

VII. MOVING INTO THE 21ST CENTURY

Development of a Preferred Alternative

After numerous evaluations and review of various investment alternatives, a Preferred Alternative was produced that included capacity expansion investments (highway, interchange, and transit) along with specific Transportation Demand Management (TDM) initiatives.

The Preferred Alternative contains capital projects/programs proposed for implementation over the course of the 2025 planning horizon. These actions have been developed in support of the region's growth strategy outlined in the Round 5-C socio-economic forecasts. These actions, projects and programs advance the region's guiding principles of improved efficiency of the current system, managing future growth in travel demand, increasing the effectiveness of alternative modes, and selectively adding transportation capacity to current systems.

In August 2000, the Baltimore Regional Transportation Board (BRTB) appointed an Oversight Committee to oversee the development of the 2001 Baltimore Regional Transportation Plan (BRTP). The Committee's initial task was to review and refine the policy statements on which the capital investment and programmatic agenda of the 2001 BRTP would be based. The Subcommittee included several BRTB members, and participation by the Citizens Advisory Committee (CAC).

In an era of scarce public financial resources, it is essential that public investments in the transportation system yield the greatest possible benefits. The guiding principles, goals and objectives were developed to serve as the fundamental basis of the 2001 BRTP. The BRTB continues the following principles to guide their articulation of long-range regional transportation priorities, policies, and actions.

The 2001 BRTP envisions a twenty-first century transportation system that meets the region's needs, moving people and goods in an efficient manner. Toward these ends, the 2001 BRTP is founded on four guiding principles:

1) Linking transportation to managing growth. This means giving priority to transportation projects and programs planned by local jurisdictions for existing and designated growth areas. Projects and actions should support redevelopment and new growth through congestion and access management, while retaining community character and respecting the planned pattern of development.

2) Improving life in our communities. This means giving priority to transportation projects that reduce air pollution. Projects should contribute to the environmental and aesthetic quality of communities in both their scale and design.

3) Increasing transportation choices. This means giving priority to projects that increase the variety of options for making a trip, including bringing public transportation to more citizens and businesses, additional highway routes as appropriate, facilitating bicycling and walking, and fostering trip-reduction options such as ridesharing and telecommuting.

4) *Maintaining the current system. This means giving priority to protecting the existing investment in our transportation system. Projects such as resurfacing, safety improvements, bridge rehabilitation and reconstruction, and new transit vehicles are essential to this effort.*

GOALS & OBJECTIVES

The goals approved by the BRTB are a refinement of goals from the 1998 BRTP and build on the guiding principles. These goals embody three major pieces of legislation — Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and its successor TEA-21, 1990 Clean Air Act Amendments (CAAA), the Maryland Growth Act of 1992/Neighborhood Preservation and Smart Growth Act of 1997. The 2001 BRTP also considers the goals of various master and strategic plans of the BRTB agencies and jurisdictions.

Policies and implementation strategies were also formulated to move the region toward those goals. The policies listed with each goal provide guidelines for programs and investments to further enhance development of the regional transportation system.

1. Regional Process Goal

The 2001 BRTP shall recognize the interdependence of the region’s jurisdictions and shall foster interjurisdictional cooperation and cohesion for the benefit of the region’s residents.

POLICIES

<p>Coordinate regional transportation planning across all modes and jurisdictions in the region through the 2001 BRTP.</p> <p style="text-align: center;">↓</p>	<p>Base the 2001 BRTP on reliable assessments of demographic, travel, land use, fiscal, and technology trends.</p> <p style="text-align: center;">↓</p>	<p>Ensure that the 2001 BRTP encourages participation of the region’s transportation interests in public/private programming and the provision of transportation improvements.</p> <p style="text-align: center;">↓</p>	
<p>STRATEGIES</p>	<p>Coordinate regional transportation planning programs, modeling, activities, and technologies with state, local, and private partners.</p>	<p>Review and assess the transportation implications of key regional trends on a regular basis.</p>	<p>Maintain and support a Citizens Advisory Committee.</p>
	<p>Update and amend the 2001 BRTP and related documents regularly in accordance with federal and state mandates and emerging regional trends.</p>	<p>Apply results of ongoing trend assessments to refine and update regional travel models and technical tools on a regular basis.</p>	<p>Foster dialogue and information-sharing with public and private interests to improve understanding of the regional transportation system.</p>
			<p>Use proactive strategies to continuously solicit input from the region’s citizens, interest groups, and private sector for the planning</p> <p>Conduct efforts to ensure low-income, minority, and mobility-impaired persons have ample opportunities for input to the</p>

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2. Physical Form/Land Use Goal

The 2001 BRTP shall establish regional transportation policies that encourage land use patterns that enhance community character, maximize transportation system efficiency, and provide for a mix of residential, commercial, employment, and recreational opportunities.

POLICIES	Ensure the 2001 BRTP works in concert with local comprehensive plans, the 1992 Economic Growth, Resource Protection, and Planning Act, and Maryland's 1997 Smart	Concentrate the upgrading and expansion of transportation infrastructure and services within State-designated priority funding areas.	Encourage joint use of transportation facilities and rights-of-way in the 2001 BRTP.	Ensure the design of the 2001 BRTP's transportation system reinforces community character and identity as well as the system's relationship to the larger
	STRATEGIES	Examine local comprehensive plans, the Maryland Transportation Plan, and findings of the Transit Advisory Panel's report, where applicable, to ensure consistency with the 2001 BRTP.	Support transportation improvements that help stabilize urban communities and employment areas.	Incorporate opportunities for sharing of transportation facilities, including intermodal options.
	Support projects that contribute to integrated land development patterns and pedestrian oriented community design to provide transportation alternatives to driving alone.	Encourage population and employment stability or growth in designated urban and growth areas.	Support joint transportation facility development that encourages transit, bicycle and pedestrian use.	Support transportation improvements that preserve and enhance communities with unique characteristics as destinations.
	Provide guidance for revisions to local comprehensive plans.	Encourage suburban growth in areas with adequate infrastructure.	Encourage land use and mixed-use development that is compatible with existing facilities, while allowing for opportunities available through new infrastructure	Encourage the integration of aesthetic considerations into transportation project planning.
	Support land use and mixed-use development that is oriented to transit, bicycle and pedestrian use.			

3. Accessibility Goal

The 2001 BRTP shall strive to achieve a balanced transportation system that is accessible, equitable, and reliable for all system users and that provides for enhanced connectivity between modes and destinations, ease of use, service proximity, and user safety.

POLICIES	Create an accessible integrated regional transportation system for all users. ↓	Enhance mobility options for the young, the elderly, the disabled, and the economically disadvantaged. ↓	Maintain and enhance access to freight movement facilities and market areas. ↓	Improve safety and security for all users of the region's transportation system. ↓	Increase the efficiency of the existing transportation system. ↓
STRATEGIES	Plan and incorporate intermodal connections and coordination.	Ensure components of the 2001 BRTP comply with the provisions of the Americans with Disabilities Act and other appropriate mandates.	Establish freight movement performance measures and continuously assess the state of the region's freight movement system.	Ensure that public safety and security continue to be a component of transportation system planning.	Give priority to the preservation needs of the existing transportation system.
	Ensure bicycle and pedestrian components and investments are included.	Encourage land use and mixed-use development that is oriented to transit, ridesharing, telecommuting, non-motorized travel modes and other alternatives to driving alone.	Encourage investments and actions that enhance freight movement both within the region and between regions.	Implement programs and initiatives to reduce accidents and fatalities throughout the transportation system.	Apply employer-based strategies to manage demand on the existing transportation system.
	Provide cost-effective mobility options to and within major activity centers, including reverse-commute provisions.	Encourage and facilitate coordination of paratransit services.	Apply technological strategies designed to facilitate the movement of freight.		Apply technological and tele-communication strategies to enhance the capacity and safety of the existing system.
	Coordinate transportation improvement and investment plans within regional transportation corridors.	Prioritize transit service expansion proposals to best meet the region's mobility needs.			Develop strategies to manage travel growth.

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4. Economic Development Goal

The 2001 BRTP shall serve the region’s economic development needs by promoting a balanced transportation system that provides links between the region’s economic core, major regional growth and activity centers, communities and neighborhoods, and key national and international commerce locations.

POLICIES	Support 2001 BRTP projects that can expand the regional market for labor and goods.	Strengthen the contribution of the freight movement system to the region’s economy.	Support enhanced access to the region’s key tourist attractions and recreational destinations.
	↓	↓	↓
STRATEGIES	Improve access to business and employment opportunities in the region through cooperative public/private efforts.	Plan for efficient access to port, airport, rail, and intermodal facilities.	Encourage investments and actions to provide improved tourist and recreational access.
	Encourage projects that support community revitalization efforts and help retain and expand businesses in these locations.	Coordinate planning between stakeholders responsible for freight movement, facilities and operations in the region.	
		Maintain and support a Freight Movement Task Force to help identify options for addressing impediments to efficient freight	

5. Environmental Quality Goal

The 2001 BRTP shall promote a sustainable regional environment by establishing policies to reduce single occupant vehicle travel, promoting alternative travel modes, and encouraging technological improvements that abate emissions from mobile sources, reduce energy consumption, and conserve and protect natural resources.

POLICIES	Ensure the 2001 BRTP facilitates attainment of National Ambient Air Quality Standards (NAAQS).	Promote efficient use of energy resources.	Promote preservation of natural and cultural resources.
	↓	↓	↓
STRATEGIES	Develop programs focused on bringing the region into attainment of the NAAQS, including programs to reduce congestion and growth in driving alone.	Encourage use of alternative fuels, advanced-technology transportation vehicles, and integrated transportation system and facility design concepts.	Encourage preservation of identified environmentally sensitive areas.
	Support technological initiatives designed to help improve regional air quality.	Promote integrated development in order to reduce trip-making and energy consumption.	Comply with the provisions of the Chesapeake Bay Agreement, the Heritage Areas and Rural Legacy programs, and other environmental protection mandates.
	Support policies and projects that promote alternative transportation modes, including transit, ridesharing, bicycle, and pedestrian facilities.	Support projects designed to maximize operational efficiency of the existing transportation system.	Encourage preservation of cultural, historic, and scenic resources.
	Coordinate regional mobile source emission reduction programs.		

ESTABLISHING PRIORITIES

A process was developed to categorize, evaluate, and prioritize projects for consideration in the fiscally-constrained long-range transportation plan, based on a combination of technical and policy-based assessments. The process included three objectives.

- To develop a technically and politically defensible 2001 BRTP
- To develop a planning process that is objective and consistent with regional and local goals
- To distinguish between clearly beneficial and marginal projects

While this process has allowed the BRTB to approach development of the 2001 BRTP in a consistent fashion, the prioritization process is an ongoing activity. A description of the process and the prioritization results can be found in Appendix B. Member jurisdictions and the Maryland Department of Transportation (MDOT) were asked to review the status of projects from the previous plan and to submit new projects for consideration.

This process required several months and a number of meetings and discussions involving BRTB members, various BRTB subcommittees and Baltimore Metropolitan Council (BMC) staff. Detailed information was needed to conduct travel demand and cost analyses for each project. Initial instructions directed sponsors to indicate how the project supported or enhanced the goals and objectives endorsed by the BRTB.

Projects that had funding commitments for construction in capital programs, such as the Transportation Improvement Program (TIP) or Consolidated Transportation Program (CTP), were not considered candidate projects. Projects were considered candidates for the 2001 BRTP if they were to be constructed or operated beyond the year 2006. A project constructed or in operation by 2006 was considered a programmed project and would, therefore, not be subject to a prioritization process. After review by all participants including BMC staff, a final list of 150 projects was compiled.

Policy-Level Project Evaluation

A policy-level evaluation for candidate projects was developed that accounted for 60 percent of each project's final numerical score. The intent was to ensure that long-standing jurisdictional and agency commitments would receive due consideration in setting regional priorities. The policy evaluation was conducted by the jurisdiction submitting a candidate project. Results of the prioritization process can be found in Appendix B.

Identifying regional policy-based transportation priorities was a challenge. To keep this task manageable, each BRTB jurisdiction was directed to designate a maximum of five high priority projects, four medium priority projects, and an unrestricted number of low priority projects based on a policy-level assessment of each project. Each jurisdiction was responsible for the consideration of land use impacts prior to submitting candidate projects. After considerable discussion and debate, the Oversight Committee concurred that Baltimore City's assessment of its unique situation within the region had validity and decided by consensus to allow the City to designate a maximum of 15 high policy-level priority projects in lieu of five high and four medium priority projects.

The Oversight Committee asked the Maryland Department of Planning (MDP) to review the submitted projects for their compatibility with the designated Priority Funding Areas within the Baltimore region. As a result of the MDP's judgments, 13 projects were assessed a five-point

reduction in their Policy-Level score.

Technical-Level Project Evaluation

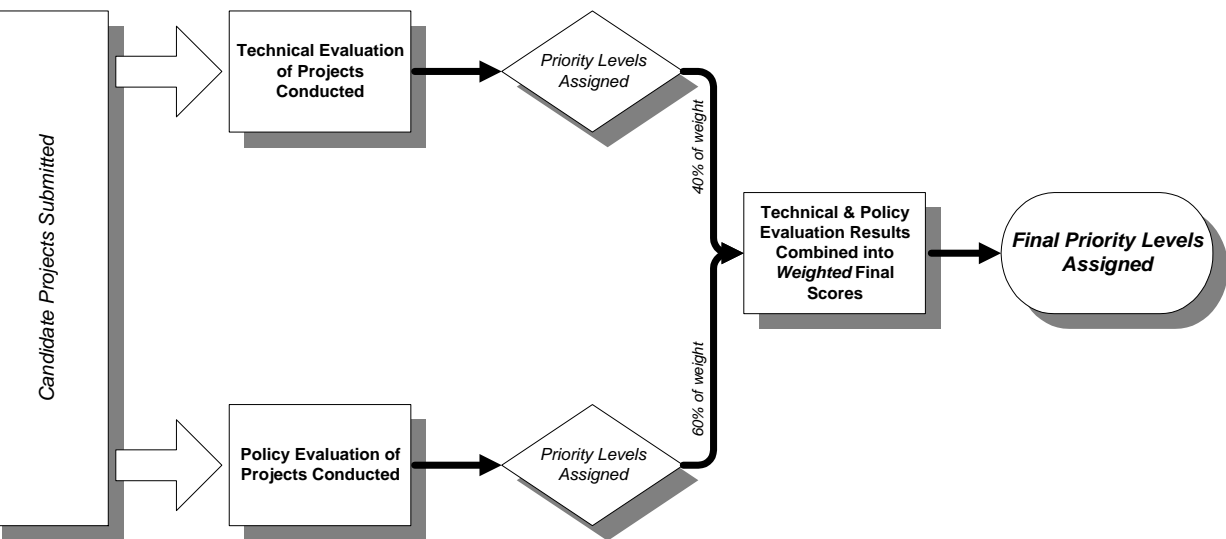
Projects were also evaluated for their impact on system performance and cost-effectiveness. This accounted for 40 percent of a project’s total score. The technical evaluation was conducted by BMC staff.

The process was designed to evaluate five categories of projects — Highway Capacity Expansion, Highway Interchange Improvements, Rail Transit Projects, Bus Transit Projects, and Bicycle and Pedestrian Projects — and thus was suitable for application to most of the projects in the 2001 B RTP candidate list.

Each criterion within a category was assigned a maximum number of points. Each project received a numerical score for each of the criteria in its category. A project’s score was generally interpolated from the highest, lowest, and/or average score for that criterion. A project’s total technical evaluation score was the sum of the points it received for all criteria. Criteria such as cost-effectiveness, the congestion index, and peak demand (in the case of highway expansion projects) have the greatest influence on a project’s total score. This process is in accord with the basic IST EA principles of system efficiency and cost-effective use of limited resources.

For highway expansion, interchange, and transit projects, much of the technical evaluation was based on output from the travel demand model. Staff also developed project cost estimates based on information supplied by the appropriate agency, MDOT’s most recent project costing methodology, or both. Staff also applied professional judgment to assign scores under the non-quantitative evaluation criteria, such as National Highway System connectivity and potential to alleviate congestion. Projects were not scored relative to the maximum possible score, but rather against each other. Figure VII-1 depicts the overall prioritization process and how the policy and technical evaluation result in combined, weighted scores.

Figure VII-1 Overall Prioritization Process



Assigning a Final Score

The final step of the project prioritization process was to combine the policy and technical evaluation scores for each project and translate them into priority levels. The objective was to develop a better understanding of which projects clearly stood apart from others as the region's most important transportation system investment priorities. Of the 150 total projects in the candidate list, 147 were evaluated from both a policy perspective and technical perspective.

FINANCING THE 2001 BRTP

One of the major contributions of ISTEA to the transportation planning process was the mandate that long-range metropolitan transportation plans be based on a standard of "financial reasonableness." The purpose of this is to ensure that the capital costs — consisting of funds for preservation and expansion of the regional transportation system — and operations and maintenance costs incurred by the projects and programs in the 2001 BRTP, are based on a level of resources that can reasonably be expected to be available in the region through 2025. Forecasting future transportation revenues is not an exact science. The state of the economy and the political climate are only two of the many factors that exert a significant influence on tax rates and the level of revenues generated in a given year. But by looking at historical patterns in the context of current policy priorities, it is possible to develop a forecast that is a useful tool to guide regional transportation plans.

Identified Revenue Sources

\$ Revenues include those designated for MDOT's statewide transportation expenditures (which include federal funds administered by MDOT) and the subcategories of operating and capital (including system preservation and system expansion) expenditures. Historically, state funds have been the largest share of the revenues for regionally-significant roadways.

\$ Other revenues accrue from the Maryland Transportation Authority (MdTA), which is responsible for improvements and maintenance at the region's toll facilities, as well as I-895, I-395, and I-95 from Caton Avenue in Baltimore City up to the Harford-Cecil county border.

\$ Revenues to be contributed by the region's local jurisdictions (includes state funds spent at the local level).

\$ Revenues to be contributed by the private sector.

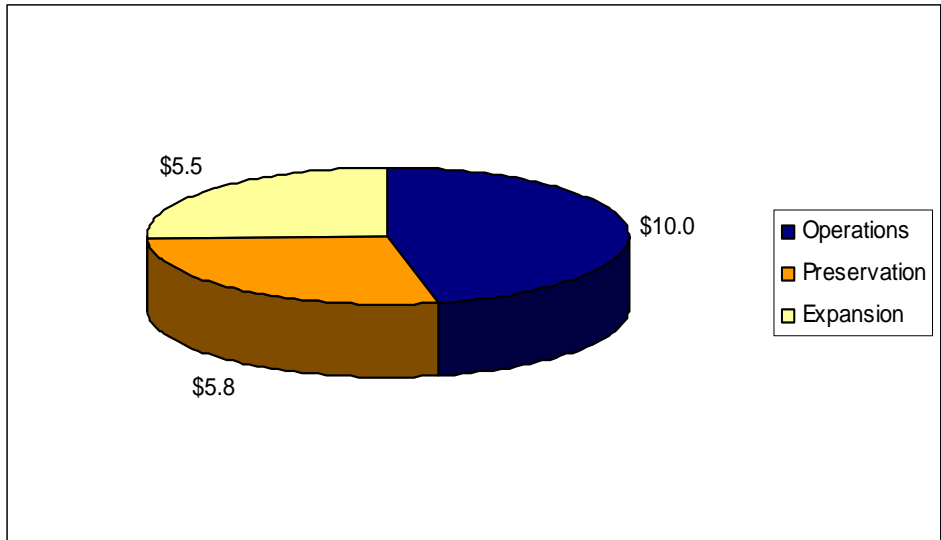
The amount of funding available for the next 25 years was assessed at approximately \$21 billion dollars, in constant 2001 dollars. The breakdown of how these funds are apportioned is:

System Operations (\$10 billion): Operations includes the day-to-day operations of the transportation system. For transit, this includes the cost of running buses and trains, and for highway it may include maintenance projects that are of a smaller scale than preservation projects.

System Preservation (\$5.8 billion): MDOT has recognized system preservation as a distinct component of capital expenditures since 1992. It was assumed that system preservation expenditures would remain at average historical levels through 2025.

System Expansion (\$5.5 billion): MDOT revenues not used for operating or preservation purposes would be available for system expansion. This is the portion of the 2001 BRTP from which all capacity-enhancing capital improvements are funded. State and federal resources devoted to expansion will decline slightly in real terms over the course of the 2001 BRTP. This is due to federal and State policies that have placed an increasing emphasis on operating, maintaining and preserving existing transportation infrastructure. It was assumed that all local and private sector funds will be spent for system expansion purposes. Figure VII-2 below displays the financial split between operations, preservation, and expansion.

Figure VII-2 Distribution of Transportation Funds through 2025 (billions)



Estimation Of Project Costs

As part of the prioritization process, the capital costs were estimated for each candidate project. The methodologies used to determine project costs for each mode were as follows:

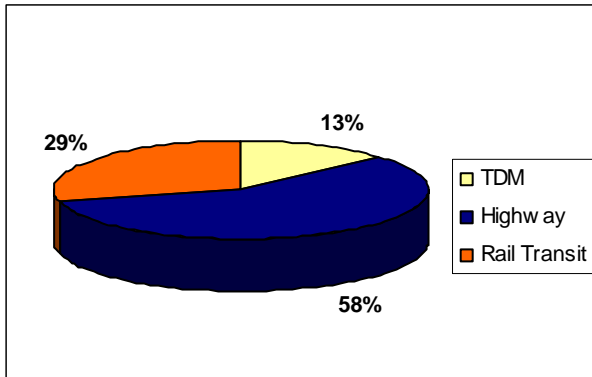
Highway & Interchange (\$3.165 billion) – The State Highway Administration (SHA) provided estimates for projects planned on State facilities. Local facility cost estimates were generally supplied by the sponsoring jurisdictions. Where figures were not available, cost estimates were developed using a unit cost methodology approved by SHA.

Transit (\$1.570 billion) – Capital costs for candidate transit projects were based on recent studies conducted by the Maryland Transit Administration (MTA), with adjustments for inflation.

TDM Strategies (\$0.708 billion) - This category includes transit intensification, commuter assistance, park-&-ride facilities, bicycle and pedestrian projects, Intelligent Transportation Systems (ITS) initiatives, alternative fuels/clean technology, and land use/growth management. Where available, existing cost estimates were used; otherwise, BMC staff in consultation with the appropriate modal administration developed costs.

Figure VII-3 displays the funding split for capital expansion projects.

Figure VII-3 System Expansion Components



TDM Strategy	Amount
Land Use/Smart Growth	\$48
ITS	\$90
Clean Technology	\$54
Bicycle/Pedestrian	\$96
Park-&-Ride	\$108
Commuter Assistance	\$72
Transit Intensification	\$240
Total	\$708

Financial Reasonableness

A set of assumptions was adopted to develop a revenue forecast for the 2007-2025 period. State funding for capital and operating expenditures was forecast based on historical spending patterns. Operating expenditures were projected to grow by one percent per year to account for planned expansions to the regional transportation system. Local contributions were estimated based on historical trends in transportation funds that jurisdictions receive from the State. Since private sector contributions generally vary by project, this funding source was accounted for by using a conservative assumption of projected revenues.

The \$5.5 billion in estimated system expansion costs is equal to the resources forecast to be available for system expansion through 2025. As a result, all projects selected for the 2001 BRTP Preferred Alternative should be able to be completed during the time frame of the 2001 BRTP. Therefore, the 2001 BRTP meets ISTEA’s required standard of financial reasonableness.

POPULATION, HOUSEHOLD AND EMPLOYMENT FORECASTS

In 1980, the region’s population was 2.2 million, which increased to nearly 2.5 million by year 2000. Population is projected to increase to 2.8 million by 2025. All of the region’s jurisdictions will see population increases by 2025.

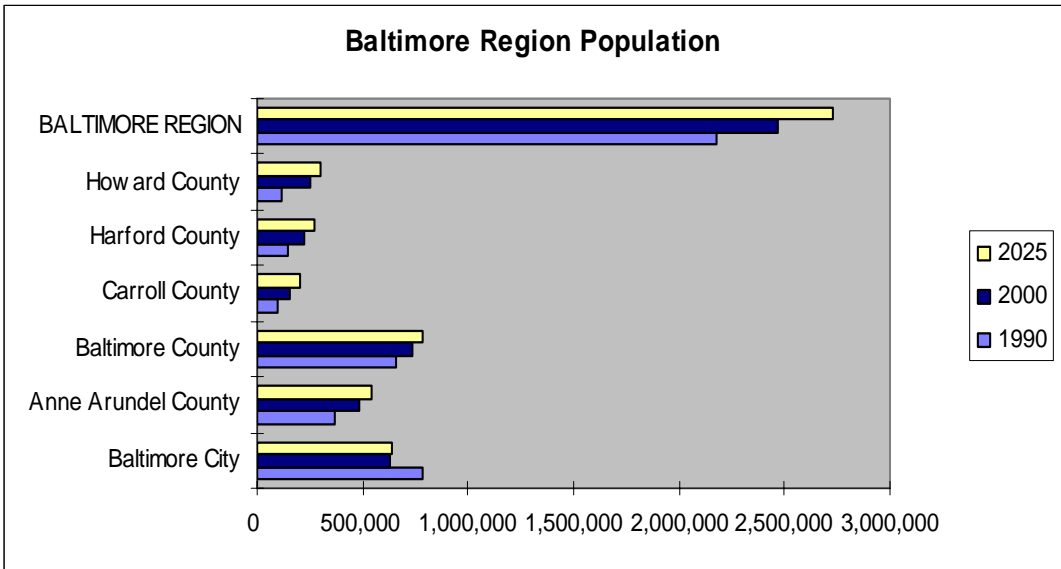
The 2001 BRTP is based upon Round 5-C socio-economic projections, developed by the BRTB, that extend to 2025. (County-level data for Round 5-C can be found in Appendix C.) The Round 5-C forecasts serve as an update to the Round 5-A forecasts, which were used in development of the 1998 BRTP. The Cooperative Forecasting Group, a technical committee of the BRTB consisting of state and local planning staffs, is responsible for generating forecasts of population, households & employment for their respective organizations.

Use of an officially endorsed set of forecasts was specifically mandated in ISTEA and continues under the Transportation Equity Act for the 21st Century (TEA-21). These forecasts must incorporate the latest socio-economic estimates, the latest changes in zoning, and any revisions or updates to local government master plans and other land use policies. Local development plans and land use policies are translated into forecasts of residential and employment activity for small units of geography designated as transportation analysis zones (TAZs). These small area forecasts, in turn, are the basis for estimating the level of travel that can be expected and the degree of consistency between the land use plans and the planned improvements to the regional transportation

system. Round 5-C includes the latest small-area population and housing activity data as well as the latest employment forecasts distributed by the Maryland Department of Planning.

A key component of socio-economic forecasting is population. Round 5-C indicates the region's population is forecast to increase from 2.5 million residents in year 2000 to nearly 2.8 million in 2025. The distribution of population is more significant than the absolute numbers, since the effects on trip-making are directly linked to the distribution of residences, employment, and desired services. The dispersal of the region's population brought on by increasing suburbanization has been a major factor in increased trip-making and traffic congestion. Figure VII-4 illustrates the population by jurisdiction for 1990, 2000 and a projection of population for 2025.

Figure VII-4

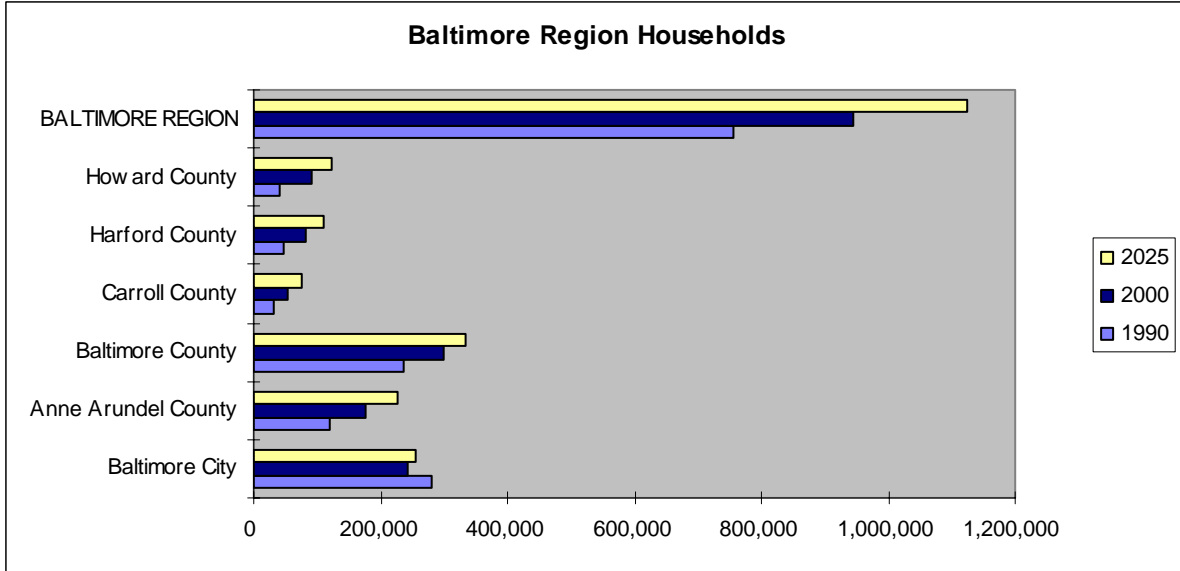


Comparing 2000 to 2025, the following growth patterns have been observed in the region:

- Anne Arundel County is projected to experience 14 percent growth with significant growth occurring in Odenton, Crofton and Maryland City/Laurel.
- Baltimore City will show a slight increase in population, on the order of two percent.
- Of all the suburban jurisdictions, Baltimore County's population will increase by a modest seven percent, yet will be second only to Anne Arundel County's increase in absolute numbers (54,400 versus 64,600).
- Carroll County will experience a high percentage of growth, and will gain nearly 49,000 new residents.
- Carroll and Harford counties will lead all jurisdictions in the region with 32 percent and 20 percent growth, respectively.
- Harford County's population is forecasted to grow approximately 20 percent. As before, a large portion of that growth will be concentrated in the Bel Air and Edgewood areas.
- Howard County will experience an 18 percent gain in population.

The Baltimore region’s households are undergoing an evolution in distribution related to the overall population increase. Figure VII-5 illustrates the changes.

Figure VII-5

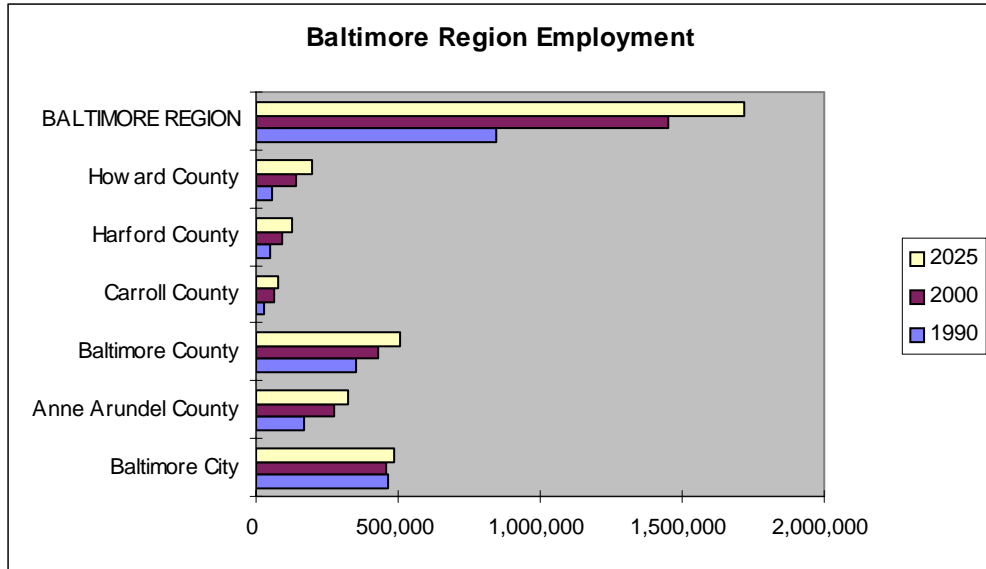


Comparing 2000 to 2025, the following household patterns have been observed in the region:

- Anne Arundel County is projected to experience 26.4 percent increase in households, with significant growth occurring in Odenton, Crofton and Maryland City/Laurel.
- Baltimore City will show a slight increase, on the order of 9.6 percent. The City is distinctive within the region in its ability to retain and attract a larger share of one-person and two-person households than outlying jurisdictions.
- Baltimore County’s households will increase by 12.4 percent, yet will be second only to Anne Arundel County’s increase in absolute numbers (37,200 versus 46,500).
- Carroll County will experience the highest percentage of household growth in the region, a 43.4 percent increase.
- Harford County’s will record a 35 percent increase in households. As with population, a large portion of that growth will be concentrated in the Bel Air and Edgewood areas.
- Howard County will experience a 28 percent growth in households.

The Baltimore region's employment growth, from 2000 to 2025, shows increases in every jurisdiction in the region. Figure VII-6 displays the increases graphically.

Figure VII-6



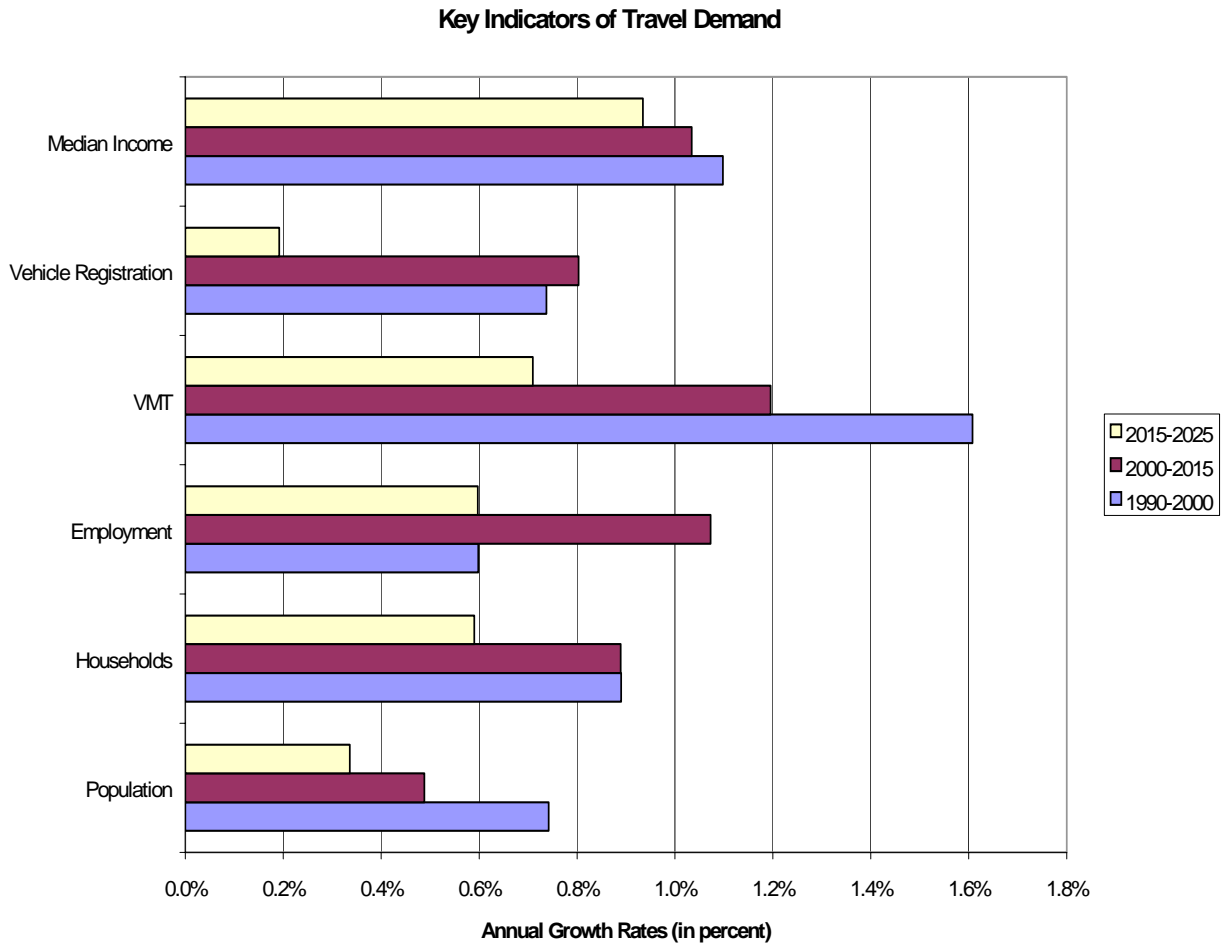
Comparing 2000 to 2025, the following employment patterns have been observed in the region:

- Anne Arundel County is projected to experience a 19 percent increase in employment.
- Baltimore City will see employment increase by 14 percent.
- Baltimore County's employment will increase by nearly 21 percent.
- Carroll County will experience a 23 percent increase in employment.
- Harford County's employment base will grow by nearly 38 percent.
- Howard County will experience the largest gain in employment in the region, with an increase of nearly 44 percent.

KEY INDICATORS OF TRAVEL DEMAND

Changing socio-economic factors have been the force behind the increase in travel-related activity. Several socio-economic factors influence person travel in the region: the distribution of population and households, automobile availability and the number and location of jobs. Figure VII-7 displays the key indicators of travel demand for the 1990 to 2025 time period.

Figure VII-7

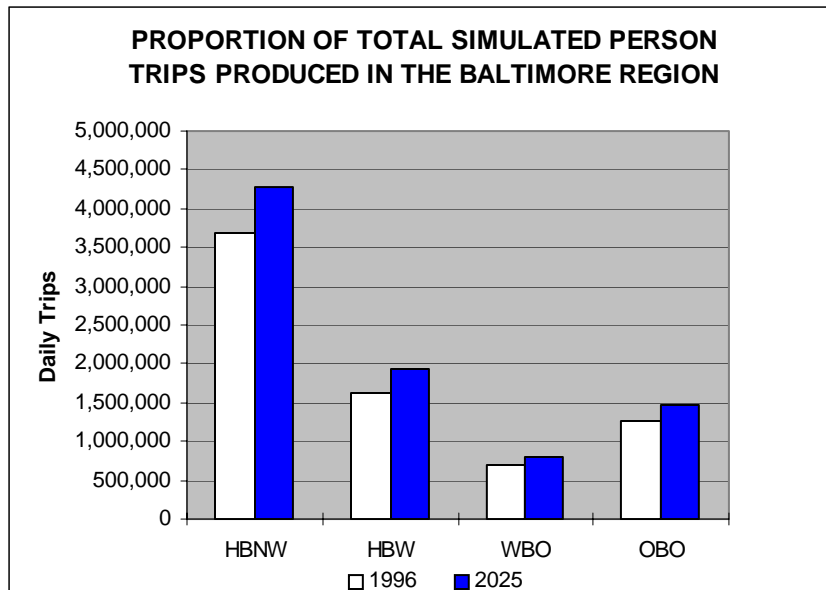


- The key indicators show that growth is slowing down in the Baltimore region. 1990-2000 growth is generally significantly higher than 2000-2015 or 2015-2025 growth.
- The growth rates in vehicle registration seems to be slowing down in the future, possibly due to saturation of vehicles in the region.
- Vehicle Miles of Travel (VMT) growth rates will still outpace population, household, and employment rates of growth in the future.
- Household growth is about double that for population growth indicating smaller average household sizes.

Socio-economic data are the basic information needed to understand future implications of congestion, patterns of movement, growth changes, etc. Existing and projected socio-economic data are entered into the Baltimore Region Travel Demand Model to determine the extent of need for network and TDM improvements. These data are needed for the trip generation module of the travel demand model to develop person trips.

As stated previously, since the model must be validated against present day conditions, the year 1996 was chosen as a base year for which information is available. (Data for the year 2000 were not completely available for this calibration activity.) Trips are generated by four main trip purposes: Home-Based Work (HBW), Home-Based Non-work (HBNW), Work-Based Other (WBO) and Other-Based Other (OBO). For the average weekday in the Baltimore region, output from the model for 1996 and 2025 conditions is illustrated in Figure VII-8. A 17 percent increase in person trips is projected from 1996 to 2025 to a total of 9.2 million person trips produced in 2025.

Figure VII-8



Trips for 1996 and 2025 are distributed throughout the region and the output vehicle trip tables from the mode choice module are assigned to the 1996 and 2025 highway networks, respectively, using a ten-increment capacity restraint all-or-nothing assignment process. Simulated volumes for the years 1996 and 2025 are used to identify corridors of congestion, some of which show “below acceptable” driving conditions. Performance measures have been developed to analyze simulation characteristics to show travel demand results.

Performance measures were calculated for 1996 and the 2025 Existing & Committed (E&C) simulations. The E&C network illustrates what level of service would result if only the projects currently built, or the limited group scheduled for construction by calendar year 2006, were completed. E&C, in this case, shows what is referred to as a “no-build” scenario, wherein all project planning terminates with the projects currently funded and scheduled.

Table VII-1 displays 1996 and 2025 E&C performance measures for an A.M. peak and 24-hour period. (Performance measure descriptions were defined in Chapter V.) The measures include: VMT, transit ridership, vehicle and person hours of delay, associated costs with delay, trip length, average speed, and air quality emissions.

Table VII-1 Regional A.M. Peak and 24-Hour Measures: 1996 and 2025 E&C

Indicator of Transportation Demand	A.M. Peak		24-Hour	
	1996	2025 E&C	1996	2025 E&C
Vehicle Miles of Travel (VMT)				
Freeways	10,534,000	13,200,000	35,456,000	46,585,000
Arterials	6,755,000	8,632,000	22,110,000	27,653,000
Collector and Local Roads	1,571,000	2,345,000	5,274,000	7,664,000
All Roads	18,860,000	24,177,000	62,840,000	81,902,000
Congested VMT (LOS E&F)				
Freeways	4,653,000	7,922,000	8,618,000	16,082,000
Arterials	749,000	2,066,000	1,253,000	3,384,000
Collector and Local Roads	125,000	396,000	245,000	661,000
All Roads	5,527,000	10,384,000	10,116,000	20,127,000
Percentage of Congested VMT (LOS E&F)				
Freeways	44.2%	60.0%	19.3%	34.5%
Arterials	11.1%	23.9%	5.1%	12.1%
Collector and Local Roads	8.0%	16.9%	0.0%	0.1%
All Roads	29.3%	42.9%	12.8%	24.6%
Total Transit Ridership	-	-	206,200	223,600
Travel Characteristics				
Average Vehicle Person Trip Length (in minutes)				
Work (HBW)	27.0	27.8	-	-
Non-Work (Non-HBW)	12.4	13.3	-	-
SOV	18.8	19.9	-	-
HOV	15.4	15.9	-	-
All Trips	18.0	19.0	-	-
Transit Mode Share	-	-	2.8%	2.6%
Performance				
Vehicle Hours of Delay	54,600	111,200	91,400	192,200
Annual Cost of Person Hours of Delay (1996 \$)	238,820,000	486,389,000	399,784,000	840,683,000
Congested Speed (mph)				
Freeways	43.2	39.3	-	-
Arterials	34.0	32.9	-	-
Collector and Local Roads	30.7	26.9	-	-
All Roads	38.2	35.3	-	-
Air Quality Conformity				
NOx (tons/day)	-	-	112.60	58.32
VOC (tons/day)	-	-	54.00	39.11
NOx Budget (tons/day)	-	-	-	96.9
VOC Budget (tons/day)	-	-	-	45.5

Performance Measures Comparison

Performance measure descriptions were defined in Chapter V. These same measures are calculated and the following statements are concluded:

- The Baltimore region on an average weekday is projected to have a 30 percent growth in VMT from a 1996 total of 62.8 million to a 2025 projection of 81.9 million.
- Severe VMT (Level of Service (LOS) E&F) is projected to grow from 10.1 million to 20.1 million, an increase of nearly 100 percent. The severe VMT in 2025 accounts for 24.6 percent of all VMT in the region.
- Severe VMT on freeways grows from 8.6 million VMT to nearly 16.1 million in 2025, an 87 percent increase.
- Transit ridership shows a moderate increase of 8.4 percent, but the transit mode share of work trips declines by seven percent.
- Vehicle and person hours of delay both increase by more than 110 percent because of increased traffic congestion.
- Average trip length for both vehicles and persons remains constant, a distance of approximately eight miles.

The weighted average highway speed (average speed including congestion factors) is another measurement used to test the level of congestion. Lower average speeds in future year simulations would suggest that highway users in the Baltimore region will experience increases in the amount of travel time from their origins to destinations. The following are the major summary points:

- Overall weighted average highway system speed for the A.M. peak period drops from 38.2 miles per hour in 1996 to 35.3 miles per hour in 2025, a sizable measure for the region as a whole, because of increasing traffic congestion.
- Freeways had a decrease in speed of four miles per hour. This is attributed to the increase in VMT on freeways with 60 percent of the freeway VMT being severe in 2025.
- Nitrogen oxide (NOx) and volatile organic compound (VOC) emissions decline sharply because of increasingly better emissions control equipment on vehicles.

Preferred Alternative Investments

CAPITAL PROJECTS

Table VII-2, which displays the capital projects/programs, is found on the following pages. Figures VII-9 through VII-13 display the location of the investments listed in Table VII-2. In compliance with federal law, this list of projects and programs has been modeled and meets air quality conformity requirements. After review by all participants, the Preferred Alternative, a final list of 126 projects, was compiled. Categories and the number of projects within each were as follows:

<i>Highway</i>	6	0
<i>projects</i>		
<i>Interchange</i>	1	6
<i>projects</i>		
<i>Transit (rail)</i>	4 projects	
<i>Transit (bus)</i>	4 projects	

Table VII-2 Capital Projects

FACILITY	LOCATION	DESCRIPTION	COST IN THOUSANDS	YEAR
Regional Highways				
I-95	Baltimore/Howard line to Howard/Prince George's line	add 2 HOV lanes	\$168,800	2020
I-95	I-695 to Baltimore/Howard line	add 2 HOV lanes	\$42,000	2020
I-695	I-83 to I-95 N	widen from 6 to 8 lanes	\$167,708	2015
I-695	I-95 S to I-95 N	add 2 HOV lanes	\$69,927	2020
I-695	MD 122 to I-95 S	widen from 6/7 to 8 lanes	\$312,709	2015
I-695	@ MD 26	interchange reconstruction	\$30,224	2010
MD 695	@ Quarantine Road	interchange reconstruction	\$10,000	2007
Regional Transit				
Light Rail Transit	Downtown to Security	fixed guideway	\$650,168	2020
Light Rail Transit	Downtown to White Marsh	fixed guideway	\$780,202	2020
Light Rail Transit	Downtown Loop and East/West Connection	fixed guideway	\$130,034	2010
Light Rail Transit Station	@ I-695	new LRT station	\$10,000	2020
Transit Package	Bus service, bus amenities and MARC improvements	initiatives to support increased ridership	\$200,000	Ongoing
City of Annapolis				
MD 2	@ MD 450	partial interchange	\$30,000	2015
Anne Arundel County				
I-97 (PFA*)	US 50/301 to MD 32/3	widen from 4 to 6 lanes	\$75,800	2020
MD 2	US 50/301 to MD 100	widen from 4/5 to 6 lanes	\$87,272	2020
MD 3 (PFA)	MD 32 to Prince George's Co. line	widen from 4 to 6 lanes	\$99,000	2020
MD 32	MD 295 to Howard Co. line	widen from 4 to 8 lanes	\$24,469	2020
MD 100	Howard Co. line to MD 2	widen from 4/6 to 6/8 lanes	\$85,670	2020
MD 100 (PFA)	@ MD 10	full interchange	\$15,000	2020
MD 100/173	MD 100/177 to MD 173	new 4 lane road	\$10,000	2020
MD 170	MD 175 to MD 100	widen from 2 to 4 lanes	\$41,600	2015
MD 175	MD 174 to MD 295	widen from 2 to 4 lanes	\$34,053	2015
MD 177 (PFA)	MD 100 to South Carolina Ave	widen from 3/2 to 5 lanes	\$19,944	2020

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FACILITY	LOCATION	DESCRIPTION	COST IN THOUSANDS	YEAR
MD 198	MD 32 to MD 295	widen from 2 to 4 lanes	\$28,070	2020
MD 295	I-695 to MD 100	widen from 4 to 6 lanes	\$27,000	2020
Broadneck Peninsula Trail - Phase IV	from Chesapeake Bay and Sandy Point State Park to the B&A Trail	bicycle/pedestrian path	\$400	2008
Chesapeake Beach Rail Trail	parallel to MD 260 from MD 4 at Wayson's Corner	bicycle/pedestrian path	\$3,150	2010
West Connector to Patapsco Valley Greenway	Stoney Run Rd. near BW Pkwy to Howard Co.	bicycle/pedestrian path	\$500	2020
Connector to Baltimore City Trails	BWI Airport to Baltimore City	bicycle/pedestrian path	\$1,000	2007
WB&A Trail Phase III	Odenton Rd. to Patuxent River	bicycle/pedestrian path	\$500	2007
South Shore Trail - Phases III & IV & V	Odenton to Annapolis	bicycle/pedestrian path	\$600	2012
Parole Bridge	across US 50/301 and	bicycle/pedestrian path	\$100	2015
City of Baltimore				
I-95	@ US 40	full interchange	\$70,000	2020
I-95	@ Washington Blvd	n/b & s/b ramps	\$25,000	2007
I-95	@ Russell Street	n/b & s/b ramps	\$25,000	2007
I-895	@ Potee Street	full interchange	\$100,000	2015
MLK Boulevard	@ I-83	1/3 mile extension & interchange	\$21,930	2020
Allied Signal Access	Harbor Point Bridge	bridge	\$11,317	2007
Gwynns Falls Trail	Middle Branch Park south to City line	bicycle/pedestrian path	\$2,000	2007
Gwynns Falls Trail	Gwynns Falls Park north to County line	bicycle/pedestrian path	\$1,000	2007
Herring Run Trail	Mt. Pleasant Park to Clifton Park	bicycle/pedestrian path	\$3,500	2007
Jones Falls Trail	Robert E. Lee Park to the Inner Harbor	bicycle/pedestrian path	\$5,000	2008

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FACILITY	LOCATION	DESCRIPTION	COST IN THOUSANDS	YEAR
Baltimore County				
I-83 (PFA)	@ Thornton Mill Rd	partial interchange	\$15,000	2015
I-795	@ Dolfield Boulevard	partial interchange	\$30,000	2015
US 1	MD 43 to Joppa/Ebenezer Rd	widen from 4 to 6 lanes	\$25,000	2020
US 1	Joppa/Ebenezer Rd to Harford Co. line	widen from 4 to 6 lanes	\$93,000	2020
MD 45	Ridgely Rd to Seminary Ave	widen from 4 to 5 lanes	\$6,380	2007
MD 145	MD 145 to MD 45	new 2 lane road	\$11,784	2015
Klausmier Rd	Gunview Rd to US 1	widen from 2 to 4	\$1,494	2015
#8 Trolley Line	Edmondson Ave to Frederick Rd	bicycle/pedestrian path	\$40	2020
MD 43 Bikeway	nearby proposed MD 43 extended	bicycle/pedestrian path	\$100	2010
Caton-Loudon Trail	Loudon Cemetery to Spring Grove Hospital	bicycle/pedestrian path	\$1,800	2020
Gwynns Falls Trail	Owings Mills Town Center to Glyndon	bicycle/pedestrian path	\$2,950	2020
Gwynns Falls Trail	Owings Mills TC to Gwynn Oak Park	bicycle/pedestrian path	\$4,500	2020
Patapsco Greenway Connector	completes connection from Relay to Oella	bicycle/pedestrian path	\$100	2010
Red Run Bikeway	Red Run Stream Valley Park	bicycle/pedestrian path	\$1,100	2010
White Marsh Run Trail	Bird River to Harford Road area	bicycle/pedestrian path	\$4,900	2010
Carroll County				
MD 26	MD 32 to MD 97	widen from 2 to 4 lanes	\$53,700	2015
MD 30	Wolf Hill Dr to Brodbeck Rd (Hampstead)	new 2 lane road	\$27,034	2007
MD 30 (PFA)	Brodbeck Road to north of Lineboro (Manchester)	right of way preservation	\$20,000	2030
MD 32	MD 26 to Howard Co. line	widen from 2 to 4 lanes	\$34,000	2020
MD 97	MD 140 to Pleasant Valley Rd	widen from 2 to 4 lanes	\$41,800	2015
MD 140	MD 31 to Old Balto/Leidy Rd	widen from 4/6 to 8 lanes	\$36,900	2020
MD 140	@ MD 97S, Center St, & Englar Rd	3 new interchanges	\$80,000	2020
North & West Branch Patapsco Trail	Along river from Westminster to Finksburg	bicycle/pedestrian path	\$4,000	2010
Little Pipe Creek Trail	Links Union Bridge and New Windsor along MD 75	bicycle/pedestrian path	\$1,160	2025

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FACILITY	LOCATION	DESCRIPTION	COST IN THOUSANDS	YEAR
Monocacy River Greenway Trail	Along the east side of the Monocacy River	bicycle/pedestrian path	\$3,500	2015
Morgan Run to Sykesville Trail	Along Morgan Run from Salem Manor to Patapsco River	bicycle/pedestrian path	\$2,632	2015
Patapsco Regional Greenway Trail	Southern Carroll Co. through Mt. Airy and Sykesville along the Patapsco River	bicycle/pedestrian path	\$2,525	2020
Wakefield Valley Community Trail	Parallel to MD 31 between Westminster and New Windsor	bicycle/pedestrian path	\$1,300	2015
Harford County				
US 1	MD 152 to Baltimore Co. line	widen from 4 to 6 lanes	\$18,000	2015
US 1	MD 152 to US 1 Bus/MD 147	widen from 4 to 6 lanes	\$35,000	2010
US 1 Business	MD 147 to MD 24	widen from 4 to 6 lanes	\$11,000	2015
US 1 Bypass	Winters Run Bridge to Hickory Bypass	widen from 2 to 4 lanes	\$56,000	2010
MD 7	MD 543 to MD 159	widen from 2 to 4 lanes	\$22,946	2010
MD 24	MD 7 to Singer Rd	widen from 4 to 6 lanes	\$80,000	2010
MD 24	Moore's Mill Rd to MD 23	widen from 2 to 4 lanes	\$16,000	2015
MD 147 (PFA)	US 1 to MD 152	widen from 2 to 4 lanes	\$7,000	2020
MD 152	US 40 to APG-Edgewood	widen from 2 to 4 lanes	\$24,140	2020
Perryman Access East	MD 159 to MD 7	new 4 lane road	\$4,892	2010
Perryman Access West	US 40 to Canning House Rd	new 4 lane road	\$2,071	2020
MD 24 Corridor bus route	Belair to Edgewood MARC	feeder bus	not applicable	2020
MD 24 Corridor bikeway	US 1 to Tollgate/MD 924	bicycle/pedestrian path	\$41	2010
MD 152 Corridor bikeway	Hess Rd to Trimble Rd	bicycle/pedestrian path	\$131	2010
Aberdeen Area bikeway	MD 132 to MD 462	bicycle/pedestrian path	\$24	2010
Havre de Grace bikeway	Juniata St/Otsego St/ Union Ave	bicycle/pedestrian path	\$22	2010

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FACILITY	LOCATION	DESCRIPTION	COST IN THOUSANDS	YEAR
Joppatowne bikeway	Towne Center Dr to Joppa Farm Rd	bicycle/pedestrian path	\$10	2010
Lower Susquehanna Heritage Greenway Trail	Generally follows the Susquehanna River from Havre de Grace to the Conowingo Dam	bicycle/pedestrian path	\$250	2007
Winters Run Greenway	South of I-95 along Winters Run to the Dam then east to Tollgate Road	bicycle/pedestrian path	\$1,950	2015
Howard County				
I-70	US 29 to Baltimore Co. line	widen from 6 to 8 lanes	\$10,000	2025
I-70	US 29 to US 40	widen from 4 to 6 lanes	\$57,419	2020
I-70 (PFA)	@ Marriottsville Rd	partial to full interchange	\$16,963	2020
US 1	Ducketts Lane to MD 32	widen from 4 to 6 lanes	\$58,449	2015
US 29	I-70 to MD 100	widen from 6/8 to 8/10 lanes, w accel/decel lanes, US 29/Long Gate Pkwy ramps	\$21,626	2015
US 29	south of MD 175 to Middle Patuxent River	widen from 4 to 6 lanes	\$25,000	2025
US 29	Columbia Rd to Montgomery Co. line	widen from 4 to 6 lanes	\$12,000	2025
US 29	@ Rivers Edge Road	full interchange	\$10,000	2025
MD 32	Cedar Lane to Anne Arundel Co. line	widen from 4/6 to 8 lanes	\$209,100	2015
MD 32 (PFA)	I-70 to Carroll Co. line	widen from 2 to 4 lanes	\$21,000	2025
MD 32 (PFA)	MD 108 to I-70	widen from 2 to 4 lanes	\$157,020	2020
MD 32 (PFA)	@ MD 144	full interchange	\$9,000	2020
MD 32 (PFA)	@ I-70	full interchange	\$11,000	2020
MD 32 (PFA)	@ Burntwoods Rd	full interchange	\$11,000	2020
MD 100	I-95 to Anne Arundel Co. line	widen from 4/6 to 6/8 lanes	\$16,350	2025
MD 108	Trotter Rd to MD 32	widen from 2 to 4 lanes	\$7,000	2025
MD 108	MD 104 to MD 175	widen from 2 to 4 lanes	\$19,500	2020
MD 216	west of US 29 to Sanner Rd	widen from 2 to 4 lanes	\$11,940	2010
Dorsey Run Rd	MD 103 to MD 175	new 2 lane road	\$6,005	2010
Dorsey Run Rd	MD 175 to MD 32	widen from 2 to 4 lanes	\$4,969	2010
Gorman Road	Stephens Rd to US 1	widen from 2 to 3 lanes	\$2,485	2025
Marriottsville Rd	MD 99 to MD 144	widen from 2 to 4 lanes	\$3,106	2015

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FACILITY	LOCATION	DESCRIPTION	COST IN THOUSANDS	YEAR
North Ridge Rd	Carls Ct to Rogers Ave and Town & Country Blvd to US 40	new 2 lane road	\$2,853	2010
Patuxent Range Rd	US 1 to Dorsey Run Rd	widen from 2 to 4 lanes	\$828	2015
Rogers Avenue	US 40 to Courthouse Dr	widen from 2 to 4 lanes	\$1,035	2010
Sanner Rd	Johns Hopkins Rd to MD 216	new 4 lane road	\$5,807	2015
Sanner Rd	Johns Hopkins Rd to Pindell School Rd	widen from 2 to 4 lanes	\$4,600	2015
Snowden River Parkway	MD 100 to Broken Land Parkway	widen from 4 to 6 lanes	\$55,492	2020
US 1 Corridor bus route	Halethorpe to Laurel	bus route (45 min. headway)	not applicable	2010
Access 2000 Bike/ Ped Connections	bike/ped connections to public transit	bicycle/pedestrian path	\$1,500	2008
Elkridge Main Street Tunnel	Main Street Elkridge under CSX rail line	renovate and improve access to pedestrian tunnel	\$300	2007
Frederick Road Pathway/Bikeway	Miller Library/Plumtree to Baltimore Co. line	bicycle/pedestrian path	\$300	2007
Savage Pathway Extension	Savage MARC station to Spinal Pathway	bicycle/pedestrian path	\$100	2007
Spinal Pathway	Ellicott City to N. Laurel	bicycle/pedestrian path	\$4,000	2020
Southern Howard Co. Pathway/ Greenway	MD 216 from west of US 29 to US 1	bicycle/pedestrian path	\$650	2010
Snowden River Parkway Bike/ Ped Corridor	MD 100 to MD 32	bicycle/pedestrian path	\$1,500	2010
Howard County schools pathways	selected locations (e.g. Elkridge, Ellicott City)	pedestrian overpasses	\$1,500	2020
US 1 Bike/ Ped Corridor	Baltimore County to Prince George's County	bicycle/pedestrian path	\$5,650	2020
US 29 Corridor	Columbia to Montgomery Co. line	bicycle/pedestrian path	\$1,500	2015
MD 99 Pathway/ Bikeway	US 29 to MD 32	bicycle/pedestrian path	\$950	2007

**PFA = This project is located outside of a certified Priority Funding Area (PFA). This project must be evaluated by both the Maryland Department of Transportation and the Maryland Department of Planning for compliance with the Smart Growth and Neighborhood Conservation Act of 1997. Further, the project must be approved by the Board of Public Works prior to receiving state funding for the purposes of right of way acquisition or construction.*

Figure VII-9

and all figures/maps in this document are available on the BMC webpage, <http://www.baltometro.org/mambo/content/view/399/322/>.

Table VII-3 Preferred Alternative Highway Projects

1	I-695: I-83 to I-95 N	31	MD 7
2	I-695: MD 122 to I-95 S	32	MD 24: MD 7 to Singer Rd
3	I-97	33	MD 24: Moores Mill Rd to MD 23
4	MD 2	34	MD 147
5	MD 3	35	MD 152
6	MD 32	36	Perryman Access East
7	MD 100	37	Perryman Access West
8	MD 100/173	38	I-70: US 29 to Balt. Co line
9	MD 170	39	I-70: US 29 to US 40
10	MD 175	40	US 1: Ducketts La to MD 32
11	MD 177	41	US 29: I-70 to MD 100
12	MD 198	42	US 29: MD 175 to Middle Patuxent River
13	MD 295	43	US 29: Columbia Rd to Mont. Co line
14	MLK Blvd	44	MD 32: Cedar La to AA Co line
15	Allied Signal Access	45	MD 32: I-70 to Car Co line
16	US 1: MD 43 to Ebenezer Rd	46	MD 32: MD 108 to I-70
17	US 1: Ebenezer Rd to Harf. Co line	47	MD 100
18	MD 45	48	MD 108: Trotter Rd to MD 32
19	MD 145	49	MD 108: MD 104 to MD 175
20	Klausmier Rd	50	MD 216
21	MD 26	51	Dorsey Run Rd: MD 103 to MD 175
22	MD 30 Hampstead Bypass	52	Dorsey Run Rd: MD 175 to MD 32
23	MD 30 Manchester Bypass	53	Gorman Rd
24	MD 32	54	Marriottsville Rd
25	MD 97	55	North Ridge Rd
26	MD 140	56	Patuxent Range Rd
27	US 1: MD 152 to Balt. Co line	57	Rogers Ave
28	US 1: MD 152 to US 1 Bus/MD 147	58	Sanner Rd: Johns Hopkins Rd to MD 216
29	US 1 Business	59	Sanner Rd: Johns Hopkins Rd to Pindell School Rd
30	US 1 Bypass	60	Snowden River Pkwy

Figure VII-10

and all figures/maps in this document are available on the BMC webpage, <http://www.baltometro.org/mambo/content/view/399/322/>.

Table VII-4 Preferred Alternative Interchange Projects

- 1 I-695 at MD 26
- 2 MD 695 at Quarantine Rd
- 3 MD 2 at MD 450
- 4 MD 100 at MD 10
- 5 I-95 at US 40
- 6 I-95 at Washington Blvd
- 7 I-95 at Russell St
- 8 I-895 at Potee St
- 9 I-83 at Thornton Mill Rd
- 10 I-795 at Dolfield Blvd
- 11 MD 140 at MD 97S, Center St, & Englar Rd
- 12 I-70 at Marriottsville Rd
- 13 US 29 at Rivers Edge Rd
- 14 MD 32 at MD 144
- 15 MD 32 at I-70
- 16 MD 32 at Burntwoods Rd

Figure VII-11

and all figures/maps in this document are available on the BMC webpage, <http://www.baltometro.org/mambo/content/view/399/322/>.

Table VII-5 Preferred Alternative HOV & Rail Transit Projects

- 1 I-95: Howard Co line to PG Co line (HOV)
- 2 I-95: I-695 to Howard Co line (HOV)
- 3 I-695: I-95 S to I-95 N (HOV)
- 4 Downtown to Social Security Light Rail
- 5 Downtown to White Marsh Light Rail
- 6 Downtown Light Rail Loop and East/West Connection
- 7 Central Light Rail Station at I-695 and I-83

Figure VII-12

and all figures/maps in this document are available on the BMC webpage, <http://www.baltometro.org/mambo/content/view/399/322/>.

Table VII-6 Preferred Alternative Bicycle & Pedestrian Projects

1	Broadneck Peninsula Trail – Phase IV
2	Chesapeake Beach Rail Trail
3	West Connector to Patapsco Valley Greenway
4	Connector to Baltimore City Trails
5	WB&A Trail – Phase III
6	South Shore Trail – Phases III, IV, & V
7	Parole Bridge
8	Gwynn’s Falls Trail: Middle Branch Park south to City line
9	Gwynn’s Falls Trail: Gwynns Falls Park north to County line
10	Herring Run Trail
11	Jones Falls Trail
12	#8 Trolley Line
13	MD 43 Bikeway
14	Caton-Loudon Trail
15	Gwynn’s Falls Trail: Owings Mills Town Ctr. to Glyndon
16	Gwynn’s Falls Trail: Owings Mills Town Ctr. to Gwynn Oak Park
17	Patapsco Greenway Connector
18	Red Run Bikeway
19	White Marsh Run Trail
20	North & West Branch Patapsco Trail
21	Little Pipe Creek Trail
22	Monocacy River Greenway Trail
23	Morgan Run to Sykesville Trail
24	Patapsco Regional Greenway Trail
25	Wakefield Valley Community Trail
26	MD 24 Corridor Bikeway
27	MD 152 Corridor Bikeway
28	Aberdeen Area Bikeway
29	Havre de Grace Bikeway
30	Joppatowne Bikeway
31	Lower Susquehanna Heritage Greenway Trail
32	Winters Run Greenway
33	Elkridge Main Street Tunnel
34	Frederick Road Pathway/Bikeway
35	Savage Pathway Extension
36	Spinal Pathway
37	Southern Howard County Pathway/Greenway
38	Snowden River Parkway Bike/Ped Corridor
39	US 1 Bike/Ped Corridor
40	US 29 Corridor
41	MD 99 Pathway/Bikeway

Figure VII-13

and all figures/maps in this document are available on the BMC webpage, <http://www.baltometro.org/mambo/content/view/399/322/>.

Table VII-7 Preferred Alternative Suburban Bus Routes

1	Westminster - Owings Mills
2	Westminster - Fort Meade
3	Westminster - BWI
4	Lake Shore - BWI
5	Manchester - Hunt Valley
6	Randallstown - Towson
7	York, PA - Towson
8	Bel Air - Hunt Valley
9	Bel Air - White Marsh
10	White Marsh – Bel Air
11	White Marsh Loop
12	Bel Air - MD 43 Extended
13	Bel Air - Towson
14	Essex - Towson
15	Annapolis - BWI

TRANSPORTATION DEMAND MANAGEMENT

The transportation demand management (TDM) strategies included in the 2001 BRTP are the outgrowth of an extensive analysis and review of alternative TDM strategies. These strategies included both areawide and corridor-level TDMs.

Seven TDMs were approved for inclusion in the 2001 BRTP:

<i>TDM Strategy</i>	<i>Selection Status</i>
<i>Transit Intensification</i>	<i>Accepted</i>
<i>Commuter Assistance</i>	<i>Accepted</i>
<i>Park-and-Ride Facilities</i>	<i>Accepted</i>
<i>Bicycle & Pedestrian Improvements</i>	<i>Accepted</i>
<i>ITS Technology</i>	<i>Accepted</i>
<i>Alternative Fuels/Vehicles</i>	<i>Accepted</i>
<i>Land Use/Growth Management</i>	<i>Accepted</i>



Transit Intensification

Improve public transit to provide incentives to forgo driving for the alternative of mass transit, including increased service on the Maryland Commuter Rail (MARC) lines where possible, expand or create new bus service throughout the system, and added amenities for the benefit of transit riders. Transit intensification TDM activities may include:

- Increase transit service frequency (shorter headways, longer operating hours)
- Expand service (routes into new parts of the community already served by transit)
- Provide new routes
- Provide transit inducements (bus stop enhancements, safety/security, automatic vehicle location systems)
- Replace vehicles
- Initiate, continue, or expand neighborhood shuttles
- Improved schedule information and/or more convenient transfers
- Improved bicycle and pedestrian access at bus stops and rail stations



Commuter Assistance

Provide comprehensive and coordinated assistance, subsidies, incentives, and services to employers and employees to encourage commuters to use alternatives to driving alone to work. Alternatives to single occupant vehicle (SOV) commute trips reduce vehicle miles of travel (VMT) and congestion (and congestion-related emissions). This program will function as a regional programmatic overlay to supplement and enhance traditional commuter-related programs and to proactively encourage the use of emerging alternative commuter strategies including telecommuting, flexible work arrangements, etc. While this program will focus on large employers (with 100+

employees), it will also extend services to smaller employers whose employees make up the largest percentage of the region's work force. Commuter assistance TDM programs may include the following.

Rideshare: The Commuter Assistance Office of the Maryland Transit Administration (MTA) provides funding support to local rideshare coordinators to strengthen ride-matching and rideshare-support services at the local level. Local rideshare coordinators provide ridesharing information and assist employers and employees in identifying opportunities for programs to support transit, flexible work hours, telecommuting, and Commuter Choice efforts.

Commuter Choice (Tax Credit) Outreach Partnership: MDOT, acting as the lead agency, works in conjunction with the Maryland Department of the Environment (MDE) and MTA to administer this program. Marketing efforts are conducted for the Commuter Tax Benefit Program to educate employers on the benefits provided by federal and state commuter choice legislation. This initiative provides tax incentives to employers to provide reduced transit fares, vanpooling opportunities, guaranteed ride home programs, and parking cash-out programs. Employees may also receive tax benefits from current federal commuter choice legislation.

Home-based Telework: This program is a voluntary region wide strategy for reducing SOV use by employees who primarily work for organizations with 100+ employees. Home-based telecommuting is also applicable to employees who work for smaller organizations.

Telework Partnership with Employers (TPE): This bi-regional program provides consultant services to assist large and smaller employers with establishing home-based telecommuting programs for their employees.

Guaranteed Ride Home Program(s): Institute/expand guaranteed ride home programs in the Baltimore region as a result of passage of the Commute Tax Benefit legislation (SB 244 and HB 310) enacted by the Maryland General Assembly in its year 2000 session, and the associated marketing by MDOT and MDE of this and other Maryland employer-based commute tax benefits.



Park-and-Ride Facilities

Provide up to 20,000 additional strategically located commuter parking spaces to intercept work trips and other trips to facilitate transfer to transit services, and to encourage formation of car/vanpools. Park-and-ride facilities encourage the use of public transit and/or ridesharing by providing central parking lots adjacent to train, subway, vanpool, or bus stops. Additional activities may include the provision of auxiliary on-site enhancements such as telephones, lighting, fencing, landscaping, improved maintenance and security.



Bicycle & Pedestrian Improvements/Amenities

A broad range of measures can be taken to enhance bicycle and pedestrian facilities in the region. In terms of capital improvements, a set of projects — largely multi-use trails — are identified in this plan earlier in this chapter. Investments in bicycle parking are another important need to encourage bicycle travel. Some capital improvements to improve bicycling and walking may be included as part of highway or transit capital or maintenance projects. In addition, the Bicycle, Pedestrian, and Greenways Transportation (BPG) Plan, a study supplementing the 2001 BRTP, includes a set of activities to support the expanded use of these travel modes, as described



below under the description of the BPG Plan.

Intelligent Transportation System (ITS) Technology

ITS programs and infrastructure consisting of traffic detection, monitoring, communications, and control systems are required to support a variety of ITS products and services in metropolitan and rural areas.

ITS projects can include traffic signal control systems, freeway management systems, transit management systems, and multi-modal traveler information systems, such as the following.

The Coordinated Highway Action Response Team (CHART) Program: Operated by the Maryland Department of Transportation and Maryland State Police, this program focuses its operations on non-recurring congestion, such as accidents. The Statewide Operations Center, and the three satellite Operations Centers in the State, 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.

Electronic Toll Collection: Continue electronic toll collection, operated by the Maryland Transportation Authority (MdTA), at the three harbor crossings, and implement at the remaining three sites (William Preston Lane Memorial "Bay" Bridge (US 50/301), Thomas J. Hatem Memorial Bridge (US 40), and the John F. Kennedy Memorial Highway (I-95) in the Baltimore region. Participate with other neighboring states in electronic toll collection to increase effectiveness.

Signal Systemization: Link signals together so that traffic operating in a given corridor can proceed smoothly from light to light without a lot of stop and go. This linking provides benefits for smoother traffic flow as well as reduced emissions resulting from idling vehicles. Signals are electronically connected, allowing intercommunication and reaction to changing traffic conditions. Timing plans are developed to optimize the system.

Multi-modal Traveler Information System: Provide multi-modal information to travelers to enable them to make more informed travel decisions, such as what route to take, what mode to take, when to leave, and 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.



Alternative Fuels/Clean Technology Vehicles

It is desirable to promote and/or fund programs to utilize new "clean fuel" or clean technology, primarily to replace existing conventional gasoline vehicles, and establish the infrastructure as necessary to support the use of alternative fuel vehicles. Clean fuels generally emit fewer pollutants (and are slower to form ozone) and are less toxic. Use of clean fuels and clean technology could also help slow atmospheric buildup of "greenhouse gas" that contributes to the potential for global warming. Several types of programs are available, including rebates, funding for incremental cost for vehicles, refueling infrastructure, marketing/promotion, education, and technical assistance.

Program incentives should be large enough to entice consumers to buy an alternative fuel vehicle (AFV); the most effective programs cover most of all of the incremental cost of the cleaner technologies. The programs should, if possible, be structured as a grant or rebate. Grants are more

likely to entice consumers to purchase AFVs than tax incentives, and government fleets pay no taxes and, therefore, will not benefit from a tax incentive. These grants should:

- Be easy for consumers to receive the incentive and for the state to administer.
- Be predictable, so public and private organizations can plan budgets around AFV incentives.
- Focus on developing a fueling infrastructure in addition to vehicle acquisition.

Alternative fuels/clean technology vehicles TDM initiatives may include the following.

Advanced Technology Vehicle Program (Maryland Department of Transportation): Assist fleet operators in applying advanced low-emission vehicle technology to their high mileage or high fuel use fleets such as taxicabs, shuttle buses, and school buses. This program has a goal of providing a predetermined amount of NOx emission reductions through the introduction of lower emitting AFVs. To qualify, vehicles should consume more than 3,000 gallons of fuel per year or travel more than 45,000 miles per year. Assistance may include funding for refueling equipment, incremental vehicle costs, or technical assistance.

Diesel Bus Catalytic Converter Program: Retrofit 1993 and older model year MTA buses with after-market oxidation catalysts to reduce emissions.

Cleaner Technology Mass Transit Study: Provide grant funding for a feasibility study of alternative fuels and/or technology (such as compressed natural gas, hybrid-electric, or fuel cell) for MTA buses and/or additional funding to implement recommendations of study.



Land Use/Growth Management

It is desirable to promote programs that are most effective when combined with certain types of urban form (physical characteristics and patterns of land development), i.e., those that are more likely to reduce motor vehicle emissions by providing and promoting alternatives to vehicle travel and that locate jobs, housing, and recreation in closer proximity to each other.

This strategy will provide incentives for unconventional developments that integrate land use and transportation planning, help create livable communities, and promote non-motorized means of transportation—particularly, transit-oriented development (TOD), and mixed-use development in Priority Funding Areas. These smart growth type developments should demonstrate their potential for reducing SOV travel demand and for decreasing air pollutant emissions associated with transportation.

Land Use/Growth Management TDM initiatives may include the following.

- Providing grants and technical assistance to support planning, design and construction of TOD, redevelopment, and mixed-uses.
- Promote environmentally friendly site design through grants and technical assistance to local jurisdictions' development review process.
- Support transportation facilities and transportation related amenities that would support TOD and other mixed-uses.

- Provide incentives for TOD developments at Metro/Light Rail stations.
- Support continuation of modeling activities to quantify air quality benefits of Smart Growth land uses.
- Support integration of transit-oriented land use planning with the Baltimore comprehensive regional rail study.

PROGRAMS/ACTIONS

JOB ACCESS AND REVERSE COMMUTE TRANSPORTATION PLAN

The overall goal of this effort was developing a comprehensive, area-wide approach to providing transportation services to welfare recipients and low-income people regardless of jurisdictional boundaries. As a result, the Job Access and Reverse Commute Transportation (JARC) Plan for the Baltimore region was prepared upon the request of the BRTB to help guide funding recommendations and short-term service planning. This plan is not meant to supersede, but to build upon existing area welfare to work transportation planning activities.

The JARC plan provides information about the geographic distribution of welfare recipients, location of employment centers with concentrations of low-income jobs, and available transportation services in the Baltimore region. In the Baltimore region, there are about 20,000 households receiving Temporary Assistance for Needy Families (TANF) welfare benefits, and the majority of these are in Baltimore City. There were 19 employment centers identified as having 10,000 or more total jobs with 1,000 low wage jobs paying \$12.00 per hour or less that would be appropriate for low-skilled workers.

The JARC Plan helps guide funding recommendations, short-term service planning, and builds on existing area welfare to work transportation planning activities.

In an attempt to identify spatial mismatches and gaps in transportation, the BMC created a geographic information system (GIS) of TANF households and destinations that welfare recipients need to access. Locations of employment centers, fixed route transit services, occupational training programs, and child care centers in the region were mapped to determine how many welfare recipients had convenient access to these facilities, based on the distance between their homes, transit stops, and potential employers. Transit services on Saturdays, Sundays and overnight were compared. Access to employment-related activities, occupational training programs, and child care centers was also determined by this method. Gaps in transportation service are considered to be where convenient access is limited.

Convenient access was determined using a quarter-mile buffer around local bus routes, commuter bus stops, and train stations. This size buffer simulates a five-minute walking distance, and is referred to as a walk access buffer. The GIS analysis determined that about 92 percent of TANF cases are within walking distance of a bus route or train station, and 88 percent of the cases are located in Baltimore City. The data show the Annapolis Regional Planning District (RPD) has adequate transit service coverage within that employment center every day, but not during overnight hours. RPDs are geographic units comprised of census tracts or groups of census tracts that do not cross jurisdiction boundaries. There are 94 RPDs within the Baltimore region. The Columbia RPD has a good amount of coverage, except on Sunday and overnight. Other employment centers have some transit service Monday through Friday during daytime hours, but little or none on weekends or overnight. Saturday transit service is not available in four of the 19 employment centers, Sunday transit service is not available in seven, and overnight transit service is not available in 13

employment centers.

Projects and strategies recommended to fill the transportation gaps were developed based on the GIS analysis and issues expressed by stakeholders. These issues include:

- Work schedules that require late night or weekend commuting
- Difficulties of balancing multiple destinations for child care and employment
- Long travel times because of multiple transfers
- Concerns about safety walking to or waiting at train stations or bus stops
- Difficulties obtaining or understanding information about transportation services

Recommendations include priorities for transit service improvements, as well as transportation projects that require coordination among partners. Since transit access is adequate in Baltimore City, and the majority of TANF cases are in Baltimore City, service improvements should be focused on reverse commute from there to suburban areas.

- Reverse commute service from Baltimore City to priority suburban employment centers
- Smaller urban areas, like Annapolis, to suburban areas where the highest concentration of TANF cases and jobs exist
- Suburb-to-suburb connections, in areas where the highest concentration of TANF cases and jobs exist
- Circulators within employment centers where the highest concentration of TANF cases and jobs exist
- Additional major job sites, such as Arundel Mills Mall, identified as having a concentration of low wage jobs will also be considered for transit services

Because most welfare recipients and low-income people in the Baltimore region live in dense urban areas served by transit, filling the gaps in transportation will primarily focus on employment centers. The 19 employment centers were ranked from highest priority to lowest, based on transit need first, and potential number of low wage jobs second. According to the ranking, a project proposed to serve Westminster, Bel Air-Fallston, Ellicott City, Edgewood-Joppa, Aberdeen-Havre de Grace, and Perry Hall-White Marsh would be weighted more heavily than a project proposed to serve Owings Mills, Security, or Eastpoint-Dundalk.

To enhance the overall quality of transit services for access to jobs in the Baltimore region, the following recommendations involve implementing new or expanded transportation service, and improving customer service and operating efficiency. All of these transit service improvements would be eligible for JARC funding, and include:

- Maintain and expand successful JARC grant-funded transit service where need is demonstrated
- Incorporate successful services funded through JARC with other transit funding sources to guarantee sustainability

- Shorten trip time by providing more express service, more frequent service, and more convenient transfer points between service providers
- Increase weekend, late night, and overnight transit service where need is demonstrated
- Create transit centers at major fixed route and demand response service transfer points to improve connectivity, and provide schedules of all systems at all transit centers and other transfer points
- Encourage employer-sponsored transportation services

In addition to activities which directly support access to jobs, transportation coordination projects such as creating Transportation Management Associations (TMAs) with coordinated efforts to assist low-income commuters and improving pedestrian access to, and safety at, transit stops are also recommended projects that directly affect transportation services, but do not provide the actual transportation services. Implementation of these projects requires coordination efforts and joint investments, and may not entirely be eligible for funding through the JARC grant program. Other strategies relate to child care, health care, land use and housing, and affect job access transportation services indirectly. Although these types of strategies would not be eligible for funding through the JARC grant program, they are included in this plan since they would improve overall access to jobs.

BICYCLE, PEDESTRIAN, AND GREENWAYS TRANSPORTATION PLAN

The BRTB has greatly expanded its bicycle- and pedestrian-related planning activities in recent years. Bicycle and pedestrian facilities provide alternatives to SOV travel, and have proven to be popular as a means of providing recreational opportunities and improving quality of life. In 1998, the BRTB conducted an analysis of the bicycle-friendliness of major roadways in the region, and followed that up with an assessment of the potential demand for bicycle trips along these routes.

In 2000, a Bicycle, Pedestrian, and Greenways Transportation (BPG) Plan was created as part of a more comprehensive regional planning effort. The BPG Plan is available as a supporting document to the 2001 BRTP. The BPG Plan resulted in the development of a number of strategies designed to promote a coordinated and strategic approach to the development of a regional network of trails, bikeways, and pedestrian facilities in the Baltimore region. The efforts that contributed to these strategies included a number of initiatives. A thorough review of the existing conditions for bicycling and walking in the Baltimore region was conducted. In addition, existing zoning and subdivision codes of local jurisdictions and State agencies were reviewed. It was found that often times, policies and practices at the State and local level had gaps in the delivery of consistent facilities. This resulted in the identification of improvements and best practices that could be used to strengthen such codes to better accommodate bicycling and walking. In addition, typical engineering solutions were also identified to illustrate different types of facility designs and how these design enhancements could be used to make improvements to the regional network.

Finally, an extensive public input initiative was conducted. Public input was critical in establishing the vision that shaped the recommendations that were included in the BPG Plan. Some of these activities included four newsletters, a bicycling and walking survey, two community workshops featuring well-noted speakers in the bicycle and pedestrian field, a workshop designed to address the bicycling and walking concerns of children, and a series of public forums held throughout the region to discuss citizen concerns and preferences. Following these efforts, a range of strategies and actions to carry out these strategies were developed, they are listed below.

Strategy 1: Physical Route Network

Immediate actions should be taken to implement high priority projects in the Baltimore region, as identified by the BPG Plan. The region's progress in becoming bicycle-and pedestrian-friendly will be measured in large part by how many miles of new facilities are put on the ground in the coming years.

Strategy 2: Actions to Protect Greenways

Greenways are corridors of open space that can vary greatly, from narrow ribbons of green that run through urban, suburban and rural areas to wide corridors that incorporate diverse natural, cultural and scenic features. Jurisdictions in the Baltimore region should continue to actively pursue the protection of greenways by developing greenway master plans, preserving greenway corridors through land protection measures, and by implementing trail networks in conjunction with greenways where appropriate.

Strategy 3: Connections to Transit

Cooperative education, publicity and marketing should show the natural connection between walking, riding a bicycle, and transit. This strategy recommends a combination of education initiatives and physical improvements to encourage better access to and accommodations at transit stations and bus stops (e.g. bicycle racks, bicycle storage capability on rail transit cars and bicycle racks on buses).

Strategy 4: Mobility-Friendly Policies

The bicycle and pedestrian modes must become fully integrated into the transportation planning and design process in order to ensure that our future roadway network is mobility-friendly. During the development of the BPG Plan, policies and practices of municipal, jurisdictional, and state agencies were analyzed for their effect on bicycle and pedestrian mobility.

Strategy 5: Regional Practices on ADA Design

The Americans With Disabilities Act (ADA) requires that all new construction and alterations meet the standards set forward in the ADA Accessibility Guidelines. This strategy would provide training for local roadway designers who are responsible for meeting ADA requirements.

Strategy 6: Maintenance and Management

Bicyclists and pedestrians are very sensitive to maintenance problems on bikeways (including on-road facilities) and pedestrian facilities. This strategy addresses the development of a framework to address both regular and remedial maintenance issues in the region.

Strategy 7: Education Initiative

One common aspect of bicycle and pedestrian-friendly communities in the United States (U.S.) is safety education programs for all users, including motorists. Safety education should go hand in hand with construction of new on-road bikeways, trails and sidewalk networks. Therefore, a key recommendation of this plan is to provide regular instruction on bicycle and pedestrian safety to area school children, adult cyclists and motorists.

Strategy 8: Wellness Initiative

The health community should be actively involved in bicycle and pedestrian programs to promote wellness and physical activity in the Baltimore region. This strategy encourages the development of bikeways, walkways and trails to promote physical activity and wellness programs for people of all ages.

Strategy 9: Encouragement Programs

Most bicycle and pedestrian-friendly communities not only provide places for people to walk and bike, but also encourage them to use these alternative transportation modes. This strategy envisions a variety of other encouragement programs that will support bicycling and walking in each jurisdiction.

Strategy 10: Safe Routes to School Program

When conditions in and around a school are hazardous for children to walk or bicycle to and from school, a Safe Routes to School program can provide needed tools to improve conditions. This program brings together key community leaders such as parents, school administrators, school and community transportation planners, and students, among others, to evaluate the school site and the surrounding area's traffic patterns, and pedestrian and bicycle conditions near the school. Area schools should institute Safe Routes to School programs, as appropriate; programs should be coordinated with the state's development of a model program.

Strategy 11: Legal and Enforcement Actions

There are a number of misconceptions regarding legal issues pertaining to bicycle and pedestrian transportation. Legal liability is an area that must be addressed in a local dialogue. In addition, the Maryland State Code can be strengthened to support bicycle and pedestrian transportation. Law enforcement agencies will play a critical role in enforcing laws and they must be included in discussions regarding bicycle and pedestrian laws in Maryland.

Strategy 12: Continued Regional Coordination

Planning and coordination on bicycle and pedestrian activities must not end at the conclusion of this BPG Plan. Much additional work will be needed on the part of local and state agencies and citizen advocates if this BPG Plan is to be implemented in a timely manner. This strategy addresses the immediate need to devote staff resources to implement this BPG Plan, as well as the critical role that citizen advocates will play in the process.