

**DATA DEVELOPMENT
AND
MODEL ENHANCEMENTS**

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PROJECT: GENERAL DEVELOPMENT AND COMPREHENSIVE PLANNING

This project is divided into three task activities:

- Development Monitoring
- Cooperative Forecasting Process
- 2010 Census and American Community Survey

TASK: DEVELOPMENT MONITORING

PURPOSE: To track new land development patterns in the region, by type (residential, commercial, industrial, etc.), location and timing.

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Development tracking is important to the transportation planning process to determine the placement of household and employment growth and associated impacts and demands on the region's transportation network. Ongoing contact with state and local agencies provides data needed for this activity. Since FY 2003, the *Building Permit Data System* at the Baltimore Metropolitan Council has been serving the region with various products and services: (1) statistical summary reports of planned building activity across the Baltimore region is compiled on a monthly basis from the building permits received and processed by BMC; (2) the reports include analysis of regional trends, supported by maps and charts highlighting notable development activity, as well as a comparison with the national trend during the reporting period; and (3) BPDS.online allows users to search the building permit files and to retrieve those items directly online through subscription.

During FY 2008, BMC staff developed pilot monitoring programs to report on mixed-use development programs and the number of residential units associated with such projects as well as the initiation of a program to track "green" environmentally oriented new construction authorizations. In FY 2009, BMC staff conducted the first full fiscal and calendar year of capturing and reporting on mixed-use and "green" permits. This activity continued and was enhanced during FY 2011.

During FY 2011, BMC staff reviewed new development patterns in the region to determine their consistency with the objectives of Maryland's Smart Growth Initiatives and Priority Funding Areas as well as locally designated priority funding areas. Three principal monitoring activities were carried out: (1) compiled development announcements from regional/local media, local economic development agencies, SHA project reports, and other sources within the local planning/development community; (2) analyzed actual development relative to existing and proposed water and sewer service areas and created a report documenting development activity; and (3) prepared quarterly and special reports of construction plans derived from the Building Permit Data System. During FY 2010, BMC staff began the development of software applications to automatically identify and capture these data from the electronic files sent by local jurisdictions. In FY 2011, BMC staff made formal presentations on these new construction monitoring activities to the Technical Committee and the Baltimore Regional Sustainability Committee.

In FY 2011, BMC staff beta-tested and piloted the implementation of software applications to automatically capture and integrate mixed-use and "green" permit data into our database. For FY 2012, BMC staff will continue implementation of software applications to post our mixed-use and "green" permit data into our pre-existing reports on construction activity and post these results on our web site.

FY 2012 PERFORMANCE OBJECTIVES:

1. Prepare monthly and quarterly reports of plans for new residential and non-residential development.
2. Prepare analyses of building permit activity by water and sewer service areas and priority funding areas.
3. Prepare residential growth "hot spots" report.
4. Continue development, beta-test software, and implement applications for capturing and reporting special building permits.
5. Prepare semi-annual reports on mixed-use and "green" permits.

BALTIMORE REGION UPWP
FY 2012 UNIFIED PLANNING WORK PROGRAM

PRODUCTS/MILESTONES	SCHEDULE
Reports on residential/non-residential development plans	Monthly/Quarterly
Reports on mixed-use and “green” construction activity	Semi-Annual
Report on residential hot spots	2 nd Quarter
Analyses/Maps on building permit activity by water and sewer services areas and priority funding areas	1 st Quarter

PARTICIPANTS: Baltimore Metropolitan Council

BUDGET: **\$220,000**

FHWA Share – \$112,640
FTA Share – \$ 63,360
MDOT Share – \$ 22,000
Local Share – \$ 22,000

TASK: COOPERATIVE FORECASTING PROCESS

PURPOSE: To generate socio-economic and demographic data through a process that reviews changes in local land development patterns as the result of changing local policies or new developments in the market. This data is a vital input to the regional travel demand forecasting process and the development of the Long Range Transportation Plan.

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In FY 2012, this work element provides for maintaining a liaison with state and local demographers and economic development officials to monitor locally sensitive development issues. Discussions will continue with the Metropolitan Washington Council of Governments as bi-regional forecasts are prepared and updated. Periodic meetings between the Cooperative Forecasting Group (CFG) and its counterpart at the Metropolitan Washington Council of Governments are included in these activities.

An activity that emerged for FY 2007 was the development of estimates that were incorporated into new socio-economic projections based on the impacts of the Base Realignment and Closure (BRAC) 2005 Commission's decision for military installations and office space in the Baltimore region. The federal military's decisions to shift federal civilian and military personnel to new locations will have a profound effect on population, housing, and employment forecasts. Each socio-economic forecast set developed by the BMC in conjunction with the Cooperative Forecasting Group since FY 2007 has incorporated individual jurisdiction estimates and projections of BRAC activity from Round 7 to the current Round 7-C. In FY 2012, BMC staff will continue to conduct research to determine the magnitude of these changes by geographic area and incorporate changes into the Round 8 Cooperative Forecasts as BRAC reaches its fully staffed military and civilian targets.

In FY 2011, BMC staff purchased and processed the 2009 ES-202 file that is the basis for current year small area employment estimates. The processing and review of the 2009 ES-202 provided BMC and local jurisdiction staffs with the technical expertise to process the 2010 ES-202 file that will be used for the long-range transportation plan and

as a validation of 2010 U.S. Census Bureau at-place employment estimates. The result of this FY 2011 activity was the creation of the 2009 Master Establishment File (MEF). In order to support BMC and local jurisdiction efforts to develop employment estimates at the jurisdiction and small area level, BMC staff early in calendar 2011 purchased the 2010 ES-202 and conducted processing, quality control and analysis of the file in order to continue the creation of a 2010 Master Establishment File that will be completed in FY 2012 after review by local planning agencies.

In FY 2012, BMC staff, with the approval of the Cooperative Forecasting Group (CFG), will develop new employment projections based on our research on estimating and forecasting employment data so that there is a consistent employment forecast dataset and accompanying long-range employment assumptions. These new employment forecasts will become a part of a new Round 8 Cooperative Forecasts. BMC will also continue to provide technical assistance initiated by the BRTB to the development of the 2011 Baltimore Region Long Range Transportation Plan.

FY 2012 PERFORMANCE OBJECTIVES:

1. Update and document assumptions for 2000-2011 forecasts to account for major new development announcements/ decisions through January 2012.
2. Document proceedings of Cooperative Forecasting Group meetings.
3. Update small area employment forecasts 2010 – 2035 by economic activity area for use in the BMC travel demand model.
4. Document forecast changes to long-range population, household and employment forecasts for 2000-2035 used in the BMC travel demand model.
5. Coordinate joint meetings to continue discussions on bi-regional growth assumptions with the Baltimore and Washington forecasting groups.
6. Provide small area residential and employment estimates and forecasts to local jurisdictions on request.

7. Prepare new regional and jurisdiction employment controls 2000-2035 with CFG, MWCOG, Maryland DLLR and MDP.
8. Continue data compilation, data development and technical assistance to BMC partners involved in the regional visioning activity and the Baltimore Region Long Range Transportation Plan.
9. Coordinate meetings with local Planning Directors.
10. Complete processing, incorporate local planning agency updates and re-tabulate 2010 employment estimates by small area based on the Maryland Department of Labor, Licensing, and Regulation's ES-202 file.

PRODUCTS/MILESTONES	SCHEDULE
Document proceedings of Cooperative Forecasting Group	Throughout Fiscal Year
Provide data to local jurisdictions upon request	Throughout Fiscal Year
Prepare and document updated short-term 2000-2011 forecasts of population and households	2 nd Quarter
Update 2000 – 2035 small area population and household forecasts submitted by local jurisdictions	2 nd Quarter
Prepare and document new regional and jurisdictional employment forecast methodologies	4 th Quarter
Update 2000-2035 small area employment forecasts by NAICS sector for use in the travel demand model	3rd Quarter
Provide data compilation, data development and technical assistance to the Baltimore Region Long-Range Transportation Plan	Throughout Fiscal Year
Complete 2010 MEF development by incorporating local planning agency quality control results and re-tabulate 2010 ES-202 file	4 th Quarter

PARTICIPANTS: Baltimore Metropolitan Council, Maryland Department of Planning, City of Annapolis, Baltimore City, and Anne Arundel, Baltimore, Carroll, Harford, and Howard counties

BALTIMORE REGION UPWP
FY 2012 UNIFIED PLANNING WORK PROGRAM

<u>BUDGET:</u>	Baltimore Metropolitan Council	\$220,000
	Anne Arundel County	\$34,650
	Baltimore City	\$54,630
	Baltimore County	\$35,000
	Carroll County	\$38,115
	Harford County	\$76,230
	Howard County	<u>\$76,230</u>
	TOTAL	\$534,855

FHWA Share –	\$273,846
FTA Share –	\$154,038
MDOT Share –	\$ 22,000
Local Share –	\$ 84,971

TASK: 2010 CENSUS AND AMERICAN COMMUNITY SURVEY

PURPOSE: To review, analyze and develop relevant (transportation) products from data released by the Department of Commerce, U.S. Bureau of the Census for use in the Baltimore region.

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A system of Community Profiles, based on 2000 Census and 2000 MEF data was implemented in FY 2003. In FY 2010, BMC staff updated Community Profiles with existing MEF data and data from the 2008 American Community Survey. FY 2012 will see updates of these profiles using new employment data by NAICS codes and the incorporation of population and travel behavior data from the 2010 American Community Survey, the 2010 Master Establishment File and the 2010 U.S. Census.

The U.S. Census Bureau released its first small area summaries of the American Community Survey (ACS) in late calendar 2010. The ACS has replaced the U.S. Census Bureau's decennial long-form questionnaire and provides small area data on an annual basis. Since these data are developed annually, the Census Bureau will conduct continuous quality control assessments because a very different sample of households is used as compared to previous census activities. In FY 2010, BMC staff analyzed and reported on the Census Bureau's 2006 - 2008 multi-year ACS product through presentations to the Technical Committee and the Baltimore Regional Transportation Board. In FY 2011, BMC staff conducted these same activities for data from the 2005 – 2009 ACS product. Late in FY 2011, presentations were made to these same groups highlighting results from the U.S. Census Summary File 1.

During FY 2010, the BMC provided the Maryland Department of Planning (MDP) and local planning agencies technical assistance in developing and implementing Census 2010 outreach activities and creating 2010 Census Complete Count Committees. Throughout FY 2010, BMC staff provided technical Assistance to local planning agencies and the U.S. Census Bureau Philadelphia Regional Office in delineating 2010 Census statistical geography at the census tract and block group level for its preliminary files and final review files.

In FY 2012, BMC staff will continue their analysis on the usability and reliability of this annual census product by comparing it with existing census data and data from the five-year (2006-2010) ACS product by small area. An updated report will continue to highlight data problems and opportunities and will detail how these data should be used in travel demand forecasting. Data from the ACS will also be compiled and analyzed to assist in Environmental Justice equity analyses as needed. During the third quarter of FY 2011, the U.S. Census Bureau released 2010 decennial census data from its PL 94-171 Redistricting data. BMC staff used these data to compare results between 100% decennial census data compilations versus ACS sample data by small area. BMC staff closely scrutinized these data and identified margins of error and/or discontinuities between 100% data and sample data.

The release of the PL 94-171 data provided BMC staff with its first view of approved U.S. Census Bureau small area geography. Based on this data release, BMC staff, along with local jurisdictions, will design new 2010 TAZ boundaries. During the 3rd quarter of FY 2011 the Census Bureau provided web-based training coordinated with FHWA and delivered software and Census 2010 data to create new transportation analysis zones (TAZ) and transportation analysis districts (TAD) for use by the bureau in creating the 2010 Census Transportation Planning Package (CTPP). It is anticipated that the Census Bureau will request TAZ boundaries for CTPP tabulations during the 1st quarter of FY 2012. BMC staff will assist in any follow-up activities by the U.S. Census Bureau, MDP or local jurisdictions on ensuring a complete count during FY 2012.

FY 2012 PERFORMANCE OBJECTIVES:

1. Analyze American Community Survey demographic and housing characteristics and procedures for using these data as inputs to the travel demand modeling process.
2. Update Community Profile series, based upon 2006 – 2010 ACS five-year sample data and the 2006 – 2010 Public Use Microdata files.

3. Develop 2010 TAZ boundaries based on accepted 2010 census geography released in the PL 94-171 file and data from Census 2010 using Census Bureau supplied software.
4. Generate topic reports based on the 2006 – 2010 ACS file and the release of the Census Summary File 1.

PRODUCTS/MILESTONES	SCHEDULE
Analysis of quality, reliability, and usability of 2006 - 2010 American Community Survey data	3 rd Quarter
Publication of Community Profiles using 2010 ACS data, 2010 ACS PUMS data and the 2010 Master Establishment File contingent upon the availability of data files	4 th Quarter
Develop 2010 TAZ boundaries based on approved 2010 census geography	1 st Quarter
Provide analysis and create web-reports on housing, travel behavior, income, immigration, etc. based on analysis of 2006 – 2010 ACS file and Summary File 1.	Throughout Fiscal Year

PARTICIPANTS: Baltimore Metropolitan Council

BUDGET: **\$140,000**

FHWA Share – \$71,680
 FTA Share – \$40,320
 MDOT Share – \$14,000
 Local Share – \$14,000

PROJECT: DATA DEVELOPMENT

This project is divided into four tasks:

- GIS Activities
- Regional Database Integration
- Integrating Transportation and Land Use Planning
- Analysis of Trends and Policy Issues

TASK: GIS ACTIVITIES

PURPOSE: To continue to develop and refine the BMC Geographic Information System (GIS) that will allow BMC staff to spatially organize, update, analyze, disseminate, and graphically depict demographic, socio-economic and travel information.

In FY 2011, BMC staff provided ongoing GIS maintenance and technical support for various transportation planning activities including analysis for the Long Range Plan, the Transportation Improvement Program, traffic monitoring systems, freight movement, and the congestion management system. GIS will continue to be a beneficial tool in storing, managing, analyzing and mapping the large number of geospatial datasets that BMC will use in FY 2012. The BMC GIS will again be used to generate all maps and to perform all spatial analysis contained in BMC reports and for requests from both inside and outside the agency. The BMC GIS will be responsible for managing the storage of all geospatial data used within the BMC. The BMC GIS will also maintain and develop GIS applications that will increase staff productivity with custom tools.

The completion of the BMC GIS Strategic Plan in FY 2009 and implementation of Phase 1 of the three-phase plan during FY 2010 and FY2011 enabled the GIS staff to provide technical assistance and enhanced GIS capabilities to internal and external users. The full implementation of Phase 1 GIS Strategic Plan activities established an internal GIS Steering Committee, defined and developed GIS Data Service Level Agreements and associated Data Stewards to shepherd these new activities. Additionally, during FY

2011 new BMC GIS Standards for Metadata and National Map Accuracy Standards were implemented. Other tasks that were completed include the launch of a GIS data warehouse, implementation of data security policies, software procurement and development, the implementation of a GIS data dictionary and archiving of GIS data.

In FY 2012, BMC staff will continue to coordinate with the Maryland State Geographic Information Coordinating Committee (MSGIC) particularly with its efforts to improve coordination among state and local agencies, reduce duplication of effort and increase data sharing. In FY 2006, BMC staff began serving on MSGIC to act as the BMC liaison; staff will continue participation on the committee in FY 2012. This task also involves BMC staff working closely with MSGIC to understand and address the needs of local and regional planning organizations when developing statewide GIS systems.

In order to more easily share data with partner agencies and to achieve more extensive use of GIS resources, BMC staff will work on completing Phase Two within BMC's GIS Strategic Plan. Significant staff resources will be dedicated to completing Phase Two of the BMC GIS Strategic Plan in FY 2012 to heighten BMC's GIS capabilities in order to keep up with the increased demand for GIS both internally and externally.

FY 2012 PERFORMANCE OBJECTIVES:

1. Provide ongoing GIS maintenance and technical support within BMC.
2. Coordinate GIS activities within the BMC.
3. Manage the storage of all geospatial data.
4. Maintain and develop GIS applications/tools.
5. Participate in MSGIC.
6. Complete Phase Two outlined in the BMC GIS Strategic Plan.
7. Update web mapping applications to assist in visualization.

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PRODUCTS/MILESTONES	SCHEDULE
Provide GIS maintenance and technical support within BMC	Throughout Fiscal Year
Manage Geospatial Data Storage	Throughout Fiscal Year
Maintain/Develop GIS Applications/Tools	Throughout Fiscal Year
Participate in MSGIC	Throughout Fiscal Year
Maintain/Update Master Network Database Application	Throughout Fiscal Year
Coordinate GIS activities within the BMC	Throughout Fiscal Year
Maps and Spatial Analysis	Throughout Fiscal Year
Complete Phase Two from BMC GIS Strategic Plan	Throughout Fiscal Year

PARTICIPANTS: Baltimore Metropolitan Council, Metropolitan Washington Council of Governments, Maryland Transit Administration, State Highway Administration, City of Annapolis, Baltimore City and Anne Arundel, Baltimore, Carroll, Harford and Howard counties

BUDGET: Baltimore Metropolitan Council **\$220,000**

FHWA Share – \$112,640
 FTA Share – \$ 63,360
 MDOT Share – \$ 22,000
 Local Share – \$ 22,000

TASK: REGIONAL DATABASE INTEGRATION

PURPOSE: To develop and refine BMC software applications and databases to facilitate the use of BMC data resources.

The Master Network Database is a repository that includes all travel model links for any future horizon year or potential modeling scenario. It has yielded several benefits: (1) the user can easily query year-specific or scenario-specific model networks for use in any given model run; (2) the user can store, manage and edit multiple links and/or multiple networks in a true GIS environment; and (3) all model results are displayed on the spatially accurate Baltimore BaseMap. In FY 2009, staff launched the web interface of the new Traffic Count Database that replaced the Regional Traffic Count File. In FY 2011 enhancements were made to both databases including an improved user interface, enhanced linkages between the databases and a more secure framework.

In addition to refining and maintaining our internal database tools, in FY 2012, BMC staff will focus on the development of a web-based interactive map application. The interactive map application will be built on a Google Maps framework and will feature several data layers. The primary goal will be to develop a tool that will support our CMP (Congestion Management Process) but will also serve as a transportation planning tool for BMC staff, our member jurisdictions, MDOT's modes and the general public. Significant staff time will be required to create the application, then format, update and maintain the data layers that will be available on the map. Additional staff time will be dedicated to meet with and interview BMC staff, our member jurisdictions, MDOT's modes and the general public to ensure no duplication of effort occurs in the development of the web-based interactive map and to maximize the value of the tool to its end-users.

FY 2012 PERFORMANCE OBJECTIVES:

1. Refine and maintain the Master Network Database and the Traffic Count Database application.

2. Work with BMC staff, MDOT's modes and our member jurisdictions to ensure no duplication of effort occurs in the development of the web-based interactive map and to maximize the value of the tool to its end-users.

PRODUCTS/MILESTONES	SCHEDULE
Refined Software and database interface from Master Network Database to Regional Traffic Count Database	4 th Quarter
Updated Master Network Database/Network Editor application	4 th Quarter
Web-based Interactive Map Application	Throughout Fiscal Year

PARTICIPANTS: Baltimore Metropolitan Council, Metropolitan Washington Council of Governments, Maryland Transit Administration, State Highway Administration, City of Annapolis, Baltimore City and Anne Arundel, Baltimore, Carroll, Harford and Howard counties

BUDGET: Baltimore Metropolitan Council **\$120,000**

FHWA Share – \$61,440
 FTA Share – \$34,560
 MDOT Share – \$12,000
 Local Share – \$12,000

TASK: INTEGRATING TRANSPORTATION AND LAND USE PLANNING

PURPOSE: To explore the relationship between the regional transportation network and land use development patterns.

As part of the FY 2008 development of the long-range transportation plan, *Transportation Outlook 2035*, public comment called for increased consideration of land use development patterns in planning for capital improvements to the transportation network. In response, the BRTB initiated research activities to further investigate the relationship between transportation and land use, and conducted a multi-year, scenario-based investigation of the relationship between transportation performance and land use policies in the region.

In FY 2012, BMC will continue to assist in the development and evaluation of transportation and land use scenarios as requested. BMC will apply, enhance and/or develop the technical tools needed to evaluate transportation and land use scenarios in support of UPWP work activities such as: development of the long range transportation plan, (LRTP) or other studies such as a regional transit plan and a regional freight-movement plan. Such tools could include the Baltimore Regional Travel Demand model, and the Production, Exchange, Capacity, Allocation System (PECAS) model and/or the INDEX software suite. With final calibration completed in FY 2011, the PECAS model in particular will allow for extensive evaluation of the influences of transportation on land use and vice versa. An example of a scenario planning activities to support LRTP development could include an evaluation of the variation in travel demand given the variation in the cost of travel over the 25-year LRTP planning horizon.

For all scenarios, applicable evaluation measures for transportation and land development characteristics as well as environmental, economic/freight and social measures would be determined, developed as required, and applied.

In addition, BMC will continue to both monitor and evaluate related policies and processes at the federal, state, regional and local levels, and coordinate regional

transportation and land-use planning initiatives with the appropriate partners. General examples of policies and processes to be monitored and evaluated could include: Implementation of the US EPA plan for Chesapeake Bay watershed restoration plan through the development of Watershed Implementation Plans — WIPs; and evolution of state-wide growth management policies through the work of the Maryland General Assembly/Maryland Sustainable Growth Commission, and the Maryland Department of Planning through the development of the Maryland State Growth Plan — *PlanMaryland*.

FY 2012 PERFORMANCE OBJECTIVES:

1. Investigate and develop technical tools as needed.
2. Conduct scenario planning activities.
3. Coordinate with local and state land use planning partners.
4. Monitor federal, state, regional and local land use policies and planning activities.

PRODUCTS/MILESTONES	SCHEDULE
Continue application of integrated transportation and land use model	Throughout Fiscal Year
Provide technical assistance in support of the LRP	1 st , 2 nd & 3 rd Quarters
Provide technical assistance in support of studies such as a regional transit plan	2 nd , 3 rd & 4 th Quarters

PARTICIPANTS: Baltimore Metropolitan Council

BUDGET: **\$150,000**

FHWA Share – \$76,800
FTA Share – \$43,200
MDOT Share – \$15,000
Local Share – \$15,000

TASK: ANALYSIS OF TRENDS AND POLICY ISSUES

PURPOSE: To identify regional travel trends and related policy issues, using existing BMC datasets and outside resources where available. In recent fiscal years, BMC has collected or compiled a number of datasets, including the 2007/2008 Household Travel Survey, the 2007 On-Board Transit Survey, the American Community Survey, and data on regional traffic conditions such as GPS-based floating car travel time data and traffic counts. The Household Travel Survey is the primary resource for this task. The results from the 2010 Census will also be available.

The analysis will be responsive to the mission of the BMC as it relates to trends and initiatives outside the agency. For example, there has been a movement in federal policy away from adding capacity to the transportation system, and toward management of the existing system. In this context, more and better data will increase understanding of regional travel conditions and lead to better decision making.

The results of the analysis will be communicated to local officials and the public. Products for fiscal year 2011 included an issue paper, "Commuters and Commuting in the Baltimore Region," and another issue paper, "Travel Differences by Age, Gender, and Lifecycle in the Baltimore Region," published in Spring 2011. Two other issue papers, titled "Travel and Energy Consumption" and "The Aging of the Regional Population and Its Effect on Travel," were also published in fiscal year 2011.

For fiscal year 2012, two topics have been suggested by the survey analysis to date:

The Aging of the Regional Population

The Baby Boomers are now moving into old age, setting off the first stage of what will be a demographic transformation of the Baltimore region. The most rapid change will occur over the next ten years, with the cumulative impact mounting for several decades beyond.

Transportation is central for the elderly to maintain their independence and, with it, the physical and emotional well-being that comes with leading an active and socially-connected life. BMC conducted previous studies to assist the six jurisdictions in the region to plan for increasing elderly travel needs. They included a 1999 study on travel patterns, and a 2004 study on residential choices, of the Baltimore region elderly population.

The release of initial 2010 Census results in fiscal year 2011 will provide an opportunity to improve upon and extend previous work. A new study could include, but would not be limited to, research tasks covering the following topics:

- Activity patterns and travel characteristics of the elderly.
- Distribution of transportation need categories (low, moderate, high).
- Spatial distribution, i.e. naturally occurring retirement communities.
- Barriers to elderly travel.
- Attitudes toward transit services; mix of service features and cost desired, and
- Declining driver skills and driver education.

In addition, two issue papers will be published to highlight policy issues identified by the study.

Details of the study will be determined following completion of a review of previous studies, and consultation with stakeholders, including local governments and non-profit social service providers, in fiscal year 2011.

Several research tasks would involve a survey. If those tasks are selected, BMC may contract with a consultant to design and conduct the survey.

Travel Indicators

The American Community Survey (ACS) of the US Census Bureau collects data on revealed and observed travel behavior in major metropolitan areas. This task will make

use of national datasets like the ACS to expand the regional travel monitoring system of the BMC. Other Census Bureau datasets will also be used, including The American Fact Finder and the PUMS files.

Major sub-tasks will be selection, analysis, synthesis, and dissemination of travel indicators. The analysis will consist of direct indicators of travel and also demographic/household characteristics that influence travel indirectly, the latter serving as an additional monitoring tool. An important component will be the creation of a user-friendly data format to be supplemented by descriptive text.

The goal of this task is to improve understanding of travel conditions in the region and thereby inform policy discussions.

Travel indicators for consideration are as follows:

- Travel Estimates
 - Average Commute Time by Mode (Auto & transit)
 - Share of work force reported using transit
 - Share of work force reporting primary work location outside jurisdiction of residents
 - Share of work force reporting primary work location outside Baltimore region
 - Share for work force reporting a departure time before am peak (6:30 – 9:30)
- Demographic/Household Characteristics
 - Share of households with a member over 62
 - Share of households with no member less than 18
 - Share of population foreign born
 - Share of population with a bachelor's degree
 - Share of households that are renter occupied.
 - Median Age

Existing BMC regional data collection programs, such as those for traffic counts, employment center cordon observations, and GPS speed monitoring, will be reviewed to identify opportunities to complement the regional monitoring program. The Bureau of Labor Statistics American Time Use Survey and other national datasets will be reviewed for the same purpose.

FY 2012 PERFORMANCE OBJECTIVES:

1. Produce two (2) issue briefs.
2. Study of Residential Choices and/or Travel Patterns of the Baltimore Region Elderly Population Using 2010 Census Results.
3. Identified set of regional traffic indicators.
4. Development of data format.
5. Analysis/Synthesis of current ACS data.
6. Monitoring report.

PRODUCTS/MILESTONES	SCHEDULE
Identified set of regional traffic indicators.	1 st Quarter
Development of data format. Analysis/Synthesis of current ACS data. Issue Brief 1 (The Aging of the Regional Population)	2 nd Quarter
Monitoring Report Issue Brief 2 (The Aging of the Regional Population)	3 rd Quarter
Report: To be determined following completion of review in fiscal year 2011, "Update of Previous Studies on the Residential Choices and Travel Patterns of the Baltimore Region Elderly Population".	4 th Quarter

PARTICIPANTS: Baltimore Metropolitan Council

BUDGET: \$60,000

FHWA Share – \$30,720
FTA Share – \$17,280
MDOT Share – \$ 6,000
Local Share – \$ 6,000

PROJECT: TRAVEL DEMAND MODELING

PURPOSE: To provide, when appropriate, updated or improved elements to the regional travel demand model.

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Essential to the region's transportation planning efforts is the Baltimore Region Travel Demand Model maintained by the BMC staff. The model is a computerized application used to simulate existing and future travel patterns in the Baltimore metropolitan area. The model estimates person, vehicle, and transit travel throughout the Baltimore region and portions of the adjoining Washington region. A continuing program of model enhancements has been carried out over the past several fiscal years to ensure that the BMC and its member jurisdictions develop their modeling capabilities in line with the "state of the practice."

FY 2011 accomplishments focused on validating a new Version 4 model (the model replaced was termed Version 3.3.) with revealed behavior from the 2007/2008 Household Travel Survey and On-Board Transit Survey, converting the model operating software to Voyager (including the conversion of transit skimming to the Public Transport module of the software), incorporating a toll choice model enhancing the simulation sensitivity to managed and expressed toll lanes, and developing technical tools and evaluating draft scenarios in the preparation for the BRTB Vision process.

Model input for the horizon year 2008 consisting of demographic data, transportation networks, and counts was gathered and used to develop estimates of travel behavior and demand. Local and nation datasets of recent observed behavior were summarized and tabulated and compared to the 2008 model output. The new Version 4 model's ability to capture changes in observed behavior was evaluated, and it was found that the model successfully replicated 2008 observed behavior and was deemed an appropriated tool for regional planning.

In order to take advantage of advanced features of the modeling software, BMC staff completed a transition to Citilabs' latest release of CUBE Voyager. In addition to allowing for greater flexibility in manipulating input databases, the Voyager module Public Transport was adopted for transit skimming. The advance module provides the ability to better evaluate the effects of transit system configurations.

Additional model enhancements include incorporating the mode choice model developed for the MTA's Red Line study and adding a tolling component developed in FY 2010 by a consultant under contract to the BMC to the model to properly evaluate road pricing strategies being implemented in the model region. Both model additions were tested and found to improve reliability. A separate report was issued on the evaluation of the tolling model, while the mode choice model enhancements were documented in the validation report.

Additional accomplishments in FY 2011 include:

- Participating in the AMPO modeling technical work group;
- Participating in training in the use of the EPA's draft mobile emission model – MOVES;
- Obtaining 2008 classified traffic counts and providing linkage to the network in preparation for a new model validation ;
- Updating the commercial vehicle and truck model delta table;
- Updating the model coefficients used in estimating non-motorized travel based on observations from the 2007/2008 Household travel Survey;
- Evaluating the tolling choice model;
- Refining and developed MOVES and travel model interface to allow for the estimation of mobile source emissions using EPA's latest emission model;
- Continue support of local and state technical studies; and
- Analysis of the model's ability to the projected traffic trends and transportation challenges facing the region.

In FY 2012, BMC staff will continue to investigate ways to apply the model in new and creative ways. A continuing program of training on the use of the validated model and its application will be maintained. A special workshop will be held to acquaint member agencies with the new features and use of the model and provide training in the use of the newly-incorporated Voyager software. State and local government participants will review the highway network as BMC staff embarks on the annual TIP/Plan/Conformity analysis.

In FY 2012, BMC staff, working with Maryland Transit Administration (MTA), will consider enhanced mode choice modeling techniques in order to provide better results when specifically investigating transit alternatives. Other models and emerging techniques will be investigated, and new input factors will be considered.

In FY 2012, BMC staff will improve the spatial accuracy of the Master Highway Network, first focusing on Interstates and Freeways. The goal is to align roadway links and nodes more closely to real-world alignments. This will allow for matching of observed traffic data with the travel model links. In addition the staff will research alternate ways to model interchanges, in an effort to simplify the network, reduce the potential for coding errors, and improve model performance.

In FY 2012, BMC staff will add a Managed Toll Lane network to the Master Highway Network. The network will include projects under construction such as I-95 Express Toll Lanes northeast of Baltimore plus current and past proposals for toll lanes on highways in the Baltimore region. The goal is to create a seamless network of toll lanes within existing highways for testing purposes. This could become a transportation scenario in up-coming plans

In FY 2012, BMC staff will work with the State Highway Administration (SHA), investigating the freight component of the Maryland Statewide Travel Model (MSTM). BMC working with SHA staff will obtain and review the statewide freight model evaluating model required input data and examining model output. A document

summarizing the statewide freight model will be developed and identify opportunities to incorporate the forecasting output within the BMC regional model.

In FY 2012, BMC staff will begin testing and evaluating the newly developed synthetic population generator and demographic evolution model. Synthesized future demographic characteristics for individual geographies in the BMC model region will be analyzed for various scenarios. Finding will be documented and shared with both Cooperative Forecasting Group and Technical Committee to demonstrate the new capabilities.

In FY 2012, BMC staff will retain qualified consultant services through the use of a Request for Qualifications in the continued refinement of the technical tools. The enhancement will include recent advances in the principles of modeling individual travel choices, particularly in the framework of activity- and tour-based travel micro-simulation. This project will utilize end products from the developed synthetic population generator and demographic evolution model, Household Travel Survey 2007, and On-Board Travel Survey 2007. The time schedule for the completion of the project will extend beyond FY 2012.

In FY 2012, BMC staff will perform planning level network analysis on toll alternative scenarios that will provide a view of potential toll corridors and toll system. The analysis will focus on evaluating travel time difference between toll and non-tolled facility, traffic routing patterns and the potential users of the toll facility under various scenarios.

Progress will continue to be made in the software field as well. BMC staff will continue to monitor developments in the travel demand modeling software field to make certain that the transportation staff have the best tools available to ensure accurate modeling of travel in the region. Other modeling tools may also be examined for specialized applications.