidewalks, road paving, utility adjustments, lighting, signage and lane markings.	Programmatically Conforming	Baltimore City	2010	na
2006 - NEW	Pratt Street Rehabilitation	12-0607-11	Local Project	Pratt Street is to be resurfaced from Martin Luther King Jr. Boulevard to President Street at the downtown/Inner Harbor area. The work will include roadway base repairs, curb and sidewalk repair.	Programmatically Conforming	Baltimore City	2008	na
2006 - NEW	Lombard Street Rehabilitation	12-0608-11	Local Project	Lombard Street, running parallel to Pratt Street, will be rehabilitated from Martin Luther King, Jr. Boulevard and President Street. The work will include the removal and replacement of road surfaces, installation of trees, tree grates, benches, sidewalks and street lighting.	Programmatically Conforming	Baltimore City	2009	na
2006 - NEW	Park Heights Avenue Resurfacing	12-0613-11	Local Project	Park Heights Avenue will be resurfaced from Druid Park Drive to Garrison Avenue. The work will also include curb and sidewalk repair.	Programmatically Conforming	Baltimore City	2006	na

Appendix C:
2006-2010 Transportation Improvement Program: List of Projects Conformity Status

Tip Year	Project Title	Tip ID #	Agency	Description	Conformity Status	Jurisdiction	Year of Operation	First Analysis Year
2006 - NEW	Druid Hill Park - Pedestrian Access	12-0615-25	Local Project	Druid Hill Park is Baltimore's premier recreational facility, however pedestrian access to the park from surrounding neighborhoods is difficult due to multi-lane, high volume roads that surround the park on the south and west. Pedestrian crossing are difficult requiring park visitors to cross six or more lanes with multiple-turning movements. This project will create safer pedestrian crossings at several locations on the west and southern perimeters.	Programmatically Conforming	Baltimore City	2007	na
2006 - NEW	Traffic Management Center	12-0616-07	Local Project	A traffic management center will be created at 414 North Calvert Street - the location of existing signal equipment and surveillance camera controls.	Programmatically Conforming	Baltimore City	2006	na
2006 - NEW	Bollinger Road Bridge Over Beaver Run	14-0601-13	Local Project	Replacement of the existing Acrow panel truss bridge with a new superstructure. The type of structure will be determined during the preliminary engineering phase.	Programmatically Conforming	Carroll County	2009	na
2006 - NEW	Baltimore City Bicycle Routes - Plan Implementation	12-0614-03	Local Project	Baltimore City is undergoing a master planning effort to identify and plan for bicycle facilities throughout Baltimore City. The Bicycle Master Plan is scheduled for completion in October 2005. The planning effort has identified some locations for on-street bicycle facilities in addition to the Gwynns Falls and Jones Falls Trail projects, currently underway. The first projects may include extending bicycle lanes from the Jones Falls along the Western Run to Fallstaff Road, and along the Herring Run from Walther Avenue to Baltimore City/County Line.	Review	Baltimore City	Ongoing	2010
2006 - NEW	Perryman Access - MD 715	None	Local Project	Amtrak railroad tracks to MD 715 access gate: Lane change = 0 to 3	Test	Harford County	2006	2010
2006 - NEW	Perryman Access - Mitchell Lane	None	Local Project	Intersection improvement at Amtrak and MD 715	Test	Harford County	2006	2010
2006 - NEW	MD 108/Centennial Lane	None	Local Project	Widen from 2 to 4 lanes, from Woodland Rd. to 1200 feet west of Centennial Lane crossing.	Test	Howard County	2009	2010
2006 - NEW	I-95 Widening - Section 100 (I-95/I-895 (N) Split to north of MD43)	None	MdTA	Widen from 8 to 12 lanes, modify interchanges @ I-895, I-695, MD 43. Out of the 12 lanes, 8 will be general purpose and 4 will be managed lanes.	Test	Regional	2009	2010
2006 - NEW	I-95 Widening - Section 200 (North of MD 43 to north of MD 22)	None	MdTA	From New Forge Road to north of MD 543, widen from 8 to 12 lanes. Eight will be general purpose and 4 will be managed. From north of MD 543 to north of MD 22, it will go from 8 to 10 general purpose lanes. Modify interchanges @ MD 152, MD 24, MD 543, MD 22.	Test	Regional	2012	2020

Appendix C:

2006-2010 Transportation Improvement Program: List of Projects Conformity Status

Tip Year	Project Title	Tip ID #	Agency	Description	Conformity Status	Jurisdiction	Year of Operation	First Analysis Year
2006 - NEW	I-95 Widening - Section 300 (North of MD 22 to Susquehanna R.)	None	MdTA	Widen from 6 to 8 lanes, modify interchanges @ MD 155	Test	Regional	2015	2020
2005	Calvert Street Rehabilitation & Streetscape	12-0512-11	Local Project	Road rehabilitation and streetscape upgrade for Calvert Street from Lombard Street to Baltimore Street.	Programmatically Conforming	Baltimore City	2006	na
2005	Bowleys Lane Resurfacing	12-0513-11	Local Project	Resurfacing of Bowleys Lane from Mannasota Avenue to Moravia Park Drive.	Programmatically Conforming	Baltimore City	2006	na
2005	Exeter Hall Resurfacing	12-0514-11	Local Project	Resurfacing of Exeter Hall from Greenmount Avenue to Aisquith Street.	Programmatically Conforming	Baltimore City	2006	na
2005	Gwynns Falls Parkway Resurfacing	12-0515-11	Local Project	Resurfacing of Gwynns Falls Parkway from Garrison Boulevard to Longwood Street.	Programmatically Conforming	Baltimore City	2006	na
2005	Argonne Drive and 39th Street Resurfacing	12-0516-11	Local Project	Resurfacing of Argonne Drive/39th Street between University Parkway and Hillen Road.	Programmatically Conforming	Baltimore City	2006	na
2005	Traffic Surveillance Camera Expansion	12-0518-04	Local Project	Installation of eleven additional traffic surveillance cameras and evaluate locations for additional cameras.	Programmatically Conforming	Baltimore City	Ongoing	na
2005	Traffic Signal Timing Optimization	12-0519-04	Local Project	Traffic signal timing will be analyzed to develop a new traffic signal timing plan for each of the 1,300 signalized intersections in Baltimore City.	Programmatically Conforming	Baltimore City	2007	na
2005	Park Heights Avenue Streetscape	12-0521-11	Local Project	Park Heights Avenue will be resurfaced from Garrsion Avenue to Northern Parkway. The work will also include curb and sidewalk repair.	Programmatically Conforming	Baltimore City	2006	na
2005	Dunk Freeland Road Bridge #157	13-0501-13	Local Project	Replacement of the deteriorated Dunk Freeland Road Bridge no. 157	Programmatically Conforming	Baltimore County	2006	na
2005	Wakefield Valley Community Trail	14-0502-25	Local Project	Macadam trail extending along MD 31 that will link two municipalities (New Windsor and Westminster); will connect to the Little Pipe Creek Trail in New Windsor (which links to Union Bridge; resulting in a continuous 8-mile long trail).	Programmatically Conforming	Carroll County	2015	na
2005	North Baltimore Collegtown Bike Routes	12-0520-03	Local Project	Designated bike routes will connect colleges and universities, primarily located in North Baltimore to each other and to the Jones Falls Trail, light rail stations, and neighborhood centers. The bike routes will be nearly evenly divided between separate striped bike lanes on existing roadways and "share the road" bicycle friendly streets marked with signage.	Review	Baltimore City	2006	2010

Appendix C:

2006-2010 Transportation Improvement Program: List of Projects Conformity Status

Tip Year	Project Title	Tip ID #	Agency	Description	Conformity Status	Jurisdiction	Year of Operation	First Analysis Year
2005	Little Pipe Creek Trail	14-0501-25	Local Project	Macadam trail that will link two municipalities (Union Bridge and New Windsor); will connect to the Wakefield Valley Community Trail in New Windsor (which links to Westminster; which will result in a continuous 8-mile long trail).	Review	Carroll County	2020	2020
2005	US 40 Corridor Improvements	16-0539-25	Local Project	A project to plan, design and implement a series of streetscape, pedestrian, bicycle and public green space improvements on public property.	Review	Howard County	2009	2010
2005	IdleAire Advanced Truckstop Electrification System	90-0501-09	Office of the Secretary	This project involves the installation of up to 190 Advanced Truckstop Electrification (ATE) units at truck stops in Jessup and Baltimore City. The ATE units provide individual electric service to trucks utilizing parking spaces. A Service Delivery Module at each space houses a heating, cooling, and ventilation units, as well as a delivery mechanism for communications and entertainment packages.	Review	Regional	Ongoing	2010
2004	Wilkins Avenue Bridge Over The Gwynns Fall River	12-0401-13	Local Project	The concrete arch structure of the Wilkins Avenue Bridge over the Gwynns Falls is to be replaced.	Programmatically Conforming	Baltimore City	2008	na
2004	Pennington / Curtis / Birch Reconstruction	12-0402-12	Local Project	Pennington Avenue from Aspen Street to Benhill Avenue; Birch Street between Pennington and Curtis Avenues; and Curtis Avenue from Birch Street to Benhill Avenue are to be reconstructed. Work is to include total reconstruction of the roadways, including new curbs, sidewalks, roadway sub-base, roadway surface, utility adjustments and other roadway appurtenances such as roadway lighting, signage and lane markings.	Programmatically Conforming	Baltimore City	2006	na
2004	Russell Street Viaduct At I-95	12-0410-13	Local Project	The bridge structure of the Russell Street Viaduct under I-95 is to be reconstructed.	Programmatically Conforming	Baltimore City	2006	na
2004	Cold Spring Lane Resurfacing	12-0411-11	Local Project	Cold Spring Lane is to be resurfaced from Hillen Road to Harford Road. Work is to include the removal/replacement of existing asphalt surfaces, roadway base repairs, curb and sidewalk repairs and other roadway appurtenance modifications.	Programmatically Conforming	Baltimore City	2006	na
2004	Monroe Street Resurfacing	12-0412-11	Local Project	Monroe Street is to be resurfaced from Gwynns Falls Parkway to Wicomico Street. Work is to include the removal/replacement of existing asphalt surfaces, roadway base repairs, curb and sidewalk repairs and other roadway appurtenance modifications.	Programmatically Conforming	Baltimore City	2008	na

Appendix C:
2006-2010 Transportation Improvement Program: List of Projects Conformity Status

Tip Year	Project Title	Tip ID #	Agency	Description	Conformity Status	Jurisdiction	Year of Operation	First Analysis Year
2004	33rd Street Resurfacing & Streetscape	12-0413-11	Local Project	Street resurfacing and streetscape enhancements are to be implemented on 33rd Street from Charles Street to Ellerslie Avenue. Work is to include the removal/replacement of existing asphalt surfaces, roadway base repairs, curb and sidewalk repairs and other roadway appurtenance modifications.	Programmatically Conforming	Baltimore City	2007	na
2004	Eutaw Street Rehabilitation And Streetscape	12-0414-11	Local Project	Eutaw Street is to be rehabilitated between Fayette and Lombard Streets. Work is to include total rehabilitation of the street, new curbs, sidewalks, roadway sub-base repairs, roadway surface, utility adjustments, roadway lighting, landscaping, signage and lane markings.	Programmatically Conforming	Baltimore City	2006	na
2004	Franklinton Road Bridge Over The Gwynns Falls	12-0416-13	Local Project	The Franklinton Road Bridge over the Gwynns Falls is to be replaced.	Programmatically Conforming	Baltimore City	2008	na
2004	Fort Avenue Bridge Over The CSX	12-0417-13	Local Project	The Fort Avenue Bridge over the CSX is to be replaced.	Programmatically Conforming	Baltimore City	2008	na
2004	Perring Parkway Ramp To W/B Northern Parkway	12-0418-13	Local Project	The Perring Parkway Off-Ramp Bridge over the Herring Run to westbound Northern Parkway is to be replaced.	Programmatically Conforming	Baltimore City	2008	na
2004	Harford Road Reconstruction And Streetscape Improvements	12-0420-12	Local Project	Harford Road is to be reconstructed from Argonne Drive to Bayonne Street. Work is to include total reconstruction of the street, including new curbs, sidewalks, roadway sub-base, roadway surface, utility adjustments and other roadway appurtenances such as streetscape and other landscaping improvements, roadway lighting, signage and lane markings.	Programmatically Conforming	Baltimore City	2010	na
2004	Russell Street Rehabilitation And Streetscape Improvements	12-0421-11	Local Project	Russell Street is to be rehabilitated between Alluvion and Bush Streets. Work is to include the removal/replacement of existing asphalt surfaces, roadway base repairs, curb and sidewalk repairs, streetscape and other landscaping improvements, and other roadway appurtenance modifications.	Programmatically Conforming	Baltimore City	2006	na
2004	Traffic Signal Led Upgrades	12-0423-04	Local Project	Baltimore City's traditional traffic signal heads at 200 locations are to be replaced with light emitting diode (LED) equipped signal heads on major routes in and out of the City.	Programmatically Conforming	Baltimore City	2008	na
2004	Potee Street Resurfacing And Streetscape Improvements	12-0425-11	Local Project	Potee Street is to be resurfaced from Hanover Street south to the City Line. Work is to include the removal/replacement of existing asphalt surfaces, roadway base repairs, curb and sidewalk repairs, streetscape and other landscaping improvements and other roadway appurtenance modifications.	Programmatically Conforming	Baltimore City	2007	na

Appendix C:

2006-2010 Transportation Improvement Program: List of Projects Conformity Status

Tip Year	Project Title	Tip ID #	Agency	Description	Conformity Status	Jurisdiction	Year of Operation	First Analysis Year
2004	Edmondson Avenue Resurfacing	12-0426-11	Local Project	Edmondson Avenue is to be resurfaced from Franklin Street to Bentalou Street. Work is to include the removal/replacement of existing asphalt surfaces, roadway base repairs, curb and sidewalk repairs, streetscape and other landscaping improvements and other roadway appurtenance modifications.	Programmatically Conforming	Baltimore City	2006	na
2004	Eastern Avenue Resurfacing And Streetscape Improvements	12-0427-11	Local Project	Eastern Avenue is to be resurfaced from Lehigh Street east to the City line. Work is to include the removal/replacement of existing asphalt surfaces, roadway base repairs, curb and sidewalk repairs, streetscape and other landscaping improvements and other roadway appurtenance modifications.	Programmatically Conforming	Baltimore City	2007	na
2004	Russell Street Resurfacing And Streetscape	12-0429-11	Local Project	Russell Street is to be resurfaced from I-95 south to the City line. Work is to include the removal/replacement of existing asphalt surfaces, roadway base repairs, curb and sidewalk repairs, streetscape and other landscaping improvements and other roadway appurtenance modifications.	Programmatically Conforming	Baltimore City	2007	na
2004	Charles Street Streetscape Improvements	12-0430-11	Local Project	Street resurfacing, new sidewalks with streetscape amenities to include brick and concrete pavers, tree grates, benches, newspaper corrals, and sidewalk ramps are proposed for Charles Street from Madison Street to North Avenue.	Programmatically Conforming	Baltimore City	2006	na
2004	Saratoga Street Streetscape Improvements	12-0431-11	Local Project	Street resurfacing, new sidewalks with streetscape amenities to include brick and concrete pavers, tree grates, benches, newspaper corrals, and sidewalk ramps are proposed for Saratoga Street between Howard and St. Paul Streets.	Programmatically Conforming	Baltimore City	2007	na
2004	Central Avenue Reconstruction	12-0432-12	Local Project	Central Avenue is to be reconstructed between Monument and Lancaster Streets. This work is to include total reconstruction of the street, including new curbs, sidewalks, roadway sub-base, roadway surface, utility adjustments and other roadway appurtenances such as roadway lighting, signage and lane markings.	Programmatically Conforming	Baltimore City	2007	na
2004	Pennington Avenue Drawbridge Over Curtis Creek	12-0433-13	Local Project	The mechanical and electronic control unit of the Pennington Avenue Bridge over Curtis Creek is to be replaced.	Programmatically Conforming	Baltimore City	2007	na
2004	Hanover Street Drawbridge Over The Middle Branch	12-0434-13	Local Project	The control panel and drive motor of the Hanover Street Drawbridge over the Middle River is to be replaced.	Programmatically Conforming	Baltimore City	2011	na

Appendix C:
2006-2010 Transportation Improvement Program: List of Projects Conformity Status

Tip Year	Project Title	Tip ID #	Agency	Description	Conformity Status	Jurisdiction	Year of Operation	First Analysis Year
2004	Paper Mill Road Bridge #502	13-0401-13	Local Project	Baltimore County is pursuing an "Adaptive Reuse" of the older, historic, and no longer used for traffic, Paper Mill Rd Bridge over Loch Raven Reservoir. The "Adaptive Reuse" includes a trail to the bridge from the NCRR Hike and Bike Trail, cleaning and painting of the bridge, and adapting the bridge for pedestrian use, with appropriate railings, walkways, etc.	Programmatically Conforming	Baltimore County	2006	na
2004	Big Falls Road Bridge # 73	13-0404-13	Local Project	Replacement of Big Falls Rd. Bridge No. 73	Programmatically Conforming	Baltimore County	2006	na
2004	Gwynnbrook Avenue Bridge # 202	13-0405-13	Local Project	Replacement of a deteriorated bridge built in 1920 to allow for the unrestricted crossing of fire equipment and refuse collection vehicles.	Programmatically Conforming	Baltimore County	2006	na
2004	Mt. Zion Road Bridge # 65	13-0406-13	Local Project	Replacement of a deteriorated single span bridge built in 1903.	Programmatically Conforming	Baltimore County	2007	na
2004	Mt. Zion Road Bridge # 391	13-0408-13	Local Project	Replacement of a deteriorated two span bridge built in the 1920s.	Programmatically Conforming	Baltimore County	2006	na
2004	Mt. Vista Road Bridge # 225	13-0409-13	Local Project	Replacement of a deteriorated two-span bridge built in the 1920s.	Programmatically Conforming	Baltimore County	2006	na
2004	Trenton Road Bridge # 68	13-0410-13	Local Project	Replacement of a deteriorated and insufficiently narrow bridge built in 1927.	Programmatically Conforming	Baltimore County	2006	na
2004	St. Clair Road Bridge # 99	15-0402-13	Local Project	This bridge carries St. Clair Bridge Road over Deer Creek. The purpose of this project is to rehabilitate the bridge	Programmatically Conforming	Harford County	2007	na
2004	Thomas Run Road Bridge # 34	15-0403-13	Local Project	The purpose of this project is to rehabilitate the bridge that carries Thomas Run Road over Thomas Run.	Programmatically Conforming	Harford County	2007	na
2004	Watervale Road Bridge # 63	15-0404-13	Local Project	This project will replace the bridge that carries Watervale Road over Winters Run.	Programmatically Conforming	Harford County	2009	na
2004	Harford Creamery Road Bridge # 104	15-0405-13	Local Project	This project is to replace Harford Creamery Road Bridge #104 over a tributary of Little Deer Creek.	Programmatically Conforming	Harford County	2008	na
2004	Pleasantville Road Bridge # 67	15-0406-13	Local Project	This project is to replace the bridge that carries Pleasantville Road over Winters Run.	Programmatically Conforming	Harford County	2008	na
2004	Bridge Repairs/Deck Replacement	16-0436-13	Local Project	This project is to repair/replace bridge decks at the following locations: Bethaney Lane at Little Patuxent River, Bonnie Branch Road at Bonnie Branch, Shady Lane over Dorsey Run, Daisy Road at Cattail Creek, Daisy Road B3849, Old Montgomery Road at Deep Run, and Pfefferkorn Rd. Bridge over the Middle Patuxent River.	Programmatically Conforming	Howard County	Ongoing	na
2004	Preventive Maintenance	40-0412-64	MTA - Transit	Provides preventive maintenance on the transit system to improve safety, reliability and passenger comfort.	Programmatically Conforming	Regional	Ongoing	na

Appendix C:

2006-2010 Transportation Improvement Program: List of Projects Conformity Status

Tip Year	Project Title	Tip ID #	Agency	Description	Conformity Status	Jurisdiction	Year of Operation	First Analysis Year
2004	LTR Communications & Signal Upgrades	40-0415-62	MTA - Transit	Provide the light rail signaling and control integration system with a sequence-of-events function which will capture and sequentially time stamp all of the events of LTR (Light Rail) railroad signaling. The capturing function will be local to the wayside signaling shelter. These events consist of the change-of-state of signaling which occur in each of the signaling device relays of all the input, output and processing bits. In addition, mobile and portable video equipment will be provided.	Programmatically Conforming	Regional	2008	na
2004	Jones Falls Trail	12-0409-03	Local Project	The Jones Falls Trail is a multi-use (pedestrian/bicycle) trail connecting the Inner Harbor to Baltimore County along the Jones Falls Valley. The first phase of the trail has been completed from Druid Hill Park to Penn Station. Phase II is undergoing design from Penn Station to the Inner Harbor. Phase III will extend primarily through Druid Hill Park to Woodberry. Phase IV will extend from Woodberry to Coldspring. Phase V will extend from Coldspring to Cylburn. Final phases will extend from Cylburn to Mount Washington and the Baltimore City/County Line.	Review	Baltimore City	2008	2010
2004	Escalator Rehabilitation	40-0405-65	MTA - Transit	Improve reliability of 81 escalators in the Metro system by rebuilding and improving safety features. Provide remote monitoring, protection from weather and snow melt and new security points. Provide new entrance canopies at Charles Center. Modify remaining exposed escalator canopies.	Review	Regional	2007	2010
2004	MD 695	None	MdTA	MD 695/Quarantine Road Interchange	Test	Baltimore City	2007	2010
2004	North Avenue	None	Local Project	US 1 to MD 24: Lane change = 0 to 2	Test	Harford County	2007	2010
2004	Tollgate Road	None	Local Project	Plumtree Road to Bel Air South Parkway: Lane change = 0 to 2	Test	Harford County	2006	2010
2003	Traffic Signal System Integration	12-0310-04	Local Project	The traffic signal system integration project started in 2003 and requires additional funding to complete the work.	Programmatically Conforming	Baltimore City	2006	na
2002	Washington Boulevard Improvements - Phase I	12-0201-24	Local Project	Washington Boulevard is to be resurfaced between Monroe Street and Martin Luther King Boulevard. Work is to include the removal/replacement of existing asphalt surfaces, roadway base repairs, curb and sidewalk repairs, streetscape and other landscaping improvements and other roadway appurtenance modifications.	Programmatically Conforming	Baltimore City	2008	na

Appendix C:
2006-2010 Transportation Improvement Program: List of Projects Conformity Status

Tip Year	Project Title	Tip ID #	Agency	Description	Conformity Status	Jurisdiction	Year of Operation	First Analysis Year
2002	Road Resurfacing - Federal Aid Program	12-0207-11	Local Project	Resurfacing or rehabilitation of various roadways on the Federal Aid system. 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.	Programmatically Conforming	Baltimore City	Ongoing	na
2002	Charles Street Reconstruction	12-0208-11	Local Project	Charles Street is to be reconstructed from 25th Street to University Parkway. This work is to include total reconstruction of the street, including new curbs, sidewalks, roadway sub-base, roadway surface, utility adjustments and other roadway appurtenances such as roadway lighting, signage and lane markings.	Programmatically Conforming	Baltimore City	2008	na
2002	Wilkins Avenue Resurfacing And Reconstruction	12-0211-12	Local Project	Wilkins Avenue is to be resurfaced from Pine Heights Avenue to Dukeland Avenue and reconstructed from Fulton Street to Dukeland Avenue. Resurfacing will generally include removal and replacement of asphalt surfaces and may include minor curb and sidewalk repairs as well as other isolated roadway appurtenances such as lighting, signage, and land marking along with new pavement.	Programmatically Conforming	Baltimore City	2007	na
2002	Edmondson Avenue Bridge Over The Gwynns Falls	12-0212-13	Local Project	The structure of the Edmondson Avenue Bridge over the Gwynns Falls is to be repaired and painted as part of the City's Gateway Enhancement Program.	Programmatically Conforming	Baltimore City	2006	na
2002	Annapolis Road Bridge Over The B/W Parkway	12-0214-13	Local Project	The structure of the Annapolis Road Bridge over the Baltimore / Washington Parkway is to be replaced.	Programmatically Conforming	Baltimore City	2009	na
2002	Southampton Road Bridge	15-0201-13	Local Project	Funds are requested for the design and reconstruction of Southampton Road Bridge #47 over Bynum Run. The bridge has been determined to be structurally inadequate through the 1989 Bridge Inspection program. The existing alignment is through an historic district and has poor sight distance at Moores Mill Road.	Programmatically Conforming	Harford County	2007	na
2002	MARC Halethorpe Station Parking Expansion	70-0201-02	MTA - Commuter Rail	Expand surface parking and investigate future parking at the Halethorpe MARC Station. 428 parking spaces will be added. The scope of the proposed work also includes high level platforms, new shelters, improved accessibility for persons with disabilities, lighting and streetscaping.	Programmatically Conforming	Regional	2006	na

**Appendix C:
2006-2010 Transportation Improvement Program: List of Projects Conformity Status**

Tip Year	Project Title	Tip ID #	Agency	Description	Conformity Status	Jurisdiction	Year of Operation	First Analysis Year
2002	CSX & Amtrak Efficiency Improvements	70-0201-54	MTA - Commuter Rail	In this region a section of track between Carroll Interlocking and St. Denis would be rehabilitated and slower speed tracks would be relocated to provide a third main line high speed track. The additional main line track will reduce conflicts between MARC and CSX trains operating in Baltimore terminal allow MARC to maintain schedules. In the Hyattsville and Annacostia areas similar improvements will be made resulting in less congestion on the Camden Line during rush hour.	Programmatically Conforming	Regional	2010	na
2002	MARC Odenton Parking Expansion	71-0202-02	MTA - Commuter Rail	Project planning activities for expansion of parking at the Odenton MARC Station. Funding will also include ROW acquisition; engineering and construction of a 700-space surface parking lot with pedestrian access under MD 175 to the station platform; and feasibility study of structured parking (gargae or parking deck) for 2500 spaces on MTA owned property.	Review	Anne Arundel County	2006	2010
2001	Marlyn Avenue Bridge # 77 Over Deep Creek	13-0101-13	Local Project	Superstructure strengthening and/or replacement of existing bridge.	Programmatically Conforming	Baltimore County	2006	na
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 Annapolis Transit, Anne Arundel County and Baltimore County RIDE, Carroll Transit Service, Harford Transit and Howard Transit.	Programmatically Conforming	Regional	Ongoing	na
2001	Areawide Recreational Trails Program	60-0101-38	State Highway Administration	The Recreational Trails Program is intended to develop and maintain recreational trails for motorized and nonmotorized recreational trail users. It includes projects that provide for the redesign, reconstruction, non-routine maintenance, or relocation of recreational trails to benefit the natural environment.	Programmatically Conforming	Regional	Ongoing	na
2001	Pedestrian Overpass Program	16-0101-03	Local Project	A program for pedestrian overpasses in the vicinity of schools.	Review	Howard County	2011	2020
2000	Harford Road Bridge Over Herring Run (Rt. 147)	12-0001-13	Local Project	The Harford Road bridge over Herring Run is to be rehabilitated or replaced.	Programmatically Conforming	Baltimore City	2010	na
2000	Urban Youth Corps Program	12-0002-99	Local Project	A training program in the highway construction/ public works industry.	Programmatically Conforming	Baltimore City	Ongoing	na
2000	Dogwood Road Bridge Over Bens Run	13-0001-13	Local Project	Replacement of existing bridge.	Programmatically Conforming	Baltimore County	2006	na

Appendix C:

2006-2010 Transportation Improvement Program: List of Projects Conformity Status

Tip Year	Project Title	Tip ID #	Agency	Description	Conformity Status	Jurisdiction	Year of Operation	First Analysis Year
2000	Bus & Rail System Preservation & Improvement	40-0015-64	MTA - Transit	Rehabilitate bus, light rail, and Metro facilities, including operating division, MTA offices, park-and-ride lots and bus turnarounds. This is a continuing project.	Programmatically Conforming	Regional	Ongoing	na
2000	Bus Replacement	40-0009-05	MTA - Transit	The project provides for the routine replacement of buses past their useful service life with new 40 foot diesel buses. In FY 06 84 buses will be replaced. All new buses are ADA compatible.	Review	Regional	Ongoing	2010
1999	Frederick Avenue Bridge Over Gwynns Falls	12-9902-13	Local Project	The Frederick Avenue Bridge over the Gwynns Falls will be replaced with a new bridge meeting current standards.	Programmatically Conforming	Baltimore City	2009	na
1999	Hawkins Point Road Bridge Over CSXT	12-9903-13	Local Project	The Hawkins Point Road Bridge over the CSXT tracks is a severely deteriorated structure and is beyond repair. The structure is to be replaced.	Programmatically Conforming	Baltimore City	2006	na
1999	Job Access And Reverse Commute Program	40-9909-69	MTA - Transit	The Job Access and Reverse Commute Program is a regional approach to assist welfare recipients and other low-income individuals access employment opportunities and increase collaboration among key agencies and organizations such as transportation providers and service agencies.	Programmatically Conforming	Regional	Ongoing	na
1999	Areawide Enhancement Projects	60-9903-29	State Highway Administration	Enhancement Program projects include: pedestrian/bicycle facilities; acquisition of scenic easements and historic sites; scenic/historic highway programs; landscaping/beautification; historic preservation; rehabilitation/operation of historic transportation facilities, including railroad facilities and canals; preservation of abandoned railway corridors; archeological planning/research; and mitigation of water pollution due to highway runoff.	Programmatically Conforming	Regional	Ongoing	na
1999	Pedestrian / Bicycle Improvements	16-9901-25	Local Project	A project for the design and construction of pathway and bicycle links to the existing network to facilitate movement between residential areas and retail centers. Installation of complimentary crosswalks, pedestrian indications, pedestrian phases, signing, ADA ramps or advanced warning signals may be required.	Review	Howard County	2008	2010
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.	Review	Regional	Ongoing	2010
1999	Metro Railcar Mid-Life Overhaul	40-9908-63	MTA - Transit	Project provides for the mid-life overhaul of Metro's railcar fleet to reach their useful life of at least 30 years. Contract provides for the overhaul of 100 cars.	Review	Regional	2008	2010

Appendix C:
2006-2010 Transportation Improvement Program: List of Projects Conformity Status

Tip Year	Project Title	Tip ID #	Agency	Description	Conformity Status	Jurisdiction	Year of Operation	First Analysis Year
1998	Forest Park Avenue Bridge Over Gwynns Falls	12-9803-13	Local Project	The seventy year old Forest Park Avenue Bridge over the Gwynns Falls is severely deteriorated and requires complete replacement.	Programmatically Conforming	Baltimore City	2006	na
1998	Argonne Drive Bridge Over Herring Run	12-9805-13	Local Project	The Argonne Drive Bridge over Herring Run is to be rehabilitated. In general, the bridge exhibits progressive deterioration.	Programmatically Conforming	Baltimore City	2007	na
1998	Lafayette Avenue Bridge Over Amtrak	12-9806-13	Local Project	The Lafayette Avenue Bridge over Amtrak is to be rehabilitated. Work will include repairing the deteriorated piers which support the bridge deck, as well as the spans over Amtrak Rail tracks.	Programmatically Conforming	Baltimore City	2007	na
1998	Traffic Signal Detectors - Installation	12-9807-09	Local Project	New traffic signal detection equipment is to be installed in the existing traffic signal system to make it more responsive to changes in traffic volumes.	Review	Baltimore City	Ongoing	2010
1997	Singer Road Bridge # 7	15-9702-13	Local Project	Design and replace Singer Bridge # 7 over Mountain Branch. The bridge has numerous deficiencies which include, but are not limited to low posting, scour under the wingwalls, and poor alignment.	Programmatically Conforming	Harford County	2006	na
1996	Cleaning And Painting Of Bridges	12-9602-19	Local Project	Cleaning and painting of various bridges in Baltimore City.	Programmatically Conforming	Baltimore City	Ongoing	na
1995	Areawide Resurfacing And Rehabilitation	60-9501-11	State Highway Administration	These are non-capacity improvements which include milling, patching, sealing, and resurfacing existing deteriorated state roadways in Anne Arundel, Baltimore, Carroll, Harford, and Howard counties as needed.	Programmatically Conforming	Regional	Ongoing	na
1995	Areawide Safety And Spot Improvements	60-9508-19	State Highway Administration	These are non-capacity highway improvements which include projects dealing with bypass lanes, acceleration and deceleration lanes, turn lanes, rail crossings, safety improvements, pavement markers, and roundabouts. Other improvements such as slope repairs, drainage improvements, and joint sealings may be included incidental to other safety improvements.	Programmatically Conforming	Regional	Ongoing	na
1995	Areawide Urban Reconstruction	60-9511-19	State Highway Administration	These are non-capacity highway improvements which include projects dealing with drainage, curb and gutter, pavement milling and resurfacing, streetscape, signs, and markings and lighting improvements.	Programmatically Conforming	Regional	Ongoing	na
1995	Areawide Congestion Management	60-9504-04	State Highway Administration	These improvements include the employment of variable message signs, video for traffic management (CCTV), traffic movement detectors, signal system coordination and remote timing, permanent congestion monitoring systems employed by the CHART program, deployment of local jurisdiction intelligent transportation system (ITS) projects.	Review	Regional	Ongoing	2010

Appendix C:
2006-2010 Transportation Improvement Program: List of Projects Conformity Status

Tip Year	Project Title	Tip ID #	Agency	Description	Conformity Status	Jurisdiction	Year of Operation	First Analysis Year
1995	Areawide Environmental Projects	60-9506-38	State Highway Administration	There are non-capacity improvements which include projects dealing with noise abatement, wetlands, reforestation, landscape planting, scenic beautification, and pedestrian or bicycle facilities.	Review	Regional	Ongoing	2010
1995	Rural Transit Systems - Capital	40-9501-05	MTA - Transit	Capital assistance to small transit systems located throughout the Baltimore region to purchase vehicles, equipment and facilities. Baltimore region transit systems include Baltimore County (Baltimore County Office on Aging), Carroll County (Carroll Transit), Harford County (Harford County Office on Aging), and Howard County (Howard Transit).	Review	Regional	Ongoing	2010
1995	Small Urban Transit Systems - Capital	40-9502-05	MTA - Transit	Capital assistance to small urban transit systems throughout the region to purchase vehicles, equipment and facilities. Baltimore region small urban transit systems include City of Annapolis (Annapolis Department of Public Transportation), Harford County (Harford County Transportation Services) Howard County (Howard Transit) and Carroll County.	Review	Regional	Ongoing	2010
1995	Local Bus Replacement - Baltimore Region	40-9507-05	MTA - Transit	Previously known as "Statewide Descretionary Capital" - Capital assistance to small transit systems located throughout the region to purchase vehicles, equipment and facilities. The match will be a maximum 10% State funds and a minimum 10 % local funds. Transit agencies eligible for funding include Annapolis Transit, Anne Arundel County and Baltimore County RIDE, Carroll Transit Service, Harford Transit and Howard Transit.	Review	Regional	Ongoing	2010
1994	US 40 Terminus Modification	12-9403-41	Local Project	The US 40 West (previously I-170 Expressway) terminus at Pulaski Street is to be modified. Modifications are to include the removal of the abandoned abutment structure, realignment and landscaping of Franklin and Mulberry Streets between Bentalou and Mount Streets.	Programmatically Conforming	Baltimore City	2010	na
1994	Biennial Bridge Inspection Program	14-9401-14	Local Project	This project includes a field inspection of 132 County owned and maintained structures, completion and submittal of inspection reports to county and state agencies for each structure.	Programmatically Conforming	Carroll County	Ongoing	na
1994	Bridge Inspection Program	15-9411-14	Local Project	This federal program provides funding for the inspection of bridges in Harford County.	Programmatically Conforming	Harford County	Ongoing	na
1994	Moore's Mill Road Bridge # 48	15-9418-13	Local Project	Funds are requested for the replacement of Moore's Mill Road Bridge #48.	Programmatically Conforming	Harford County	2006	na

**Appendix C:
2006-2010 Transportation Improvement Program: List of Projects Conformity Status**

Tip Year	Project Title	Tip ID #	Agency	Description	Conformity Status	Jurisdiction	Year of Operation	First Analysis Year
1993	Areawide Bridge Replacement And Rehabilitation	60-9310-13	State Highway Administration	These are non-capacity improvements which include structural replacements, deck rehabilitation, superstructure replacements, parapet reconstruction, cleaning and painting, and general maintenance on various state owned bridges as needed in Anne Arundel, Baltimore, Carroll, Harford and Howard counties. A portion of this project may be funded using STP for cleaning and painting.	Programmatically Conforming	Regional	Ongoing	na
1993	Boston Street Viaduct	12-9304-44	Local Project	A new Boston Street grade-separated viaduct is to be constructed. The Canton, Conrail/Norfolk Southern and B&O Railroads currently cross Boston Street. In addition, at-grade service devices are to be constructed between Conkling and Newkirk Streets.	Test	Baltimore City	2015	2020
1992	Bridge Inspection Program	12-9209-14	Local Project	Bridges within Baltimore City are to be inspected every two years as required by federal regulations.	Programmatically Conforming	Baltimore City	Ongoing	na
1992	Monroe Street Viaduct Over The B&O Railroad	12-9215-13	Local Project	Replace the deck and repair the substructure of the Monroe Street Viaduct over the Baltimore & Ohio Railroad tracks (Bridge # 5214 over the CSX mainline.)	Programmatically Conforming	Baltimore City	2006	na
1992	Rural Transit Systems - Operating Assistance	40-9204-61	MTA - Transit	Operating assistance to transit system located in the Baltimore region. Baltimore region systems include Baltimore County (Baltimore County Office on Aging), Carroll County (Carroll Transit), Harford County (Harford County office on Aging), and Howard County (Howard Transit).	Programmatically Conforming	Regional	Ongoing	na
1989	Biennial Bridge Inspection	13-8901-14	Local Project	Countywide inspection of all bridges as federally mandated.	Programmatically Conforming	Baltimore County	Ongoing	na

APPENDIX D

Round 6-B Cooperative Forecasts

Round 6-B
Cooperative Forecast - Population and Household Controls

<u>ROUND 6-B POPULATION</u>								
<u>Jurisdiction</u>	<u>1990</u>	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>	<u>2020</u>	<u>2025</u>	<u>2030</u>
Anne Arundel County	427,239	489,656	511,600	526,800	540,100	551,000	562,100	567,600
Baltimore City	736,014	651,154	646,000	658,700	658,000	659,000	661,000	662,300
Baltimore County	692,134	754,292	790,700	819,700	832,900	841,900	844,300	846,800
Carroll County	123,372	150,897	169,500	179,700	187,000	191,900	194,100	193,200
Harford County	182,132	218,590	234,700	254,700	268,200	276,500	283,000	290,500
Howard County	187,328	250,800	273,500	294,200	308,900	319,300	320,300	321,100
Baltimore Region	2,348,219	2,515,389	2,626,000	2,733,800	2,795,100	2,839,600	2,864,800	2,881,500

<u>ROUND 6-B HOUSEHOLDS</u>								
<u>Jurisdiction</u>	<u>1990</u>	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>	<u>2020</u>	<u>2025</u>	<u>2030</u>
Anne Arundel County	149,114	178,670	190,600	201,100	210,500	218,400	224,800	228,100
Baltimore City	276,484	257,996	256,600	266,400	271,800	272,000	272,900	273,400
Baltimore County	268,280	299,877	316,900	330,100	337,000	340,800	344,300	346,700
Carroll County	42,248	52,503	59,500	63,600	66,900	69,500	71,300	71,800
Harford County	63,193	79,667	87,500	96,100	103,200	109,200	113,800	117,200
Howard County	68,337	90,950	100,000	108,700	117,500	124,700	127,100	127,600
Baltimore Region	867,656	959,663	1,011,100	1,066,000	1,106,900	1,134,600	1,154,200	1,164,800

<u>ROUND 6-B EMPLOYMENT</u>								
<u>Jurisdiction</u>	<u>1995</u>	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>	<u>2020</u>	<u>2025</u>	<u>2030</u>
Anne Arundel County	258,200	297,000	317,100	334,700	357,100	379,600	401,500	423,300
Baltimore City	452,400	460,600	467,300	479,000	489,000	497,200	505,000	505,000
Baltimore County	409,600	452,500	469,100	493,300	502,300	506,200	509,000	511,800
Carroll County	57,400	68,300	76,300	84,300	86,800	88,300	89,300	90,300
Harford County	80,500	96,000	105,100	111,100	115,500	119,900	124,500	124,500
Howard County	123,600	160,000	180,000	200,000	215,000	230,000	245,000	260,000
Baltimore Region	1,381,700	1,534,400	1,614,900	1,702,400	1,765,700	1,821,200	1,874,300	1,914,900

Note: Anne Arundel County data includes the City of Annapolis.

APPENDIX E

Excerpt: Executive Summary & Introduction,
Baltimore Region Travel Demand Model for Base Year 2000
(Task Report 04-01)

Excerpt: Executive Summary & Introduction, Baltimore Region Travel Demand Model for Base Year 2000, Task Report 04-01

This Appendix includes the Executive Summary and Introduction to Task Report 04-01. This text provides a general overview of the major enhancements to the regional travel demand model. To request the complete report in draft form, please contact Gene Bandy (BMC) at gbandy@baltometro.org or 410-732-9573.

Executive Summary and Introduction

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 -1 for a map of the Baltimore region and the model area.

This report documents the model development completed in summer 2003 to simulate person travel and ultimately traffic conditions for the year 2000. It supercedes the 1996 model completed in September 2001. Several enhancements to the model have been made as a result of continuous research and application of enhanced modeling techniques, many of which have been suggested to BMC staff:

- New Base Year of 2000
- 2000 Demographic Data
- 2000 Transportation Analysis Zone (TAZ) Structure
- Transportation Networks in GIS
- Improvements to Model Code Using TP+ Software
- New Truck and Commercial Vehicle Models
- Equilibrium Assignment Methodology
- Network Speed and Capacity Updates
- Drive Access to Transit Trips in Assignment
- BWI Special Generator Update

- Addition of Home-Based Other (HBO), Home-Based School (HBSch), and Work-Based Other (WBO) to Distribution Feedback Loop
- Barrier Penalty Revisions
- Mode Choice for I-X/X-I trips

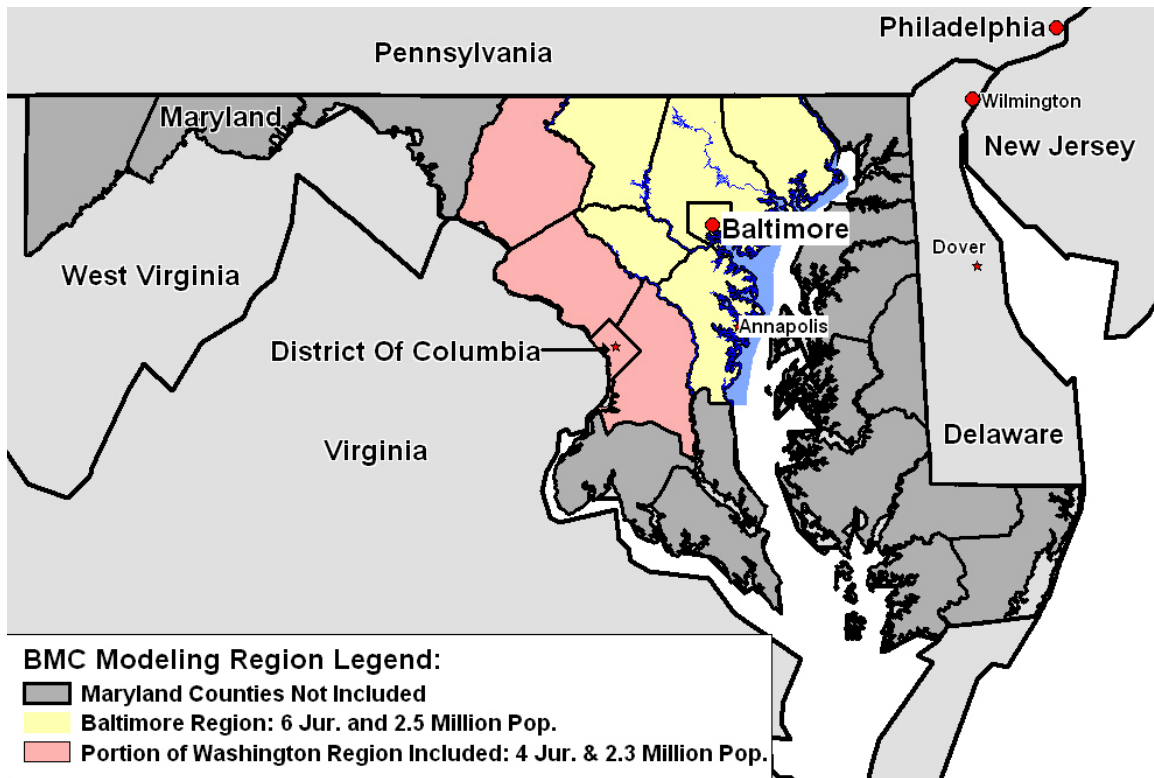
These are discussed in more detail in the next few pages.

A transportation model requires significant data inputs. Chapter III of this report describes, in general terms, the transportation analysis zone (TAZ) structure and input data used by the model.

A more detailed description of the model can be found in Chapter IV, along with details of the changes made for this model run.

The 2000 model base year results are documented in Chapter V.

Exhibit -1 The Baltimore Region and Model Region



Several enhancements have been made to the 2000 model [henceforth referred to as TR00; TR for the new truck model and 00 for the model year (2000)].

- New Base Year of 2000

A new base year of 2000 was chosen because it is a Census year. Previously, 1996 had been the base year. The 2000 year will remain the base year for the next model update when additional data from the 2000 Census and 2001 Household Travel Survey will be available.

- 2000 Demographic Data

The demographic data used by the model (Round 6) was updated to reflect the 2000 Census. The demographic data projections based on the 2000 Census (Round 5-D and Round 6) showed that there was significantly more population in Baltimore City and other denser areas than had been expected in the previous round of demographic forecasts (Round 5-C). The 1996 model used Round 5-C demographic data based on projections from the 1990 Census.

- 2000 Transportation Analysis Zone (TAZ) Structure

BMC staff developed a new TAZ structure based on 2000 Census geography with 1,151 TAZs in the Baltimore region and 1,463 TAZs in the modeled region. (The 1998 TAZ structure used in the previous model had 1,014 TAZs in the Baltimore region and 1,326 in the modeled region.) Both structures include 270 Washington region TAZs and 42 external stations.

- Transportation Networks in GIS

The software used to run the model, TP+, has a built-in network editing environment known as VIPER. For the past 3 years, BMC modeling staff have worked to transfer the transportation network system from the VIPER environment into a customized program using Geographic Information System (GIS) technology. All highway network editing has been performed using MapInfo GIS since the spring of 2001. The spatial components of transit network editing (park and ride lots and rail stations) have been performed in MapInfo since the spring of 2003. The text component of the transit network editing system, which is still the bulk of the transit network, continues to be performed in VIPER or a text editor due to the difficulty in transferring it to GIS. The customized program in MapInfo is called the Master Network system. Using the Master Network has improved network accuracy by improving network checking, attribute calculation, and spatial representation.

- Improvements to Model Code

The model code contains all the commands necessary to run the BMC travel demand model in TP+. For this model update, version 3.0 of the TP+ software was used along with version 3.0.6 of the TRNBUILD transit module. The 1996 model used version 2.0.3 of TP+. The differences between TP+ version 3.0 and version 2.0.3 were small.

Many changes were made to make the model code more efficient. First, additional parameterization was added to the model code. Parameterization is a process that replaces variables set within the model code, also called the job stream, with variables set at the beginning of the run. These parameters can then be easily changed and, therefore, errors minimized by making all of them visible in one place. While several parameters had been in place for the prior validation, additional parameterization was performed for this effort.

Additionally, steps were taken to reduce the amount of time required for the model to run. The new 2000 TAZ structure has many unused zone numbers, which have been reserved for future use of the Metropolitan Washington Council of Government's (MWCOG) complete TAZ structure, for additional TAZs for local subarea analysis, and additional external stations. However, these unused zone numbers still require processing, which slows down the model run. As a result, two simple lines of code were inserted into each module to skip unused TAZ numbers (other than the transit pathbuilding modules that do not support this). At the beginning of processing, further calculations are skipped for those TAZs that are not used, and this has decreased processing time tremendously.

Lastly, upon recommendation of a BRTB subcommittee reviewing a critique of the Baltimore Region Travel Demand Model, bucket rounding was removed from the model process. Bucket rounding was used to provide conversion to whole numbers of trip tables while avoiding distortions caused by rounding errors that can occur when the more than 2 million active zonal interchanges are converted into integers. Fractional trips are now carried throughout the model chain and then rounded to the nearest whole trip after trip assignment. While the concept of fractional trips is difficult to comprehend, examination of interim model results reveals that their use provides a higher degree of precision in the modeling process.

- New Truck and Commercial Vehicle Model

In year 2002-2003, BMC retained a transportation consultant to develop a new set of truck and commercial vehicle models with three trip purposes: commercial vehicles, medium trucks, and heavy trucks. Commercial vehicles are 2-axle, 4-tire vehicles used for business purposes. Medium trucks are 2-axle, 6-tire trucks, and heavy trucks are vehicles with 3 or more axles. The models were developed using an innovative technique called *adaptable assignment*, which develops a model from classified count data.

- Equilibrium Assignment Methodology

The previous version of the model used the incremental capacity restraint traffic assignment methodology, first assigning through trips, then 10 increments of 10% each of the remaining trips. The equilibrium

assignment technique, used by many large MPOs, assigns traffic to the network by minimizing travel times for all trips. The equilibrium methodology was tested and incorporated into the 2000 model .

- Network Speed and Capacity Updates

Free flow speeds were updated using off-peak data collected in the field by the BMC during the period from 1998 to 2002. Using a Geographic Information System interface, each vehicle's time and position were plotted adjacent to model links representing the highway system that had been traversed. This yielded a data set with hundreds of data points from which new values of speed were statistically compared and extracted. Increases or decreases based on the revised data ranged from 1 to 5 miles per hour, depending on the type of roadway and density of the area. The road capacities used by the model were updated to reflect the 2000 *Highway Capacity Manual* (HCM), which is the most recent version. The 1996 model used capacities based on the 1994 HCM.

- Drive Access to Transit Trips in Assignment

Previously, drive access to transit trips (*i.e.*, trips from home to a park-and-ride lot) were not assigned to the highway network. A methodology was developed to determine which transit stations these trips utilized, and then assigns these trips from the production zone (origin or destination zone for non-home-based trips).

- BWI Special Generator Update

BWI Airport, located in Anne Arundel County, is a special trip generator because of its unique purpose. A special trip table has been used to reflect additional vehicle trips generated by the airport beyond those explained by the model. The BWI trip table used for the 1996 model was developed using BMC's 1995 BWI Airport Parking Survey data. With the changes to TAZ structure, the old BWI trip table was no longer suitable. Therefore, major updates to the BWI trip table were made using the new data sets from BMC's 1999 and 2001 BWI Airport Parking Surveys and Metropolitan Washington Council of Government's 1998 Airport Passenger Survey.

- Addition of Home-Based Other (HBO), Home-Based School (HBSch), and Work-Based Other (WBO) to Distribution Feedback Loop

The process of redistributing a trip purpose after the first assignment onto the transportation network that uses travel times from that assignment is called congestion feedback. In the 1996 Validation, only Home-Based Work (HBW) trips used congestion feedback. In response to a consultant recommendation, BMC staff conducted research to ascertain whether or not additional trip purposes should also use congested feedback. The results indicated that HBO, HBSch,

and WBO trips should also be included in the congested feedback process.

- Revised Barrier Penalties

Barrier penalties add time for travel between selected jurisdictions or areas to simulate the higher perceived travel costs associated with crossing geographical or political boundaries. Modifications were made in the Home-Based Work barrier penalties to increase travel between selected jurisdictions.

- Mode Choice for I-X/X-I trips

The mode choice model, developed in 2001, assumed that all internal to external (I-X) and external to internal (X-I) trips were single occupant autos; all the I-X and X-I person trips were converted to the same number of auto trips. This was in conflict with another part of the model which assumed a specific auto occupancy rate that would mean fewer vehicle trips than person trips. After mode choice, the I-X and X-I trips would be converted to vehicle trips by a FRATAR process meant to hold trips at external stations to a specific value. The change to the model was to factor the I-X and X-I trips to vehicle trips at the mode choice stage, but still run the FRATAR process to ensure that all externally-oriented trips be as close as possible to the fixed value at the external stations. The factors are defined in the model description found in the next chapter.

APPENDIX F

24-Hour Conversion Factors to
Create Period Trip Tables

24-Hour Conversion Factors to Create Period Trip Tables

	Midnight to 6:00 a.m.			6:00 a.m. to 10:00 a.m.			10:00 a.m. to 3:00 p.m.			3:00 p.m. to 7:00 p.m.			7:00 p.m. to Midnight			Total Day
	Percent of Daily	I to J	J to I	Percent of Daily	I to J	J to I	Percent of Daily	I to J	J to I	Percent of Daily	I to J	J to I	Percent of Daily	I to J	J to I	Percent of Daily
HBW	6.21	60	40	39.60	97	3	10.21	51	49	33.31	10	90	10.67	17	83	100
HBSH	1.26	56	44	10.75	79	21	32.62	40	60	35.46	32	68	19.91	29	71	100
HBO	2.52	60	40	20.61	82	18	19.79	52	48	33.86	44	56	23.22	29	71	100
HBSch	0.07	69	31	44.93	97	3	18.55	19	81	29.79	12	88	6.65	28	72	100
WBO	1.44	50	50	24.02	50	50	36.44	50	50	33.94	50	50	4.16	50	50	100
OBO	0.75	50	50	20.47	50	50	37.50	50	50	30.20	50	50	11.08	50	50	100
CV	4.50	50	50	25.10	50	50	28.90	50	50	29.40	50	50	12.10	50	50	100
MT	6.5	50	50	27.3	50	50	36	50	50	22.9	50	50	7.3	50	50	100
HT	13.3	50	50	22.5	50	50	32.6	50	50	18.3	50	50	13.3	50	50	100
BWI	4.88	50	50	19.86	50	50	25.7	50	50	27.52	50	50	22.04	50	50	100
XX	5.00	50	50	24.00	50	50	26.40	50	50	28.80	50	50	15.80	50	50	100

APPENDIX G

Procedures for Determining Regional
Transportation-Related Emissions

PROCEDURES FOR DETERMINING REGIONAL TRANSPORTATION-RELATED EMISSIONS

The BMC has maintained a process for a number of years that meets the modeling requirements for a designated severe ozone nonattainment area. Since the revocation of the 1-hour ozone standard on June 15, 2005, the Baltimore region is no longer a severe nonattainment area for 1-hour ozone. It is now a moderate nonattainment area for the 8-hour ozone standard, a nonattainment area for PM_{2.5}, and a maintenance area for CO. However, due to persistent air quality issues in the Baltimore region, the region still follows the same procedures. This appendix displays the requirements from final rules in *italics* followed by a brief statement in **bold** type of how the BMC staff has addressed or satisfied the rule.

(1) By January 1, 1997, estimates of regional transportation-related emissions used to support conformity determinations must be made at a minimum using network-based travel models according to procedures and methods that are available and in practice and supported by current and available documentation. These procedures, methods, and practices are available from DOT and will be updated periodically. Agencies must discuss these modeling procedures and practices through the interagency consultation process, as required by §93.105(c)(1)(i). Network-based travel models must at a minimum satisfy the following requirements:

The BMC staff presently employs a 4-step travel forecasting model that is sensitive to changes in land use patterns, transportation infrastructure, and transportation policies. The MPO utilizes the Planning Directors Committee to increase communication between transportation and land use planners. The Planning Directors provide insight in coordinating a regional approach to developing future socioeconomic data estimates.

(i) Network-based travel models must be validated against observed counts (peak and off-peak, if possible) for a base year that is not more than 10 years prior to the date of the conformity determination. Model forecasts must be analyzed for reasonableness and compared to historical trends and other factors, and the results must be documented;

The present travel model was validated to ground counts for the year 2000 using the Round 6 socioeconomic data. The BMC conducted a household survey to gather travel information, system characteristics, and socioeconomic variables during calendar year 1993. These data were used to update the generation and distribution components of the 4-step process. During FY 1997, BMC conducted an on-board transit survey. Using the two observed data sets and consultant services, a new logit mode choice model was developed. In 2001, the Baltimore region participated as an add-on to the National Household Transportation Survey (NHTS) sampling 3,100 weekday and 380 weekend household travel. This wealth of data will be used in continuing the enhancement of the travel model.

- (ii) *Land use, population, employment, and other network-based travel model assumptions must be documented and based on the best available information;*

Socioeconomic data and other model assumptions are documented in reports available from the BMC. Model assumptions are based on observed data collected in recent years in the Baltimore region and from other national data sets. Additional information about the truck model can be found in Task Reports prepared by the consultant.

- (iii) *Scenarios of land development and use must be consistent with the future transportation system alternatives for which emissions are being estimated. The distribution of employment and residences for different transportation options must be reasonable;*

BMC has traditionally met with representatives of local jurisdictions in the development of land use forecasts. Estimates of socioeconomic data are reviewed annually to adjust for changes in policies. BMC staff has also been investigating a formal land use model to assist in the development of future rounds of socioeconomic data. Transportation networks will be key inputs in the execution of the land use model.

- (iv) *A capacity-sensitive assignment methodology must be used, and emissions estimates must be based on a methodology which differentiates between peak and off-peak link volumes and speeds and uses speeds based on final assigned volumes;*

The assignment of vehicle trips to the highway network is conducted using equilibrium. Vehicle use is projected for five time periods, creating peak and off-peak estimates of volume and speed. Model results are post processed using final assigned volumes and an adjusted Bureau of Public Roads (BPR) volume delay curve to estimate travel speed for each hour of the day. The adjustment to the BPR curve was recommended in the Travel Model Improvement Program, October, 1997 report *Travel Model Speed Estimation and Post Processing Methods for Air Quality Analysis*.

- (v) *Zone-to-zone travel impedances used to distribute trips between origin and destination pairs must be in reasonable agreement with the travel times that are estimated from final assigned traffic volumes. Where use of transit currently is anticipated to be a significant factor in satisfying transportation demand, these times should also be used for modeling mode splits; and*

Evaluation of travel times used to distribute trips and assign trips revealed reasonable agreement between them. A comparison of travel times using both modes (highway and transit) is used to calculate the number of potential transit users.

- (vi) *Network-based travel models must be reasonably sensitive to changes in the time(s), cost(s), and other factors affecting travel choices.*

The BMC model considers changes in time and cost during distribution, mode split, and trip assignment. These variables are used to reflect changes in the attractiveness of destinations or choice of mode.

- (2) *Reasonable methods in accordance with good practice must be used to estimate traffic speeds and delays in a manner that is sensitive to the estimated volume of travel on each roadway segment represented in the network-based travel model.*

Delay is based on an adjusted BPR volume delay curve. Inputs to the equation are highway capacity and simulated volume. The BMC employs a cross-class capacity lookup table to determine capacity by facility and area type. As simulated volume approaches capacity, travel speed is reduced. Peak spreading is used when hourly volume exceeds 30% of capacity. The redistributed volume is used in the speed estimation.

- (3) *Highway Performance Monitoring System (HPMS) estimates of vehicle miles traveled (VMT) shall be considered the primary measure of VMT within the portion of the nonattainment or maintenance area and for the functional classes of roadways included in HPMS, for urban areas which are sampled on a separate urban area basis. For areas with network-based travel models, a factor (or factors) may be developed to reconcile and calibrate the network-based travel model estimates of VMT in the base year of its validation to the HPMS estimates for the same period. These factors may then be applied to model estimates of future VMT. In this factoring process, consideration will be given to differences between HPMS and network-based travel models, such as differences in the facility coverage of the HPMS and the modeled network description. Locally developed count-based programs and other departures from these procedures are permitted subject to the interagency consultation procedures of §93.105(c)(1)(i).*

Emission estimates for BRTP and 2006-2010 TIP are based on VMT projections from the travel model that have been adjusted on a functional and area (urban/rural) type within each jurisdictional basis using an HPMS adjustment factor; an estimate for local VMT, which is not estimated by the travel model; and a seasonal/monthly adjustment.

APPENDIX H

Methodology, Calculations, and
ERS Tracking Table

Methodology, Calculations, and Emission Reduction Strategies Tracking Table

This appendix includes several items related to the estimation of emissions reduced by various strategies that cannot be accounted for in the travel demand model, including:

- ERS Tracking Table for Implemented ERSs (calculated using MAQONE)
- ERS Tracking Table for Programmed ERSs (calculated using MAQONE)
- Emission estimation calculations for CHART
- Description of strategies in the Plan, including the Regional Commuter Assistance Program, Home-based Telecommuting, New Park & Ride Spaces/Lots, and the Bicycle Element of the Plan

Implemented Transportation Projects

Implementing Agency	Jurisdiction	Vehicles		Vehicle Emissions kg/year					
				2010		2020		2030	
				Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx

Anne Arundel County

Anne Arundel Co.

Year **Project Name/Description**

1998 Forest Drive Enhancement

Add center turn lane, correct safety concerns, beautification, widen Forest Dr from Pal Park to Catrina Lane with provisions for a bikeway.

2000 Duvall Hwy Improvements

Provide left turn lane and construct sidewalks along both sides of the widened section (connect to high school)

2002 Odenton MARC Enhancement

-5 -47

-0.13

-4.88

-0.13

-1.82

-0.13

-1.4

Construct sidewalks, street trees and lighting and pedestrian plaza

2003 Andover Park Renovations

Renovations and paving of 1.1 mile trail

2003 West St. Improvement

Provide assistance to City of Annapolis for improvements

Implementing Agency	Jurisdiction	Vehicle Emissions kg/year							
		Vehicles		2010		2020		2030	
		VT	VMT	Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx
2003	<u>East - West Blvd</u> Two-lane road, hiker/biker trail, and landscaping	-2	-5	-0.01	-0.53	-0.01	-0.2	-0.01	-0.15
2005	<u>Chestnut Tree / Green Holly</u> This project is a Highway Safety Improvement to design and reconstruct the roadway at the intersection of Chestnut Tree and Greenholly Dr., construct sidewalks and relocate underground and above ground utilities to improve sight distance and vehicle circulation.								
2005	<u>Woods Road Bike Path (name change)</u> Provide a bike path from Chelsea Beach Community to the Lake Shore Park and a culvert beneath Woods Road.								
2005	<u>WB&A - West County Trail - Phase I</u> Construct new 3.6 mile trail from the Odenton MARC Station to Patuxent Road. Provides Odenton area with direct link to Patuxent River and Annapolis-Odenton South Shore Trail.	-2	-5	-0.01	-0.53	-0.01	-0.2	-0.01	-0.15
2005	<u>Ferndale Road Sidewalk</u> Install 5 foot wide sidewalk with curb and gutter along the north side of Ferndale Rd. from Hollins Ferry Rd. to Aviation Blvd.			-0.01	-0.49	-0.01	-0.19	-0.01	-0.13
2005	<u>Crestwood Sidewalk, Curb, Gutter</u> This project is for replacement of sidewalks, curb and gutter which no longer function due to deterioration or resurfacing of roads and are beyond repair in the Crestwood Community. This project also includes milling, patching, and resurfacing of the roads as determined by a preliminary engineering study.								

Implementing Agency

Jurisdiction	Vehicles		Vehicle Emissions kg/year					
			2010		2020		2030	
			Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx

2005 Idlewilde Road

Provide the connection of Idlewilde Rd. to Jumpers Hole Rd. Construct curb, gutter, and sidewalks on the South side and shoulder on the North side for parking.

2005 Provinces Sidewalk/ Root Guard

This project will remove trees or prevent root protrusion and replace damaged sidewalks that have been raised by shallow tree roots from trees planted in the area between the sidewalks and curbs.

Baltimore City

Baltimore City

Year Project Name/Description

1999 Gwynns Falls Trail - Phase 1

4.7 mile trail from Leakin Park to Edmondson Avenue

2000 Harris Creek

Create a model urban park with brick ped promenade/path (located at the end of the Anchorage Promenade portion of the Baltimore waterfront)

2001 Dolfield Commercial Area

Acquire deteriorating commercial property to redevelop the shopping center to accommodate expansion of existing businesses and create space for new enterprises adjacent to the Cold Spring Lane Transit Station

Implementing Agency	Jurisdiction	Vehicles		Vehicle Emissions kg/year					
				2010		2020		2030	
				Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx

2004 Market Street Improvements

Construct various street improvements and enhancements to the MTA Subway Station lot at Market Place

2004 Druid Lake Jogging Path

Modify Druid Park Drive to provide room for the completion of the walking/jogging path around Druid Lake

2004 Market Place - Public Improvements

Construct various street improvements and enhancements to the MTA Subway Station

2005 Main Street Program: Street/Streetscaping

Sidewalk repairs, street lighting, and street trees are scheduled for various locations in conjunction with the City's Main Street program. FY 2005 funds are for sidewalk improvements on Pennsylvania Ave. and to begin construction on Monument St.

2005 Eutaw Street Streetscape

Work is to include total rehabilitation of the street. new curbs, sidewalks, roadway sub-base repairs, roadway surface, lighting, etc. FY 05 funds are for construction.

2005 Gwynns Falls Trail Phase III

The design for the section of the Gwynns Falls Trail near the Maryland Science Center and the new Visitors Center in the Inner Harbor is to be completed.

Implementing Agency

Jurisdiction	Vehicles		Vehicle Emissions kg/year							
			2010		2020		2030			
			VT	VMT	Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx
2005 <u>Pedestrian Wayfinding Signage Program</u>										
<p>Pedestrian wayfinding signs are to be designed and installed in the Downtown and the Mt. Vernon Cultural District as part of the master plans for these areas. This is the prototype for a City-wide system.</p>										
2005 <u>Traffic Control System Study</u>										
<p>Evaluate traffic command and control system: design and implement new and more responsive system. Replace obsolete equipment that governs 900 traffic lights in the CBD.</p>										
2005 <u>War Memorial Plaza Renovation</u>										
<p>The renovation of the War Memorial Plaza is to include demolishing the sunken interior pavement and replacing it with a large lawn, perennial flower borders, decorative lights, benches and a new fountain. The entire park will also be ADA accessible.</p>										
2005 <u>Gwynn Falls Greenway</u>										
2005 <u>Gwynns Falls Trail - Phase II and III</u>	-13	-34	-0.1	-4.29	-0.1	-1.62	-0.1	-1.23		
<p>5.5 miles. Develop a linear park and recreational trail along the Gwynns Falls, linking Leakin Park to Middle Branch Park and eventually Baltimore County and Patapsco State Park. Phase 3 will link Carroll and Middle Branch Parks to the Inner Harbor</p>										

Baltimore Co.

Implementing Agency

Jurisdiction	Vehicles		Vehicle Emissions kg/year					
			2010		2020		2030	
			Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx

Baltimore Co.

Year Project Name/Description

1999	<u>Church Lane - North</u>								
	Rehabilitate 5000' of roadway to increase vehicular and ped traffic service & safety (McDonogh Road to Old Court Rd)								
1999	<u>Dogwood Road</u>								
	Right of way, curbs, gutters, sidewalks (Rolling Run Drive to Belmont Ave. in association with HCFA site)								
1999	<u>Towson Business District</u>								
	Infrastructure projects adjacent to the commercial core (road improvements, streetscape, pedestrian amenities)								
2000	<u>Cromwell Bridge Road Corridor</u>								
	New structure over Gunpowder Falls and two lane road with sidewalk (Glenarm Road at Cub Hill and Cromwell Br)								
2000	<u>Winters Lane</u>								
	Right of way, curb, gutters, sidewalks (Frederick Road to Edmonson Ave)								
2001	<u>Halethorpe Roads</u>	-5	-3	-0.01	-0.54	-0.01	-0.21	-0.01	-0.15
	Repair roads, install curb and gutter, install sidewalks (upon request) on 4 avenues (phase 1 of improvements in Halethorpe community)								
2001	<u>Symington Ave</u>	-5	-3	-0.01	-0.54	-0.01	-0.21	-0.01	-0.15
	Install curbs, gutters, sidewalks								

Implementing Agency

	Jurisdiction	Vehicles		Vehicle Emissions kg/year					
		VT	VMT	2010		2020		2030	
				Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx
2003	<u>Central Ave</u> Right of way, curbs, gutters, sidewalks	-5	-3	-0.01	-0.54	-0.01	-0.21	-0.01	-0.15
2003	<u>Michigan Avenue</u> Right of way, curb, gutters, sidewalks	-5	-3	-0.01	-0.54	-0.01	-0.21	-0.01	-0.15
2004	<u>Church Lane - South</u> Right of way, curb, gutters, sidewalks (Reisterstown Road to Greenwood Road)	-5	-3	-0.01	-0.54	-0.01	-0.21	-0.01	-0.15
2005	<u>North Point Enterprise Zone</u> Improve roadway, curbs, gutters, sidewalks in North Point Enterprise Zone	-5	-3	-0.01	-0.54	-0.01	-0.21	-0.01	-0.15
2005	<u>Alababama Avenue</u> Right of way, curbs, gutters, sidewalks	-5	-3	-0.01	-0.54	-0.01	-0.21	-0.01	-0.15

Baltimore County

Baltimore Co.

Year Project Name/Description

2004 Paper Mill Road Bridge #502
Reuse Paper Mill bridge (no longer used for traffic) over Loch Raven Reservoir to include a trail to the bridge from the NCR Hike and Bike trail, cleaning and painting of the bridge, adapting the bridge for pedestrian use with railings and walkways.

Carroll County

Implementing Agency

Jurisdiction	Vehicles		Vehicle Emissions kg/year					
			2010		2020		2030	
			Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx

Carroll Co.

Year Project Name/Description

2004	<u>Freedom Park Trails</u>	0	-1	0	-0.11	0	-0.04	0	-0.03
	Construct a 6 foot wide macadam multi-use trail that will encompass the perimeter of the park. The trail will also connect to the existing Patapsco Valley Greenway Trail System along the Patapsco River. (p. 57)								

City of Annapolis

Annapolis

Year Project Name/Description

2001	<u>A-STEP Map/Brochure</u>								
	Bus, hike, and bike guidelines. First map of public open space and alternative transportation facilities.								
2002	<u>Improved bus stop amenities</u>	-5	-44	-0.13	-4.53	-0.12	-1.7	-0.12	-1.31
	Installation of improved bus stop amenities for shelters and bus stops, including maps.								
2002	<u>Bike Racks on Buses</u>								
	Install bike racks on City's buses to encourage cyclists to take the bus								

Implementing Agency	Jurisdiction	Vehicle Emissions kg/year							
		Vehicles		2010		2020		2030	
		VT	VMT	Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx
2004	<u>Popular Avenue Trail Extensions</u>								
	Install a trail from the Parole Areas and the Annapolis Mall to the historic district. Extend from western end of Windel Ave to Admiral Drive.								
2004	<u>Truxtun Park Path</u>								
	Construction of Truxtun Park waterside path as an element of the Citywide path network.								
2004	<u>West Street Revitalization</u>								
	Total reconstruction of West Street from Church Circle to Amos Garrett Blvd, including urban design streetscape on West Street and West Washington Street.								
2004	<u>Bus Shelters</u>	-13	-110	-0.31	-11.33	-0.31	-4.24	-0.31	-3.29
	Build bus shelters for bus riders with the goal of increasing ridership, may include the purchase of trash receptacles and benches								
2005	<u>Forest Drive Sidewalks</u>								
	Provide and/or improve sidewalks along Forest Drive.								
2005	<u>Annapolis Transit ITS Implementation</u>								
	Implement ITS using global positioning system with 2-way communication, on board displays/enunciators and real time on-site readouts								
2005	<u>Intelligent Transportation Systems</u>								
	Install new technologies to enhance transit, such as automated vehicle location, time of arrival displays, and automated data collection.								

Implementing Agency	Jurisdiction	Vehicle Emissions kg/year							
		Vehicles		2010		2020		2030	
		VT	VMT	Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx

2005	<u>Recreational Trail at NAAA Stadium</u>	-2	-5	-0.01	-0.53	-0.01	-0.2	-0.01	-0.15
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Construct a paved recreational trail around the perimeter of the Navy stadium to improve pedestrian access around the stadium and connect to adjacent trails in the City of Annapolis.

2005	<u>Edgewood Road Improvements</u>								
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Reconstruction of about 6,600 feet of Edgewood Road, including sidewalks and bike paths.

2005	<u>Church Circle Sidewalks</u>								
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Install new granite curb, brick sidewalks and bollards to prevent vehicle loading on the new sidewalk.

Clean Air and Transportation, Inc.

Regionwide

Year **Project Name/Description**

2001	<u>Commuter Choice Public Education and Marketing Campaign</u>								
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Market research and marketing campaign to provide public education and commuter choice programs

Harford County

Harford Co.

Year **Project Name/Description**

Implementing Agency

Implementing Agency	Jurisdiction	Vehicles		Vehicle Emissions kg/year						
				2010		2020		2030		
				Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx	
2002	<u>Ma & Pa Heritage Trail</u>									
	Phase II Blakes Venture Park to Friends Park 1.8 miles									
2002	<u>Singer Road</u>									
	Project to improve 1,850 LF of Singer Rd. between MD 924 and MD 24 to include storm drains and sidewalks.									
2004	<u>Abingdon Rd./Rte. 924/Box Hill S. Pkwy</u>									
	Abingdon Rd. between existing MD Rte.924 and Box Hill South Pkwy. is to be improved to adequately handle existing and projected traffic loads. 4,400 LF of closed section road is to be built. Sidewalks will also be constructed to improve pedestrian access from the communities of Box Hill to commercial sites along MD Rte.924.									
2004	<u>Promenade Restoration</u>									
	Tropical Storm Isabel caused extensive damage to the Havre de Grace Promenade and the adjacent embankment. For FY 04, this project includes the removal of debris from the water, stabilization of the hillside, and engineering for the repair of the Promenade. Reconstruction of the walkway itself will be done in FY 05.									
2005	<u>Whiteford/Cardiff Road & Storm Drain</u>	-2	-1	0	-0.16	0	-0.06	0	-0.05	
	Project to rehabilitate Old Pylesville Rd. between MD 136 and the Pennsylvania state line to include roadway, storm drain and sidewalk improvements.									
2005	<u>Red Pump Road/ MD 24</u>	-2	-1	0	-0.23	0	-0.09	0	-0.06	
	Project to improve 3,325 LF of Red Pump Rd. between MD 24 and Vale Rd. to include storm drains and sidewalks.									

Implementing Agency

Jurisdiction

Vehicles
VT VMT

Vehicle Emissions kg/year

2010		2020		2030	
Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx

Howard County

Howard Co.

Year Project Name/Description

1999 ColumBus Replacement

A project to purchase new transit vehicles as replacements or new vehicles for the ColumBus fleet- Purchase of 1 new bus as a replacement to an existing bus.

1999 Construction of a connecting bridge at Howard Community College

Construction of a connecting bridge (assume sidewalks included) to connect campus to Hickory Ridge Building at Howard Community College

1999 Guilford Road Sidewalks

A project for the reconstruction of 2,000 LF of narrow and non-handicapped compliant sidewalks along Guilford Rd. from Broken Land Pkway to Kings Contrivance Village Center.

1999 Linkages in the County's pedestrian/bike trail system

A project for construction of improvements for key linkages in the County's pedestrian/bike trail system. This project will improve the overall network of trails and pathways in the County by allowing more effective use of bicycle and walking as visible

Implementing Agency	Jurisdiction	Vehicle Emissions kg/year							
		Vehicles		2010		2020		2030	
		VT	VMT	Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx
2000	<u>Sidewalk pathway along Broken Land Pkwy</u> Construction of 5,000 LF of sidewalk/pathway along Broken Land Pkwy from Stevens Forest Rd. to Cradlerock Way South.								
2000	<u>ColumBus Replacement</u> A project to purchase 2 new 30 ft. transit coaches and a smaller bus or van as replacements or new vehicles for the ColumBus fleet.	0	0	0	-184.6	0	-184.6	0	0
2002	<u>Sidewalks/pathways for School Children</u> A project to provide a safe walking route for school children. Sidewalk projects awaiting requests include: Font Hill Rd.; Columbia Rd.; Brittany Lane; Worthington Way. Project replaced by K-5035	-2	-1						
2002	<u>Bus Purchases</u> Replace and acquire wheelchair accessible buses and vehicles, bus stop shelters and signage, fixed-route preventative maintenance program for the entire fleet and equipment for technologically enhanced customer service phone system								
2003	<u>North Laurel sidewalk construction</u> Sidewalk construction requested by the public in North Laurel to provide sidewalks along Madison Ave.; Baltimore Ave.; and Decatur Rd.								
2003	<u>Broken Land Pkwy Pedestrian Facilities</u> Project to provide enhanced pedestrian facilities, both at grade and grade separated, along the Broken Land Pkwy.								

Implementing Agency	Jurisdiction	Vehicle Emissions kg/year							
		Vehicles		2010		2020		2030	
		VT	VMT	Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx
2003	<u>Park & Ride at MD 32/MD 108</u> Funds for land acquisition for Park & ride MD 32/MD 108 is included in this project. New roadway construction in Howard County.- Sharing costs with SHA	-84	-1395	-3.97	-137.03	-3.92	-51.21	-3.91	-40.07
2003	<u>Howard County Pathway System</u> A project to develop a 30-mile spinal pathway system linking Alpha Ridge Park, David Force Park, Centennial Park, Lake Elkhorn, King's Contrivance, and follow Little Patuxent River to Savage Park.	-197	-516	-1.47	-62.13	-1.45	-23.31	-1.45	-17.7
2005	<u>Broken Land Pkwy IVHS Corridor</u> Project to construct a traffic responsive signal system from MD 108 along Harpers Farm Rd. and Twin Rivers Rd. tying into the existing signal system along Broken Land Pkwy., continuing to Guilford Rd. to Old Columbia Rd.								
2005	<u>Normandy Lane and US 40 Park-n-Ride lot</u> 50 new spaces	-21	-87	-0.25	-9.7	-0.24	-3.64	-0.24	-2.8

MDOT

Anne Arundel Co.

Year Project Name/Description

1997	<u>Nursery Road Park-n-Ride lot</u> 104 new spaces
1998	<u>Signal Systemization - MD 450</u> King George Street/MD 436 to USNA Gate 8

Implementing Agency	Jurisdiction	Vehicles		Vehicle Emissions kg/year					
				2010		2020		2030	
				Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx
1999	<u>Signal Systemization - MD 2</u> Jones Station Road to Earleigh Heights Road								
2001	<u>Signal Systemization - MD 173</u> Riviera Drive to Edwin Raynor Blvd								
2001	<u>Signal Systemization - MD 178</u> MD 450 to Bestgate Road								
2001	<u>Signal Systemization - MD 450</u> MD 2 to MD 178								
2001	<u>Electronic Toll Collection - US 50/301 Bay Bridge</u>	0	0	0	-1.53	0	-0.66	0	-0.55
2002	<u>MARC BWI Rail Station Parking Garage</u> Add 1790 spaces	803	-17824	-50.74	-1570.0	-50.11	-585.16	-49.98	-462.93
2002	<u>Baltimore Region Rideshare Program - 2003</u> Provides funding support to local rideshare coordinators to strengthen ridematching and ridesharing coordination services to both commuters and employers								
2003	<u>Odenton Road Ped/Bike Enhancement</u> .94 mile trail from Sappington Station Road to Odenton Marc Station	-3	-8	-0.02	-0.91	-0.02	-0.34	-0.02	-0.26
2004	<u>WB&A Trail - West County Trail</u> 2.7 mile trail from Odenton to Strawberry Lake Way	-8	-21	-0.06	-2.48	-0.06	-0.93	-0.06	-0.7
2004	<u>Signal Systemization - MD 2</u> MD 450 to MD 665								

Implementing Agency

	Jurisdiction	Vehicles		Vehicle Emissions kg/year					
		VT	VMT	2010		2020		2030	
				Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx
2005	<u>MD 295 at MD 175 Park-n-Ride lot</u> add 40 new spaces	-17	-92	-0.26	-9.58	-0.26	-3.58	-0.26	-2.77
	Baltimore City								
Year	Project Name/Description								
1997	<u>Penn Station Light Rail Extension</u> Intercity rail								
1997	<u>Falls Road Park-n-Ride lot</u> 104 new spaces								
1997	<u>Downtown Transit Store</u> Transit sales and information location								
1998	<u>Mount Washington Light Rail Station Access</u> Develop pedestrian connection to Mill development								
1998	<u>Reisterstown Plaza Metro Station Improvement</u> Daycare Center - 100 spaces								
1999	<u>Electronic Toll Collection - I-695 Key Bridge</u>	0	0	0	-2.77	0	-1.15	0	-0.98
1999	<u>Jones-Falls Trail</u>								
1999	<u>Electronic Toll Collection - I-95 Fort McHenry Tunnel</u>								

Implementing Agency	Jurisdiction	Vehicle Emissions kg/year							
		Vehicles		2010		2020		2030	
		VT	VMT	Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx
1999	<u>Electronic Toll Collection - I-895 Baltimore Harbor Tunnel</u>	0	0	0	-17.83	0	-6.71	0	-5.54
2002	<u>Greyhound Terminal</u> Facility designed to function as intermodal center with access to local and intercity bus service, and Amtrak, MARC, and Light Rail trains.								
2002	<u>Howard Street Parking Garage</u> Construct a parking garage in support of a \$30 million joint development project at the Cultural Center Light Rail								
2002	<u>Baltimore Region Rideshare Program - 2003</u> Provides funding support to local rideshare coordinators to strengthen ridematching and ridesharing coordination services to both commuters and employers								
2003	<u>Charles Street Improvements</u> Construct sidewalk improvements with bus stop shelters and transit kiosk, lighting at the northbound stop Charles/Fayette Street bus stop and the St. Paul/Fayette Street southbound bus stop	-64	-523	-1.49	-55.32	-1.47	-20.78	-1.47	-16.19
2003	<u>Belair-Edison Community Association</u> Install new bus shelter, paint CSX railroad bridge and make sidewalk improvements to the bus shelter area.	-27	-218	-0.62	-23.05	-0.61	-8.66	-0.61	-6.75
2005	<u>Bus Engine Upgrade</u> Overhaul 150 engines per year								

Implementing Agency

Jurisdiction

Vehicles
VT VMT

Vehicle Emissions kg/year

2010		2020		2030	
Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx

2005 Bus Transit Annunciation System

Retrofit 250 (+16) buses with equipment to automatically announce stops, public service, and other messages using GPS technology. In addition, an interior LED sign is provided to aid the hearing impaired.

Baltimore Co.

Year Project Name/Description

1998 Signal Systemization - US 40

Middle River Road to Days Cove Road

1998 Lutherville Park-n-Ride lot

120 new spaces

1998 Signal Systemization - MD 542

I-695 to Taylor Avenue

1998 Signal Systemization - MD 166

Bloomsbury Avenue to MD 372

1999 Retrofit sidewalk - US 40

Provide 2000 linear feet of sidewalk from Nuwood Rd to Double T Diner in Catonsville

1999 Retrofit Sidewalk - MD 140

5500 linear feet of sidewalk; High Falcon Rd. to Franklin Blvd.

2000 Retrofit Sidewalk - MD 122 Security Blvd.

Implementing Agency	Jurisdiction	Vehicle Emissions kg/year							
		Vehicles		2010		2020		2030	
		VT	VMT	Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx
2000	<u>Retrofit Sidewalk - MD 140 Reisterstown Rd</u> Provide sidewalk on eastside only from Owings Mills Blvd to Enchanted Hills Rd. Total length of new sidewalk is 1,500 linear feet								
2001	<u>Catonsville Public Library Access</u> Construct a sidewalk between the public library and the bus stop in conjunction with facility expansion of the library	-1	-1	-0.01	-0.55	-0.01	-0.21	-0.01	-0.15
2001	<u>Signal Systemization - MD 122</u> I-695 to Rolling Road								
2002	<u>Owings Mills/Randallstown Shuttle</u> Neighborhood shuttle in the Owings Mills/Randallstown area of Baltimore County								
2002	<u>Baltimore Region Rideshare Program - 2003</u> Provides funding support to local rideshare coordinators to strengthen ridematching and ridesharing coordination services to both commuters and employers								
2004	<u>Signal Systemization - MD 122</u> I-695 to Social Security entrance								
2004	<u>Signal Systemization - MD 150</u> Stemmers Run Road to Kingston Rd								
2005	<u>Halethorpe MARC Station Parking Expansion</u> Add new spaces up to 450 + total; may include new shelters, lighting, and streetscaping	196	-3384	-9.63	-297	-9.51	-110.65	-9.49	-87.68

Implementing Agency

	Jurisdiction	Vehicles		Vehicle Emissions kg/year						
		VT	VMT	2010		2020		2030		
				Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx	
2005	<u>Signal Systemization - MD 542</u> Taylor Avenue to Loch Hill Rd Carroll Co.									
Year	Project Name/Description									
1998	<u>Signal Systemization - MD 140</u> MD 97 to Sullivan Road									
1998	<u>Signal Systemization - MD 30</u> Northwoods Trail to MD 482									
1999	<u>Roundabout</u> MD 194 at Frederick									
1999	<u>Signal Systemization - MD 26</u> Johnsville Road to Monroe Avenue									
2000	<u>Signal Systemization - MD 30</u> York Street to MD 27									
2002	<u>Baltimore Region Rideshare Program - 2003</u> Provides funding support to local rideshare coordinators to strengthen ridematching and ridesharing coordination services to both commuters and employers									
2002	<u>Wakefield Valley Community Trail</u> .8 mile trail from Long Valley Drive to Takoma Farm Road	-3	-7	-0.02	-0.82	-0.02	-0.31	-0.02	-0.23	

Implementing Agency

Jurisdiction

Vehicles
VT VMT

Vehicle Emissions kg/year

2010		2020		2030	
Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx

Harford Co.

Year Project Name/Description

- 1997 Signal Systemization - MD 24
MD 924 to US 1 Business
- 1998 Signal Systemization - US 40
MD 755 to MD 24
- 1998 Signal Systemization - US 1 Business
Atwood Road to Tollgate Road
- 1999 Retrofit sidewalk - MD 462
Hillcrest Dr. to Windemere Rd. - 1,920 linear feet
- 1999 Retrofit sidewalk - MD 924
Homestead St. to Heighe St., 500 linear feet
- 1999 US 40 at MD 152 Park-n-Ride lot
146 new spaces
- 1999 MD 22 at Bynum Run Park Park-n-Ride lot
60 added spaces
- 1999 Ma & Pa Heritage Trail - Phase I
Rail-to-Trail-Conversion
- 1999 Retrofit Sidewalk - MD 22
Barnes Street to Maitland Street - 270 linear ft.

Implementing Agency

	Jurisdiction	Vehicles		Vehicle Emissions kg/year					
		VT	VMT	2010		2020		2030	
				Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx
2000	<u>Signal Systemization - MD 24</u> Tolgate Road to MD 755								
2000	<u>Signal Systemization - US 40</u> Old Post Road to Ostego Street/MD 155								
2000	<u>I-95 at MD 152 Park-n-Ride lot</u> add 40 spaces								
2000	<u>Retrofit Sidewalk - US 1</u> Tollgate Rd to MD 24, 1000 linear ft.								
2001	<u>I-95 at MD 543 Park-n-ride lot</u> 128 new spaces	-51	-277	-0.79	-28.7	-0.78	-10.74	-0.78	-8.31
2001	<u>Local Bus Replacement</u> Purchase 4 new vehicles	0	0	0	-704.6	0	-704.6	0	0
2002	<u>US 1 at MD 23 Park-n-Ride lot</u> add 60 new spaces	-24	-130	-0.37	-13.45	-0.37	-5.04	-0.36	-3.9
2002	<u>Baltimore Region Rideshare Program - 2003</u> Provides funding support to local rideshare coordinators to strengthen ridematching and ridesharing coordination services to both commuters and employers								
2004	<u>Signal Systemization MD 24</u> MD 23 to Red Pump Road								

Howard Co.

Year Project Name/Description

Implementing Agency	Jurisdiction	Vehicle Emissions kg/year							
		Vehicles		2010		2020		2030	
		VT	VMT	Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx
1997	<u>MD 32 at MD 108 Park-n-Ride lot</u> 200 new spaces								
1998	<u>Signal Systemization - MD 175</u> MD 108 to Pocomoke Avenue								
2000	<u>Local Bus Replacement</u> Purchase 1 new vehicle; rehab 6 vehicles								
2000	<u>Howard County Shuttle Service</u> Shuttle service from MARC to BWI employers	0	-3	-0.01	-0.36	-0.01	-0.14	-0.01	-0.11
2001	<u>Signal Systemization - US 1</u> Amberton Drive to Business Parkway								
2002	<u>Howard County Spinal Pathway - Phase III B</u> Construct a bicycle/pedestrian trail from Lake Elkhorn to Savage Park.	-2	-4	-0.01	-0.5	-0.01	-0.19	-0.01	-0.14
2002	<u>Baltimore Region Rideshare Program - 2003</u> Provides funding support to local rideshare coordinators to strengthen ridematching and ridesharing coordination services to both commuters and employers								
2004	<u>Bus Shelter Program</u> Expand bus shelter program	-1	-9	-0.03	-0.93	-0.03	-0.35	-0.03	-0.27
2005	<u>Centennial Access Pathway</u> .5 mile trail from Old Annapolis Road to Centennial Road								

Implementing Agency

Jurisdiction

Vehicles
VT VMT

Vehicle Emissions kg/year

2010		2020		2030	
Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx

Regionwide

Year Project Name/Description

1997 ENDZONE Partners Program - 1997

Public/private partnership working to improve air quality by motivating individuals to take voluntary actions that reduce emissions.

1997 CHART - 1997

Focuses on non-recurring congestion, includes traffic patrols, video traffic management, variable message signs, permanent congestion monitoring systems, and a rapid response team.

1997 Baltimore Region Rideshare Program - 1997

Provides funding support to local rideshare coordinators to strengthen ridematching and ridesharing coordination services to both commuters and employers

1998 ENDZONE Partners Program - 1998

Public/private partnership working to improve air quality by motivating individuals to take voluntary actions that reduce emissions.

1998 Baltimore Region Rideshare Program - 1998

Provides funding support to local rideshare coordinators to strengthen ridematching and ridesharing coordination services to both commuters and employers

Implementing Agency

Implementing Agency	Jurisdiction	Vehicles		Vehicle Emissions kg/year								
				2010		2020		2030				
				Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx			
		VT	VMT									
1998	<u>CHART - 1998</u>											
	Focuses on non-recurring congestion, includes traffic patrols, video traffic management, variable message signs, permanent congestion monitoring systems, and a rapid response team.											
1999	<u>ENDZONE Partners Program - 1999</u>											
	Public/private partnership working to improve air quality by motivating individuals to take voluntary actions that reduce emissions.											
1999	<u>CHART - 1999</u>											
	Focuses on non-recurring congestion, includes traffic patrols, video traffic management, variable message signs, permanent congestion monitoring systems, and a rapid response team.											
1999	<u>Baltimore Region Rideshare Program - 1999</u>											
	Provides funding support to local rideshare coordinators to strengthen ridematching and ridesharing coordination services to both commuters and employers											
2000	<u>On-line Transit Store</u>											
	Web site that provide a variety of transit passes, to purchase tickets and provides transit information											
2000	<u>ENDZONE Partners Program - 2000</u>											
	Public/private partnership working to improve air quality by motivating individuals to take voluntary actions that reduce emissions.											
2000	<u>Bus Replacements</u>			0	0	0	-13871	0	-11326	0	0	0
	Purchase 67 new buses											

Implementing Agency**Jurisdiction****Vehicles**
VT VMT**Vehicle Emissions kg/year****2010****2020****2030****Direct PM2.5 NOx****Direct PM2.5 NOx****Direct PM2.5 NOx**

2000 CHART - 2000

Focuses on non-recurring congestion, includes traffic patrols, video traffic management, variable message signs, permanent congestion monitoring systems, and a rapid response team.

2000 Baltimore Region Rideshare Program - 2000

Provides funding support to local rideshare coordinators to strengthen ridematching and ridesharing coordination services to both commuters and employers

2001 MARC New Bi-level Coach Purchase

Purchase and use 50 bi-level coaches

2001 CHART - 2001

Focuses on non-recurring congestion includes traffic patrols, video traffic management, variable message signs, permanent congestion monitoring systems, and a rapid response team.

2001 Baltimore Region Rideshare Program - 2001

Provides funding support to local rideshare coordinators to strengthen ridematching and ridesharing coordination services to both commuters and employers

2001 Light Rail Vehicle Purchase

Purchase 18 vehicles

2002 Chart 2002

Focuses on non-recurring congestion includes traffic patrols, video traffic management, variable message signs, permanent congestion monitoring systems and rapid response team.

Implementing Agency	Jurisdiction	Vehicle Emissions kg/year							
		Vehicles		2010		2020		2030	
		VT	VMT	Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx
2003	<u>Baltimore Region Rideshare 2003</u> Provides funding support to local rideshare coordinators to strengthen ridematching coordination services to both commuters and employers. Grants provided for rideshare in AA Co., Balt City, Balt Co., Carroll Co., Harford Co., and Howard Co.								
2003	<u>Multi-modal Traveler Information System</u> Collect traffic, transit, and tourism data, consolidate it, and disseminate information to travelers								
2004	<u>LTR Cromwell Maintenance and Layover Facility</u> Staging and management of Light Rail vehicles								
2005	<u>Bus Replacements</u> Purchase 125 buses in Contract Year - 2	0	0	0	-50159	0	-57567	0	0
2005	<u>Bus Replacements</u> Purchase 107 buses in Contract Year - 3 94 - 40ft. Low-floor diesel buses 3 - 30ft. Low-floor diesel buses 10 - 40ft. Hybrid electric buses			0	-42133	0	-48357	0	0
2005	<u>Clean Fuel Vehicle Program</u> Funding incentives for alternative fuel vehicle deployment in taxi, limo, bus fleets	0	0	0	71.21	0	94.69	0	94.69
2005	<u>Bus EPA Engine Upgrades</u> Perform engine overhaul/replacement on 318 MTA buses that includes addition or upgrade of catalytic converters and EPA-approved engines and rebuild kits required to meet the 0.19 bhp-hr emission regulations.								

Implementing Agency	Jurisdiction	Vehicle Emissions kg/year							
		Vehicles		2010		2020		2030	
		VT	VMT	Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx

2005 Congestion Outreach

To be determined

2005 Bus Replacements

Purchase 100 buses in Contract Year - 1

0 0

0 -69204

0 -39564

0 0

Private - American Lung Association

Regionwide

Year Project Name/Description

2001 Clean Commuter Club

Promote the use of transit through education, outreach, and incentives (discount a certain retailers).

State Of MD

Regionwide

Year Project Name/Description

2003 Advanced Technology Vehicles

State of MD CNG Fleet

0 0

0 129.35

0 162.44

0 162.44

Programmed Transportation Projects

Implementing Agency	Jurisdiction	Vehicles		Vehicle Emissions kg/year					
				2010		2020		2030	
				Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx

Anne Arundel County

Anne Arundel Co.

Year Project Name/Description

2006	<u>South Shore Trail</u>			-0.01	-0.53	-0.01	-0.2	-0.01	-0.15
	Acquire property, design and construct a trail (link with Annapolis Pathway System), between Annapolis and Odenton on WB&A								
2006	<u>Odenton MARC Enhancement Phase II</u>								
	Provide a direct sidewalk connection between Odenton Rd. and the Odenton Marc Train Parking Area and a sidewalk extension between Morgan Rd. and MD 170.								
2007	<u>Odenton Rd Sidewalk</u>								
	Pedestrian improvements to Odenton road, recommended in the town plan (includes connection to Marc station)								
2007	<u>Cape St. Claire Rd. Wide</u>			-0.01	-0.53	-0.01	-0.2	-0.01	-0.15
	Design and construct widening of road between Woodland Circle and Hilltop Dr., and provide sidewalks								

Implementing Agency

Jurisdiction	Vehicles		Vehicle Emissions kg/year							
			2010		2020		2030			
			Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx		
2007 <u>Freetown Rd. Sidewalk</u>										
<p>This project provides sidewalks along Freetown Rd. and Spencer Rd. in the Freetown Community. Phase I is a sidewalk along Freetown Rd. from Freetown Park to Solley. Rd. Phase II is a sidewalk along Spencer Rd. from Freetown Rd. to Pine Way. Phase III is a sidewalk along Spencer Rd. from Howard Manor Dr. to Lincoln Dr.</p>										
2007 <u>Pasadena Road Improvements</u>										
<p>Based on input from the Citizen's Advisory Committee, funds are requested to address impacts of East-West Boulevard traffic on Pasadena Road. This project will include sidewalks on both sides of the road, two median islands with associated road widening, a raised intersection at Penny Lane, and the relocation of the intersection at Spruce Lane to improve sight distance.</p>										
2007 <u>St. Margaret & Browns Woods Int</u>										
<p>This project is to study the intersection of MD 179 and Browns Woods Rd. to eliminate the severely skewed intersection angle and to provide sidewalks for pedestrian safety.</p>										
2007 <u>Downs Park Renov</u>										
<p>This project will provide a number of renovation projects within Downs Park, including repaving of roadways and trails.</p>										
2008 <u>Broadneck Peninsula Trail</u>			-0.01	-0.53	-0.01	-0.2	-0.01	-0.15		
<p>Develop multi-use trail to connect Bay Bridge and Sandy Point State Park with B&A Trail</p>										

Implementing Agency**Jurisdiction****Vehicles**
VT VMT**Vehicle Emissions kg/year****2010** **2020** **2030**
Direct PM2.5 **NOx** **Direct PM2.5** **NOx** **Direct PM2.5** **NOx**

2009 Odenton Town Center Blvd.

Creation of a roadway and sidewalk from MD 175 through the MD 32 underpass to Town Center Blvd in Seven Oaks.

2009 Kinder Park Development

This project authorizes the preparation of a master plan and the design and construction of Kinder Farm Park. The master plan calls for trails, among other items.

Baltimore City

Baltimore City

Year Project Name/Description

2006 Traffic Management Center

Design/build contract to upgrade the existing Traffic Management Center.

2006 Museum Walk Streetscaping Program

A unified streetscape treatment that will guide tourists to the new African-American Museum is to be installed in the vicinity of Pratt and President Streets. FY 2005 funds are for design and construction.

2006 Pleasant Street Streetscape

Resurfacing, sidewalk reconstruction and streetscape improvements are scheduled for Pleasant St. from Charles St. to St. Paul St. as part of the downtown Streetscape Program.

Implementing Agency**Jurisdiction****Vehicles**

VT VMT

Vehicle Emissions kg/year**2010****2020****2030**

Direct PM2.5

NOx

Direct PM2.5

NOx

Direct PM2.5

NOx

2006 Fayette Street Streetscape

Work is to include total rehabilitation of the street, new curbs, sidewalks, roadway sub-base repairs, roadway surface, etc. FY 2004 funds are for construction.

2006 Charles Street Streetscape Improvements

From Madison St. to North Ave. -- Street resurfacing, new sidewalks with streetscape amenities to include brick and concrete pavers, tree grates, benches, newspaper corrals, and sidewalk ramps.

2006 Robert E. Lee Park - Bridge Replacement

The bridge that crosses the Jones Falls to provide access to Robert E. Lee Park is severely decayed and is to be completely replaced.

2006 Traffic Signal System Integration

Funds are needed to continue the Traffic Integration Project which was issued a notice to proceed in July, 2003.

2006 Druid Hill Park: Pedestrian Entrance Improvements

Major pedestrian entrances in Druid Hill Park are to be renovated to improve neighborhood access to the park and the Jones Falls Greenway. Improvements will include new walks, new steps, ADA ramps, park lighting and park entrance signs.

2006 Govans Area Streetscape Improvements

Streetscape and sidewalk improvements are scheduled for 5500-5700 York Rd. to Northern Parkway Phase II is from Cording to Northern Parkway including sidewalk construction, curb and sidewalk repairs, street lighting, trees and trash receptacles.

Implementing Agency**Jurisdiction****Vehicles**
VT VMT**Vehicle Emissions kg/year****2010** **2020** **2030**
Direct PM2.5 **NOx** **Direct PM2.5** **NOx** **Direct PM2.5** **NOx**

2006 North Baltimore Collegetown Bike Routes

Designated bike routes will connect colleges and universities, primarily located in North Baltimore to each other and to the Jones Falls Trail, light rail stations, and neighborhood centers. The bike routes will be nearly evenly divided between separate striped bike lanes on existing roadways and "share the road" bicycle friendly streets marked with signage.

2006 Star Spangled Heritage Trail- Phase II

Complete design and installation of Phase II of the Star Spangled Heritage Trail, a system of interpretive kiosk signs, site signs, and sidewalk markers, integrated with the Downtown Pedestrian Wayfinding System, from Monument Square to Penn Station.

2006 W. Baltimore Street Streetscape

Baltimore St. between Charles and Howard streets require pedestrian level lighting, sidewalk base repairs. Some street resurfacing is required from Charles to Greene to complete the "connection" to the Westside Initiative.

2006 Center Plaza Improvements

Center Plaza is to be redesigned and renovated to correct its unsafe and deteriorated surface condition.

2006 Calvert Street Streetscape

Calvert St. from Fayette to Baltimore St. needs pedestrian level lighting, sidewalk repairs and street resurfacing to complete the "connection" between Municipal Center and streetscape improvements completed in the area.

Implementing Agency

	Jurisdiction	Vehicles		Vehicle Emissions kg/year								
				2010		2020		2030				
				Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx			
		VT	VMT									
2007	<u>Harford Road Modifications and Streetscape Enhancements</u>											
	Various roadway modifications including traffic calming measures, landscaping, and other streetscape enhancements are to be implemented on Harford Rd. between Argonne Dr. and Bayonne St. FY 05 funds are for construction.											
2007	<u>Central Avenue Reconstruction</u>											
	Total reconstruction of the street between Monument and Lancaster Streets , including new curbs, sidewalks, roadway subbase, roadway surface, utility adjustments, lighting, signage, and lane markings											
2007	<u>Signal Timing Optimization Citywide</u>											
	Funds are to be for a program to analyze existing and develop new traffic signal timing plans for each of the 1,300 signalized intersections in Baltimore.											
2007	<u>Druid Hill Park: Jones Falls Greenway Extension</u>											
	The pedestrian/bicycle path system in Druid Hill Park will be renovated to extend the Jones Falls Greenway through Druid Hill Park. The project is also to include resurfacing existing walks and making new connections for safe crossings at park roads.											
2007	<u>West Side Corridor Transportation Improvements</u>											
	The Westside Intermodal Corridor Study was conducted to identify opportunities in a corridor between Frederick Ave. and Liberty Heights Ave. The study recommends a trail extension and an intersection improvement. FY2005 funds are for construction.											

Implementing Agency**Jurisdiction****Vehicles**
VT VMT**Vehicle Emissions kg/year****2010****2020****2030****Direct PM2.5 NOx****Direct PM2.5 NOx****Direct PM2.5 NOx**

2007 West Side Corridor Study

Reconfigure Franklinton Road Corridor; create hiker/biker trail tie into Gwynn Falls Greenway

2007 Mt. Vernon Cultural District Streetscape Improvements

Street and sidewalk improvements are to be implemented in the Mt. Vernon Cultural District as part of District's Plan to stabilize and enhance the commercial, office, and residential environment of the area. FY 05 funds will construct Mt. Vernon Place.

2007 Charles Street Reconstruction

Total reconstruction of the street between 25th Street and University Parkway , including new curbs, sidewalks, roadway subbase, roadway surface, utility adjustments, lighting, signage, and lane markings.

2008 St. Paul Place Streetscape Phase II

Streetscape improvements are scheduled for the west side of St. Paul St. (Upper St. Paul Place) from Saratoga St. to Centre St. This is a continuation of the Downtown Streetscape program.

2008 Gateways: Preston Gardens Walkway & Stair Restoration

Renovation of Preston Gardens is to include replacement of sidewalks and the restoration of the historic stone stairways in the St. Paul median.

Implementing Agency

	Jurisdiction	Vehicles		Vehicle Emissions kg/year					
				2010		2020		2030	
				Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx

2008 Gateways: Mt. Vernon Park Master Plan Implementation - East Panel
 Phase II of implementation of the Mount Vernon Master Plan is to include restoration of the walks and gardens of the east square. The sidewalks are to be replaced and planting beds protected from pedestrians. The layout will be adjusted to meet ADA codes.

2008 Lombard St./Light St. Streetscapes
 Pedestrian lighting and sidewalk improvements are needed for both sides of Lombard St. between Market Place and Howard as well as the resurfacing of Light St. between Lombard and Redwood with sidewalk reconstruction on west side of the block.

2008 Orleans Street Streetscape
 Work is to include total rehabilitation of the street, new curbs, sidewalks, roadway sub-base repairs, roadway surface, lighting, etc.

2008 Inner Harbor Promenade
 Install promenade (for particular properties); obtain easements; complete promenade

2008 Saratoga Street Streetscape
 Resurfacing and streetscape improvements are scheduled for Saratoga St. to Eutaw St. to St. Paul St. as part of the Downtown Streetscape Program. Elements include new poured sidewalks and curbs, pedestrian lighting, landscaping and furniture.

Implementing Agency	Jurisdiction	Vehicles		Vehicle Emissions kg/year					
				2010		2020		2030	
				Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx

2008 Dundalk Transportation Study

Evaluate the transportation needs of the heavy industries located in the extreme southeastern sector of the City. Develop truck routing options which meet the needs of the businesses while minimizing the impact on residential corridors.

2008 Union Wharf

This project is for the construction of water front structures at Union Wharf around 760 feet in length and a pedestrian bridge across the waterway at the east end of Thames St.

2008 East Baltimore Redevelopment Area Street Improvements

Various street improvements including: reconstruction, resurfacing, realignment, new streets, new sidewalks, street trees, landscaping, traffic calming, etc.

Baltimore Co.

Baltimore Co.

Year **Project Name/Description**

2006 Regional Park Development

Development of indoor and outdoor regional park facilities throughout the county. Amenities include athletic fields, comfort stations, trails, etc.

2006 Park & Recreation Center Accessibility

New construction and/or capital renovation of recreation facilities including comfort stations, pavillions, picnic and seating areas, boating areas, parking facilities and pathways in accordance with ADA.

Implementing Agency**Jurisdiction****Vehicles**
VT VMT**Vehicle Emissions kg/year**

2010		2020		2030	
Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx

2006 Dundalk Streetscape

Dundalk Ave. provides identifying character to the communities which it serves. This project will enhance and improve the image of Dundalk.

2006 Nunnery Lane

Rehabilitation of existing roadway which includes the reconstruction of curb, gutter, and sidewalk.

2006 Greenways/Stream Valleys/Trails Dvlp.

Acquisition and development of stream valley parks and greenways throughout the county including development of recreational trails.

2006 Recreation Facility Renovations

Capital improvements and/or capital renovations to existing parks and facilities including comfort stations, plantings, benches, pavilions, lighting, sidewalks, fountains, etc.

2006 Tall Trees Park

This park is being constructed on the site of the former Village of Tall Trees Apartment Complex. It will consist of walking paths, athletic fields and picnic areas.

2006 Community Conservation Rd. Improvements

This project provides the funds to implement community conservation roadway improvement efforts throughout the county. FY 05 funds are for a round-about at the intersection of Sollers Point Rd. and Dundalk Ave. in Dundalk.

Implementing Agency**Jurisdiction****Vehicles**

VT VMT

Vehicle Emissions kg/year**2010****2020****2030**

Direct PM2.5 NOx

Direct PM2.5 NOx

Direct PM2.5 NOx

2006 Kenwood Avenue

This project will consist of roadway improvements that will include the construction of storm drains, curb, gutter, and sidewalks which will improve pedestrian safety. These improvements will provide a safe place for school children to walk to Golden Ring Middle School.

2006 Grays Road

Funding to rehabilitate and reconstruct an industrial road to improve access to the industrial corridor served.

2006 Traffic Signals

Construction of new traffic signal poles and replacement of existing traffic signal poles, controller/cabinets where necessary. Also included is the installation of video monitors at some intersections.

2006 Church Lane-North

This project will rehabilitate about 5000 feet of roadway to increase vehicular and pedestrian traffic service and safety.

2006 Traffic Calming

This project will support a traffic calming program countywide in response to concerns from various communities.

2006 Curbs, gutters and sidewalks

Replacement and repair of deteriorated curbs, gutters and sidewalks as well as construction of new sidewalks where needed.

Implementing Agency	Jurisdiction	Vehicles		Vehicle Emissions kg/year							
				2010		2020		2030			
				VT	VMT	Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx
2006	<u>Countywide Revitalization</u>										
	To fund acquisition, demolition, renovation, repair, maintenance, development or redevelopment of residential or commercial properties to enhance and foster community open space, recreation, public infrastructure and improvements, economic development, streetscapes, and community revitalization.										
2006	<u>Street Rehabilitation (Countywide)</u>										
	Among other things, this project provides for regrading, repaving, draining and widening of existing county streets where residents have petitioned for widening, sidewalks, curbs and gutters.										
2006	<u>Sidewalk Ramps Program</u>										
	This project provides funds to construct sidewalk ramps to assist the handicapped.										
2006	<u>Community Conservation</u>										
	Funds to community conservation efforts throughout county (given to community associations)										
2006	<u>Countywide revitalization</u>			-0.01	-0.54	-0.01	-0.21	-0.01	-0.15		
	Provides ped streetscape improvements in commercial revitalization areas										
2006	<u>Dundee-Salt peter Creek</u>										
	Design of additional trail system and marine study facilities (phase II, 1998)										
2006	<u>Community Conservation</u>			-0.01	-0.54	-0.01	-0.21	-0.01	-0.15		
	Funds to community conservation efforts throughout county (given to community associations)										

Implementing Agency

Jurisdiction	Vehicles		Vehicle Emissions kg/year							
			2010		2020		2030			
			VT	VMT	Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx
2007	<u>Community/Neighborhood Park Development</u>									
	Various-- including Greenways/Stream Valleys/ Trails Dev (12.309)									
2007	<u>Greenways/Stream Valleys/Trails Dev.</u>									
	Acquisition and development of stream valley parks and greenways, including develop rec trails county wide, Turner Station Park)									
2007	<u>Benjamin Bannecker Historical Park</u>									
	Develop historical/nature study area, construction of visitor's area, expansion of trails and maintenance facilities (Oella Ave and Old Frederick)									
2007	<u>Gwynns Falls Stream Valley Park</u>									
	Construct trail system between Milford Mill Road and Old Court Road									
2007	<u>Owings Mills Joint Development</u>									
	Build a town center that includes a square, main street, road and path network, hotel, library, education center.									
2007	<u>Dundalk Heritage Trail and Park</u>									
	Funds to construct a trail and park that will connect the center of historic Dundalk to Baltimore City and the waterfront.									
2009	<u>Waterfront Enhancement</u>									
	New development and/or capital renovation of water-related facilities at waterfront parks including boat ramps, fishing piers, bulkheads, parking and trails.									

Carroll County

Carroll Co.

Year Project Name/Description

Implementing Agency	Jurisdiction	Vehicles		Vehicle Emissions kg/year					
				2010		2020		2030	
				Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx
2008	<u>Deer Park Linear Trail</u>			0	-0.13	0	-0.05	0	-0.04
	This project provides planned funding for the development of a six-foot wide, 1.04 mile macadam multi-purpose trail at Deer Park for walking, biking and in-line skating.								
2011	<u>Middlebrooke Community Trail</u>								
	Construct a 1.3 mile, 6-ft wide trail extending from the Health Dept. to the Middlebrook residential development, to the Carroll County Farm Museum, past the Carroll County General Hospital, and finally to the Landon C. Burns Park. Project will interconne								
2013	<u>Sykesville to Piney Run Park Greenway</u>			-0.05	-1.94	-0.04	-0.72	-0.04	-0.55
	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.								

City of Annapolis

Annapolis

Year Project Name/Description

2006	<u>Smart Bike Program</u>
	Institute a Smart Bike program -- locating computerized bike racks/bikes at key locations throughout the City near bicycle trails, commercial areas, and transit facilities. Registered users will use a smart card to access the bikes.

Implementing Agency	Jurisdiction	Vehicles		Vehicle Emissions kg/year					
				2010		2020		2030	
				Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx

2008 Coordinated Traffic Signal Control System

A coordinated traffic control system for all City owned traffic signals to optimize traffic flows by real time cycle adjustments as detected by the monitoring system.

2008 Gateway Enhancements

Extend the theme of the Naval Academy View Bridge to the King George Street Bridge and connecting to West Annapolis with the use of street lighting, stone walls, brick accent sidewalks, bicycle trail, decorative iron fencing and a traffic circle at the Rte. 450 / King George Street intersection.

2008 Poplar Avenue Trail (Admiral Dr. from Poplar to Jennifer Rd.)

Extend the trail system along Admiral Dr. to make connections from the existing Poplar Trail to the South Shore Trail in AACo. near Annapolis Mall.

-0.01 -0.53 -0.01 -0.2 -0.01 -0.15

2010 Taylor Avenue Bike/Ped Facilities

Build a new bike/ped trail along Taylor Avenue

2010 Transit Center

Feasibility study followed by design, land acquisition, and construction of a multi-modal transit plaza. Current design is an open air plaza with shelters, information displays, and passenger amenities.

Harford County

Harford Co.

Year Project Name/Description

Implementing Agency

Jurisdiction	Vehicles VT VMT		Vehicle Emissions kg/year					
			2010		2020		2030	
			Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx
2007 <u>Tollgate Road/W. Ring Factory - Plumtree</u> Project to widen this section of Tollgate Rd. to 30 feet to provide the ability/potential to accommodate a large percentage of bicycles as well as vehicles.			0	-0.16	0	-0.06	0	-0.05
2007 <u>Bike Trails/Linear Park Development</u> Project to acquire and develop bike trails, greenways and linear parks. Greenways and linear parks are to be acquired and constructed as connections between parks and centers of population.								
2007 <u>Edgeley Grove Farm</u> Development of the site will include active recreation facilities and construction of a hiker/biker trail crossing Winters Run to Heavenly Waters Park.								
2008 <u>Southampton Road Bridge</u> Design and reconstruct bridge #47 over Bynum Run. Will increase capacity for the roadway, make approaches safer, allow for bicycle traffic and provide safer intersection at Moores Mill Road.								
2010 <u>Singer Road Improvements</u> Singer Rd. from Winters Run Bridge east to Beaver Dam Rd. is to be upgraded to safely handle the capacity of the road segment as well as add sidewalks or a hiker/biker trail to access the Winters Run stream valley area.								

Howard County

Howard Co.

Year Project Name/Description

Implementing Agency	Jurisdiction	Vehicles		Vehicle Emissions kg/year							
				2010		2020		2030			
				VT	VMT	Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx
2006	<u>Centennial Park Access Pathway</u>			-0.01	-0.5	-0.01	-0.19	-0.01	-0.14		
	Project to develop a pathway along Little Patuxent River from Old Annapolis Rd. to MD 108 and connecting with the existing pathway system in Centennial Park.										
2006	<u>High Ridge Park Sidewalks</u>			-0.01	-0.62	-0.01	-0.24	-0.01	-0.17		
	A project for the installation of approximately 2,500 LF of sidewalks to provide for safe walking on All Saints Rd. and near MD 216 bridge.										
2006	<u>North Laurel Sidewalks</u>			-0.01	-0.5	-0.01	-0.19	-0.01	-0.14		
	Sidewalk construction requested by the public in North Laurel to provide sidewalks along Madison Ave.; Baltimore Ave.; and Decatur Rd.										
2006	<u>Hickory Ridge Roadside Improvements</u>										
	A project for the design and construction of various walkways along neighborhood roads.										
2007	<u>Sidewalk Repair Program</u>										
	This project is for the repair of deteriorated sidewalks and driveway aprons that are in public rights-of-way.										
2007	<u>Broken Land Pkwy IVHS Corridor</u>										
	Project to construct a traffic responsive signal system from MD 108 along Harpers Farm Rd. and Twin Rivers Rd. tying into the existing signal system along Broken Land Pkwy., continuing to Guilford Rd and run along Guilford Rd to Old Columbia Rd. Project										
2007	<u>Broken Land Parkway Sidewalks</u>			-0.01	-0.51	-0.01	-0.19	-0.01	-0.14		
	A project for the design and construction of a sidewalk along the east side of Brokenland Parkway between the two intersections with Cradlerock Way.										

Implementing Agency	Jurisdiction	Vehicle Emissions kg/year							
		Vehicles		2010		2020		2030	
		VT	VMT	Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx
2007	<u>Junction Industrial Park Sidewalks</u>			-0.01	-0.51	-0.01	-0.19	-0.01	-0.14
	A project for the design and construction of approximately 4,000 LF of walkways to serve the business community.								
2007	<u>Construction of traffic response signal system along 4 roadways</u>								
	Construct a traffic responsive signal system to interconnect existing signals along Snowden River Pkwy, Harpers Farm Rd., Cedar Lane, Oakland Mills Rd and Twin Rivers Rd.								
2007	<u>Roadway Emergency Management and Information System</u>								
	Project to create a computerized database built on the County's GIS system. This system would allow all county agencies to access the operational status of all roads, bridges and drainage systems.								
2007	<u>Hunt Club Sidewalk</u>			-0.01	-0.77	-0.01	-0.29	-0.01	-0.21
	Construction of approximately 4,000 LF of sidewalk along Hunt Club Rd. from US 1 to Bauman Dr.								
2007	<u>Construction of pedestrian access along State roads.</u>			-0.01	-0.5	-0.01	-0.19	-0.01	-0.14
	Project to construct improved pedestrian access facilities along State roads. Grant funds available through State Retrofit Sidewalk Program. Design underway for projects along US 1 and MD 103.								
2007	<u>Walkways along neighborhood roads for internal sidewalk system</u>			-0.01	-0.5	-0.01	-0.19	-0.01	-0.14
	A project for the design and construction of various walkways along neighborhood roads to complete an internal sidewalk system. Project locations: Owen Brown Rd; Cardinal Lane, Freetown Rd.; Martin Rd.; Cedar Lane ; Audobon Drive, and Harriet Tubman.								

Implementing Agency	Jurisdiction	Vehicles		Vehicle Emissions kg/year					
				2010		2020		2030	
				VT	VMT	Direct PM2.5	NOx	Direct PM2.5	NOx
2007	<u>St. John's Lane Sidewalk</u>			-0.01	-0.5	-0.01	-0.19	-0.01	-0.14
	Project to construct sidewalk and pathway improvements along St. Johns Lane to link Mt. Hebron High School to Misty Woods Lane.								
2008	<u>Sidewalks for Guilford Elementary School</u>								
	Installation of sidewalks/pathways to provide safe walking route for school children . Projects awaiting requests include: Montgomery Rd.; Oakland Mills Rd.; Stevens Rd.; Guilford Elementary School Pedestrian Network. Project continues K-5024.								
2008	<u>Robert Fulton Sidewalks</u>			-0.01	-0.51	-0.01	-0.19	-0.01	-0.14
	A project to construct approximately 4,000 LF of sidewalk along Robert Fulton Drive from Solar Walk Way to Columbia Gateway Drive.								
2008	<u>Port Capital Sidewalks</u>			-0.01	-0.51	-0.01	-0.19	-0.01	-0.14
	A project for the construction of approximately 1,200 LF of sidewalk along Port Capital Drive from US1 to New Colony Boulevard.								
2008	<u>FY02 Bus Stop Improvements</u>			-0.25	-9.3	-0.25	-3.48	-0.25	-2.7
	Implement a series of improvements to Howard Transit bus stops, including approach sidewalks, shelters, signs, and map holders.								
2008	<u>Columbia - 100 Parkway Area Sidewalks</u>			-0.01	-0.77	-0.01	-0.29	-0.01	-0.21
	Construction of approximately 4000 ft. of pedestrian sidewalks to connect residential communities along Columbia 100 Parkway to restaurant/shopping areas and Howard High School .								

Implementing Agency	Jurisdiction	Vehicles		Vehicle Emissions kg/year							
				2010		2020		2030			
				Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx		
2008	<u>MD 216 Pedestrian Facility</u>										
	A project to construct roadside improvements for approximately 7,000 LF along MD 216 between Lime Kiln Rd. and the Howard County Safety complex.										
2008	<u>Roadside Improvement Program</u>										
	This project is to repair, replace, or install sidewalks and ramps for handicapped areas.										
2008	<u>Snowden River Parkway Sidewalks</u>			-0.01	-0.77	-0.01	-0.29	-0.01		-0.21	
	Construction of approximately 4000 ft. of sidewalks from Dobbins Road to Tamar Drive										
2009	<u>Rogers Avenue Sidewalk</u>			-0.01	-0.51	-0.01	-0.19	-0.01		-0.14	
	A project to design and construct shoulders or walkways along Roger's Avenue from Route 40 to Faber Way.										
2009	<u>School Crosswalk Improvements</u>										
	This project is for the installation of crosswalks, raised cross walks, chokers, sidewalks, raised shoulders, signs and/or other roadway retrofits to provide for an enhanced walking route for school children.										
2009	<u>Pedestrian OverPass Program</u>										
	Program for pedestrian overpass in the vicinity of schools										
2009	<u>Cedar Villa Heights Sidewalks</u>										
	A project for the design and construction of sidewalk and curb and gutter along neighborhood roads.										

Implementing Agency	Jurisdiction	Vehicles		Vehicle Emissions kg/year						
				2010		2020		2030		
				Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx	
2010	<u>Residential Traffic Calming</u>									
	Project to construct geometric roadway changes to reduce traffic speeding in residential areas and to improve roadway safety at spot locations along collector roadways. Speed humps. Traffic circles, raised intersections, and slow points are technique tha									
2010	<u>Ilchester Road Walkways</u>			-0.01	-0.51	-0.01	-0.19	-0.01	-0.14	
	A project for the construction of a sidewalk on Ilchester Rd. from Crestwood Ln. to Wharff Ln.									
2010	<u>Guilford Rd Pedestrian/Bike Improvements</u>			-0.01	-0.5	-0.01	-0.19	-0.01	-0.14	
	Project to construct paved shoulders along one or both sides of Guilford Rd between Oakland Mills Rd. and Mission Rd.									
2010	<u>Pedestrian/Bicycle Improvements</u>			-0.01	-0.5	-0.01	-0.19	-0.01	-0.14	
	Project to construct pathway/bike links to the existing network to facilitate movement between light rail, and community and retail centers. Locations may include: Howard County spinal pathway in Savage to Savage MARC station; US 29 Columbia to Montgomer									
2010	<u>Long Gate Sidewalk</u>									
	The project is for the reconstruction of approximately 1,500 LF concrete curb storm drain inlets and sidewalk along Long Gate Parkway, including the bridge over MD 100.									
2010	<u>Pedestrian/Bicycle Improvements</u>			-0.01	-0.5	-0.01	-0.19	-0.01	-0.14	
	Design and construct pathway/bicycle links to the existing network to facilitate movement between MARC and community and retail centers. At some locations, install crosswalks, pedestrian indications, pedestrian phases, signing, ADA ramps, or advanced war									

Implementing Agency	Jurisdiction	Vehicles		Vehicle Emissions kg/year						
				2010		2020		2030		
				Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx	
2010	<u>US 40 Corridor Enhancement</u>									
	A project to plan, design and implement a series of streetscape, pedestrian, bicycle, and public green space improvements on public property.									
2010	<u>Community Renewal / Enhancements</u>									
	A project to design and implement a series of pedestrian improvements, streetscape enhancements and repair or enhancement of public green spaces.									
2011	<u>Pedestrian Overpass Program</u>			-0.01	-0.5	-0.01	-0.19	-0.01	-0.14	
	Construct pedestrian bridges/overpasses in the vicinity of schools									
2011	<u>US 1 Corridor Revitalization</u>									
	Plan, design, and implement a series of streetscape, pedestrian, bicycle, and public green space improvements.									
2011	<u>Oakland Mills Rd. South - Walkway/Bikeway</u>			-0.01	-0.5	-0.01	-0.19	-0.01	-0.14	
	Project to construct pedestrian/bicycle improvements along Oakland Mills Road (south) from Snowden River Pkwy to Guilford Rd.									
2011	<u>General Sidewalk and Walkway Extensions</u>			-0.01	-0.48	-0.01	-0.18	-0.01	-0.13	
	A project to design and construct routine sidewalk and walkway extensions under 1,000 feet in length. Projects will be initiated by public request or where the need is created by development or to connect existing walks. Projects included are :St. Johns									

Implementing Agency

Jurisdiction	Vehicles VT VMT		Vehicle Emissions kg/year					
			2010		2020		2030	
			Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx

2012	<u>MD 99 Pedestrian Facility</u>			-0.02	-1.52	-0.02	-0.58	-0.02	-0.42
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Roadside improvements for approximately 12,000 LF along MD 99 where sidewalks and pathways are not interconnected and there are no shoulders for pedestrian and bicycle use. This project is beyond the scope of SHA improvements.

2012	<u>Transit Operation Repair Facility</u>								
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A project for site selection, acquisition, design and construction of a multi-jurisdictional transit facility.

MDOT

Anne Arundel Co.

Year Project Name/Description

2006	<u>MARC Odenton Parking Expansion</u>			-5.67	-175.43	-5.6	-65.38	-5.59	-51.72
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A 700-space parking lot, and a facility study for structured parking (garage or parking deck)

Baltimore City

Year Project Name/Description

2007	<u>Light Rail Cold Spring Station Parking</u>			-5.16	-163.16	-5.1	-61.09	-5.09	-48.6
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Construct a 300-space park-n-ride facility at the Cold Spring Light Rail Station.

Baltimore Co.

Year Project Name/Description

2006	<u>Signal Systemization - US 1 Alt</u>								
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Selma/Halethorpe Road to Lansdowne Rd

Implementing Agency

Jurisdiction	Vehicles		Vehicle Emissions kg/year					
			2010		2020		2030	
			Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx

Harford Co.

Year Project Name/Description

- 2006 Signal Systemization - MD 22
John Carroll Highschool to MD 543
- 2006 Signal Systemization - MD 22
Prospect Hill Rd. to Campus Hill SC.
- 2006 Signal Systemization - MD 22
Technology Dr. to Rogers Ave./US 40 ramps (new limits)

MDOT

Year Project Name/Description

2006	<u>Baltimore Region Rideshare Program - 2006</u> Baltimore Region Rideshare Program - 2006	-91.1	-3151.0	-89.95	-1173.3	-89.73	-911.79
2006	<u>Baltimore Region Rideshare Program - 2006</u> Baltimore Region Rideshare Program - 2006	-56.72	-2010.7	-56	-749.07	-55.86	-580.77
2006	<u>Baltimore Region Rideshare Program - 2006</u> Baltimore Region Rideshare Program - 2006	-9.12	-301.72	-9	-112.3	-8.98	-87.4
2006	<u>Baltimore Region Rideshare Program - 2006</u> Baltimore Region Rideshare Program - 2006	-29.17	-988.12	-28.8	-368.01	-28.73	-286.47
2006	<u>Baltimore Region Rideshare Program - 2006</u> Baltimore Region Rideshare Program - 2006	-52.81	-1906.9	-52.14	-711.18	-52.01	-552.23
2006	<u>Baltimore Region Rideshare Program - 2006</u> Baltimore Region Rideshare Program - 2006	-21.55	-813.5	-21.28	-304.47	-21.23	-235.88

Regionwide

Year Project Name/Description

Implementing Agency

Implementing Agency	Jurisdiction	Vehicles		Vehicle Emissions kg/year								
				2010		2020		2030				
				Direct PM2.5	NOx	Direct PM2.5	NOx	Direct PM2.5	NOx			
		VT	VMT									
2006	<u>MARC Halethorpe Station Parking Expansion</u>											
	Expand surface parking and investigate future parking at the Halethorpe MARC Station. 428 parking spaces will be added. The scope of the proposed work also includes high level platforms, new shelters, improved accessibility for persons with disabilities, lighting and streetscaping.											
2006	<u>MARC II Overhaul</u>											
	Overhaul 35 MARC II cars originally delivered in 1991 and 1993. In addition to system upgrades, install bike racks to toilet-equipped cars.											
2006	<u>Bus Replacements</u>			0	-48191	0	-48357	0		0		0
	Replace 105 buses in Contract Year - 4											
2007	<u>Light Rail Double Tracking</u>											
	Install double track on up to eight sections of the Light Rail system, consisting of improvements to trackwork, station platforms, structures, signaling, and communications.											

CHART CMAQ JUSTIFICATION

The goal of the Chesapeake Highway Advisory Routing Traffic (CHART) Program is to improve incident detection time, response time and clearance time to remove nonrecurring freeway obstructions and to re-route traffic around incidents if necessary. The statewide CHART operations centers continually survey states roadways to detect and clear incidents as quickly as possible.

According to a Performance Evaluation of the CHART Program prepared by the University of Maryland, in 2004, the traffic patrols alone saved 32.05 million vehicle hours of delay. The overall computation results from this finding show that there would be a total of 263.24 million vehicle hours of delay without CHART funded incident reduction efforts. In contrast, due to the efficient response of CHART, the total average weekday vehicle delay has been reduced to 231.19 million hours, about 32.05 million hours less idle time.

The estimated reductions in vehicle emissions and the total delay reduction of 32.05 million vehicle hours annually is estimated to save a total of 123,270 vehicle hours of idling time daily in the Baltimore and Washington regions together. Of this number, 68,008 vehicle hours of daily idling time will be reduced in the Baltimore region and 55,262 will be reduced in the Washington region. The emission reductions of **72.23 tons per year NOx** in the Baltimore region will provide benefits to help this nonattainment area meet its air quality mandate as well as provide for the transportation needs of its citizens.

Emissions analysis calculation: (MOBILE6)

Baltimore Region:

1. 68,008 daily vehicle hours of idling saved
2. Idling emission factors 2010: NOx 3.707 gm/hr
3. $\text{NOx} = ((3.707 \times 68,008) / 1000) \times .001102 \times 260 \text{ weekdays/year} = \underline{72.23 \text{ tons/year}}$

REGIONAL COMMUTER ASSISTANCE (RCA) PROGRAM

The Regional Commuter Assistance program is a voluntary regionwide program for reducing Single Occupant Vehicle use by employees that work for large and small employers. This program is an employer- and employee-friendly successor to the Employee Commute Options program mandated by the federal Clean Air Act Amendments of 1990.

The RCA program is a regional programmatic overlay that encompasses traditional commuter-related programs. The RCA program is part of the adopted 2004 Baltimore Regional Transportation Plan, and has been approved by the Maryland Department of Transportation as an Emission Reduction Strategy (ERS) for the Baltimore region.

This program includes traditional and emerging Emission Reduction Strategy (ERS) programmatic elements such as rideshare program (carpool and vanpool), transit information/ fare subsidy program, employer shuttle service, flexible work arrangements (flex hours and flex days), emergency ride home (ERH) program, parking cashout, preferential parking, video conferencing, live near your work, proximate commuting, etc. Telecommuting is also included as a menu item in the RCA program, but is accounted for separately for technical reasons.

HOME-BASED TELECOMMUTING

Home-based Telecommuting is a voluntary regionwide strategy for reducing SOV use by employees that work for large and small employers. This analysis uses different telecommuting utilization rates for employees of large and small employers as well as for employees of government and private organizations. The 1999 Baltimore Region Telecommuting Baseline Study documented the magnitude and characteristics of telecommuting on which this measure is based. This study showed a significantly higher level of telecommuting use than had been previously assumed (3.6% instead of the previous 2.0%).

The 2004 and 2005 Alternate Commute Surveys conducted by BMC confirmed the extent to which employers are providing telecommuting options for their employees, and the level of employee interest in this option.

Home-based telecommuting is one of the menu items of Emission Reduction Strategies (ERS) available in the Regional Commuter Assistance (RCA) program. However, the emission reduction potential of home-based telecommuting is analyzed separately from the more traditional programmatic components of the RCA program for technical reasons including fewer days per week telecommuting (2.91 days / week), and longer work trip length reductions (55.8 miles / day).

PARK-&-RIDE PROGRAM

Since the first lot was opened in Baltimore County in 1976, P-&-R lots have helped to reduce traffic congestion and air pollution in the Baltimore region. They function to intercept commuter and other trips, and permit travelers to transfer from single occupant vehicle commuting to more efficient travel modes that range from carpools to commuter rail trains.

The P-&-R program assumes the construction of new P-&-R spaces in the 2004 BRTP to meet projected demand. Under this plan, the 25,000 additional P-&-R spaces to be built would almost double the number of existing P-&-R spaces serving Baltimore region commuters and other users.

The proposed expansion of P-&-R facilities is based on the findings of the 2002 Baltimore Region P-&-R Study. This study documented the service areas, utilization rates, and travel characteristics associated with different types of P-&-R facilities. This study also documented the trip origins and destinations of P-&-R lot users.

Currently there are 105 P-&-R facilities containing over 28,000 parking spaces that serve the Baltimore region. These lots have been constructed and operated by a combination of the following: State Highway Administration, Maryland Transit Administration, and local governments. Future facilities are expected to be constructed by these organizations as well as by other groups in conjunction with possible joint development projects.

The new P-&-R spaces in the plan could include: 60% surface P-&-R spaces, 20% high access P-&-R spaces, 10% rail transit P-&-R spaces, and 10% leased P-&-R spaces. Parking spaces in the above categories are needed to meet the different segments of overall P-&-R demand identified in the 2002 P-&-R Study. It is assumed that the P-&-R spaces that will become operational in this program will yield VMT reductions that are proportional to VMT reductions documented in the 2002 P-&-R Study.

BICYCLE ELEMENT OF THE 2004 BRTP

This emission reduction strategy assumes the completion of the bicycle element of the Plan by 2020. This analysis also assumes completion of other bicycle-related improvements in the region by the same date.

The major groups of bicycle riders used in this analysis include bicycle commuters, college student bicycle riders, and other non-leisure bicycle users. Baseline data for bicycle commuters is the 2000 Census. Baseline data for college student bicycle riders is regional college enrollment information and projections. The other non-leisure bicycle users are projected as a percent of the other two bicycle user groups.

The projection of 2020 and 2030 bicycle commuters is based on Round 6-B population and employment projections. The projection of 2020 and 2030 college student enrollment and bicycle riders is based on a Maryland Department of Planning report -

Projections of Age, Race & Sex 2000-2030, 2004. The later report shows that the college age population group steadily increases until around 2010 and then gradually declines. An average bicycle trip length for the bicycle user groups used in this analysis is assumed to be 1.8 miles.

Based on an aggregate behavior approach, the increase in 2020 and 2030 bicycle use is assumed to be proportional to the proposed increase in planned regional bikeway facilities in the adopted Baltimore Regional Bicycle, Pedestrian and Greenway Transportation Plan. This measure assumes that the mileage of off-street bikeways that could be built by the 2030 would be completed by 2020. It is expected that new on-street bikeways would add additional bike trips, but these trips are not reflected in this analysis because of difficulties in accurately forecasting on-street bicycle usage.

APPENDIX I

Correspondence Related to the
Air Quality Modeling Process

[Correspondence related to the air quality modeling process
is available upon request.]

APPENDIX J

Resolutions

BALTIMORE METROPOLITAN PLANNING ORGANIZATION

**BALTIMORE REGIONAL TRANSPORTATION BOARD
RESOLUTION #06-1**

**ENDORSEMENT OF ROUND 6-B COOPERATIVE FORECASTING PROCESS
THROUGH 2030 FOR USE IN LOCAL AND REGIONAL TRANSPORTATION AND
AIR QUALITY PLANNING PURPOSES**

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, and Howard, and the Maryland Department of Transportation, the Maryland Department of the Environment, and the Maryland Department of Planning; and

WHEREAS, the Metropolitan Planning Organization has responsibility for developing future estimates of travel demand in the Baltimore region and approving conformity analysis on the Baltimore Regional Transportation Plan and the Transportation Improvement Program for the Baltimore region; and

WHEREAS, in connection with these responsibilities, the Baltimore Regional Transportation Board established the Cooperative Forecasting Group to develop a consensus among State, local and regional planners regarding the current estimates and long-range projections of the growth and development in the Baltimore region; and

WHEREAS, the previously adopted Round 6-A forecasts have been updated to reflect the latest forecasts of socioeconomic development in the Baltimore region; and

WHEREAS, the Cooperative Forecasting Group has recommended to the Baltimore Regional Transportation Board a set of forecasts termed Round 6-B, developed at the 2000 transportation analysis zone structure, for use in transportation and air quality planning activities; and

WHEREAS, the purpose of the socioeconomic forecasting analysis is to provide inputs to decision makers to assist with determining the overall travel demand and air quality effects of growth, at the regional level, on future year highway and transit networks; and

NOW, THEREFORE, BE IT RESOLVED that the Baltimore Regional Transportation Board endorses the Round 6-B cooperative forecasting process for use in transportation and air quality planning in the Baltimore region as provided in Attachment 1.

I HEREBY CERTIFY that the Baltimore Regional Transportation Board, as the Metropolitan Planning Organization for the Baltimore region, approved the aforementioned resolution at its August 23, 2005 meeting.

Date

Harvey Gold, Chairman
Baltimore Regional Transportation Board

**Proposed Round 6-B
Cooperative Forecasts - Population and Household Controls**

ROUND 6-B POPULATION

<u>Jurisdiction</u>	<u>1990</u>	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>	<u>2020</u>	<u>2025</u>	<u>2030</u>
Anne Arundel County	427,239	489,656	511,600	526,800	540,100	551,000	562,100	567,600
Baltimore City	736,014	651,154	646,000	658,700	658,000	659,000	661,000	662,300
Baltimore County	692,134	754,292	790,700	819,700	832,900	841,900	844,300	846,800
Carroll County	123,372	150,897	169,500	179,700	187,000	191,900	194,100	193,200
Harford County	182,132	218,590	234,700	254,700	268,200	276,500	283,000	290,500
Howard County	187,328	250,800	273,500	294,200	308,900	319,300	320,300	321,100
Baltimore Region	2,348,219	2,515,389	2,626,000	2,733,800	2,795,100	2,839,600	2,864,800	2,881,500

ROUND 6-B HOUSEHOLDS

<u>Jurisdiction</u>	<u>1990</u>	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>	<u>2020</u>	<u>2025</u>	<u>2030</u>
Anne Arundel County	149,114	178,670	190,600	201,100	210,500	218,400	224,800	228,100
Baltimore City	276,484	257,996	256,600	266,400	271,800	272,000	272,900	273,400
Baltimore County	268,280	299,877	316,900	330,100	337,000	340,800	344,300	346,700
Carroll County	42,248	52,503	59,500	63,600	66,900	69,500	71,300	71,800
Harford County	63,193	79,667	87,500	96,100	103,200	109,200	113,800	117,200
Howard County	68,337	90,950	100,000	108,700	117,500	124,700	127,100	127,600
Baltimore Region	867,656	959,663	1,011,100	1,066,000	1,106,900	1,134,600	1,154,200	1,164,800

ROUND 6-B EMPLOYMENT

<u>Jurisdiction</u>	<u>1995</u>	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>	<u>2020</u>	<u>2025</u>	<u>2030</u>
Anne Arundel County	258,200	297,000	317,100	334,700	357,100	379,600	401,500	423,300
Baltimore City	452,400	460,600	467,300	479,000	489,000	497,200	505,000	505,000
Baltimore County	409,600	452,500	469,100	493,300	502,300	506,200	509,000	511,800
Carroll County	57,400	68,300	76,300	84,300	86,800	88,300	89,300	90,300
Harford County	80,500	96,000	105,100	111,100	115,500	119,900	124,500	124,500
Howard County	123,600	160,000	180,000	200,000	215,000	230,000	245,000	260,000
Baltimore Region	1,381,700	1,534,400	1,614,900	1,702,400	1,765,700	1,821,200	1,874,300	1,914,900

Note: Anne Arundel County data includes the City of Annapolis.

BALTIMORE METROPOLITAN PLANNING ORGANIZATION

**BALTIMORE REGIONAL TRANSPORTATION BOARD
RESOLUTION #06-2**

**APPROVAL OF THE BALTIMORE REGION
2006-2010 TRANSPORTATION IMPROVEMENT PROGRAM**

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, and Howard, and the Maryland Department of Transportation, the Maryland Department of the Environment, and the Maryland Department of Planning; and

WHEREAS, the 2006-2010 Transportation Improvement Program was prepared in response to the final guidance of the Intermodal Surface Transportation Efficiency Act regarding the metropolitan planning process and meets the spirit and intent of the Transportation Equity Act for the 21st Century, and all projects and activities funded in this document have been developed in relationship to the regionally adopted, 2004 Baltimore Regional Transportation Plan; and

WHEREAS, the Transportation Improvement Program is financially constrained by year and includes a financial plan that demonstrates that projects can be implemented using current revenue sources; and

WHEREAS, the Annual Element of the 2006-2010 Transportation Improvement Program is comprised of a mix of the following project categories: sixty-three percent highway preservation, eighteen percent emission reduction, six percent transit, eight percent environmental/safety, three percent enhancement program, one percent each commuter rail and miscellaneous; and

WHEREAS, the Annual Element of the 2006-2010 Transportation Improvement Program uses federal funds for the following categories: fifty-two percent to highway preservation, sixteen percent to emission reduction, twenty-four percent to transit, two percent to commuter rail, five percent to enhancement program, one percent to environmental/safety, and less than one percent each to highway capacity and miscellaneous; and

WHEREAS, opportunities for public comment were provided, including various public participation/education meetings on project elements, methodology and results of the conformity analysis and were duly considered by the Metropolitan Planning Organization in this deliberation process; and

WHEREAS, the Baltimore Metropolitan Planning Organization (MDOT certifies independently, as attached, as the direct recipient of funds) hereby certifies that the transportation planning process is addressing the major issues in the metropolitan planning area and is being conducted in accordance with all applicable requirements of:

- I. 49 U.S.C. Section 5323 (k) and 23 U.S.C. 134;
- II. Title VI of the Civil Rights Act of 1964 and the Title VI Assurance executed by each State under 23 U.S.C. 324 and 29 U.S.C. 794;
- III. Section 1101 of the Transportation Equity Act for the 21st Century (Pub. L.105-178) regarding the involvement of disadvantaged business enterprises in the FHWA and the FTA funded project (Sec.105 (f), Pub. L. 97-424, 96 Stat. 2100, 49 CFR part 23);
- IV. The provision of the Americans with Disabilities Act of 1990 (Pub. L.101-336, 104 Stat. 327, as amended) and the U.S. DOT implementing regulation;
- V. The provision of 49 CFR part 20 regarding restrictions on influencing certain activities; and
- VI. Sections 174 and 176 (c) and (d) of the Clean Air Act as amended (42 U.S.C. 7504, 7506 (c) and (d)).

NOW, THEREFORE, BE IT RESOLVED that the Baltimore Regional Transportation Board approves the 2006-2010 Baltimore Region Transportation Improvement Program.

I HEREBY CERTIFY that the Baltimore Regional Transportation Board, as the Metropolitan Planning Organization for the Baltimore region, approved the aforementioned resolution at its August 23, 2005 meeting.

Date

Harvey Gold, Chairman
Baltimore Regional Transportation Board

BALTIMORE METROPOLITAN PLANNING ORGANIZATION

**BALTIMORE REGIONAL TRANSPORTATION BOARD
RESOLUTION #06-10**

**APPROVAL OF THE CONFORMITY DETERMINATION OF THE
2004 BALTIMORE REGIONAL TRANSPORTATION PLAN AND
2006-2010 BALTIMORE REGION TRANSPORTATION IMPROVEMENT PROGRAM:
FINE PARTICULATE MATTER**

WHEREAS, the Baltimore Regional Transportation Board is the designated Metropolitan Planning Organization for the Baltimore region, and includes official representatives of the cities of Annapolis and Baltimore, the counties of Anne Arundel, Baltimore, Carroll, Harford, and Howard, and the Maryland Department of Transportation, the Maryland Department of the Environment, and the Maryland Department of Planning; and

WHEREAS, the Baltimore Regional Transportation Board, as the Metropolitan Planning Organization for the Baltimore region, is required under 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; and

WHEREAS, the Baltimore Regional Transportation Board, in concert with the Maryland Departments of the Environment and Transportation, developed a work program to address the conformity procedures specified in the above-mentioned rule in a time frame consistent with requirements in the Metropolitan Planning regulations; and

WHEREAS, a conformity determination has already been performed on the 2004 Baltimore Regional Transportation Plan and 2006-2010 Baltimore Region Transportation Improvement Program to address the 8-hour ozone standard and the carbon monoxide standard, this supplemental conformity determination only addresses the fine particulate matter standard; and

WHEREAS, this is the first conformity determination performed for the Baltimore nonattainment area for fine particulate matter, and the Baltimore Regional Transportation Board has accepted the methodology to perform the conformity determination from the Interagency Consultation Group which was made available to the public; and the U.S. Environmental Protection Agency has found the methodology to be consistent with applicable EPA regulations and guidance for performing the conformity analysis; and,

WHEREAS, an interim emissions test was applied in this conformity determination because there is currently no adequate or approved State Implementation Plan budget for fine particulate matter; the interim emissions test chosen for use was the one in which annual emissions of direct fine particulate matter and the fine particulate matter precursor

nitrogen oxides for horizon year scenarios are determined to be no greater than 2002 baseline emissions; and

WHEREAS, a comprehensive analysis of the 2004 Baltimore Regional Transportation Plan and 2006-2010 Baltimore Region Transportation Improvement Program has been conducted to ensure consistency with the interim emissions test for direct fine particulate matter and the fine particulate matter precursor nitrogen oxides; and

WHEREAS, opportunities for public comment, with respect to the methodology and results of the conformity analysis, were provided. These opportunities included the following: regularly scheduled Interagency Consultation Group meetings open to the public, a public comment period following internet posting of the draft conformity analysis, and an opportunity for a public meeting. These comments were duly considered by the Metropolitan Planning Organization in this deliberation process; and

WHEREAS, the analyses and findings are reported in the "Conformity Determination of the 2004 Baltimore Regional Transportation Plan and the 2006-2010 Baltimore Region Transportation Improvement Program: Fine Particulate Matter," dated December 2005, which provides a basis for a finding of conformity (Attachment 1) to the interim emissions test required by §93.109 (i)(2) of the Final Transportation Conformity Rule Amendments of July 1, 2004; and

NOW, THEREFORE, BE IT RESOLVED that the Baltimore Regional Transportation Board approves the Conformity Determination of the 2004 Baltimore Regional Transportation Plan and the 2006-2010 Baltimore Region Transportation Improvement Program: Fine Particulate Matter.

I HEREBY CERTIFY that the Baltimore Regional Transportation Board, as the Metropolitan Planning Organization for the Baltimore region, approved the aforementioned resolution at its December 13, 2005 meeting.

Date

Harvey Gold, Chairman
Baltimore Regional Transportation Board

Final Emissions Results
(tons/year)

		2010 Emissions		2020 Emissions		2030 Emissions		
		Direct PM2.5	NO _x	Direct PM2.5	NO _x	Direct PM2.5	NO _x	
2002 Baseline Year Emissions		1,043.51	63,759.38	1,043.51	63,759.38	1,043.51	63,759.38	
NETWORK BASED ANALYSIS		563.62	30,052.81	427.26	9,997.09	435.04	7,015.55	
Emission Reduction Strategies	IMPLEMENTED	-0.90	-172.98	-0.90	-154.22	-0.09	-0.60	
	PROGRAMMED TIP, CTP, & CIP	Rideshare	-0.29	-10.11	-0.28	-3.77	-0.28	-2.93
		Bus Replacement		-99.57		-106.61		0.00
		CHART (Areawide Congestion Management)		-72.23				
		Pathways/Bicycle trails	0.00	0.00	0.00	-0.20	0.00	-0.31
		Sidewalks/Pedestrian Improvements	0.00	-0.10	0.00	0.00	0.00	0.00
		Park-&-Ride Programmed	-0.01	-0.37	-0.01	-0.14	-0.10	-0.11
		Transit Enhancements	0.00	-0.01	0.00	0.00	0.00	0.00
		Arterial Improvements (System Signalization)						
	PLANNED	Regional Commuter Assistance	See qualitative description of planned emission reduction strategies in Appendix H. The methodology for determining emission reductions is currently being reviewed. As a result, no credit has been taken in this conformity analysis for these emission reduction strategies.					
		Home-Based Telecommuting						
		Planned Park-&-Ride lots						
		Bicycle Element of the Plan						
	Off-Network Analysis Total		-1.20	-355.37	-1.19	-264.94	-0.47	-3.95
IMPLEMENTATION TOTAL		562.42	29,697.44	426.07	9,732.15	434.57	7,011.60	
2002 Baseline vs. Implementation		-481.09	-34,061.94	-617.44	-54,027.23	-608.94	-56,747.78	