June 2012

Growing Smarter 2012-2016 Subdivision Staging Policy **appendix 2** Transportation Policy Area Review (TPAR)



Montgomery County Planning Department The Maryland-National Capital Park and Planning Commission

MontgomeryPlanning.org

2012 Subdivision Staging Policy

- Appendix 1 Pace and Pattern of Development
- Appendix 2 TPAR Report
- Appendix 3 Developer Contributions to Infrastructure
- Appendix 4 School Capacity Forecasting
- Appendix 5 Draft County Council Resolution

Note

This report reflects some, but not all of the actions of the Planning Board. The Planning Board approved the methodology for arriving at the Transportation Policy Area (TPAR) Payment Rates detailed in this report, but made its final recommendations in the Subdivision Staging Policy Report, "Growing Smarter" and in the draft County Council resolution attached as Appendix 5.

FINAL REPORT 2012 Transportation Policy Area Review

Prepared by:



Motion Maps, LLC



For the Montgomery County Planning Department

July 2012

Acknowledgements

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Planning Staff and the Consultant Team wishes to acknowledge the very valuable cooperation, feedback and assistance in this work from the following staff of the Montgomery County Department of Transportation:

Edgar Gonzalez, Deputy Director for Transportation Policy, and Staff of the "Policy Group": Gary Erenrich, Anne Root Bob Simpson, and Phil McLaughlin, Division of Transit Services

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Transportation Policy Area Review for 2012

Section I: Introduction

The Planning Board was charged with refinement of the methodology developed by the Montgomery County Department of Transportation (MCDOT) to replace the policy area test for transportation adequacy in the current Subdivision Staging Policy (formerly known as the Growth Policy). The current test is known as Policy Area Mobility Review (PAMR) and the proposed replacement is called the Transportation Policy Area Review (TPAR).

The MCDOT consulted a wide array of stakeholders, including civic leaders, the business community, developers, advocacy groups, technical experts, staff, and policy makers, for their ideas and feedback. The Transportation, Infrastructure, Energy and Environment Committee of the Montgomery County Council reviewed the proposal and agreed that TPAR should:

- 1. Be simple to understand and monitor
- 2. Balance congestion levels with approved development and needed transportation infrastructure in accordance with Approved Master Plans
- 3. Provide greater assurance that transportation improvements that form the basis for approval of new development actually take place
- 4. Encourage continued economic development while maintaining quality of life
- 5. Be based on Approved Master Plans
- 6. Study transit and travel demand management **separately** from arterial roadways and bicycle and pedestrian improvements
- 7. Tie the Growth Policy firmly to the Montgomery County Capital Improvements Program (CIP), the State of Maryland Consolidated Transportation Program (CTP) and the Montgomery County Operating Budget
- 8. Forecast future transportation performance to identify future inadequacies that could result in the programming and construction of additional transportation projects
- 9. Identify solutions to the forecasted transportation inadequacies and monitor progress on development activity and on the timely provision of transportation solutions.
- 10. Reflect understanding of stakeholder feedback
- 11. Maintain quality of life
- 12. Apply additional public and private resources to the timely provision of new facilities

The County Council asked that the Planning Department undertake a study to refine the process, conduct a countywide application of the roadway and transit mobility assessments and prepare a proposal to implement the TPAR process in conjunction with the Subdivision Staging Policy. The results of this effort are contained in this report.

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Section II: Overview of the Proposed New Policy Area Review Process

The new TPAR identifies inadequacies and solutions specific to each Policy Area. The basics of the proposal consist of five parts as shown in Exhibit 2.1. The interrelationships among the parts are very important to the overall effectiveness of TPAR. These interrelationships are discussed in some detail along with the steps to carry out each of the five parts in Section III of this TPAR Report.



Exhibit 2.1 Parts of the Transportation Policy Area Review Process

- 1. Establish adequacy standards for the provision of transit services, identify future transit inadequacies, and develop a set of proposed transit improvements
- 2. Identify roadway inadequacies and solutions an average of ten years ahead of the adoption of a given Growth Policy, based on the approved forecast of development activity for the same 10-year time period.
- 3. Develop cost estimates for the transit and roadway solutions identified in the previous two parts, and allocate costs to each Policy Area.
- 4. Establish when a capital project or major transit service improvement will be programmed, and the level of public private cost participation for each policy area.
- 5. Implement a monitoring and reporting mechanism to: (a) determine that the assumed development is in fact taking place in accord with the forecasts, (b) ensure that the supporting transportation improvements are proceeding in concert as budgeted, (c) support programs to monitor actual transportation system performance, and (d) recommend specific actions to ensure better balance between transportation and development activity in the target year(s).

Development of this application of the TPAR Review involved close coordination between the Planning Board and MCDOT. Forecasts of development activity and travel demand modeling are the responsibility of the Planning Board; while capital programming, project development and implementation, and roadway and transit operations are the responsibility of MCDOT. TPAR engenders a close working relationship to ensure that development activity forecasts and transportation infrastructure improvements take place in concert and not at cross purposes or independent from each other. This process continues and will continue to strengthen as the process is reviewed by the public, decision-making bodies and finalized as policy.

The Proposed TPAR Policy in a Nutshell

This summary presents a synopsis of the proposed Transportation Policy Area Review in order to facilitate the reading and understanding of this document:

- 1. The policy's intent is to provide guidance in the subdivision development review process to ensure balance, or progress toward balance, between development activity (based on the adopted cooperative forecast, rather than the pipeline of approved development projects) projected ten years forward and the provision of transportation services (both transit and roads) within the same time frame.
- 2. To that end, the policy suggests that standards of **transportation adequacy** be established for each Policy Area in the County, for transit services and for roadway levels of congestion. For this purpose, the proposed policy suggests all Policy Areas be classified as being urban, suburban, or rural.
- 3. A Policy Area is in adequate balance when both transit services and roadways are projected to meet the transportation adequacy standards in the ten year period.
- 4. If a Policy Area is projected not to meet the adequacy standards ten years from the adoption of the policy, then the County should program transit services and/or road improvements in the Operating Budget or CIP to meet the 10-year forecast of development activity.
- 5. The capital transit and roadway improvements to be programmed must come from the Adopted and Approved Master Plans that cover the specific Policy Area where the inadequacy may exist.
- 6. The proposed improvements are to be funded through public-private partnership, with different levels of participation, based on public policy considerations of where growth is most desirable. Growth will be allowed in all Policy Areas of the County, in accordance with their Adopted Master Plans. No moratorium is proposed anywhere due to inadequate areawide transportation, but in turn County residents should be assured that adequate transportation improvements will be implemented in a timely manner to support the growth.
- 7. The public-private cost sharing proposal is two-fold:
 - a. First, the private participation will be met by a TPAR payment, the rates for which may differ by Policy Area and account for longer-term 30-year needs. Such payment is analogous to the PMAR payments under the current policy. That

payment must occur prior to building permit, in the form of cash or through an irrevocable letter of credit, or similar surety, due within five years from the date of the building permit approval. It may be amortized over a period of several years. All payments collected in this process must be tracked and spent in the Policy Areas for which these funds are collected or on projects that will have a direct benefit to the Policy Area.

- b. Second, the County should program transit services and/or road improvements to ensure that "solutions" are in place and operational within the same time frame as the approved development.
- 8. Once a predetermined threshold of private payments has been collected, a capital project and/or transit service improvement should be programmed to bring the Policy Area into the adequate standard. Depending on the complexity and size of the improvement, engineering and design funds may have to be programmed in advance of private funds being collected. This will be determined through the CIP process.
- 9. Finally, the proposed policy recommends critical monitoring and reporting of key elements of the policy. These elements include the monitoring of development activity and the programming and implementation of transit services and capital transportation projects. The policy recommends the preparation of an annual report on the trends during the prior year, and recommendations for action to ensure that the desirable balance between development activity and transportation is achieved in the 10-year period. Support for the monitoring and reporting of transportation system performance is also an element of this policy.

Benchmarking Peer Jurisdictions with Areawide Transportation Review Processes

One of the initial tasks that was done in preparing this report was to conduct a benchmarking review of a sample of peer jurisdictions nationally who are known to or thought to have an areawide transportation review process for the impact of proposed development. Exhibit 2.2 on the next page identifies the names of all of the jurisdictions who were contacted. Those whose names are in larger, red font were those who were found to be closer peers and who have a functioning areawide transportation review process.

In total thirteen jurisdictions were contacted and/or researched on their websites about their process. A questionnaire was developed and in some cases filled in by staff of those jurisdictions and in other cases the pertinent features about their process were filled in by the consultant team. Some of this was done in conjunction with also getting information on their Local Area Transportation Review procedures as well.

Seven main features of Areawide Transportation Reviews are identified and assessed in this peer comparison:

- Cumulative impacts versus Development of Regional Impact
- Jurisdictional coverage and area versus corridor coverage; including corridor-by-corridor summaries
- Time frame of the assessment of areawide impact; as well as the frequency of the adequacy assessment

- When during the development process does adequacy get assessed and what linkages are there to other processes
- Use of public/private funding for transportation programs and projects
- Transit adequacy methods
- Increased monitoring of roadway travel times and speeds, as well as monitoring transit travel times and speeds using an "operations orientation".

The responses of the peer jurisdictions about their processes were reviewed and a summary of potential refinements that might be applicable to the TPAR were made. The following are generalizations made from the summary material:

- Using just Forecasts for areawide review, including a 6-year or 10 year time horizon, will give better travel patterns and more realistic transportation needs
- Follow more of an "operations orientation" by having a "Coordination Overlap" element of TPAR that has both a regulatory focus as well as transportation improvement focus
- Refine TPAR so that all PM Peak Period transit routes are used in the measure of "Average Headway"
- Implement the proposed TPAR monitoring idea to use the actual performance of arterials; use the "slowness ratio" to compare to the modeled congestion measure
- Test using Automatic Vehicle Location data to monitor transit speeds,

Appendix A can be found at the back of this Report that is a copy of presentation material that was used to assess the results of benchmarking review of this sample of peer jurisdictions. More specifics of this benchmarking and of this above list of generalizations can be found there.



Exhibit 2.2 Peer Jurisdictions Contacted about their Areawide Transportation Review Processes

Section III: Details of the Transportation Policy Area Review Process

The Transportation Policy Area Review (TPAR) process is an important element of the Subdivision Staging Policy. A precursor approach was enacted locally four decades ago as the Adequate Public Facilities Ordinance (APFO). Three decades ago the Growth Policy Report series recognized the need for an areawide type review of a more forward looking balance between programmed transportation improvements and proposed new subdivisions. In the mid 1980's and through the 1990's that process to regulate such future balances became the Annual Growth Policy (AGP). During the past decade the basic process was briefly suspended and then reestablished as the Policy Area Mobility Review (PAMR), which is the process currently in effect until recommendations of the Subdivision Staging Policy to change that policy are approved by the County Council.

The Master Plan decision making process needs to consider traffic conditions in a long-range time frame and sets a delicate balance between development activity, transportation infrastructure, and other factors at the time of build-out. Typically, the development and infrastructure included in a Master Plan is intended to be completely constructed within a 20 to 40 year stage of time. One of the critical issues that residents, businesses, officials and their planning staff, and transportation agencies collectively face is how to address the existing levels of congestion in the present and during the regulatory planning stage in the near future. It is not satisfactory to wait for the planned transportation and development balances.

The following graphic is a framework to interrelate the balancing process at different stages over time. The framework also includes a monitoring and decision-making stage during which the performance of the transportation system is assessed. Three main stages needing balance are: (1) regulatory planning stage, (2) transportation improvement stage, and (3) master plan stage. TPAR is a process that periodically examines the Countywide and Policy Area balances in a consistent manner at the same time for each of these main three stages.



Exhibit 3.1: TPAR Framework for Development Activity and Transportation Concurrency

TPAR better enables elected officials to give guidance to the: (a) Planning Board in regulatory planning and master planning activities, and (b) Executive and the Montgomery County Department of Transportation (MCDOT) in planning and programming transportation improvements and services. Having a more prominent, cooperative, and coordinative role for MCDOT is an important innovation associated with TPAR. Appendix B has been provided that outlines the cooperative coordination roles that have been forming between the Planning Department Staff and the Transportation Planning staff of MCDOT for each part and step of the TPAR process.

Achieving balance between development activity and infrastructure, or at a minimum, consistently managing or reducing the level of imbalance, is one of the critical roles of TPAR. To this end, selection of the central time stage to use in TPAR is critical. A 10 year time stage was selected based on the following, mainly transportation improvement, considerations:

- Development activity forecasts for the County and the Washington Region are reported in five year increments up to 30 years into the future (Cooperative Forecasts)
- The current "pipeline" for approved residential subdivisions Countywide has about 7 to 8 years of growth; and the "job pipeline" has about 13 to 15 years of growth.
- A typical road project that adds capacity to the road network takes anywhere from 8 to 12 years to complete, from the time it is first added to the County's Capital Improvements Program (CIP) or the Maryland Department of Transportation Consolidated Transportation Program (CTP).
- Major transit projects such as the Purple Line or Corridor Cities Transitway (CCT) that involve Federal funding and requirements may take as long or even longer than 12 years.
- Capital Projects are typically programmed over a period of 6 years or more, and financed over an even longer time period through bonds and other instruments.
- The life expectancy of a new bus is roughly12 years and replacement cycles need to be set to take such aging into account in conjunction with fleet and garage expansion.

Thus, the TPAR analysis for Transit and Roadway Adequacy mainly uses the ten year time stage. For purposes of the full and long-term accounting of costs and the fair allocation of the same, a longer-term time horizon is needed for that part of the proposed TPAR process and the 30 year Forecast of development activity is used as a benchmark in that part of TPAR. While the term of master plan stage is used here and is associated with this 30 year forecast, TPAR is not to be construed as a comprehensive reassessment of any master plan or the worthiness of any of the component parts of an approved master plan. The regulatory planning stage is linked with the approved CIP and CTP and those fully-funded projects that can be implemented by the 6 year end of those documents.

The following parts of Section III describes in detail each of the five Parts of the TPAR process:

- Identify Transit Inadequacies and Solutions
- Identify Roadway Inadequacies and Solutions
- Allocate Costs for Improvements
- Program Public Commitments
- Monitor and Report

1: Identify Transit Inadequacies and Solutions:

Exhibit 3.2 shows the six main steps associated with identifying transit inadequacies and solutions. Please note that the term "transit" also accounts for Transportation Management Districts (TMDs), their associated activities, as well as bicycle and pedestrian transit access.



TPAR takes into direct consideration the different forms of Transit Service provided or planned for in the County: Heavy Rail (Metrorail), Commuter Rail (MARC), arterial and local Bus Service, future Light Rail Transit (LRT), future Bus Rapid Transit (BRT), and indirectly Transportation Demand Management (TDM) activities. Some of these forms of transit service are currently outside of the County's direct operational and financial control. Therefore, the TPAR Review is focused primarily on the provision of Bus Service, improving TDM services, and bicycle and pedestrian access while accounting for the importance and value of the more fixed-track forms of transit.

Major studies of a potential BRT system and supporting service characteristics are currently underway. To date there is no clear indication from the BRT studies of a route or routes that could be implemented within the 10 year transportation improvement stage of TPAR. The transit planning sketch-level methodology, discussed below, that is a refinement to TPAR is too broad and general a method for its results to be an analytic determinant of the feasibility of a BRT route. However, when one or more routes and service characteristics are defined, including modifications to current bus service or changes to road through-lanes, then the transit adequacy part of the TPAR process will be able to account for such types of transit improvements.

Step 1 – Classify Policy Areas by Density and Transit Categories: The first transit related step shown in Exhibit 3.2 is to classify Policy Areas in accordance with defined categories of density and transit service. TPAR defines three distinct categories for the County as a function of the development characteristics of each Policy Area expressed in terms of densities and type of transit service. (A map of Policy Areas and their abbreviations is located in the introduction to Section VI of this document.) The names given to the defined categories are consistent with those used by the County Council in the adoption of the Road Code, which uses the same designations although they are defined differently. Each Policy Area is classified as either:

Urban, Suburban or Rural, as defined and discussed next. Key policy issues for the Subdivision Staging Policy are: (1) how to distinguish over time between the urban and suburban policy area categories, and (2) how does a particular policy area transition from suburban to urban?

Urban Policy Areas are those Policy Areas with (a) higher population and/or employment densities, measured in terms of the number of people and employees per gross square mile, as well as (b) significant amounts of transit service including combinations of Metrorail Service, extensive and/or intensive bus service, and/or future LRT or BRT service. Two sub-categories of Urban Policy Areas are being provided – with and without Metrorail.

Suburban Policy Areas are those Policy Areas that have intermediate or moderate levels of population and employment density and usually just bus transit service, although they may also have Commuter Rail service with far-apart-spaced stations. An area having LRT or BRT service might not be the determinant that a particular area is no longer a Suburban Policy Area. Rather, such transitions of one or more Policy Areas being designated as an Urban Policy Area would be made as part of the periodic review and updates of the Subdivision Staging Policy. Such reviews need to consider forecast population and/or employment densities as well as the programmed quantity and forecast performance quality of the transit services.

Rural Policy Areas are those Policy Areas located primarily in the Agricultural Reserve of the County. These areas are characterized by very low population and employment densities and have very limited transit service.

Exhibit 3.3a shows the proposed initial TPAR classification of each Policy Area by just three of the transit service and density categories. Exhibit 3.3b shows the expected classification of each Policy Area by all four transit service and density categories, which includes the category of Urban Policy Areas without Metrorail. The General Plan of the County envisioned that the areas that generally correspond to the five Policy Areas, with the future designation of Urban without Metrorail, would be urban. Thus the Subdivision Staging Policy is providing a means to transition over time for those five Policy Areas from being classified as "Suburban" to be designated as "Urban without Metrorail".

In Exhibits 3.3a and 3.3b the six right-most columns gives the current (year 2010) population and employment densities by policy area as well as those forecast for the 10-year time of 2022 and the long-term one of 2040. The forecast densities are shown as rounded estimates. Trend analysis of those current and forecast densities indicates that values of 5,000 persons per square mile and/or 2,500 employees per square mile generally distinguish urban from suburban. Various site-design related features such as minimal setbacks, substantial building heights, mixed land uses, and significant pedestrian activity and sufficiently wide sidewalk width are often associated with being urban. However, accounting for such micro-level features is beyond the scope of an areawide process such as TPAR. The six leftmost columns of Exhibits 3.3a and 3.3b, after the area name column, identify the current or future areawide quantity or presence of transit services. The question of which comes first, the density or the transit service is a rhetorical one looking to the past. However, it is a very important policy issue when looking towards the future and a decision needs to be made by the elected officials that a particular Policy Area should transition from a suburban one to an urban one. Specific recommendations are given later in this document in Section V that addresses that issue once enough other information has been assembled. The sequencing of the rows in these two exhibits is covered later in the discussion of Step 4.

Policy Areas by Three Categories of Type of Transit and Population										Fore	casts o	f Popul	ation
and Employment Density for TPAR 2012 (6-7-12)											mploym	ent De	nsities
	Number	of Bus	Routes		MARC	Future	Gross	Pop.	Emp.	20	22	20	40
	Total of all Routes	Peak Period Only	All-Day Routes	Metro Rail?	Com- muter Rail?	Light Rail and/or BRT?	the in 2010 Policy (person Area per sq. (sq. mi.) mi.)		in 2010 (emp. per sq. mi.)	Popula- tion Density	Employ- ment Density	Popula- tion Density	Employ- ment Density
"Urban" Policy Areas	with Met	rorail											
Silver Spring/Takoma Park	35	14	21	Y	Y	Y	10.49	8,622	4,376	9,900	4,800	10,300	5,400
North Bethesda	15	4	11	Y	Y	Y	9.25	5,216	7,430	7,400	8,800	9,500	10,600
Kensington/Wheaton	29	12	17	Y	Y		19.26	4,853	1,230	5,600	1,400	6,000	1,500
Bethesda/Chevy Chase	17	6	11	Y		Y	20.24	4,962	4,339	5,800	4,800	6,100	5,100
Rockville City	16	2	14	Y	Y	Y	13.64	4,314	5,794	5,300	6,900	6,100	7,700
Derwood	7	2	5	Y	Y		8.22	2,274	2,556	2,850	3,100	4,000	4,000
"Suburban" Policy Are	<u>eas</u>												
R&D Village	5	2	3			Y	2.38	3,076	8,764	4,100	11,400	9,100	17,700
Gaithersburg City	10	1	9		Y	Y	11.03	5,446	4,967	6,400	6,000	7,600	7,600
Fairland/White Oak	14	7	7				20.66	3,700	1,495	3,700	2,000	3,700	2,400
Germantown West	9	2	7		Y	Y	10.98	5,652	1,347	5,900	1,800	6,900	2,900
Montgomery Village/Airpark	9	3	6				9.41	5,472	1,372	5,300	1,300	5,600	1,400
Aspen Hill	11	3	8				13.05	4,644	478	4,900	550	4,600	560
Germantown East	5	2	3			Y	6.57	3,568	1,310	3,800	2,100	4,400	3,600
Cloverly	2	2	0				9.83	1,621	137	1,600	160	1,600	160
North Potomac	7	3	4				10.49	2,570	1,427	2,600	160	2,900	170
Olney	5	4	1				17.36	1,887	317	2,000	320	2,100	330
Potomac	10	2	8			Y	28.07	1,696	431	1,800	520	1,800	530
Clarksburg	2	1	1			Y	14.91	934	255	2,200	460	2,600	1,300
"Rural" Policy Areas													
Rural West	1	1	0		Y		132.90	157	20	160	20	170	20
Damascus	1	0	1				9.42	1,119	248	1,190	280	1,350	280
Rural East	1	0	1				117.18	289	48	310	60	330	60

Exhibit 3.3a: Categorization of Policy Areas by Three Density and Transit Elements

Policy Areas by Four Categories of Type of Transit and Population											ecasts o	f Popul	ation		
and Er	and E	mployn	nent De	nsities											
	Number	ber of Bus Routes		Number of Bus Routes			MARC	MARC Future Com- Com- Rail muter and/or Rail? BRT?	Gross	Pop.	b. Emp. bity Density 10 in 2010 con (emp. cq. per sq.) mi.)	2	022	2040	
	Total of all Routes	Peak Period Only	All-Day Routes	Metro Rail?	Metro Com- Rail? muter Rail?	the Policy Area (sq. mi.)	in 2010 (person per sq. mi.)		Popula tion Densit	- Employ- ment / Density		Popula- tion Density	Employ- ment Density		
"Urban" Policy Areas.	with Me	trorail													
Silver Spring/Takoma Park	35	14	21	Y	Y	Y	10.49	8,622	4,376	9,900	4,800	10,300	5,400		
North Bethesda	15	4	11	Y	Y	Y	9.25	5,216	7,430	7,400	8,800	9,500	10,600		
Kensington/Wheaton	29	12	17	Y	Y		19.26	4,853	1,230	5,600	1,380	6,000	1,450		
Bethesda/Chevy Chase	17	6	11	Y		Y	20.24	4,962	4,339	5,800	4,800	6,100	5,100		
Rockville City	16	2	14	Y	Y	Y	13.64	4,314	5,794	5,300	6,900	6,100	7,700		
Derwood	7	2	5	Y	Y		8.22	2,274	2,556	2,800	3,100	4,000	4,000		
"Urban" Policy Areas.	without	Metror	ail												
R&D Village	5	2	3			Y	2.38	3,076	8,764	4,100	11,400	9,100	17,700		
Gaithersburg City	10	1	9		Y	Y	11.03	5,446	4,967	6,400	6,000	7,600	7,600		
Montgomery Village/Airpark	9	3	6				9.41	5,472	1,372	5,300	1,320	5,600	1,420		
Germantown West	9	2	7		Y	Y	10.98	5,652	1,347	5,900	1,810	6,900	2,920		
Germantown East	5	2	3			Y	6.57	3,568	1,310	3,800	2,140	4,400	3,600		
"Suburban" Policy Ar	eas														
Fairland/White Oak	14	7	7				20.66	3,700	1,495	3,700	2,000	3,700	2,350		
Aspen Hill	11	3	8				13.05	4,644	478	4,900	550	4,600	560		
Cloverly	2	2	0				9.83	1,621	137	1,600	160	1,590	160		
North Potomac	7	3	4				10.49	2,570	143	2,600	160	2,900	170		
Olney	5	4	1				17.36	1,887	317	1,960	320	2,120	330		
Potomac	10	2	8			Y	28.07	1,696	431	1,770	520	1,820	530		
Clarksburg	2	1	1			Y	14.91	934	255	2,170	460	2,620	1,300		
"Rural" Policy Areas															
Rural West	1	1	0		Y		132.90	157	20	160	20	170	20		
Damascus	1	0	1				9.42	1,119	248	1,190	280	1,350	280		
Rural East	1	0	1				117.18	289	48	310	60	330	60		

Exhibit 3.3b: Categorization of Policy Areas by Four Density and Transit Elements

Step 2 – Are Transit Adequacy Standards Met?: TPAR uses bus transit quality of service for each of these three TPAR Policy Area categories by using three "**transit service performance factors**" to assess the adequacy of the transit service of each Policy Area. The performance factors and the standards given here are consistent with the 2008 Montgomery County Strategic Transit Plan and are also based on guidance from various Master Plans and Sector Plans. The three transit service performance factors are specified as the following:

- **Coverage of Service:** In general, the factor of coverage indicates how close in space are potential users to the transit service. The particular measure is the percentage of the area of a Policy Area located within a certain distance from Metrorail Station, Light Rail Station and Ride On and Metrobus service. While the selection of what distances to use is in part a research question, a reasonable and pragmatic choice was made to use two of several such walk-access measures used by the travel demand forecasting model. In particular, the values of a one mile walk of a Metrorail station or one-third of a mile walk of a bus stop were selected. Transit users access transit by other means as well such as Park-and-Ride, Kiss-and-Ride, or bicycling and those ways of accessing transit are included in the travel forecasting but as a judgment. Explicitly accounting for them in this performance factor would add too much complexity and lose some transparency.
- **Peak Headways:** In general, the factor of peak headway indicates how frequently in time is the transit service provided so as to be more convenient to users. The particular measure is the weighted average of the frequency of service of the different bus routes operated by Metrobus and Ride On in the Policy Area specifically how frequently, on average, the buses run during the weekday evening peak period. In areas where future LRT or BRT systems are to be provided, the averages would be adjusted to reflect the presence (or future presence) of those systems.
- **Span of Service:** In general, the factor of span indicates over what time duration during a typical weekday is the transit service available to potential users. The particular measure is the average time duration on weekdays that bus service is scheduled averaged only for that subset of routes that provide "all-day" service but not any routes with split-service in the AM and/or PM. For example, in an urban area, buses may operate for 17 hours a day or longer, such as from 5:00 AM to 10:00 PM on weekdays.

Factors Characterizing Bus Transit Quality of Service in Montgomery County [#]											
Transit Service Area Categories	Coverage: (percent of area within a 1 mile walk of Metro and/or 1/3 mile walk of bus)	Peak Headways: (equal to or less than minutes between buses on average in Peak Hour)	Span of Service: (equal to or more than hours in duration per weekday on average)								
Urban with Metrorail	Greater than 80%	20 minutes	17 Hours								
Urban without Metrorail	Greater than 50%	14 minutes	14 Hours								
Suburban	Greater than 30%	20 minutes	14 Hours								
Rural	Greater than 5%	30 minutes	4 Hours								

Exhibit 3.4a: Transit Quality of Service Factors Standards for Montgomery County

updated 6/7/2012

[#] = Consistent with the 2008 Montgomery County Strategic Transit Plan and based on guidance from various Master Plans and Sector Plans

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Part of Step 2 is to specify or amend a set of "regulatory standards" of transit adequacy, particularly for bus transit services. Exhibit 3.4a above is that set of bus Transit Service Adequacy Standards, for each of the three factors of adequacy, for each of the four Transit Policy Area Categories. TPAR is more than a regulatory approach and it is also intended to give guidance to the needed and desirable levels of investment in transportation. As such, it also needs to identify performance targets for these three service factors towards which service improvements can be aimed and not just provide minimal regulatory adequacy standards.

Exhibits 3.4b, 3.4c, and 3.4d present these sets of "planning targets" for the three service factors and for the four Policy Area Categories. Arrows are shown going away from the standards towards the targets. The graphics also show the ranges of values for the factors that would be considered as being inadequate for that particular factor and Policy Area Category. Having a result for any factor lying within the "ranges" between the standards and the targets would be adequate performance.

TPAR requires the analysis of the bus transit services in each Policy Area for adequacy, contrasting the services provided to the Coverage, Peak Headway, and Span standards for Urban, Suburban and Rural areas, respectively. A Policy Area is found to provide **adequate** transit service when all three service factors meet the minimum standards. If inadequacy in any one of the three factors associated with the bus transit network is determined in Step 2, then solutions need to be identified in Step 4, as discussed later. There may be some special circumstances in selected Policy Areas where an exception to this policy could be made for one of the factors.



Exhibit 3.4c: Transit Adequacy Standards – Targets for Peak Headway



Exhibit 3.4d: Transit Adequacy Standards – Targets for Span of Service



To improve understanding of how identifying solutions might typically work in practice, Exhibit 3.5 shows general solutions to improve bus transit service factors to meet the standards if one of the factors was found not to be adequate.

Transit Inadequacy Related to:	General Solutions to Achieve Transit Service Adequacy
Coverage	Implement more bus routes serving more areas closer to the population or employment areas within the Policy Area
Peak Headway	Add more frequent bus service during the peak periods to reduce the time between the arrival of buses (headway) serving the Policy Area
Span of Service	Increase the number of hours the bus service is provided for selected routes serving the Policy Area

Exhibit 3.5:	General	Solutions	to Achieve	Transit	Adequacy
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Exhibit 3.6 on the next page is a summary of results of the bus Transit Adequacy Analysis of the current bus services in each Policy Area. That summary is structured only using three of the Policy Area Categories, which given the results is taking a conservative approach. Specifically, the service factors were applied to each Policy Area in the County based on bus service information for Ride-On and MetroBus at the beginning of 2012. The highlighted areas in bright yellow with red numbers indicate the transit service factors that are not achieving that TPAR adequacy standard for those Policy Areas. Particularly noteworthy is that 14 of the 19 Policy Areas do not attain the Peak Headway standards for current service conditions. In order to attain the status of adequacy, the general types of solutions outlined in Exhibit 3.5 above would have to be implemented by the 10-year transportation improvement stage, which is 2022, in the effected Policy Areas. While the preparation of Exhibit 3.6 nominally concludes Step 2 of the Transit Adequacy Analysis, in order to prepare that summary of results various aspects of the analytic procedures that are also useful in Step 4 need to be set up and applied in Step 2.

Step 3 – No Additional Transit Costs: If Step 2 shows that standards are met in each of the Policy Areas, then the analysis proceeds to Step 3 of the Transit Adequacy Analysis, and then immediately on to Step 6.

Step 4 – Identify Transit Solutions to meet Transit Adequacy Standards: The discussion of Coverage given above and the text in Exhibit 3.6 indicates the specific definition used for the factor of Coverage – the percent of each Policy Area within 1 mile of a rail station or 1/3 of a mile of a bus stop. This definition of Coverage results in there being a very wide range of values for the 19 Policy Areas, from a high of about 96% to a low of about 7% of the area of each Policy Area. It can be seen by inspection of Exhibit 3.6 that the sequence of rows used for each Policy Area is in order of decreasing coverage across the three Transit Service Categories. That is an intentional choice of how to sequence the Policy Area rows to present the summary results. Being sequenced by decreasing Coverage makes it easier for the reader to see patterns of inadequacy in that transit service factor, and perhaps the other two factors as well. This sequence of rows in Exhibit 3.3 above; and as the reader will see the sequence of discussion of the individual Policy Areas in Section VI of TPAR. This sequencing approach is similar to the one used in the Roadway Adequacy Analysis, which sequences the road within a Policy Areas summary in accord to decreasing congestion in the peak direction of traffic flow.

Transit Adequacy Analysis Results TPAR 2012 (6-4-12)								
		Coverage	Peak	Span:				
	Number	(Percent of	Headway	Duration of				
	of Bus	area within	by Bus in PM	Weekday Bus				
	Routes	1 mile rail;	Peak Hour	Service				
		1/3 mi.of bus)	(minutes)	(hours)				
"Urban" Policy Areas	served b	y Metrorail						
Silver Spring/Takoma Park	35	96%	18.2	18.9				
North Bethesda	15	87%	21.3	17.7				
Kensington/Wheaton	29	82%	20.7	18.5				
Bethesda/Chevy Chase	17	81%	20.4	17.4				
Rockville City	16	80%	21.2	17.8				
Derwood	7	70%	21.1	18.8				
Inadoquato vorsus		more than	less than	more than				
the Stenderde chown	XX.X	80%	14.0 ##	17.0				
the Standards shown		## =	20.0 with Metr	orail				
"Suburben" Delieu Ar								
Suburban Policy Ar		700/	05.0	45.0				
R&D VIIIage	5	76% 75%	25.8	15.6				
	10	75%	20.0	17.0				
	14	48%	19.1	18.8				
Germantown West	9	48%	21.8	18.6				
	9	47%	21.0	17.9				
Aspen Hill	11 E	44%	19.9	19.3				
Germaniown East	с С	39%	21.4	17.8				
Cloverly	Ζ	30%	20.0	0.0				
North Potomac	/ 	29%	24.3	17.0				
Oiney	5 10	20%	25.0	22.3				
Potomac	10	23%	21.1	16.4				
		10%	<u> </u>	14.1				
the Standards shown	XX.X	30%	20.0	14.0				
Rural Policy Areas		001	00.0	0.0.*				
Rural West	1	8%	30.0	6.3 *				
Damascus	1	/% 70/	20.0	15./				
Kural East	1	1%	20.0	15./				
inadequate versus	XX.X	more than	less than	more than				
the Standards shown		5%	30.0	4.0				
* Span includes Peak Period	d Routes be	ecause of absen	ce of All Day Ro	utes				

Exhibit 3.6: Results of the Transit Service Adequacy Analysis

This discussion now turns to refined methods that have been selected and added to this part of the TPAR process of the analysis associated with the Transit Adequacy Analysis. There was little direct experience to draw upon from the prior AGP or PAMR processes, nor from the overall state-of-the-practice, each of which have involved less analysis of transit than of roadways. As such, a considerable portion of the work for this report was focused on practical TPAR refinements to develop better methods for Transit Adequacy Analysis.

In seeking and analyzing particular solutions a judgment was made to first focus or start with the Transit Service Factor of Peak Headway in conjunction with developing and applying a Transit sketch-planning approach. Span and coverage are considered in this approach, but at a later time. Cooperative coordination was carried out with the transit planning staff of MCDOT to obtain their current "transit profiles", which are operationally oriented summaries of the characteristic features of the Ride-On bus routes. An earlier version of a prior year was used in the Transit Adequacy Analysis associated with the Proposed TPAR Report of the Executive in 2010. Similar profile-type information was obtained from staff of the Washington Metropolitan Area Transit Authority (WMATA) and integrated into the Transit sketch-planning analysis set-up. Information in these profiles includes:

- Bus service headways by four main time periods of a weekday
- Route service durations that could be used to calculate the Span of Service for each route
- Other information such as the number of buses needed to meet the bus scheduling requirements; the number of daily bus trips; the average number of daily riders; and the average number of riders per bus trip
- Identifiers were added, in particular which Policy Areas are served by each bus route.

The next part of the Transit Adequacy Analysis is a Transit sketch-planning approach, which is a method to first graphically array maps of route coverage and graphs of the scatter of Peak Headway versus Span for each route in a Policy Area. Second, that information was then organized by Policy Area and appropriate averages for Peak Headway and Span of Service were calculated and overlaid on each of the scatter graphs. Third, those maps and graphs were shared and reviewed with MCDOT staff. Those Coverage maps and Peak Headway versus Span graphs are part of the graphics shown for each Policy Area in Section VI of this TPAR report.

MCDOT transit planning staff was able to use that organized information to identify: (a) 9 Policy Areas that could benefit from improved Peak Headways, and (b) a target number of total buses that could be used to improve headways. The Transit sketch-planning set up was then used, with the support of MCDOT staff, to identify and select about 13 bus routes to <u>directly</u> serve those 9 areas, allocate buses to routes, and then recalculate the average Peak Headway. That recalculation verified that if those buses would be added to the specified routes, then the resulting Peak Headways would enable those specific Policy Areas to attain adequacy. Since those routes also serve other Policy Areas. In five of those the indirect affect would be to attain Peak Headway adequacy. The last part of this TPAR refinement was to "test" those potential improved headways using the Travel Demand Model, the first time Planning Staff had tried such an analysis. The general results of that analysis are discussed in Section V and Section VI of this TPAR Report along with that of a second set of Peak Headway improvements that would be needed for adequacy if 5 of the Policy Areas were classified as Urban without Metrorail.

Step 5 – Estimate Transit Service Costs and Capital Investment Needs: It will help with understanding to discuss this step later in Part 3 of this Section III

2. Identify Roadway Inadequacies and Solutions

Exhibit 3.7 identifies six main steps associated with the second part of the TPAR process, identifying roadway inadequacies and solutions. Please note that the term "roadway" also accounts for traffic operations, bikeways, walkways, and their associated activities. The numbering of these steps starts with 11 to help differentiate this part of TPAR from the prior part on Transit Adequacy. A variation of Exhibit 3.7 is shown later in Exhibit 3.11, below.



ibit 3.7: Identifying Roadway Inadequacies and Solutio (Source: Proposed TPAR Report, April 2010)

TPAR takes into direct consideration the main current and future network of roadways in the County irrespective of which governmental agency built, maintains, or operates the road. Most of the main roads are the responsibility of either the Maryland Department of Transportation (MDOT) State Highway Administration (SHA) or the Montgomery County Department of Transportation (MCDOT). The recently opened MD 200 (Intercounty Connector) as a toll toad is being managed and operated by the Maryland Transportation Authority (MdTA), an affiliated agency of MDOT. The Cities of Rockville and Gaithersburg have some roads that are mainly local roads but also some roads are major enough to be included in the TPAR roadway analysis.

There are roads that function as arterial roads that are owned and operated by the Department of Parks of the Maryland National Capital Park and Planning Commission (MNCPPC). The National Park Service (NPS) also has similar park-oriented roads that function such that they are also included in the TPAR roadway analysis. On the other hand, the Roadway Adequacy Analysis does not directly account for truly local streets, minor roads, and even some of the minor arterials. Those very local streets and roads have low amounts of traffic and the TPAR analysis accounts for them only in an indirect manor – but their adequacy is not assessed.

Step 11A – Gather Information on Projects of the CIP and CTP: This first step involves gathering the most current information from the County's Capital Improvement Program (CIP), the Consolidated Transportation Program (CTP) of MDOT, and other similar approved programming documents. A list is then developed of that subset of projects that would be constructed and operating by the end of the sixth year of those capital programs. Many but not

all CIP or CTP projects provide added "capacity" to the roadway network. Those documents also contain many other important and necessary projects that are there for other concerns such as safety improvements, roadway preservation and maintenance, more efficient traffic operations, sound reduction, other environmental protection related projects, as well as Enhancement Projects that address aesthetics considerations or reduction of community impact. The CIP and CTP are also multimodal documents and differentiation needs to be made in the summaries. The list of projects is presented and discussed later in Section V.

Step 11B – Gather Information about Forecasts of Development Activity: The TPAR

assessment analytically examines future balances between existing plus programmed transportation improvements from the prior step (11A), with development activity forecasts from this step (11B). This step gathers current information from the Regional / County Cooperative Development Forecast prepared by MNCPPC for the County in cooperation with the Metropolitan Washington Council of Governments (MWCOG) and other jurisdictions throughout the Washington Metropolitan Region. For the sake of simplicity, this is referred to as the *Cooperative Forecast*. The Cooperative Forecast projects household and employment growth in the County in five year increments to 2040. The Cooperative Forecast is updated regularly and adopted by MWCOG for planning purposes in the region.

		Forecasts of Development Activity by Policy Area								
Abrev-	Policy Area Namo	Ho	ouseholds	(Round 8.0	O)	Employment (Round 8.0 with WOSG)				
iation	Toncy Area Name	2010	2018	2022	2040	2010	2018	2022	2040	
AH	Aspen Hill	24,699	24,894	24,920	25,017	7,175	7,228	7,242	7,317	
BCC	Bethesda / Chevy Chase	39,621	43,340	44,446	47,688	87,464	94,653	97,941	102,733	
CLK	Clarksburg	4,270	7,878	10,030	13,767	2,545	4,449	6,844	19,446	
CLV	Cloverly	5,312	5,370	5,399	5,421	1,607	1,607	1,607	1,607	
DAM	Damascus	3,562	4,011	4,049	4,658	2,616	2,672	2,630	2,653	
DER	Derwood	6,157	7,087	8,665	12,928	20,937	20,995	25,561	32,470	
FWO	Fairland / White Oak	28,004	28,370	28,569	29,263	30,013	37,835	41,953	48,587	
GBG	Gaithersburg City	24,182	25,151	27,631	33,657	53,185	63,676	65,685	83,974	
GTE	Germantown East	8,097	8,410	9,005	11,116	9,896	11,915	14,033	23,460	
GTW	Germantown West	22,203	23,097	24,366	30,194	14,883	16,974	19,830	32,038	
KW	Kensington/Wheaton	36,836	38,850	40,032	43,574	25,769	26,234	26,575	27,969	
MVA	Mont. Village/Airpark	18,520	18,630	18,650	18,682	11,594	12,238	12,457	13,381	
NB	North Bethesda	20,615	25,193	26,741	36,305	68,402	77,812	81,675	98,270	
NP	North Potomac	9,085	8,987	9,452	10,725	1,572	1,615	1,666	1,800	
OLY	Olney	11,455	11,957	12,400	13,361	5,532	5,584	5,604	5,721	
POT	Potomac	17,131	17,877	17,690	18,029	12,296	14,359	14,475	14,828	
RDV	R&D Village	2,364	4,159	3,814	9,777	20,052	23,656	27,163	41,969	
RKV	Rockville City	24,226	27,441	29,179	34,404	74,800	87,030	93,852	105,725	
SSTP	Silver Sp./ Takoma Park	35,746	39,888	40,920	44,155	46,862	48,385	50,274	56,409	
RurE	Rural East	11,528	11,761	12,256	12,679	5,653	6,243	6,456	6,855	
RurW	Rural West	6,887	7,248	7,383	7,600	3,147	3,155	3,156	3,163	
Mo	ontgomery County Total =	360,500	389,599	405,597	463,000	506,000	568,315	606,679	730,375	

Exhibit 3.8: Forecast of Households and Employment by Policy Area to 2040

The current forecasts are termed Round 8.0, with modifications for the White Oak Science Gateway (WOSG) master plan area, which is referred to in the table by the initials. An extraction from those forecasts, summarized by Policy Area in the County, and interpolated between the appropriate 5-year forecast increments for the years 2018 and 2022, is given above

in Exhibit 3.8. Additional information about the Cooperative Forecasts is available from various sources. More discussion of the forecasts for each of the Policy Areas is given in Section VI.

Step 12 – Apply the Transportation Demand Model: TPAR uses the 10-year Cooperative Forecast of development activity, and the roadway and transit capital projects programmed for completion in the 6-year County CIP and the State CTP, as the input to the localized version of the Regional Travel Demand Model that is managed by Planning Department staff. The Regional Travel Demand Model is developed and used by the National Capital Region Transportation Planning Board (TPB), which is staffed by the Transportation Planning Department of MWCOG. This regional model is periodically updated and must be certified for use by the United States Department of Transportation for its approved use in the Regional Air Quality Analysis mandated by the United States Environmental Protection Agency (EPA). Versions of the regional model have been refined over many years and applied to various countywide assessments, master plan development, and to the AGP, PAMR, and now TPAR. The Travel Demand Model provides consistent and reliable results for use as a tool in the travel forecast for future transportation conditions of this analysis.

The cooperative work done by and for MCDOT in proposing the general TPAR approach relied on the Planning Staff applying the Travel Demand Model to a series of "comparison combinations", which are an agreed-to set of: (a) current development plus future development activity and (b) existing transportation plus programmed CIP and CTP projects as well as potential improvements to the transportation system that are not yet programmed. The term of "conditional project" is used for the subset of potential future projects not yet programmed that the MCDOT would recommend to be likely new projects to be added to the next CIP and CTP. The term "conditional" recognizes that the actual decision making authority rests with the Executive and Council for the inclusion of a new CIP project as well as with State officials with regards to CTP projects. That subsequent set of decision making activities regarding the actual programming of one or more new projects is the "transportation planning improvement stage" discussed in the introduction to this Section.

In the TPAR Analysis the Travel Demand Model is applied in an **iterative** fashion. Referring back to Exhibit 3.7 it shows that steps 12 through 16 and back to 12 again are applied iteratively and with the intent of going back and around through several cycles through these steps:

- Step 12: Analysis of a comparison combination using the Model
- Step 13: Summarization of the raw modeling results using post-processing methods
- Step 14: Review and assessment for potential future inadequacies
- Step 15: Refine and/or revise the comparison combinations to test potential projects
- Step 16: Consideration of prior recommendations for needed projects back to
- Step 12: Reapply the model to the new comparison combination of future conditions.

Such an iterative process works best when there is a high degree of coordination, cooperation, and information sharing particularly between Planning Staff and staff of MCDOT. Cooperation is also needed from staff of other agencies such as MDOT/SHA and MWCOG. During implementation of the TPAR process a set of roles and mutual expectations has developed that are outlined in Appendix C, Cooperative Coordination Roles for TPAR, which applies to all of the steps, not just these of the Roadway Adequacy Analysis.

Step 13 – Summarize Roadway Performance by Policy Area and Arterial Segments: To facilitate coordination among staffs and later with decision makers it is necessary to summarize

in several ways the various raw results and outputs of applying the Travel Demand Model. The methods and techniques of summarization are referred to as "post-processing". One post-processing summarization method developed for and used in the Roadway Adequacy Analysis is a conversion of the results using spreadsheets that array representations of the roadways, directional "links" in the modeling system, so that they are organized in order of Policy Area and as well as individual links for the same roadway where traffic is moving in the same direction. The post-processing conversion can then be used to determine which of the two directions of flow is more peaked. That enables there to be summaries by: (1) Policy Area, (2) roadway within each Policy Area, and (3) peak or non-peaked flow direction.

Those spreadsheets are then used as inputs to various graphics that help communicate the summary results. An example of such a graphic is given later in Exhibit 3.10 of this part of Section 3. Such summary graphics are used more extensively in the discussion of Section V and Section VI. These summaries and graphics are tailored to match the two basic geographic scales of analysis of the assessment: (a) Policy Area-by-Policy Area on a countywide basis, and (b) within each Policy Area, an arterial segment -by-arterial segment basis. A 10 year transportation improvement planning stage basis is the main time stage used in the assessment.

Step 14 – Assess Future Inadequacies of the Roadway Network: The assessment of the adequacy of the roadway network is done on an areawide basis for each Policy Area as a whole. That is consistent with prior versions of the APFO, the AGP, and the current PAMR. One new feature of TPAR is having information that distinguishes congestion by that which would occur in the peak directions of traffic in each Policy Area as well as the level of congestion in the non-peak directions of traffic. The term "directions" is used in the plural because in all Policy Areas there tends to be two peak flow directions and two non-peak flow directions that flip-flop from the AM peak to the PM peak. For the PM peak in most Policy Areas, and for roads within them, the peak flow is northbound and eastbound. Which directions are the peak directions or non-peak is not predetermined as an input to the modeling analysis. Rather, it is an output result of the modeling and the relative patterns of household and employment locations and amounts locally in a Policy Area, throughout the County, and across the region. Another new feature of TPAR is having a summary of the distribution among the arterial roadways serving a Policy Area regarding their average peak and non-peak congestion levels.

The measure of overall roadway performance for each Policy Area is the **average** PM peak period congestion for the peak directions of traffic. That performance measure can be derived from the Travel Demand Model and the post-processing of the results. The performance measure for individual roadways can also be monitored and if enough samples or observations are made then theoretically an areawide **average** can also be estimated for observed traffic.

The performance measure is then calculated by using: (1) the average link-speed by direction of travel that is a raw result of the Travel Demand Model, and (2) dividing that by the "free-flow speed" for that link and direction of travel. The values used for the free flow speed are inputs to the modeling and are used by the model as one of the parameters in forecasting the amount of travel on each of the modeled roadway links. Those free slow speed values come from the regional modeling inputs prepared by MWCOG. As an example, if the average free flow speed in the peak direction is 40 mph and the modeled average PM speed is 30 mph then the congestion measure is 30 divided by 40, which equals 0.75 or 75%; if the average modeled speed was 20 mph then the congestion measure would be 0.50 or 50%; and if the average modeled speed was 15 mph then the congestion measure would be 0.375 or 37.5%.

Using the ratios or percentages allows for comparison among different roadways types and roadways of the same type that may have different free flow speeds as that can vary by location within the region. Using the ratios or percentages also facilitates calculating an average for all of the roadways modeled in a Policy Area by using a weighted-average that accounts for different contributions to the average between high volume roads and more lightly traveled roads. The networks used in the Travel Demand Model use all freeways, major highways, major arterials, and some minor arterials. However, as noted in the introduction to this Part, the Roadway Adequacy Analysis does not directly account for truly local streets, minor roads, and even some of the minor arterials. Those very local streets and roads have low amounts of traffic and the TPAR analysis accounts for them only in an indirect manor – but their adequacy is not assessed. The average congestion is summarized in the assessment only for major highways, major arterials, and some minor arterials – freeways while accounted for in the overall modeling are not included. That is consistent with prior versions of the APFO, the AGP, and the current PAMR.

The Roadway Adequacy Analysis considers the "network effect" of improvements added to other Policy Areas. For example, if a new project is added to the network in Germantown, it may also help sufficiently reduce congestion in a nearby area, say Clarksburg. Through the iterative process of adding specific, potential, roadway improvements, and combinations, it is possible to establish combinations of new roads or widenings that will bring balance to, or significantly improve the performance of, the roadway network in more than one Policy Area.

Another aspect of this Step is to discuss what standards to use in determining adequacy. For decades the Transportation profession world-wide has been using a publication of the Transportation Research Board, the *Highway Capacity and Quality of Service Manual*, often termed the Highway Capacity Manual (HCM) for short. The latest version of the HCM was published and released in January 2011 and it uses the measure of link speed by direction as the performance measure for arterials. While the prior version of the HCM classified arterial roadways into four categories, the new HCM makes no distinction between such major or minor arterial roads. The HCM has not evolved to having a method for an areawide measure of roadway performance nor of standards for that concept.

The HCM does, however, have a standard method of defining different Quality of Service levels for any arterial road. It is basically the same measure that is being used in TPAR to measure performance of individual roadway link-segments – that of the **average** speed of traffic compared to the free flow speed, expressed as a percentage or ratio. Associated with the HCM method are "Level of Service" grades for ranges of those ratios or percents. The following are the ranges defined in the latest HCM associated with each of the six specified arterial Levels of Service:

LOS A	85%	or greater	•
LOS B	70%	to	85%
LOS C	50%	to	70%
LOS D	40%	to	50%
LOS E	30%	to	40%
LOS F	30%	or less	

This standard is a consistent yardstick and whether the measured value for a particular roadway is adequate is a local determination of what degree of congestion along the measurement scale is considered adequate or inadequate. The TPAR Roadway Adequacy Assessment is building upon

this HCM approach in two ways. First is to define an "**areawide average**" as being a volumeweighted average of all of the modeled arterial roads within a Policy Area and differentiated by peak and non peak traffic directions. Second is to adapt this standard scale of performance and accept that it also applies to this "areawide average" performance measure. Then it would be a local determination as to which level or levels constitute adequacy for a whole Policy Area.

The TPAR Roadway Adequacy Analysis retains and accepts the classification of each Policy Area by its level of transit service: Urban (with and without Metrorail), Suburban and Rural. Using the above discussion, TPAR specifies the following acceptable levels of average roadway congestion levels in the peak traffic directions within each Policy Area, where the Adequacy Standard differs for Urban, Suburban, and Rural Policy Areas, as shown in Exhibit 3.9.

Proposed Roadway (Arterial) Level of Service Standards									
Policy Area Categories	Acceptable Average Arterial Level of Service								
Urban with Metrorail	Average congestion of "D/E" borderline in the peak flow directions								
Urban without Metrorail	Average congestion of "D/E" borderline in the peak flow directions								
Suburban	Average congestion of Mid-"D" or less in the peak flow directions								
Rural	Average congestion of "C/D" borderline in the peak flow directions								

Exhibit 3.9: Standards of Acceptable Roadway Average Level of Service

The last main aspect of this Step is to show an example of how all of the discussion from above comes together in a countywide assessment of Policy Areas of the County with respect to their average performance of the roadways within each area. Exhibit 3.10, on the next page, presents the countywide summary of the analysis results of one of the comparison combinations. This comparison combination used: (1) the 10-year Cooperative Forecasts that were discussed above in Step 11B, (2) a roadway network representative of the 10-year transportation improvement stage that consisted of: (a) existing roads plus, (b) the programmed CIP and CTP projects plus, (c) a few conditional roadway projects, as well as (3) representation of a conditional bus transit project to improve Peak Headways in 9 Policy Areas. The following notes should be used in reading the results in the Exhibit.

- The vertical "green-hatched" bars show the **range** of the average of roadway speeds by direction of travel in relation to the "free flow speed", or LOS, for each Policy Area in the PM peak period.
- The bottom of the bar shows the average LOS in the peak direction of travel. The top of the bar shows the average speed (LOS) in the non-peak direction.
- The measurement scale weighted average LOS is shown on the left side of the chart.
- Horizontal dotted orange lines are shown to depict the adequacy standards (LOS) for the Rural, Suburban and Urban (with Metrorail) Policy Areas, from left to right, which graphically corresponds to the Standards of Adequacy given in Exhibit 3.9 above.

A review of the results depicted in the Exhibit 3.10 for the Base Case scenario indicates that for this combination of future development activity and transportation network improvements that three Policy Areas could have **average** road congestion in the peak traffic directions that are more congested (below the adequacy standards shown) by 2022. Please note again that the measurement scale used on the left side of Exhibit 3.10 shows the same **average** Level of Service scale as discussed above on the previous page. The mathematical notation of having a

"short horizontal bar" to denote an average that is placed above each of the Level of Service "letters" is there as a reminder that the measure being used is intended to represent **average** conditions.



Exhibit 3.10: Example of a Countywide Summary of Average Congestion Levels by Policy Area.

There is another important caveat in reviewing these types of summary charts. The chart should be interpreted such that for this combination of future development activity and transportation network improvements three Policy Areas **could** have average road congestion in the peak traffic directions that are more congested (below the adequacy standard shown) by 2022. That would likely be the case, and here is the caveat, <u>unless enough or appropriate other "conditional projects" are programmed in the intervening time and would be operational by 2022</u>. Please note that it is anticipated that when one or more Policy Areas are classified as Urban without Metrorail that the sequencing of the Policy Area-Bars in exhibits such as 3.10 may be changed so that they are immediately to the left of the bar for the Derwood (DER) Policy Area.

Section V and Section VI give the full Roadway Adequacy Assessment in conjunction with the Transit Adequacy Assessment and discusses the analysis results for several of the same comparison combinations. Those discussions are intended to provide pertinent information that can be used in the support of various staging related decision making activities.

Step 15 – Prepare Additional Comparison Combinations for Further Assessment: The purpose of this step is to refine and/or revise the comparison combinations to test other potential projects, or to conclude that no further Roadway Adequacy Assessments are needed for TPAR for this cycle.

To move a Policy Area that has average roadway performance that is more congested on average than the specified standard for that Area, the TPAR process is used to identify and select potential transportation roadway improvements from the resources of Step 16. Given sufficient time and resources the new comparison combination goes through an iteration cycle and the results are reviewed and assessed. When adequacy is attained it is concluded that no further Roadway Adequacy Assessments are needed for TPAR for this cycle,

Step 16 – Potential Projects Not Yet Programmed: As part of the development of the proposed policy, MCDOT obtained from the MNCPPC a list of all future un-built roadway and bikeway projects in each County Master Plan. MCDOT together with MNCPPC then reviewed and validated the list, and classified each project as a developer or County responsibility. The list of road projects to be built or widened by the public sector is broken down by Policy Area and displayed in Appendix C. In addition, it has been a regular practice over recent years for the locally elected officials to prepare a list of transportation improvement priorities to be reviewed with members of the Maryland Legislature and then submitted to MDOT for their consideration. Those lists may also be a resource in this Step as they might have worthy projects that are not identified in the Master Plans, such as a project that is mainly safety related.



Exhibit 3.11: Modifications for Long-Range Analysis for Costing Purposes

Step 17 – Long-Range Analysis for Costing Purposes: Exhibit 3.11 is a modification to Exhibit 3.7 given above to carry out a similar iterative analytic process for the prime purpose of Long-Range Costing. In the discussion of the next Part on Allocating Costs for Needed Improvements the reasons for having such a similar analysis process are explained. The main

differences between the processes shown in Exhibit 3.11 compared to the one shown in Exhibit 3.7 are: (1) the time period for the Development Activity Forecasts used in the analysis – 30-year forecasts versus 10-year forecasts, and (2) a more extensive network of transportation improvements is given consideration.

For purposes of transparency of TPAR it is important to explicitly recognize this Step 17 to prepare and analyze combinations of projects from State and regional long-range plans and from Master Plans of the County for Long-Range Costing purposes. The reasons for doing that Cost Analysis are discussed in some detail below in Part 3 of this Section. The Long-Range Costing Analysis uses the same modeling system as the prior iterations and 10-year analysis for the Transportation Improvement Planning Stage. However, again, the input assumptions differ first by using the long-term (30-year) forecasts of development activity and then second by selecting future planned long-range transportation improvements to generally attain adequacy in most Policy Areas.

While it is desirable for the TPAR Costing Analysis to generally indicate such longer-term roadway adequacy at this time, it is not essential as the main purpose for testing the roadway adequacy in this Step 17 is to sufficiently set the TPAR Payment Rates by Policy Area. Subsequent updates to TPAR will have the opportunity to fine tune such longer-range planned improvements and/or to urge modifications to the development activity forecasts if that seems more appropriate.

Part 3: Allocate Costs for Needed Improvements

As indicated in Exhibit 3.12, the TPAR recommends implementation of a public – private cost sharing arrangement to fund projects to raise Policy Areas to transportation adequacy in the future. TPAR provides a methodology to: (1) estimate costs; (2) implement improvements and; (3) allocate costs to the public and private sectors. In developing this methodology, it is recognized that the implementation of solutions does not always involve the same time frames.

For example, some bus related transit improvements can be added more easily, as well as incrementally, on an annual basis relative to roadway improvements to meet the adequacy standard within the established time frame. This is particularly the case when service Span is increased by providing bus service for more hours during the day. On the other hand, improving Peak Headways or coverage in an area typically may initially require the acquisition of new buses. There is typically 12 to 18 months duration from the time a bus is ordered to the time it is put into daily service. Other major capital transit projects, such as a Bus Rapid Transit (BRT) System, the Purple Line or the Corridor Cities Transitway can be as lengthy and complex as building a major road.



Exhibit 3.12: Develop and Allocate Costs of the Needed Improvements (Source: Proposed TPAR Report, April 2010, with amendments)

In the example of roadway projects under current MCDOT procedures, implementation of a road project starts with Facility Planning Phases 1 and 2 during which a project is programmed for:

- Final design
- Right of way acquisition, and
- Construction

That last decision of programming for construction takes place only after completion of Phase 2, which is at about 35 percent of the engineering. Depending on the complexity of a project, this

implementation process can take up to 12 years. TPAR recommends that the existing process of developing roadways be streamlined to ensure timely completion of road projects designated as **solutions** to congestion problems. Once completed, the life expectancy of a roadway capital project will provide its basic function for a very long period of time as compared to the 12 year average life expectancy of a bus.

In Exhibit 3.12 above there is a vertical dashed line shown between Step 26 and Step 27. The Steps to the left of that dashed line are actions that are taken prior to the approval of the TPAR Process by the Council. The Steps to the right of that dashed line are intended actions to be taken in the on-going administration of the TPAR Process. The latter also includes all of the Steps given below for Parts 4 and 5 of the TPAR Process. The approval of TPAR by the Council will have this dual aspect: (1) approving the policy basis and analysis results leading up to Step 27, and (2) a policy directive to administer the TPAR Process as described in the Steps from Step 27 to the last Step of the Process.

Step 23 – Cost Estimates for Capital Facilities and Operating Expenses: The allocation of cost shares between public agencies and private development indicated in Exhibit 3.12 should take into consideration the different life expectancies of the service or capital project. In the case of bus transit services needed to improve performance in the ten year period, cost estimates can be prepared and a share assigned to the increased forecast development in the next ten year period. Public shares of this type of cost are typically budgeted in the annual operating budget of the County.

However, in the case of a road or a large capital transit project, an issue of fairness arises in assigning the total private share of roadway cost to the forecast development that takes place in the next ten years. Doing so would place the entire burden of the cost on the first ten years of development. Future development beyond the 10 year forecast would be able to enjoy the benefit of the capital project at no cost, receiving "free rider" benefits. If such a policy was implemented, then it would act as a deterrent for private sector building in the near future. That in turn could create a possible barrier to the sustained economic development of the County, as most developers would wait for enough another proposed development projects to go first and let the other proposed development projects pay the private share.

Steps 24a and 24b – Calculation of the Trend in Total Trip-Ends by Policy Area and **Payments per Trip-End**: With the goal of encouraging economic development, TPAR proposes that all capital project costs associated with the construction of road capital projects serving a Policy Area be estimated and then prorated. With this approach, the total cost of needed projects in each Policy Area is prorated by the 30 year forecasted increase in units of development in the same Policy Area. This yields a payment rate per unit of development for each Policy Area, where the unit of development is expressed in terms of the number of forecast new trip-ends. That will provide consistency with the procedures used in the Local Area Transportation Reviews, which also is based on the net-number of site related new trip-ends. This payment rate per unit of development can be more fairly allocated to all future development, not only to that development that may occur in the first ten years of the policy. It is recognized that this aspect of the TPAR process varies from the 10-year time stage used elsewhere in the process. The goal is to determine a more equitable private contribution while bringing an area to an adequate level of performance. Specifically, for roadway projects as well as major capital transit projects such as a BRT system, the CCT and the Purple Line, TPAR costs would be determined as described below:

- Using the Department's transportation demand model, estimate the total number of evening peak period "Trip-Ends" (by policy area) forecast to occur first by the 2022, 10year time horizon, and then by the 2040, long-term time horizon. The calculation and summary of the incremental Trip-Ends by Policy Area is given in Exhibit 3.13, below. That table shows that for the evening peak hour in 2010 there was just over an estimated one million trip-ends in Montgomery County. The Exhibit shows a shorter-term growth of about 113,000 Trip-Ends, or about an 11.3 % growth between 2010 and 2022. The Exhibit also shows a longer-term growth of about 256,000 Trip-Ends, or about a 25.5 % growth between 2010 and 2040, which includes the prior amount. The Exhibit also shows the percent that the growth in total Trip-Ends in each Policy Area is forecast to be of the total growth in Trip-Ends.
- 2. Using a list of un-built Master Planned transportation projects other sources, and results of prior analyses, identify those Long-Range Projects that are needed to attain the adequacy standard for each policy area assuming a year 2040 time horizon.
- 3. Estimate the costs, by policy area, associated with the Long-Range Projects that have been identified and used in the long-range assessment of adequacy.

Trends in PM Peak Hour (5-6PM) Total Person Trip-Ends for All Trip Types (Motorized and Non-Motorized) by Policy Area Category and Policy Area (updated 6-25-12)		Total Trip Ends by TPAR Policy Area 2010	Total Trip Ends by TPAR Policy Area 2022	Total Trip Ends by TPAR Policy Area 2040 v2		2010 to 2022 Total Trip End Growth by Policy Area	2010 to 2040 Total Trip End Growth by Policy Area	2010 to 2022 Percent Growth of Total Trip Ends by Policy Area	2010 to 2040 Percent Growth of Total Trip Ends by Policy Area	
SSTP	26	Silver Spring/Takoma Park	73,954	81,663	86,413		7,708	12,459	6.8%	4.9%
NB	18	North Bethesda	71,912	88,557	109,660		16,646	37,748	14.7%	14.7%
KW	16	Kensington/Wheaton	81,431	87,796	92,966		6,366	11,535	5.6%	4.5%
BCC	3	Bethesda/Chevy Chase	120,712	133,624	140,514		12,912	19,802	11.4%	7.7%
RKV	23	Rockville City	89,051	103,476	116,073		14,425	27,023	12.7%	10.6%
DER	7	Derwood	28,862	34,137	43,697		5,276	14,836	4.7%	5.8%
RDV	22	R & D Village	14,105	19,997	34,497		5,892	20,392	5.2%	8.0%
GBG	10	Gaithersburg City	98,339	112,333	135,907		13,994	37,568	12.4%	14.7%
FWO	8	Fairland/White Oak	71,163	71,453	73,514		290	2,351	0.3%	0.9%
GTW	13	Germantown West	50,584	54,602	67,681		4,018	17,098	3.5%	6.7%
MVA	17	Montgomery Village/Airpark	51,136	51,428	52,140		292	1,004	0.3%	0.4%
AH	1	Aspen Hill	43,248	43,673	43,703		424	455	0.4%	0.2%
GTE	11	Germantown East	24,787	27,223	34,705		2,436	9,918	2.2%	<mark>3.9%</mark>
CLV	5	Cloverly	10,505	10,553	10,638		48	133	0.0%	<mark>0.1%</mark>
NP	19	North Potomac	20,011	20,376	22,266		365	2,255	0.3%	0.9%
OLY	20	Olney	30,823	31,819	34,292		996	3,469	0.9%	<mark>1.4%</mark>
POT	21	Potomac	47,997	51,069	52,182		3,072	4,186	2.7%	1.6%
CLK	4	Clarksburg	11,673	26,538	38,086		14,865	26,413	13.1%	<mark>10.3%</mark>
DAM	6	Damascus	12,931	13,791	15,236		860	2,306	0.8%	0.9%
RurE	30	Rural East	31,560	33,382	35,549		1,823	3,990	1.6%	1.6%
RurW	31	Rural West	17,767	18,345	18,796		578	1,029	0.5%	0.4%
Tota	l Tri	p Ends to/from Policy Areas	1,002,549	1,115,838	1,257,665		113,289	255,966	100.0%	100.0%
						[]	11.3%	25.5%		

Exhibit 3.13: Summary of Trends in Trip-Ends by Policy Area

For the local bus transit (Ride-On) system, TPAR costs by policy area are determined using a combination of annualized capital costs plus annual operating cost for the additional bus service to bring policy areas into transit adequacy, as identified in the adopted TPAR Report. In those calculations the shorter-term time increment in the growth of new Trip-Ends, for 2010 to 2022, will be used. The conditional Ride-On bus Headway improvements discussed above in Part 1 of this Section are considered as having near County-wide benefits serving almost each Policy Area but the costs of those improvements are allocated to each Policy Area in proportion to the route lengths of the improved routes in each Policy Areas to the total lengths of those routes.

The final part of the calculation is to tabulate and estimate the Payment Rate per Trip-End of each cost component and in total for each Policy Area. Those calculations are presented and discussed below as part of Section V, which applies TPAR to the Policy Areas.

Step 25 – Establish Criteria for Additions into the CIP/CTP: The cost components described above (i.e., roadway, major capital transit and local bus transit and associated Commuter Assistance, and transit access for bicycles and pedestrians) would be combined to develop a total TPAR payment rate (by policy area). The determination of TPAR payment rates, for both roadway and transit-related projects, would be a collaborative effort between MCDOT and Planning Board staff. MCDOT would normally take the lead on developing cost estimates for both roadway and transit projects needed to meet adequacy standards. Planning Board staff would develop evening peak hour Trip-End estimates, produce per trip-end rate estimates and calculate TPAR Payment Rates (by Policy Area) based on the public/private cost sharing allocation paradigm discussed below. This step would also rely on criteria set and refined by the elected officials that can result in using TPAR to better stage growth by **specifying the collection level** that triggers the programming of projects in each Policy Areas. However, the overall processes for proposing and approving the CIP as well as the CTP will need to be followed. This Step also relates to Step 32 discussed in Part 4, below.

Step 26a and 26b – Set Public-Private Cost Sharing and Shares for Households and Employment: The TPAR methodology gives elected officials the ability and responsibility to set a public/private cost sharing participation for each Policy Area. The level of public financing could be assessed in various ways, such as these four options:

- (1) Same for all areas of the County;
- (2) Separately for each policy area;
- (3) By geographic category (Urban, Suburban, and Rural); or
- (4) By assigning priorities for development to each Policy Area.

As an example, the implementation of TPAR under Option (4) could offer desirable flexibility. As one possibility, three different levels of priority for development: high, medium and low, could be considered. In high priority policy areas, the costs of the improvements could be split 3/4 public – 1/4 private. In medium priority policy areas the split could be at 50 - 50. For low priority policy areas for development, the split could be 1/4 public – 3/4 private. Policy Areas where elected officials want to encourage development will be identified as high priority and so on. In any case, under TPAR development can proceed, with payment, in all policy areas. In low priority areas, the private sector will carry a higher share of the costs. The discussion in Section V below proposes using Option 1, having the same proportions in all areas.
It is important to point out that it is the policy intent of TPAR that there will be no Policy Areas where development will be stopped outright due to inadequate areawide transportation. At the same time it is also important to note that the policy intent of TPAR in letting development proceed is that elected officials are also providing a high degree of certainty and commitment to ensure that the transportation solutions to accommodate such development are implemented in a timely manner.

As noted in the introductory discussion for this Part of Section III, the TPAR Process at this step, once approved by the Council, will transition to one of an on-going administration of TPAR. The Local Area Transportation Reviews (LATR) by the Planning Board on a case-by-case basis for proposed subdivisions will also be used to apply the TPAR policies. The Board is carrying out a process to review and possibly refine the current LATR Guidelines during 2012. It is anticipated that the Board's adoption of revised Guidelines will take place after the Council has acted on the Subdivision Staging Policy.

Step 27 – Aggregate Policy Area Payments Collected as Part of the Subdivision Process:

The decisions made in the public/private partnership to fund the transportation improvements will result in the establishment of a TPAR Payment Rate, similar in nature to those set up under the Policy Area Mobility Review (PAMR) in policy areas which require mitigation. This TPAR Payment Rate would be applied against the number of net new Trip Ends associated with a proposed subdivision and then collected as part of the Subdivision Approval Process, prior to the release of building permits. The collection of these Payments must be tracked for each Policy Area and the expenditure of the Payments must be programmed in the Policy Area where the TPAR Payments are collected, except when the minimum TPAR Payment is collected, as discussed in the following paragraph. The TPAR cost allocation process will ensure that new development will contribute toward the transportation improvements to support it.

TPAR also proposes a maximum and minimum TPAR Payment Rate. In areas where the private burden may be too high, the payment should be no larger than the payment under PAMR, or the equivalent of \$12,000 per trip (or as adjusted, see below). In those areas where the transit and roadway adequacy standards are both met, a minimum TPAR Payment Rate should be used. Such minimum TPAR Payments would help finance transit-related improvements for adjacent Policy Areas where such improvements are required and where the improved bus route provides continuity of service to the area with the minimum TPAR Payment Rate. Similarly, the minimum TPAR Payments could be used to supplement roadway improvements in an adjacent area, where connectivity may provide additional network benefits. As a starting point for public discussion, a minimum TPAR Payment Rate at five percent (5%) of the maximum payment is recommended, or the equivalent of \$600 per Trip-End generated by the development. Both the maximum and minimum TPAR Payment Rate would be adjusted every July 1, on the basis of a national or regional construction cost index.

Steps 28 and 29 – Triggering the Criteria Set in Step 25 to Initiate Proposed Programming: MCDOT will use the cost allocation based criteria identified in Step 25 above to be a trigger to recommend the initiation of a project into the CIP of the County. If the needed project in a Policy Area is a CTP project of MDOT, then MCDOT will work with locally elected officials to help advance that project in the CTP review and approval process. As indicated by Step 29 in Exhibit 3.12, there could be considerable time passed between triggering of a recommendation and actual approval taking place to have a specific project or service be approved as being programmed. That process is discussed more in Step 32 of the next Part of the TPAR Process.

Part 4: Program Public Commitments

Under TPAR, once developers pay the TPAR payment, their development proceeds in accordance with the regular subdivision process. The County continues to collect the TPAR payments as more developments are approved.

As TPAR revenues are collected, they are applied to the improvement of transit service and roadway construction on a "proportional basis" to the transit and roadway deficiencies. When a certain percentage of the cost of the highest priority capital project serving a given Policy Area is collected, the County programs the project or service. Exhibit 3.14 below indicates the general sequence of these activities related to the programming of public commitments.



Exhibit 3.14: Programming Public Commitments – Monitor and Report Progress (Source: adapted from the Proposed TPAR Report, April 2010)

Step 32 – Program the Project and/or Service: As noted in the Part 3 discussion above, elected officials can use the TPAR to better stage growth by **specifying the collection level** that triggers the programming of projects in each Policy Areas. That is shown above in Exhibit 3.12 as Step 25, "establishing criteria for additions into the CIP/CTP."

TPAR recommends the initial level to trigger programming of a capital project to be ten percent of the estimated construction cost multiplied by the selected public-private cost sharing ratios identified as part of Step 26 in Exhibit 3.12, above in Part 3. This criteria seems reasonable given that for a typical roadway project, the engineering design cost varies between eight and twelve percent. With this recommendation, a project would be programmed when the expected private participation for the project covers the portion of the design cost attributable to the private sector. MCDOT may need to program funding in advance of receiving private funds, especially for design and engineering of complex projects, or equipment that requires a long lead time. The County Council and Executive will request needed improvements to MDOT for State roads as a priority in the CTP and State budgets.

As an example, if the cost of the highest priority road project in a Policy Area has an estimated construction cost of \$10 million, and the share ratio of public-private participation for that area is 3/4 public – 1/4 private, then that capital project should be programmed when a total of \$250,000 is collected in TPAR payments in that area (\$10,000,000 * 0.1 * 0.25). No other capital project

in the area would be programmed until enough TPAR payments are collected to pay for the private allocation share of the total cost of that project. After the private share for a project is collected, then additional TPAR payments are accumulated to program the second highest priority capital project, following the same procedure as for the first one. To implement such a process, MCDOT and the Executive will need to make recommendations in the development of each CIP for review and approval by the Council regarding the priority sequence if more than one CIP project serves a Policy Area. Such a prioritization of projects will serve to focus the limited public and private resources into a quicker implementation of needed improvements than having the funding spread across more than one project.

Step 33 – Identify as a Committed Project in the CIP: Feedback from the stakeholder meetings conducted during the development of the proposed TPAR 10 process indicated that a key element of the policy should be the firm commitment by elected officials that the identified capital roadway project or transit service will be implemented. There was significant agreement among stakeholders, that if development is approved, the public sector should provide the necessary infrastructure or services to serve the transportation demands imposed by that development in a timely manner. How to do the same for the CTP needs to be addressed. The Council will determine how this goal will be achieved.

Step 34 – Schedule and Implement within the 10-Year Time Stage: During the stakeholder meetings referenced above, multi-year payment options for the TPAR payments were suggested so that those who must pay the new payment have some cash flow to lessen their burden at the start of the development activity. To address this matter, the following process is recommended to be implemented during the Development review process:

- The development application identifies the: (a) Policy Area of the proposed development, (b) nature and size of the proposed development, and (c) expected total peak period and peak hour trip generation to and from the proposed development.
- 2. The Planning Staff, in coordination with MCDOT staff, determines the required TPAR Payment amount based on the approved TPAR Payment Rate for the Policy Area and the number of Trip-Ends associated with the approval of the proposed subdivision. The proposed subdivision may in addition have various local access and circulation requirements that they would need to be responsible for making as conditions of approval of the proposed subdivision.
- 3. Planning Board approves the development, with conditions, including assurance that the TPAR payment will be made or transportation improvements (if substituted for some or all of the payment) will be constructed (permitted and bonded) at time of building permit. If the amount of development is changed during the approval process, MCDOT would recalculate the payment.
- 4. Developer either pays the TPAR payment or posts an irrevocable letter of credit for the payment at time of building permit. If the latter, the five-year time period for payment starts. At this point, the developer has met his/her obligations under TPAR and can proceed with the next steps in the subdivision process. The payment or approved irrevocable letters of credit will be considered a part of the collection of the TPAR payment for purposes of programming projects or transit services.
- 5. MCDOT will track the revenues collected in coordination with the Departments of Finance and the OMB, and recommend programming of projects as appropriate.

5: Monitor and Report on TPAR Results and on Transportation System Performance

The final part of the overall TPAR process is a dual set of processes. The first is a new activity aimed at better assuring a balance over time between new development activity and the implementation of transportation facilities and services programmed in part to serve the new development activity. The second is recognition of the continued importance of the Mobility Assessment Report, which was started in 2004 and has been evolving since then, and focuses on the monitoring and reporting of transportation system performance. Each of those are discussed separately next.

Monitor and Report on TPAR Results: The monitoring of the key components of the TPAR administrative processes would need to begin in the year after the approval of TPAR. This monitoring and reporting process would be a joint annual effort between MCDOT and Planning Department Staff with MCDOT taking the responsibility for drafting a joint report and presentation of results and recommendations.

Exhibit 3.15 below shows various steps needed to monitor and report on TPAR results, including making recommendations for revised or new transportation improvement solutions. The monitoring and reporting is performed in the context of the 10-year transportation planning implementation stage.



Exhibit 3.15: Process to Annually Monitor and Report on TPAR Results (Source: adapted from the Proposed TPAR Report, April 2010)

Step 42 and 43 – Monitor and Report on Development and Implementation Commitments: The list of elements that must be monitored and possible actions to remedy any imbalance follows:

(a) <u>Development Approvals and Building Permits Issued</u>: If the rate of growth is continuously and sufficiently higher than projected, then additional infrastructure facilities or transit services may need to be programmed. If the growth occurs significantly more slowly, then public sector financial commitments could perhaps be delayed but not removed from the capital programs.

- (b) <u>Timely Implementation of the Programmed Transportation Projects</u>: Once a TPAR project is programmed in the CIP or CTP its progress towards implementation must be tracked and reported on a quarterly or semi-annual basis.
- (c) <u>Collection and Dedication of TPAR payments by Policy Area</u>: This information can be used by agency staff to alert elected officials of the need for timely programming of projects as was discussed above for Step 28 of Part 3, Develop and Allocate Costs for the Needed Improvements.
- (d) Ongoing Costs of Infrastructure and Improved Transit Services: Payments Rates by Policy Area may need to be adjusted on a biennial basis to reflect the updated costs of the infrastructure projects used in the calculation of the TPAR Payment Rates. Such updated costs would be associated with: (1) the biennial update of the CIP, (2) annual provisions in the Operating Budget for new or improved transit services, and (3) the annual review and publication of the update of the CTP by MDOT. Once a project funded with TPAR Payments is programmed for design, then it should remain in the CIP unless it is delayed for implementation or technical reasons.
- (e) <u>Current Non Auto Driver Mode Share (NADMS) Percentage Goals</u>: For those Policy Areas where the Council has approved specific NADMS goals, the monitoring report should also present the results of the progress in reaching the mode share goals for those Policy Areas. This element should also become part of the monitoring of transportation system performance.

A key objective of this monitoring process is to ascertain the degree to which the development activity and/or the transportation improvements are "on schedule".

Step 44 – Recommendations for Revised or New Solutions: The integrated monitoring and reporting of these elements must be a cooperative effort between the Executive Branch, the MDOT, and Planning Department Staff of MNCPPC. Specific responsibilities must be outlined for each unit of government. No one agency has sole responsibility for the different monitoring and reporting elements of TPAR. Appendix B gives an outline of the current expectations for the general role responsibility for each of the five main parts of TPAR, including this part of the monitoring and reporting activities.

One key element of the reporting requirement must be the analysis and perhaps recommendations for adjustment of the different components of TPAR to better achieve future the transportation - development activity balances at the regulatory planning stage and at the transportation planning implementation stage.

Once again, it is best for the smooth development of the County and acceptance by residents if the recommendations are the result of a joint MNCPPC – County Executive Branch effort. The continued economic development of the County and the timely provision of transit services and roadway improvements merit the cooperative efforts of all agencies involved.

Monitoring and Reporting on Transportation System Performance: This is seen as a parallel process to the monitoring and reporting of the TPAR results. Exhibit 3.15 above is oriented primarily to the administrative aspects of the TPAR results. This part of the process is oriented to the monitoring of the performance of the transportation system in Montgomery County. As such Exhibit 3.15 does not implicitly deal with this process due to its broad scope as discussed below.

Currently the MNCPPC produces a *Mobility Assessment Report* (MAR) that gathers, assembles, and analyzes various aspects of how well the transportation system is performing in general, as well as for particular types of facilities and even particular facilities. The MAR is budgeted to be carried out once every two years. The most recent report was presented to Council in 2011.

The 2010 Report of the Executive on *Moving Toward a New Transportation Policy Area Review* commented on the need for this process of monitoring transportation system performance. The report said that this type of monitoring may be used in support of TPAR, with specific adjustments that provide more consistency and continuity of effort than the present methodology. For example, the actual performance of arterials could be monitored to serve as a check over time on the modeled results.

The work associated with preparing this TPAR report did begin to address the feasibility of two innovative ways to more effectively monitor transportation system performance, in particular that of measuring average automobile and transit vehicle speeds on a sample of arterials in the County.

• Monitoring Average Arterial Speed Using Data from the Vehicle Probe Project and Archived Samples of Private Sector Data of Monitored Average Speeds: The 2011 MAR presented the initial results of the utility of using estimates of vehicle speeds that are prepared by a private sector company, INRIX, and through a contract with the I-95 Corridor Coalition is cooperatively purchased. The data is used in Travel Information Systems in different ways such as producing the travel times now being posted on overhead roadway information signs of MDOT. The work in the 2011 MAR was based on a small sample from archives of that data source purchased by MNCPPC.

Subsequent to that the MWCOG made a more comprehensive purchase in the summer of 2011 from the archives of INRIX for a full set of data for arterials throughout the Washington Region for the time period of 2010. For this 2012 TPAR work, Planning Department Staff was able to obtain permissions to also use part of the regional sample of MWCOG and to begin testing ways in which that new and more extensive source of monitored transportation system performance data could be used.

The Center for Advanced Transportation Technology (CATT Lab) of the University of Maryland maintains an archive of the INRIX data purchased through the I-95 Corridor Coalition and is part of the team assisting Planning Department Staff on TPAR. They and staff of MWCOG provided guidance to Planning Department Staff on extracting samples of data sets on arterial travel speeds purchased by MWCOG. Samples were analyzed on the average weekday speeds for three arterial roadway sections in the Bethesda Chevy Chase Area that was considered in the parallel work on the LATR Refinements being done in conjunction with this TPAR work. Samples were also used in

response to issues raised during Planning Board worksessions on the Draft 2012 TPAR Report.

• Monitoring the Average Speed of Bus Transit Service Using Changes in Locations of Buses from Archived Samples of Bus Location Data: The Ride-On System of MCDOT has, as a management feature, a system that uses Global Positioning Systems (GPS) for Ride-On buses that in the transit management and operations profession is termed an Automatic Vehicle Location (AVL) System. As part of support for gathering data on transportation system performance in the Washington region, the CATT Lab of UMD has been gathering and archiving that AVL data from MCDOT, but had not yet begun a program to analyze and summarize the data into various types of information. The CATT Lab had also been similarly gathering and archiving bus AVL data from the Metrobus system of WMATA, but for that too they had not yet begun to analyze that data source.

As part of the work on TPAR the staff at the CATT Lab began testing the use of the AVL data to see whether new metrics related to transportation system performance of transit service and/or arterial performance could be developed for use in the TPAR monitoring of transportation system performance activities. Samples of AVL data from the Ride-On system for buses traveling on MD 355, US 29, and on Randolph Road were selected and summarized.

A general conclusion of both of these tests of new data sources for the more effective monitoring transportation system performance appears promising. Planning Department staff will continue to research using these new data sources for possible use in the next Mobility Assessment Report.

In addition, Planning Staff of the MDOT/SHA have independently begun to initiate work that would also use annual updates of the same data source of the I-95 Vehicle Probe as well as the broader set of archived estimates for 2011 of arterial travel speeds also gathered by INRIX. A coordination meeting was held among SHA, MWCOG, and MNCPPC staff to begin a collaborative process to analyze that expanded set of monitored data on average speeds as part of the next Mobility Assessment Report. The intent of the collaboration would be to have Planning Department Staff focus on Montgomery County arterial roads, MWCOG staff on other roads in the Washington Region, and SHA staff on other roads elsewhere in Maryland.

Recent Changes in Federal Legislation related to Transportation System Performance: At the end of June 2012 Congress enacted and the President signed the "Moving Ahead for Progress in the 21st Century Act", or the "MAP-21" legislation that extends the authorization for Federal surface transportation programs through 2014. A new key component of the Federal legislation is the establishment of a Performance Management subtitle that includes a "…performance-driven, outcomes-based approach to planning...."Section 150, National goals and performance management measures states on page 124:

"...(a) DECLARATION OF POLICY.—Performance management will transform the Federal-aid highway program and provide a means to the most efficient investment of Federal transportation funds by refocusing on national transportation goals, increasing the accountability and transparency of the Federal-aid highway program, and improving project decision-making through performance-based planning and programming.

"(b) NATIONAL GOALS.—It is in the interest of the United States to focus the Federalaid highway program on the following national goals:

"(1) SAFETY.—To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.

"(2) INFRASTRUCTURE CONDITION.—To maintain the highway infrastructure asset system in a state of good repair.

"(3) CONGESTION REDUCTION.—To achieve a significant reduction in congestion on the National Highway System.

"(4) SYSTEM RELIABILITY.—To improve the efficiency of the surface transportation system.

"(5) FREIGHT MOVEMENT AND ECONOMIC VITALITY.—To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.

"(6) ENVIRONMENTAL SUSTAINABILITY.—To enhance the performance of the transportation system while protecting and enhancing the natural environment. "(7) REDUCED PROJECT DELIVERY DELAYS.—To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices.

"(c) ESTABLISHMENT OF PERFORMANCE MEASURES.—

"(1) IN GENERAL.—Not later than 18 months after the date of enactment of the MAP–21, the Secretary, in consultation with State departments of transportation, metropolitan planning organizations, and other stakeholders, shall promulgate a rulemaking that establishes performance measures and standards ...

Taking July 1, 2012 as the date of enactment, then the referenced 18 months after date would be about January 1, 2014. That would have the referenced rulemaking being available in the same general time period proposed for the next update of the TPAR in 2014. That will provide an opportunity for the TPAR-14 Report to consider any pertinent roadway and transit performance measures that would be being promulgated nationally at that time.

Section IV: Ways that TPAR Differs from the Current PAMR Methodology

TPAR differs from the existing PAMR in many respects. TPAR:

- 1. Uses separate adequacy standards for transit service and roadway operations.
- 2. Defines transit standards in a simple, easy to understand manner, consistent with the County's Transit Strategic Plan.
- 3. Uses roadway congestion in the PM peak direction of travel to measure adequacy, rather than the weighted average of both directions.
- 4. Recommends specific roadway projects and transit service additions to improve the transportation network in a Policy Area where inadequacies are found or forecasted.
- 5. Uses a 10-year forecast of development activity rather than the "pipeline" of approved development.
- 6. Analyzes variable transportation scenarios to serve the forecast of development activity for the next 10 years. This differs from the current PAMR method that analyzes variable amounts of development activity that could be supported by the set programmed transportation improvements of the 6-year CIP and CTP.
- 7. Examines the within-Policy Area roadway and transit performance, not just the overall average for the area. TPAR presents information for the arterial roadways serving Policy Areas. Such analyses show that while the overall average for an area may be inadequate, there are still many arterial roads that operate at acceptable congestion levels. In addition, TPAR presents information on the transit system performance of Policy Areas based on three metrics: coverage, peak headway, and span of service.
- 8. Closely ties development approvals with the programming and timely implementation of transportation solutions.
- 9. Clearly identifies public-private cost sharing responsibilities, and ensures that services are programmed and funded in the Policy Areas where new development will occur.
- 10. Requires regular monitoring and reporting of conditions of the key elements of the policy and requires the cooperation of the Executive Branch and MNCPPC in the formulation of solutions and adjustments to the Policy when there are discrepancies between the plans and the in-the-field realities.
- 11. Firmly ties the Subdivision Staging Policy to the CIP, CTP and the Operating Budget.
- 12. Provides an open, iterative process and identifies for elected officials specific transportation projects to select to ensure balance in transportation development activity within a "rolling" ten year (on average) time frame.
- 13. Gives elected officials the ability and responsibility to prioritize development and transportation projects in certain areas of the County, while permitting growth throughout the County.

Section V: Applying TPAR to Policy Areas and Local Area Transportation Reviews

For this first full implementation of TPAR, Planning Department Staff, MCDOT staff, along with support of a consultant team separately analyzed the transit and roadways systems in accord with the steps outlined and discussed above in Section III. This Section reports on the countywide results by Policy Area of applying the TPAR process using the three time stages of: (a) regulatory stage of 2018, (b) transportation improvement stage of 2022, and (c) tests of development activity at the master plan stage using the Cooperative Forecasts for 2040.

This Section summarizes these general results: (1) in terms of potential transit solutions, (2) in terms of roadway adequacy that reviews and summarizes the results for sets of comparison combinations of 10-year transportation networks and future development activity, (3) consideration of an illustrative list of additional projects for purposes of a 30-year Costing Analysis, and (4) then an outline is given of how TPAR applies in general to the review of a new subdivision. The application of the TPAR approach to each of the specific Policy Areas is covered subsequently in Section VI.

1a. Countywide Solutions for Transit Adequacy

Peak Headway Solutions for Current Inadequacies in 9 Suburban Policy Areas: As discussed above in Section III, Part 2 of this Report, Transit Adequacy was analyzed with the assumption of current bus service by WMATA and Ride On, as well as the presence of the Metrorail and MARC Commuter Rail system. Adequacy is measured in terms of three transit related factors of Coverage, Peak Headway, and Span of Service, as defined in Section III. The resultant Transit Adequacy Analysis found that many of the Suburban Policy Areas currently have inadequate Peak Headway and that would continue until one or more solutions are programmed. The general solution would be to add more frequent bus service during the peak periods to reduce the average time headway between buses serving those Policy Areas.



Cooperatively with MCDOT, a potential conditional project has been identified that could directly attain Peak Headway standards in nine Suburban Policy Areas and indirectly attain the Peak Headway standards in five of the Urban Policy Areas with similar inadequate Peak Headway. Exhibit 5.1 is an example for Germantown West (GTW) and shows the variations in Peak Headway and Span for the 9 bus routes serving the area. The X-axis shows the Span per route while the Y-axis shows Peak Headways per route, and the points are labeled to show the route numbers. This Exhibit shows that the average Peak Headway for all routes is about 21.8 minutes and the average span for just the allday routes is about 18.6 hours. The potential conditional solution to improve Headways could add buses on three of those routes.

Exhibit 5.1 Peak Headway vs. Span Example Chart



Exhibit 5.2 Potential Conditional Bus Project to Increase Peak Headways (Scenario #1)

MCDOT transit planning staff was able to use information organized in this manner to identify: (a) 9 Policy Areas that could benefit from improved Peak Headways, and (b) a target number of buses, in the range of 25 to 35 new buses, that could be used to improve headways. The Transit sketch-planning methodology was then used, with the support of MCDOT staff, to identify and select about 13 bus routes to directly serve those 9 areas, an allocation of buses to routes, and then a recalculation of the average Peak Headway. The revised allocation of buses that was tested (termed Scenario #1) added 32 buses (plus 15% for spares) to those routes and it is estimated that would attain the Peak Headway standards. That number of buses (including spares) is about 11% of the current Ride-On bus fleet. Exhibit 5.2 above is a graphic that shows the coverage of those routes that would potentially have improved Peak Headways and their broad coverage across much of the County. It is possible because of the addition of one or more buses to a route that the route Coverage in some of the Policy Areas could be increased at essentially no extra costs. That in particular may be the case for some of those few Policy Areas that are also inadequate with respect to Coverage, such as North Potomac, Olney, and Rockville City. This TPAR analysis assumes that would be a feature of this potential conditional project. That recalculation verified that if those additional buses would be added to the specified routes then the resulting Peak Headways would directly enable those specific Policy Areas to attain adequacy. In addition, since those routes also serve other Policy Areas there would be indirect improved Peak Headways in about eight additional Policy Areas. In five of those Policy Areas the indirect affect would be to also attain Peak Headway adequacy. However, all of this recognizes that the actual decision, to propose all of these bus service changes, is a responsibility of MCDOT and that they may choose to implement this conditional project differently than described here. The route locations are shown only in general terms and are not a commitment to any particular route improvement.

As a conclusion, this conditional project, which could be implemented over a few years, could:

- Help all of the Policy Areas of the County attain Peak Headway adequacy.
- Help three or perhaps four of the Policy Areas with inadequate Coverage to have some minor restructuring of the exiting routes to attain adequate Coverage.
- Help the Cloverly Policy Area where Span of Service is currently inadequate attain adequacy if the one likely route that would serve that Policy Area would be changed by MCDOT to have it provide the minimal all-day service for a Suburban Policy Area.

Transit Solutions for Span: With the one change in the Span of Service for Cloverly just given above, all of the Policy Areas would be adequate for the factor of Span of Service.

Transit Solutions for Coverage: There are two Policy Areas that would remain with inadequate Coverage. Adequacy for Coverage could be attained in one case by some minor rerouting of buses serving the Derwood Policy Area at the discretion of MCDOT, which could be accomplished in conjunction with the potential conditional project for Peak Headways as Derwood would be one of the Policy Areas otherwise being indirectly affected. An option for a possible restructuring of routes is to have one of the several routes that approach the Shady Grove station use Needwood Road, which currently does not have bus service.

Exhibit 5.3 Coverage for Clarksburg



The second case, the Clarksburg Policy Area, would require an exception by policy. About 16% of the CLK Policy Area is located within 1/3 of a mile of one of the 2 bus routes currently serving the area. Exhibit 5.3 shows where in particular bus service coverage is provided in the CLK area. The standard for Coverage for a Suburban Policy Area is 30%. Therefore, transit coverage in the CLK Policy Area is not yet adequate. A temporary and interim exception is recommended to have that standard only apply to the area of CLK east of I-270, in which case the Coverage is adequate for a Suburban area. A refinement to this exception is needed for the Cabin Branch area located west of I-270 (i.e., the triangular-shaped area bounded by I-270, MD 121 and West Old Baltimore Road). The exception would also apply to that area when master-planned development comes on line and bus service is made

available to support that development.

1b. Countywide Solutions for Peak Headway Adequacy if Five Suburban Areas are Classified as being Urban without Metrorail Policy Areas

Following the approach of the Transit Adequacy Analysis just discussed, a similar analysis was performed to generally determine how much additional transit service would need to be added to the five current Suburban Policy Areas, which could be reclassified as Urban without Metrorail. That set of potential bus route Peak Headway improvements is being termed Scenario #2, and their likely Coverage is shown in Exhibit 5.4.



Exhibit 5.4: Potential Conditional Project to Increase Peak Headways (Scenario #2)

This Transit Adequacy Analysis builds upon the discussion given above on page 14 in Section III, Part 1. The particular challenge in this Transit Adequacy Analysis was first to seek attaining the Peak Headway standards for "Urban without Metrorail" Policy Areas, which from Exhibit 3.4a above on page 16 is an average of 14 minutes between buses in the PM Peak Period. It appears conceptually possible to add enough potential bus service increases to most but not all of the existing routes serving those five areas that could: (a) just attain the Peak Headway in some of those five areas, and (b) be somewhat towards the planning target in the other areas as some routes serve adjacent areas. Exhibit 5.4 is also intended to illustrate that the pattern of Scenario #2 bus service improvements would complement and connect with the three end stations on the Metrorail Red Line as well as five commuter rail stations. That would provide good connections to those regional transit services and have the potential to serve more of the overall travel.

It is estimated that it would take about 48 additional new buses for Scenario #2 (in addition to the 32 buses estimated above to attain Suburban standards for existing services in Scenario #1). A factor of 15% also needs to be added for spare buses that are needed for effective operations. From a Subdivision Staging Policy perspective it would seem that the first Transit Adequacy solution, Scenario #1 specified to obtain the Suburban standards would be programmed first. Thus to accomplish both policy objectives would require about a total of 80 new buses plus 12 for spares, which is about 26% of the current Ride-On bus fleet including spares. That level of commitment would add buses to 18 routes, 6 of which would likely be improved in the first improvement set. That set of 18 likely routes is identified in Exhibit 5.4 shows a concentration of bus routes in the I-270 Corridor between Rockville and Clarksburg. Perhaps as few as five of the bus routes serving that combined group of Policy Areas would not need to have their bus service improved.

Generalized Consideration of Capital and Operating Costs: Current capital costs for purchasing new clean diesel buses of about 40 seats varies between \$0.5 and \$0.6 million dollars per bus depending upon the purchase size and mix of hybrid buses. Current operating costs for putting a new bus into peak period operations of about 6 hours is about \$0.12 to \$0.15 million annually for labor and direct operating expenses such as fuel. The direct number of required buses is used for the operating expenses but the direct plus spare number of buses is used in the capital costs. Thus using those factors the 10-year capital and operating cost for Scenario #1 would be about \$64 million while the 10-year capital and operating cost for Scenario #2 would be about \$95 million more, or a total for both sets of about \$160 million.

Consideration of Bus Garage Capacity: It is also unclear whether such a large relative increase in the Ride-On bus fleet would require expansion of the current and/or programmed bus garages, which could add a substantial cost impact and possible physical constraint to proceeding with such a full expansion as Scenario #2. There are currently three garage facilities for Ride-On that service the fleet of about 350 buses, which includes the spares. The facility in the Silver Spring area is at its capacity and services about 150 buses. The Equipment Maintenance and Operations Center (EMOC) near Shady Grove Road, is in the last phase of a programmed expansion and will service about 200 buses when completed in the next year or two. Rental space is used near Nicholson Court for about 75 to 100 of the smaller buses used for service. Thus, in about two years, there will be garage capacity to serve up to about 75 more buses than the current full fleet with spares.

There have been plans and a PDF in the CIP for a North County Maintenance Depot that was anticipating being able to serve up to 120 Ride-On buses. However, the planning for this facility is on an indefinite hold pending resolution of various environmental concerns. Planning for the CCT as a BRT and for other BRT services and their specialized large capacity buses requirements have been working on their own options for garage, maintenance, and operation center locations and are a major cost factor in those transportation planning activities.

Recommendations: The first set (Scenario #1) of transit adequacy improvements are necessary and would constitute an increase in Ride-On bus service that is perhaps somewhat more than 10% of the current bus fleet. Such a level of improvement over the next 10 years seems reasonable even with the currently difficult fiscal conditions. That level of transportation improvement is likely to have capital and operating costs that would enable elected officials to make a commitment to them over the next few years so as to be implemented within the 10-year

time horizon of 2022. There appears to be sufficient garage capacity to serve such an addition to the Ride-On fleet. The benefits of that investment, as shown in Exhibit 5.2 above, would accrue generally Countywide and as such TPAR Payments derived from the generally identified costs should be allocated throughout most of the County.

While the additional set of transit adequacy solutions described in Scenario #2 is desirable from an implementation perspective of the General Plan, it is questionable whether in these times of financial uncertainty in general, and for transportation investments in particular, that timely commitments could be made in order to implement these Scenario #2 improvements. It would seem more appropriate to put energy first into making the budget commitments to successfully program the expansion of the local Ride-On bus services to meet inadequacies associated with current bus transit services, which is that of Scenario #1.

It is also unclear whether such a set of improvements (Those of Scenario #2) would reinforce or conflict with the project planning objectives and particular plans for the CCT transit improvement that has been underway for a number of years. The CCT as a BRT will require a comprehensive restructuring of the local bus services throughout the I-270 Corridor. It is possible that interim investment in new buses to serve that corridor could be redeployed if appropriate, with some effort and cost, perhaps even to other locales in the County. On the other hand the equipment-mix and size of the buses may not be a good fit with the bus restructuring needs. If an investment was made, and those particular buses would not be a good fit for restructuring, then they still may be of value with respect to giving added flexibility to the overall, Countywide bus replacement program and that might forestall some on-going investment in that program.

In conclusion, it is recommended that the Council, with Executive review: (a) consider establishing a fourth Policy Area Category of "Urban without Metrorail" now, but (b) put an implementation hold on making commitments to achieve those standards until the next TPAR review in 2014. That would give the elected officials and the Board more opportunity to see how the TPAR system is performing before they consider making very tough financial commitments in these fiscally uncertain times.

The Board also wants to point out that not all of the five Policy Areas that under this approach could be classified as "Urban without Metrorail" need to be so classified at the same time. Thus the Council could consider making such classifications incrementally one or more Policy Area at a time and stage this desirable approach more gradually and at a more affordable, effective, and more manageable pace. In that regard, for example, there could be a Scenario #3 that could focus on enhancing enough current routes with additional Peak Headway focused in the Research and Development Village and the Gaithersburg City Policy Areas such that those two Policy Areas would have adequate Peak Headway, Coverage, and Span to classify those two Policy Areas as Urban without Metrorail. It is estimated that Peak Headways would be enhanced on 6 routes that would also be included in Scenario #1 and #2 and on 5 of the 12 routes that would be enhanced only in Scenario #2. Further, it is estimated that Scenario #3 would require about 27 additional buses plus 4 spares and would have an estimated 10-Year cost of about \$53.5 million more than Scenario #1. The combined number of new buses needed for Scenarios #1 and #3 would be about 59 plus 9 spares or 68 new buses. That number of new buses could be serviced during the 10-year period to 2022 by the programmed garage expansion.

2. Countywide Solutions for Roadway Adequacy

The overall Roadway Adequacy Analysis steps were discussed above in Section III, Part 2. This part presents and discusses the main countywide roadway adequacy results of applying that part of the TPAR approach. Three main stages are presented in terms of the comparison combinations that were analyzed, although other comparison combinations were considered. The three main comparison combinations and their associated future networks and development activity forecasts are as follows:

- **Regulatory Planning Stage**, which uses the 2018 network with programmed CIP and CTP projects and 2018 development activity
- **Transportation Planning Improvement Stage**, which uses a 2022 network with the prior projects plus new conditional projects and 2022 development activity and
- **Transportation Master Plan—Costing Stage**, which uses the same network as the first but with 2040 development activity.

Exhibits 5.5a and 5.5b include the results of one of the first steps of the Roadway Adequacy Assessment, which is to prepare a list of programmed roadway and transit projects organized by Policy Area. That was the list of projects used in the Regulatory Planning Stage part of the analysis. The list also contains several potential conditional projects which were used in the Transportation Planning Improvement Stage part of the analysis. The list has also been augmented to more clearly identify longer range Master Plan projects that are being used in the longer-term Costing Analysis, as per the discussion in Section III on page 31 for Steps 23 and 24. For ease of review, Exhibit 5.5a is associated with County wide projects and those in the Urban Policy Areas with Metrorail and Exhibit 5.5b for projects in the remainder of the Policy Areas. This is also anticipated in helping in the Costing Analysis discussed later in this Section.

L.	Staging of County CIP,	State CTP and Master Plan Projects Used in TPAR 2012	(updated to	6-19-1	12)	C	Cond.	MP
Program Documen	Project Name	Improvement Type and/or Limits (Long-range Conditional Projects in red, italic fonts)	Policy Area	Open by 2012	Prog. by 2018		Proj. by 2022	Proj. by 2040
СТР	Intercounty Connector (MD 200)	I-370 to I-95 (6 lane freeway)	Countywide	Y	Y		Y	Y
СТР	Intercounty Connector (MD 200)	I-95 to US 1 (4 lane freeway)	Countywide	Ν	Y		Y	Y
СТР	Intercounty Connector (MD 200)	Collector/Distributor Lanes along I-95, MD 200 to MD 198	Countywide	Ν	Y		Y	Y
СТР	Purple Line LRT	Project Planning may be sufficient if conditional funding approved	Countywide	Ν	Ν		Y	Y
СТР	Corridor Cities Transitway BRT	Shady Grove to Metropolitan Grove	Countywide	Ν	Ν		Y	Y
CLRP	Corridor Cities Transitway BRT	Metropolitan Grove to Clarksburg	Countywide	N	Ν		Ν	Y
CIP	Equip Maint Oper Ctr (EMOC)	Bus Garage expansion to serve Ride-On buses	Countywide	N	Y		Y	Y
CIP	North County Depot	Bus Garage expansion to serve Ride-On buses	Countywide	N	Ν		Y	Y
CIP	Ride-On Peak Headway Cond Imp	Peak headway improvements: assumption of 13 routes in 9 Areas	Countywide	Ν	Some		Y	Y
070		Other Oracle & Matter (MADO/Dista Or	0070	N	X		V	N/
CIP	Paul S. Sarbanes Transit Ctr		551P	N	Y		Y	Y
CIP	Citadel Ave. Extended		NB	Y Y	Y		Y	Y
CIP	Montrose Parkway West	Montrose Rd to Hoya St. (4 lanes)	NB	Ŷ	Y		Y	Y
CIP	Nebel St. Extended	Chapman Ave. to Randolph Rd (4 lanes)	NB	Ŷ	Y		Y	Y
CIP	Chapman Ave Extended	Randolph Rd to Old Georgetown Rd (2 lanes)	NB	N	Ŷ		Y	Y
CIP	Montrose Parkway East	Parklawn Dr to Veirs Mill Road (MD 586) (4 lanes)	NB	N	Ŷ		Y	Y
CIP	Montrose Parkway East	MD 355/Montrose Parkway Interchange to Parklawn Dr (4 lanes)	NB	N	Y		Y	Y
СТР	Rockville Pike (MD 355) / Montrose Parkway Interchange	Randolph Road	NB	Ν	Y		Υ	Υ
СТР	Georgia Ave (MD 97)	Interchange of Georgia Avenue (MD 97) with Randolph Rd	ĸw	N	Y		Y	Y
CIP	Forest Glen Metro Underpass	Underpass of Georgia Ave (MD 97) Pedestrians/Bike Improvement	ĸw	N	Ν		Y	Y
СТР	Connecticut Ave. (MD 185)	I-495 to Jones Bridge Road (BRAC project) (add 4th SB Lane)	BCC	Ν	Y		Y	Y
СТР	Connecticut Ave. (MD 185)	Manor Road to I-495 (BRAC project) (Add 4th NB lane)	BCC	N	Y		Y	Y
RKV			RKV					
CIP	Redland Rd	Crabbs Branch Way to Needwood Rd (4 lanes)	DER	Y	Y		Y	Y
CIP	Redland Rd	Needwood Rd to Baederwood Lane (3 lanes)	DER	Y	Y		Y	Y
CLRP	MidCounty Highway	Shady Grove Rd. to Mont. Village Ave (MD124); (widen to 6 lanes)	DER	Ν	Ν		Ν	Y
CLRP	MidCounty Highway	Shady Grove Rd. to ICC (4 lanes)	DER	N	Ν		N	Y

Exhibit 5.5a: Transportation Projects in the Road Adequacy and Cost Analysis; Part A

	Staging of County CIP,	State CTP and Master Plan Projects Used in TPAR 2012 (updated to	7-10-1	2)	Cond.	MP
Program Documen	Project Name	Improvement Type and/or Limits	Policy Area	Open by 2012	Prog. by 2018	Proj. by 2022	Proj. by 2040
CLRP	Sam Eig Highway	Fields Rd to Great Seneca Hwy (MD 119) (widen to 6 lanes)	RDV	Ν	Ν	Ν	Y
CIP	Watkins Mill Rd Extended	MD 355 to MD 117, without a connection yet across I-270 (4 lanes)	GBG	Y	Y	Y	Y
СТР	Watkins Mill Rd Bridge of I-270	(interchange would be a separate and later project)	GBG	Ν	Ν	Y	Y
СТР	Watkins Mill Rd Interchange	Interchange of I-270 with Watkins Mill Road Extended	GBG	Ν	Ν	Y	Y
CLRP	MidCounty Highway	Shady Grove Rd. to Mont. Village Ave (MD124); (widen to 6 lanes)	GBG	N	Ν	Ν	Y
CLRP	Great Seneca Hwy (MD 119)	Quince Orchard Rd (MD 124) to Sam Eig Hwy (widen to 6 lanes)	GBG	Ν	Ν	Ν	Y
CIP	Fairland Rd Improvement	US 29 to Prince George's County line (3 lanes)	FWO	Y	Y	Y	Y
CIP	Greencastle Road	Greencastle Ridge Terrace to Fairland Park Entrance (4 lanes)	FWO	Y	Y	Y	Y
СТР	Columbia Pike Interchange	Interchange of Columbia Pike (US 29) with Fairland Road	FWO	Ν	Ν	Y	Y
CLRP	Spencerville Rd (MD 198)	US 29 to Peach Orchard Rd (widen to 4 lanes)	FWO	N	Ν	Ν	Y
CIP	Father Hurley Blvd Extended	Wisteria Dr to Germantown Rd (MD 118) (4 lanes)	GTW	Y	Y	Y	Y
CIP	Century Boulevard	Complete connecting loop road to Crystal Rock Drive (4 lanes)	GTW	Ν	Y	Y	Y
CIP	Dorsey Mill Rd Bridge over I-270	Century Blvd to Observation Drive	GTW	Ν	Ν	Y	Y
CIP	Snouffer School Road	Sweet Autumn Drive to Centerway Road (5 lanes)	MVA	Ν	Y	Y	Y
CIP	Snouffer School Road North	Centerway Rd to Ridge Heights Drive (4 lanes) (Webb Tract)	MVA	N	Y	Y	Y
СТР	Woodfield Rd. (MD 124)	Airpark Road to Fieldcrest Road (6 lanes)	MVA	Y	Y	Y	Y
CIP	Goshen Road	Odenhal Road to Warfiled Road (widen to 4 lanes)	MVA	Ν	Y	Y	Y
CLRP	MidCounty Highway	Shady Grove Rd. to Mont. Village Ave (MD124); (widen to 6 lanes)	MVA	N	Ν	Ν	Y
CLRP	Norbeck Rd (MD 28)	Georgia Ave (MD 97) to Layhill Rd (MD 182) (widen to 4 lanes)	AH	N	Ν	Ν	Y
CIP	Dorsey Mill Rd Bridge over I-270	Century Blvd to Observation Drive	GTE	Ν	Ν	Y	Y
CLRP	MidCounty Highway	Middlebroook Road to Ridge Road (MD 27) (4 lanes)	GTE	Ν	Ν	Ν	Y
			CLV				
СТР	Clopper Road Widening (MD 117)	Watkins Mill Road to Game Preserve Road	NP	Ν	Ν	Y	Y
CLRP	Great Seneca Hwy (MD 119)	Quince Orchard Rd (MD 124) to Mateny Rd (widen to 6 lanes)	NP	N	Ν	Ν	Y
			OLY				
			POT				
CIP	Stringtown Road	MD 355 to St. Clair Rd / Snowden Farm (4 lanes)	CLK	Y	Y	Y	Y
Private	Snowden Farm Parkway	MD 355 to MD 121 (2 lanes); Md121 to MD 27 (4 lanes)	CLK	Ν	Y	Y	Y
Private	Little Seneca Parkway	MD 27 to MD 355 (4 lanes)	CLK	Ν	Y	Y	Y
CIP	Woodfield Rd Extended	North of Main St. (MD 108) to Ridge Rd (Md 27) (2 lanes)	DAM	Y	Y	Y	Y
	Footnote 1: Existing plus FY12	CIP Amendment to the FY11 Approved CIP					

Exhibit 5.5b: Transportation Projects in the Road Adequacy and Cost Analysis; Part B

The left most column of the two-part Exhibit indicates the basic source document for the project that includes the MDOT CTP, the County's CIP, the Constrained (Fiscally) Long-Range Transportation Plan (CLRP) of MWCOG, and private/public projects associated with approved developments. The project name and then the improvement type and/or limits are given next followed by the abbreviation for the Policy Area that is directly served by the project, or whether the project is considered a County wide one. If a project spans two or more adjacent areas it generally is listed in each Policy Area.

The four right-most columns are indications of staging-status for purpose of the adequacy and costing analyses. The first two of the staging-status columns are applicable to the Regulatory Planning Stage, which includes consideration of Local Area Transportation Reviews (LATR). The first of those columns has green shading with bolded "Y" for Yes; or gray shading and a gray "N" for No. The same general format is used for the next column but light-yellow shading is used instead. A non-shaded row in the second staging-status column indicates that project was previously available for the prior stage.

The last two right-most columns are used to indicate whether a new project is beginning to be considered as a "conditional project" by the 10-year time horizon of 2022, or as a longer-term "costing-related" project that could address anticipated remaining deficiencies associated with the Transportation Planning Improvement Stage, where such costing projects have three gray-No's to the left. A few rows in the Exhibits are blank indicating that no programmed, conditional, or costing projects have been identified for that Policy Area.

Regulatory Planning Stage: Exhibit 5.6 presents the results of the Roadway Adequacy Analysis for the Regulatory Planning Stage using the 2018 network with programmed CIP and CTP projects and 2018 development activity. This comparison combination is similar in terms of its input assumptions to that which would be used in the current PAMR analysis except there the amount and pattern of the development activity would be based on the "pipeline" of approved development. As discussed in the example of a similar chart in Section II, Part 2, the "brown-hatched" bars show: (a) the **range** of the average of roadway speeds by direction of travel in relation to the "free flow speed", or LOS, for each Policy Area in the PM peak period, (b) the bottom of the bar shows the average LOS in the peak direction of travel, and (c) the top of the bar shows the average speed (LOS) in the non-peak direction.

The results indicate reading from left to right that two Policy Areas (Potomac and North Potomac) for this combination of network and development would be slightly more congested on average than their standard. Two other Policy Areas (Fairland White Oak and Gaithersburg) would have their peak direction average congestion levels being very close to the standard. Additional information is presented in Section VI for all of the Policy Areas that indicates which of the roadways in each area would have: (1) peak direction congestion more congested than the standard for the area, and (2) which roadways are less congested on average than the standard.



Exhibit 5.6: Countywide Results for the Regulatory Planning Stage

Transportation Planning Improvement Stage: Exhibit 5.7 presents the results of the Roadway Adequacy Analysis for the Transportation Planning Improvement Stage using: (a) development activity for 2022 and (b) a 2022 network with programmed CIP and CTP projects and the conditional projects from Exhibit 5.5a and b. This comparison combination is a new feature of TPAR and is designed to give better guidance to MCDOT in the programming activities. Similar to the preceding chart, the "green-hatched" bars show (a) the **range** of the average of roadway speeds by direction of travel in relation to the "free flow speed", or LOS, for each Policy Area in the PM peak period, (b) the bottom of the bar shows the average LOS in the peak direction.

The results indicate reading from left to right that two Policy Areas (Potomac and Fairland White Oak) for this combination of network and development would be more congested on average than their standard. Three other Policy Areas (Aspen Hill, Gaithersburg, and Bethesda Chevy Chase) would have their peak direction average congestion levels being very close to the standard. Additional information is presented in Section VI for all of the Policy Areas that indicates which of the roadways in each area would have peak direction congested on average than the areawide standard. The need for consideration of additional potential conditional projects is part of those discussions in Section VI for each of the Policy Areas.



Exhibit 5.7: Countywide Results for the Transportation Planning Improvement Stage

Transportation Master Plan—Costing Stage: Exhibit 5.8 presents the results of the Roadway Adequacy Analysis for the Master Plan – Costing Stage using the 2018 network with programmed CIP and CTP projects and 2040 development activity. This comparison combination is a new feature of TPAR and is designed to give improved guidance to MCDOT on how to better allocate the future cost of transportation improvements in different Policy Areas. It is recognized that this is mostly a hypothetical comparison combination and is not at all likely to happen. It makes the point, however, that if no additional projects would be added to the CIP and CTP and development proceeded as in the Cooperative Forecasts for 2040 then the degree of congestion in many Policy Areas of the County would be severely congested on average and most of the remaining Policy Areas would have average congestion near their standard. Additional information on this combination is also presented in Section VI for all of the Policy Areas that indicates which of the roadways in each area would be the most impacted by this hypothetical combination. In those discussions, this comparison combination is also a good indicator of which roadways in each Policy Area would be most in need of improvement.

Part of Performance Management activities of the new Federal "MAP-21" Legislation is the preparation at the regional level of a Financial Plan (see page 106 of that Bill) that: "(I) demonstrates how the adopted transportation plan can be implemented; (II) indicates resources from public and private sources that are reasonably expected to be made available to carry out the plan;" and "(III) recommends any additional financing strategies for needed projects and programs." Further, the financial plan may include, for illustrative purposes, additional projects that would be included in the adopted transportation plan if reasonable additional resources beyond those identified in the financial plan were available.



Exhibit 5.8: Countywide Results for the Master Plan – Costing Stage

3. Analysis of the Illustrative List of Additional Projects for Purposes of 30-year Costing

In Exhibit 5.5a and 5.5b given above the two right-most columns identify what have been termed as 10-year Conditional Projects or 30-Year Projects for Costing Purposes. Both of those lists are in keeping with the ideas of "MAP-21", just referenced above, of there being "Illustrative List(s)" of future projects that would be included in the regional financial plan if reasonable additional (**public** and **private**) resources beyond those identified in the financial plan were available (emphasis added). This part of this Section focuses on the Costing Analysis for those conditional, illustrative projects that are identified in TPAR12 and provides a local policy .basis for identifying the magnitude of needed additional public and private resources to serve 10-year and 30-year forecasted growth in development activity within Montgomery County.

Overview of the Costing Analysis: Exhibit 3.12 given above in Section III, Part 3 gave general guidance and the Steps needed to carry out the TPAR Costing Analysis. An important part of that general approach is to separately account for transit cost and roads cost, which is in keeping with a major premise of TPAR to have interrelated but separate analyses for transit and roads in relations to the forecasts of development activity. In this specific application of the TPAR approach for the overall costing analysis the results for Transit are presented first while the results for Roads are presented second. In addition to their presentation order there are analytical differences in the costing methods, assumptions, and "accounting" for such costs. One key difference is for the local, bus oriented transit and similar mid-term improvements to be related to a 30-year time horizon, while the roads and major capital intensive transit projects are related to a 30-year, long-range time horizon. With respect to allocating the costs of each to respective Policy Areas, Exhibit 3.13 on Trends in Trip-End Growth was given above as a reasonable way to prorate such costs to particular Policy Areas, for the 10-year and 30-year time horizons. An approach to then divide those costs into appropriate public and private shares is given later in this Part in conjunction with the roll-up of the respective Transit and Road related costs.

Allocation of Transit-Related 10-Year Costs to Policy Areas for Transit Scenario #1:

Exhibit 5.9A below for the Allocation of 10-Year Costs to Policy Areas is adapted from the Trend in Trip-Ends information presented above in Exhibit 3.13. To facilitate the transparency of the discussion of this and a few of the succeeding tables, row numbers (down on the left) and column letters (across the top) associated with those of the underlying spreadsheets are given here. Columns H and K give the total trips-ends by Policy Area estimated for 2010 and 2022, while Columns R and Y respectively give the Trip-End Growth and the Percent Growth of Policy Area Trip-Ends to the total growth in Trip-ends in the County. Columns R and Y are used in the proration of Conditional Project costs to particular Policy Areas in the four column pairs to the right of the "lavender" Column AD. The following explains the content of those four pairs of columns.

• Columns AE and AF: The 10-year capital and operating costs for the Peak Headway improvement conditional transit project of Scenario #1 was estimated (on page 47 above) at about \$64 million and is shown here in Column AF/Row 5. The percentages shown in Column AE are based on the proportion of the improved routes that is located in each respective Policy Area while the allocated dollars in Column AF are the prorated by dividing the miles for each area by the total miles and multiplying that proportion by the total estimated cost for Scenario #1. The sum of the dollar values shown in Column AF add back to the total of \$64 million. Thus the combined affect of Columns AE and AF is to allocate that estimated cost among the 17 Policy Areas shown in proportion to their

bus route miles to be improved. Interagency coordination has indicated that using the percentage of the miles of each improved bus route, which pass through each Policy Area relative to the total route-miles of that set of routes in all Policy Areas, is a reasonable way to allocate these transit improvement costs among the Policy Areas.

	С	D	E	Н	K	O R	V	Y	AD	AE	AF	AI	AJ	AK	AL	AM	AN
1 2 3			Policy Areas	Total Trip Ends by TPAR Policy Area 2010	Total Trip Ends by TPAR Policy Area 2022	2010 to 2022 Total Trip End Growth by Policy Area		2010 to 2022 Percent Growth of Total Trip Ends by Policy Area		2010 to 2022 Improved Route-Mile Allocation: for Peak Headway Enhance- ments	Peak Headway Improve- ment on about 13 routes in about 9 Primary areas	2010 to 2022 Percent Growth of Total Trip Ends by Policy Area	Enhanced Commuter Servces Programs	2010 to 2022 Percent Growth of Total Trip Ends by Policy Area	Enhanced Bicycle and Pedestrian Improve- ments	Allocated TPAR-12 Transit, 10-Year Costs by Policy Area (\$1,000's)	Allocated TPAR-12 Transit, 10-Year Costs per Trip-End
4										Cost to Allo	cate (1000's)	Cost to Alloc	ate (1000's)	Cost to Alloc	ate (1000's)	undate o	f 7-23-12
5										Cost =	\$64,000	Cost =	\$3,000	Cost =	\$3,000	update o	17 20 12
6	SSTP	26	Silver Spring/Takoma Park	73,954	81,663	7,708	1 [6.8%				6.8%	\$422	6.8%	\$280	\$702	\$91
7	NB	18	North Bethesda	71,912	88,557	16,646		14.7%		9.0	\$3,332	14.7%	\$911	14.7%	\$606	\$4,848	\$291
8	KW	16	Kensington/Wheaton	81,431	87,796	6,366		5.6%		6.8	\$2,535	5.6%	\$348	5.6%	\$232	\$3,115	\$489
9	BCC	3	Bethesda/Chevy Chase	120,712	133,624	12,912		11.4%		3.5	\$1,312	11.4%	\$707	11.4%	\$470	\$2,488	\$193
10	RKV	23	Rockville City	89,051	103,476	14,425		12.7%		12.2	\$4,503					\$4,503	\$312
11	DER	7	Derwood	28,862	34,137	5,276		4.7%		13.8	\$5,099	4.7%	\$289	4.7%	\$192	\$5,580	\$1,058
12	RDV	22	R & D Village	14,105	19,997	5,892		5.2%		7.1	\$2,620	5.2%	\$323	5.2%	\$214	\$3,157	\$536
13	GBG	10	Gaithersburg City	98,339	112,333	13,994		12.4%		24.2	\$8,961					\$8,961	\$640
14	FWO	8	Fairland/White Oak	71,163	71,453	290		0.3%		2.2	\$797		\$400	0.3%	\$11	\$1,207	\$4,157
15	GTW	13	Germantown West	50,584	54,602	4,018		3.5%		12.0	\$4,432		\$0	3.5%	\$146	\$4,578	\$1,139
16	MVA	17	Montgomery Village/Airpark	51,136	51,428	292		0.3%		3.3	\$1,204		\$0	0.3%	\$11	\$1,215	\$4,160
17	AH	1	Aspen Hill	43,248	43,673	424		0.4%		6.7	\$2,487		\$0	0.4%	\$15	\$2,502	\$5,896
18	GTE	11	Germantown East	24,787	27,223	2,436		2.2%		11.4	\$4,232		\$0	2.2%	\$89	\$4,321	\$1,773
19	CLV	5	Cloverly	10,505	10,553	48		0.0%		4.1	\$1,519		\$0	0.0%	\$2	\$1,521	\$31,448
20	NP	19	North Potomac	20,011	20,376	365		0.3%		8.7	\$3,231		\$0	0.3%	\$13	\$3,245	\$8,884
21	OLY	20	Olney	30,823	31,819	996		0.9%		18.3	\$6,785		\$0	0.9%	\$36	\$6,822	\$6,846
22	POT	21	Potomac	47,997	51,069	3,072		2.7%		15.7	\$5,833		\$0	2.7%	\$112	\$5,945	\$1,935
23	CLK	4	Clarksburg	11,673	26,538	14,865		13.1%		11.1	\$4,117		\$0	13.1%	\$541	\$4,658	\$313
24	DAM	6	Damascus	12,931	13,791	860		0.8%					\$0	0.8%	\$31	\$31	\$36
25	RurE	30	Rural East	31,560	33,382	1,823		1.6%		2.7	\$1,001					\$1,001	\$549
26	RurW	31	Rural West	17,767	18,345	578		0.5%									
27	Tota	l Tri	p Ends to/from Policy Areas	1,002,549	1,115,838	113,289		100.0%		172.7	\$64,000	48.4%	\$3,400	72.8%	\$3,000	\$70,400	

Exhibit 5.9A: Allocation of 10-Year Transit Costs to Policy Areas for Transit Scenario #1

- Columns AI and AJ for an Enhanced Commuter Services Program: These two • columns address the need for comprehensive Transportation Demand Management improvements in several of the Policy Areas, which as noted as part of the initial discussions of Transit in Section III, Part 2 is considered an aspect of Transit for costing purposes. This is a recommendation for having as part of this Scenario #1 an enhancement to the Commuter Services Program administered by MCDOT to serve the selected set of Policy Areas as shown in Exhibit 5.9A. It is being proposed that an additional 10 percent of the total cost for the Peak Headway improvements be set aside for these activities and that of enhanced bicycling and pedestrian improvements activities, which is discussed in the next column-pair. It is proposed by Column AI to have the enhancements serve: (1) five Policy Areas with the five current Transportation Demand Management Districts (TMD) that have been established by law, (2) provide for similar services in the Kensington Wheaton Policy Area, which does not yet have a formal TMD, and (3) for the Fairland White Oak Policy Area, help work towards establishing a somewhat different type of TMD that would provide commuter assistance not only at the work end of a commute trip but also at the home end for current and future residents of the Fairland White Oak area. A separate target allocation for the Fairland White Oak Policy Area of about \$400,000 dollars is being proposed over the 10-year period.
- Columns AK and AL for an Enhanced Bicycling and Pedestrian Improvement Program: These service enhancements are seen as being Countywide and would be oriented to making better pedestrian and bicycling access connections between existing and future development to various transit services. The District of Columbia has been

successfully demonstrating the benefits of supporting privately run Bike Sharing programs and a similar pilot project is being developed by MCDOT with support of a Federal grant. These allocations could provide for further expansions of such enhanced bicycling improvements in additional appropriate locations in the County. Costs are not shown being allocated for the Cities of Rockville or Gaithersburg as they may continue to choose to fund their own such pedestrian and bicycling improvements.

• Columns AM and AN; Transit 10-Year Cost Totals and Costs per Net New Trip-End: Column AM is the sum of the allocated dollars per Policy Area from Columns AF, AJ, and AL. As shown in Column AM/Row 27 that would total about \$70.4 million over the 10-year period, or about \$7 million per year. Dividing the respective amounts in each row of Column AM by the net growth in trip-ends from Column R results in the 10-year Transit related costs for this Scenario being prorated per Net-New Trip-Ends for each Policy Area, which are the rates shown in Column AN. Those amounts are the Transitrelated TPAR Payment Rates without minimums or maximums. The Total TPAR Payment Rates, which still need to account for Road related costs, are discussed below.

10-Year Costs for Transit Scenarios #2 and #3 as Options: Exhibits 5.9B and 5.9C present the comparable information to that just presented and discussed for Exhibit 5.9A. However, these two additional Exhibits respectively present the comparable 10-Year cost related information for Transit Scenarios #2 and #3. Exhibit 5.9B shows the allocation of 10-year costs to Policy Areas for Scenario #2, which includes enhanced Peak Headway and perhaps some Coverage and Span to serve the five Policy Areas that could be classified as Urban without Metrorail. Columns AK and AL present the allocation of an estimate net cost of the North County Maintenance Depot to serve the Ride-On buses, although the feasibility of being able to deliver that project within the 10-Year time frame is uncertain. Again, as a reminder, these costs shown in Exhibit 5.9B would be in addition to those of Transit Scenario #1 shown in Exhibit 5.9A.

	С	D	E	Н	K	O R	V Y	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN
1 2 3			Policy Areas	Total Trip Ends by TPAR Policy Area 2010	Total Trip Ends by TPAR Policy Area 2022	2010 to 2022 Total Trip End Growth by Policy Area	2010 to 2022 Percent Growth of Total Trip Ends by Policy Area		2010 to 2022 Improved Route-Mile Allocation: for 5 Policy Areas as Urban w/o Metrorail	Headway and Coverage Improve- ments for 5 Policy Areas as Urban w/o Metrorail	2010 to 2022 Percent Growth of Total Trip Ends by Policy Area	Enhanced Commuter Servces Programs for 5 Policy Areas as Urban w/o Metrorail	2010 to 2022 Percent Growth of Total Trip Ends by Policy Area	Enhanced Bicycle and Pedestrian Improve- ments for 5 Policy Areas as Urban w/o Metrorail	2010 to 2022 Improved Route-Mile Allocation: for 5 Policy Areas as Urban w/o Metrorail	North County Bus Garage Improve- ments for 5 Policy Areas as Urban w/o Metrorail	Allocated TPAR-12 Transit, 10-Year Costs by Policy Area (\$1,000's)	Allocated TPAR-12 Transit, 10-Year Costs per Trip-End
4									Cost to Allo	cate (1000's)	Cost to Allo	cate (1000's)	Cost to Allo	cate (1000's)	Cost to Allo	cate (1000's)	undoto o	(7 00 10
5									Cost =	\$95,000	Cost =	\$2,500	Cost =	\$7,000	Cost =	\$90,000	upuate o	17-23-12
6	SSTP	26	Silver Spring/Takoma Park	73,954	81,663	7,708	6.8%										\$0	\$0
7	NB	18 I	North Bethesda	71,912	88,557	16,646	14.7%		0.8	\$368			14.7%	\$2,340			\$2,708	\$163
8	KW	16	Kensington/Wheaton	81,431	87,796	6,366	5.6%										\$0	\$0
9	BCC	3	Bethesda/Chevy Chase	120,712	133,624	12,912	11.4%										\$0	\$0
10	RKV	23	Rockville City	89,051	103,476	14,425	12.7%		24.9	\$12,061					24.9	\$11,470	\$23,531	\$1,631
11	DER	7	Derwood	28,862	34,137	5,276	4.7%		29.3	\$14,206	2.5%	\$393	4.7%	\$742	29.3	\$13,510	\$28,851	\$5,468
12	RDV	22	R & D Village	14,105	19,997	5,892	5.2%		12.6	\$6,086	5.2%	\$818	5.2%	\$828	12.6	\$5,788	\$13,521	\$2,295
13	GBG	10	Gaithersburg City	98,339	112,333	13,994	12.4%		43.3	\$20,955					43.3	\$19,929	\$40,884	\$2,922
14	FWO	8	Fairland/White Oak	71,163	71,453	290	0.3%										\$0	\$0
15	GTW	13 (Germantown West	50,584	54,602	4,018	3.5%		35.0	\$16,951	3.5%	\$558	3.5%	\$565	35.0	\$16,121	\$34,195	\$8,510
16	MVA	17 I	Montgomery Village/Airpark	51,136	51,428	292	0.3%		19.0	\$9,199	2.5%	\$393	0.3%	\$41	19.0	\$8,749	\$18,383	\$62,943
17	AH	1 /	Aspen Hill	43,248	43,673	424	0.4%										\$0	\$0
18	GTE	11 (Germantown East	24,787	27,223	2,436	2.2%		14.6	\$7,045	2.2%	\$338	2.2%	\$343	14.6	\$6,700	\$14,425	\$5,921
19	CLV	5 (Cloverly	10,505	10,553	48	0.0%										\$0	\$0
20	NP	19	North Potomac	20,011	20,376	365	0.3%		5.7	\$2,750			0.3%	\$51	5.7	\$2,616	\$5,417	\$14,831
21	OLY	20	Olney	30,823	31,819	996	0.9%										\$0	\$0
22	POT	21	Potomac	47,997	51,069	3,072	2.7%										\$0	\$0
23	CLK	4 (Clarksburg	11,673	26,538	14,865	13.1%		11.1	\$5,379			13.1%	\$2,090	11.1	\$5,116	\$12,585	\$847
24	DAM	6	Damascus	12,931	13,791	860	0.8%										\$0	\$0
25	RurE	30	Rural East	31,560	33,382	1,823	1.6%										\$0	\$0
26	RurW	31	Rural West	17,767	18,345	578	0.5%										\$0	
27	Tota	l Trip	Ends to/from Policy Areas	1,002,549	1,115,838	113,289	100.0%		196.2	\$95,000	15.9%	\$2,500	44.0%	\$7,000	195.5	\$90,000	\$194,500	

Exhibit 5.9B: Allocation of 10-Year Transit Costs to Policy Areas for Transit Scenario #2

Exhibit 5.9C, below shows the allocation of 10-year costs to Policy Areas for Scenario #3, which includes enhanced Peak Headway and perhaps some Coverage and Span to serve two of the five Policy Areas that could be classified as Urban without Metrorail. For purposes of this example it is assumed that the two Policy Areas would be the Research and Development Village and Gaithersburg City Policy Areas. Columns AK and AL shows no net cost of the North County Maintenance Depot to serve the Ride-On buses as it is estimated that Scenario #3 could operate without the need to have the bus garage system capacity that would be associated with that future improvement. Again, as a reminder, these costs shown in Exhibit 5.9C would be in addition to those of Transit Scenario #1 shown in Exhibit 5.9A, and would be in lieu of Scenario #2.

	С	D	E	Н	K	O R	V Y	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN
1 2 3			Policy Areas	Total Trip Ends by TPAR Policy Area 2010	Total Trip Ends by TPAR Policy Area 2022	2010 to 2022 Total Trip End Growth by Policy Area	2010 to 2022 Percent Growth of Total Trip Ends by Policy Area		2010 to 2022 Improved Route-Mile Allocation: for 2 of 5 Policy Areas as Urban w/o Metrorail	Headway and Coverage Improve- ments for 2 Policy Areas as Urban w/o Metrorail	2010 to 2022 Percent Growth of Total Trip Ends by Policy Area	Enhanced Commuter Servces Programs for 2 Policy Areas as Urban w/o Metrorail	2010 to 2022 Percent Growth of Total Trip Ends by Policy Area	Enhanced Bicycle and Pedestrian Improve- ments for 2 Policy Areas as Urban w/o Metrorail	2010 to 2022 Improved Route-Mile Allocation: for 2 of 5 Policy Areas as Urban w/o Metrorail	North County Bus Garage Improve- ments for 5 Policy Areas as Urban w/o Metrorail	Allocated TPAR-12 Transit, 10-Year Costs by Policy Area (\$1,000's)	Allocated TPAR-12 Transit, 10-Year Costs per Trip-End
4									Cost to Allor	cate (1000's)	Cost to Allo	cate (1000's)	Cost to Allo	cate (1000's)	Cost to Allo	cate (1000's)	undate o	f 7-23-12
5									Cost =	\$53,500	Cost =	\$350	Cost =	\$5,000	Cost =		upuate o	17-23-12
6	SSTP	26	Silver Spring/Takoma Park	73,954	81,663	7,708	6.8%										\$0	\$0
7	NB	18	North Bethesda	71,912	88,557	16,646	14.7%		0.8	\$305			14.7%	\$1,672			\$1,976	\$119
8	KW	16	Kensington/Wheaton	81,431	87,796	6,366	5.6%										\$0	\$0
9	BCC	3	Bethesda/Chevy Chase	120,712	133,624	12,912	11.4%										\$0	\$0
10	RKV	23	Rockville City	89,051	103,476	14,425	12.7%		19.2	\$7,692							\$7,692	\$533
11	DER	7	Derwood	28,862	34,137	5,276	4.7%		16.2	\$6,497			4.7%	\$530			\$7,027	\$1,332
12	RDV	22	R & D Village	14,105	19,997	5,892	5.2%		11.6	\$4,640	5.2%	\$350	5.2%	\$592			\$5,582	\$947
13	GBG	10	Gaithersburg City	98,339	112,333	13,994	12.4%		31.1	\$12,469							\$12,469	\$891
14	FWO	8	Fairland/White Oak	71,163	71,453	290	0.3%										\$0	\$0
15	GTW	13	Germantown West	50,584	54,602	4,018	3.5%		23.1	\$9,280			3.5%	\$404			\$9,684	\$2,410
16	MVA	17	Montgomery Village/Airpark	51,136	51,428	292	0.3%		3.3	\$1,303			0.3%	\$29			\$1,333	\$4,563
17	AH	1	Aspen Hill	43,248	43,673	424	0.4%										\$0	\$0
18	GTE	11	Germantown East	24,787	27,223	2,436	2.2%		11.4	\$4,580			2.2%	\$245			\$4,825	\$1,980
19	CLV	5	Cloverly	10,505	10,553	48	0.0%										\$0	\$0
20	NP	19	North Potomac	20,011	20,376	365	0.3%		5.7	\$2,278			0.3%	\$37			\$2,315	\$6,337
21	OLY	20	Olney	30,823	31,819	996	0.9%										\$0	\$0
22	POT	21	Potomac	47,997	51,069	3,072	2.7%										\$0	\$0
23	CLK	4	Clarksburg	11,673	26,538	14,865	13.1%		11.1	\$4,456			13.1%	\$1,493			\$5,948	\$400
24	DAM	6	Damascus	12,931	13,791	860	0.8%										\$0	\$0
25	RurE	30	Rural East	31,560	33,382	1,823	1.6%										\$0	\$0
26	RurW	31	Rural West	17,767	18,345	578	0.5%										\$0	
27	Tota	l Trip	o Ends to/from Policy Areas	1,002,549	1,115,838	113,289	100.0%		133.4	\$53,500	5.2%	\$350	44.0%	\$5,000	0.0	\$0	\$58,850	

Exhibit 5.9C: Allocation of 10-Year Transit Costs to Policy Areas for Transit Scenario #3

Results of the 30-Year, Road Adequacy Analysis: One of the main premises for the TPAR costing approach discussed above in Section III, Part 3 related particularly to longer-term projects such as arterial roads and major transit improvements, was to avoid a "free-rider" situation. As such the TPAR Costing Analysis for such projects is using the 30-year forecast of Development Activity, which for the 2012 TPAR analysis involves using the 2040 Development Forecasts. Exhibit 5.8 above showed the interim results of the long-range Roadway Adequacy Analysis using the 30-Year forecast of Development Activity and a future road network consisting of existing roads and programmed improvements. The roadways in a number of additional Policy Areas would not be attaining the adequacy standards for Roads with that combination.

For purposes of doing the 30-Year Costing Analysis two sets of roadways were identified that are shown above in Exhibit 5.5a and 5.5b as the last two columns, which respectively are Conditional Projects for the 10-Year period to 2022, and an illustrative list of potential conditional projects for the 30-Year period to 2040. Similar roadway-by-roadway results given below in Section VI on a Policy Area -by-Policy Area basis were also used to help identify this appropriate illustrative list of potential Conditional Projects as was information presented in Appendix C. Exhibit 5.10 below presents the results of the modeling analysis on a Policy Area – by Policy Area basis while also comparing those results to those from Exhibit 5.8 given above.

The following is a discussion of results of particular Policy Areas shown in Exhibit 5.10 relative to the adequacy standards for those Policy Areas.

• **Countywide TPAR Summary Chart**: Exhibit 5.10 compares the two combinations of modeled future Development Activity and future transportation network improvements as already discussed. It shows (by the green-dashed oblong shapes) that for most of the Policy Areas the set of Long-Range Cost-Improvements would result in the Roadway network meeting the adequacy standards for those areas. In particular reading from left to right – particularly for OLY, NP, GTE, AH, and MVA, and DER. The direct improvements in DER of connecting Midcounty Highway to MD 200 (the ICC) would further improve the road adequacy of that Policy Area. Technical modifications were done to clarify the boundary between the Aspen Hill and Olney Policy Areas as a result of this Costing Analysis. A few Policy Areas would perhaps remain problematic as discussed next, which are indicated by the blue-arrows in Exhibit 5.10.



Exhibit 5.10: Countywide Results for the Master Plan – Costing Stage

- **Potomac Policy Area (POT)**: while the congestion levels are forecast to not be adequate, being so would be in keeping with the policies of the Potomac Master Plan regarding retaining the character of the two-lane roads. As such no road improvements are being tested for this Policy Area and the congestion levels will be considered as being adequate.
- Fairland White Oak (FWO): Exhibit 5.6, page 51, for the Regulatory Planning Stage shows this area having roadway adequacy but the 10-year forecast in Exhibit 5.7, page 52, shows this area having roadway congestion that does not meet the adequacy standards. That is even more so for the longer-term forecasts shown in Exhibit 5.8, page 53. Two potential longer-term Cost-Improvement solutions were modeled and while they would result in somewhat less average congestion, they appear not to be sufficient to attain roadway adequacy by themselves. To a considerable degree, the congestion levels of two of the main State Highways, US 29 (Columbia Pike) and MD 650 (New Hampshire Avenue) would significantly contribute to the Policy Area inadequacy. While it is desirable for the TPAR Process to have a forecast of longer-term adequacy at this time it is not essential, as the purpose of the testing for roadway adequacy of this part of the Transportation Improvement Planning Stage is to sufficiently set the TPAR Payment Rates by Policy Area. Thus it is recommended that in lieu of pursuing further Costing-Improvements at this time for this Policy Area, it is recommended that: (1) special enhanced efforts at Transportation Demand Management are being suggested as part of Scenario #1, as discussed above in the discussion on Transit Costing, (2) urge the Executive and Council to advocate that further improvements to those State Roads be considered for inclusion in the next Joint Priority Letter to the Maryland DOT, and (3) special attention be given to this Policy Area in the next TPAR Report and in the monitoring activities, particularly with regards to the impacts of through traffic from and to Howard County.
- Gaithersburg Policy Area (GBG): The long-term forecast for this Policy Area is one of inadequate road congestion although the 10-year forecast shows adequacy. The City of Gaithersburg does not have an APFO requirement but it does have independent development approval authority. The 30-Year illustrative list of potential conditional projects included several roadway improvements in addition to improved bus headways. While together they would result in somewhat less longer-term average congestion, it would not be enough improvement to maintain the current 10-year forecast of adequacy. Two options to consider for the next TPAR Report in lieu of testing further minor improvements would be: (1) a lowering by the City of their long-term development activity forecasts, and/or (2) considering the connection of Mid-County Highway between the Germantown East and the Gaithersburg Policy Areas.
- **Rockville Policy Area (RKV)**: the long-term 30-Year forecast for this Policy Area has the roadway congestion not meeting the adequacy standards, although the 10-year forecast shows adequacy. Seeking a possible solution, such as the planned widening of Wootton Parkway between Falls Road and Darnestown Road was not pursued given the independent capital programming and APFO authority of the City of Rockville. A lowering by the City of their long-term development activity forecasts could also be considered.

Allocation of Road-Related 30-Year Costs to Policy Areas: Exhibits 5.11a and 5.11b for the Allocation of 30-Year Costs to Policy Areas are adapted from the Trend in Trip-Ends information presented above in Exhibit 3.13. To facilitate the transparency of the discussion of these and a preceding table, row numbers (down on the left) and column letters (across the top)

associated with those of the underlying spreadsheets are given here too. In both of these Exhibits Column U gives the Trip-End Growth and shows the forecast of total growth in Trip-ends in the County over the approximate 30-Year future period. Column U is used in the final calculation in Column AR of the cost per Trip-End for each particular Policy Area. The following discusses the content of Exhibit 5.11a:

- Exhibit 5.11a shows the estimated total cost and its allocation to selected Policy Areas for six arterial Roadway Projects that are expected to be the administrative responsibility of MCDOT, although for one of them (Watkins Mill Road Bridge and Interchange at I-270) a negotiated agreement for intergovernmental cost sharing with the MDOT/SHA, the City of Gaithersburg, and the use of Federal Highway funding seems particularly appropriate.
- Project cost estimates for the first three of those Conditional Projects was provided by MCDOT while that for the other three was prepared by the Consultant team.
- For conditional projects that span more than one Policy Area the costs were respectively allocated to each Policy Area in proportion to the length of the project within each area.
- These two illustrative lists of projects given in Exhibits 5.11a and 5.11b come from the two right-most columns of Exhibits 5.5a and 5.5b, which are given earlier in this Section. These are Conditional Projects that are not yet provided for in the County's CIP or Illustrative Projects that need to be given consideration for inclusion in the MDOT CTP.
- Exhibit 5.11b shows the estimated total cost and its allocation to selected Policy Areas for 5 arterial Roadway Projects that are expected to be the administrative responsibility of MDOT/SHA.
- For these projects too, which span more than one Policy Area, the total cost is allocated among the Policy Areas in proportion to the length of the project within each area.
- It is recognized that the illustrative list of projects is focused on arterial roads and that MDOT/SHA would also be needing to include in future CTPs other more major transportation improvements, such as any further widening of I-270 or major transit-related projects such as the Corridor Cities Transitway or the Purple Line, as well as minor projects for other purposes.
- While these Conditional Roadway Projects would be of local significance being included in the TPAR, there are also seen as being of regional significance. For the latter, consideration needs to be given for implementation funding in accord with regional and statewide administrative practices and requirements so as to be successful for future State and Federal funding, including the most recent expectations for performance-based planning. TPAR is seen as being such a performance-based planning approach and as such would help to satisfy such requirements.

Proposed Public Private Cost Sharing, TPAR Payments, and Policy Recommendations:

Exhibit 5.12, below gives an illustrative example of alternative public - private cost sharing percentages to help visualize one of the main policy choices of the Board and Council. The Exhibit shows a progression of 11 stacked-bars with the left-most one being 100% private funding of future improvements needed to achieve TPAR adequacy standards to the right-most one of 100% public funding. Three of the in-between stacked-bars, shown in yellow and green, respectively illustrate lower, medium, or higher priority for a higher share of public funding. There is more of a share for public funding reading from left-to-right in the Exhibit, and more of the funding being shared by the private sector reading from right-to-left.

	CC	E E	0	U	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR
1						Condit	ional Pro	jects Ant	icipated	for Imple	mentatio	n Primar	ily by the	Montgor	nery Cou	nty Depa	irtment of	f Transpo	ortation
2 3 4	-	Policy Areas		2010 to 2040 Total Trip End Growth by Policy Area		MCDOT Road Costs to Policy Area: Midco. Hwy Extension North to MD 27	Allocated TPAR-12 MCDOT Road Cost by Road Length in Policy Area (1,000's)	MCDOT Road Costs to Policy Area: Midco. Hwy Extension South to MD 200	Allocated TPAR-12 MCDOT Road Cost by Road Length in Policy Area (1,000's)	MCDOT Road Costs to Policy Area: Dorsey Mill Rd Bridge over I-270	Allocated TPAR-12 MCDOT Road Cost by Road Length in Policy Area (1,000's)	MCDOT & MD/SHA Road Costs to Policy Area: Watkins Mill Rd Bridge & Interchng over I-270	Allocated TPAR-12 MCDOT Road Cost by Road Length in Policy Area (1,000's)	MCDOT Road Costs to Policy Area: Midco. Hwy Widen; MVA Ave- Shdy Grve	Allocated TPAR-12 MCDOT Road Cost by Road Length in Policy Area (1,000's)	MCDOT Road Costs to Policy Area: Sam Eig Hwy: Fields Rd to Gt. Seneca Hwy.	Allocated TPAR-12 MCDOT Road Cost by Road Length in Policy Area (1,000's)	Allocated TPAR-12 30-Year Costs by Policy Area (\$1,000's)	Allocated TPAR-12 30-Year Costs per Trip-End
5						Length, mi.	Cost	Length, mi	Cost	Length, mi	Cost	Length, mi	Cost	Length, mi	Cost	Length, mi	Cost		
6						3.00	\$131,538	0.94	\$33,490	0.86	\$24,253	1.00	\$40,000	3.06	\$48,960	0.55	\$6,600		
7	SSTP 2	6 Silver Spring/Takoma Park		12,459														\$0	\$0
8	NB 1	8 North Bethesda		37,748														\$0	\$0
9	KW 1	6 Kensington/Wheaton		11,535														\$0	\$0
10	BCC 3	Bethesda/Chevy Chase		19,802														\$0	\$0
11	RKV 2	3 Rockville City		27,023														\$0	\$0
12	DER 7	7 Derwood		14,836				0.94	\$33,490					1.04	\$16,640			\$50,130	\$3,379
13	RDV 2	2 R & D Village		20,392												0.55	\$6,600	\$6,600	\$324
14	GBG 1	0 Gaithersburg City		37,568								1.00	\$40,000	1.35	\$21,600			\$61,600	\$1,640
15	FWO 8	B Fairland/White Oak		2,351														\$0	\$0
16	GTW 1	3 Germantown West		17,098						0.56	\$12,676							\$12,676	\$741
17	MVA 1	7 Montgomery Village/Airpark		1,004										0.67	\$10,720			\$10,720	\$10,679
18	AH 1	Aspen Hill		455														\$0	\$0
19	GTE 1	1 Germantown East		9,918		3.00	\$131,538			0.30	\$11,577							\$143,115	\$14,430
20	CLV 5	Cloverly		133														\$0	\$0
21	NP 1	9 North Potomac		2,255														\$0	\$0
22	OLY 2	0 Olney		3,469														\$0	\$0
23	POT 2	1 Potomac		4,186														\$0	\$0
24	CLK 4	l Clarksburg		26,413														\$0	\$0
25	DAM 6	5 Damascus		2,306														\$0	\$0
26	RurE 3	0 Rural East		3,990														\$0	\$0
27	RurW 3	1 Rural West		1,029														\$0	\$0
28	Total T	rip Ends to/from Policy Areas		255,966		3.00	\$131,538	0.94	\$33,490	0.86	\$24,253	1.00	\$40,000	3.06	\$48,960	0.55	\$6,600	\$284,841	

Exhibit 5.11a: Costs and Policy Area Allocations of MCDOT Conditional Road Projects

	С	D	E	0	U	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AQ	AR
1							Illustrat	ive Proje	cts to be	Impleme	nted by t	the Maryl	and State	Highwa	y Admini	stration -	- For Info	rmation
2 3 4			Policy Areas	2 Ti 0	2010 to 2040 Total rip End Growth by Policy Area		MD/SHA Road Costs to Policy Area: MD 117 Widen: Longdraft to Waring Station Rd	Allocated TPAR-12 MD/SHA Road Cost by Road Length in Policy Area (1,000's)	MD/SHA Road Costs to Policy Area: US 29 Columbia Pk; Fairland Interchng	Allocated TPAR-12 MD/SHA Road Cost by Road Length in Policy Area (1,000's)	MD/SHA Road Costs to Policy Area: MD 119 Widen Sam Eig Hwy to Mateny Rd	Allocated TPAR-12 MD/SHA Road Cost by Road Length in Policy Area (1,000's)	MD/SHA Road Costs to Policy Area: MD 28 Norbeck Rd; MD 97 to MD 182	Allocated TPAR-12 MD/SHA Road Cost by Road Length in Policy Area (1,000's)	MD/SHA Road Costs to Policy Area: MD 198 Spencer- ville. Rd; Burtons- ville. to Peach Or	Allocated TPAR-12 MD/SHA Road Cost by Road Length in Policy Area (1,000's)	Allocated TPAR-12 30-Year Costs by Policy Area (\$1,000's)	Allocated TPAR-12 30-Year Costs per Trip-End
5				1 Г		1	Length, mi	Cost	Length, mi	Cost	Length, mi	Cost	Length, mi	Cost	Length, mi	Cost		
6							1.04	\$8,520	1.00	\$40,000	4.58	\$32,800	2.56	\$18,720	1.17	\$7,020		
7	SSTP	26	Silver Spring/Takoma Park		12,459	1											\$0	\$0
8	NB	18	North Bethesda		37,748												\$0	\$0
9	КW	16	Kensington/Wheaton		11,535												\$0	\$0
10	BCC	3	Bethesda/Chevy Chase		19,802												\$0	\$0
11	RKV	23	Rockville City		27,023												\$0	\$0
12	DER	7	Derwood		14,836												\$0	\$0
13	RDV	22	R & D Village		20,392												\$0	\$0
14	GBG	10	Gaithersburg City		37,568						2.58	\$18,477					\$18,477	\$492
15	FWO	8	Fairland/White Oak		2,351				1.00	\$40,000					1.17	\$7,020	\$47,020	\$20,002
16	GTW	13	Germantown West		17,098		0.18	\$1,475			0.50	\$3,581					\$5,055	\$296
17	MVA	17	Montgomery Village/Airpark		1,004												\$0	\$0
18	AH	1	Aspen Hill		455								2.56	\$18,720			\$18,720	\$41,165
19	GTE	11	Germantown East		9,918												\$0	\$0
20	CLV	5	Cloverly		133												\$0	\$0
21	NP	19	North Potomac		2,255		0.86	\$7,045			1.50	\$10,742					\$17,788	\$7,887
22	OLY	20	Olney		3,469												\$0	\$0
23	POT	21	Potomac		4,186												\$0	\$0
24	CLK	4	Clarksburg		26,413												\$0	\$0
25	DAM	6	Damascus		2,306												\$0	\$0
26	RurE	30	Rural East		3,990												\$0	\$0
27	RurW	31	Rural West		1,029												\$0	\$0
28	Tota	l Tri	p Ends to/from Policy Areas	2	255,966		1.04	\$8,520	1.00	\$40,000	4.58	\$32,800	2.56	\$18,720	1.17	\$7,020	\$107,060	

Exhibit 5.11b: Costs and Policy Area Allocations of MDOT/SHA Illustrative Road Projects





For ease of future administration of TPAR it is better to think of these shares as being rounded, even percentages. However, there is a spectrum of choices for the Council to make and for the Board to subsequently administratively apply for the public-private share for any Policy Area. The proposed set by Policy Area of the share for private funding to be used in setting the TPAR Payments is given below in Exhibit 5.13 in Column AU. If the Council so chooses, each Policy Area could have its own unique public-private share percentage, although that is not a set that the Board is recommending.

Exhibit 5.13: is a summary of the proposed allocation of costs to Policy Areas for TPAR 2012 Payments, including the proposed public – private cost sharing and the 2012 TPAR Payment Rate per new Trip-End per Policy Area. This Exhibit is the concluding one for TPAR and embodies the key policy choices of the Board and Council. First there is an explanation of its content and then there is discussion of the policy choices and implications.

Exhibit 5.13 presents a roll-up summary from three preceding Exhibits of: (1) the 10-Year Transit-related costs allocations from Exhibit 5.9A in Columns AM and AN, (2) the 30-Year Road-related cost allocations to be the responsibility of MCDOT from Exhibit 5.11a in Columns AO and AP, and then (3) the 30-Year Road-related cost allocations of MDOT/SHA from Exhibit 5.11b in Columns AQ and AR. The values in Column AS are the sum of Columns AM and AO. Similarly, the values in Column AT are the sum of those in Column AN and Column AP. It is recognized that there is a little of an "apples and oranges" aspect in Exhibit 5.13 of adding together for Column AT the 10-Year allocated costs of Column AN with the 30-Year Cost of Column AP, which is why Column AT is labeled as Allocated TPAR-12 Costs per Future Trip-End. As long as that continues to be consistently done in subsequent updates to TPAR, equity among the Policy Area will continue to be maintained.

	С	D	E	R	U	Y	AC	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW
1				2010 to 2022	2010 to 2040	2010 to 2022 Percent	2010 to 2040	2010 to 2022	Allocated	MCDOT Allocated	MCDOT	MD/SHA Allocated	MD/SHA Allocated	Total	Allocated	Cont	Payment New Tr	Rates per ip-End
2			Policy Areas	Total Trip End Growth by Policy Area	Total Trip End Growth by Policy Area	Growth of Total Trip Ends by Policy Area	Growth of Total Trip Ends by Policy Area	Allocated Transit- Related Costs by Policy Area	TPAR-12 10-Year Transit Costs per Trip-End	30-Yr Road Costs by Policy Area (\$1,000's)	Allocated TPAR-12 30-Year Costs per Trip-End	TPAR-12 30-Yr Costs by Policy Area (\$1,000's)	TPAR-12 30-Yr Road Costs per Trip- End	TPAR-12 Costs by Policy Area (\$1,000's)	TPAR-12 Costs per Future Trip-End	Sharing Percent Private Costs	Payment Rates without Maximum and Minimum	Payment Rates with Maximum and Minimum
6	SSTP	26	Silver Spring/Takoma Park	7,708	12,459	6.8%	4.9%	\$702	\$91	\$0	\$0	\$0	\$0	\$702	\$91	50%	\$46	\$600
7	NB	18	North Bethesda	16,646	37,748	14.7%	14.7%	\$4,848	\$291	\$0	\$0	\$0	\$0	\$4,848	\$291	50%	\$146	\$600
8	KW	16	Kensington/Wheaton	6,366	11,535	5.6%	4.5%	\$3,115	\$489	\$0	\$0	\$0	\$0	\$3,115	\$489	50%	\$245	\$600
9	BCC	3	Bethesda/Chevy Chase	12,912	19,802	11.4%	7.7%	\$2,488	\$193	\$0	\$0	\$0	\$0	\$2,488	\$193	50%	\$96	\$600
10	RKV	23	Rockville City	14,425	27,023	12.7%	10.6%	\$4,503	\$312	\$0	\$0	\$0	\$0	\$4,503	\$312	50%	\$156	\$600
11	DER	7	Derwood	5,276	14,836	4.7%	5.8%	\$5,580	\$1,058	\$50,130	\$3,379	\$0	\$0	\$55,710	\$4,437	50%	\$2,218	\$2,218
12	RDV	22	R & D Village	5,892	20,392	5.2%	8.0%	\$3,157	\$536	\$6,600	\$324	\$0	\$0	\$9,757	\$859	50%	\$430	\$600
13	GBG	10	Gaithersburg City	13,994	37,568	12.4%	14.7%	\$8,961	\$640	\$61,600	\$1,640	\$18,477	\$492	\$70,561	\$2,280	50%	\$1,140	\$1,140
14	FWO	8	Fairland/White Oak	290	2,351	0.3%	0.9%	\$1,207	\$4,157	\$0	\$0	\$47,020	\$20,002	\$1,207	\$4,157	50%	\$2,078	\$2,078
15	GTW	13	Germantown West	4,018	17,098	3.5%	6.7%	\$4,578	\$1,139	\$12,676	\$741	\$5,055	\$296	\$17,254	\$1,881	50%	\$940	\$940
16	MVA	17	Montgomery Village/Airpark	292	1,004	0.3%	0.4%	\$1,215	\$4,160	\$10,720	\$10,679	\$0	\$0	\$11,935	\$14,839	50%	\$7,420	\$7,420
17	AH	1	Aspen Hill	424	455	0.4%	0.2%	\$2,502	\$5,896	\$0	\$0	\$18,720	\$41,165	\$2,502	\$5,896	50%	\$2,948	\$2,948
18	GTE	11	Germantown East	2,436	9,918	2.2%	3.9%	\$4,321	\$1,773	\$143,115	\$14,430	\$0	\$0	\$147,436	\$16,204	50%	\$8,102	\$8,102
19	CLV	5	Cloverly	48	133	0.0%	0.1%	\$1,521	\$31,448	\$0	\$0	\$0	\$0	\$1,521	\$31,448	50%	\$15,724	\$12,000
20	NP	19	North Potomac	365	2,255	0.3%	0.9%	\$3,245	\$8,884	\$0	\$0	\$17,788	\$7,887	\$3,245	\$8,884	50%	\$4,442	\$4,442
21	OLY	20	Olney	996	3,469	0.9%	1.4%	\$6,822	\$6,846	\$0	\$0	\$0	\$0	\$6,822	\$6,846	50%	\$3,423	\$3,423
22	POT	21	Potomac	3,072	4,186	2.7%	1.6%	\$5,945	\$1,935	\$0	\$0	\$0	\$0	\$5,945	\$1,935	50%	\$968	\$968
23	CLK	4	Clarksburg	14,865	26,413	13.1%	10.3%	\$4,658	\$313	\$0	\$0	\$0	\$0	\$4,658	\$313	50%	\$157	\$600
24	DAM	6	Damascus	860	2,306	0.8%	0.9%	\$31	\$36	\$0	\$0	\$0	\$0	\$31	\$36	50%	\$18	\$600
25	RurE	30	Rural East	1,823	3,990	1.6%	1.6%	\$1,001	\$549	\$0	\$0	\$0	\$0	\$1,001	\$549	50%	\$274	\$600
26	RurW	31	Rural West	578	1,029	0.5%	0.4%		\$0	\$0	\$0	\$0	\$0	\$0	\$0	50%	\$0	\$600
27	Tota	I Tri	p Ends to/from Policy Areas	113,289	255,966	100.0%	100.0%	\$70,400		\$284,841		\$107,060		\$355,241		l	update 7-27-	12

Exhibit 5.13: Proposed Allocation of Costs to Policy Areas Including Public – Private Cost Sharing and the 2012 TPAR Payment Rate per Trip-End per Policy Area

The three remaining Columns of AU, AV and AW are covered in the discussion below of five key policy choices and recommendations.

- Not Applying the Fourth Category of Policy Area of "Urban without Metrorail" at this **Time**: The first two of the five key policy choices are contained in the Column sets for the 10-Year Transit-related cost allocations and the 30-Year Road-related cost allocations. The first of these two key policy choices relates to the consideration of applying the classification of Policy Area by transit availability to apply at this time the category of "Urban without Metrorail" to up to five Policy Areas in the I-270 Corridor, which is covered earlier in Section V, Part 2 in the discussion of Transit Scenarios #2 and #3. The Board is not recommending at this time that Council choose Transit Scenario #2 due to first the uncertainty of being able to provide the necessary and sufficient bus garage system service capacity within the 10-Year time period of 2022, and second due to a significant commitment that implies for the County to bear those costs within the 10-Year period. Nor did the Board recommend Transit Scenario #3. But if the Council wants to consider going in the policy direction of providing higher standards of transit service in parts of the I-270 Corridor prior to a commitment to funding and implementing the CCT, then Transit Scenario #3 may be a more feasible option than Transit Scenario #2 if those additional public costs could be supported within the 10-Year time frame to 2022.
- Not Including MDOT/SHA Arterial Projects in the TPAR Cost Allocations to Policy Areas: The second of these two key policy choices is directly shown in Exhibit 5.13 in Columns AQ and AR. Those two columns are also shown in "gray font and strike-though" to indicate that the values shown for information there were <u>not</u> included in the 30-year Road-related cost allocations by Policy Area, which also means that they are <u>not</u> part of the cost allocation roll-up of Columns AS and AT in Exhibit 5.13. Inclusion of such anticipated

MDOT/SHA projects from the illustrative list of Conditional Projects would significantly increase the future cost per Trip-End in several of the Policy Areas. It should be noted that TPAR is envisioned as a tool that would provide funding in support of County transportation projects and inform the development of recommendations for the prioritization of State transportation projects. The funding focus of the process on County transportation projects stems from the situation that the County does not have direct influence on the programming of State transportation projects, although when the County's Delegation to Annapolis acts in a coordinated manor they collectively can have significant impact on priority setting within the County. Of concern are the total amount of resources and not just the amount available for funding projects serving County transportation projects which are needed in order to achieve adequacy by the 30-year time horizon. This information is useful for the development of recommendations for the prioritization of such projects and perhaps for the broader question of overall funding levels statewide.

- **Proposal for Specific Public and Private Costs Sharing Percentages**: Column AU of Exhibit 5.13 presents the specific proposed cost-sharing percentages for the private sector development as a percent of the total allocation of Costs per Future Trip-End by Policy Area given in Column AT. These two recommendations satisfy the intent of Steps 26a and 26b given above in Exhibit 3.12 of Section II, Part 3. As noted in the discussion there, those two Steps constitute the last ones needed for the review and approval actions of TPAR by the Council to be initiated. The following presents the recommendations contained in Column AU of Exhibit 5.13. As a starting point for discussion, a County-wide cost-sharing percentage of 50% for private sector development is assumed for all policy areas in the County. This percentage reflects an equal cost sharing allocation between the public and private sectors. However, alternative public-private cost sharing percentages may be implemented as described conceptually in Exhibit 5.12 above. These alternative percentages may be assigned Countywide or by policy areas in order to support County planning or policy objectives.
- Setting of the TPAR Payments and Maximum and Minimum TPAR payments per Policy Area: Column AV of Exhibit 5.13 presents the specific proposed Payment Rate per new Trip-End for private sector development for each Policy Area. The number of new Trip-Ends will be determined on a case-by-case basis as part of the administration of the Local Area Transportation Review procedures by the Board and will be consistent with those of the proposed subdivision being reviewed at that time. Under the prior Policy Area Mobility Review (PAMR) procedures there has been a Maximum Payment rate, and for TPAR, the continuation of that practice is recommended. Specifically, it is recommended that for TPAR 2012 that the Maximum TPAR Payment Rate per new Trip-End be set at \$12,000. This maximum rate is consistent with the current per trip mitigation payment for PAMR. Column AW of Exhibit 5.13 presents the specific proposed Payment Rate per new Trip-End for private sector development for each Policy Area including a maximum rate, which would apply to one Policy Area, that of Cloverly.

It is further recommended that there also be a **Minimum TPAR Payment Rate** per new Trip-End to be set at a value of 5 (five) percent of the Maximum Rate. Those rates would similarly be applied during the case-by-case review of a proposed subdivision in accord with the Local Area Transportation Review Procedures adopted by the Board. Column AW of Exhibit 5.13 also presents that the minimum TPAR Payment Rate would apply to the ten

Policy Areas shown. As a secondary policy recommendation, it is the intent that such private funds collected as a result of the Minimum Rates be applied first by the MCDOT in their subsequent actions to the provision of transit-related transportation services, including those associated with the Commuter Services Program as well as the pedestrian and bicycling programs.

The values shown in Column AV for each Policy Area are the values for the TPAR Payment Rates that would otherwise apply if there were not to be a Maximum of a Minimum rate set by policy action by the Council.

• **Relationship of TPAR Payments to the Current Development Impact Fees**: Currently there is a Development Impact Fee tax that is collected at the time of building permit for the main purposes of transportation project funding. There have been comments received on drafts of the TPAR Report to the effect that the TPAR Payment may be able to substitute for or eliminate the Development Impact Fee tax. It is recommended by the Board that the Council not take action to eliminate this Impact Fee tax. Further, it is also recommended that the Council should not set policy to credit the TPAR Payments toward satisfying the obligation for a developer paying the Development Impact Fee tax.

4. Application of TPAR to a new Subdivision Development: To facilitate understanding from the perspective of the development community, we present the following outline of the TPAR Process for developers:

- 1. Developer identifies the Policy Area of the proposed development at the Preliminary Plan stage, the nature and quantification of the proposed development, and expected peak trip generation of the proposed subdivision.
- 2. Planning Board reviews the development and if approved the development, with whatever modifications if any, transmits to the Departments of Permitting Services and Transportation the relevant information of the approval, including:
 - a. Approval number
 - b. Location of the Policy Area
 - c. Approved number of housing units or square feet of development
 - d. Expected number of peak trips generated by the development and the expected TPAR Payment.
- 3. Developer notifies MCDOT of the information in 2, and the number of units or square feet of development to be submitted for approval in a given record plat, *prior to the approval of the record plat.* (Note: a subdivision may be broken down into several record plats during its implementation).
- 4. MCDOT verifies the TPAR payment associated with the record plat, and provides identification of the account where monies should be recorded.
- 5. Developer either pays the TPAR payment or posts an irrevocable letter of credit for the payment. If the latter, a five-year time period for payment starts. At this point, the developer has met his/her obligations under TPAR and can proceed with the next steps in the subdivision process.
- 6. MCDOT records the information and maintains the running totals of collection per Policy Area, and the breakdown for transit and roadway improvements. Information to be readily available to the public.
- 7. Are roadway or transit improvements ready for programming? If so, MC DOT requests formal programming of the improvements
- 8. MCDOT maintains and tracks letter of credit collections and deadlines.
- 9. MCDOT / MNCPPC Monitor and Report

Section VI presented next in this Report indicates the TPAR results for each of the Policy Areas.

Section VI: Application of TPAR to Each Policy Area

This Section provides a discussion of the application of the general TPAR approach to 19 of the Policy Areas of the County. The discussion summarizes the analysis one area at a time using localized graphics and brief text. Eight aspects are discussed and presented for each Policy Area:

- Overview including the classification of the Policy Area
- Development Activity Forecasts
- Programmed Transportation Improvements
- Transit Adequacy Analysis
- Roadway Adequacy Analysis
- Guidance for Local Area Transportation Reviews
- Guidance for Conditional Transportation Solutions
- Guidance for the Master Plan Stage

This document sequences the discussion of policy areas in two ways: (1) according to the classification by type of Policy Area as categorized by type of transit service and population and employment densities – in particular those of Urban, Suburban, and Rural Policy Areas, and (2) by transit coverage percentage from most to least within each of the three respective categories. However, TPAR has not been applied to the Rural East or Rural West Policy Areas. As a result, the third category of Rural Policy Areas has only one summary, for the Damascus Policy Area.

The Following two list gives the sequence within the Urban and Suburban categories, respectively. It is anticipated that the reader will use this list as a Table of Contents to more quickly find the areas they are more interested in reviewing. As such, the page number within this section associated with the summary for each Policy Area is also given.

Ur	ban	Policy Areas:	Page 1
	1.	Silver Spring/Takoma Park	69
	2.	North Bethesda	75
	3.	Kensington/Wheaton	81
	4.	Bethesda/Chevy Chase	87
	5.	Rockville City	93
	6.	Derwood	99
Su	bur	ban Policy Areas:	
	1.	R&D Village	105
	2.	Gaithersburg City	111
	3.	Fairland/White Oak	117
	4.	Germantown West	123
	5.	Montgomery Village/Airpark	129
	6.	Aspen Hill	135
	7.	Germantown East	141
	8.	Cloverly	147
	9.	North Potomac	153
	10.	Olney	159
	11.	Potomac	165
	12.	Clarksburg	171
-		T W	

Rural Policy Areas:

13.	Damascus	
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As a further aid to the reader the following map display of the Policy Areas is presented here. A three letter abbreviation is also used to make the map more readable. A separate alphabetized list of Policy Areas names and their corresponding abbreviations is also given as the abbreviations are often used in the ensuing tables and graphics of the report to conserve space.

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Montgomery Village / Airpark	MVA				
North Bethesda	NB				
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R&D Village	RDV	1			
Rockville	RKV				
Silver Spring / Takoma Park	SSTP				
Rural East	RurE				
Rural West	RurW				

# Silver Spring Takoma Park Policy Area

A. <u>Overview of the Policy Area</u>: Silver Spring Takoma Park (SSTP) is categorized as an Urban Policy Area, given the transit and development activity features of the area. This area is characterized by two Metrorail stations (Silver Spring and Takoma Park), a commuter rail station, high population and employment densities, and overall transit coverage of about 96% of its area. Significant redevelopment is continuing to take place. The Master Planned improvement of the Purple Line Light Rail Transit (LRT) line has reached a stage of project planning development where implementation of that major transit project may be able to be accomplished within 10 years by 2022 if overall transportation funding becomes firm.

This Policy Area is also served by the Silver Spring Transportation Management District (TMD) that is an operational program of the Montgomery County Department of Transportation (MCDOT). The TMD works in conjunction with major employers in the Silver Spring Central Business District (CBD) to coordinate ridesharing and promote transit and non-motorized transportation. MCDOT also operates the Silver Spring Parking Lot District that consolidates and charges for off-street parking and manages the pricing and enforcement of the on-street parking meters.

**B.** <u>Forecast of Development Activity</u>: The SSTP Policy Area is forecast to grow during the regulatory planning stage of TPAR12 between 2010 and 2018 by about 4,142 households and 1,523 jobs. During the transportation improvement stage of TPAR12 between 2018 and 2022 growth would be about 1,032 households and 1,889 jobs more. During the master plan stage between 2022 and 2040 growth is forecast to be an additional 3,235 households and 6,135 jobs. This growth is moderate-to-high and is on par with the share of the total growth in the County.

Source of the Forecasts :	Но	useholo	d Foreca	sts beir	ng used l	by TPAF	R12	Em	ployme	nt Forec	asts be	ing used	by TPA	R12
Round 8.0 (revised) of the Regional Cooperative Forecasts	Forecast for 2010	Growth 2010 to 2018	Forecast for 2018	Growth 2018 to 2022	Forecast for 2022	Growth 2022 to 2040	Forecast for 2040	Forecast for 2010	Growth 2010 to 2018	Forecast for 2018	Growth 2018 to 2022	Forecast for 2022	Growth 2022 to 2040	Forecast for 2040
Silver Sp./ Takoma Park	35,746		39,888		40,920		44,155	46,862		48,385		50,274		56,409
Growth in the Policy Area		4,142		1,032		3,235			1,523		1,889		6,135	
Percent Growth of Area		11.6%		2.6%		7.9%			3.2%		3.9%		12.2%	
Percent of County Growth		14.2%		6.5%		5.6%			2.4%		4.9%		5.0%	
Montgomery County	360,500		389,599		405,597		463,000	506,000		568,315		606,679		730,375
Growth in the County		29,099		15,998		57,403			62,315		38,364		123,696	

C. <u>Programmed Transportation Improvements</u>: There is a current major improvement project under construction, the Paul S. Sarbanes Transit Center that will consolidate the MARC and Amtrak commuter rail station at the bus terminal and staging area of the Silver Spring Metrorail Station. That project will increase pedestrian access for more transit users to the heart of the CBD and facilitate transfers among transit services, including Commuter and Intercity buses services. The countywide project of the Purple line Purple Line LRT has reached a stage of project planning development where implementation of that major transit project may be able to be accomplished within 10 years by 2022 if overall transportation funding becomes firm.

Program Document	TPAR12 Staging of County CIP and State CTP Projects (updated to 3-19-12)					Cond.
	Project Name	Improvement Type and/or Limits	Policy Area	Open by 2012	Prog. by 2018	Proj. by 2022
СТР	Paul S. Sarbanes Transit Ctr	Silver Spring Metro/MARC/Ride-On	SSTP	Ν	Y	Y
СТР	Purple Line LRT	Project Planning may be sufficient if conditional funding approved	Countywide	Ν	Ν	Y




### D. Transit Adequacy Analysis:

The SSTP Policy Area includes two Metrorail Stations: Silver Spring and Takoma Park and a third (Forest Glen) is within walking distance of portions of the policy area. The area also will have future stations on the Purple Line, as well the new Transit Center that will also tie into the Purple Line.

**Coverage of Service:** About 96% of the SSTP Policy Area is located within 1 mile of a Metrorail station or 1/3 of a mile of one of the 35 bus routes currently serving the area as well as several Commuter Bus routes from the Baltimore area. The graphic to the left shows where in particular bus service coverage is provided in the SSTP area. The standard for Coverage for an Urban Policy Area is 80%. Therefore transit coverage in the SSTP Policy Area is adequate.

**Peak Headways:** All buses on average provide 18.2 minutes between buses during the weekday evening peak period in the SSTP Policy Area. Some provide very frequent service such as the J1-J3 or Q2 Metrobuses. In areas like SSTP where Metrorail or future LRT are provided, the standard for average Peak Headway is 20 minutes or less. Thus, the average peak headway for the SSTP area is adequate.

**Span of Service**: The average value of span is 18.9 hours per day for routes that operate all-day. The urban standard is 17.0 hours per day on average for all-day routes. Therefore transit span in the SSTP Policy Area is adequate. **E.** <u>Roadway Adequacy Analysis</u>: In the Roadway Adequacy Analysis all of the Policy Areas are analyzed together applying the regional travel demand model to Montgomery County specifics. Combinations consisting of future forecasts of development activity and future roadway and transit networks are analyzed and compared Countywide and within each Policy Area. The modeling results are summarized for each "comparison-combination" using a post-processing spreadsheet process to estimate overall arterial roadway performance for each of the Policy Areas as well as link-by-link performance of major and minor arterials within each area.</u>

**Modeling Network Level of Detail:** Major and minor arterial roads within the SSTP Policy Area were analyzed for their future roadway performance for each of several future Countywide comparison-combinations. The following graphic shows those major and minor arterials used in the analysis. The freeway system of the region was also accounted for in the analysis but these performance results are not summarized. On-the-other-hand, the Roadway Adequacy Analysis does not account for truly local streets, minor roads, or even some of the minor arterials as those very local streets and roads have low amounts of traffic. It is beyond the state-of-the-practice to model the use of such low traffic roads. Nevertheless, the pattern of such local streets is depicted in the background in the roadway network graphic to provide context and aid understanding.



**Comparing Combinations of Future Development Activity and Transportation Networks:** Results of the Roadway Adequacy Analysis for SSTP roadways are represented by the "brownhatched" bars shown in the arterial performance graphic, which disaggregates the overall performance of arterials in the SSTP Policy Area to display them on an arterial-by-arterial basis. The comparison-combination used in this graphic is for the regulatory planning stage based on the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.



This arterial performance graphic has notes to help readers better understand how to interpret the chart, yet some elaboration can also be helpful. This exhibit displays the average roadway Level of Service for each of the named arterial segments within the SSTP that were shown in the prior graphic. Towards the left, one of the bars is itself an average, in this case of 24 minor arterials roads. The sequencing of the roadways in this graphic, going from left to right, is in order of increasingly congested conditions in the peak flow direction.

Assessment of Areawide Roadway Adequacy for the SSTP Policy Area: The overall weighted average for the SSTP Policy Area is highlighted by the bar bordered in red near the center-right of the bars. The bottom of that highlighted bar for the Policy Area Average is <u>above</u> the dashed and bolded horizontal line. That line represents the proposed Policy Area Adequacy Standard for Urban Policy Areas, such as the SSTP area. Therefore, the SSTP Policy Area overall has adequate future areawide roadway traffic conditions for the combination for the regulatory planning stage, which analyzed the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.

**F.** <u>**Guidance to Local Area Transportation Review (LATR) in the SSTP Policy Area**</u>: The prior graphic shows that 16 of the depicted left-most arterial roads (and the 24 minor arterials not shown) have link-based peak period Level of Service that on average for the whole link-segment in the peak-flow direction is less congested that the Standard for an Urban Policy Area, often considerably less. Yet the graphic also shows that there are 4 other roadway link-segments in the

SSTP Policy Area that are <u>more</u> congested than the Standard for an Urban Policy Area. Reading from right to the left in the prior graphic, locally inadequate congested conditions would be more likely found on parts of: (a) Adelphi Rd., (b) MD 650 New Hampshire Ave., (c) MD 97 Georgia Ave., and (d) US 29, Colesville Rd. Particular attention should be given to the LATRs for proposed subdivisions that use those arterial roads for access to their proposed site.

In addition, given the overall high volumes of traffic throughout many parts of the SSTP Policy Area during peak periods, proposed subdivisions that would rely on other arterial roads serving the SSTP area may also need to have focused attention on their LATR. In particular, such focus would be on the need for smaller-scale, localized, or site-specific improvements such as turnlanes at nearby intersections, access or local circulation needs, bus stops, sidewalks, and so on.

**G.** <u>Guidance for Conditional Transportation Solutions</u>: The next graphic is similar to the prior one but instead the comparison-combination used in this graphic is for the transportation improvement planning stage that uses the 2022 forecast of Development Activity and the 2018 Programmed CIP and CTP plus selected "conditional projects", which could be implemented by the 10-year time-horizon of 2022. The Purple Line LRT is assumed to be available by 2022 in this scenario. Green-hatched bars are used to better differentiate this set of results from the prior one. The growth in household and employment between 2018 and 2022 are estimated not to cause the SSTP Policy Area to lose the overall areawide adequate roadway conditions associated with the regulatory planning stage – as such, finding additional solutions was not emphasized.</u> However, localized congestion would be somewhat more during this 10-year transportation improvement time period than that during the regulatory staging time period.

B       Image: Spin Spin Spin Spin Spin Spin Spin Spin														
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Proposed Policy Area Adequacy Standard														
Note 1: The bars show the range of PM Peak         Period Congested Speed relative to "Free Flow         Speed" for arterial segments in the Policy         Area:         (1) averaged by direction of flow, and         (2) weighted by the Vehicle-Miles-Traveled.         Note 2: Bottom-of-Bar is the average for the         Peak Flow Direction, while the Top-of-Bar is the         Arterial Performance within the Silver Spring Takoma Park (SSTP) Policy Area	to help stand irts													

While other options to improve the roadway network over the next 10 years in the SSTP Policy Area do not exist or are impractical, transit improvements and enhancements as well proactive traffic signal improvements could be undertaken to improve the functioning of the roadway network in this Policy Area, which is also used by the bus route system. The prior graphic can be used as a guide to focuson which roadways, singularly or in combination, should receive such operational attention.

**H.** <u>Guidance for the Master Plan Stage</u>: The following graphic shows that the SSTP area would maintain its overall roadway adequacy into the long term. The traffic patterns would remain similar with the roads already having more peak congestion possibly becoming more congested than the standard for an Urban Policy Area. Thus increases emphasis on improved Traffic Management and Operations as well as more intense Transportation Demand Management should continue.

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## North Bethesda Policy Area

A. <u>Overview of the Policy Area</u>: North Bethesda (NB) is categorized as an Urban Policy Area, given the transit and development activity features of the area. This area is characterized by three Metrorail stations (Grosvenor, White Flint, and Twinbrook), high population and employment densities, and overall transit coverage of more than 80% of its area. Notable growth associated with major development proposals in the White Flint Sector Plan Area are occurring in conjunction with improved circulation roadways and improvements to east-west travel related to recent implementation of Montrose Parkway from and to the west, an interchange at MD 355 Rockville Pike, and still to be programmed sections of Montrose Parkway from and to the east.

This Policy Area is also served by the North Bethesda Transportation Management District (TMD) that is an operational program of the Montgomery County Department of Transportation (MCDOT). The TMD works in conjunction with major employers primarily in the White Flint area to coordinate ridesharing and promote transit and non-motorized transportation. MCDOT also operates a program that manages the pricing and enforcement of on-street parking meters, which are in the vicinity of the Grosvenor and White Flint Metrorail stations. Considerable Park and Ride spaces are provided at the three stations. The MARC commuter rail system also has a station at Garret Park and one is being planned nearer to the White Flint business area.

**B.** <u>Forecast of Development Activity</u>: The North Bethesda Policy Area is forecast to grow during the regulatory planning stage of TPAR12 between 2010 and 2018 by about 4,578 households and 9,410 jobs. During the transportation improvement stage of TPAR12 between 2018 and 2022 growth would be about 1,548 households and 3,863 jobs more. During the master plan stage between 2022 and 2040 growth is forecast to be an additional 9,564 households and 16,595 jobs. This growth is high and an increasing share of total County growth.

Source of the Forecasts :	Но	useholo	d Foreca	sts beir	ng used l	by TPAF	R12	Em	ployme	nt Forec	asts be	ing used	by TPA	R12
Round 8.0 (revised) of the Regional Cooperative	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for
Forecasts	2010	2018	2018	2022	2022	2040	2040	2010	2018	2018	2022	2022	2040	2040
North Bethesda	20,615		25,193		26,741		36,305	68,402		77,812		81,675		98,270
Growth in the Policy Area		4,578		1,548		9,564			9,410		3,863		16,595	
Percent Growth of Area		22.2%		<b>6.1%</b>		35.8%			13.8%		5.0%		20.3%	
Percent of County Growth		15.7%		9.7%		16.7%			15.1%		10.1%		13.4%	
Montgomery County	360,500		389,599		405,597		463,000	506,000		568,315		606,679		730,375
Growth in the County		29,099		15,998		57,403			62,315		38,364		123,696	

**C.** <u>**Programmed Transportation Improvements**</u>: The North Bethesda area has the largest number of programmed projects of any of the Policy Areas. These are staged improvements to the Montrose Parkway project being jointly done by MCDOT and MDOT/SHA. Three of the projects are more localized circulation improvements that will provide easier travel in the area.

_ t	TPAR12 Sta	ging of County CIP and State CTP Projects (updated)	ted to 3-19-1	2)		Cond.
Program Docume	Project Name	Improvement Type and/or Limits	Policy Area	Open by 2012	Prog. by 2018	Proj. by 2022
CIP	Citadel Ave. Extended	Marinelli Rd to Nicholson Lane (2 lanes)	NB	Y	Y	Y
CIP	Montrose Parkway West	Montrose Rd to Hoya St. (4 lanes)	NB	Y	Y	Y
CIP	Nebel St. Extended	Chapman Ave. to Randolph Rd (4 lanes)	NB	Y	Y	Y
CIP	Chapman Ave Extended	Randolph Rd to Old Georgetown Rd (2 lanes)	NB	Ν	Y	Y
CIP	Montrose Parkway East	Parklawn Dr to Veirs Mill Road (MD 586) (4 lanes)	NB	Ν	Y	Y
СТР	Rockville Pike (MD 355) / Montrose Parkway Interchange	Includes connection on Montrose Parkway West from Hoya St to Randolph Road	NB	Ν	Y	Y
CIP	Montrose Parkway East	MD 355/Montrose Parkway Interchange to Parklawn Dr (4 lanes)	NB	Ν	Ν	Y



Ride On Route and #

Metrobus Route and #



### D. Transit Adequacy Analysis:

The NB Policy Area includes three Metrorail Stations: Grosvenor, White Flint, and Twinbrook. The area also includes one MARC station at Garret Park as well as one being planned nearer the White Flint business area.

**Coverage of Service:** About 87% of the NB Policy Area is located within 1 mile of a Metrorail station or 1/3 of a mile of one of the 15 bus routes currently serving the area. The graphic to the left shows where in particular bus service coverage is provided in the NB area. The standard for Coverage for an Urban Policy Area is 80%. Therefore transit coverage in the NB Policy Area is adequate.

Peak Headways: All buses on average provide 21.3 minutes between buses during the weekday evening peak period in the NB Policy Area. Some provide very frequent service such as the C2 or J1-J3 Metrobuses. In areas like NB where Metrorail and Commuter Rail are provided, the standard for average Peak Headway is 20 minutes or less. Thus, the average peak headway for the NB area is not yet adequate. The Transit Adequacy Analysis has shown that a "conditional project" to improve peak headways in other areas has routes that also serve the NB area. and as a result the NB area could attain peak headway adequacy within the next 10 years.

**Span of Service**: The average value of span is 17.7 hours per day for routes that operate all-day. The urban standard is 17.0 hours per day on average for all-day routes. Therefore transit span in the NB Policy Area is adequate. **E.** <u>Roadway Adequacy Analysis</u>: In the Roadway Adequacy Analysis all of the Policy Areas are analyzed together applying the regional travel demand model to Montgomery County specifics. Combinations consisting of future forecasts of development activity and future roadway and transit networks are analyzed and compared Countywide and within each Policy Area. The modeling results are summarized for each "comparison-combination" using a post-processing spreadsheet process to estimate overall arterial roadway performance for each of the Policy Areas as well as link-by-link performance of major and minor arterials within each area.</u>

**Modeling Network Level of Detail:** Major and minor arterial roads within the NB Policy Area were analyzed for their future roadway performance for each of several future Countywide comparison-combinations. The following graphic shows those major and minor arterials used in the analysis. The freeway system of the region was also accounted for in the analysis but these performance results are not summarized. On-the-other-hand, the Roadway Adequacy Analysis does not account for truly local streets, minor roads, or even minor arterials as those very local streets and roads have low amounts of traffic. It is beyond the state-of-the-practice to model the use of such low traffic roads. Nevertheless, the pattern of such local streets is depicted in the background in the roadway network graphic to provide context and aid understanding.



**Comparing Combinations of Future Development Activity and Transportation Networks:** Results of the Roadway Adequacy Analysis for NB roadways are represented by the "brownhatched" bars shown in the arterial performance graphic, which disaggregates the overall performance of arterials in the NB Policy Area to display them on an arterial-by-arterial basis. The comparison-combination used in this graphic is for the regulatory planning stage based on the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.



This arterial performance graphic has notes to help readers better understand how to interpret the chart, yet some elaboration can also be helpful. This exhibit displays the average roadway Level of Service for each of the named arterial segments within the NB that were shown in the prior graphic. One of the bars near the middle is itself an average, in this case of 10 minor arterial roads. The sequencing of the roadways in this graphic, going from left to right, is in order of increasingly congested conditions in the peak flow direction.

Assessment of Areawide Roadway Adequacy for the NB Policy Area: The overall weighted average for the NB Policy Area is highlighted by the bar bordered in red near the center-right of the bars. The bottom of that highlighted bar for the Policy Area Average is <u>above</u> the dashed and bolded horizontal line. That line represents the proposed Policy Area Adequacy Standard for Urban Policy Areas, such as the NB area. Therefore, the NB Policy Area overall has adequate future areawide roadway traffic conditions for the combination for the regulatory planning stage, which analyzed the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.

**F.** <u>**Guidance to Local Area Transportation Review (LATR) in the NB Policy Area**</u>: The prior graphic shows that 20 of the depicted left-most arterial roads (and the 10 minor arterials not shown) have link-based peak period Level of Service that on average for the whole link-segment in the peak-flow direction is less congested that the Standard for an Urban Policy Area, often considerably less. Yet the graphic also shows that there are some 4 other roadway link-segments

in the NB Policy Area that are <u>more</u> congested than the Standard for an Urban Policy Area. Reading from right to the left in the prior graphic, locally inadequate congested conditions would be more likely found on parts of: (a) Randolph Rd (b) MD 187 Old Georgetown Rd, (c) MD 355 Rockville Pike, and (d) MD547 Strathmore Ave. Particular attention should be given to the LATRs for proposed subdivisions that use those arterial roads for access to their proposed site. In addition, given the overall moderate to high volumes of traffic throughout other parts of the NB Policy Area during peak periods, proposed subdivisions that would rely on other arterial roads serving the NB area may also need to have focused attention on their LATR. In particular, such focus would be on the need for smaller-scale, localized, site-specific improvements such as turn-lanes at nearby intersections, access or local circulation needs, bus stops, sidewalks.

**G.** <u>**Guidance for Conditional Transportation Solutions</u>:** The next graphic is similar to the prior one but instead the comparison-combination used in this graphic is for the transportation improvement planning stage that uses the 2022 forecast of Development Activity and the 2018 Programmed CIP and CTP plus selected "conditional projects", which could be implemented by the 10-year time-horizon of 2022. One of those is the extension of Montrose Parkway to the east to MD 586 Veirs Mill Road in the Kensington Wheaton Policy Area. In this graphic, Greenhatched bars are used to better differentiate this set of results from the prior one. The growth in household and employment between 2018 and 2022, are estimated not to cause the NB Policy Area to lose the overall areawide adequate roadway conditions associated with the regulatory planning stage</u>. However, the high growth rates in development activity point to the need to continue to identify additional conditional transportation solutions for the NB Area.

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Other options to improve the roadway network over the next 10 years in the NB Policy Area are potentially feasible. However, attention should also be given to transit improvements and enhancements as well proactive traffic signal improvements that could be undertaken to increase the functioning of the roadway and transit networks in this Policy Area. The prior graphic can be used as a guide in focusing on which roadways could receive such operational attention.

**H.** <u>**Guidance for the Master Plan Stage:</u>** The following graphic shows that the NB Policy Area would maintain its overall roadway adequacy into the long term. The traffic patterns would remain similar and a few additional roads already having more peak congestion would possibly become more congested than the standard for an Urban Policy Area. Thus emphasis should be given to increased or improved Traffic Management and Operations as well as more intense Transportation Demand Management.</u>



## **Kensington Wheaton Policy Area**

A. <u>Overview of the Policy Area</u>: Kensington Wheaton (KW) is categorized as an Urban Policy Area, given the transit and development activity features of the area. This area is characterized by three Metrorail stations (Forest Glen, Wheaton, and Glenmont), high population and moderate employment densities, and overall transit coverage of more than 80% of its area. The KW Policy Area is also served by the Commuter Rail MARC system and Amtrak trains stopping at the Kensington Station. Development activity has been and is forecast to be steady and with redevelopment near the two of the Metrorail Stations is keeping on par with overall growth in Montgomery County.

This Policy Area is also served by the Wheaton Parking Lot District that is operated by the Montgomery County Department of Transportation (MCDOT). The Parking Lot District is managed to consolidate and charge for off-street parking and as well as the pricing and enforcement of the on-street parking meters.

**B.** <u>Forecast of Development Activity</u>: The KW Policy Area is forecast to grow during the regulatory planning stage of TPAR12 between 2010 and 2018 by about 2,014 households and 465 jobs. During the transportation improvement stage of TPAR12 between 2018 and 2022 growth would be about 1,182 households and 341 jobs more. During the master plan stage between 2022 and 2040 growth is forecast to be an additional 3,542 households and 1,394 jobs. This pace of growth is moderate and it is a fairly steady share of the total growth in the County.

Source of the Forecasts :	Но	useholo	d Foreca	sts beir	ng used l	by TPAF	R12	Em	ployme	nt Foreca	asts be	ing used	by TPA	R12
Round 8.0 (revised) of the Regional Cooperative	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for
Forecasts	2010	2018	2018	2022	2022	2040	2040	2010	2018	2018	2022	2022	2040	2040
Kensington/Wheaton	36,836		38,850		40,032		43,574	25,769		26,234		26,575		27,969
Growth in the Policy Area		2,014		1,182		3,542			465		341		1,394	
Percent Growth of Area		5.5%		3.0%		8.8%			1.8%		1.3%		5.2%	
Percent of County Growth		6.9%		7.4%		6.2%			0.7%		0.9%		1.1%	
Montgomery County	360,500		389,599		405,597		463,000	506,000		568,315		606,679		730,375
Growth in the County		29,099		15,998		57,403			62,315		38,364		123,696	

**C.** <u>**Programmed Transportation Improvements</u>**: There are two programmed projects to improve roadway capacity in the KW area to address impacts of growth and traffic that passes through the area. The first of these is an interchange of MD 97 Georgia Avenue and Randolph Road south of the Glenmont Metrorail Station. An announcement was recently made of a special grant from the United States Department of Transportation that will provide an underpass of MD 97 Georgia Avenue in the vicinity of Forest Glen Road. The underpass will facilitate pedestrian and bicycling travel between the Forest Glen Station entrance on the west side of Georgia Avenue.</u>

Ę	TPAR12 Stag	ging of County CIP and State CTP Projects (update	ed to 3-21-1	2)		Cond.
Program Docume	Project Name	Improvement Type and/or Limits	Policy Area	Open by 2012	Prog. by 2018	Proj. by 2022
СТР	Georgia Ave (MD 97)	Interchange of Georgia Avenue (MD 97) with Randolph Rd	KW	Ν	Y	Y
CIP	Forest Glen Metro Underpass	Underpass of Georgia Ave (MD 97) for pedestrians and bicycles	KW	Ν	Ν	Y



**Route-by-Route and Average Adequacy:** Kensington Wheaton (KW) in 2012 35.0 18.5 Hours iust 39 All-Day Routes 19 37 31 53 8 30.0 51 33 25.0 Z2 🔷 20.7 Minutes 38⁴⁸ (min) 9 20.0 PM Peak Headway Adequate Average **PM Peak** 26 34 15.0 Headway 5 Y5-Y9 for all **Routes** Z9/Z29 10.0 L8 Z11/Z13 🔷 **♦**Q1/Q2 C2/C4 5.0 Peak Only All-Day Adequate Average Legend Span for just All-**Ride-On Routes** Day Routes  $\diamond$ Metrobus Routes 0.0 6:00 24:00 0:00 12:00 18:00 17.0 Span (hours)

## D. Transit Adequacy Analysis:

The KW Policy Area includes three Metrorail Stations: Forest Glen, Wheaton, and Glenmont. The area also is served by the MARC Commuter Rail and Amtrak train service at the Kensington Station.

**Coverage of Service:** About 82% of the KW Policy Area is located within 1 mile of a Metrorail station or 1/3 of a mile of one of the 29 bus routes that crisscross serving the area. The graphic to the left shows where in particular bus service coverage is provided in the KW area. The standard for Coverage for an Urban Policy Area is 80%. Therefore, transit coverage in the KW Policy Area is adequate.

Peak Headways: All buses on average provide 20.7 minutes between buses during the weekday evening peak period in the KW Policy Area. Some provide very frequent service such as the Metrobus routes of L8, Y5-Y9, Q1/Q2, and the C2/C4. In areas like KW where Metrorail is provided the standard for average Peak Headway is 20 minutes or less. Thus, the average peak headway for the KW area is not yet adequate. The transit Adequacy Analysis has shown that a "conditional project" to improve peak headways in other areas has routes that also serve the KW area. and as a result the KW area could attain peak headway adequacy within the next 10 years.

**Span of Service**: The average value of span is 18.5 hours per day for routes that operate all-day. The urban standard is 17.0 hours per day on average for all-day routes. Therefore transit span in the KW Policy Area is adequate. **E.** <u>Roadway Adequacy Analysis</u>: In the Roadway Adequacy Analysis all of the Policy Areas are analyzed together applying the regional travel demand model to Montgomery County specifics. Combinations consisting of future forecasts of development activity and future roadway and transit networks are analyzed and compared Countywide and within each Policy Area. The modeling results are summarized for each "comparison-combination" using a post-processing spreadsheet process to estimate overall arterial roadway performance for each of the Policy Areas as well as link-by-link performance of major and minor arterials within each area.</u>

**Modeling Network Level of Detail:** Major and minor arterial roads within the KW Policy Area were analyzed for their future roadway performance for each of several future Countywide comparison-combinations. The following graphic shows those major and minor arterials used in the analysis. The freeway system of the region was also accounted for in the analysis but these performance results are not summarized. On-the-other-hand, the Roadway Adequacy Analysis does not account for truly local streets, minor roads, or even some of the minor arterials as those very local streets and roads have low amounts of traffic. It is beyond the state-of-the-practice to model the use of such low traffic roads. Nevertheless, the pattern of such local streets is depicted in the background in the roadway network graphic to provide context and understanding.



**Comparing Combinations of Future Development Activity and Transportation Networks:** Results of the Roadway Adequacy Analysis for KW roadways are represented by the "brownhatched" bars shown in the arterial performance graphic, which disaggregates the overall performance of arterials in the KW Policy Area to display them on an arterial-by-arterial basis. The comparison-combination used in this graphic is for the regulatory planning stage based on the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.



This arterial performance graphic has notes to help readers better understand how to interpret the chart, yet some elaboration can also helpful. This exhibit displays the average roadway Level of Service for each of the named arterial segments within the KW that were shown in the prior graphic. Towards the left side of the graphic, one of the bars is itself an average, in this case of 27 minor arterials roads. The sequencing of the roadways in this graphic, going from left to right, is in order of increasingly congested conditions in the peak flow direction.

Assessment of Areawide Roadway Adequacy for the KW Policy Area: The overall weighted average for the KW Policy Area is highlighted by the bar bordered in red near the center-right of the bars. The bottom of that highlighted bar for the Policy Area Average is <u>above</u> the dashed and bolded horizontal line. That line represents the proposed Policy Area Adequacy Standard for Urban Policy Areas, such as the KW area. Therefore, the KW Policy Area overall has adequate future areawide roadway traffic conditions for the regulatory planning stage combination, which analyzed the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.

**F.** <u>**Guidance to Local Area Transportation Review (LATR) in the KW Policy Area</u>: The prior graphic shows that 16 of the depicted left-most arterial roads (and the 27 minor arterials not shown) have link-based peak period Level of Service that on average for the whole link-segment in the peak-flow direction is less congested that the Standard for an Urban Policy Area, often considerably less. Yet the graphic also shows that there are some 5 other roadway link-segments in the KW Policy Area that are more congested than the Standard for an Urban Policy Area.</u>** 

Reading from right to the left in the prior graphic, locally inadequate congested conditions would be more likely found on parts of: (a) MD 547 Knowles Ave., (b) US 29 Colesville Rd, (c) Kemp Mill Rd, (d) MD 185 Connecticut Ave, and (e) MD 182 Layhill Rd. Particular attention should be given to the LATRs for proposed subdivisions that use those arterial roads for access to their proposed site.

In addition, given the overall high volumes of traffic throughout many parts of the KW Policy Area during peak periods, proposed subdivisions that would rely on other arterial roads serving the KW area may also need to have focused attention on their LATR. In particular, such focus would be on the need for smaller-scale, localized, or site-specific improvements such as turnlanes at nearby intersections, access or local circulation needs, bus stops, sidewalks, and so on.

**G.** <u>Guidance for Conditional Transportation Solutions</u>: The next graphic is similar to the prior one but instead the comparison-combination used in this graphic is for the transportation improvement planning stage that uses the 2022 forecast of Development Activity and the 2018 Programmed CIP and CTP plus selected "conditional projects", which could be implemented by the 10-year time-horizon of 2022. "Green-hatched" bars are used to better differentiate this set of results from the prior one. The growth in household and employment between 2018 and 2022, are estimated not to cause the KW Policy Area to lose the overall areawide adequate roadway conditions associated with the regulatory planning stage – as such, finding additional solutions was not emphasized.</u>

B       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D <thd< th=""> <thd< th=""> <thd< th=""></thd<></thd<></thd<>	Ā	Forest Glen Ave		Glenallan Ave	Dennis Ave	27 minor arterials				o Creek Pkwy			Amherst Ave				Kens 2 201	Adeo singto 022   8 Cli	quacy on W Deve P/CTI	y of t heat lopm P + "(	he M on (K ent F Cond	ain R (W) ( orec	oads TPAF asts al Pro	; in {12-3 with oject	A): s"
Image: Construction of point of poi	Ē				8		Plyers Mill Rc	niversity Blvc	Arcola Ave	Slig	each Drive	Dewey Rd		èn Rd/Cap. View	ph Rd	ea Avg			<u> </u>	Ave	Rc	5 Connecticut Ave	Pa		
D       Proposed Policy Area         Adequacy Standard       Adequacy Standard         Note 1: The bars show the range of PM Peak Period Congested Speed relative to "Free Flow Speed" for arterial segments in the Policy Area: (1) averaged by direction of flow, and       Analysis Combinaions Dev. Forecast Network F12-2022       Guidance to reviewers to help better understance	ē							MD193 U			B			MD192 Forrest Gl	Randol	Policy Ar	Eastwood Ave	MD586 Veirs Mill Rd	Cedar Lar	MD097 Georgia	MD182 Layhil	MD18	Kemp Mill	olesville Rd	υ
F Note 1: The bars show the range of PM Peak Period Congested Speed relative to "Free Flow Speed" for arterial segments in the Policy Area: (1) averaged by direction of flow, and Guidance to reviewers to help better understance	D	Proposed Policy Area Adequacy Standard															MD547 Knowes Av								
(2) weighted by the Vehicle-Miles-Traveled. Note 2: Bottom-of-Bar is the average for the Peak Flow Direction, while the Top-of-Bar is the average for the Non-Dock Flow Direction Arterial Performance within the Kensington Wheaton (KW) Policy Area	Ĩ		<u>N</u> F S / () F F	Note 1 Period Speed Area: 1) ave 2) we Note 2 Peak F	: The I Con I" for erage ighte : Bot	e bars geste arteri d by d d by t tom-c Direct	show d Spe al seg direct the Ve of-Bar tion, v	the eed re gmen ion o ehicle is th vhile	range elative its in f f flow e-Mile e ave the T	e of P e to " the P y, and s-Tra rage op-of	M Pea Free olicy velec for th -Bar i	ak Flow d. is the		Anal v. Fo F12-2 -	ysis ( recas 022		binaio Netwo 12-202 -	ns ork 22-06			}	G revie bette th	uida ewer: er un ese (	nce t s to l ders Char vised 3	o help tand ts -15-12

It can be noted in comparing the prior graphic to the previous one that in the period of the transportation improvement stage between 2018 and 2022 that one more of the roadways on average, MD 97 Georgia Avenue would more likely have peak flow congestion conditions that would be more congested than the Policy Area standard for the Urban Policy Areas. Consideration should be given to monitoring actual congestion trends and identifying further potential conditional solutions.

While other options to improve the roadway network over the next 10 years in the KW Policy Area potentially feasible, transit improvements and enhancements as well proactive traffic signal improvements should be undertaken to increase the functioning of the roadway and transit networks in this Policy Area. The prior graphic can be used as a guide in focusing on which roadways could receive such operational attention.

**H.** <u>Guidance for the Master Plan Stage</u>: The following graphic shows that the KW Policy Area would maintain its overall roadway adequacy into the long term. The traffic patterns would remain similar and a few additional roads already having more peak congestion possibly becoming more congested than the standard for an Urban Policy Area. Thus emphasis increase emphasis on improved Traffic Management and Operations as well as more intense Transportation Demand Management should continue.

Ā					ior arterials				łwy			t Ave				Kens 2 2012	Adeo angto 2040 Roa	quac on W Deve ds +	y of t heato lopm 2018	he M on (K ent F Prog	ain R W) (T Foreca gramn	oads PAR asts ned (	in 12-21 with CIP/C	F <b>3)</b> : CTP
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ē		Forest	Ge	Dennis	8		MDM MDM				Dewei		MD192 Forrest Glen	Randolph Rd	Policy Area	Eastwood Ave	1D586 Veirs Mill Rc	Z Cedar Lane	🛛 MD097 Georgia Avt	MD182 Layhill R	MD18	Kemp Mill Rd		s Ave
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## Bethesda Chevy Chase Policy Area

A. <u>Overview of the Policy Area</u>: Bethesda Chevy Chase (BCC) is categorized as an Urban Policy Area as it has 3 Metrorail stations (Friendship Heights, Bethesda, and Medical Center), high population and employment densities, and overall transit coverage of more than 80% of its area. Notable growth is occurring associated with the Base Realignment and Closure (BRAC) process at the Naval Medical Center, which includes programmed transportation improvements. The Master Planned improvement of the Purple Line Light Rail Transit line has reached a stage of project planning development where implementation of that major transit project may be able to be accomplished within 10 years by 2022 if overall transportation funding becomes firm.

This Policy Area is also served by the Bethesda Transportation Management District (TMD) that is an operational program of MCDOT. The TMD works in conjunction with major employers in the Bethesda CBD and NIH and Naval Medical Center campuses to coordinate ridesharing and promote transit and non-motorized transportation for travel to and from the area. MCDOT also operates the Bethesda Parking Lot District that consolidates and charges for off-street parking as well as manages the pricing and enforcement of the on-street parking meters. The National Crescent Trail provides significant recreational bicycling opportunities as well as with other bike lanes and routes provides connectivity between the residential and employment areas.

**B.** <u>Forecast of Development Activity</u>: The Bethesda Chevy Chase Policy Area is forecast to grow during the regulatory planning stage of TPAR12 between 2010 and 2018 by about 3,719 households and 7,189 jobs. During the transportation improvement stage of TPAR12 between 2018 and 2022 growth would be about 1,106 households and 3,288 jobs more. During the master plan stage between 2022 and 2040 growth is forecast to be an additional 3,242 households and 4,792 jobs. Growth is significant but a declining share of the County growth.

Source of the Forecasts :	Но	useholo	d Foreca	sts beir	ng used l	by TPAF	R12	Em	ployme	nt Forec	asts be	ing used	by TPA	R12
Round 8.0 (revised) of the Regional Cooperative	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for
Forecasts	2010	2018	2018	2022	2022	2040	2040	2010	2018	2018	2022	2022	2040	2040
Bethesda / Chevy Chase	39,621		43,340		44,446		47,688	87,464		94,653		97,941		102,733
Growth in the Policy Area		3,719		1,106		3,242			7,189		3,288		4,792	
Percent Growth of Area		9.4%		2.6%		7.3%			8.2%		3.5%		4.9%	
Percent of County Growth		12.8%		6.9%		5.6%			11.5%		8.6%		3.9%	
Montgomery County	360,500		389,599		405,597		463,000	506,000		568,315		606,679		730,375
Growth in the County		29,099		15,998		57,403			62,315		38,364		123,696	

**C.** <u>**Programmed Transportation Improvements</u>: There are two programmed projects that would provide improved roadway capacity in the BCC Policy Area that are being implemented to address impacts of the BRAC development activity of the Federal Government. These are improvements to parts of MD 185, Connecticut Avenue. Other BRAC related improvements will be done that will address bicycling and pedestrian circulation concerns. The countywide conditional project of the Purple line Purple Line LRT has reached a stage of project planning development where implementation of that major transit project may be able to be accomplished within 10 years by 2022 if overall transportation funding becomes firm.</u></u>** 

_ t	TPAR12 Sta	ging of County CIP and State CTP Projects (update	ed to 3-19-1	2)		Cond.
Program Docume	Project Name	Improvement Type and/or Limits	Policy Area	Open by 2012	Prog. by 2018	Proj. by 2022
СТР	Connecticut Ave. (MD 185)	I-495 to Jones Bridge Road (BRAC project) (add 4th SB Lane)	BCC	Ν	Y	Υ
СТР	Connecticut Ave. (MD 185)	Manor Road to I-495 (BRAC project) (add 4th NB Lane)	BCC	Ν	Y	Υ
СТР	Purple Line Light Rail Transit	Project Planning may be sufficient if conditional funding approved	Countywide	Ν	Ν	Y



#### D. Transit Adequacy Analysis:

The BCC Policy Area includes three Metrorail Stations: Bethesda, Friendship Heights, and Medical Center, The area also includes two future stations on the Purple Line, one near Connecticut Avenue, Chevy Chase Lake Drive and Newdale Road, and another located at Elm Street and Woodmont Avenue.

**Coverage of Service:** 81.2% of the BCC Policy Area is located within 1 mile of a Metrorail station or 1/3 of a mile of one of the 17 bus routes servicing the area. The graphic to the left shows where in particular bus service coverage is provided in the BCC area. The standard for Coverage for an urban area is 80.0%. Therefore transit coverage in the

BCC Policy Area is adequate.



Peak Headways: All buses on average operate every 20.4. minutes during the weekday evening peak period in the BCC Policy Area. Some provide very frequent service such as the L8 or J1-J3 Metrobuses. In areas like BCC where Metrorail, Light Rail Transit or future BRT systems are provided, the standard for average Peak Headway is 20 minutes or less. Thus the average peak headway for the BCC area is not yet adequate. A conditional countywide project to improve peak headways in other areas could also attain adequacy in the BCC area too.

**Span of Service**: The average value of span is 17.4 hours per day for routes that operate all-day. The urban standard is 17.0 hours per day on average for all-day routes.

**E.** <u>Roadway Adequacy Analysis</u>: In the Roadway Adequacy Analysis all of the Policy Areas are analyzed together applying the regional travel demand model to Montgomery County specifics. Combinations consisting of future forecasts of development activity and future roadway and transit networks are analyzed and compared Countywide and within each Policy Area. The modeling results are summarized for each "comparison-combination" using a post-processing spreadsheet process to estimate overall arterial roadway performance for each of the Policy Areas as well as link-by-link performance of major and minor arterials within each area.</u>

**Modeling Network Level of Detail:** Major and minor arterial roads within the BCC Policy Area were analyzed for their future roadway performance for each of several future Countywide comparison-combinations. The following graphic schematically shows those major and minor arterials that were used and summarized. The freeway system of the region was also accounted for in the analysis but their performance results are not summarized. On-the-other-hand, the Roadway Adequacy Analysis does not account for truly local streets, minor roads, or even some of the minor arterials as such very local streets and roads have low volumes of traffic. It is beyond the state-of-the-practice to model the use of them. The pattern of such local streets is nevertheless depicted in the background in the roadway graphic for purpose of understanding.



**Comparing Combinations of Future Development Activity and Transportation Networks:** Results of the Roadway Adequacy Analysis for BCC roadways are represented by the "brownhatched" bars shown in the arterial performance graphic, which disaggregates the overall performance of arterials in the BCC Policy Area to display them on an arterial-by-arterial basis. The comparison-combination used in this graphic is for the regulatory planning stage that uses the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.



This arterial performance graphic has notes to help readers better understand how to read the chart, yet some elaboration can also be help. This exhibit displays the average roadway Level of Service for each of the named arterial segments within the BCC that were shown in the prior graphic. Towards the left, one of the bars is itself an average, in this case of 24 minor arterials roads. The sequencing of the roadways in this graphic, going from left to right, is in order of increasingly congested conditions in the peak flow direction.

Assessment of Areawide Roadway Adequacy for the BCC Policy Area: The overall weighted average for the BCC Policy Area is highlighted by the bar bordered in red near the center-right of the bars. The bottom of that highlighted bar for the Policy Area Average is above the dashed and bolded horizontal line. That line represents the proposed Policy Area Adequacy Standard for Urban Policy Areas, such as the BCC area. Therefore, the BCC Policy Area has adequate future roadway conditions for the combination for the regulatory planning stage, which analyzed the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP, results in overall areawide adequate roadways in the BCC Policy Area.

**F.** <u>Guidance to Local Area Transportation Review (LATR) in the BCC Policy Area</u>: The prior graphic shows that 18 of the depicted left-most arterial roads (and 24 minor arterials not shown) have link-based peak period Level of Service that on average for the whole link-segment in the peak-flow direction is less congested that the Standard for an Urban Policy Area, often considerably less. Yet the graphic also shows that there are some 8 other roadway link-segments

in the BCC Policy Area that are <u>more</u> congested than the Standard for an Urban Policy Area. Reading from right to the left in prior graphic locally inadequate congested conditions would be more likely found on parts of: (a) MD 185, Connecticut Ave. (b) Jones Bridge Rd, (c) McArthur Blvd, (d) Jones Mill Rd, (e) MD 187 Old Georgetown Rd, (f) Cedar Lane, (g) MD 396 Massachusetts Ave, and (h) MD 410 East West Hwy. Particular attention should be given to the LATRs for proposed subdivisions that use those arterial roads for access to their proposed site.

In addition, given the overall high volumes of traffic throughout many parts of the BCC Policy Area during peak periods, proposed subdivisions that would rely on other arterial roads serving the BCC area may also need to have focused attention on their LATR. In particular, such focus would be on the need for smaller-scale, localized, or site-specific improvements such as turnlanes at nearby intersections, access or local circulation needs, bus stops, sidewalks, and so on.

**G.** <u>**Guidance for Conditional Transportation Solutions</u>:** The next graphic is similar to the prior one but instead the comparison-combination used in this graphic is for the transportation improvement planning stage that uses the 2022 forecast of Development Activity and the 2018 Programmed CIP and CTP plus selected "conditional projects", which could be implemented by the 10-year time-horizon of 2022. The Purple Line LRT is assumed to be available by 2022 in this scenario. Green-hatched bars are used to better differentiate this set of results from the prior one. The growth in household and employment between 2018 and 2022, are estimated not to cause the BCC Policy Area to lose the overall areawide adequate roadway conditions associated with the regulatory planning stage. However, it would be very close to doing so and effort and solutions should be sought during the intervening time period.</u>

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D E	Proposed Policy Area																	MD614 G	MD190 Rive		W			Jones Mit	MacArtour Blvd		MD185 Com
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During the transportation improvements stage time period the Roadway Adequacy Analysis in the prior graphic suggests that three additional roadways would likely be frequently experiencing locally inadequate congestion conditions, those of: (1) MD 190 River Road, (2) MD 614 Goldsboro Rd, and (3) MD 355 Wisconsin Ave. Traffic operations and localized improvements may be workable for some locations along those roadway segments. More attentive monitoring of congestion trends along those roadway segments should also be undertaken. It is noted that the BRAC improvements for the Naval Hospital Expansion, include a MD 355 Pedestrian Crossing, as well as intersection and pedestrian improvements. While the BRAC improvements will help to maximize the efficiency of the existing network in the BCC area, directly accounting for the effects of such localized improvements is beyond the current state-of-the-practice in the regional-based modeling of the type used in the TPAR analysis. While options to improve the roadway network over the next 10 years in the BCC Policy Area do not exist or are impractical, transit improvements and enhancements as well proactive traffic signal improvements could be undertaken to improve the functioning of the roadway network in this policy area, which is also used by the bus route system. The prior graphic can be used as a guide in focusing on which roadways should receive such operational attention.

**H.** <u>Guidance for the Master Plan Stage</u>: . The following graphic shows that the BCC area would maintain its overall roadway adequacy into the long term but that some additional roads would have peak congestion more congested than the standard for an Urban Policy Area. Thus emphasis on Traffic Management and Operations and Transportation Demand Management should continue.

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# **Rockville Policy Area**

A. <u>Overview of the Policy Area</u>: Rockville (RKV) is categorized as an Urban Policy Area, given the transit and development activity features of the area. This area is characterized by one Metrorail stations (Rockville) and one adjacent station (Twinbrook), high population and employment densities, and overall transit coverage of more than 80% of its area. Notable growth is occurring associated with the Rockville Town Center. It is recognized that the City of Rockville has an Adequate Public Facilities Ordinance that includes an areawide transportation analysis. How this TPAR approach meshes with that has had little exploration as of this writing.

**B.** <u>Forecast of Development Activity</u>: The RKV Policy Area is forecast to grow during the regulatory planning stage of TPAR12 between 2010 and 2018 by about 3,215 households and 12,230 jobs. During the transportation improvement stage of TPAR12 between 2018 and 2022 growth would be about 1,738 households and 6,822 jobs more. During the master plan stage between 2022 and 2040 growth is forecast to be an additional 5,225 households and 11,873 jobs. That amount of growth is high and will result in the RKV area having an increasing share of the total growth in the County particularly over the next 10 years.</u>

Source of the Forecasts :	Но	useholo	l Foreca	sts beir	ng used l	by TPAF	R12	Em	ployme	nt Forec	asts be	ing used	by TPA	R12
Round 8.0 (revised) of the Regional Cooperative	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for
Forecasts	2010	2018	2018	2022	2022	2040	2040	2010	2018	2018	2022	2022	2040	2040
Rockville City	24,226		27,441		29,179		34,404	74,800		87,030		93,852		105,725
Growth in the Policy Area		3,215		1,738		5,225			12,230		6,822		11,873	
Percent Growth of Area		13.3%		6.3%		17.9%			16.4%		7.8%		12.7%	
Percent of County Growth		11. <b>0</b> %		10.9%		9.1%			19.6%		17.8%		9.6%	
Montgomery County	360,500		389,599		405,597		463,000	506,000		568,315		606,679		730,375
Growth in the County		29,099		15,998		57,403			62,315		38,364		123,696	

**C.** <u>**Programmed Transportation Improvements**</u>: There are no programmed projects to improve roadway capacity in the RKV area to address impacts of development in the CIP or CTP. The City of Rockville does have its own CIP and one road project for Southlawn Lane while it would improve safety and access will not add capacity to the over roadway network.

_ t	TPAR12 Stagii	ng of County CIP and State CTP Projects (u)	odated to 3-	21-12)		Cond.
Program Docume	Project Name	Improvement Type and/or Limits	Policy Area	Open by 2012	Prog. by 2018	Proj. by 2022
			RKV			



### D. Transit Adequacy Analysis:

The RKV Policy Area includes the Rockville Metrorail Station and parts are within walking distance of two others: Twinbrook and Shady Grove. MARC Commuter Rail and Amtrak service is at the Rockville Station.

**Coverage of Service:** About 80% of the RKV Policy Area is located within 1 mile of a Metrorail station or 1/3 of a mile of one of the 15 bus routes currently serving the area. The graphic to the left shows where in particular bus service coverage is provided in the RKV area. The standard for Coverage for an Urban Policy Area is 80%. Therefore, transit coverage in the RKV Policy Area is adequate.



**Peak Headways:** All buses on average provide 21.2 minutes between buses during the weekday evening peak period in the RKV Policy Area. Some provide very frequent service such as the Q1/Q2 Metrobuses. In areas like RKV where Metrorail the standard for average Peak Headway is 20 minutes or less. Thus, the average peak headway for the RKV area is not yet adequate. A conditional countywide project to improve peak headways in other areas could further improve adequacy in the RKV area too.

**Span of Service**: The average value of span is 17.8 hours per day for routes that operate all-day. The urban standard is 17.0 hours per day on average for all-day routes. Therefore, transit span in the RKV Policy Area is adequate. **E.** <u>Roadway Adequacy Analysis</u>: In the Roadway Adequacy Analysis all of the Policy Areas are analyzed together applying the regional travel demand model to Montgomery County specifics. Combinations consisting of future forecasts of development activity and future roadway and transit networks are analyzed and compared Countywide and within each Policy Area. The modeling results are summarized for each "comparison-combination" using a post-processing spreadsheet process to estimate overall arterial roadway performance for each of the Policy Areas as well as link-by-link performance of major and minor arterials within each area.</u>

**Modeling Network Level of Detail:** Major and minor arterial roads within the RKV Policy Area were analyzed for their future roadway performance for each of several future Countywide comparison-combinations. The following graphic shows those major and minor arterials used in the analysis. The freeway system of the region was also accounted for in the analysis but these performance results are not summarized. On-the-other-hand, the Roadway Adequacy Analysis does not account for truly local streets, minor roads, or even some of the minor arterials as those very local streets and roads have low amounts of traffic. It is beyond the state-of-the-practice to model the use of such low traffic roads. Nevertheless, the pattern of such local streets is depicted in the background in the roadway network graphic to provide context and aid understanding.



**Comparing Combinations of Future Development Activity and Transportation Networks:** Results of the Roadway Adequacy Analysis for RKV roadways are represented by the "brownhatched" bars shown in the arterial performance graphic, which disaggregates the overall performance of arterials in the RKV Policy Area to display them on an arterial-by-arterial basis. The comparison-combination used in this graphic is for the regulatory planning stage based on the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.



This arterial performance graphic has notes to help readers better understand how to interpret the chart, yet some elaboration can also be helpful. This exhibit displays the average roadway Level of Service for each of the named arterial segments within the RKV that were shown in the prior graphic. Towards the left, one of the bars is itself an average, in this case of 9 minor arterials roads. The sequencing of the roadways in this graphic, going from left to right, is in order of increasingly congested conditions in the peak flow direction.

Assessment of Areawide Roadway Adequacy for the RKV Policy Area: The overall weighted average for the RKV Policy Area is highlighted by the bar bordered in red near the center-right of the bars. The bottom of that highlighted bar for the Policy Area Average is <u>above</u> the dashed and bolded horizontal line. That line represents the proposed Policy Area Adequacy Standard for Urban Policy Areas, such as the RKV area. Therefore, the RKV Policy Area overall has adequate future areawide roadway traffic conditions for the combination for the regulatory planning stage, which analyzed the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.

**F.** <u>**Guidance to Local Area Transportation Review (LATR) in the RKV Policy Area</u>: The prior graphic shows that 18 of the depicted left-most arterial roads (and the 9 minor arterials not shown) have link-based peak period Level of Service that on average for the whole link-segment in the peak-flow direction is less congested that the Standard for an Urban Policy Area, often considerably less. Yet the graphic also shows that there are some 8 other roadway link-segments</u>** 

in the RKV Policy Area that are <u>more</u> congested than the Standard for an Urban Policy Area. Reading from right to the left in the prior graphic, locally inadequate congested conditions would be more likely found on parts of: (a) Twinbrook Pkwy/Rollons Ave, (b) MD 911 First Street, (c) MD 927 Montrose Rd, (d) MD 189 Falls Rd, and (e) MD 28 Norbeck Rd. Particular attention should be given to the LATRs for proposed subdivisions that use those arterial roads for access to their proposed site.

In addition, given the overall high volumes of traffic throughout many parts of the RKV Policy Area during peak periods, proposed subdivisions that would rely on other arterial roads serving the RKV area may also need to have focused attention on their LATR. In particular, such focus would be on the need for smaller-scale, localized, or site-specific improvements, including turnlanes at nearby intersections, access or local circulation needs, bus stops, and sidewalks.

**G.** <u>Guidance for Conditional Transportation Solutions</u>: The next graphic is similar to the prior one but instead the comparison-combination used in this graphic is for the transportation improvement planning stage that uses the 2022 forecast of Development Activity and the 2018 Programmed CIP and CTP plus selected "conditional projects", which could be implemented by the 10-year time-horizon of 2022. Green-hatched bars are used to better differentiate this set of results from the prior one. The growth in household and employment between 2018 and 2022, are estimated not to cause the RKV Policy Area to lose the overall areawide adequate roadway conditions associated with the regulatory planning stage – as such, finding additional solutions was not emphasized

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ē			Great	Nelson	Gude Dr			Edmonstp		Darnes	Policy Area	M	MD028 W. Mont	ollege Pkwy	Washington St	WD3	6 Veirs Mill Rc	Mill Rd	ve Rd	Seven Lo	MD028 Norbeck Rd	alls Rd	rose Rd	D911 First Street	winbrook-Rollins
ō	Pi	opos	sed F	olicy	y Are	a		Ø	Ø					8	Z		MD58	Glen Glen	Shady Gro			MD189 F	MD927 Mont		
Ē	Adequacy Standard																								
F	Note 1: The bars show the range of PM Peak Period Congested Speed relative to "Free Flow Speed" for arterial segments in the Policy Area (1) averaged by direction of flow, and (2) weighted by the Vehicle-Miles-Traveled. Note 2: Bottom-of-Bar is the average for the Peak Flow Direction, while the Top-of-Bar is the average for the Non-Peak Flow Direction								low rea: the	De	Ana v. Fo F12-2 -	ysis reca 022	Com st	binai Netv 12-20	ons vork 022-0	6			- ro	Gu eviev etter the	idan vers und se C <i>Revi</i>	ce to to h ersta harts sed 3-	elp and s		

While other options to improve the roadway network over the next 10 years in the RKV Policy Area are not being proposed at this time, transit improvements and enhancements as well proactive traffic signal improvements must be undertaken to increase the functioning of the network in this Policy Area. The prior graphic can be used as a guide in focusing on which roadways, singularly or in combination should receive such operational attention.

**H.** <u>**Guidance for the Master Plan Stage</u>:** The following graphic shows that the RKV Policy Area would not maintain its overall roadway adequacy into the long term. Further, it can also be seen that many additional roadways would be more congested in the peak direction than the standard for an Urban Policy Area, which implies either that many long-term transportation improvements will be needed or that the forecasts of development activity are too high. The pattern suggests that most roadways in Rockville would be so congested during peak periods in the long-term. In the nearer term emphasis could be given to developing a Rockville-specific Traffic Management and Operations program as well as more a Transportation Demand Management program.</u>

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Ē	Note 1: The bars show the range of PM Peak Period Congested Speed relative to "Free Flow Speed" for arterial segments in the Policy Area: (1) averaged by direction of flow, and (2) weighted by the Vehicle-Miles-Traveled. Note 2: Bottom-of-Bar is the average for the Peak Flow Direction, while the Top-of-Bar is the average for the Non-Peak Flow Direction								low rea:	De	Ana v. Fo F12-2 -	ysis recas 040	Com st	binai Netv 12-20	ons vork 018-0	2			r b	Gu eviev etter the	idan vers und se C <i>Revi</i>	ce to to h ersta harts	elp and s 21-12		
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## **Derwood Policy Area**

A. <u>Overview of the Policy Area</u>: Derwood (DER) is categorized as an Urban Policy Area, given the transit and development activity features of the area. This area is characterized by having the Shady Grove Metrorail Station, the terminal of the Red Line with a large number of Park and Ride spaces and a special access roadway from I-370 and MD 200. There is a MARC Commuter Rail and Amtrak Rail station at Washington Grove, which is within the Policy Area. The recently opened MD 200 (Intercounty County Connector) passes through the middle part of the Derwood area and access and egress is provided by an interchange at Shady Grove Road.

The development in the area is however at present only moderate in terms of population and employment densities. The overall transit coverage is presently less than the standard for an Urban Policy Area, which is having more than 80% of the area with transit service. Notable growth has been occurring in the adjacent Rockville Policy Area associated with the King Farm.

**B.** <u>Forecast of Development Activity</u>: The DER Policy Area is forecast to grow during the regulatory planning stage of TPAR12 between 2010 and 2018 by about 930 households and 58 jobs. During the transportation improvement stage of TPAR12 between 2018 and 2022 growth would be about 1,578 households and 4,566 jobs more. During the master plan stage between 2022 and 2040 growth is forecast to be an additional 4,263 households and 6,909 jobs. This growth is high as a percent of current development for the area, but it is on par or slightly increasing relative to the total forecast of growth in the County.</u>

Source of the Forecasts :	Но	useholo	d Foreca	sts beir	ng used l	by TPA	R12	Em	ployme	nt Forec	asts be	ing used	by TPA	R12
Round 8.0 (revised) of the Regional Cooperative	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for
Forecasts	2010	2018	2018	2022	2022	2040	2040	2010	2018	2018	2022	2022	2040	2040
Derwood	6,157		7,087		8,665		12,928	20,937		20,995		25,561		32,470
Growth in the Policy Area		930		1,578		4,263			58		4,566		6,909	
Percent Growth of Area		15.1%		22.3%		49.2%			0.3%		21.7%		27.0%	
Percent of County Growth		3.2%		9.9%		7.4%			0.1%		11.9%		5.6%	
Montgomery County	360,500		389,599		405,597		463,000	506,000		568,315		606,679		730,375
Growth in the County		29,099		15,998		57,403			62,315		38,364		123,696	

**C.** <u>**Programmed Transportation Improvements**</u>: There are two programmed projects that will be improving roadway capacity in the DER area, each associated with parts of Redland Road as noted in the graphic below.

_ t	TPAR12 Stagi	ng of County CIP and State CTP Projects (u)	odated to 3-	21-12)		Со	nd.
Program Docume	Project Name	Improvement Type and/or Limits	Policy Area	Open by 2012	Prog. by 2018	Pr b 20	roj. )y )22
CIP	Redland Rd	Crabbs Branch Way to Needwood Rd (4 lanes)	DER	Y	Y	`	Y
CIP	Redland Rd	Needwood Rd to Baederwood Lane (3 lanes)	DER	Υ	Y	`	Y



#### D. Transit Adequacy Analysis:

The DER Policy Area includes the Shady Grove Metrorail Station as well as the nearby Washington Grove Station that is serviced by MARC Commuter Rail and Amtrak.

**Coverage of Service:** About 70% of the DER Policy Area is located within 1 mile of a Metrorail station or 1/3 of a mile of one of the 7 bus routes currently serving the area. The graphic to the left shows where in particular bus service coverage is provided in the DER area. The standard for Coverage for an Urban Policy Area is 80%. Therefore transit coverage in the DER Policy Area is nominally not adequate.



Peak Headways: All buses on average provide 21.1 minutes between buses during the weekday evening peak period in the DER Policy Area. Some provide very frequent service such as the Q1/Q2Metrobuses. In areas like DER where Metrorail is provided the standard for average Peak Headway is 20 minutes or less. Thus, the average peak headway for the DER area is not yet adequate. A conditional countywide project to improve peak headways to serve other adjacent and nearby Policy Areas could result within the next 10 years that the DER area could attain Peak Headway adequacy.

**Span of Service**: The average value of span is 18.8 hours per day for routes that operate all-day. The Urban standard is 17.0 hours per day on average for all-day routes. Therefore, transit span in the DER Policy Area is adequate. **E.** <u>Roadway Adequacy Analysis</u>: In the Roadway Adequacy Analysis all of the Policy Areas are analyzed together applying the regional travel demand model to Montgomery County specifics. Combinations consisting of future forecasts of development activity and future roadway and transit networks are analyzed and compared Countywide and within each Policy Area. The modeling results are summarized for each "comparison-combination" using a post-processing spreadsheet process to estimate overall arterial roadway performance for each of the Policy Areas as well as link-by-link performance of major and minor arterials within each area.</u>

**Modeling Network Level of Detail:** Major and minor arterial roads within the DER Policy Area were analyzed for their future roadway performance for each of several future Countywide comparison-combinations. The following graphic shows those major and minor arterials used in the analysis. The freeway system of the region was also accounted for in the analysis but these performance results are not summarized. On-the-other-hand, the Roadway Adequacy Analysis does not account for truly local streets, minor roads, or even some of the minor arterials as those very local streets and roads have low amounts of traffic. It is beyond the state-of-the-practice to model the use of such low traffic roads. Nevertheless, the pattern of such local streets is depicted in the background in the roadway network graphic to provide context and aid understanding.



**Comparing Combinations of Future Development Activity and Transportation Networks:** Results of the Roadway Adequacy Analysis for DER roadways are represented by the "brownhatched" bars shown in the arterial performance graphic, which disaggregates the overall performance of arterials in the DER Policy Area to display them on an arterial-by-arterial basis. The comparison-combination used in this graphic is for the regulatory planning stage based on the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.



This arterial performance graphic has notes to help readers better understand how to interpret the chart, yet some elaboration can also be helpful. This exhibit displays the average roadway Level of Service for each of the named arterial segments within the DER that were shown in the prior graphic. One of the bars is itself an average, in this case of 4 minor arterials roads, which is the fourth bar from the right. The sequencing of the roadways in this graphic, going from left to right, is in order of increasingly congested conditions in the peak flow direction.

Assessment of Areawide Roadway Adequacy for the DER Policy Area: The overall weighted average for the DER Policy Area is highlighted by the bar bordered in red near the center-right of the bars. The bottom of that highlighted bar for the Policy Area Average is <u>above</u> the dashed and bolded horizontal line. That line represents the proposed Policy Area Adequacy Standard for Urban Policy Areas, such as the DER area. Therefore, the DER Policy Area overall has adequate future areawide roadway traffic conditions for the combination for the regulatory planning stage, which analyzed the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.

**F.** <u>Guidance to Local Area Transportation Review (LATR) in the DER Policy Area</u>: The prior graphic shows that all but one of the depicted left-most arterial roads (and the 4 minor arterials not shown) have link-based peak period Level of Service that on average for the whole link-segment in the peak-flow direction is less congested that the Standard for an Urban Policy Area. The graphic also shows that there is only one roadway link-segment in the DER Policy

Area that are <u>more</u> congested than the Standard for an Urban Policy Area – which is that of Mid County Highway. Thus locally inadequate congested conditions would be more likely found on in the vicinity of that roadway. Particular attention should be given to the LATRs for proposed subdivisions that would use that arterial road for access to their proposed site. Further, It can be seen that most of the roadways throughout many parts of the DER Policy Area during peak periods would have fairly busy but acceptable traffic flow conditions. Thus, proposed subdivisions that would rely on other arterial roads serving the DER area may also need to have focused attention on their LATR. In particular, such focus would be on the need for smallerscale, localized, or site-specific improvements such as turn-lanes at nearby intersections, access or local circulation needs, bus stops, sidewalks, and so on.

**G.** <u>**Guidance for Conditional Transportation Solutions</u>:** The next graphic is similar to the prior one but instead the comparison-combination used in this graphic is for the transportation improvement planning stage that uses the 2022 forecast of Development Activity and the 2018 Programmed CIP and CTP plus selected "conditional projects", which could be implemented by the 10-year time-horizon of 2022. Green-hatched bars are used to better differentiate this set of results from the prior one. The growth in household and employment between 2018 and 2022, are estimated not to cause the DER Policy Area to lose the overall areawide adequate roadway conditions associated with the regulatory planning stage</u>. The prior analyses done for the Proposed TPAR in 2010 did consider the extension of Midcounty Highway to become direct access ramps to and from the new Intercounty Connector (MD 200). While not considered in this Roadway Adequacy Analysis for TPAR12, it could become a future conditional project.



While other options to improve the roadway network over the next 10 years in the DER Policy Area are not being proposed, some potential future conditional projects can be found in Appendix E, the list of unbuilt Master Plan Projects. In addition, transit improvements and enhancements as well proactive traffic signal improvements could be undertaken to improve the functioning of the roadway network in this Policy Area. The prior graphic can be used as a guide in focusing on which roadways could receive such operational attention.

**H.** <u>**Guidance for the Master Plan Stage</u>:** The following graphic shows that while the Derwood Policy Area would maintain its overall roadway adequacy into the long term, it can also be seen that most roadways would be about as congested in the peak direction as the standard for an Urban Policy Area. In the nearer term and mid-term emphasis could be given to developing a Derwood-specific Traffic Management and Operations program as well as a Transportation Demand Management program.</u>



# **R&D Village Policy Area**

A. <u>Overview of the Policy Area</u>: R&D Village (RDV) is categorized as an Suburban Policy Area, given the transit and development activity features of the area. This area has high population and employment densities, and overall transit coverage of more than 30% of its area. Notable growth is occurring associated with the implementation of development projects located in the Life Science Center (LSC). The staging of master-planned development in the LSC is linked to the realization of major transportation-related improvements including: (1) the implementation of phases of the Corridor Cities Transitway (CCT) between the Shady Grove Metro and Clarksburg (2) the achievement of non-auto driver mode share goals and; (3) the implementation of selected arterial roadway improvements.

**B.** <u>Forecast of Development Activity</u>: The RDV Policy Area is forecast to grow during the regulatory planning stage of TPAR12 between 2010 and 2018 by about 1,795 households and 3,604jobs. During the transportation improvement stage of TPAR12 between 2018 and 2022 growth would be about 1,442 households and 3,507 jobs more. During the master plan stage between 2022 and 2040 growth is forecast to be an additional 5,963 households and 14,806 jobs. While the household and job growth is high relative to the current development activity, it is only a moderate but increasing share of the total growth in the County.</u>

Source of the Forecasts:	Но	usehol	d Foreca	sts beir	ng used l	by TPAF	R12	Em	ployme	nt Forec	asts be	ing used	by TPA	R12
Round 8.0 (revised) of the Regional Cooperative	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for
Forecasts	2010	2018	2018	2022	2022	2040	2040	2010	2018	2018	2022	2022	2040	2040
R&D Village	2,364		4,159		5,600		9,777	20,052		23,656		27,163		41,969
Growth in the Policy Area		1,795		1,442		5,963			3,604		3,507		14,806	
Percent Growth of Area		75.9%		34.7%		106.5%			18.0%		14.8%		54.5%	
Percent of County Growth		6.2%		9.0%		10.4%			5.8%		9.1%		12.0%	
Montgomery County	360,500		389,599		405,597		463,000	506,000		568,315		606,679		730,375
Growth in the County		29,099		15,998		57,403			62,315		38,364		123,696	

**C.** <u>**Programmed Transportation Improvements</u>**: There are no programmed projects that serve the RDV area. As also noted in the discussion of other Policy Areas, a "conditional project" has been identified to provide Peak Hour Headway improvements to about a dozen Ride-On routes that currently serve about 8 of the Suburban Policy Areas needing improved Peak Hour Headways to attain the Peak Headway Adequacy Standard. Most of those dozen routes would directly serve more than one Policy Area, as well as indirectly serve a similar number of: (a) other Suburban Policy Areas combined with (b) several of the Urban Policy Areas. Such a "conditional project" could be implemented in a few increments over a few years or all at once. Interim ridership results and user responses to travel surveys would be monitored over time and refinements could be made along the way.</u>

_ t	TPAR12 Stag	ing of County CIP and State CTP Projects	updated to 3-2	1-12)		(	Cond.
Program Docume	Project Name	Improvement Type and/or Limits	Policy Area	Open by 2012	Prog. by 2018		Proj. by 2022
CIP	Ride-On Peak Headway Imprv.	Peak headway improvements: about 12 routes in about 8 Areas	Countyw ide	Ν	Some		Y


Ride On Route and #

#### D. Transit Adequacy Analysis:

The RDV Policy Area would be well served by several stations of the Corridor Cities Transitway (CCT) when it is implemented at a future time.

Coverage of Service: About 75% of the RDV Policy Area is located within 1/3 of a mile of one of the 5 bus routes currently serving the area, and with the CCT in place that coverage within a 1/3 mile of a station would increase that percentage. The graphic to the left shows where in particular current bus service coverage is provided in the RDV area. The standard for Coverage for a Suburban Policy Area is 30%. Therefore transit coverage in the RDV Policy Area is adequate.



**Peak Headways:** All buses on average provide 25.8 minutes between buses during the weekday evening peak period in the RDV Policy Area. In areas like RDV where future LRT is to be provided, the standard for average Peak Headway is 20 minutes or less. Thus, the average peak headway for the RDV area is not yet adequate. A "conditional" countywide project to improve peak headways could attain adequacy within the next 10 years.

**Span of Service**: The average value of span is 15.8 hours per day for routes that operate all-day. The urban standard is 14.0 hours per day on average for all-day routes. Therefore transit span in the RDV Policy Area is adequate. **E.** <u>Roadway Adequacy Analysis</u>: In the Roadway Adequacy Analysis all of the Policy Areas are analyzed together applying the regional travel demand model to Montgomery County specifics. Combinations consisting of future forecasts of development activity and future roadway and transit networks are analyzed and compared Countywide and within each Policy Area. The modeling results are summarized for each "comparison-combination" using a post-processing spreadsheet process to estimate overall arterial roadway performance for each of the Policy Areas as well as link-by-link performance of major and minor arterials within each area.</u>

**Modeling Network Level of Detail:** Major and minor arterial roads within the RDV Policy Area were analyzed for their future roadway performance for each of several future Countywide comparison-combinations. The following graphic shows those major and minor arterials used in the analysis. The freeway system of the region was also accounted for in the analysis but these performance results are not summarized. On-the-other-hand, the Roadway Adequacy Analysis does not account for truly local streets, minor roads, or even some of the minor arterials as those very local streets and roads have low amounts of traffic. It is beyond the state-of-the-practice to model the use of such low traffic roads. Nevertheless, the pattern of such local streets is depicted in the background in the roadway network graphic to provide context and aid understanding.



**Comparing Combinations of Future Development Activity and Transportation Networks:** Results of the Roadway Adequacy Analysis for RDV roadways are represented by the "brownhatched" bars shown in the arterial performance graphic, which disaggregates the overall performance of arterials in the RDV Policy Area to display them on an arterial-by-arterial basis. The comparison-combination used in this graphic is for the regulatory planning stage based on the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.



This arterial performance graphic has notes to help readers better understand how to interpret the chart, yet some elaboration can also helpful. This exhibit displays the average roadway Level of Service for each of the named arterial segments within the RDV that were shown in the prior graphic. The sequencing of the roadways in this graphic, going from left to right, is in order of increasingly congested conditions in the peak flow direction.

Assessment of Areawide Roadway Adequacy for the RDV Policy Area: The overall weighted average for the RDV Policy Area is highlighted by the bar bordered in red near the center-right of the bars. The bottom of that highlighted bar for the Policy Area Average is <u>above</u> the dashed and bolded horizontal line. That line represents the proposed Policy Area Adequacy Standard for Suburban Policy Areas, such as the RDV area. Therefore, the RDV Policy Area overall has adequate future areawide roadway traffic conditions for the combination for the regulatory planning stage, which analyzed the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.

**F.** <u>Guidance to Local Area Transportation Review (LATR) in the RDV Policy Area</u>: The prior graphic shows that none of the depicted left-most arterial roads have link-based peak period Level of Service that on average for the whole link-segment in the peak-flow direction is <u>above</u>, or less congested than the Standard for a Suburban Policy Area, often considerably above. Yet the graphic also shows that there is only one roadway link-segments in the RDV Policy Area that is <u>more</u> congested than the Standard for a Suburban Policy Area. In the prior graphic, locally

inadequate congested conditions would be more likely found associated with parts of Sam Eig Highway. Particular attention should be given to the LATRs for proposed subdivisions that use that arterial road for access to their proposed site.

In addition, given the overall moderate to high volumes of traffic throughout many parts of the RDV Policy Area during peak periods, proposed subdivisions that would rely on other arterial roads serving the RDV area may also need to have focused attention on their LATR. In particular, such focus would be on the need for smaller-scale, localized, or site-specific improvements, including turn-lanes at nearby intersections, access or local circulation needs, bus stops and sidewalks.

**G.** <u>**Guidance for Conditional Transportation Solutions</u>:** The next graphic is similar to the prior one but instead the comparison-combination used in this graphic is for the transportation improvement planning stage that uses the 2022 forecast of Development Activity and the 2018 Programmed CIP and CTP plus selected "conditional projects", which could be implemented by the 10-year time-horizon of 2022... "Green-hatched" bars are used to better differentiate this set of results from the prior one. The growth in household and employment between 2018 and 2022, are estimated not to cause the RDV Policy Area to lose the overall areawide adequate roadway conditions associated with the regulatory planning stage – as such, finding additional solutions was not emphasized for this Policy Area at this time.</u>



While other options to improve the roadway network over the next 10 years in the RDV Policy Area are not being proposed at this time, some potential future conditional projects can be found in Appendix E, the list of unbuilt Master Plan Projects. In addition, transit improvements and enhancements as well proactive traffic signal improvements could be undertaken to improve the functioning of the roadway network in this Policy Area. The prior graphic can be used as a guide in focusing on which roadways could receive such operational attention.

**H.** <u>Guidance for the Master Plan Stage</u>: The following graphic shows that while the RDV Policy Area would continue to maintain its current regulatory stage overall roadway adequacy into the long term master plan stage. However, the main access to and from I-270 would likely be severely congested in the absence of further "conditional projects" from the Master Plan. Given this longer-term outlook, in the nearer term and mid-term, emphasis should be given to developing a R&D Village-specific Traffic Management and Operations program as well as a Transportation Demand Management program.</u>



## **Gaithersburg Policy Area**

A. <u>Overview of the Policy Area</u>: Gaithersburg (GBG) is categorized as a Suburban Policy Area, given the transit and development activity features of the area. This area is characterized by two MARC Commuter Rail – Amtrak stations (Gaithersburg and Metropolitan Grove) as well as a third nearby one at Washington Grove in the adjacent Derwood Policy Area. There are high population and employment densities and overall transit coverage of about 75% of its area. Notable growth has been occurring associated with the Kentlands and Lakelands areas, as well as nearby employment locations. Significant growth is just beginning on the Crown Farm area that has been annexed to be part of the City of Gaithersburg. The City of Gaithersburg exercises development regulation authority over property located within the boundary of that municipality. The County exercises development authority over property located in the non-municipal areas of the Gaithersburg Policy Area.

**B.** <u>Forecast of Development Activity</u>: The GBG Policy Area is forecast to grow during the regulatory planning stage of TPAR12 between 2010 and 2018 by about 969 households and 10,491 jobs. During the transportation improvement stage of TPAR12 between 2018 and 2022 growth would be about 2,480 households and 2,009 jobs more. During the master plan stage between 2022 and 2040 growth is forecast to be an additional 6,026 households and 18,289 jobs. While this growth is high, it is also an increasing share of the total growth in the County.

Source of the Forecasts :	Но	usehol	d Foreca	sts beir	ng used l	by TPAF	R12	Em	ployme	nt Forec	asts be	ing used	by TPA	R12
Round 8.0 (revised) of the Regional Cooperative	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for
Forecasts	2010	2018	2018	2022	2022	2040	2040	2010	2018	2018	2022	2022	2040	2040
Gaithersburg City	24,182		25,151		27,631		33,657	53,185		63,676		65,685		83,974
Growth in the Policy Area		969		2,480		6,026			10,491		2,009		18,289	
Percent Growth of Area		4.0%		9.9%		21.8%			19.7%		3.2%		27.8%	
Percent of County Growth		3.3%		15.5%		10.5%			16.8%		5.2%		14.8%	
Montgomery County	360,500		389,599		405,597		463,000	506,000		568,315		606,679		730,375
Growth in the County		29,099		15,998		57,403			62,315		38,364		123,696	

**C.** <u>**Programmed Transportation Improvements**</u>: There is one programmed project and one proposed "conditional project" in the GBG area, both of which are associated with the extension of Watkins Mill Rd across I-270. The County CIP project will provide roads on each side of I-270 connecting to MD 355 and to MD 117. A subsequent MDOT CTP potential conditional project would provide the connecting span over I-270. Providing interchange ramps to and from I-270 could also be a separate potential conditional project in TPAR12.

t_	TPAR12 St	taging of County CIP and State CTP Projects (update	d to 4-5-12)			Cond.
Program Docume	Project Name	Improvement Type and/or Limits	Policy Area	Open by 2012	Prog. by 2018	Proj. by 2022
CIP	Watkins Mill Rd Extended	MD 355 to MD 117; without a connection yet across I-270 (4 lanes)	GBG	Y	Y	Y
СТР	Watkins Mill Rd Bridge of I-270	(interchange could be a separate and later project)	GBG	Ν	Ν	Y
СТР	Watkins Mill Rd Interchange	Interchange of I-270 with Watkins Mill Road Extended	GBG	Ν	Ν	Y



Metrobus Route and #



# **D.** Transit Adequacy Analysis:

The GBG Policy Area includes two MARC Commuter Rail – Amtrak stations (Gaithersburg and Metropolitan Grove) and a third nearby at Washington Grove in the Derwood Policy Area. There is also a major commuter Park and Ride lot at I-270 and MD 124 Quince Orchard Rd that is served by the new MDOT/MTA Bus services that use MD 200 and connects to Laurel and Thurgood Marshall Airport.

Coverage of Service: About 75% of the GBG Policy Area is located within 1 mile of a Metrorail station or 1/3 of a mile of one of the 10 bus routes currently serving the area. The graphic to the left shows where in particular bus service coverage is provided in the GBG area. The

standard for Coverage for an Suburban Policy Area is more than 30%. Therefore transit coverage in the GBG Policy Area is adequate.

Peak Headways: All buses on average provide 20.0 minutes between buses during the weekday evening peak period in the GBG Policy Area. In areas like GBG where commuter rail and bus service is provided, the standard for average Peak Headway is 20 minutes or less. Thus, the average peak headway for the GBG area is adequate. A conditional countywide project to improve peak headways in nearby areas could further improve peak headways within the next 10 years.

**Span of Service**: The average value of span is 17.6 hours per day for routes that operate all-day. The urban standard is 17.0 hours per day on average for all-day routes. Therefore transit span in the GBG Policy Area is adequate.

**E.** <u>Roadway Adequacy Analysis</u>: In the Roadway Adequacy Analysis all of the Policy Areas are analyzed together applying the regional travel demand model to Montgomery County specifics. Combinations consisting of future forecasts of development activity and future roadway and transit networks are analyzed and compared Countywide and within each Policy Area. The modeling results are summarized for each "comparison-combination" using a post-processing spreadsheet process to estimate overall arterial roadway performance for each of the Policy Areas as well as link-by-link performance of major and minor arterials within each area.</u>

**Modeling Network Level of Detail:** Major and minor arterial roads within the GBG Policy Area were analyzed for their future roadway performance for each of several future Countywide comparison-combinations. The following graphic shows those major and minor arterials used in the analysis. The freeway system of the region was also accounted for in the analysis but these performance results are not summarized. On-the-other-hand, the Roadway Adequacy Analysis does not account for truly local streets, minor roads, or even some of the minor arterials as those very local streets and roads have low amounts of traffic. It is beyond the state-of-the-practice to model the use of such low traffic roads. Nevertheless, the pattern of such local streets is depicted in the background in the roadway network graphic to provide context and aid understanding.



**Comparing Combinations of Future Development Activity and Transportation Networks:** Results of the Roadway Adequacy Analysis for GBG roadways are represented by the "brownhatched" bars shown in the arterial performance graphic, which disaggregates the overall performance of arterials in the GBG Policy Area to display them on an arterial-by-arterial basis. The comparison-combination used in this graphic is for the regulatory planning stage based on the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.



This arterial performance graphic has notes to help readers better understand how to interpret the chart, yet some elaboration can also be helpful. This exhibit displays the average roadway Level of Service for each of the named arterial segments within the GBG that were shown in the prior graphic. The left-most of the bars is itself an average, in this case of 5 minor arterials roads. The sequencing of the roadways in this graphic, going from left to right, is in order of increasingly congested conditions in the peak flow direction.

Assessment of Areawide Roadway Adequacy for the GBG Policy Area: The overall weighted average for the GBG Policy Area is highlighted by the bar bordered in red near the center-right of the bars. The bottom of that highlighted bar for the Policy Area Average is <u>above</u> the dashed and bolded horizontal line. That line represents the proposed Policy Area Adequacy Standard for Urban Policy Areas, such as the GBG area. Therefore, the GBG Policy Area overall has adequate future areawide roadway traffic conditions for the combination for the regulatory planning stage, which analyzed the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.

**F.** <u>**Guidance to Local Area Transportation Review (LATR) in the GBG Policy Area</u>: The prior graphic shows that 7 of the depicted left-most arterial roads (and the 5 minor arterials not shown) have link-based peak period Level of Service that on average for the whole link-segment in the peak-flow direction is less congested that the Standard for an Urban Policy Area, often considerably less. Yet the graphic also shows that there are some 8 other roadway link-segments</u>** 

in the GBG Policy Area that are <u>more</u> congested than the Standard for an Urban Policy Area. Reading from right to the left in the prior graphic, locally inadequate congested conditions would be more likely found on parts of: (a) Sam Eig Hwy, (b) Diamondback Rd, (c) Summit Ave/Goshen Rd, (d) part of Shady Grove Rd in the area, (e) MD 119 Great Seneca Hwy, (f) East Diamond Ave, (g) MD 117 Clopper Rd/West Diamond Ave, and (h) Odendhal Ave. Particular attention should be given in the LATRs of the City of Gaithersburg for proposed subdivisions that use those arterial roads for access to their proposed site. In addition, roads in other parts of the GBG Policy Area during peak periods have heavy traffic, and proposed subdivisions that would rely on such other arterial roads serving the GBG area may also need to have focused attention on their LATR. In particular, such focus would be on the need for smaller-scale, localized, or site-specific improvements, including turn-lanes at nearby intersections, access or local circulation needs, bus stops and, sidewalks.

**G.** <u>**Guidance for Conditional Transportation Solutions:</u> The next graphic is similar to the prior one but instead the comparison-combination used in this graphic is for the transportation improvement planning stage that uses the 2022 forecast of Development Activity and the 2018 Programmed CIP and CTP plus selected "conditional projects", which could be implemented by the 10-year time-horizon of 2022.** Green-hatched bars are used to better differentiate this set of results from the prior one. The growth in household and employment between 2018 and 2022, are estimated not to cause the GBG Policy Area to lose the overall areawide adequate roadway conditions associated with the regulatory planning stage. However, as many of the roads are projected to have conditions more congested than the standard, further "conditional projects"</u> need to be identified. The following two are not yet considered in the Exhibit below.

Ā	5 Minor Arterials		art)	erry Pkwy	Adequacy of the Adequacy of th												
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ē			Mido			Watkir	MD124 Mont. Vige	MMM MD355	Policy Area		MD117 Clopper/W. D	E. Dia	MD119 Gt. Senec	ove Rd	mmit Ave / Goshen R		Eig Hwy
Б	P	roposed	Policy	Area			8	Ø				8		ady Gr	- 3 		Sam
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A likely conditional project for further analysis would be completion of an interchange at Watkins Mill Road that would add to the overpass currently being shown as a "conditional project" for this Policy Area. The network effects associated with such an improvement would also need to be complemented with the widening of MD 117 Clopper Road from Watkins Mill Road to Game Preserve Road in the adjacent North Potomac Policy Area to help keep that Policy Area from otherwise having inadequate roadways. While other options to improve the roadway network over the next 10 years in the GBG Policy Area are not being proposed at this time, some potential future conditional projects can be found in Appendix E, the list of unbuilt Master Plan Projects. In addition, transit improvements and enhancements as well proactive traffic signal improvements could be undertaken to improve the functioning of the roadway network in this Policy Area. The prior graphic can be used as a guide in focusing on which roadways could receive such operational attention.

**H.** <u>Guidance for the Master Plan Stage</u>: The following graphic shows that the GBG Policy Area would not maintain its overall roadway adequacy into the long term. Further, it can also be seen that four additional roadways would be more congested in the peak direction than the standard for an Urban Policy Area, which implies either that many long-term transportation improvements will be needed or that the forecasts of development activity are too high. The pattern suggests that most roadways in Gaithersburg would be very congested during peak periods in the long-term. In the nearer term emphasis could be given to developing a Gaithersburg-specific Traffic Management and Operations program as well as a focused Transportation Demand Management program.

Ā		or Arterials										Gai 201:	Adeq therst 2040 E 2 Roac	uacy o ourg Ci Develop Is + 20	f the M ty (GB oment 18 Pro	Aain Ro G) (TP Foreca gramm	ads in AR12-2 sts wit ed CIP	: <mark>F3):</mark> h /CTP
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# Fairland / White Oak Policy Area

A. <u>Overview of the Policy Area</u>: Fairland / White Oak (FWO) is categorized as a Suburban Policy Area, given the transit and development activity features of the area. It has express bus service with several park and ride lots, moderate population and employment densities, and overall transit coverage of more than 30% of its area. Notable employment growth has been occurring at the United States Food and Drug Administration Campus in White Oak and proposals for the White Oak Science Gateway master plan are likely to increase the growth potentialin the future. The recently opened MD 200 (Intercounty County Connector) traverses the north central part of the area in an east-west direction. Access and egress is provided by three interchanges with: (1) Briggs Chaney Road, (2) US 29 Columbia Pike, and (3) MD 650 New Hampshire Avenue.

**B.** <u>Forecast of Development Activity</u>: The FWO Policy Area, based on the 1997 Master Plan, is forecast to grow during the regulatory planning stage of TPAR12 between 2010 and 2018 by about 366 households and 7,822 jobs. During the transportation improvement stage of TPAR12 between 2018 and 2022 growth would be about 199 households and 4,118 jobs more. During the master plan stage between 2022 and 2040 growth is forecast to be an additional 694 households and 6,634 jobs. Further household growth in this area is forecast to be low to moderate but employment growth will be high relative to current employment in the area and be at a faster pace than the total growth in the County, resulting in an increasing share of jobs in this area.</u>

Source of the Forecasts :	Но	usehol	d Foreca	sts beir	ng used l	by TPAF	R12	Em	ployme	nt Forec	asts be	ing used	by TPA	R12
Round 8.0 (revised) of the Regional Cooperative Forecasts	Forecast for 2010	Growth 2010 to 2018	Forecast for 2018	Growth 2018 to 2022	Forecast for 2022	Growth 2022 to 2040	Forecast for 2040	Forecast for 2010	Growth 2010 to 2018	Forecast for 2018	Growth 2018 to 2022	Forecast for 2022	Growth 2022 to 2040	Forecast for 2040
Fairland / White Oak	28,004		28,370		28,569		29,263	30,013		37,835		41,953		48,587
Growth in the Policy Area		366		199		694			7,822		4,118		6,634	
Percent Growth of Area		1.3%		0.7%		2.4%			<b>26.1%</b>		10.9%		15.8%	
Percent of County Growth		1.3%		1.2%		1.2%			12.6%		10.7%		5.4%	
Montgomery County	360,500		389,599		405,597		463,000	506,000		568,315		606,679		730,375
Growth in the County		29,099		15,998		57,403			62,315		38,364		123,696	

**C.** <u>**Programmed Transportation Improvements</u>**: There are two programmed projects that would be a modest addition to roadway capacity in the FWO area, one being an extra lane on parts of Fairland Road and the other a short widening of parts of Greencastle Road. In addition, there is a Countywide project associated with MD 200 (the Intercounty Connector) that will extend the new roadway east to connect to US Route 1 in Laurel, which should somewhat shift some travel patterns in the FWO Policy Area. Providing an interchange of US 29 Columbia Pike with Fairland Road is potential conditional project in TPAR12 and was considered in the Proposed TPAR Report of 2010.</u>

_ t	TPAR12 Sta	ging of County CIP and State CTP Projects (updated)	ted to 4-5-12	2)		Cond.
Program Docume	Project Name	Improvement Type and/or Limits	Policy Area	Open by 2012	Prog. by 2018	Proj. by 2022
CIP	Fairland Rd Improvement	US 29 to Prince George's County line (3 lanes)	FWO	Y	Y	Y
CIP	Greencastle Road	Greencastle Ridge Terrace to Fairland Park Entrance ( 4 lanes)	FWO	Y	Y	Y
СТР	Columbia Pike Interchange	Interchange of Columbia Pike (US 29) with Fairland Rd	FWO	Ν	Ν	Y



### D. Transit Adequacy Analysis:

The FWO Policy Area includes express bus service with several park and ride lots particularly along the US 29 Columbia Pike corridor, as well as good local transit service.

**Coverage of Service:** About 48% of the FWO Policy Area is located within 1/3 of a mile of one of the 14 bus routes currently serving the area. The graphic to the left shows where in particular bus service coverage is provided in the FWO area. The standard for Coverage for a Suburban Policy Area is more than 30% of the area. Therefore transit coverage in the FWO Policy Area is adequate.

Metrobus Route and # Peak Headways: All buses on average provide 19.1 minutes between buses during the weekday evening peak period in the FWO Policy Area. Some provide very frequent service such as the K6, or Z8 Metrobuses and the Route 20 Ride-On. In areas like FWO where bus service is provided, the standard for average Peak Headway is 20 minutes or less. Thus, the average peak headway for the FWO area is adequate. A "conditional" countywide project to improve peak headways in adjacent areas could further improve Peak Headways during the next 10 years.

> **Span of Service**: The average value of span is 18.8 hours per day for routes that operate all-day. The urban standard is 14.0 hours per day on average for all-day routes. Therefore transit span in the FWO Policy Area is adequate.

**E.** <u>Roadway Adequacy Analysis</u>: In the Roadway Adequacy Analysis all of the Policy Areas are analyzed together applying the regional travel demand model to Montgomery County specifics. Combinations consisting of future forecasts of development activity and future roadway and transit networks are analyzed and compared Countywide and within each Policy Area. The modeling results are summarized for each "comparison-combination" using a post-processing spreadsheet process to estimate overall arterial roadway performance for each of the Policy Areas as well as link-by-link performance of major and minor arterials within each area.</u>

**Modeling Network Level of Detail:** Major and minor arterial roads within the FWO Policy Area were analyzed for their future roadway performance for each of several future Countywide comparison-combinations. The following graphic shows those major and minor arterials used in the analysis. The freeway system of the region was also accounted for in the analysis but these performance results are not summarized. On the other hand, the Roadway Adequacy Analysis does not account for truly local streets, minor roads, or even some of the minor arterials as those very local streets and roads have low amounts of traffic. It is beyond the state-of-the-practice to model the use of such low traffic roads. Nevertheless, the pattern of such local streets is depicted in the background in the roadway network graphic to provide context and aid understanding.



**Comparing Combinations of Future Development Activity and Transportation Networks:** Results of the Roadway Adequacy Analysis for FWO roadways are represented by the "brownhatched" bars shown in the arterial performance graphic, which disaggregates the overall performance of arterials in the FWO Policy Area to display them on an arterial-by-arterial basis. The comparison-combination used in this graphic is for the regulatory planning stage based on the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.



This arterial performance graphic has notes to help readers better understand how to interpret the chart, yet some elaboration can also be helpful. This exhibit displays the average roadway Level of Service for each of the named arterial segments within the FWO that were shown in the prior graphic. Towards the left, one of the bars is itself an average, in this case of 15 minor arterials roads. The sequencing of the roadways in this graphic, going from left to right, is in order of increasingly congested conditions in the peak flow direction.

Assessment of Areawide Roadway Adequacy for the FWO Policy Area: The overall weighted average for the FWO Policy Area is highlighted by the bar bordered in red near the center-right of the bars. The bottom of that highlighted bar for the Policy Area Average is just <u>above</u> the dashed and bolded horizontal line. That line represents the proposed Policy Area Adequacy Standard for Suburban Policy Areas, such as the FWO area. Therefore, the FWO Policy Area overall has adequate future areawide roadway traffic conditions for the combination for the regulatory planning stage, which analyzed the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.

# **F.** <u>Guidance to Local Area Transportation Review (LATR) in the FWO Policy Area</u>: The prior graphic shows that 9 of the depicted left-most arterial roads (and the 15 minor arterials not shown) have link-based peak period Level of Service that on average for the whole link-segment in the peak-flow direction is less congested that the Standard for an Suburban Policy Area, often considerably less. Yet the graphic also shows that there are 2 other roadway link-segments in the

FWO Policy Area that are <u>more</u> congested than the Standard for a Suburban Policy Area. Reading from right to the left in the prior graphic, locally inadequate congested conditions would be more likely found on parts of (a) MD 650 New Hampshire Ave, and (b) US 29 Columbia Pike. Particular attention should be given to the LATRs for proposed subdivisions that use those two major arterial roads for access to their proposed site. In addition, given the overall moderate to high volumes of traffic throughout many parts of the FWO Policy Area during peak periods, proposed subdivisions that would rely on other arterial roads serving the FWO area may also need to have focused attention on their LATR. In particular, such focus would be on the need for smaller-scale, localized, or site-specific improvements such as turn-lanes at nearby intersections, access or local circulation needs, bus stops, sidewalks, and so on.

**G.** <u>**Guidance for Conditional Transportation Solutions:</u>** The next graphic is similar to the prior one but instead the comparison-combination used in this graphic is for the transportation improvement planning stage that uses the 2022 forecast of Development Activity and the 2018 Programmed CIP and CTP plus selected "conditional projects", which could be implemented by the 10-year time-horizon of 2022. Green-hatched bars are used to better differentiate this set of results from the prior one. The growth in household and employment between 2018 and 2022, are estimated to cause the FWO Policy Area to lose the overall areawide adequate roadway conditions associated with the regulatory planning stage in the absence of identifying and beginning to program new "conditional projects". The prior analyses done for the Proposed TPAR in 2010 did consider a planned interchange of US 29 with Fairland Road. Although it was not considered in the TPAR12 Roadway Adequacy Analysis so far, it should become a conditional project and should be analyzed as such.</u>



While other options to improve the roadway network over the next 10 years in the FWO Policy Area are not being proposed, some potential future conditional projects can be found in Appendix E, the list of unbuilt Master Plan Projects. In addition, transit improvements and enhancements as well proactive traffic signal improvements could be undertaken to improve the functioning of the roadway network in this Policy Area. The prior graphic can be used as a guide in focusing on which roadways could receive such operational attention.

**H.** <u>Guidance for the Master Plan Stage</u>: The following graphic shows that while the FWO Policy Area would continue to not maintain its current regulatory stage overall roadway adequacy into the long term master plan stage, based on the 1997 Master Plan. It can also be seen that four additional roads would become very congested in the absence of further "conditional projects" from the Master Plan. Given this longer-term outlook, in the nearer term and mid-term emphasis should be given to developing a Fairland White Oak-specific Traffic Management and Operations program as well as a Transportation Demand Management program.</u>



## **Germantown West Policy Area**

A. <u>Overview of the Policy Area</u>: Germantown West (GTW) is categorized as a Suburban Policy Area, given the transit and development activity features of the area. This area is characterized by a MARC Commuter Rail – Amtrak stations (Germantown) and would be served by several stations of the Corridor Cities Transitway (CCT) when it is implemented at a future time. There is high population and moderate employment densities, and overall transit coverage of more than 30% of its area. Notable growth is occurring in the vicinity of the Germantown Town Center Area.

**B.** <u>Forecast of Development Activity</u>: The GTW Policy Area is forecast to grow during the regulatory planning stage of TPAR12 between 2010 and 2018 by about 894 households and 2,091 jobs. During the transportation improvement stage of TPAR12 between 2018 and 2022 growth would be about 1,269 households and 2,856 jobs more. During the master plan stage between 2022 and 2040 growth is forecast to be an additional 5,828 households and 12,208 jobs. While the household growth is low to moderate, and the job growth is high relatively to the current development activity, it is only a moderate but increasing share of the total growth in the County.</u>

Source of the Forecasts :	Но	usehol	d Foreca	sts beir	ng used l	by TPAF	R12	Em	ployme	nt Forec	asts be	ing used	by TPA	R12
Round 8.0 (revised) of the Regional Cooperative	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for
Forecasts	2010	2018	2018	2022	2022	2040	2040	2010	2018	2018	2022	2022	2040	2040
Germantown West	22,203		23,097		24,366		30,194	14,883		16,974		19,830		32,038
Growth in the Policy Area		894		1,269		5,828			2,091		2,856		12,208	
Percent Growth of Area		4.0%		5.5%		23.9%			14.0%		16.8%		61.6%	
Percent of County Growth		3.1%		7.9%		10.2%			3.4%		7.4%		9.9%	
Montgomery County	360,500		389,599		405,597		463,000	506,000		568,315		606,679		730,375
Growth in the County		29,099		15,998		57,403			62,315		38,364		123,696	

**C.** <u>**Programmed Transportation Improvements</u>:** There are two programmed projects to improve roadway capacity in the GTW area one to extend and connect Farther Hurley Boulevard to MD 118 Germantown Road, the other a circulation project related to Century Boulevard loop to Crystal Rock Drive. As also noted in the discussion of other Policy Areas, a "conditional project" has been identified to provide Peak Hour Headway improvements to about a dozen Ride-On routes that currently serve about 8 of the Suburban Policy Areas needing improved Peak Hour Headways to attain the Peak Headway Adequacy Standard</u>. Most of those dozen routes would directly serve more than one Policy Area, as well as indirectly serve a similar number of: (a) other Suburban Policy Areas combined with (b) several of the Urban Policy Areas. Such a "conditional project" could be implemented in a few increments over a few years or all at once. Interim ridership results and travel survey user responses would be monitored over time and refinements could be made along the way.

Ę	TPAR12 Sta	ging of County CIP and State CTP Projects (upda	ted to 3-21-12	2)		Cond.
Program Docume	Project Name	Improvement Type and/or Limits	Policy Area	Open by 2012	Prog. by 2018	Proj. by 2022
CIP	Father Hurley Blvd Extended	Wisteria Dr to Germantown Rd (MD 118) (4 lanes)	GTW	Y	Y	Y
CIP	Century Boulevard	Complete connecting loop road to Crystal Rock Drive (4 lanes)	GTW	Z	Y	Y
CIP	Ride-On Peak Headway Imprv.	Peak headway improvements: about 12 routes in about 8 Areas	Countywide	Ν	Some	Y



Metrobus Route and #



# **D.** Transit Adequacy Analysis:

The GTW Policy Area is currently well served by Commuter Rail and express bus service to Shady Grove Metro and would be well served by several stations of the Corridor Cities Transitway (CCT) when it is implemented at a future time.

Coverage of Service: About 48% of the GTW Policy Area is located within 1/3 of a mile of one of the 9 bus routes or currently serving the area, and with current Commuter Rail the future CCT in place that coverage within a 1/3 mile of a station would increase that percentage. The graphic to the left shows where in particular bus service coverage is provided in the GTW area. The standard for Coverage for a Suburban Policy Area is 30%. Therefore transit

coverage in the GTW Policy Area is adequate.

Peak Headways: All buses on average provide 21.8 minutes between buses during the weekday evening peak period in the GTW Policy Area. Some provide very frequent service such as the Route 100 Ride-on buses. In areas like GTW with Commuter Rail and future LRT, the standard for average Peak Headway is 20 minutes or less. Thus, the average peak headway for the GTW area is not yet adequate. A "conditional" countywide project to improve peak headways could attain adequacy within the next 10 years.

**Span of Service**: The average value of span is 18.6 hours per day for routes that operate all-day. The Suburban standard is 14.0 hours per day on average for all-day routes. Therefore transit span in the GTW Policy Area is adequate.

**E.** <u>Roadway Adequacy Analysis</u>: In the Roadway Adequacy Analysis all of the Policy Areas are analyzed together applying the regional travel demand model to Montgomery County specifics. Combinations consisting of future forecasts of development activity and future roadway and transit networks are analyzed and compared Countywide and within each Policy Area. The modeling results are summarized for each "comparison-combination" using a post-processing spreadsheet process to estimate overall arterial roadway performance for each of the Policy Areas as well as link-by-link performance of major and minor arterials within each area.</u>

**Modeling Network Level of Detail:** Major and minor arterial roads within the GTW Policy Area were analyzed for their future roadway performance for each of several future Countywide comparison-combinations. The following graphic shows those major and minor arterials used in the analysis. The freeway system of the region was also accounted for in the analysis but these performance results are not summarized. On-the-other-hand, the Roadway Adequacy Analysis does not account for truly local streets, minor roads, or even some of the minor arterials as those very local streets and roads have low amounts of traffic. It is beyond the state-of-the-practice to model the use of such low traffic roads. Nevertheless, the pattern of such local streets is depicted in the background in the roadway network graphic to provide context and aid understanding.



**Comparing Combinations of Future Development Activity and Transportation Networks:** Results of the Roadway Adequacy Analysis for GTW roadways are represented by the "brownhatched" bars shown in the arterial performance graphic, which disaggregates the overall performance of arterials in the GTW Policy Area to display them on an arterial-by-arterial basis. The comparison-combination used in this graphic is for the regulatory planning stage based on the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.



This arterial performance graphic has notes to help readers better understand how to interpret the chart, yet some elaboration can also be help. This exhibit displays the average roadway Level of Service for each of the named arterial segments within the GTW that were shown in the prior graphic. Two from the left, one of the bars is itself an average, in this case of 9 minor arterial roads. The sequencing of the roadways in this graphic, going from left to right, is in order of increasingly congested conditions in the peak flow direction.

Assessment of Areawide Roadway Adequacy for the GTW Policy Area: The overall weighted average for the GTW Policy Area is highlighted by the bar bordered in red near the center-right of the bars. The bottom of that highlighted bar for the Policy Area Average is <u>above</u> the dashed and bolded horizontal line. That line represents the proposed Policy Area Adequacy Standard for Urban Policy Areas, such as the GTW area. Therefore, the GTW Policy Area overall has adequate future areawide roadway traffic conditions for the combination for the regulatory planning stage, which analyzed the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.

**F.** <u>**Guidance to Local Area Transportation Review (LATR) in the GTW Policy Area</u>: The prior graphic shows that none of the depicted left-most arterial roads (and the 9 minor arterials not shown) have link-based peak period Level of Service that on average for the whole link-segment in the peak-flow direction is less congested that the Standard for an Urban Policy Area, often considerably less.** Nevertheless, particular attention should be given to the LATRs for</u>

proposed subdivisions that use some of the more congested arterial roads for access to their proposed site.

In addition, given the overall light-to-moderate volumes of traffic throughout many parts of the GTW Policy Area during peak periods, proposed subdivisions that would rely on other arterial roads serving the GTW area may also need to have focused attention on their LATR. In particular, such focus would be on the need for smaller-scale, localized, or site-specific improvements such as turn-lanes at nearby intersections, access or local circulation needs, bus stops, sidewalks, and so on.

**G.** <u>Guidance for Conditional Transportation Solutions</u>: The next graphic is similar to the prior one but instead the comparison-combination used in this graphic is for the transportation improvement planning stage that uses the 2022 forecast of Development Activity and the 2018 Programmed CIP and CTP plus selected "conditional projects", which could be implemented by the 10-year time-horizon of 2022.. "Green-hatched" bars are used to better differentiate this set of results from the prior one. The growth in households and employment between 2018 and 2022, are estimated not to cause the GTW Policy Area to lose the overall areawide adequate roadway conditions associated with the regulatory planning stage – as such, finding additional solutions was not emphasized at this time.</u>



While other options to improve the roadway network over the next 10 years in the GTW Policy Area are not being proposed, some potential future conditional projects can be found in Appendix E, the list of unbuilt Master Plan Projects. In addition, transit improvements and enhancements as well proactive traffic signal improvements could be undertaken to improve the functioning of the roadway network in this Policy Area. The prior graphic can be used as a guide in focusing on which roadways could receive such operational attention.

**H.** <u>Guidance for the Master Plan Stage</u>: The following graphic shows that while the GTW Policy Area would continue to maintain its current regulatory stage overall roadway adequacy into the long term master plan stage. It can also be seen however, that two of the roads segments in the area would likely become congested in the absence of further "conditional projects" from the Master Plan. Given this longer-term outlook, in the nearer term and mid-term emphasis should be given to developing a Germantown-specific Traffic Management and Operations program.



# Montgomery Village / Airpark Policy Area

A. <u>Overview of the Policy Area</u>: Montgomery Village / Airpark (MVA) is categorized as a Suburban Policy Area, given the transit and development activity features of the area. This area is served by bus transit service, high population and moderate employment densities, and overall transit coverage of more than 30% of its area.

**B.** <u>Forecast of Development Activity</u>: The MVA Policy Area is forecast to grow during the regulatory planning stage of TPAR12 between 2010 and 2018 by about 110 households and 644 jobs. During the transportation improvement stage of TPAR12 between 2018 and 2022 growth would be about 20 households and 219 jobs more. During the master plan stage between 2022 and 2040 growth is forecast to be an additional 32 households and 924 jobs. This growth is low, particularly in terms of the number of households and the employment growth would be a small (1 percent or less) share of the total growth in the County.</u>

Source of the Forecasts :	Но	usehol	d Foreca	sts beir	ng used l	by TPAF	R12	Em	ployme	nt Forec	asts be	ing used	by TPA	R12
Round 8.0 (revised) of the Regional Cooperative	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for
Forecasts	2010	2018	2018	2022	2022	2040	2040	2010	2018	2018	2022	2022	2040	2040
Mont. Village/Airpark	18,520		18,630		18,650		18,682	11,594		12,238		12,457		13,381
Growth in the Policy Area		110		20		32			644		219		924	
Percent Growth of Area		0.6%		0.1%		0.2%			5.6%		1.8%		7.4%	
Percent of County Growth		0.4%		0.1%		0.1%			1.0%		0.6%		0.7%	
Montgomery County	360,500		389,599		405,597		463,000	506,000		568,315		606,679		730,375
Growth in the County		29,099		15,998		57,403			62,315		38,364		123,696	

**C.** <u>**Programmed Transportation Improvements**</u>: There are three programmed projects to improve roadway capacity in the MVA area including recent improvements to parts of MD 124 Woodfield Road and two parts of a staged improvement to parts of Snouffer School Road.

ut _	TPAR12 Stagi	ng of County CIP and State CTP Projects (u)	odated to 3-	-21-12)		Cond.
Program Docume	Project Name	Improvement Type and/or Limits	Policy Area	Open by 2012	Prog. by 2018	Proj. by 2022
CIP	Snouffer School Road	Sweet Autumn Drive to Centerway Road (5 lanes)	MVA	Ν	Y	Y
CIP	Snouffer School Road North	Centerway Rd to Ridge Heights Drive (4 lanes) (Webb Tract)	MVA	Ν	Y	Y
СТР	Woodfield Rd. (MD 124)	Airpark Road to Fieldcrest Road (6 lanes)	MVA	Y	Υ	Y



#### D. Transit Adequacy Analysis:

The MVA Policy Area has adequate bus transit service in terms of each of the three service factors: Coverage, Peak Headway and Span of Service.

Coverage of Service: About 47% of the MVA Policy Area is located within 1/3 of a mile of one of the 9 bus routes currently serving the area. The graphic to the left shows where in particular bus service coverage is provided in the MVA area. One of those routes is the J7/J9 Metrobus route that terminates at the Transit Center adjacent to Lakeforest Mall and that center is within walking distance of parts of the southern portion of Montgomery Village. The standard for Coverage for a Suburban Policy Area is 30%. Metrobus Route and # Therefore transit coverage in the MVA Policy Area is adequate.



**Peak Headways:** All buses on average provide 19.4 minutes between buses during the weekday evening peak period in the MVA Policy Area. In areas like MVA where only buses are provided, the standard for average Peak Headway is 20 minutes or less. Thus, the average peak headway for the MVA area is adequate. A "conditional" countywide project to directly improve peak headways in nearby areas could indirectly further improve Peak Headways in the MVA area within the next 10 years.

**Span of Service**: The average value of span is 18.0 hours per day for routes that operate all-day. The urban standard is 14.0 hours per day on average for all-day routes. Therefore transit span in the MVA Policy Area is adequate. **E.** <u>Roadway Adequacy Analysis</u>: In the Roadway Adequacy Analysis all of the Policy Areas are analyzed together applying the regional travel demand model to Montgomery County specifics. Combinations consisting of future forecasts of development activity and future roadway and transit networks are analyzed and compared Countywide and within each Policy Area. The modeling results are summarized for each "comparison-combination" using a post-processing spreadsheet process to estimate overall arterial roadway performance for each of the Policy Areas as well as link-by-link performance of major and minor arterials within each area.</u>

**Modeling Network Level of Detail:** Major and minor arterial roads within the MVA Policy Area were analyzed for their future roadway performance for each of several future Countywide comparison-combinations. The following graphic shows those major and minor arterials used in the analysis. The freeway system of the region was also accounted for in the analysis but these performance results are not summarized. On-the-other-hand, the Roadway Adequacy Analysis does not account for truly local streets, minor roads, or even some minor arterials as those very local streets and roads have low amounts of traffic. It is beyond the state-of-the-practice to model the use of such low traffic roads. Nevertheless, the pattern of such local streets is shown as background in the roadway network graphic to provide context and facilitate understanding.



**Comparing Combinations of Future Development Activity and Transportation Networks:** Results of the Roadway Adequacy Analysis for MVA roadways are represented by the "brownhatched" bars shown in the arterial performance graphic, which disaggregates the overall performance of arterials in the MVA Policy Area to display them on an arterial-by-arterial basis. The comparison-combination used in this graphic is for the regulatory planning stage based on the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.



This arterial performance graphic has notes to help readers better understand how to interpret the chart, yet some elaboration can also be helpful. This exhibit displays the average roadway Level of Service for each of the named arterial segments within the MVA that were shown in the prior graphic. Towards the left, one of the bars is itself an average, in this case of 6 minor arterial roads. The sequencing of the roadways in this graphic, going from left to right, is in order of increasingly congested conditions in the peak flow direction.

Assessment of Areawide Roadway Adequacy for the MVA Policy Area: The overall weighted average for the MVA Policy Area is highlighted by the bar bordered in red near the center-right of the bars. The bottom of that highlighted bar for the Policy Area Average is <u>above</u> the dashed and bolded horizontal line. That line represents the proposed Policy Area Adequacy Standard for Suburban Policy Areas, such as the MVA area. Therefore, the MVA Policy Area overall has adequate future areawide roadway traffic conditions for the combination for the regulatory planning stage, which analyzed the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.

**F.** <u>**Guidance to Local Area Transportation Review (LATR) in the MVA Policy Area</u>: The prior graphic shows that 5 of the depicted left-most arterial roads (and the 6 minor arterials not shown) have link-based peak period Level of Service that on average for the whole link-segment in the peak-flow direction is less congested that the Standard for a Suburban Policy Area, often considerably less. Yet the graphic also shows that there are 3 other roadway link-segments in the</u>** 

MVA Policy Area that are <u>more</u> congested than the Standard for a Suburban Policy Area. Reading from right to the left in the prior graphic, locally inadequate congested conditions would be more likely found on parts of: (a) Emory Grove Road, (b) Watkins Mill Rd, and (c) Goshen Road. Particular attention should be given to the LATRs for proposed subdivisions that use those arterial roads for access to their proposed site.

In addition, given the overall high volumes of traffic throughout many parts of the MVA Policy Area during peak periods, proposed subdivisions that would rely on other arterial roads serving the MVA area may also need to have focused attention on their LATR. In particular, such focus would be on the need for smaller-scale, localized, or site-specific improvements such as turnlanes at nearby intersections, access or local circulation needs, bus stops, sidewalks, and so on.

**G.** <u>Guidance for Conditional Transportation Solutions</u>: The next graphic is similar to the prior one but instead the comparison-combination used in this graphic is for the transportation improvement planning stage that uses the 2022 forecast of Development Activity and the 2018 Programmed CIP and CTP plus selected "conditional projects", which could be implemented by the 10-year time-horizon of 2022... "Green-hatched" bars are used to better differentiate this set of results from the prior one. The growth in household and employment between 2018 and 2022, are estimated not to cause the MVA Policy Area to lose the overall areawide adequate roadway conditions associated with the regulatory planning stage – as such, finding additional solutions was not emphasized, although some potential conditional projects are discussed next.</u>



Goshen Rd and perhaps Watkins Mill Rd could be considered as potential conditional projects. However, both also point to a continued long term need for improved through movement as well as some access, such as could be provided by one of the Mid County Highway alternatives between GTE, MVA, and GBG. While other options to improve the roadway network over the next 10 years in the MVA Policy Area are not being proposed, some potential future conditional projects can be found in Appendix E, the list of unbuilt Master Plan Projects. In addition, transit improvements and enhancements as well proactive traffic signal improvements could be undertaken to improve the functioning of the roadway network in this Policy Area. The prior graphic can be used as a guide in focusing on which roadways could receive such operational attention.

**H.** <u>Guidance for the Master Plan Stage</u>: The following graphic shows that the MVA Policy Area would not maintain its current regulatory stage overall roadway adequacy into the long-term master plan stage. It can also be seen that two additional roads (Montgomery Village Avenue and MD 124 (Woodfield Rd) would become somewhat congested in the peak flow direction in the absence of further "conditional projects" from the Master Plan. Given this longer-term outlook, in the nearer term and mid-term emphasis should be given to developing a MVA-specific Traffic Management and Operations program as well as a Transportation Demand Management program.



# **Aspen Hill Policy Area**

A. <u>Overview of the Policy Area</u>: Aspen Hill (AH) is categorized as a Suburban Policy Area, given the transit and development activity features of the area. This area is served by bus transit service, high population and low employment densities, and overall transit coverage of more than 30% of its area. There is no notable growth that recently occurred or is expected to occur in this Policy Area. The large retirement community of Leisure World is located in the AH Policy Area. The recently opened MD 200 (Intercounty County Connector) traverses the eastern part of the area and access and egress is provided by an interchange at MD 182 Layhill Rd.

**B.** <u>Forecast of Development Activity</u>: The AH Policy Area is forecast to grow during the regulatory planning stage of TPAR12 between 2010 and 2018 by about 195 households and 53 jobs. During the transportation improvement stage of TPAR12 between 2018 and 2022 growth would be about 26 households and 14 jobs more. During the master plan stage between 2022 and 2040 growth is forecast to be an additional 97 households and 75 jobs. This growth is very low and results in this area having very low shares of the total growth in the County.

Source of the Forecasts :	Но	usehol	d Foreca	sts beir	ng used l	by TPAF	R12	Em	ployme	nt Forec	asts be	ing used	by TPA	R12
Round 8.0 (revised) of the Regional Cooperative	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for
Forecasts	2010	2018	2018	2022	2022	2040	2040	2010	2018	2018	2022	2022	2040	2040
Aspen Hill	24,699		24,894		24,920		25,017	7,175		7,228		7,242		7,317
Growth in the Policy Area		195		26		97			53		14		75	
Percent Growth of Area		0.8%		0.1%		0.4%			0.7%		0.2%		<b>1.0%</b>	
Percent of County Growth		0.7%		0.2%		0.2%			0.1%		0.0%		0.1%	
Montgomery County	360,500		389,599		405,597		463,000	506,000		568,315		606,679		730,375
Growth in the County		29,099		15,998		57,403			62,315		38,364		123,696	

**C.** <u>**Programmed Transportation Improvements**</u>: There are no programmed projects to improve roadway or transit projects that would directly serve this area.

_ t	TPAR12 Stagii	ng of County CIP and State CTP Projects (u)	odated to 3-	21-12)		Cond.
Program Docume	Project Name	Improvement Type and/or Limits	Policy Area	Open by 2012	Prog. by 2018	Proj. by 2022
			AH			



#### D. Transit Adequacy Analysis:

The AH Policy Area has adequate bus transit service in terms of each of the three service factors: Coverage, Peak Headway and Span of Service.

**Coverage of Service:** About 44% of the AH Policy Area is located within 1/3 of a mile of one of the 11 bus routes currently serving the area. The graphic to the left shows where in particular bus service coverage is provided in the AH area. The standard for Coverage for a Suburban Policy Area is 30%. Therefore transit coverage in the AH Policy Area is adequate.



Peak Headways: All buses on average provide 19.9 minutes between buses during the weekday evening peak period in the AH Policy Area. Some provide very frequent service such as the O1/O2Metrobuses. In areas like AH where only buses are provided, the standard for average Peak Headway is 20 minutes or less. Thus, the average peak headway for the AH area is adequate. A "conditional" countywide project to directly improve peak headways in nearby areas could indirectly further improve Peak Headways in the AH area within the next 10 years.

**Span of Service**: The average value of span is 19.3 hours per day for routes that operate all-day. The urban standard is 14 hours per day on average for all-day routes. Therefore transit span in the AH Policy Area is adequate. **E.** <u>Roadway Adequacy Analysis</u>: In the Roadway Adequacy Analysis all of the Policy Areas are analyzed together applying the regional travel demand model to Montgomery County specifics. Combinations consisting of future forecasts of development activity and future roadway and transit networks are analyzed and compared Countywide and within each Policy Area. The modeling results are summarized for each "comparison-combination" using a post-processing spreadsheet process to estimate overall arterial roadway performance for each of the Policy Areas as well as link-by-link performance of major and minor arterials within each area.</u>

**Modeling Network Level of Detail:** Major and minor arterial roads within the AH Policy Area were analyzed for their future roadway performance for each of several future Countywide comparison-combinations. The following graphic shows those major and minor arterials used in the analysis. The freeway system of the region was also accounted for in the analysis but these performance results are not summarized. On-the-other-hand, the Roadway Adequacy Analysis does not account for truly local streets, minor roads, or even some of the minor arterials as those very local streets and roads have low amounts of traffic. It is beyond the state-of-the-practice to model the use of such low traffic roads. Nevertheless, the pattern of such local streets is depicted in the background in the roadway network graphic to provide context and aid understanding.



**Comparing Combinations of Future Development Activity and Transportation Networks:** Results of the Roadway Adequacy Analysis for AH roadways are represented by the "brownhatched" bars shown in the arterial performance graphic, which disaggregates the overall performance of arterials in the AH Policy Area to display them on an arterial-by-arterial basis. The comparison-combination used in this graphic is for the regulatory planning stage based on the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.



This arterial performance graphic has notes to help readers better understand how to interpret the chart, yet some elaboration can also be helpful. This exhibit displays the average roadway Level of Service for each of the named arterial segments within the AH that were shown in the prior graphic. Towards the left, one of the bars is itself an average, in this case of 4 minor arterials roads. The sequencing of the roadways in this graphic, going from left to right, is in order of increasingly congested conditions in the peak flow direction.

Assessment of Areawide Roadway Adequacy for the AH Policy Area: The overall weighted average for the AH Policy Area is highlighted by the bar bordered in red near the center-right of the bars. The bottom of that highlighted bar for the Policy Area Average is <u>above</u> the dashed and bolded horizontal line. That line represents the proposed Policy Area Adequacy Standard for Suburban Policy Areas, such as the AH area. Therefore, the AH Policy Area overall has adequate future areawide roadway traffic conditions for the combination for the regulatory planning stage, which analyzed the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.

**F.** <u>**Guidance to Local Area Transportation Review (LATR) in the AH Policy Area**</u>: The prior graphic shows that 6 of the depicted left-most arterial roads (and the 4 minor arterials not shown) have link-based peak period Level of Service that on average for the whole link-segment in the peak-flow direction is less congested that the Standard for a Suburban Policy Area, often considerably less. Yet the graphic also shows that there are some 5 other roadway link-segments

in the AH Policy Area that are <u>more</u> congested than the Standard for a Suburban Policy Area. Reading from right to the left in the prior graphic, locally inadequate congested conditions would be more likely found on parts of: (a) MD 97 Georgia Ave, (b) MD 115 Muncaster Mill Rd, (c) Aspen Hill Rd, (d) MD 28 Norbeck Rd, and (e) MD586 Veirs Mill Rd. Particular attention should be given to the LATRs for proposed subdivisions that use those arterial roads for access to their proposed site.

In addition, given the overall high volumes of traffic throughout many parts of the AH Policy Area during peak periods, proposed subdivisions that would rely on other arterial roads serving the AH area may also need to have focused attention on their LATR. In particular, such focus would be on the need for smaller-scale, localized, or site-specific improvements such as turnlanes at nearby intersections, access or local circulation needs, bus stops, sidewalks, and so on.

**G.** <u>**Guidance for Conditional Transportation Solutions</u>:** The next graphic is similar to the prior one but instead the comparison-combination used in this graphic is for the transportation improvement planning stage that uses the 2022 forecast of Development Activity and the 2018 Programmed CIP and CTP plus selected "conditional projects", which could be implemented by the 10-year time-horizon of 2022.. "Green-hatched" bars are used to better differentiate this set of results from the prior one. The growth in households and employment between 2018 and 2022, are estimated not to cause the AH Policy Area to lose the overall areawide adequate roadway conditions associated with the regulatory planning stage – as such, finding additional solutions was not emphasized</u>



While other options to improve the roadway network over the next 10 years in the AH Policy Area are not being proposed, some potential future conditional projects can be found in Appendix E, the list of unbuilt Master Plan Projects. In addition, transit improvements and enhancements as well proactive traffic signal improvements could be undertaken to improve the functioning of the roadway network in this Policy Area. The prior graphic can be used as a guide in focusing on which roadways could receive such operational attention.

**H.** <u>Guidance for the Master Plan Stage</u>: The following graphic shows that the AH Policy Area would not maintain its current regulatory stage overall roadway adequacy into the long term master plan stage. It can also be seen that one or two additional roads would become very congested in the absence of further "conditional projects" from the Master Plan. Given this longer-term outlook, in the nearer term and mid-term emphasis should be given to developing a Aspen Hill-specific Traffic Management and Operations program.



# **Germantown East Policy Area**

A. <u>Overview of the Policy Area</u>: Germantown East (GTE) is categorized as a Suburban Policy Area, given the transit and development activity features of the area. There is moderate population and moderate employment densities, and overall transit coverage of more than 30% of its area. Notable growth is occurring associated with the Master Plan recommendations for the Germantown Employment Area.

**B.** <u>Forecast of Development Activity</u>: The GTE Policy Area is forecast to grow during the regulatory planning stage of TPAR12 between 2010 and 2018 by about 313 households and 2,019 jobs. During the transportation improvement stage of TPAR12 between 2018 and 2022 growth would be about 595 households and 2,118 jobs more. During the master plan stage between 2022 and 2040 growth is forecast to be an additional 2,111 households and 9,427 jobs. While the household growth is low-to-moderate and the job growth is high relative to the current development activity, it is only a moderate but increasing share of the total growth in the County.</u>

Source of the Forecasts :	Household Forecasts being used by TPAR12							Employment Forecasts being used by TPAR						R12
Round 8.0 (revised) of the Regional Cooperative	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for
Forecasts	2010	2018	2018	2022	2022	2040	2040	2010	2018	2018	2022	2022	2040	2040
Germantown East	8,097		8,410		9,005		11,116	9,896		11,915		14,033		23,460
Growth in the Policy Area		313		595		2,111			2,019		2,118		9,427	
Percent Growth of Area	1	3.9%		7.1%		23.4%			20.4%		17.8%		67.2%	
Percent of County Growth	1	1.1%		3.7%		3.7%			3.2%		5.5%		7.6%	
Montgomery County	360,500		389,599		405,597		463,000	506,000		568,315		606,679		730,375
Growth in the County		29,099		15,998		57,403			62,315		38,364		123,696	

**C.** <u>**Programmed Transportation Improvements</u>**: There are no programmed projects to improve roadway or transit capacity in the GTE area. As also noted in the discussion of other selected Policy Areas, a "conditional project" has been identified to provide Peak Hour Headway improvements to about a dozen Ride-On routes that currently serve about 8 of the Suburban Policy Areas needing improved Peak Hour Headways to attain the Peak Headway Adequacy Standard. Most of those dozen routes would directly serve more than one Policy Area, as well as indirectly serve a similar number of: (a) other Suburban Policy Areas combined with (b) several of the Urban Policy Areas. Such a "conditional project" could be implemented in a few increments over a few years or all at once. Interim ridership results and user travel survey responses would be monitored over time and refinements could be made along the way.</u>

_ Ħ	TPAR12 Staging of County CIP and State CTP Projects (updated to 3-21-12)								
Jram	Ductorst Name	land the second terms and the second second		Open	Prog.	Proj.			
Proç Doci	Project Name	Improvement Type and/or Limits	Policy Area	by 2012	by 2018	2022			
CIP	Ride-On Peak Headway Imprv.	Peak headway improvements: about 12 routes in about 8 Areas	Countywide	Ν	Some	Y			


D. Transit Adequacy Analysis:

The GTE Policy Area has adequate coverage and span of service but is not yet adequate in terms of Peak Headway.

**Coverage of Service:** About 39% of the GTE Policy Area is located within 1/3 of a mile of one of the 5 bus routes currently serving the area. The graphic to the left shows where in particular bus service coverage is provided in the GTE area. The standard for Coverage for a Suburban Policy Area is 30%. Therefore transit coverage in the GTE Policy Area is adequate.



Peak Headways: All buses on average provide 21.4 minutes between buses during the weekday evening peak period in the GTE Policy Area. Some provide moderately frequent service is provided by two of the Ride-On routes, No. 55 and No. 70, the latter of which only operates in the morning and afternoon peaks. In areas like GTE where only buses are provided, the standard for average Peak Headway is 20 minutes or less. Thus, the average peak headway for the GTE area is not yet adequate. A "conditional" countywide project to improve peak headways could attain adequacy within the next 10 years.

**Span of Service**: The average value of span is 17.8 hours per day for the three routes that operate all-day. The Suburban standard is 14.0 hours per day on average for all-day routes. Therefore transit span in the GTE Policy Area is adequate. **E.** <u>Roadway Adequacy Analysis</u>: In the Roadway Adequacy Analysis all of the Policy Areas are analyzed together applying the regional travel demand model to Montgomery County specifics. Combinations consisting of future forecasts of development activity and future roadway and transit networks are analyzed and compared Countywide and within each Policy Area. The modeling results are summarized for each "comparison-combination" using a post-processing spreadsheet process to estimate overall arterial roadway performance for each of the Policy Areas as well as link-by-link performance of major and minor arterials within each area.</u>

**Modeling Network Level of Detail:** Major and minor arterial roads within the GTE Policy Area were analyzed for their future roadway performance for each of several future Countywide comparison-combinations. The following graphic shows those major and minor arterials used in the analysis. The freeway system of the region was also accounted for in the analysis but these performance results are not summarized. On-the-other-hand, the Roadway Adequacy Analysis does not account for truly local streets, minor roads, or even some of the minor arterials as those very local streets and roads have low amounts of traffic. It is beyond the state-of-the-practice to model the use of such low traffic roads. Nevertheless, the pattern of such local streets is depicted in the background in the roadway network graphic to provide context and understanding.



**Comparing Combinations of Future Development Activity and Transportation Networks:** Results of the Roadway Adequacy Analysis for GTE roadways are represented by the "brownhatched" bars shown in the arterial performance graphic, which disaggregates the overall performance of arterials in the GTE Policy Area to display them on an arterial-by-arterial basis. The comparison-combination used in this graphic is for the regulatory planning stage based on the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.



This arterial performance graphic has notes to help readers better understand how to interpret the chart, yet some elaboration can also be helpful. This exhibit displays the average roadway Level of Service for each of the named arterial segments within the GTE that were shown in the prior graphic. The sequencing of the roadways in this graphic, going from left to right, is in order of increasingly congested conditions in the peak flow direction.

Assessment of Areawide Roadway Adequacy for the GTE Policy Area: The overall weighted average for the GTE Policy Area is highlighted by the bar bordered in red near the center-right of the bars. The bottom of that highlighted bar for the Policy Area Average is <u>above</u> the dashed and bolded horizontal line. That line represents the proposed Policy Area Adequacy Standard for Urban Policy Areas, such as the GTE area. Therefore, the GTE Policy Area overall has adequate future areawide roadway traffic conditions for the combination for the regulatory planning stage, which analyzed the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.

**F.** <u>Guidance to Local Area Transportation Review (LATR) in the GTE Policy Area</u>: The prior graphic shows that seven of the depicted left-most arterial roads have link-based peak period Level of Service that on average for the whole link-segment in the peak-flow direction is <u>less</u> congested that the Standard for a Suburban Policy Area, some considerably less congested. Yet the graphic also shows that there are two other roadway link-segments in the GTE Policy Area that are <u>more</u> congested than the Standard for a Suburban Policy Area. Reading from right

to the left in the prior graphic, locally inadequate congested conditions would be more likely found on parts of: a) MD 355 Frederick Road and (b) Brink Road. Particular attention should be given to the LATRs for proposed subdivisions that use those arterial roads for access to their proposed site. In addition, given the overall moderate-to-high volumes of traffic throughout many parts of the GTE Policy Area during peak periods, proposed subdivisions that would rely on other arterial roads serving the GTE area may also need to have focused attention on their LATR. In particular, such focus would be on the need for smaller-scale, localized, or site-specific improvements, including turn-lanes at nearby intersections, access or local circulation needs, bus stops and sidewalks.

**G.** <u>**Guidance for Conditional Transportation Solutions</u>:** The next graphic is similar to the prior one but instead the comparison-combination used in this graphic is for the transportation improvement planning stage that uses the 2022 forecast of Development Activity and the 2018 Programmed CIP and CTP plus selected "conditional projects", which could be implemented by the 10-year time-horizon of 2022.. "Green-hatched" bars are used to better differentiate this set of results from the prior one. The growth in household and employment between 2018 and 2022, are estimated not to cause the GTE Policy Area to lose the overall areawide adequate roadway conditions associated with the regulatory planning stage – as such, finding additional solutions was not emphasized at this time. However, it is noted that the peak traffic flow congestion on MD 27 Ridge Road, Brink Road and MD 355 Frederick Road are forecasted, on average, to be more congested than the areawide standard.</u>



While other options to improve the roadway network over the next 10 years in the GTE Policy Area are not being proposed, some potential future conditional projects can be found in Appendix E, the list of unbuilt Master Plan Projects. In addition, transit improvements and enhancements as well proactive traffic signal improvements could be undertaken to improve the functioning of the roadway network in this Policy Area. The prior graphic can be used as a guide in focusing on which roadways could receive such operational attention.

**H.** <u>Guidance for the Master Plan Stage</u>: The following graphic shows that while the GTE Policy Area would not maintain its current regulatory stage overall roadway adequacy into the long-term, master plan stage. It can also be seen that two additional roads, MD 27 Ridge Road and Germantown Road, would become more congested than forecast for the regulatory time period in the absence of further "conditional projects" from the Master Plan. Given this longer-term outlook, in the nearer term and mid-term emphasis should be given to developing a GTE-specific Traffic Management and Operations program as well as a Transportation Demand Management program to serve the growing employment concentrations in the area. The analyses done for the Proposed TPAR10 considered parts of Midcounty Highway extended as a potential "conditional" project and it appears that future TPAR adequacy analyses may need to consider that further.



# **Cloverly Policy Area**

A. <u>Overview of the Policy Area</u>: Cloverly (CLV) is categorized as a Suburban Policy Area, given the transit and development activity features of the area. This area is served by bus transit service, low population and extremely low employment densities, and overall transit coverage of just at 30% of its area. There is no notable growth that recently occurred or is expected to occur in this Policy Area. The recently opened MD 200 (Intercounty County Connector) traverses the southern boundary of the CLV area and access and egress is provided by an interchange at MD 650 New Hampshire Avenue.

**B.** <u>Forecast of Development Activity</u>: The CLV Policy Area is forecast to grow during the regulatory planning stage of TPAR12 between 2010 and 2018 by about 58 households and 0 jobs. During the transportation improvement stage of TPAR12 between 2018 and 2022 growth would be about 29 households and 0 jobs more. During the master plan stage between 2022 and 2040 growth is forecast to be an additional 22 households and 0 jobs. This growth is extremely low in terms of past growth in the area as well as a share of the total growth in the County.

Source of the Forecasts :	Но	usehol	d Foreca	sts beir	ng used l	by TPAF	R12	Em	ployme	nt Forec	asts be	ing used	by TPA	R12
Round 8.0 (revised) of the Regional Cooperative	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for
Forecasts	2010	2018	2018	2022	2022	2040	2040	2010	2018	2018	2022	2022	2040	2040
Cloverly	5,312		5,370		5,399		5,421	1,607		1,607		1,607		1,607
Growth in the Policy Area		58		29		22			0		0		0	
Percent Growth of Area		1.1%		0.5%		0.4%			0.0%		0.0%		0.0%	
Percent of County Growth		0.2%		0.2%		0.0%			0.0%		0.0%		0.0%	
Montgomery County	360,500		389,599		405,597		463,000	506,000		568,315		606,679		730,375
Growth in the County		29,099		15,998		57,403			62,315		38,364		123,696	

**C.** <u>**Programmed Transportation Improvements</u>**: There are no programmed projects to improve roadway capacity in the CLV area. As also noted in the discussion of other Policy Areas, a "conditional project" has been identified to provide Peak Hour Headway improvements to about a dozen Ride-On routes that currently serve about 8 of the Suburban Policy Areas needing improved Peak Hour Headways to attain the Peak Headway Adequacy Standard. Most of those dozen routes would directly serve more than one Policy Area, as well as indirectly serve a similar number of: (a) other Suburban Policy Areas combined with (b) several of the Urban Policy Areas. Such a "conditional project" could be implemented in a few increments over a few years or all at once. Interim ridership results and travel survey user responses would be monitored over time and refinements could be made along the way.</u>

t	TPAR12 Sta	ging of County CIP and State CTP Projects	(updated to 3-21	-12)		С	ond.
Program Docume	Project Name	Improvement Type and/or Limits	Policy Area	Open by 2012	Prog. by 2018	F 2	² roj. by 2022
CIP	Ride-On Peak Headway Imprv.	Peak headway improvements: about 12 routes in about 8 Areas	Countywide	Ν	Some		Υ





#### D. Transit Adequacy Analysis:

The CLV Policy Area does not yet have adequate transit service in terms of the factors of Peak Headway and in terms of the factor of Span of service. It is right at the standard of having adequate Coverage.

**Coverage of Service:** About 30% of the CLV Policy Area is located within 1/3 of a mile of one of the 2 bus routes currently serving the area. The graphic to the left shows where in particular bus service coverage is provided in the CLV area. The standard for Coverage for a Suburban Policy Area is 30%. Therefore transit coverage in the CLV Policy Area is adequate.

**Peak Headways:** All buses on average provide 26.5 minutes between buses during the weekday evening peak period in the CLV Policy Area. In bus serviced areas like CLV the standard for average Peak Headway is 20 minutes or less. Thus, the average peak headway for the CLV area is not yet adequate. A "conditional" countywide project could directly improve peak headways in the CLV area and the area could attain adequacy within the next 10 years.

**Span of Service**:. Both bus routes serving the CLV area currently only provide peak period and not all-day service. The Suburban standard is 14.0 hours per day on average for all-day routes. Therefore transit span in the CLV Policy Area is not yet adequate. It is may be feasible to change the bus schedule for one of the routes to provide improved Span as part of the Peak Headway "conditional" project. **E.** <u>Roadway Adequacy Analysis</u>: In the Roadway Adequacy Analysis all of the Policy Areas are analyzed together applying the regional travel demand model to Montgomery County specifics. Combinations consisting of future forecasts of development activity and future roadway and transit networks are analyzed and compared Countywide and within each Policy Area. The modeling results are summarized for each "comparison-combination" using a post-processing spreadsheet process to estimate overall arterial roadway performance for each of the Policy Areas as well as link-by-link performance of major and minor arterials within each area.</u>

**Modeling Network Level of Detail:** Major and minor arterial roads within the CLV Policy Area were analyzed for their future roadway performance for each of several future Countywide comparison-combinations. The following graphic shows those major and minor arterials used in the analysis. The freeway system of the region was also accounted for in the analysis but these performance results are not summarized. On-the-other-hand, the Roadway Adequacy Analysis does not account for truly local streets, minor roads, or even some of the minor arterials as those very local streets and roads have low amounts of traffic. It is beyond the state-of-the-practice to model the use of such low traffic roads. Nevertheless, the pattern of such local streets is depicted in the background in the roadway network graphic to provide context and aid understanding.



**Comparing Combinations of Future Development Activity and Transportation Networks:** Results of the Roadway Adequacy Analysis for CLV roadways are represented by the "brownhatched" bars shown in the arterial performance graphic, which disaggregates the overall performance of arterials in the CLV Policy Area to display them on an arterial-by-arterial basis. The comparison-combination used in this graphic is for the regulatory planning stage based on the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.



This arterial performance graphic has notes to help readers better understand how to interpret the chart, yet some elaboration can also be helpful. This exhibit displays the average roadway Level of Service for each of the named arterial segments within the CLV that were shown in the prior graphic. The sequencing of the roadways in this graphic, going from left to right, is in order of increasingly congested conditions in the peak flow direction.

Assessment of Areawide Roadway Adequacy for the CLV Policy Area: The overall weighted average for the CLV Policy Area is highlighted by the bar bordered in red near the center-right of the bars. The bottom of that highlighted bar for the Policy Area Average is <u>above</u> the dashed and bolded horizontal line. That line represents the proposed Policy Area Adequacy Standard for Urban Policy Areas, such as the CLV area. Therefore, the CLV Policy Area overall has adequate future areawide roadway traffic conditions for the combination for the regulatory planning stage, which analyzed the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.

**F.** <u>Guidance to Local Area Transportation Review (LATR) in the CLV Policy Area</u>: The prior graphic shows that all of the depicted seven arterial roads have link-based peak period Level of Service that on average for the whole link-segment in the peak-flow direction is <u>less</u> congested that the Standard for a Suburban Policy Area, often considerably less. Unlike other Policy Area, this graphic shows that there are no roadway link-segments in the CLV Policy Area that are <u>more</u> congested than the Standard for a Suburban Policy Area. As such little direct

guidance or attention needs to be given to the LATRs for proposed subdivisions in the CLV Policy Area. In addition, given the overall low-to-moderate volumes of traffic throughout many parts of the CLV Policy Area during peak periods, proposed subdivisions that would rely on other arterial roads serving the CLV area there may nevertheless be some arterials that would need to have focused attention on their LATR. In particular, such focus would be on the need for smaller-scale, localized, or site-specific improvements, including turn-lanes at nearby intersections, access or local circulation needs, bus stops and, sidewalks.

**G.** <u>**Guidance for Conditional Transportation Solutions</u>:** The next graphic is similar to the prior one but instead the comparison-combination used in this graphic is for the transportation improvement planning stage that uses the 2022 forecast of Development Activity and the 2018 Programmed CIP and CTP plus selected "conditional projects", which could be implemented by the 10-year time-horizon of 2022. "Green-hatched" bars are used to better differentiate this set of results from the prior one. The growth in household and employment between 2018 and 2022, are estimated not to cause the CLV Policy Area to lose the overall areawide adequate roadway conditions associated with the regulatory planning stage – as such, finding additional solutions was not emphasized. However, conditions along the two relatively congested roadways in the CLV Policy Area, Norwood Road and MD 198 Spencerville Road, will need to be monitored.</u>



While other options to improve the roadway network over the next 10 years in the CLV Policy Area are not being proposed, some potential future conditional projects can be found in Appendix E, the list of unbuilt Master Plan Projects.

**H.** <u>Guidance for the Master Plan Stage</u>: The following graphic shows that while the CLV Policy Area would continue to maintain its current regulatory stage overall roadway adequacy into the long term master plan stage. It can also be seen that two roads in the long term would become congested in the peak flow direction absence further "conditional projects" from the Master Plan.



#### North Potomac Policy Area

A. <u>Overview of the Policy Area</u>: North Potomac (NP) is categorized as a Suburban Policy Area, given the transit and development activity features of the area. This area is served by bus transit service, moderate population and employment densities, and overall transit coverage of just under 30% of its area. There is no notable growth that recently occurred or is expected to occur in this Policy Area, although that is not the case in adjacent Policy Areas. The planned Corridor Cities Transitway would serve this Policy Area in the future.

**B.** <u>Forecast of Development Activity</u>: The NP Policy Area is forecast to grow during the regulatory planning stage of TPAR12 between 2010 and 2018 by about 165 households and 43 jobs. During the transportation improvement stage of TPAR12 between 2018 and 2022 growth would be about 465 households and 51 jobs more. During the master plan stage between 2022 and 2040 growth is forecast to be an additional 1,273 households and 134 jobs. This household growth is slow compared to previous household development in the area. While the job growth is also low and a small share of the total growth in the County, it is a moderate growth compared to previous job growth within the area.

Source of the Forecasts:	e of the Forecasts : Household Forecasts being used by TPAR12										nt Forec	asts be	ing used	by TPA	R12
Round 8.0 (revised) of the Regional Cooperative	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for		Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for
Forecasts	2010	2018	2018	2022	2022	2040	2040		2010	2018	2018	2022	2022	2040	2040
North Potomac	9,085		9,250		9,452		10,725		1,572		1,615		1,666		1,800
Growth in the Policy Area		165		465		1,273				43		51		134	
Percent Growth of Area		1.8%		5.0%		13.5%				2.7%		3.2%		<b>8.0%</b>	
Percent of County Growth		0.6%		2.9%		2.2%				0.1%		0.1%		0.1%	
Montgomery County	360,500		389,599		405,597		463,000		506,000		568,315		606,679		730,375
Growth in the County		29,099		15,998		57,403				62,315		38,364		123,696	

**C.** <u>**Programmed Transportation Improvements</u>**: There are no programmed projects to improve roadway or transit capacity in the NP area. As also noted in the discussion of other Policy Areas, a "conditional project" has been identified to provide Peak Hour Headway improvements to about a dozen Ride-On routes that currently serve about 8 of the Suburban Policy Areas needing improved Peak Hour Headways to attain the Peak Headway Adequacy Standard. Most of those dozen routes would directly serve more than one Policy Area, as well as indirectly serve a similar number of: (a) other Suburban Policy Areas combined with (b) several of the Urban Policy Areas. Such a "conditional project" could be implemented in a few increments over a few years or all at once. Interim ridership results and travel survey user responses would be monitored over time and refinements could be made along the way.</u>

In the Proposed TPAR Report of 2010 a project that was considered is a widening of a section MD 117 Clopper Road that is located in North Potomac. For TPAR12 this project is once again proposed but as a potential conditional project.

_ t	TPAR12 S	Staging of County CIP and State CTP Projects (up	dated to 4-5-12)			Cond.
Program Docume	Project Name	Improvement Type and/or Limits	Policy Area	Open by 2012	Prog. by 2018	Proj. by 2022
CIP	Ride-On Peak Headway Imprv.	Peak headway improvements: about 12 routes in about 8 Areas	Countywide	Ν	Some	Υ
СТР	Clopper Rd Widening (MD 117)	Watkins Mill Rd to Game Preserve Rd	NP	Ν	Ν	Y



Ride On Route and #

Metrobus Route and #



# D. Transit Adequacy Analysis:

The NP Policy Area does not yet have adequate transit service in terms of the factors of Peak Headway and it is just shy of having adequate Coverage. However, the NP area is adequate in terms of the factor of Span of service. The future CCT will be serving this area.

Coverage of Service: About 29% of the NP Policy Area is located within 1/3 of a mile of one of the 7 bus routes currently serving the area. The graphic to the left shows where in particular bus service coverage is provided in the NP area. The standard for Coverage for a Suburban Policy Area is 30%. Therefore transit coverage in the NP Policy Area is not yet adequate. Given the several routes and a "conditional" project for Peak Headways it seems very feasible to extend somewhat one or more routes to attain adequate Coverage.

**Peak Headways:** All buses on average provide 24.3 minutes between buses during the weekday evening peak period in the NP Policy Area. In areas like NP where future LRT will be provided, the standard for average Peak Headway is 20 minutes or less. Thus, the average peak headway for the NP area is not yet adequate. A "conditional" countywide project that could directly serve this area to improve peak headways could attain adequacy within the next 10 years.

**Span of Service**: The average value of span is 17.0 hours per day for routes that operate all-day. The urban standard is 14.0 hours per day on average for all-day routes. Therefore transit span in the NP Policy Area is adequate. **E.** <u>Roadway Adequacy Analysis</u>: In the Roadway Adequacy Analysis all of the Policy Areas are analyzed together applying the regional travel demand model to Montgomery County specifics. Combinations consisting of future forecasts of development activity and future roadway and transit networks are analyzed and compared Countywide and within each Policy Area. The modeling results are summarized for each "comparison-combination" using a post-processing spreadsheet process to estimate overall arterial roadway performance for each of the Policy Areas as well as link-by-link performance of major and minor arterials within each area.</u>

**Modeling Network Level of Detail:** Major and minor arterial roads within the NP Policy Area were analyzed for their future roadway performance for each of several future Countywide comparison-combinations. The following graphic shows those major and minor arterials used in the analysis. The freeway system of the region was also accounted for in the analysis but these performance results are not summarized. On-the-other-hand, the Roadway Adequacy Analysis does not account for truly local streets, minor roads, or even some of the minor arterials as those very local streets and roads have low amounts of traffic. It is beyond the state-of-the-practice to model the use of such low traffic roads. Nevertheless, the pattern of such local streets is depicted in the background in the roadway network graphic to provide context and aid understanding.



**Comparing Combinations of Future Development Activity and Transportation Networks:** Results of the Roadway Adequacy Analysis for NP roadways are represented by the "brownhatched" bars shown in the arterial performance graphic, which disaggregates the overall performance of arterials in the NP Policy Area to display them on an arterial-by-arterial basis. The comparison-combination used in this graphic is for the regulatory planning stage based on the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.



This arterial performance graphic has notes to help readers better understand how to interpret the chart, yet some elaboration can also be helpful. This exhibit displays the average roadway Level of Service for each of the named arterial segments within the NP that were shown in the prior graphic. The sequencing of the roadways in this graphic, going from left to right, is in order of increasingly congested conditions in the peak flow direction.

Assessment of Areawide Roadway Adequacy for the NP Policy Area: The overall weighted average for the NP Policy Area is highlighted by the bar bordered in red near the center-right of the bars. The bottom of that highlighted bar for the Policy Area Average is <u>below</u> the dashed and bolded horizontal line. That line represents the proposed Policy Area Adequacy Standard for Suburban Policy Areas, such as the NP area. Therefore, the NP Policy Area overall does not have adequate future areawide roadway traffic conditions for the combination for the regulatory planning stage, which analyzed the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.

**F.** <u>**Guidance to Local Area Transportation Review (LATR) in the NP Policy Area**</u>: The prior graphic shows that six of the depicted left-most arterial roads have link-based peak period Level of Service that on average for the whole link-segment in the peak-flow direction is <u>less</u> congested that the Standard for an Urban Policy Area, some considerably less. Yet the graphic also shows that there are three other roadway link-segments in the NP Policy Area that are <u>more</u> congested than the Standard for an Urban Policy Area. Reading from right to the left in the prior

graphic, locally inadequate congested conditions would be more likely found on parts of: (a) MD 119 Great Seneca Highway, (b) MD 117 Clopper Road, and (c) Piney Meeting House Road. Particular attention should be given to the LATRs for proposed subdivisions that use those arterial roads for access to their proposed site.

In addition, given the overall high volumes of traffic throughout many parts of the NP Policy Area during peak periods, proposed subdivisions that would rely on other arterial roads serving the NP area may also need to have focused attention on their LATR. In particular, such focus would be on the need for smaller-scale, localized, or site-specific improvements, including turnlanes at nearby intersections, access or local circulation needs, bus stops, and sidewalks, and so on.

**G.** <u>Guidance for Conditional Transportation Solutions</u>: The next graphic is similar to the prior one but instead the comparison-combination used in this graphic is for the transportation improvement planning stage that uses the 2022 forecast of Development Activity and the 2018 Programmed CIP and CTP plus selected "conditional projects", which could be implemented by the 10-year time-horizon of 2022. "Green-hatched" bars are used to better differentiate this set of results from the prior one. The low growth in household and employment between 2018 and 2022, high growth elsewhere, and reduced traffic due to conditional Peak Headway changes, would result in the NP Policy Area attaining overall areawide adequate roadway conditions associated with the regulatory planning stage – as such, finding additional solutions was not emphasized at this time.</u>



While other options to improve the roadway network over the next 10 years in the FWO Policy Area are not being proposed, some potential future conditional projects can be found in Appendix E, the list of unbuilt Master Plan Projects. In addition, transit improvements and enhancements as well proactive traffic signal improvements could be undertaken to improve the functioning of the roadway network in this Policy Area. The prior graphic can be used as a guide in focusing on which roadways could receive such operational attention.

**H.** <u>Guidance for the Master Plan Stage</u>: The following graphic shows that while the NP Policy Area would return to overall roadway inadequate conditions of the current regulatory stage adequacy in the long term master plan stage. It can also be seen that two additional roads would become congested in the absence of further "conditional projects" from the Master Plan. The analyses done for the Proposed TPAR10 considered widening parts of MD 117 Clopper Road as a potential "conditional" project and it appears that future TPAR adequacy analyses will need to consider that sooner than later.



# **Olney Policy Area**

A. <u>Overview of the Policy Area</u>: Olney (OLY) is categorized as a Suburban Policy Area, given the transit and development activity features of the area. This area is served by bus transit service, moderate population and low employment densities, and overall transit coverage of less than 30% of its area. There is no notable growth that recently occurred or is expected to occur in this Policy Area. The recently opened MD 200 (Intercounty County Connector) traverses the southern part of the Olney area and access and egress is provided by an interchange at MD 97 Georgia Avenue.

**B.** <u>Forecast of Development Activity</u>: The OLY Policy Area is forecast to grow during the regulatory planning stage of TPAR12 between 2010 and 2018 by about 502 households and 52 jobs. During the transportation improvement stage of TPAR12 between 2018 and 2022 growth would be about 443 households and 20 jobs more. During the master plan stage between 2022 and 2040 growth is forecast to be an additional 961 households and 117 jobs. This household growth is moderate and the job growth is low with respect to previous house development in the area. While the household growth is forecast to be a small to low share of the total growth in the County and the job growth is very small growth compared to total job growth in the County.</u>

Source of the Forecasts:	Но	usehol	d Foreca	sts beir	ng used l	by TPAF	R12	Em	ployme	nt Forec	asts be	ing used	by TPA	R12
Round 8.0 (revised) of the Regional Cooperative Forecasts	Forecast for 2010	Growth 2010 to 2018	Forecast for 2018	Growth 2018 to 2022	Forecast for 2022	Growth 2022 to 2040	Forecast for 2040	Forecast for 2010	Growth 2010 to 2018	Forecast for 2018	Growth 2018 to 2022	Forecast for 2022	Growth 2022 to 2040	Forecast for 2040
Olney	11,455		11,957		12,400		13,361	5,532		5,584		5,604		5,721
Growth in the Policy Area		502		443		961			52		20		117	
Percent Growth of Area		4.4%		3.7%		7.8%			0.9%		0.4%		2.1%	
Percent of County Growth		1.7%		2.8%		1.7%			0.1%		0.1%		0.1%	
Montgomery County	360,500		389,599		405,597		463,000	506,000		568,315		606,679		730,375
Growth in the County		29,099		15,998		57,403			62,315		38,364		123,696	

**C.** <u>**Programmed Transportation Improvements</u>**: There are no programmed new projects to improve roadway capacity in the Olney area at this time. As also noted in the discussion of other Policy Areas, a "conditional project" has been identified to provide Peak Hour Headway improvements to about a dozen Ride-On routes that currently serve about 8 of the Suburban Policy Areas needing improved Peak Hour Headways to attain the Peak Headway Adequacy Standard. Most of those dozen routes would directly serve more than one Policy Area, as well as indirectly serve a similar number of: (a) other Suburban Policy Areas combined with (b) several of the Urban Policy Areas. Such a "conditional project" could be implemented in a few increments over a few years or all at once. Interim ridership results and travel survey user responses would be monitored over time and refinements could be made along the way.</u>

_ t	TPAR12 Stag	ging of County CIP and State CTP Projects	(updated to 3-21	-12)		Cond.
Program Docume	Project Name	Improvement Type and/or Limits	Policy Area	Open by 2012	Prog. by 2018	Proj. by 2022
CIP	Ride-On Peak Headway Imprv.	Peak headway improvements: about 12 routes in about 8 Areas	Countywide	Ν	Some	Y





# D. Transit Adequacy Analysis:

The Olney Policy Area does not yet have adequate transit service in terms of the factors of Peak Headway nor having adequate Coverage. However, the Olney area is adequate in terms of the factor of Span of service.

**Coverage of Service:** About 26% of the Olney Policy Area is located within 1/3 of a mile of one of the 5 bus routes currently serving the area. The graphic to the left shows where in particular bus service coverage is provided in the OLY area. The standard for Coverage for a Suburban Area is 30%. Therefore transit coverage in the Olney Policy Area is not yet adequate. Given the several routes and a "conditional" project for Peak Headways it seems feasible to extend one or more of the routes to get adequate Coverage.

**Peak Headways:** All buses on average provide 25.0 minutes between buses during the weekday evening peak period in the Olney Policy Area. Some provide frequent service such as the Y5-Y9 Metrobuses. In bus served areas like OLY the standard for average Peak Headway is 20 minutes or less. Thus, the average peak headway for the OLY area is not yet adequate. A "conditional" countywide project that could directly serve this area to improve peak headways could attain adequacy within the next 10 years.

**Span of Service**: The value of span is 22.3 hours per day for the one route that operates all-day due to service to Montgomery General Hospital. The Suburban standard is 14.0 hours per day on average for all-day routes. Therefore transit span in the OLY Policy Area is adequate. **E.** <u>Roadway Adequacy Analysis</u>: In the Roadway Adequacy Analysis all of the Policy Areas are analyzed together applying the regional travel demand model to Montgomery County specifics. Combinations consisting of future forecasts of development activity and future roadway and transit networks are analyzed and compared Countywide and within each Policy Area. The modeling results are summarized for each "comparison-combination" using a post-processing spreadsheet process to estimate overall arterial roadway performance for each of the Policy Areas as well as link-by-link performance of major and minor arterials within each area.</u>

**Modeling Network Level of Detail:** Major and minor arterial roads within the OLY Policy Area were analyzed for their future roadway performance for each of several future Countywide comparison-combinations. The following graphic shows those major and minor arterials used in the analysis. The freeway system of the region was also accounted for in the analysis but these performance results are not summarized. On-the-other-hand, the Roadway Adequacy Analysis does not account for truly local streets, minor roads, or even some of the minor arterials as those very local streets and roads have low amounts of traffic. It is beyond the state-of-the-practice to model the use of such low traffic roads. Nevertheless, the pattern of such local streets is depicted in the background in the roadway network graphic to provide context and aid understanding.



**Comparing Combinations of Future Development Activity and Transportation Networks:** Results of the Roadway Adequacy Analysis for OLY roadways are represented by the "brownhatched" bars shown in the arterial performance graphic, which disaggregates the overall performance of arterials in the OLY Policy Area to display them on an arterial-by-arterial basis. The comparison-combination used in this graphic is for the regulatory planning stage based on the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.



This arterial performance graphic has notes to help readers better understand how to interpret the chart, yet some elaboration can also be helpful. This exhibit displays the average roadway Level of Service for each of the named arterial segments within the OLY that were shown in the prior graphic. The leftmost bar is itself an average, in this case of 8 minor arterials roads. The sequencing of the roadways in this graphic, going from left to right, is in order of increasingly congested conditions in the peak flow direction.

Assessment of Areawide Roadway Adequacy for the OLY Policy Area: The overall weighted average for the OLY Policy Area is highlighted by the bar bordered in red near the center-right of the bars. The bottom of that highlighted bar for the Policy Area Average is <u>above</u> the dashed and bolded horizontal line. That line represents the proposed Policy Area Adequacy Standard for Suburban Policy Areas, such as the OLY area. Therefore, the OLY Policy Area overall has adequate future areawide roadway traffic conditions for the combination for the regulatory planning stage, which analyzed the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.

# **F.** <u>**Guidance to Local Area Transportation Review (LATR) in the OLY Policy Area</u></u>: The prior graphic shows that six of the depicted left-most arterial roads (and the nine minor arterials not shown) have link-based peak period Level of Service that on average for the whole link-segment in the peak-flow direction is <u>less</u> congested that the Standard for a Suburban Policy Area. Yet the graphic also shows that there are three other roadway link-segments in the OLY</u>**

Policy Area that are <u>more</u> congested than the Standard for a Suburban Policy Area. Reading from right to the left in the prior graphic, locally inadequate congested conditions would be more likely found on parts of: (a) MD 97 Georgia Ave, (b) MD 182 Layhill Rd, and (c) MD 28 Norbeck Rd. Particular attention should be given to the LATRs for proposed subdivisions that use those arterial roads for access to their proposed site.

In addition, given the overall moderate to high volumes of traffic throughout many parts of the Olney Policy Area during peak periods, proposed subdivisions that would rely on other arterial roads serving the Olney area may also need to have focused attention on their LATR. In particular, such focus would be on the need for smaller-scale, localized, or site-specific improvements such as turn-lanes at nearby intersections, access or local circulation needs, bus stops, sidewalks, and so on.

**G.** <u>**Guidance for Conditional Transportation Solutions</u>:** The next graphic is similar to the prior one but instead the comparison-combination used in this graphic is for the transportation improvement planning stage that uses the 2022 forecast of Development Activity and the 2018 Programmed CIP and CTP plus selected "conditional projects", which could be implemented by the 10-year time-horizon of 2022.. "Green-hatched" bars are used to better differentiate this set of results from the prior one. The growth in household and employment between 2018 and 2022, are estimated not to cause the OLY Policy Area to lose the overall areawide adequate roadway conditions associated with the regulatory planning stage – as such, finding additional solutions was not emphasized at this time.</u>



While other options to improve the roadway network over the next 10 years in the Olney Policy Area are not being proposed, some potential future conditional projects can be found in Appendix E, the list of unbuilt Master Plan Projects. In addition, transit improvements and enhancements as well proactive traffic signal improvements could be undertaken to improve the functioning of the roadway network in this Policy Area. The prior graphic can be used as a guide in focusing on which roadways could receive such operational attention.

**H.** <u>Guidance for the Master Plan Stage</u>: The following graphic shows that while the Olney Policy Area would just retain the current regulatory stage overall roadway adequacy by the time period of the long term master plan stage – as such, finding additional solutions was not emphasized at this time.. It can also be seen that additional road MD 108 Olney-Laytonsville Road would become congested in the absence of "conditional projects" from the Master Plan. Other roads would have heavy traffic but still operate at an acceptable level of congestion on average. Given this longer-term outlook, in the nearer term and mid-term emphasis should be given to developing an Olney-specific Traffic Management and Operations program.</u>



#### **Potomac Policy Area**

A. <u>Overview of the Policy Area</u>: Potomac (POT) is categorized as a Suburban Policy Area, given the transit and development activity features of the area. This area is served by bus transit service, low population and low employment densities, and overall transit coverage of less than 30% of its area. There is no notable growth that recently occurred or is expected to occur in this Policy Area.

**B.** <u>Forecast of Development Activity</u>: The POT Policy Area is forecast to grow during the regulatory planning stage of TPAR12 between 2010 and 2018 by about 746 households and 2,063 jobs. During the transportation improvement stage of TPAR12 between 2018 and 2022 growth would be about 240 households and 116 jobs more. During the master plan stage between 2022 and 2040 growth is forecast to be an additional 339 households and 353 jobs. This growth is slow and is a declining share of the total growth in the County.

Source of the Forecasts :	R12	Em	ployme	nt Forec	asts be	ing used	by TPA	R12						
Round 8.0 (revised) of the Regional Cooperative	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for
Forecasts	2010	2018	2018	2022	2022	2040	2040	2010	2018	2018	2022	2022	2040	2040
Potomac	17,131		17,450		17,690		18,029	12,296		14,359		14,475		14,828
Growth in the Policy Area		746		240		339			2,063		116		353	
Percent Growth of Area		4.4%		1.4%		1.9%			16.8%		0.8%		2.4%	
Percent of County Growth		2.6%		1.5%		0.6%			3.3%		0.3%		0.3%	
Montgomery County	360,500		389,599		405,597		463,000	506,000		568,315		606,679		730,375
Growth in the County		29,099		15,998		57,403			62,315		38,364		123,696	

**C. Programmed Transportation Improvements**: There are no programmed projects to improve roadway capacity in the POT. The Potomac Master Plan has a policy that intentionally limits the character and width of roadway for most to be and remain as two-lane roads. There are a few exceptions for additional turn lanes at selected intersections and Appendix E that list Master planned Road Improvements by Policy Area does have a limited number (5) for the POT area. Regarding transit, as also noted in the discussion of other Policy Areas, a "conditional project" has been identified to provide Peak Hour Headway improvements to about a dozen Ride-On routes that currently serve about 8 of the Suburban Policy Areas needing improved Peak Hour Headways to attain the Peak Headway Adequacy Standard. Most of those dozen routes would directly serve more than one Policy Area, as well as indirectly serve a similar number of: (a) other Suburban Policy Areas combined with (b) several of the Urban Policy Areas. Such a "conditional project" could be implemented in a few increments over a few years or all at once. Interim ridership results and travel survey user responses would be monitored over time and refinements could be made along the way.

_ t	TPAR12 Sta	ging of County CIP and State CTP Projects	(updated to 3-21-	-12)		C	Cond.
rogram	Project Name	Improvement Type and/or Limits	Policy Area	Open by	Prog. by		Proj. by
				2012	2018		2022
CIP	Ride-On Peak Headway Imprv.	Peak headway improvements: about 12 routes in about 8 Areas	Countywide	Ν	Some		Y



#### D. Transit Adequacy Analysis:

The POT Policy Area does not yet have adequate transit service in terms of the factors of Peak Headway and it is shy of having adequate Coverage. However, the POT area is adequate in terms of the factor of Span of service

**Coverage of Service:** About 23% of the POT Policy Area is located within 1/3 of a mile of one of the 10 bus routes currently serving the area. The graphic to the left shows where in particular bus service coverage is provided in the POT area. The standard for Coverage for a Suburban Policy Area is 30%. Therefore transit coverage in the POT Policy Area is not yet adequate.

Ride On Route and #

Metrobus Route and #



Peak Headways: All buses on average provide 21.1 minutes between buses during the weekday evening peak period in the POT Policy Area. Some provide very frequent service such as the J1-J3 Metrobuses that goes to the Transit Center adjacent to Montgomery Mall. In areas like POT where Metrorail or future LRT are not provided, the standard for average Peak Headway is 20 minutes or less. Thus, the average peak headway for the POT area is not yet adequate. A "conditional" countywide project could directly improve peak headways in the POT area and the area could attain adequacy within the next 10 year time period.

**Span of Service**: The average value of span is 16.4 hours per day for routes that operate all-day. The Suburban standard is 14.0 hours per day on average for all-day routes. Therefore, transit span in the POT Policy Area is adequate. **E.** <u>Roadway Adequacy Analysis</u>: In the Roadway Adequacy Analysis all of the Policy Areas are analyzed together applying the regional travel demand model to Montgomery County specifics. Combinations consisting of future forecasts of development activity and future roadway and transit networks are analyzed and compared Countywide and within each Policy Area. The modeling results are summarized for each "comparison-combination" using a post-processing spreadsheet process to estimate overall arterial roadway performance for each of the Policy Areas as well as link-by-link performance of major and minor arterials within each area.</u>

**Modeling Network Level of Detail:** Major and minor arterial roads within the POT Policy Area were analyzed for their future roadway performance for each of several future Countywide comparison-combinations. The following graphic shows those major and minor arterials used in the analysis. The freeway system of the region was also accounted for in the analysis but these performance results are not summarized. On-the-other-hand, the Roadway Adequacy Analysis does not account for truly local streets, minor roads, and even some of the minor arterials as those very local streets and roads have low amounts of traffic. It is beyond the state-of-thepractice to model the use of such low traffic roads. Nevertheless, the pattern of such local streets is depicted in the background in the roadway network graphic for purpose of understanding.



**Comparing Combinations of Future Development Activity and Transportation Networks:** Results of the Roadway Adequacy Analysis for POT roadways are represented by the "brownhatched" bars shown in the arterial performance graphic, which disaggregates the overall performance of arterials in the POT Policy Area to display them on an arterial-by-arterial basis. The comparison-combination used in this graphic is for the regulatory planning stage based on the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.



This arterial performance graphic has notes to help readers better understand how to interpret the chart, yet some elaboration can also be helpful. This exhibit displays the average roadway Level of Service for each of the named arterial segments within the POT that were shown in the prior graphic. The leftmost of the bars is itself an average, in this case of 4 minor arterials roads. The sequencing of the roadways in this graphic, going from left to right, is in order of increasingly congested conditions in the peak flow direction.

Assessment of Areawide Roadway Adequacy for the POT Policy Area: The overall weighted average for the POT Policy Area is highlighted by the bar bordered in red near the center-right of the bars. The bottom of that highlighted bar for the Policy Area Average is <u>below</u> the dashed and bolded horizontal line. That line represents the proposed Policy Area Adequacy Standard for Suburban Policy Areas, such as the POT area. Therefore, the POT Policy Area overall does not have adequate future areawide roadway traffic conditions for the combination for the regulatory planning stage, which analyzed the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.

# **F.** <u>Guidance to Local Area Transportation Review (LATR) in the POT Policy Area</u>: The prior graphic shows that 7 of the depicted left-most arterial roads (and the 4 minor arterials not

prior graphic shows that 7 of the depicted left-most arterial roads (and the 4 minor arterials not shown) have link-based peak period Level of Service that on average for the whole link-segment in the peak-flow direction is <u>less</u> congested that the Standard for a Suburban Policy Area. Yet the graphic also shows that there are some 7 other roadway link-segments in the POT Policy

Area that are <u>more</u> congested than the Standard for a Suburban Policy Area. Reading from right to the left in the prior graphic, locally inadequate congested conditions would be more likely found on parts of: (a) Kentsdale Dr, MD 190 River Rd, (c) McArthur Blvd, (d) Westlake Dr, (e) Seven Locks Rd, (f) MD 189 Falls Rd, and (g) South Glen Rd. Particular attention should be given to the LATRs for proposed subdivisions that use those arterial roads for access to their proposed site. In most locations the capacity of the roads (a measure of the quantity of possible use per unit of time) is limited, which can result in congested traffic conditions (a measure of the quality experience of using the road per unit time). Given the overall congestion levels of traffic throughout most parts of the POT Policy Area during peak periods in the peak direction of flow, proposed subdivisions that would rely on arterial roads serving the POT area may need to have focused attention on their LATR. In particular, such focus would be on the need for smallerscale, localized, or site-specific improvements such as turn-lanes at nearby intersections, access or local circulation needs, bus stops, sidewalks, and so on.

**G.** <u>**Guidance for Conditional Transportation Solutions</u>:** The next graphic is similar to the prior one but instead the comparison-combination used in this graphic is for the transportation improvement planning stage that uses the 2022 forecast of Development Activity and the 2018 Programmed CIP and CTP plus selected "conditional projects", which could be implemented by the 10-year time-horizon of 2022. "Green-hatched" bars are used to better differentiate this set of results from the prior one. The growth in household and employment between 2018 and 2022, in the POT Policy Area would result in overall congestion becoming somewhat more congested relative to the regulatory planning stage. However, given the Master Plan policy regarding roadway congestion in the Potomac area, finding potential "conditional projects" that could be solutions to the congestion were not pursued.</u>



**H.** <u>Guidance for the Master Plan Stage</u>: The following graphic shows that the POT Policy Area would have its current regulatory stage overall roadway inadequacy continues into the long term master plan stage. It can also be seen that four additional roads (i.e., Glen Road, Tuckerman Lane, Montrose Road and Persimmon Tree Road) would become very congested in the absence of any "conditional projects" from the Master Plan.



# **Clarksburg Policy Area**

A. <u>Overview of the Policy Area</u>: Clarksburg (CLK) is categorized is categorized as a Suburban Policy Area, given the transit and development activity features of the area. There is moderate population and moderate employment densities, and overall transit coverage of less than 30% of its area, considerably less than the standard for a Suburban Policy Area. Notable growth is occurring just on the east side of I-270 at this time, which is in accord with the staging from the Master Plan. If one was to only consider the east side of Clarksburg the transit coverage there would be more than the Suburban standard of 30% -- an exception in the interim is recommended in this instance for this Transit Adequacy factor. More specifics on this are discussed above in Section V. The planned Corridor Cities Transitway would serve this Policy Area in the future.

**B.** <u>Forecast of Development Activity</u>: The CLK Policy Area is forecast to grow during the regulatory planning stage of TPAR12 between 2010 and 2018 by about 3,608 households and 1,904 jobs. During the transportation improvement stage of TPAR12 between 2018 and 2022 growth would be about 2,152 households and 2,395 jobs more. During the master plan stage between 2022 and 2040 growth is forecast to be an additional 3,737 households and 12,602 jobs. While the household and the job growth is high relatively to the current development activity, it is also a high but declining share of the total household growth in the County but will be a moderate but increasing share of the job growth in the County.</u>

Source of the Forecasts:	Но	usehol	d Foreca	sts beir	ng used l	by TPAF	R12	Em	ployme	nt Forec	asts be	ing used	by TPA	R12
Round 8.0 (revised) of the Regional Cooperative	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for
Forecasts	2010	2018	2018	2022	2022	2040	2040	2010	2018	2018	2022	2022	2040	2040
Clarksburg	4,270		7,878		10,030		13,767	2,545		4,449		6,844		19,446
Growth in the Policy Area		3,608		2,152		3,737			1,904		2,395		12,602	
Percent Growth of Area		84.5%		27.3%		37.3%			74.8%		53.8%		184.1%	
Percent of County Growth		12.4%		13.5%		6.5%			3.1%		6.2%		10.2%	
Montgomery County	360,500		389,599		405,597		463,000	506,000		568,315		606,679		730,375
Growth in the County		29,099		15,998		57,403			62,315		38,364		123,696	

**C.** <u>**Programmed Transportation Improvements</u>:** There are two programmed projects to improve roadway capacity in the CLK area to address impacts of planned growth, which in this instance are being done in conjunction with private developers with projects in the area. As also noted in the discussion of other selected Policy Areas, a "conditional project" has been identified to provide Peak Hour Headway improvements to about a dozen Ride-On routes that currently serve about 8 of the Suburban Policy Areas needing improved Peak Hour Headways to attain the Peak Headway Adequacy Standard. Most of those dozen routes would directly serve more than one Policy Area, as well as indirectly serve a similar number of: (a) other Suburban Policy Areas combined with (b) several of the Urban Policy Areas. Such a "conditional project" could be implemented in a few increments over a few years or all at once. Interim ridership results and user travel survey responses would be monitored over time and refinements could be made along the way.</u>

Ę	TPAR12 Stag	ging of County CIP and State CTP Projects (update	ed to 3-21-1	2)		C	Cond.
Program Docume	Project Name	Improvement Type and/or Limits	Policy Area	Open by 2012	Prog. by 2018		Proj. by 2022
Private	Snowden Farm Parkway	MD 355 to MD 27 (4 lanes)	CLK	Ν	Y		Y
Private	Little Seneca Parkway	MD 27 to MD 355 ( 4 lanes)	CLK	Ν	Y		Y
CIP	Ride-On Peak Headway Imprv.	Countywide	Ν	Some		Y	



Ride On Route and #

Route-by-Route and Average Adequacy: Clarksburg (CLK) in 2012 35.0 14.1 Hours just All-Day Routes 30.0 Minutes 30.0 All Routes 25.0 min) 20.0 Adequate PM Peak Head Average **PM Peak** 15.0 Headway for all **Routes** 10.0 5.0 Adequate Average Legend Peak Only All-Day Ride-On Routes Span for just All- $\Diamond$ Day-Routes Metrobus Routes 0.0 24:00 0:00 6:00 12:00 14.0 Hours 18:00 Span (hours)

#### D. <u>Transit Adequacy Analysis</u>:

The CLK Policy Area does not yet have adequate transit service in terms of the factors of Coverage and Peak Headway although it is just adequate in terms of the factor of Span of service.

**Coverage of Service:** About 16% of the CLK Policy Area is located within 1/3 of a mile of one of the 2 bus routes currently serving the area. The graphic to the left shows where in particular bus service coverage is provided in the CLK area. The standard for Coverage for a Suburban Policy Area is 30%. Therefore transit coverage in the CLK Policy Area is not yet adequate. A temporary interim exception is recommended to have that standard

Metrobus Route and # only apply to the area of CLK east of I-270, in which case the Coverage is adequate for a Suburban area

**Peak Headways:** Buses on average provide 30.0 minutes between them during the weekday evening peak period in the CLK Policy Area. In areas like CLK where only buses are provided, the standard for average Peak Headway is 20 minutes or less. Thus, the average peak headway for the CLK area is not yet adequate. A "conditional" countywide project to improve peak headways could attain adequacy within the next 10 years.

**Span of Service**: The average value of span is 14.1 hours per day for routes that operate all-day. The urban standard is 14.0 hours per day on average for all-day routes. Therefore transit span in the CLK Policy Area is just adequate. **E.** <u>Roadway Adequacy Analysis</u>: In the Roadway Adequacy Analysis all of the Policy Areas are analyzed together applying the regional travel demand model to Montgomery County specifics. Combinations consisting of future forecasts of development activity and future roadway and transit networks are analyzed and compared Countywide and within each Policy Area. The modeling results are summarized for each "comparison-combination" using a post-processing spreadsheet process to estimate overall arterial roadway performance for each of the Policy Areas as well as link-by-link performance of major and minor arterials within each area.</u>

**Modeling Network Level of Detail:** Major and minor arterial roads within the CLK Policy Area were analyzed for their future roadway performance for each of several future Countywide comparison-combinations. The following graphic shows those major and minor arterials used in the analysis. The freeway system of the region was also accounted for in the analysis but these performance results are not summarized. On-the-other-hand, the Roadway Adequacy Analysis does not account for truly local streets, minor roads, or even some of the minor arterials as those very local streets and roads have low amounts of traffic. It is beyond the state-of-the-practice to model the use of such low traffic roads. Nevertheless, the pattern of such local streets is depicted in the background in the roadway network graphic to provide context and aid understanding.



**Comparing Combinations of Future Development Activity and Transportation Networks:** Results of the Roadway Adequacy Analysis for CLK roadways are represented by the "brownhatched" bars shown in the arterial performance graphic, which disaggregates the overall performance of arterials in the CLK Policy Area to display them on an arterial-by-arterial basis. The comparison-combination used in this graphic is for the regulatory planning stage based on the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.





This arterial performance graphic has notes to help readers better understand how to interpret the chart, yet some elaboration can also be help. This exhibit displays the average roadway Level of Service for each of the named arterial segments within the CLK that were shown in the prior graphic. Towards the left, one of the bars is itself an average, in this case of 9 minor arterials roads. The sequencing of the roadways in this graphic, going from left to right, is in order of increasingly congested conditions in the peak flow direction.

Assessment of Areawide Roadway Adequacy for the CLK Policy Area: The overall weighted average for the CLK Policy Area is highlighted by the bar bordered in red near the center-right of the bars. The bottom of that highlighted bar for the Policy Area Average is <u>above</u> the dashed and bolded horizontal line. That line represents the proposed Policy Area Adequacy Standard for Urban Policy Areas, such as the CLK area. Therefore, the CLK Policy Area overall has adequate future areawide roadway traffic conditions for the combination for the regulatory planning stage, which analyzed the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.

**F.** <u>**Guidance to Local Area Transportation Review (LATR) in the CLK Policy Area**</u>: The prior graphic shows that 7 of the depicted left-most arterial roads (and the 9 minor arterials not shown) have link-based peak period Level of Service that on average for the whole link-segment in the peak-flow direction is <u>less</u> congested that the Standard for an Urban Policy Area, often considerably less. Yet the graphic also shows that there is only one roadway link-segment in the

CLK Policy Area that is <u>more</u> congested than the Standard for a Suburban Policy Area, which is that of MD 27 Ridge Road. Particular attention should be given to the LATRs for proposed subdivisions that use those arterial roads for access to their proposed site.

In addition, given the overall the low volumes of traffic throughout many parts of the CLK Policy Area during peak periods, proposed subdivisions that would rely on other arterial roads serving the CLK area may also need to have some attention on their LATR. In particular, such focus would be on the need for smaller-scale, localized, or site-specific improvements such as turn-lanes at nearby intersections, access or local circulation needs, bus stops, and sidewalks.

**G.** <u>Guidance for Conditional Transportation Solutions</u>: The next graphic is similar to the prior one but instead the comparison-combination used in this graphic is for the transportation improvement planning stage that uses the 2022 forecast of Development Activity and the 2018 Programmed CIP and CTP plus selected "conditional projects", which could be implemented by the 10-year time-horizon of 2022.. "Green-hatched" bars are used to better differentiate this set of results from the prior one. The growth in households and employment between 2018 and 2022, are estimated not to cause the CLK Policy Area to lose the overall areawide adequate roadway conditions associated with the regulatory planning stage – as such, finding additional solutions was not emphasized at this time.</u>



While other options to improve the roadway network over the next 10 years in the CLK Policy Area are not being proposed, some potential future conditional projects can be found in Appendix E, the list of unbuilt Master Plan Projects. The prior graphic can be used as a guide in focusing on which roadways could receive such operational attention.

**H.** <u>**Guidance for the Master Plan Stage</u>:** The following graphic shows that while the CLK Policy Area would continue to maintain its current regulatory stage overall roadway adequacy into the long term master plan stage. It can also be seen that one additional road would become somewhat congested in the absence of further "conditional projects" from the Master Plan. The analyses done for the Proposed TPAR10 considered parts of MD 355 in Clarksburg for a potential "conditional" project and that project could have some beneficial network effects that could address congestion on the other roadways. Thus, the future TPAR adequacy analyses could consider that further as an optional solution.</u>



#### **Damascus Policy Area**

A. <u>Overview of the Policy Area</u>: Damascus (DAM) is categorized as a Rural Policy Area, given the transit and development activity features of the area. This area is characterized low population and low employment densities and is served by bus transit service that provides overall transit coverage of slightly more than 5% of its area. There is no notable growth that recently occurred or is expected to occur in this Policy Area.

**B.** <u>Forecast of Development Activity</u>: The Damascus Policy Area is forecast to grow during the regulatory planning stage of TPAR12 between 2010 and 2018 by about 449 households and 9 jobs. During the transportation improvement stage of TPAR12 between 2018 and 2022 growth would be about 38 households and 5 jobs more. During the master plan stage between 2022 and 2040 growth is forecast to be an additional 609 households and 23 jobs. This household growth is moderate to high with respect to previous household development in the area. However, compared to total job growth in the County the household growth is forecast to be a small to low share of the total growth in the County and the job growth is very small.</u>

Source of the Forecasts :	Но	usehol	d Foreca	sts beir	ng used	by TPAF	R12	Em	ployme	nt Forec	asts be	ing used	by TPA	R12
Round 8.0 (revised) of the Regional Cooperative	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for	Forecast for	Growth 2010 to	Forecast for	Growth 2018 to	Forecast for	Growth 2022 to	Forecast for
Forecasts	2010	2018	2018	2022	2022	2040	2040	2010	2018	2018	2022	2022	2040	2040
Damascus	3,562		4,011		4,049		4,658	2,616		2,625		2,630		2,653
Growth in the Policy Area		449		38		609			9		5		23	
Percent Growth of Area		12.6%		0.9%		1 <b>5.0%</b>			0.3%		0.2%		0.9%	
Percent of County Growth		1.5%		0.2%		1.1%			0.0%		0.0%		0.0%	
Montgomery County	360,500		389,599		405,597		463,000	506,000		568,315		606,679		730,375
Growth in the County		29,099		15,998		57,403			62,315		38,364		123,696	

**C.** <u>**Programmed Transportation Improvements**</u>: There is one programmed project to improve roadway capacity in the Damascus area, which is an extension of Woodfield Road between MD 108 Main Street and MD 27 Ridge Road.

t .	TPAR12 Stagi	ng of County CIP and State CTP Projects (up	odated to 3-	21-12)		С	Cond.
Program Documei	Project Name	Improvement Type and/or Limits	Policy Area	Open by 2012	Prog. by 2018	F	Proj. by 2022
CIP	Woodfield Rd Extended	North of Main St. (MD 108) to Ridge Rd (Md 27) (2 lanes)	DAM	Υ	Y		Υ


#### D. Transit Adequacy Analysis:

The Damascus Policy Area has adequate bus transit service in terms of each of the three service factors: Coverage, Peak Headway and Span of Service.

**Coverage of Service:** About 7% of the Damascus Policy Area is located within a 1/3 of a mile of the one bus route currently serving the area. The graphic to the left shows where in particular bus service coverage is provided in the Damascus area. The standard for Coverage for a Rural Policy Area is 5%. Therefore transit coverage in the Damascus Policy Area is adequate.



**Peak Headways:** The one bus route operates on a 20 minutes frequency between buses during the weekday evening peak period in the Damascus Policy Area. In Rural areas like Damascus where bus service is provided, the standard for average Peak Headway is 20 minutes or less. Thus, the average peak headway for the Damascus area is adequate.

**Span of Service**: The one bus route provides service with a value of span of 15.7 hours per day on weekdays. The Rural standard is more than 6.0 hours per day on average. Therefore transit span in the Damascus Policy Area is adequate. **E.** <u>Roadway Adequacy Analysis</u>: In the Roadway Adequacy Analysis all of the Policy Areas are analyzed together applying the regional travel demand model to Montgomery County specifics. Combinations consisting of future forecasts of development activity and future roadway and transit networks are analyzed and compared Countywide and within each Policy Area. The modeling results are summarized for each "comparison-combination" using a post-processing spreadsheet process to estimate overall arterial roadway performance for each of the Policy Areas as well as link-by-link performance of major and minor arterials within each area.</u>

**Modeling Network Level of Detail:** Major and minor arterial roads within the Damascus Policy Area were analyzed for their future roadway performance for each of several future Countywide comparison-combinations. The following graphic shows those major and minor arterials used in the analysis. The freeway system of the region was also accounted for in the analysis but these performance results are not summarized. On-the-other-hand, the Roadway Adequacy Analysis does not account for truly local streets, minor roads, or even some of the minor arterials as those very local streets and roads have low amounts of traffic. It is beyond the state-of-the-practice to model the use of such low traffic roads. The pattern of such local streets is shown in the background in the roadway network graphic for purpose of understanding.



**Comparing Combinations of Future Development Activity and Transportation Networks:** Results of the Roadway Adequacy Analysis for Damascus roadways are represented by the "brown-hatched" bars shown in the arterial performance graphic, which disaggregates the overall performance of arterials in the Damascus Policy Area to display them on an arterial-by-arterial basis. The comparison-combination used in this graphic is for the regulatory planning stage based on the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.



This arterial performance graphic has notes to help readers better understand how to interpret the chart, yet some elaboration can also be helpful. This exhibit displays the average roadway Level of Service for each of the named arterial segments within the Damascus area that were shown in the prior graphic. Towards the left, one of the bars is itself an average, in this case of 3 minor arterials roads. The sequencing of the roadways in this graphic, going from left to right, is in order of increasingly congested conditions in the peak flow direction.

Assessment of Areawide Roadway Adequacy for the Damascus Policy Area: The overall weighted average for the Damascus Policy Area is highlighted by the bar bordered in red near the center-right of the bars. The bottom of that highlighted bar for the Policy Area Average is <u>above</u> the dashed and bolded horizontal line. That line represents the proposed Policy Area Adequacy Standard for Urban Policy Areas, such as the Damascus area. Therefore, the Damascus Policy Area overall has adequate future areawide roadway traffic conditions for the combination for the regulatory planning stage, which analyzed the 2018 forecast of Development Activity and the 2018 Programmed CIP and CTP.

#### F. Guidance to Local Area Transportation Review (LATR) in the Damascus Policy Area:

The prior graphic shows that all of the six depicted arterial roads (and the three minor arterials not shown) have link-based peak period Level of Service that on average for the whole link-segment in the peak-flow direction is <u>less</u> congested that the Standard for an Rural Policy Area, often considerably less. The graphic shows that there are no roadway link-segments in the area

that are <u>more</u> congested than the Standard for a Rural Policy Area. Thus no particular guidance needs to be given to the LATRs for proposed subdivisions in the area other than the LATR Guidelines itself.

**G.** <u>**Guidance for Conditional Transportation Solutions:</u> The next graphic is similar to the prior one but instead the comparison-combination used in this graphic is for the transportation improvement planning stage that uses the 2022 forecast of Development Activity and the 2018 Programmed CIP and CTP plus selected "conditional projects", which could be implemented by the 10-year time-horizon of 2022...** "Green-hatched" bars are used to better differentiate this set of results from the prior one. The growth in household and employment between 2018 and 2022, are estimated not to cause the Damascus Policy Area to lose the overall areawide adequate roadway conditions associated with the regulatory planning stage – as such, finding additional solutions was not emphasized at this time.</u>



**H.** <u>Guidance for the Master Plan Stage</u>: The following graphic shows that the Damascus Policy Area would continue to maintain its current regulatory stage overall roadway adequacy into the long term master plan stage. However, it can also be seen that one of the area roadways, MD 124 Woodfield Road, is likely to become somewhat congested in the absence of further "conditional projects" from the Master Plan. Future monitoring and modeling forecasting should be carried out to better determine whether such a future situation is likely to happen and what solutions can be implemented to address it.</u>



### Appendixes

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#### **Appendix A:**

#### Benchmarking Peer Jurisdictions with Areawide Transportation Review Processes

One of the initial tasks that was done in preparing this report was to conduct a benchmarking review of a sample of peer jurisdictions nationally who are known to thought to have an areawide transportation review process for the impact of proposed development. The graphic below identifies the names of all of the jurisdictions who were contacted. Those whose names are in larger, red font were those who were found to be were found to be closer peers and who have a functioning areawide transportation review process.

In total thirteen jurisdictions were contacted and/or researched on their websites about their process. A questionnaire was developed and in some cases filled in by staff of those jurisdictions and in other cases the pertinent features about their process were filled in by the consultant team. Some of this was done in conjunction with all getting information on their Local Area Transportation Review procedures as well.



Seven main features of Areawide Transportation Reviews are identified and assessed in this peer comparison:

- Cumulative impacts versus Development of Regional Impact
- Jurisdictional coverage and area versus corridor coverage; including corridor-by-corridor summaries
- Time frame of the assessment of areawide impact; as well as the frequency of the adequacy assessment
- When during the development process does adequacy get assessed and what linkages are there to other processes
- Use of public/private funding for transportation programs and projects
- Transit adequacy methods

• Increased monitoring of roadway travel times and speeds, as well as monitoringr transit travel times and speeds using an "operations orientation

The responses of the peer jurisdictions about their processes were reviewed and a summary of potential refinements that might be applicable to the TPAR were made. The following are generalizations made from the summary material:

- Using just Forecasts for areawide review, including a 6-year or 10 year time horizon, will give better travel patterns and more realistic transportation needs
- Follow more of an "operations orientation" by
- Have a "Coordination Overlap" element of TPAR that has both a regulatory focus as well as transportation improvement focus
- Refine TPAR so that all PM Peak Period transit routes are used in the measure of "Average Headway"
- Implement the proposed TPAR monitoring idea to use the actual performance of arterials; use the "slowness ratio" to compare to the modeled congestion measure
- Test using Automatic Vehicle Location data to monitor transit speeds,

The following is a set of presentation material that was used to assess the results of benchmarking review of this sample of peer jurisdictions.



## 2A. Jurisdictional Coverage and Area vs. **Corridor Coverage**

Maps are

at the same Scale



- Areawide review in Mont. Co. accounts for the entire County, although Rockville and Gaithersburg have own methods
- Three Policy Area Types are used in the • proposed TPAR: Urban, Suburban, and Rural
- The Policy Area Types are based upon availability of transit facilities & services
- **Transportation Adequacy Standards for** transit & roads vary by Policy Area Type
- Roadway standards for average speeds based upon modeled travel times; and Dratorridor-by-corridor summaries are used



- Areawide Example: King Co, WA only has Concurrency Reviews in eastern 2/3 of the County; excludes "urban" parts
- Urban cities have their own TIA reviews
- Transit service is concentrated in the western urban parts, thus the King Co. Concurrency is only automobile based
- **Relies on Urban Growth Boundaries** based on WA State Growth Mgmt. Act
- Concurrency uses standards for average speed based on observed corridor-bycorridor travel time samples (next page)

6

7

## 2B. Corridor-by-Corridor Summaries



- Co., WA: proposing that corridor concurrency become the focus of the review and not rely on current TIA methods
- Annual monitoring of corridor travel times in the Urban Growth Area within Clark Co.; coordinates reviews with CIP projects
- Council considering a roadway "Built-Out" corridor category; then monitor impacts focus on a Mgmt. Plan with Access Mgmt., Travel Demand Mgmt., & Tran. Sys. Mgmt.
- Removing text on specific way to collect travel time anticipating new data sources Follow more of an "operations orientation"

Potential TPAR Dran of 1-10-12



Concurrency standards from 2000 HCM for average speed; annual travel time samples for selected set of corridors; averaged to a set of 25 "Travel Sheds" Observe more samples than done in the Mont. Co monitoring of arterial corridors "Highways of Statewide Significance" are not included in areawide methods **Corridor Concurrency controls over TIAs** Sheds with >15% of total miles failing **Concurrency are "failing" Travel Sheds** 39 jurisdictions have local TIA methods







## 5B. Use of Public/Private Funding for Transportation Programs and Projects

t#	CMP Element	Requirement	Timing	Responsible AgencY
2.	Traffic Level of Service	1) Annually monitor and submit report on the level of service on CMP roadway	Dec 1	Member Agencies
	Element	network intersections using CMP software and procedures.		
		2) Monitor performance of CMP rural highways and freeways	Dec 1	VTA
3.	Multimodal Performance	Collect available transportation performance measurement data for use in land use	Ongoing	VTA
	Measures Element	analysis, deficiency plans and the CIP		
4.	Trip Reduction and	No current requirements		Member Agencies
	Transportation Demand			and VTA
	Management Element			
5.	Transportation Model	1) Certify that the CMP model is consistent with the regional model	Biennially	MTC
	and Database Element	2) Certify that Member Agency models are consistent with the CMP model	As	VTA and Member
			Needed	Agencies
6.	Community Form and	1) Prepare a Transportation Impact Analysis (TIA) for project that generate 100 or	Ongoing	Member Agencies
	Impact Analysis Element	more peak hour trips and submit to the CMP according to TIA Guidelines schedule		
		2) Submit relevant conditions of approval to VTA for projects generating TIAs	Ongoing	Member Agencies
		Prepare monthly report on adopted conditions for VTA Board, CMPP and PAC, TAC,	Ongoing	VTA
		CAC, and BAC		
		3) Prepare and submit land use monitoring data to the CMP opn all land use	Oct 1	Member Agencies
		projects approved from July 1 to June 30 of the previous year		
		4) Submit an annual statement certifying that the Member Agency has complied	Oct 1	Member Agencies
		with the CMP Land Use Impact Analysis Program		
7.	Annual Monitoring and	1) Outline the requirements and procedure established for conductin annual traffic	Dec 1	Member Agencies
	Conformance Element	LOS and land use monitoring efforts. Support the traffic LOS and Land 2) Use		and VTA
		Integration and Impact Analysis Elements		
8.	Capital Improvement	Develop a list of projects intended to maintain or improve the level of service on the	Biennially	Member Agencies
	Program Element	designated system and to maintain transit performance standards		with VTA
9.	Deficiency Plan Element	1) Prepare Deficiency Plans for facilities that violate CMP traffic LOS standards	As	All affected Member
		or that are project to violate LOS standards using the adopted Requirements for	Needed	Agencies
		Deficiency Plans		
		2) Submit Deficiency Plan Implemention Status Report as part of annual monitoring	Dec 1	Member Agencies
				11 D 0 1 DI



Source: Exhibit 3.1: Identifying Transit Inadequacies and Solutions, *Moving Toward a New Transportation Policy Area Review*, April 2010, p. 8

- Steps 2 and 4 shown above are from the Proposed TPAR Report and are being developed for the 2012 TPAR Refinement
- Review of potential "Peer Jurisdictions" provides little insight into whether peers may be doing similar work with transit services; <u>exception:</u> Santa Clara, CA using a transit accessibility measure from their modeling
- It is expected that MNCPPC will do Step 2 based upon data from MCDOT and WMATA
- Will also initiate Step 4 while working with MCDOT to assess/refine new transit services
- MCDOT to take lead in Step 5; with MNCPPC



Chart above shows 2010 Headway and Span in Fairland White Oak Policy Area Agree with MCDOT refinement for Span being measured only for "Full Service" However, would refine TPAR so that all PM Peak Period transit routes are used in the measure of "Average Headway" Potential TPAR Refinement #4

#### 7A. Increased Monitoring of Roadway Travel Times and Speeds using an "Operations Orientation"

Montgomery Co., MD: Mobility Assessment Report (MAR), Oct 2011, Congested Roads

- Prior monitoring reports (2004 to 2009) did similar GPS-based samples of travel time and speed on arterials in Mont. Co.
- Proposed TPAR used modeled corridorby-corridor arterial speed vs. free flow speed ("slowness ratio") as the criterion for future roadway congestion levels
- MAR 2011 introduced a new monitoring data source of private sector observed travel time and speed, also used by MDOT, to describe Congested Roadways (*p. 18*) and used the "travel time index" measure
- A full set of the new monitoring data source is now available; meets proposed TPAR monitoring idea to use the actual 
   performance of arterials as a consistency check Draft of 1-10-12

King Co., WA: Transportation Concurrency Management (TCM) Program, Sept 2010

Annually sample 350 miles of arterials for travel time/speed using 8 GPS devices 3 to 10 runs daily over a 1 to 3 day period to get peak 2-hours between 4:00 to 6:30 PM on T, W, or Th in March, April, May Percent of sampled roadway miles per "Travel Shed" operating at less than the LOS standard speed is the criterion for Concurrency approvals; Washington State DOT during 2008/09 studied travel times on area freeways

WA DOT Performance Measurement "Grey Book" annually using operations data sources; uses "slowness ratio" of observed speed vs. free flow speed, the "inverse" of a "travel time index"

#### Potential TPAR Refinement #5a

MDOT/SHA Planning Office is working on using similar operations data for their monitoring and performance activities

#### 7B. New Monitoring for Transit Travel Times and Speeds using an "Operations Orientation"

Montgomery Co., MD: Mobility Assessment Report (MAR), Oct 2011, Transit Analysis

- Transit monitoring analysis presents route coverage, headways, and ridership for Ride-On and Metrobus for route-by-route
- TPAR Refinement testing bus operational 

   data of Automatic Vehicle Location (AVL)
   from Ride-On and Metrobus to assess
   monitored bus travel times and speeds
- WMATA and MWCOG performing a regional bus "Hot Spot" study of locations • where buses operate most slowly, which can be compared to monitored arterial locations of slow travel to better monitor Transit Deficiencies over time
- The measure of transit slowness vs. road slowness is also the modeled measure used as one of the two parts of the current Policy Area Mobility Review chart analysis; test using AVL data to monitor transit service speeds, which may also help in measuring the effect of BRT service in TPAR and the Subdivision Staging Policy

Monitoring of Transit Performance by "Peer Jurisdictions": Santa Clara Co, CA

There are few examples of the monitoring of actual transit performance in the areawide methods of Peer Jurisdictions The Santa Clara CO. CMA is also the main transit agency serving the area including operating LRT, BRT, Express, and local bus services; yet even the monitoring element of their CMP is absent information Their Transit Accessibility measure is a derived one from their modeling system and not actually monitored; their Transit Sustainability Policy is based on average boarding per Revenue Hour or station Monitoring of transit travel time and speed is not part of the Concurrency methods in King Co. or Vancouver, WA; yet nearby Tri-Met of Portland, OR is using bus AVL data, at finer spatial and temporal scales, to also monitor at the end of each day their bus travel times and speed Potential TPAR

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Refinement #5b

#### Appendix B: Cooperative Coordination Roles for TPAR







## **Appendix C: List of Unbuilt Master Plan Projects**

Menu of Master Planned Transportation Improvements						
Sorted by Policy Area, Mode, and Improvement Type Not Programmed by 2018						
Policy Area(s)	Project Name	Implemen- tation	Limits	Improve- ment Type	Facility Type	
CLK,GTE,GTW,G BG,RDV,DER,RK	Corridor Cities Transitway (Proposed)	State	Shady Grove to Clarksburg	Т	LRT	
BCC,SSTP	Purple Line Transitway (Proposed)	State	Bethesda to New Carrollton	Т	LRT	
NB,POT	North Bethesda Transitway (Proposed)	State	Grosvenor Metro to Montgomery Mall	Т	LRT	
OLY,AH,KW	Georgia Avenue Busway (Proposed)	State	Glenmont to Olney	Т	BRT	
POT,BCC,NB,KW ,SSTP,FWO	Capital Beltway	State	American Legion Bridge to Woodrow Wilson Bridge	R	1	
GTE,MVA,GBG	Midcounty Hwy (Proposed)	County	Montgomery Village Av to MD 27	R	2	
AH	MD097 Georgia Ave & MD028 Norbeck Rd	State	Interchange	R	1	
AH	MD028 Norbeck Rd	State	MD 97 to MD 182	R	2	
AH	MD182 Layhill Rd	State	ICC to Norwood Rd	R	2	
AH	Aspen Hill Rd	County	MD 586 to MD 185	R	3	
BCC	MD 355 & Cedar Ln	State	Interchange	R	1	
BCC	River Rd	State	DC Line to I-495	R	2	
BCC	Bradley Blv	State	MD 614 to I-495	R	3	
BCC	Goldsboro Rd	State	MD 396 to MD 191	R	3	
BCC	Massachusetts Ave	State	Sangamore Rd to MD 614	R	3	
CLK	I 270 & New Cut Rd	State	Interchange	R	1	
CLK	MD027 Ridge Rd	State/Dev	MD 355 - Brink Rd to Skylark Rd	R	2	
CLK	MD121 Clarksburg Rd	State/Dev	Top Tidge Dr to Chrisman Hill Dr (Broadway Av to I-270)	R	2	
CLK	MD121 Clarksburg Rd Relocated	State/Dev	West Old Baltimore Rd to Broadway Ave	R	2	
CLK	MD355 Frederick Rd	State/Dev	Brink Rd to Cool Brook Ln	R	2	
CLK	MD355 Frederick Rd Relocated	State	Cool Brook Ln to Snowden Farm Pkwy	R	2	
CLK	A-304 (Proposed)	County/Dev	MD 121 to Newcut Rd Ex)	R	3	
CLK	A-307 (Proposed)	County/Dev		R	3	
CLK	Observation Dr Extended	County/Dev	Little Seneca Cr to Roberts Tavern Dr	R	2	
CLK	Hyattstown Bypass (Proposed)	State	MD 355 to MD 355	R	3	

Menu of Master Planned Transportation Improvements Sorted by Policy Area, Mode, and Improvement Type						
Not Programmed by 2018						
Policy Area(s)	Project Name	Implemen- tation	Limits	Improve- ment Type	Facility Type	
CLK	New Cut Rd Extended	County/Dev	West Old Baltimore Rd; Broadway Ave. to MD 27	R	2	
CLK	Snowden Farm Pkwy (Proposed)	County/Dev	MD 27 to Clarksburg Rd	R	2	
CLK	Snowden Farm Pkwy (Proposed)	County/Dev	Clarksburg Rd to MD 355	R	2	
CLK	Brink Rd	County/Dev	MD 355 to MD 27	R	3	
CLK	Shawnee La	County/Dev	Gateway Center Dr to MD 355	R	3	
CLK	Stringtown Rd	County/Dev	Overlook Crossing Dr to Snowden Farm Pkwy	R	3	
CLV	Norwood Rd	County	MD 650 to MD 182	R	3	
CLV	MD 028 Norbeck Rd	State	MD182 to Peach Orchard Rd	R	2	
CLV	Thompson Rd Extended	County	Rainbow Dr to Thompson Dr	R	3	
DAM	NONE					
DER	MD355 Frederick Rd & Gude Dr	State	Interchange	R	1	
DER	ICC & Mid-County Hwy	State	Interchange	R	1	
DER	Metro Access Crabbs Branch Wy	County/Dev	Interchange	R	1	
DER	Crabbs Branch Way Extended	County/Dev	Shady Grove Rd to Amity Dr	R	3	
FWO	US 29 & Blackburn Dr	State	Interchange	R	1	
FWO	US 29 & Fairland	State	Interchange	R	1	
FWO	US 29 & Greencastle Rd	State	Interchange	R	1	
FWO	US 29 & Musgrove Rd	State	Interchange	R	1	
FWO	US 29 & Stewart Dr	State	Interchange	R	1	
FWO	US 29 & Tech Rd	State	Interchange	R	1	
FWO	MD 028 Norbeck Rd	State	Peach Orchard Rd to PG Line	R	2	
FWO	Briggs Chaney Rd	County	ICC to PG Line	R	3	
FWO	Burtonsville Blv	State/Dev	MD 198 to Dustin Rd	R	3	
FWO	Calverton Blv	County	Cherry Hill Rd to PG Line	R	3	
FWO	Fairland Rd	County	MD 650 to PG Line	R	3	
FWO	Greencastle Rd	County	Robey Rd to PG Line	R	3	

Menu of Master Planned Transportation Improvements Sorted by Policy Area, Mode, and Improvement Type Not Programmed by 2018						
Policy Area(s)	Project Name Implemen- tation Limits		Improve- ment Type	Facility Type		
GBG	I 270 and Watkins Mill Rd	County/State/De	Interchange	R	1	
GBG,NP	MD117 West Diamond Ave	State	Seneca Creek St Pk to Muddy Branch Rd	R	2	
GBG,NP	MD124 Montgomery Village Ave	State	MD 28 to Longdraft Rd	R	2	
GBG,NP	Muddy Branch Rd	County	MD 28 to MD 117	R	2	
GBG,NP	Longdraft Rd	County	MD 124 to MD 117	R	3	
GBG	Oakmont Ave Extended	County	Oakmont Av to Washington Grove	R	3	
GBG	Oden'hal Ave	County	Lost Knife Rd to Summit Av	R	3	
GTE	MD027 & MD355	State	Interchange	R	1	
GTE	MD027 & Observation Dr	State	Interchange	R	1	
GTE	MD118 & MD355	State	Interchange	R	1	
GTE	MD118 & Mid County Hwy	State	Interchange	R	1	
GTE	MD355 & Middlebrook Rd	State	Interchange	R	1	
GTE	Shakespeare Dr	County/Dev	Watkins Mill Rd to MD 355	R	3	
GTE	Watkins Mill Rd	County	Midcounty Hwy to Midcounty Hwy	R	3	
GTE	Dorsey Mill Rd	County	Bridge over I-270	R	3	
GTW	MD117 Clopper Rd	State	Seneca Creek St Pk to east of MD	R	2	
GTW	MD119 Great Seneca Hwy	State	Longdraft Rd to Middlebrook Rd	R	2	
GTW	Father Hurley Blv	County	Wisteria Dr to Crystal Rock Dr	R	2	
GTW	Crystal Rock Dr Extended	Dev (Kinster Dr to Dorsev Mill	Kinster Dr to Dorsey Mill Rd	R	3	
GTW	Dorsey Mill Rd	County/Dev	Bridge over I-270	R	3	
GTW	Observation Dr Extended	County	Waters Discovery Ln to Little Seneca	R	3	
KW	MD586 Veirs Mill Rd & Randolph	State	Interchange	R	1	
KW	MD586 Veirs Mill Rd	State	Twinbrook Pkwy to Randolph Rd	R	2	
KW	Capitol View Ave Relocated	State/Dev	Edgewood Rd to Stoneybrook Dr	R	3	
MVA	MD115 Muncaster Mill Rd	State	Redland Rd to MD 124	R	2	
MVA	MD124 Woodfield Rd	State	Emory Grove Rd to Warfield Rd	R	2	
MVA	MD124 Montgomery Village Av	State	Russell Av to Midcounty Hwy	R	2	

Menu of Master Planned Transportation Improvements Sorted by Policy Area, Mode, and Improvement Type Not Programmed by 2018						
Policy Area(s)	Project Name	Implemen- tation	Limits	Improve- ment Type	Facility Type	
MVA	Goshen Rd Widening	County	Oden'hal Rd to Warfield Rd	R	2	
MVA	Snouffer School Rd	County/Dev	MD 124 to Goshen Rd	R	3	
MVA	Wightman Rd	County	Goshen Rd to Brink Rd	R	3	
NB	Montrose Pkw (Proposed)	State	Maple Av to Parklawn Dr	R	2	
NB	Montrose Pkw (Proposed)	County	Parklawn Dr to MD 586	R	2	
NB	Old Georgetown Rd	County	MD 355 to Nebel St	R	2	
NB	Twinbrook Pkw	County	Chapman Av to Ardennes Av	R	3	
NB	Woodglen Dr Extended	County/Dev	Nicholson Ln to Marinelli Rd	R	3	
OLY	MD097 Brookeville Byp (Proposed)	State	Goldmine Rd to Georgia Av	R	2	
OLY	MD097 Georgia Ave	State	MD 108 to Prince Phillip Dr	R	2	
OLY	MD028 Norbeck Rd	State	MD 97 to MD 182	R	2	
OLY	MD108 Olney-Laytonsville Rd	State	Muncaster Rd to Olney Mill Rd	R	2	
POT	MD189 Falls Rd Relocated	State	Democracy Blvd to Rockville Line	R	2	
POT	MD190 River Rd Relocated	State	Riverwood Dr To River Oaks Ln	R	2	
POT	Montrose Rd Extended	County	MD 189 to Falls Rd Relocated	R	3	
POT	Montrose Rd	County	Seven Locks Rd to I-270	R	3	
POT	Westlake Dr	County	Westlake Ter to Tuckerman Ln	R	3	
RDV	MD028 Key West Ave & MD119 Great Seneca Hwy	State	Interchange	R	1	
RDV	Sam Eig Hwy & Fields/Diamondback Dr	State/County	Interchange	R	1	
RDV	Sam Eig Hwy & MD119 Great Seneca Hwy	State	Interchange	R	1	
RDV	Shady Grove Rd & MD028 Damestown Rd	State	Interchange	R	1	
RDV	Darnestown Rd Relocated	County	Darnestown Rd to Great Seneca	R	2	
RDV	MD119 Great Seneca Hwy Relocated	County/State	Darnestown Rd to Sam Eig Hwy	R	2	
SSTP	Lyttonsville Rd	County	Grubb Rd to Lyttonsville Pl	R	3	
SSTP	Seminary Rd	County/Dev	MD 192 to MD 97	R	3	
RKV,GBG,GTE,G	I-270 (HOV and Widening)	State	I-370 to Frederick Co Line	R	1	
RURW	MD118 Germantown Rd	State	MD 28 to MD 117	R	2	
RURW	Whites Ferry Rd Relocated	County	Partnership Rd to west of Partnership Rd	R	3	

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June 2012

# growing smarter

2012-2016 Subdivision Staging Policy **appendix 2** Transportation Policy Area Review (TPAR)



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