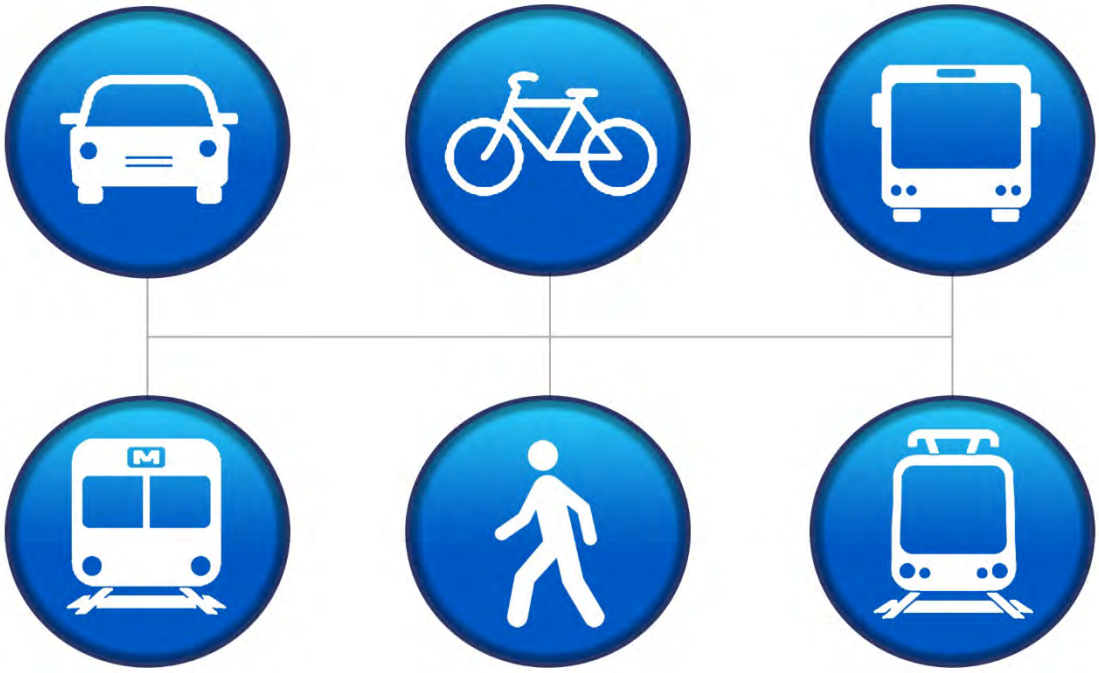
# LATR

## Local Area Transportation Review Guidelines

Fall 2017



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MARYLAND - NATIONAL CAPTIAL PARK AND PLANNING COMMISSION

# Abstract

Local Area Transportation Review Guidelines
Planning Board Updates: May 13, 2010, June 17, 2011, February 9, 2012 and January 24, 2013.
These guidelines are to be used for preparation and review of transportation studies for development in Montgomery County. This information should be used by transportation engineers, planners, public agency reviewers and community members participating in the development review process.

# Source of Copies

The Maryland-National Capital Park and Planning Commission
Montgomery County Planning Department
8787 Georgia Avenue
Silver Spring, MD 20910-3760
http://montgomeryplanning.org/planning/transportation/

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# I. Executive Summary

The LATR Guidelines are to be used for preparation and review of transportation studies for development in Montgomery County. This document should be used by transportation engineers, planners, public agency reviewers and community members participating in the development review process.

Earlier versions of these guidelines reflected both local area and policy area transportation tests required by Montgomery County law for new development. These tests have been routinely revised and updated over the years. Most recently, on November 15, 2016, the Montgomery County Council adopted a new Subdivision Staging Policy, which included several important changes to the review of transportation adequacy and eliminated the Transportation Policy Area Review test. The Planning Board approved these revised guidelines on April 20, 2017, to reflect the latest Subdivision Staging Policy. This document reflects that action and a subsequent revision approved by the Planning Board on September 28, 2017.

The new guidelines specify the more context-sensitive and multi-modal procedures and analysis methods reflected in the 2016-2020 Subdivision Staging Policy as they relate to the determination of adequacy of local intersection performance in the context of the development review process. The guidelines contain many new ideas that essentially rethink how the County approaches the evaluation of local transportation system performance. The following key changes are reflected in this document.

- Recognizing that there is not a “one size fits all” set of rules that applies countywide but rather that the expectations for transportation system adequacy and the types of appropriate mitigation need to be applied in a context-sensitive manner.
- Organizing policy areas into four groups (i.e., Red, Orange, Green and Yellow) that recognize current land use patterns, the prevalence of modes of travel other than the single-occupant vehicle and the planning vision for different parts of Montgomery County.
- Updating vehicle-trip generation rates and developing person-trip generation rates that reflect the diversity of land use patterns and travel behavior across the county.
- Creating the ability to adjust trip generation rates based on reduced parking where such reductions are supported by the zoning code.
- Establishing a new system for evaluating local area transportation conditions that emphasizes the application of delay-based measures reflecting the experience of travelers, rather than focusing on critical lane volume.
- Expanding LATR to include a set of multi-modal (i.e., bicycle, pedestrian and transit) transportation tests beyond those that focus on motor vehicle travel.

In summary, these guidelines provide for the application of a more robust and multi-modal set of local transportation system performance evaluation procedures. The Subdivision Staging Policy recommends that Montgomery County further evolve over time through the incremental

implementation of proportional cost-sharing (pro-rata share) transportation districts, in addition to those established in White Flint and White Oak.

In areas where such pro-rata share districts are established, development will proceed conditioned on the payment of a fee to the county, commensurate with the applicant's proportion of the cost of a Unified Mobility Program[1] (UMP). In this context, the components of the UMP and the fee per peak-hour vehicle (or person) trip will be established by County Council resolution after a public hearing.

[1] A Unified Mobility Program reflects a selected set of master-planned transportation projects (including the associated costs of design, land acquisition, construction and site improvements, and utility relocation) needed to achieve LATR adequacy at the master plan planning horizon.

# II. Introduction

## A. PRINCIPLES OF LOCAL AREA TRANSPORTATION REVIEW

Chapter 8, Article IV and Chapter 50 of the Montgomery County Code direct the Montgomery County Planning Board to find that public facilities will be adequate to serve proposed development. This Adequate Public Facilities (APF) finding requires forecasting travel demand generated by proposed development and comparing it to the capacity of existing and programmed roads and transit. An applicant for proposed development must show that adequate transportation facilities will be in place within a specified time period.

Alternatively, the applicant must provide those facilities or make a Traffic Mitigation Payment toward area-wide transportation needs. These guidelines explain the methodology for determining adequacy, specify mitigation for projected traffic generated by proposed development projects and describe how Traffic Mitigation Payments are determined.

There is a set of multi-modal tests (applied to motor vehicle, transit, bike and pedestrian travel) for determining transportation adequacy — the Local Area Transportation Review (LATR). These tests, described in the subsequent sections of these guidelines, are required by the 2016-2020 Subdivision Staging Policy adopted by the County Council on November 15, 2016.

These guidelines explain the methodology for documenting and analyzing the likely impact of proposed development on intersection performance. The criteria in these guidelines determine whether a development can satisfy the requirements for transportation adequacy.

Following the standards of the Subdivision Staging Policy, the Planning Board must not approve a development if local area transportation conditions are deemed inadequate. The Planning Department staff's review and the Planning Board's decision are based on existing and programmed roads, available and programmed mass transportation and physical improvements or trip mitigation measures to be provided by the applicant.

## B. APPLICABILITY

LATR is applied to development projects that will generate at least 50 total weekday peak-hour person trips. Projects that generate fewer than 50 total weekday peak-hour person trips must prepare a transportation statement describing the basis for any exemption from LATR.

The LATR test is applied by policy area (see Map 1). Detailed policy area maps, with streets shown, are provided in the 2016-2020 Subdivision Staging Policy Resolution 18-671 found here (see pages 27-67):

http://www.montgomerycountymd.gov/COUNCIL/Resources/Files/res/2016/20161115_18-671.pdf

LATR compliance is not required for developments in the White Flint Policy Area if applicants agree to participate in the White Flint Special Taxing District for transportation infrastructure improvements in lieu of satisfying the transportation Adequate Public Facility (APF) tests for LATR. Similarly, LATR compliance is not required for developments in the White Oak Policy Area because applicants pay a mitigation fee specified by the White Oak Local Area Transportation Improvement Program for transportation infrastructure improvements in lieu of satisfying the transportation APF tests for LATR (see Appendix 4).

In the Potomac Policy Area, the only developments subject to LATR are those with site-generated trips that will impact the following intersections:

- Montrose Road at Seven Locks Road;
- Democracy Boulevard at Seven Locks Road;
- Tuckerman Lane at Seven Locks Road;
- Democracy Boulevard at Westlake Drive;
- Westlake Drive at Westlake Terrace;
- Westlake Drive at Tuckerman Lane;
- Bradley Boulevard at Seven Locks Road;
- River Road at Bradley Boulevard;
- River Road at Piney Meetinghouse Road;
- River Road at Falls Road;
- Falls Road at Democracy Boulevard; and
- River Road at Seven Locks Road.

LATR mitigation and/or payments are not required for public facility project mandatory referrals, for which the Planning Board's comments are advisory. Mandatory referrals are often unique uses, such as schools or other public services. The transportation review requirements for these facilities follow Mandatory Referral Guidelines, which require a pedestrian and bicycle safety statement, pedestrian and vehicular circulation plan and a transportation statement or transportation study as applicable.

## C. HOW TO USE THESE GUIDELINES

These guidelines are to be used by applicants to prepare transportation studies for Montgomery County Planning Board approval and by staff when reviewing those studies.

The following chart (Figure 1) illustrates the steps needed to arrive at a recommendation for approval of the transportation test for the Adequate Public Facilities Ordinance. These guidelines describe the information needed from the applicant to determine the answer at each step of the process and the considerations staff must evaluate when reviewing the document.

Project applications requiring LATR studies include:

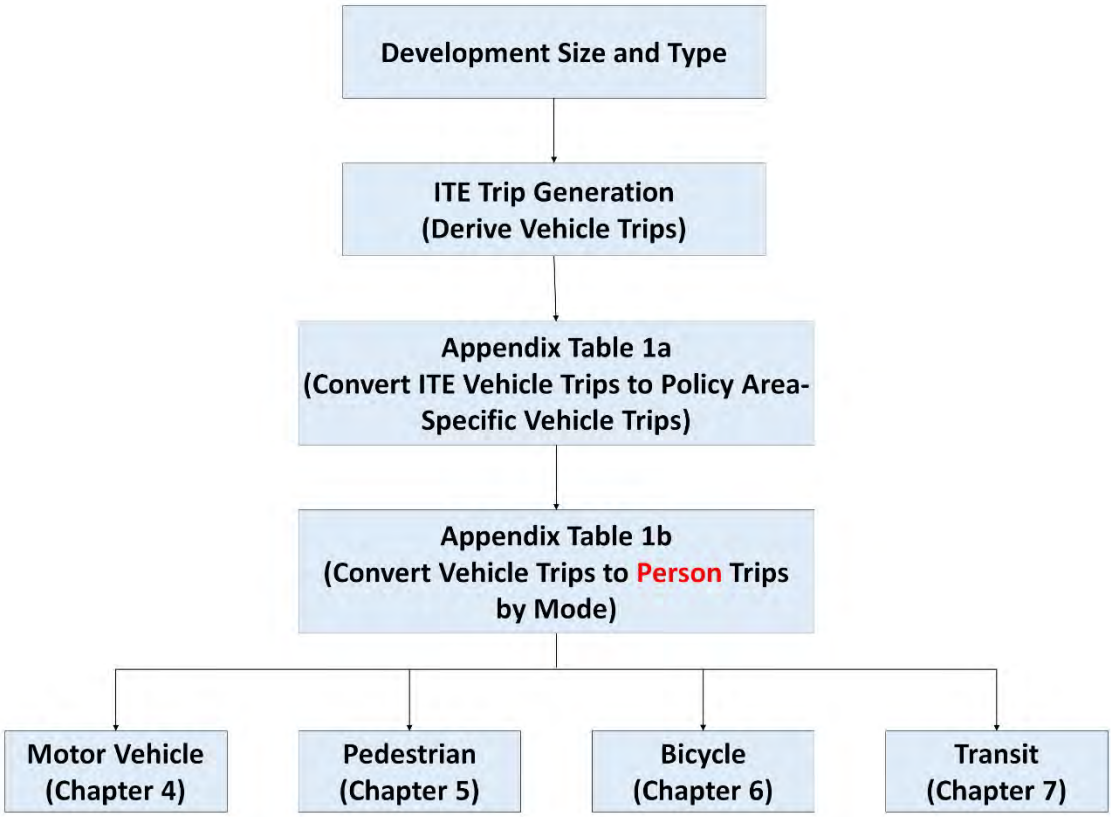
- Preliminary plans (as part of a subdivision application).
- Site plans not requiring subdivision.
- Conditional use and zoning cases before the Board of Appeals and County Council.

These guidelines also apply in cases where a preliminary plan of subdivision or a site plan is not required for a building permit, and a determination of Adequate Public Facilities (APF) must be made prior to or at the time of building permit release by the Planning Department in accordance with Montgomery County Code Chapter 8, Article IV and Code of Montgomery County Regulations (COMCOR) 50.00.01.10D. APF review at building permit may be conducted in the following manner:

- If a complete and adequate transportation statement is submitted and the proposed development generates less than 50 total peak-hour person trips, the APF determination may be approved administratively by the Planning Department Director or designee.
- If a complete and adequate transportation study is submitted and the proposed development generates 50 or more total peak-hour person trips, the APF determination must be approved by the Planning Board following a full public hearing.

Refer to COMCOR 50.00.01.10D for the review process including a Development Applications and Regulatory Coordination (DARC) Division application, noticing for a Planning Board hearing and other details.

**Figure 1: Montgomery County Local Area Transportation Review Process**




When a proposed development is projected by the LATR process to contribute to inadequate transportation conditions, the applicant should consult with Planning Department staff, Montgomery County Department of Transportation (MCDOT), Maryland State Highway Administration (SHA) and neighboring jurisdictions (when applicable) as appropriate to develop recommendations that can mitigate the project's impact and thereby gain Planning Board approval. A description and a prioritization of these mitigation approaches are provided in Section II.F of these guidelines.

The guideline procedures outlined in this document are intended to provide a snapshot of estimated future transportation conditions for proposed development. These procedures are not intended to establish delay-free travel conditions.

## D. RELATIONSHIP TO GUIDING DOCUMENTS

These guidelines focus on the timing or staging of development in combination with transportation-related public facilities and come into play primarily during the regulatory process. Montgomery County's General Plan, as amended by approved and adopted master, sector and functional plans, determines the amount, pattern, location and type of development within the county. The master planning process is largely aspirational, creating a long-term vision for our communities. These guidelines have a more focused, shorter term view. Their purpose is to evaluate individual proposals for development, determining if the county's transportation network has sufficient capacity to accommodate the additional demand.

County master plans identify where growth is appropriate and at what levels or densities this growth should occur. They provide a vision for the future of the county — from the General Plan's very conceptual level to much more detailed recommendations in small area sector plans. For each master plan, some high-level analysis is done regarding infrastructure needed to accommodate the vision outlined in the master plan. This analysis utilizes methods and procedures described in these guidelines to determine the balance between land use and transportation capacity at the master planning horizon and may result in recommended capital improvements that could be implemented by the public sector, private sector, or a combination of the two.

Local Area Transportation Review must always be consistent with the standards and staging mechanisms of adopted master and sector plans.

The Capital Improvements Program (CIP) and the Consolidated Transportation Program (CTP) are the tools through which the county and state respectively increase the capacity of public transportation facilities to support existing development and future growth. For the Local Area Transportation Review procedures described in these guidelines, the programmed transportation projects eligible for consideration as a future condition in a transportation study are those fully funded for construction in the first six years of the county's currently approved Capital Improvements Program, the state's Consolidated Transportation Program or any municipal capital improvements program.

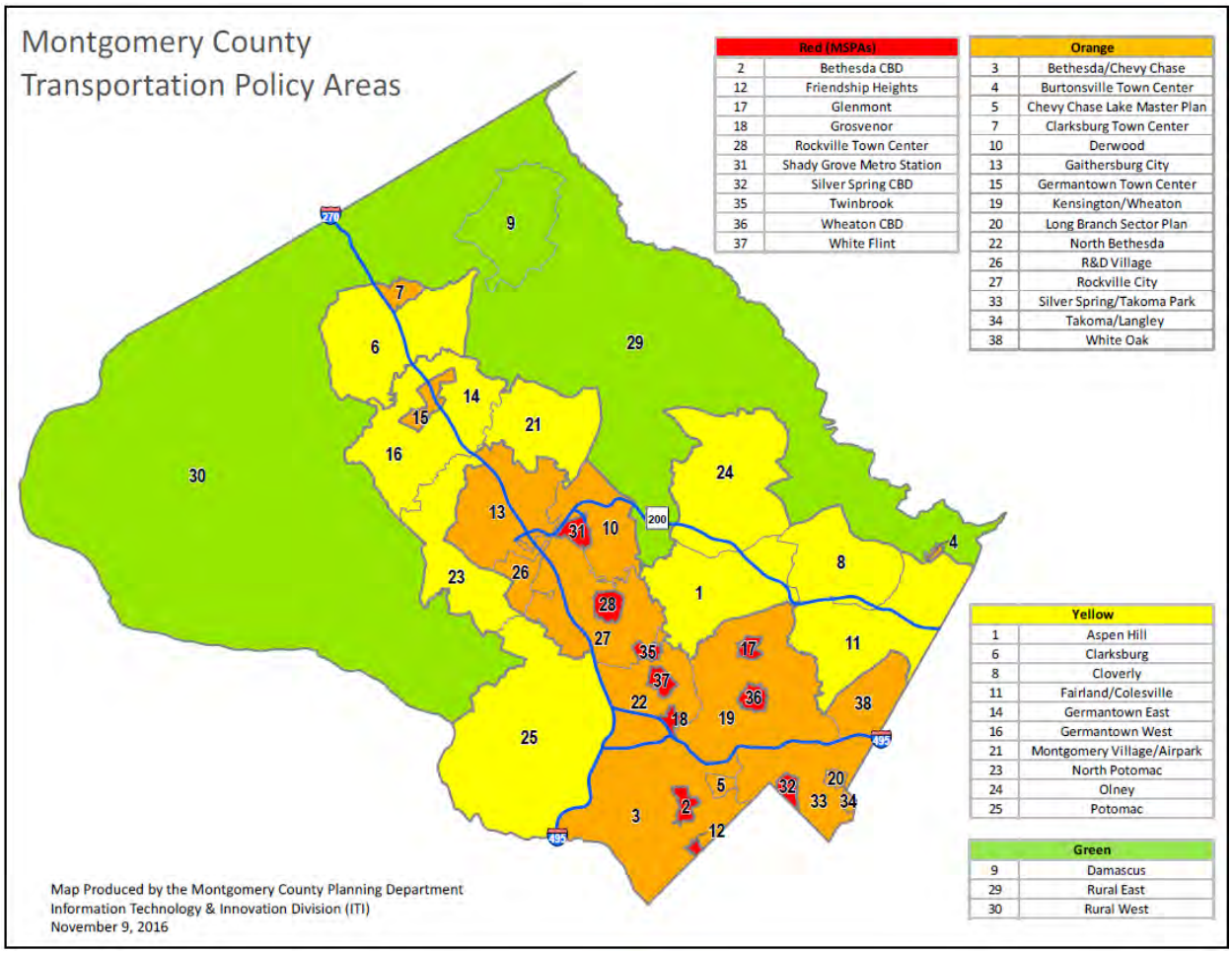
These guidelines are also recognized as the standard for reports to the Board of Appeals and Hearing Examiner for conditional use and zoning cases.

## E. POLICY AREA DEFINITIONS

For the purposes of these guidelines, county policy areas are organized into four (4) categories described as follows and depicted in Map 1:

- **Red**: Down-county central business districts and Metro station policy areas (MSPAs) characterized by high-density development and the availability of premium transit service (i.e., Metrorail, MARC).
- **Orange**: Corridor cities, town centers and emerging transit-oriented development (TOD) areas where premium transit service (i.e., Corridor Cities Transitway, Purple Line, bus rapid transit) is planned.
- **Yellow**: Lower density areas of the county characterized by mainly residential neighborhoods with community-serving commercial areas.
- **Green**: The county's Agricultural Reserve and rural areas.

**Map 1: Subdivision Staging Policy Areas**




## F. MITIGATION PRIORITIES

These guidelines prioritize the application of modal mitigation approaches as follows when projected traffic generated from proposed projects exceeds the applicable policy area congestion standard:

- Transportation demand management (TDM) approaches to reduce vehicular demand.
- Pedestrian or bicycle improvements.
- Transit facility or service improvements.
- Intersection operational improvements.
- Roadway capacity improvements.

A mitigation approach may be elevated in the priority list if it is explicitly identified in an area master plan or sector plan.

In Road Code Urban Areas (RCUAs) and Bicycle Pedestrian Priority Areas (BPPAs), adjustment of the prioritization of mitigation approaches listed above may be made to allow for mitigation

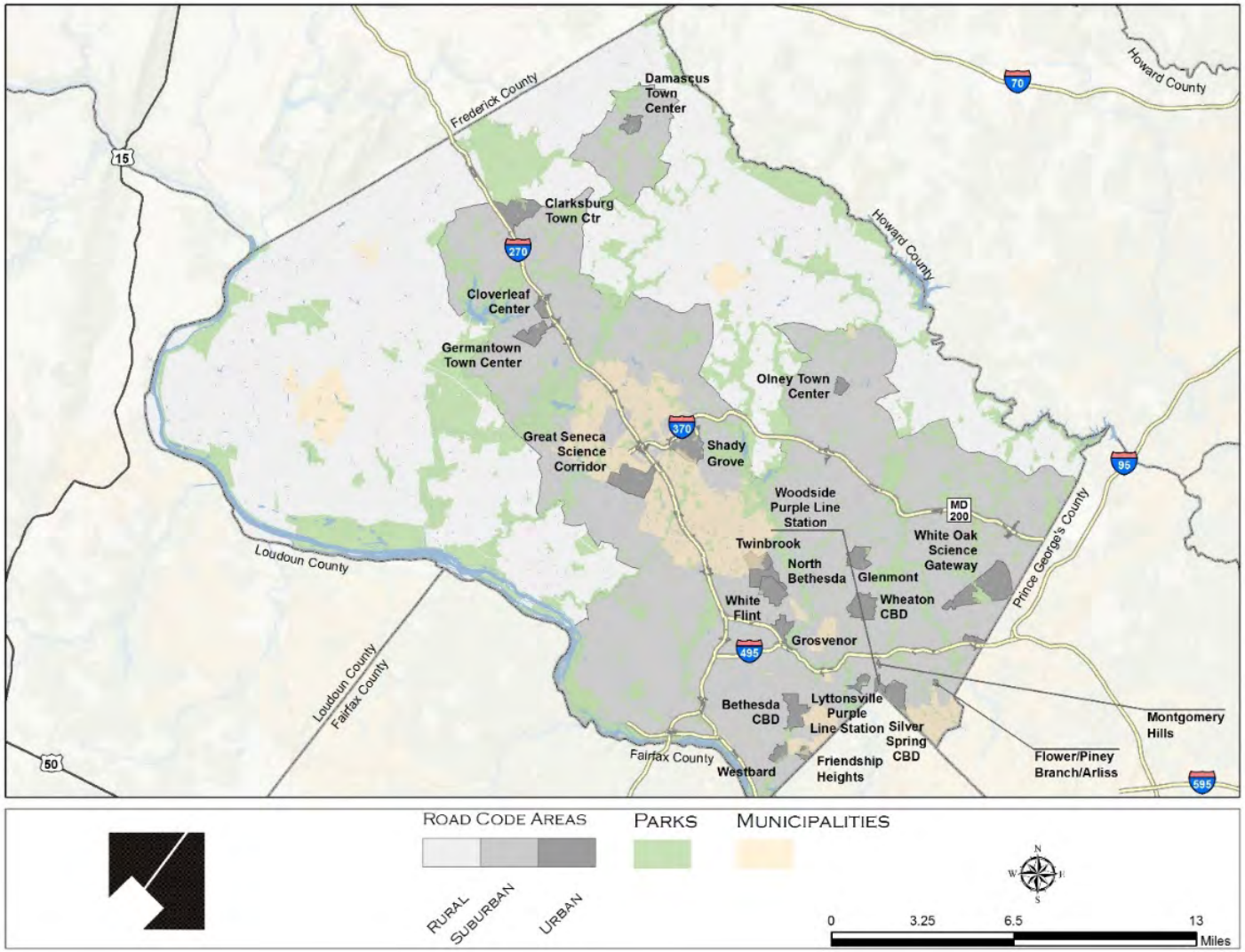
payment in lieu of construction as described below.

The consideration of land use context in defining appropriate transportation solutions extends beyond the policy area geography. For example, the implementation of transportation facilities is governed by Section 49 of the County Code, also known as the "Road Code." As with policy areas, the Road Code also defines portions of the county as urban, suburban or rural, and these definitions are also adopted by County resolution (while being more finely-grained than the policy area definitions).

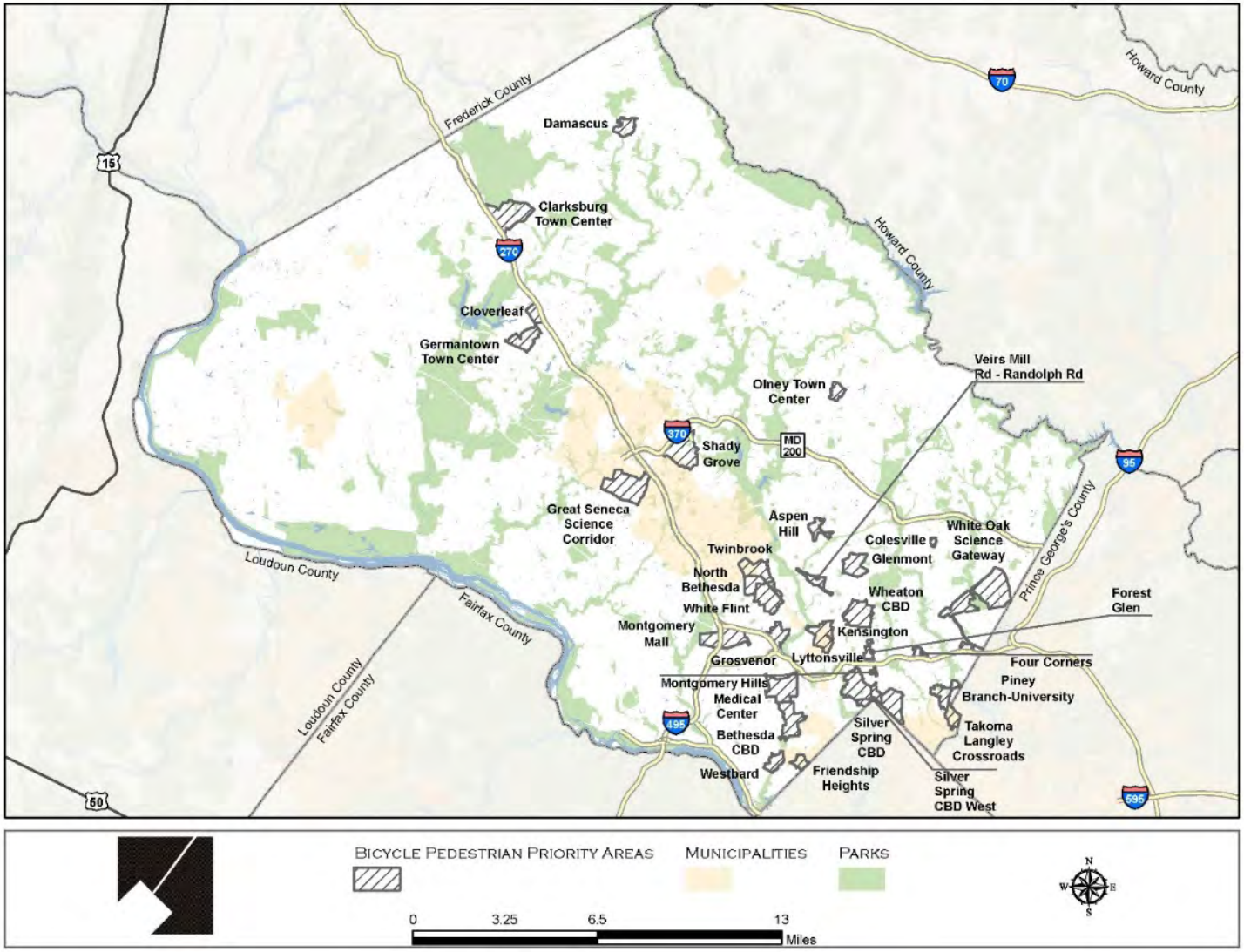
The Road Code Urban Areas (RCUAs), such as the Olney Town Center or Damascus Town Center, reflect nuances within a policy area where the land use is expected to generate a higher proportion of walking and bicycling than in other locations of the same policy area. Accordingly, there should be slower speed limits, wider sidewalks and similar design elements associated with a walkable town center in the RCUAs. The county has also designated Bicycle Pedestrian Priority Areas (BPPAs) that are locations where the enhancement of bicycle and pedestrian traffic is a priority. Maps depicting the boundaries of RCUAs and BPPAs are provided as Map 2 and Map 3, respectively.

These RCUA and BPPA designations describe places within the county where the rights-of-way are busiest; not only due to the concentration of pedestrian activity, but also due to smaller parcels with multiple connections to utility lines, more closely spaced driveways and intersections, and more overlapping activities for capital improvements and maintenance within both public and private realms.

The identification and implementation of transportation solutions in these RCUAs and BPPAs, therefore, tend to be the most complex. It is more efficient in these areas for the public sector to implement transportation solutions in a coordinated fashion. Therefore, in RCUAs and BPPAs where an applicant needs to mitigate an LATR impact, a mitigation payment in lieu of construction will be allowed. This payment is permitted in cases where construction of needed mitigation requires coordination among multiple projects or acquisition of an offsite right-of-way, or results in a disproportionate cost burden for the applicant.




**Map 2: Montgomery County Road Code Urban Areas**




**Map 3: Montgomery County Bicycle Pedestrian Priority Areas**

## G. DEFINITIONS OF MODAL ADEQUACY

To achieve an approximately equivalent transportation level of service in all areas of Montgomery County, greater vehicular traffic congestion is permitted in policy areas with greater transit accessibility and usage, and non-motorized quality of service is prioritized in areas where higher pedestrian and bicyclist volumes are expected. For each type of modal analysis that may be required, these guidelines define the basis for the definition of adequacy (i.e., the 2010 and 6th Editions of the Highway Capacity Manual). Applicants are encouraged to use state-of-the-practice software tools to conduct transportation adequacy analyses and may propose clarifications as warranted as part of an LATR transportation study scoping.

**Motor vehicle adequacy** is defined by the intersection level of service standards by policy area described in Section IV.A of the guidelines. For intersections located within Red or Orange policy areas, the Highway Capacity Manual operational (delay-based) level of service standard applies to all study intersections[2]. For intersections located within Yellow or Green policy areas, the critical lane volume (CLV) level of service standard applies to study intersections with a CLV of 1,350 or less. The Highway Capacity Manual delay-based level of service standard applies to study intersections with a CLV of more than 1,350.

**Pedestrian system adequacy** is defined as providing level of service (LOS) D or better for any signalized crosswalk. Any site that generates at least 50 total peak-hour pedestrian trips (including trips to transit[3]) must:

- Fix (or fund) all Americans with Disabilities Act (ADA) noncompliance issues within a 500-foot radius of site boundaries, including, but not limited to, curb ramps and sidewalks.
- Ensure Level of Service (LOS) D for crosswalk pedestrian delay (or no more delay than existing) at LATR study intersections within 500 feet of site boundaries or within a Road Code Urban Area/Bicycle Pedestrian Priority Area (RCUA/BPPA). This pedestrian delay can be achieved by considering means to reduce crosswalk distances and demonstrating a practical approach to signal timing. The applicant is responsible for identifying a revised signal timing concept for consideration, but is not required to obtain approval from the Montgomery County Department of Transportation or Maryland State

[2] Although all intersections in Red and Orange policy areas are subject to HCM analysis, intersections analyzed as part of a corridor will reflect the average delay of the entire corridor rather than the subject intersection in isolation.

[3] Pedestrian trips are calculated by adding the number of estimated non-motorized trips to the number of estimated transit trips.

Highway Administration, nor is the operating agency required to implement it.

Regardless of the development size and location, if an intersection operational analysis is triggered for any intersections within a RCUA/BPPA, motor vehicle mitigation must not increase average pedestrian crossing time at the intersection.

**Bicycle system adequacy** is defined as providing a low level of traffic stress (LTS) for bicyclists. For any proposed development generating at least 50 total peak-hour non-motorized trips and located within a quarter mile of an educational institution or existing/planned bikeshare station, the applicant must make improvements needed to provide a low level of traffic stress (LTS-2) conditions that link the site to or otherwise extend an LTS-2 facility within 750 feet of a development site boundary or implement a master-planned improvement that provides an equivalent improvement in LTS.

**Transit system adequacy** for LATR is defined as providing a peak load of LOS D for bus transit service routes (1.25 transit riders per seat) during the peak period (in the peak direction)[4]. For any development generating at least 50 total peak-hour transit trips, the applicant must inventory bus routes at stations/stops within 1,000 feet of the site and identify the peak load for each route at that station. The applicant must coordinate with the transit service provider to identify and implement (or fund) improvements that would be needed to address conditions worse than LOS D due to additional patrons generated by the development.

For the purposes of defining background, total future and total future with mitigation conditions for multimodal intersection analysis:

- Total future conditions for motor vehicle traffic must incorporate existing traffic plus traffic generated by background development and site development.
- Total future conditions for transit must incorporate existing conditions, plus reasonably assumed changes associated with any improvements in the six-year capital program (such as the Purple Line).
- Total future conditions for bicycles and pedestrians are typically defined as having demand equal to existing conditions.

[4] Pursuant to the *Transit Capacity and Quality of Service Manual*, 3rd Edition, published by the Transportation Research Board.

# III. LATR Study Submission

## A. SCOPING PROCESS

A transportation scoping form[5] must be filed prior to an applicant's development application submittal[6]. The transportation scoping form must show the number of net new **peak-hour person trips** generated by the project's proposed land use. If the proposed development generates fewer than 50 net new peak-hour person trips, the applicant may proceed with a transportation statement. If the proposed development generates 50 or more net new peak-hour person trips, the applicant must coordinate with Planning Department staff to develop a scope for a transportation study. Transportation studies submitted without a staff-approved scoping form will not be accepted.

Planning Department staff will review the applicant's scoping form and provide guidance regarding approved but unbuilt developments, relevant pending applications, study intersection identification, trip distribution and traffic assignment and other information required to complete the study. It is the applicant's responsibility to prepare the initial transportation study scope in accordance with the LATR Guidelines. Planning staff will respond to all scoping requests within 15 working days.

Upon completion of the scoping form, the applicant may proceed with data collection and analysis. A draft transportation study (including supporting Synchro files and signal timing plan information, if applicable) should be submitted to Planning Department staff for review. Once staff determine that the application is complete and adequate (no later than 15 days following submittal), the applicant can include the transportation study as part of the official submittal[7]. Applicants should provide seven hard copies and one PDF copy on two CDs of the transportation study to Planning Department staff for distribution to the reviewing agencies. Transportation studies submitted directly to the Planning Department without prior coordination with Planning Department staff will result in longer comment periods from MDSHA and MCDOT.

## B. TRANSPORTATION STUDY CRITERIA

Applicants should use the following general criteria and analytical techniques to demonstrate the expected impact on public roadway intersections from the proposed development. The

[5] See http://montgomeryplanning.org/wp-content/uploads/2017/09/LATR_ScopingForm_091917.pdf

[6] Development applications requiring an adequate public facility finding must include a transportation study or a transportation statement for review.

[7] At the time of this document's publication, the Planning Department is accepting plans electronically using the E-Plans platform.

analysis should consider existing traffic, background traffic generated by developments approved and not yet built, and projected traffic generated by the applicant's project.

Planning Department staff may require that traffic data from nearby pending applications be included in the transportation study if those applications are likely to be approved by the Planning Board before the subject application's projected Planning Board hearing date. Additionally, any nearby development applications approved prior to approval of the subject application may warrant an updated transportation study to include the associated transportation impacts. Transportation studies should reflect any transportation improvements that are fully funded by and required of nearby development projects.

Traffic studies should base their analysis on current and up-to-date traffic counts. Typically, traffic counts older than one calendar year are not accepted. Traffic studies submitted with count data older than one year may need to be revised and updated with new traffic counts.

These guidelines expand on the application of the state-of-the-practice in transportation analysis tools to provide measures that are more readily correlated with traveler experience than the critical lane volume (CLV) approach. In so doing, these guidelines also introduce three new quantitative measures of adequacy for pedestrians, bicyclists and transit. These proposed adequacy measures are described in subsequent sections of this document.

Other multimodal elements of the LATR process, notably the requirement for all LATR studies to incorporate a qualitative pedestrian-bicycle impact statement, are retained. LATR for each mode of travel must be completed for any subdivision that would generate at least 50 peak-hour person trips by that mode.

The guidelines prescribe the use of context-sensitive trip generation and mode split analyses to determine the need for an LATR Study (as contrasted with a transportation statement) and the need for quantitative analysis of each of the four modes of travel. The LATR process utilizes the most recently published vehicle-trip generation rates in the Institute of Transportation Engineers (ITE) Trip Generation Manual.

These rates are applied in concert with context-sensitive trip generation adjustment factors associated with each policy area to define site vehicle driver, vehicle passenger, transit and non-motorized person trips, using information provided in Appendices Tables 1a and 1b. Table 1 below describes the application of this using a hypothetical 100,000 gross-square-foot office building in the Germantown East Policy Area.

| Table 1. LATR Guidelines Appendix References for Trip Generation | | | |
|---|---|---|---|
| **Appendix** | **Title/Purpose** | **Primary Use** | **Example Case** |
| Table 1a | Institute of Transportation Engineers (ITE) Vehicle Trip Rate Adjustment Factors | Adjust ITE estimate of site-generated vehicle trips | Using the average rates from pages 1260 and 1261 of the ITE 9th Edition Trip Generation Manual and Appendix Table 1a, the site is estimated to generate 156*0.95=148 a.m. peak-hour vehicle trips and 149*0.95=142 p.m. peak-hour vehicle trips. The a.m. peak hour is the critical peak hour for person-trip generation analysis as the ITE vehicle-trip rate is higher for the a.m. peak hour than for the p.m. peak hour. |
| Table 1b | Mode Split Assumptions by Policy Area | Identify which modes require quantitative analysis by considering the number of person trips generated by each mode for the subject policy area. | The number of person trips generated by a travel mode is the total number of person trips multiplied by the mode share for that mode.<br><br>The first step is to convert ITE vehicle trips to policy-area specific total person trips. For the a.m. peak hour, the total number of person trips is the number of vehicle trips divided by the Appendix Table 1b auto driver mode share (148 / 72.1% = 205).<br><br>The number of person trips exceeds the threshold of 50 so that a quantitative auto analysis is required.<br><br>The next steps are to calculate person trips by transit and non-motorized modes for considering transit system adequacy, pedestrian system adequacy and bicycle system adequacy.<br><br>The number of transit trips (205 * 1.8% = 4) is fewer than the threshold of 50 so that a quantitative transit analysis is not required.<br><br>The number of non-motorized trips (205 * 5.0% = 10) plus the number of transit trips (4, from above) totals 14, or fewer than the threshold of 50, so a quantitative pedestrian analysis is not required.<br><br>The number of non-motorized trips (10, as shown above) is fewer than the threshold of 50, so a quantitative bicycle analysis is not required, regardless of whether the site is within a quarter mile of an educational institution or an existing or planned bike parking area or bikeshare station. |

Once the context-sensitive number of person trips generated by mode is established, certain sites may be eligible for further mode shift analysis through the consideration of trip generation characteristics of retail land uses, transit proximity, parking management and transportation demand management (TDM) as noted in the following paragraphs.

**Ancillary Retail**

The vehicle-trip generation rates published by the Institute of Transportation Engineers (ITE) and the policy area factors in Appendix Tables 1a and 1b, address retail site driveway traffic. In most cases, a significant amount of driveway traffic is "pass-by" or "diverted link" traffic; in other words, few of those vehicles are making a separate trip solely to or from the retail land use.

The ITE trip generation processes are adept at addressing this characteristic of mixed-use development for vehicle trips, but not so robust in considering trips made by other modes (particularly in the most urban settings when some of those trips may be made to or from other uses in the same building and may not even require traveling outdoors).

ITE vehicle trip generation rates typically presume a stand-alone retail building with customer parking provided on-site, a characteristic common throughout the county except in more urban areas. Where retail uses are incorporated as an ancillary use within a mixed-use building, these guidelines presume no new person trips are generated where a nominal amount of ancillary ground-floor retail exists in a mixed-use building that is predominantly residential or office.

The presumption that no new person trips are generated applies for up to 15,000 gross square feet of retail space in a building that has least 90 percent of its floor area ratio (FAR) devoted to non-retail uses, if no parking spaces for retail customers are included in the site plan. For sites located within parking lot districts (PLD), an applicant proposing ground-floor retail with parking requirements achieved through participation in the PLD may assume 2.0 peak-hour vehicle trips, 1.0 peak-hour pedestrian trip and 1.0 peak-hour transit trip for each 1,000 gross square feet of retail space during the evening peak period, with morning peak period rates equal to 25 percent of evening peak period rates.

**Transit Proximity**

Based on Table S-2 in the 2005 Development Related Ridership Survey report from the Washington Metropolitan Area Transit Authority (WMATA), sites located outside a Red policy area but located within 1,000 feet of an existing or planned site for a light-rail transit (LRT) or a bus rapid transit (BRT) station may shift additional trips from auto drivers to transit patrons based on the walking distance to transit, with a value of:

- 1 percentage point of mode share for every 50 feet closer than 1,000 feet for office development.
- 1 percentage point of mode share for every 100 feet closer than 1,000 feet for residential development.

**Parking Management**

Research indicates that there is a correlation between parking supply and vehicle-trip generation, particularly when applied in a supportive parking-pricing environment with alternative transportation options. Applicants may adjust vehicle-trip generation rates if, per Section 59.6.2.4 of the Montgomery County Code, they propose parking ratios lower than the baseline minimums that include specific supportive actions identified to reduce parking demand. No additional actions other than those needed to satisfy Section 59.6.2.4 are required to make this trip generation adjustment.

For residential uses, each 2 percent reduction in parking below the minimum number of spaces yields a 1 percent reduction in vehicle-trip generation rates for that use. This relationship is based on the equation in Table 2-9 of the Transportation Research Board's TCRP Report 128, "Effects of TOD on Housing, Parking, and Travel." Applying this equation to a prototypical transit-oriented development (TOD) site with 10 dwelling units per acre, a ratio of 1 parking space per dwelling unit would yield 0.24 peak-hour vehicle trips, and a ratio of 0.5 parking spaces per dwelling units would yield 0.18 peak-hour vehicle trips (in other words, a 50 percent reduction in parking yields a 25 percent reduction in vehicle trips).

For office uses, each 3 percent reduction in parking below the minimum number of spaces yields a 1 percent reduction in vehicle-trip generation rates for that use. This relationship is based on the relationships shown in Figure 6-9 of a 2004 report by Lund, Cervero and Wilson for the California Department of Transportation (Caltrans) "Travel Characteristics of Transit Oriented Development in California."

The report shows that in a transit/transportation demand management-rich environment, a similar reduction from 1.0 to 0.5 parking spaces at an office site could be expected to increase transit mode share from 41 percent to 50 percent (which, for simplicity sake, is assumed to equal a reduction in auto mode share from 59 percent to 50 percent). In other words, in this case, a reduction of 50 percent of parking spaces reduces auto trips by about 15 percent or roughly a 3:1 ratio.

**Traffic Mitigation Agreements (TMAgs)**

Applicants wishing to further reduce vehicular impacts through transportation demand management (TDM) programs may propose additional TDM programs and services whose effectiveness will be negotiated with M-NCPPC and MCDOT staff, pivoting from the context-sensitive trip generation rates already incorporated above and with binding elements to be included in a traffic mitigation agreement (TMAg).

**Transportation Statement**

Owners and developers of projects that are projected to generate less than 50 net new peak-hour person trips for LATR need to submit only a transportation statement. This statement must demonstrate the conditions that justify the exemption.

Information to be provided in a transportation statement includes:

a. Development project location—planning area and policy area;
b. Proposed nonresidential square footage;
c. Proposed number of dwelling units (single-family or multifamily);
d. Proposed land uses (as defined by the Department of Permitting Services);
e. Estimated number of new and total peak-hour person trips generated by the proposed land uses; and
f. Rationale for exemption.

If the project is not exempt, the applicant must prepare a transportation study. Depending on the project size, uses and location, the contents of a transportation study will vary. The applicant and Planning Department staff, in a meeting or through correspondence, will establish a scope for the study using the elements described below. (For zoning and special exception cases, Planning Department staff may consult with the Hearing Examiner and initiate a meeting with the applicant and interested groups or individuals to establish the scope of the transportation analysis.)

**Existing Use Trip Credits**

If use and occupancy permits for at least 75 percent of the originally approved development were issued more than 12 years before the LATR transportation statement request, the applicant may take credit for existing site trips based on the current LATR trip generation methodology in support of determining the 50-peak-hour person trip threshold. Likewise, if the proposed use will be replacing an existing land use and that land use was occupied for more than 12 years, the applicant may take credit for the existing site trips based on the current LATR trip generation methodology. These existing trips should be reflected in the transportation study as "background" traffic. If an LATR transportation study is required and the 12-year existing trip credit is applicable, the number of signalized intersections in the study will be based on the increased number of net new peak-hour trips rather than the total number of peak-hour trips. In these cases, an LATR transportation study is not required for any expansion that generates five or fewer additional peak-hour person trips.

**Amendments to Previously Approved Adequate Public Facilities**

Projects are limited to the trip threshold established in the APF approval that may be reflected in the approved transportation study. Applications to amend valid APFs may modify the approved land use, trip generation, distribution and assignment without providing a new transportation study provided the amendment does not generate more peak hour trips than the original approval. Amendments that generate more trips than the previous approval must

prepare a new transportation study that evaluates the full impact of the proposed development under the effective Subdivision Staging Policy.

Transportation studies associated with amendments and APF extensions should use the most current LATR trip generation rates and guidelines for the purposes of trip generation. In accordance with the LATR Guidelines direction to avoid piecemeal development, structures less than 12 years old are considered "new" trips for trip generation purposes and are therefore included in the total number of new trips associated with the amendment application to determine the scope of study and transportation impact of a new development application. In practice, trips associated with the existing use may be considered a component of background trips because these trips will be on the road at the time of data collection.

When requesting an amendment or extension to a valid APF, an applicant may proceed using one of the following options:

i. Retain the originally approved APF and, if necessary, file for an extension or amend the approval to reflect fewer trips or other changes (other than increased trip generation. The extension may require a transportation study based on Planning Staff's review of transportation conditions in the vicinity of the project based on County Code Section 50.4.3.J.7.a.iii.c.

ii. Amend the originally approved APF so that new trips are reviewed under the effective Subdivision Staging Policy and, if applicable, old trips are retained. Change the development program to remain within the APF trip cap of the originally approved project.

iii. Obtain an entirely new APF approval by submitting a new transportation study under the effective Subdivision Staging Policy.

## C. CONTENTS REQUIRED FOR COMPLETENESS

### 1. **Adequacy Determination**

A transportation study must consider adequacy of the following elements:

- Quantitative motor vehicle adequacy analysis (if the 50-peak-hour person trip threshold is exceeded).
- Quantitative pedestrian system adequacy analysis (if the 50-peak-hour non-motorized trip threshold is exceeded, including consideration of transit trips).
- Quantitative bicycle system adequacy analysis (if the 50-peak-hour non-motorized trip threshold is exceeded and the site is within a quarter mile of an educational institution or an existing or planned bikeshare station).
- Quantitative transit system adequacy analysis (if the 50-peak-hour transit trip threshold is exceeded).

For each modal adequacy consideration required, the study must make a statement that the proposed development, with any required mitigation, will result in a finding of adequate operations for that mode, supported by the analytic processes and information described in the subsequent chapters of these guidelines.

**2. Pedestrian and Bicycle Impact Statement**

To ensure safe and efficient pedestrian and bicycle access and circulation to and within the site, each transportation study, regardless of pedestrian and bicycle-trip generation, must include a Pedestrian and Bicycle Impact Statement that describes:

- Pedestrian and bicycle counts at each intersection: pedestrian counts will be recorded at each leg of the intersection; bicycle counts will be recorded as turn movements.
- Any capital or operating modifications required to maximize safe pedestrian and bicyclist access to the site and surrounding area.
- Inventory map of existing and proposed sidewalks, off-road shared-use paths and bikeways near the site. The map should note whether these facilities are generally consistent with the county's Road Code design standards for sidewalk, path, landscape panel width and street trees.
- Location of existing and proposed bicycle parking provided on and in the vicinity of the site.
- Bicycle and pedestrian circulation to/from and within the site.
- Existing and proposed bus stops, shelters, benches and other amenities, including real time transit information in the vicinity of the site.
- Pedestrian and bicycle accommodations at nearby intersections, including crosswalks, countdown pedestrian signals (CPS), push buttons, median refuges and ADA-compliant ramps and accessible pedestrian signals (APS).
- Information on bus route numbers, service frequency and end destinations of bus routes.
- In central business districts and Metro station policy areas, recognition of peak pedestrian and bicycle activity periods.
- Presence of existing street lighting in the vicinity of the site.

Applicants should consult with Planning Department staff to determine the scope of the items referenced above.

**3. TDM Strategy Statement**

If an applicant is proposing trip-reduction measures, the study must include:

- A description of proposed Traffic Mitigation Agreement (TMAg) elements that will be approved by the Planning Board, the Board of Appeals (if applicable) and MCDOT. The description must include, at a minimum, the following elements:
  - Vehicle trip reduction goals, including the specific number of peak-hour vehicles to be reduced in both the weekday morning and evening peak periods.

- TMAg actions and a quantitative assessment of how they will achieve the required vehicle-trip reduction goals.
- Required duration of the TMAg, whether the TMAg will be enforced based on the provision of specified actions (regardless of outcome), measured outcomes (regardless of actions provided) or a combination of both.
- Measures to be used in enforcement.
- Suggested methods of monitoring.
- Security instrument to fund the continuation of the traffic mitigation program for its remaining term if the applicant defaults.
- Penalties if the vehicle trip reduction goals are not met.

• Written statements from both MCDOT and Planning Department staffs concurring with the proposed approach to traffic mitigation.

## D. REVIEW PROCESS

Planning Department staff evaluates transportation studies considering the following elements, described here to ensure consistent review by staff and provide applicants with additional information about how their studies will be analyzed.

To warrant an LATR transportation study, a proposed development must have a measurable transportation impact on a local area. Measurable transportation impact is defined as a development that generates 50 or more total (i.e., new, pass-by, and diverted, but applying trip credits for existing or replaced uses) weekday peak-hour **person** trips in the morning (6:30 a.m. to 9:30 a.m.) and/or evening (4:00 p.m. to 7:00 p.m.) peak periods. If the proposed development generates less than 50 net new **person** trips or is a renovation and/or redevelopment that will result in less than 50 total person trips, a transportation statement is permitted instead of an LATR transportation study.

To determine if a development will generate 50 or more net new peak-hour weekday **person** trips, Planning Department staff uses the following criteria:

- For retail development, pass-by and diverted trips are included, or considered in establishing the 50-**person** trip threshold for a transportation study *and* later, for designing site access and circulation. The fact that pass-by and diverted trips are already on the network is reflected in evaluating delay or critical lane volume measurements. Trip credits for existing or replaced uses are also applied in establishing the 50-person trip threshold.
- Planning Department staff will exercise professional judgment in consultation with the applicant to determine the appropriate land area to consider. Parcels that will be separated by unbuilt roadways remain “land at one location,” but parcels separated by business district streets, arterial roadways, major highways or freeways may cease to be “land at one location” even if in common ownership.

In certain circumstances, Planning Department staff may, in consultation with the applicant, require analysis of transportation conditions during a different three-hour weekday peak period; for example, 6:00 a.m. to 9:00 a.m. (versus the standard 6:30 a.m. to 9:30 a.m.) or 3:30

p.m. to 6:30 p.m. (versus the standard 4:00 p.m. to 7:00 p.m.), to reflect the site's location or trip-generation characteristics, existing conditions or conditions affecting background or total future conditions. For example, a school where classes end before the start of the evening peak period may warrant analysis of an earlier peak period.

For some specialized land uses, trip-generation rates may not be available. In such cases, Planning Department staff may request that determining rates be a part of the transportation study, most likely by collecting existing driveway counts at similar land uses. If special rates are to be used, staff must approve them prior to submission of the transportation study.

An applicant should not avoid the intent of this requirement by submitting piecemeal applications or approval requests. However, an applicant may submit a plan of subdivision for less than 50 peak-hour person trips if agreeing in writing that, upon filing future applications, the applicant will comply with the requirements of these guidelines when the total number of site-generated peak-hour person trips at one location has reached 50 or more. Then, a transportation study will be required to evaluate the impact of the total number of site-generated trips in accordance with the guidelines.

The County Council establishes congestion standards throughout Montgomery County (stated in terms of delay levels), which depend on the character of development and the availability of transit options. These standards are developed by policy area and adopted in the Subdivision Staging Policy (see Map 1). Planning Department staff maintains an inventory of intersection traffic data based on traffic counts collected by MCDOT, MDSHA and private sector traffic engineering consultants to provide applicants with a preliminary assessment of conditions in the vicinity of a proposed development.

# IV. Motor Vehicle System Adequacy


## A. ANALYSIS PROCEDURES AND TOOLS

### 1. Vehicular Delay

Each policy area has an established congestion standard for intersections, which is applied to meet the LATR test. These standards and mitigation requirements for intersections that exceed these standards are adopted by the County Council and specified in these guidelines, which are updated as needed to reflect industry standards, local transportation conditions, and Council action. The policy area congestion standards are fixed; they do not change based on the location of the study site. Intersections on the boundary of two policy areas are judged by the congestion standard of the policy area which allows a greater level of congestion; intersections clearly located within a policy area that differs from the policy area location of the subject development application will be evaluated based on the policy area in which the intersection is located (e.g., an intersection located in an Orange policy area will be subject to Orange policy area standards, even if the subject development is in an adjacent Red policy area).

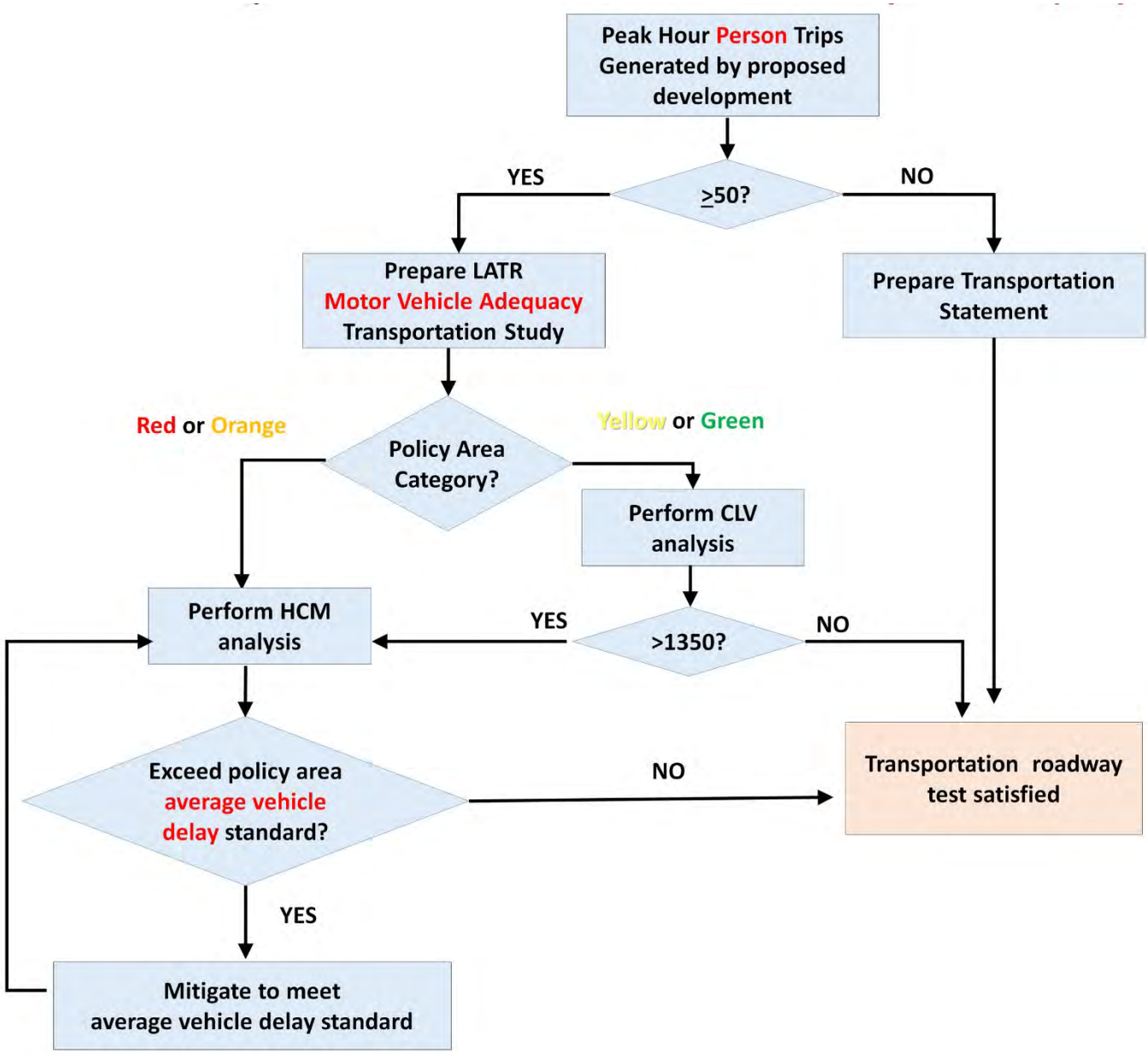
To achieve an approximately equivalent transportation level of service in all areas of the county, greater vehicular traffic congestion is permitted in policy areas with greater transit accessibility and usage. For motor vehicle adequacy, Table 2 shows the intersection level of service standards by policy area.

For intersections located within **Red** or **Orange** policy areas, the Highway Capacity Manual (HCM) delay-based level of service standard applies to all signalized study intersections. For intersections located within **Yellow** or **Green** policy areas, the critical lane volume (CLV) level of standard applies to signalized study intersections with a CLV of 1,350 or less, and the Highway

Capacity Manual (HCM) delay-based level of service standard applies to signalized study intersections with a CLV of more than 1,350. The steps reflected in this process are depicted in Figure 2.

For stop or yield-controlled intersections, the delay standard applies to the average vehicle delay calculated by the HCM for controlled movements with the inclusion of zero seconds of delay for vehicles that do not stop or yield. For instance, a stop-controlled intersection with 100 vehicles each experiencing 60 seconds of delay and 1,000 mainline vehicles without delay, the average vehicular delay is (1,000*0+100*60)/1,100=5.4 seconds per vehicle.

**Figure 2: Local Area Transportation Review Process – Motor Vehicle System Adequacy**



| Table 2: Subdivision Staging Policy Intersection Congestion Standards | | | |
|---|---|---|---|
| **Policy Area** | **HCM Average Vehicle Delay Standard (seconds/vehicle)** | **Critical Lane Volume Congestion Equivalent** | **HCM Volume-to-Capacity Equivalent** |
| 29 Rural East<br>30 Rural West | 41 | 1350 | 0.84 |
| 9 Damascus | 48 | 1400 | 0.88 |
| 6 Clarksburg<br>14 Germantown East<br>16 Germantown West<br>13 Gaithersburg City<br>21 Montgomery Village/Airpark | 51 | 1425 | 0.89 |
| 8 Cloverly<br>23 North Potomac<br>25 Potomac<br>24 Olney<br>26 R&D Village | 55 | 1450 | 0.91 |
| 10 Derwood<br>1 Aspen Hill<br>11 Fairland/Colesville | 59 | 1475 | 0.92 |
| 7 Clarksburg Town Center<br>15 Germantown Town Center<br>27 Rockville City | 63 | 1500 | 0.94 |
| 4 Burtonsville Town Center<br>22 North Bethesda | 71 | 1550 | 0.97 |
| 3 Bethesda/Chevy Chase<br>5 Chevy Chase Lake<br>19 Kensington/Wheaton<br>20 Long Branch<br>33 Silver Spring/Takoma Park<br>34 Takoma/Langley<br>38 White Oak | 80 | 1600 | 1.00 |
| 2 Bethesda CBD<br>32 Silver Spring CBD<br>36 Wheaton CBD<br>12 Friendship Heights CBD<br>37 White Flint<br>35 Twinbrook<br>18 Grosvenor<br>17 Glenmont<br>28 Rockville Town Center<br>31 Shady Grove | 120 | 1800 | 1.13 |

These guidelines describe operational analyses for intersections using delay-based performance standards to either reduce average peak-hour delay per vehicle below the policy area delay standard identified in the 2016 Subdivision Staging Policy or maintain build-condition average delay per vehicle below the total future (consisting of existing traffic plus traffic generated by approved but unbuilt development) average delay. The guidelines describe whether the intersection analysis performance is to be made for an individual intersection or requires a network analysis to address closely spaced intersections operating in tandem.

If an individual intersection is analyzed, the vehicular delay threshold applies to the entire intersection, not to individual approaches or turning movements in the intersection. Similarly, if a network of multiple intersections is analyzed, the vehicular delay threshold applies to the entire network, not to individual intersections within the network. The focus on average delay is intended to help facilitate a focus on management and operations strategies; as the county builds out its roadway network, the emphasis is less on constructing additional automobile capacity and more on finding more efficient means for operating the current network to accommodate changing travel demands through techniques such as signal timing, signing and marking, and vehicle progression.

The derivation of the policy area average vehicular delay thresholds applies a level of service (LOS) equivalency between critical lane volume (CLV) and delay, using LOS/delay thresholds in the Highway Capacity Manual shown in Table 3.

**Table 3. Equivalency Between CLV, LOS and Average Vehicle Delay**

| HCM LOS Threshold / Boundary | Corresponding Average Vehicle Delay per HCM (seconds) | Corresponding CLV Value |
|---|---|---|
| A / B | 10 | 1000 |
| B / C | 20 | 1150 |
| C / D | 35 | 1300 |
| D / E | 55 | 1450 |
| E / F | 80 | 1600 |
| n/a | 120 | 1800 |

### 2. Critical Lane Volume Intersection Analysis Method

An intersection's ability to carry traffic can be expressed as critical lane volume (CLV), the level of congestion at critical locations with conflicting vehicle movements, usually an intersection. Current CLV standards for each policy area are based on achieving approximately equivalent combined transportation roadway and transit levels of service in all areas of the county (see Map 1). Greater vehicular traffic congestion is permitted in policy areas with greater transit accessibility and use.

For a transportation study, the existing, background and site-generated traffic for identified intersections should be measured against intersection capacity using the critical lane volume

method. The analysis should be carried out for the peak hour of both the weekday morning and evening peak periods, and should use traffic data for non-holiday weekdays and other non-typical occurrences.

The CLV method is generally accepted by most Maryland public agencies, including MDSHA, MCDOT, cities of Rockville, Gaithersburg and Takoma Park, and Montgomery County Planning Department. The methodology will fit most intersection configurations and can be easily varied for special situations and unusual conditions.

While some assumptions, such as lane use factors (see Step 3 below), may vary between jurisdictions and agencies, the general CLV methodology is consistent. An excellent reference source is MDSHA's web site:

https://www.roads.maryland.gov/ohd2/Traffic%20Impact%20Study%20Guidelines.pdf.

The CLV method can be used at signalized or un-signalized intersections. For un-signalized intersections, a two-phase operation should be assumed. The traffic volumes should be those approaching the intersection as determined in each step of the transportation study (existing, existing plus background and existing plus background plus site).

Applicants should use the following steps to determine the congestion level of an intersection with a simple two-phase signal operation.

**Step 1:** Determine the signal phasing, number of lanes and total volume of entering turning movements on all intersection approaches and the traffic movements permitted in each lane.

**Step 2:** Subtract from the total approach volume any right-turn volume that operates continuously throughout the signal cycle (a free-flow right-turn bypass). Also, subtract the left-turn volume if it has an exclusive lane. An exclusive turning lane must be long enough to store all the turning vehicles in a typical signal cycle without overflowing into the adjacent through lanes. Otherwise, none or only a percentage of the turning volume may be subtracted from the total approach volume.

**Step 3:** Determine the maximum volume per lane for each approach by multiplying the volume calculated in Step 2 by the appropriate lane-use factor selected from Table 4. (Note: Do not count lanes established for exclusive use such as right- or left-turn storage lanes. The lane use factor for a single exclusive use lane is 1.00. Consult with Planning Department staff and MCDOT regarding any overlap signal phasing.)

| Table 4: Montgomery County Lane Use Factors | |
|---|---|
| **Number of Approach Lanes** | **Lane Use Factor*** |
| 1 | 1.00 |
| 2 | 0.53 |
| 3 | 0.37 |
| 4 | 0.30 |
| 5 | 0.25 |
| ** Based on local observed data and the 2010 Edition of the Highway Capacity Manual* | |

**Step 4:** Select the maximum volume per lane in one direction (e.g., northbound) and add it to the opposing (e.g., southbound) left turn volume.

**Step 5:** Repeat Step 4 by selecting the maximum volume per lane in the opposite direction (e.g., southbound) and the opposing (e.g., northbound) left-turn volume.

**Step 6:** The higher total of Step 4 or Step 5 is the critical volume for phase one (e.g., north-south).

**Step 7:** Repeat Steps 4 through 6 for phase two (e.g., east-west).

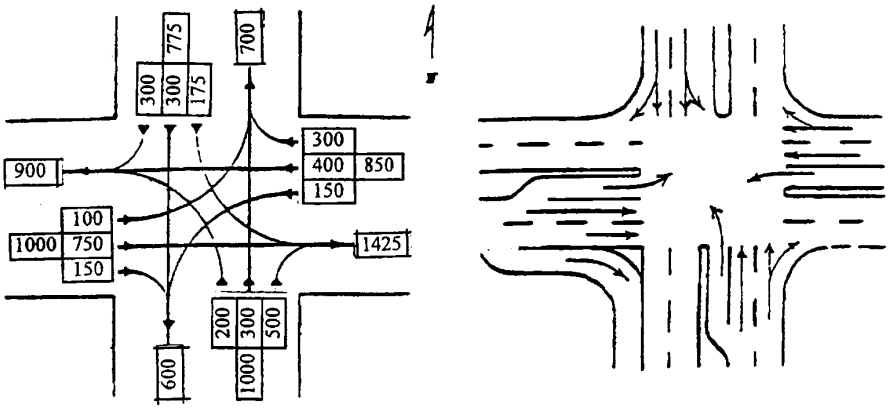
**Step 8:** Add the critical lane volumes for the two phases to determine the CLV for the intersection. At some intersections, two opposing flows may move on separate phases. For these cases, each opposing phase becomes a part of the intersection's CLV (see Table 5).

An example of a CLV calculation for a hypothetical intersection is provided in Table 5 and depicted in Figure 3 below.

| Table 5: Critical Lane Volume Calculations | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Direction from the:** | **Lane approach volume** | | **Critical lane use factor** | | **Approach volume** | | **Opposing lefts** | | **Lane volume per approach** |
| north | 775[1] | x | 0.53 | = | 411 | + | 200 | = | 611 |
| south | 800[2] | x | 0.53 | = | 424 | + | 175 | = | 599 |
| | 500 | x | 1.00 | = | 500 | + | 175 | = | 675[5] |
| east | 700[3] | x | 0.53 | = | 371 | + | 100 | = | 471 |
| west | 750[4] | x | 0.53 | = | 398 | + | 150 | = | 548[5] |

1 Approach volumes are the sum of through, right-, and left-turn movements in two lanes.
2 For a heavy right turn, evaluate worst of rights in one lane or through and rights in two lanes.
3 Approach volumes are the sum of through and right-turn movements in two lanes.
4 Approach volumes are through only because of free right and separate left.
5 Intersection critical lane volume = higher sum = 675 + 548 = 1,223.

**Figure 3: Example Intersection Turning Movements and Lane Configurations**




**TURNING MOVEMENT VOLUMES** **LANE CONFIGURATIONS**

The following conditions should be observed where applicable:

- Right-turn overlaps can be assumed where an exclusive right-turn lane exists, except in cases when an approach is signed for a "no turn on red" condition.
- The critical lane volume (CLV) for five-leg intersections should be addressed according to the individual signal phases identified in the field.
- In cases where existing pedestrian crossing time criteria are not met, applicants must inform MCDOT, request that they revise the signal timing, and include this revision in the pedestrian statement.
- Crossing distances are to be measured from the curb to the edge of the far travel lane (not curb to curb).
- "Desired times" are to be determined by dividing the crossing distance by 3.5 feet per second and then subtracting the total clearance time for that associated phase, as per the Manual on Uniform Traffic Control Devices.
- The CLV calculation for roundabouts should calculate the sum of the approach flow and circulating flows, as defined by the Highway Capacity Manual, for each approach and comparing the highest sum to the LATR standards.

### 3. Isolated Intersection Delay

Vehicular delay can be considered for isolated intersections where the intersection operations can fairly be assessed independent of upstream or downstream traffic flow conditions. In such cases, the adequacy of the transportation system for intersections is based on the correlation between intersection level of service and vehicular delay as described in the *2010 Highway Capacity Manual* and shown in Table 2. Adequacy is achieved when the average intersection vehicle delay in the total future with mitigation condition does not exceed either the congestion standard shown in Table 2 or the average intersection vehicle delay in the background condition, whichever is higher.

**4. Network Delay**

For study intersections where the average intersection vehicle delay is greater than 80 seconds in existing, background or total future conditions, and either:

a. the intersection is located on a congested roadway with a travel time index greater than 2.0 as documented by monitoring reports[8] **or**
b. the intersection is located in close proximity, within 600 feet, of another traffic signal.

A more robust network operations analysis approach should be applied using micro-simulation tools (such as Synchro, SimTraffic, CORSIM and VISSIM). Additional guidance on micro-simulation parameters is available from Planning Department staff.

## B. DETERMINING BACKGROUND AND TOTAL FUTURE CONDITIONS

Applicants should use the following general criteria and analytical techniques to demonstrate the expected impact on public roadway intersections by the proposed development. The analysis should consider existing traffic, background traffic generated by developments approved and not yet built, and projected traffic generated by the applicant's project.

Planning Department staff may require that traffic from nearby pending applications is included in the transportation study if those applications are likely to be approved by the Planning Board before the subject application's projected Planning Board hearing date. Otherwise, the transportation study would have to be updated to include the pending applications that were approved between the transportation study's scoping and the Planning Board hearing date. Transportation studies should also reflect any improvements that will be made by nearby development projects.

**Intersections**

The number of intersections included will be based on the projected trips generated by the development under consideration. As shown in Table 6, the number of signalized intersections and significant non-signalized intersections in each direction is based on the maximum number of new weekday peak-hour vehicle trips generated by the proposed land uses, unless Planning Department staff in consultation with MCDOT, MDSHA and municipalities, if appropriate, finds that special circumstances warrant a more limited study.

Planning Department staff, in cooperation with the applicant, will use judgment and experience in deciding the **significant** intersections to be studied. For example, the ramps and termini of future interchanges will be treated as signalized intersections. The county's central business

[8] Relevant monitoring reports include the latest edition of the MWCOG Congestion Management Report, MDSHA State Highway Mobility Report and the Montgomery County Mobility Assessment Report. Applicants should consult with Planning Department staff regarding the appropriate reference to use.

districts (CBDs) and Metro station policy areas (MSPAs) have more closely-spaced intersections. Accordingly, not every signalized intersection should be studied and, as a result, the study may cover a larger area. Site access driveways are not included in the first ring of intersections.

**Table 6: Intersections to be Included in a Transportation Study**

| Weekday Peak-Hour Site Vehicle Trips | Minimum Number of Intersections in Each Direction |
|---|---|
| < 250 | 1 |
| 250 – 749 | 2 |
| 750 – 1,249 | 3 |
| 1,250 – 1,749 | 4 |
| 1,750 – 2,249 | 5 |
| 2,250 – 2,749 | 6 |
| >2,749 | 7 |

The term "each direction" applies to every study intersection. For example, in a hypothetical grid, the first ring from the site access point or off-site PLD garage, if applicable, would include four intersections. The second ring would include not only the next four intersections along the streets serving the site, but also the four intersections with cross streets encountered in the first ring. As the number of intersections in each direction grows linearly from one to five, the number of total study area intersections grows at a greater rate.

When determining the intersections to be studied, Planning Department staff will also consider:

- Geographic boundaries such as rivers, major streams, parks, interstate routes, railroads;
- Political boundaries, although intersections located within the cities of Rockville and Gaithersburg where the Planning Board does not have subdivision authority, will be included in the transportation study and the studies will be shared with nearby incorporated cities;[9]
- Contiguous land under common ownership;
- Extent of diverted and pass-by trips; and
- Functional classification of roadways, for example, a six-lane major highway.

A site may generate a quantity of peak-hour vehicle trips that is projected to increase the critical lane volume through an intersection by fewer than five CLV. In this situation, the applicant is required to improve another intersection for the same project and/or is participating in a traffic mitigation program. In such a case, the intersection does not need to be analyzed in the transportation study, even if it would otherwise be identified as appropriate to

[9] In such cases, the coordination of any new proposed intersection improvements shall be in accordance with the memorandum of understanding provided in Appendix 3.

study. However, CLV analyses must be submitted in addition to any necessary HCM delay analyses to demonstrate applicability, if these conditions are intended to be applied to the transportation study.

Applicants must develop a trip distribution and an assignment pattern during the scoping process and work with Planning Department staff to determine which intersections don't require full study. This process will be documented in the scoping correspondence.

## C. CONTENTS REQUIRED FOR COMPLETENESS

A motor vehicle transportation study must consider the following elements:

1. Average vehicle delay and critical lane volume (CLV) at intersections;[10]
2. Approved but unbuilt development[11];
3. Existing intersection turning movement counts and CLV calculations (for all policy areas);
4. Trip generation, directional distribution and trip assignment;
5. Mode split assumptions;
6. CIP and CTP improvements;
7. Circulation and safety for high transportation impact venues, including gap analysis;
8. Land use and size;
9. Queuing/delay analysis (if applicable);
10. Pedestrian and bicycle impacts;
11. Improvement and mitigation options; and
12. Traffic mitigation agreement (if needed).

Elements 1 through 4 are described below.

**1. Average Vehicle Delay or CLV at Intersections**

See the discussion above provided in Section IV.A.

[10] For intersections located within policy areas categorized as Red or Orange, Highway Capacity Manual (HCM) delay-based intersection level of service standards apply to all study intersections. CLV analysis is still required for these intersections and must be submitted as appendices to the transportation study. For intersections located within policy areas categorized as Yellow or Green, the critical lane volume (CLV) level of service standard applies to study intersections with a CLV of 1,350 or less and the HCM delay-based intersection level-of-service standard applies to study intersections with a CLV of more than 1,350.

[11] Background trips associated with the development pipeline should be factored in, as presented in the APF finding of the approved transportation study of each respective pipeline project. Peak-hour trips associated with the development pipeline should not be converted to person peak-hour trips.

**2. Approved but Unbuilt Development**

As a general guideline, background traffic from approved but unbuilt developments will be in the same geographic area as the intersections to be studied if that background development is estimated to contribute at least 5 peak-hour trips. If the background traffic is generated from a large, staged development, the transportation study and its review will also be staged. As noted above, background traffic data should also include effective trip mitigation programs or uncompleted physical improvements that have been required of nearby developments. In appropriate cases, Planning Department staff may require that traffic from nearby unapproved applications or constructed buildings with unusually high vacancy rates also be included in the transportation study.

**3. Existing Intersection Turning Movement Counts**

Generally, intersection turning movement counts are acceptable when they are less than one year old at the time a transportation study is submitted. Traffic counts should not be conducted according to the following:

- On a Monday or Friday;
- During summer months or when public schools are not in session;
- On federal, state or county holidays;
- On the day before or after federal holidays;
- During the last two weeks of December and the first week of January or when a major incident or event results in significantly different traffic volumes and patterns;
- When weather or other conditions have disrupted normal daily traffic; and
- When federal, state or county government employees have options to telework due to weather conditions.

For special circumstances, such as summer camps, non-summer or summer traffic counts, the highest counts will be used in the transportation study.

Planning Department staff will compare new traffic counts for reasonableness against observed traffic counts collected by independent sources (including MDSHA, MCDOT and professional transportation planning/engineering consultants) reflecting industry standards and established professional methodologies, including older traffic counts at the same location or nearby locations, and may require a location be re-counted if a notable discrepancy exists among the sources reviewed.

**4. Trip Generation, Directional Distribution, Directional Split, and Trip Assignment**

*Trip Generation*

Trips projected to be generated by the proposed development and background traffic should be determined in accordance with the latest edition of the Institute of Transportation Engineers

(ITE) Trip Generation Manual and the Trip Generation Handbook[12]. Guidance for calculating trip equations or rates, as well as whether to use rates or equations, from land uses or zoning classifications can be obtained from these documents, as can guidance regarding pass-by, diverted and internal trip capture rates.

The trip generation results derived from the ITE documents are refined using context-sensitive adjustment factors provided in Appendix Table 1a. Developments that generate less than five peak-hour background vehicle trips (i.e., subdivisions of four or fewer single-family detached houses) are not generally included, unless located at a critical analyzed intersection, since tracking those trips is not pragmatic.

Planning Department staff is authorized to make minor technical changes to Appendix Tables 1a and 1b to reflect new information or to correct errors. Applicants who wish to use adjustment factors that are different from those provided in Tables 1a and 1b must provide written justification and source documentation at the scoping process. Documentation of the approved change must be included in the final transportation study. Applicants should check with staff to ensure they are using the latest version of this Appendix.

In some cases, adjusting the trips derived from the process described above may be appropriate. For example, the effect of pass-by and diverted trips for retail, including fast food restaurants, child day care centers and automobile filling stations, and the total trips from mixed uses, such as office and retail, will be considered on a case-by-case basis, using the best available information. Deviations may also be appropriate for a particular site. Appropriate rates for these sites could be based on traffic counts of comparable facilities (preferably located within the county) of vehicles both entering and leaving those sites and will be considered by staff. Applicants will need to obtain approval for any deviation from staff at the scoping process.

### *Directional Distribution*

Planning Department staff provides applicants with guidance pertaining to the directional distribution of background and site-generated trips for office and residential uses from the latest edition of the Trip Distribution and Trip Assignment Guidelines (see Appendix 2). The distribution of trips entering and leaving the proposed development will be determined based on the relative location of other trip generators, including background development, employment centers, commercial centers, regional or area shopping centers, transportation terminals or other trip table information provided by staff. For land uses not covered in ITE

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[12] Trip rates should be calculated using the best fit line formula (if available), unless the $R^2$ factor is lower than 75. Considerations for using the ITE trip rate can also be made for land uses with a relatively low number of studies. Applicants who wish to use the ITE trip rate, need to consult with staff during the study scoping process.

documents, distribution should be developed in consultation with Planning Department staff.

### *Directional Split*

The directional split is the percentage of the trips entering and leaving the site during the peak hour and the direction in which those trips are traveling. Refer to the latest edition of ITE's Trip Generation Manual for directional split guidance.

### *Trip Assignment*

Trip assignment is an estimate of the impact of future traffic on the nearby road network. It tends to be less accurate farther from the origin or destination of travel. The assignment factors will be determined in consultation with Planning Department staff and applied to the generated trips. The resulting volumes will be assigned to the nearby road network. Generated trips, background traffic and existing traffic will be combined to determine the adequacy of transportation facilities. Trip assignment will be extended to the nearest major intersection, or intersections, in consultation with Planning Department staff.

If trip assignment affects an intersection with a CLV of 2,000 or average vehicle delay of 150 seconds, diverting estimated traffic to alternate routes may be considered. Diversions will be based on feasible alternatives and should create a balance that reflects the project's transportation impacts on both primary and alternate routes, and without excessively burdening local residential streets. Impacts on primary and alternate intersections must be mitigated in accordance with the policy area congestion standards. Staff, in consultation with the applicant, MDSHA and MCDOT, will resolve these cases individually before presentation to the Planning Board.

## D. MITIGATION OBJECTIVES AND APPROACHES

See the discussion provided in **Section II.F Mitigation Priorities**.

To maintain an equivalent level of service for both auto and non-auto modes of travel, the Planning Board may permit an applicant to provide fewer roadway improvements or less traffic mitigation in exchange for providing non-auto transportation facilities that will enhance pedestrian safety or encourage non-auto mode choices.

Such facilities must be implemented to reduce the congestion levels at intersections that exceed the congestion standard and where an improvement need has been identified. Trip distribution and assignment assumptions in the LATR Transportation Study are key factors in determining local intersection impacts and the level of trip mitigation required.

In determining the adequacy of improvements, the Planning Board must balance the environmental and community impacts of reducing congestion as well as the safe and efficient accommodation of pedestrians, bicyclists and bus patrons. Periodic monitoring may or may not be required of non-auto transportation facilities.

Non-auto facilities to mitigate congestion may include bikeshare stations (in county-designated expansion areas), sidewalks, bike paths, Super Shelters, bus shelters and benches, bike racks

and lockers, and static or real-time transit information signs, described in more detail below.

**Sidewalks, Bike Paths, Pedestrian Refuge Islands, Accessible or Countdown Pedestrian Signals and Curb Ramps**

These features must be constructed off-site (i.e. across center line of adjacent roadway, outside of extension of lot lines) and should provide safe access from the proposed or existing development to any of the following uses:

- Rail or bus transit stations or stops;
- Public facilities (school, library, park, post office, etc.);
- Recreation centers;
- Retail centers that employ 20 or more persons at any time;
- Housing developments of 27 or more single-family detached units;
- Office centers that employ 100 or more persons;
- Existing sidewalks or bike paths and;
- Adjacent private amenity space (sitting area, theater, community center).

Accessible pedestrian signals (for the visually impaired), retrofitting existing traffic signals with countdown lights and reconstructing existing substandard curb ramps (to current ADA guidelines) should be allowed as optional facilities.

These features must be within one-quarter mile of the edge of the proposed development and must be located off-site. Staff will determine the eligibility of off-site improvements. For transit stations or stops, the frequency of transit service must be at intervals of 20 minutes or less during the weekday morning and evening peak periods. Appropriate new bikeway segments can be found in the Bicycle Master Plan or in the applicable master or sector plan. The Bicycle Master Plan prioritizes bikeways by activity center; for example: Metro stations, CBDs, downtowns, park trails, etc.

The monetized value of the non-auto facilities is $16,000 per vehicle trip, up to a maximum of 100 vehicle trips. For instance, the provision of a $160,000 capital project can be used to reduce a site's trip generation by 10 vehicle trips.

# V. Pedestrian System Adequacy

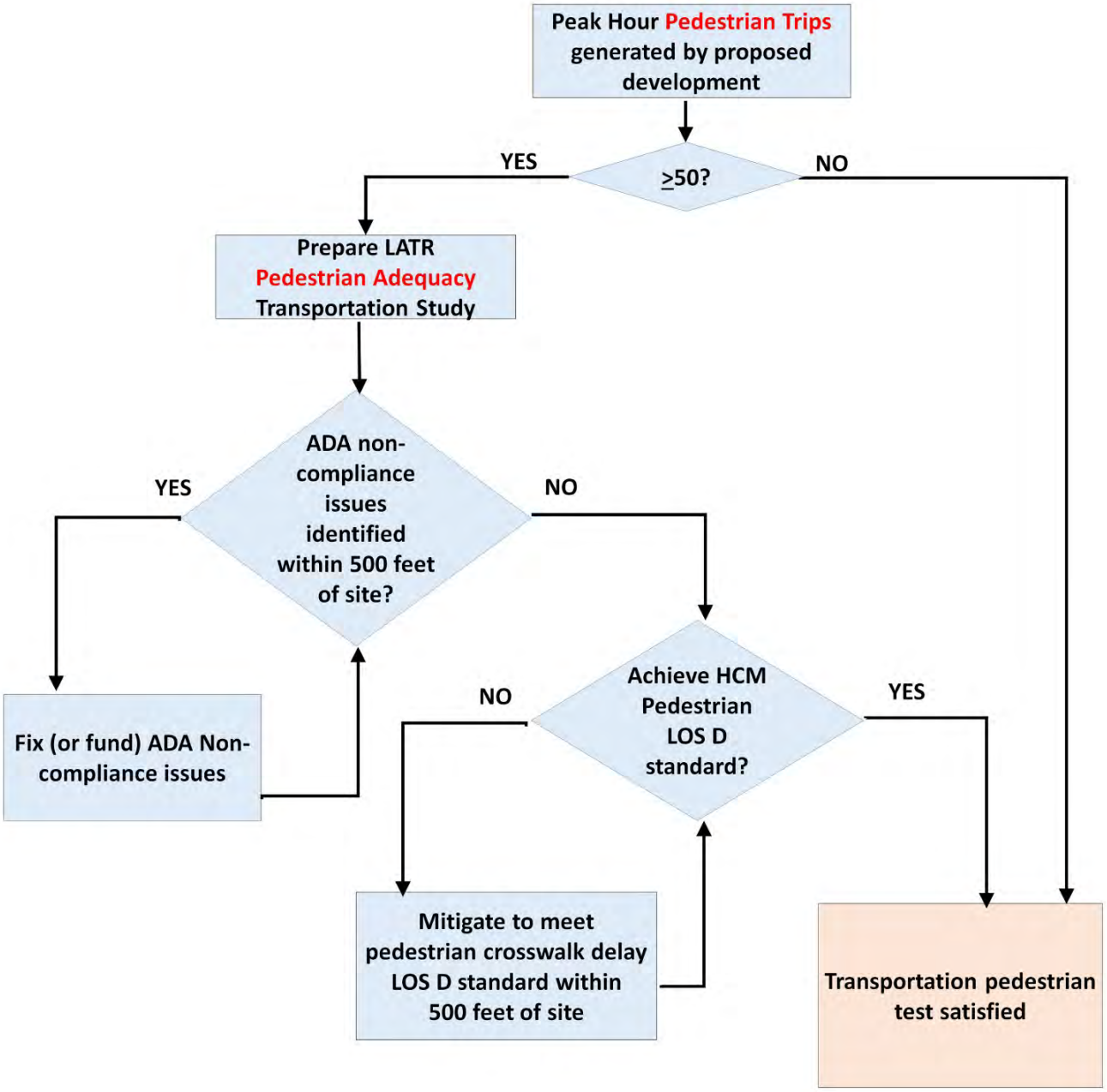
## A. ANALYSIS PROCEDURES AND TOOLS

Pedestrian system adequacy is defined as providing level of service (LOS) D capacity or better in any crosswalk. Any site that generates at least 50 pedestrian peak-hour trips (including trips to transit) must:

- Fix (or fund) all Americans with Disabilities Act (ADA) noncompliance issues, including, but not limited to, curb ramps and sidewalks, within a 500-foot radius of site boundaries **or** within the distance to the nearest signalized intersections located beyond a 500-foot radius of site boundaries.
- Ensure LOS D for crosswalk pedestrian delay (or no more delay than existing) at any LATR study intersections that are located within 500 feet of site boundaries or within a Road Code Urban Area/Bicycle Pedestrian Priority Area (RCUA/BPPA). This delay can be achieved by considering means to reduce crosswalk distances and demonstrating a practical approach to signal timing. The applicant is responsible for identifying a revised signal timing concept for consideration but is not required to obtain MCDOT or MDSHA approval, nor is the operating agency required to implement it.

Each of these elements of pedestrian system adequacy is depicted in Figure 4 and described below.

**Figure 4: Local Area Transportation Review Process – Pedestrian System Adequacy**




## ADA Compliance

In the context of a pedestrian transportation study, ADA noncompliance issues identified within 500 feet **or** within the distance to the nearest signalized intersections located beyond a 500-foot radius of a development site boundary as part of a quantitative pedestrian analysis must be fixed or funded by the applicant.

The best way to determine if a curb ramp is accessible is to survey it to determine the extent to which it complies with ADA accessibility requirements. Instruction on how to conduct these

surveys are provided in the ADA Tool Kit[13]. This tool kit includes instructions on how to survey curb ramps for compliance with the ADA Standards and a Curb Ramps Survey form for use in conducting the surveys.

The instructions, located in Appendix 1 of the ADA Tool Kit, are keyed to the Curb Ramps Survey form, located in Appendix 2 of the ADA Tool Kit. This information provides an explanation of how to obtain the information needed to answer each question on the survey form. The instructions will also include photographs and illustrations showing how and where to take measurements. The Curb Ramps Survey form and instructions will help applicants identify the most common accessibility problems with curb ramps, but they will not necessarily identify all problems.

**Pedestrian Crosswalk Delay**

Regardless of the development size and location, if an intersection operational analysis is triggered for any intersections within a RCUA/BPPA, mitigation must not increase average pedestrian crossing time at the intersection.

The adequacy standards for pedestrians apply to crosswalks at study area intersections for sites that generate at least 50 non-motorized and transit trips combined. The basis for this recommendation is the Highway Capacity Manual approach to defining crosswalk performance. Chapter 18 of the 2010 Highway Capacity Manual takes the concept of intersection performance for pedestrians to a more detailed level, combining crosswalk performance and delay into a unitless value that translates to level of service.

The approach to defining adequacy considers pedestrian delay only. This consideration is due to the level of complexity with intersection signal timing and phasing in the areas of the county likely to generate significant pedestrian trips. Such areas require analysis and constituent concerns about the unitless values associated with the CLV approach to vehicle performance.

Regardless of the number of site-generated pedestrian trips, improvements considered at any signalized intersection in a Road Code Urban Area (RCUA) or Bicycle Pedestrian Priority Area (BPPA) must not cause the total amount of pedestrian travel time (waiting for a signalized crossing and completing that crossing) to increase from the background (also called “total future”) condition.

The methodology for evaluating pedestrians at signalized intersections is described in the 2010 Highway Capacity Manual (HCM), beginning in Chapter 18, page 59. It includes a series of steps and several equations. Specifically, Step 2 starting on page 65 describes the procedure for evaluating the performance of a crosswalk.

[13] https://www.ada.gov/pcatoolkit/toolkitmain.htm

## B. DETERMINING BACKGROUND AND TOTAL FUTURE CONDITIONS

The determination of pedestrian signalized crosswalk delay depends on the existing pedestrian volumes at the intersection and the average delay per pedestrian following 2010 HCM procedures for background and total future conditions. In short, the existing pedestrian delay at each crosswalk assumes random arrivals and is therefore equal to half the duration of the time between the end of one signal cycle's walk phase and the beginning of the next cycle walk phase.

The average delay per pedestrian for the intersection is the average of all crosswalks, weighted by volume. Given the analytic challenges associated with pedestrian distribution and path assignments, the existing pedestrian volumes suffice as demand values for all intersection conditions unless the applicant chooses to work with the Planning Department to make explicit assumptions (as might be the case where the logical pedestrian path between the development site and a nearby destination such as a transit station or retail center would be meaningful in considering adequacy). The standard of pedestrian adequacy is an average signal delay of less than 40 seconds per pedestrian, or no worse than the background (or total future) conditions.

## C. MITIGATION OBJECTIVES AND APPROACHES

For pedestrian delay, mitigation is required to achieve either the 40 seconds per delay per pedestrian or no more delay than in the background (or total future) condition. Expected types of mitigation include signal phasing or timing changes to increase the amount of green time provided to pedestrian crossings (thereby reducing the number of pedestrians queued at the start of the walk signal and the duration of their wait). The applicant is responsible for identifying a revised signal timing concept for consideration but is not required to obtain MCDOT or MDSHA approval, nor is the operating agency required to implement it.

# VI. Bicycle System Adequacy


## A. ANALYSIS, PROCEDURES AND TOOLS

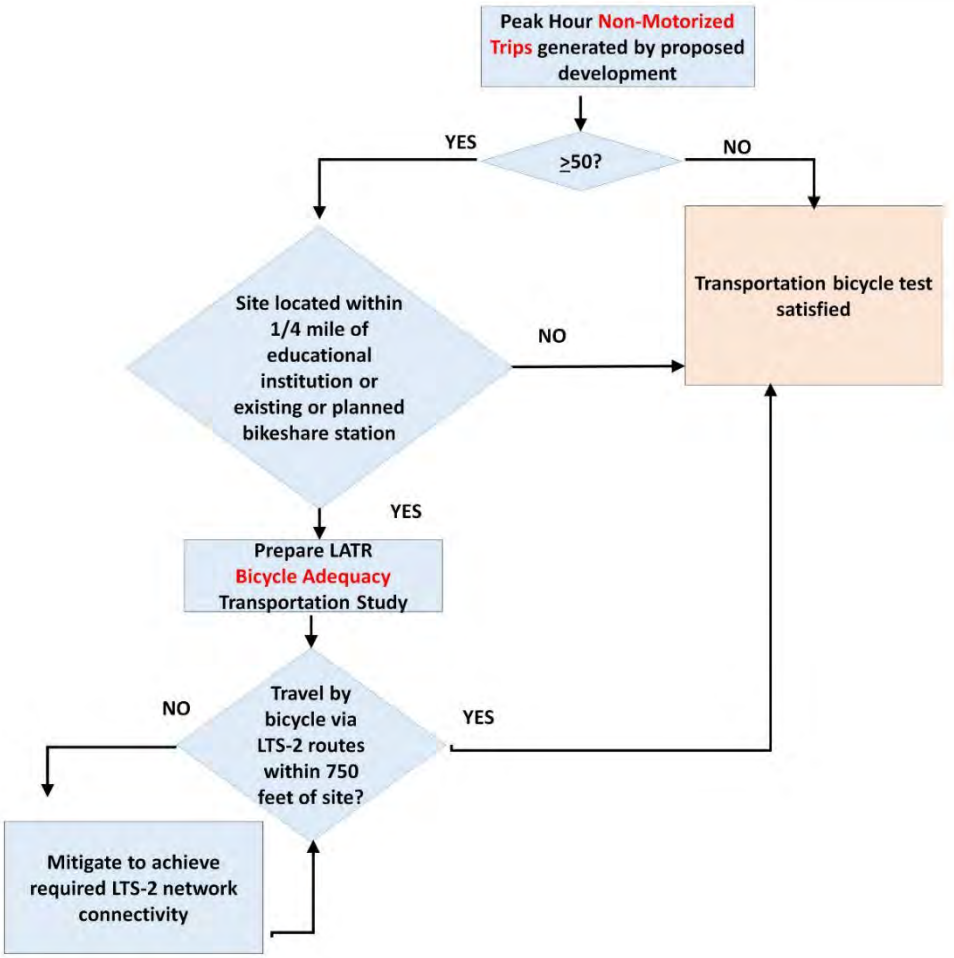
The adequacy standards for bicyclists are designed to be synchronized with the development and implementation of the Bicycle Master Plan. The concept of level of traffic stress for bicyclists elegantly evaluates network connectivity for bicyclists, recognizing that different roadways will be, or can be redesigned to be, comfortable for bicyclists of varying skill levels and that not all roadways will necessarily accommodate all levels of bicyclists with a high degree of comfort. By considering a network approach to bicycling, an appropriate level of accommodation for bicyclists can be established.

The level of traffic stress (LTS) process is still in development in Montgomery County. The standard for bicycle system adequacy is to be able to travel via LTS-2 (low levels of traffic stress) routes to destinations within 750 feet of a development site boundary if that development site generates at least 50 peak-hour non-motorized trips and is likely to include a significant bicycling population as indicated by one-quarter-mile proximity to an educational institution or an existing or planned bikeshare station. This process is depicted in Figure 5.

More information regarding the LTS approach can be found here:

http://www.mcatlas.org/bikestress/

**Figure 5: Local Area Transportation Review Process – Bicycle System Adequacy**




## B. DETERMINING BACKGROUND AND TOTAL FUTURE CONDITIONS

The assessment of bicycle level of traffic stress does not require identifying or forecasting any bicycle travel demand beyond the extent of defining the need for a bicycle system adequacy determination. The assessment of adequacy is made fully on the degree to which the site is connected to a low level of traffic stress network based on existing conditions and bicycle system improvements funded for construction within the six-year CIP or CTP.

## C. MITIGATION, OBJECTIVES AND APPROACHES

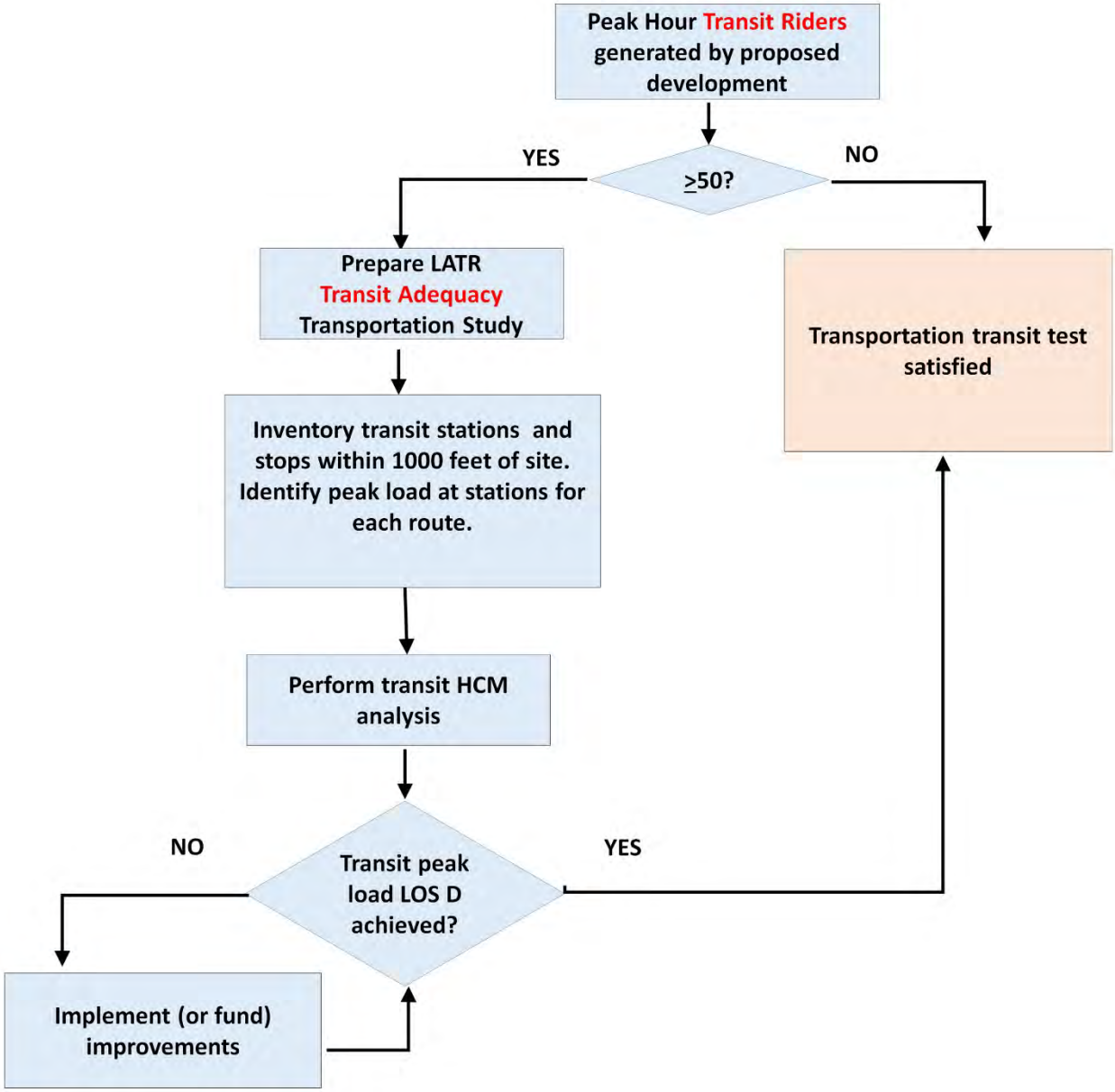
Bicycle system adequacy is defined as providing a low level of traffic stress (LTS) for bicyclists. For any proposed development generating at least 50 peak-hour non-motorized trips and located within a quarter mile of an educational institution or existing/planned bikeshare station, the applicant must make improvements needed to provide low level of traffic stress (LTS-2) conditions that link the site to or otherwise extend an LTS-2 facility within 750 feet of a development site boundary. Alternatively, the applicant can implement or fund a master-planned improvement that provides an equivalent improvement in LTS.

# VII. Transit System Adequacy


## A. ANALYSIS PROCEDURES AND TOOLS

Transit system adequacy for LATR is defined as providing a peak load of level of service (LOS) D for bus transit service routes (1.25 transit riders per seat) during the peak period (in the peak direction). For any development generating at least 50 peak-hour transit riders, the applicant must inventory bus routes at stations/stops within 1,000 feet of the site and identify the peak load at that station for each route. The applicant must coordinate with the transit service provider to identify and implement (or fund) improvements that would be needed to address conditions worse than LOS D due to additional patrons generated by the development. This process is depicted in Figure 6 below.

**Figure 6: Local Area Transportation Review Process – Transit System Adequacy**




The adequacy standard for transit riders considers the capacity of bus transit service in the vicinity of the site. This definition reflects the concern that while the county has focused on addressing transportation system capacity concerns by incentivizing modal shifts from autos to transit, some transit routes are now themselves congested and need to be considered for adequacy.

The proposed standard is LOS D for peak load conditions on buses during the weekday peak hour and is based on a quality of service measure from the Second Edition of the *Transit Capacity and Quality of Service Manual* (TCQSM) (see Figure 7 below), which is generally considered a comfortable standee load for the purposes of transit facility design.

**Figure 7: Transit Capacity and Quality of Service Manual – Second Edition**

| LOS | Load Factor (p/seat) | Standing Passenger Area ($ft^2$/p) | ($m^2$/p) | Comments |
|---|---|---|---|---|
| A | 0.00-0.50 | >10.8† | >1.00† | No passenger need sit next to another |
| B | 0.51-0.75 | 8.2-10.8† | 0.76-1.00† | Passengers can choose where to sit |
| C | 0.76-1.00 | 5.5-8.1† | 0.51-0.75† | All passengers can sit |
| D | *1.01-1.25** | 3.9-5.4 | 0.36-0.50 | Comfortable standee load for design |
| E | *1.26-1.50** | 2.2-3.8 | 0.20-0.35 | Maximum schedule load |
| F | *>1.50** | <2.2 | <0.20 | Crush load |

*Approximate value for comparison, for vehicles designed to have most passengers seated. LOS is based on area.
†Used for vehicles designed to have most passengers standing.

**Exhibit 3-26**
Fixed-Route Passenger Load LOS

As is the case with the proposed pedestrian adequacy standard, the most recent (third) edition of the TCQSM has combined several independent quality of service measures into a single transit score that is more complex and unitless, and, therefore, more difficult to measure and, understand. The basic concept of peak load factors with the thresholds and commentary from the second edition of the TCQSM has been retained as Exhibit 5-16 in the third edition, but without the LOS designation.

## B. DETERMINING BACKGROUND AND TOTAL FUTURE CONDITIONS

In the context of the LATR approach, an application for any site generating 50 peak-hour transit users is required to consider the following elements of transit system adequacy:

- Identify bus stops within a 1,000-foot walking distance of the site and inventory the number of riders that board, alight and remain on the bus for all buses serving each stop during the LATR a.m. and p.m. peak periods. Development sites within 1,000 feet of a Metrorail station entrance are exempt from Section VII as the transit patrons are likely to have a significant orientation toward Metrorail rather than buses.
- Calculate the peak-hour passenger load for each route based on the buses that serve the route and the higher of the passenger loads for buses arriving or departing at each station. Gauge the passengers per seat (in the peak direction) against the TCQSM standard of less than 1.25 persons per seat.

This measure is designed to reflect transit capacity for local area conditions where the county has a role in addressing transit system adequacy associated with local development. Therefore, the focus is on the bus system (whether operated by the Washington Metropolitan Area Transit Authority [WMATA] or the Montgomery County Ride-On), as contrasted with the more regional focus of Metrorail or MARC system capacity (similar to the fact that LATR for autos does not explicitly consider freeway conditions).

The measure also considers the "peak load" from a temporal perspective, but only regarding the bus while at the local stop, as contrasted with the more common transit system planning practice of considering the "peak load point." This focus on the local stop is because it is likely that for longer routes, particularly within the WMATA system, the peak load point may be miles from a development site (for instance, the experience of the Y2 between Wheaton and Silver Spring is not germane to the local effect of a development along the Y2 in Olney).

## C. MITIGATION OBJECTIVES AND APPROACHES

An adverse effect would be a bus route with a peak load above 1.25 at the subject station and mitigation would include provisions for capital improvements to reduce that peak load below 1.25 (or the background condition if already higher than 1.25). Mitigation would need to be developed in close coordination with Planning Department staff and the transit system operators using simplified calculations.

As an example, consider a case with a bus route running on 30-minute headways. In the peak hour, two buses running in the peak direction of transit commuter flow, each with 40 seats, provide 80 seats of capacity serving the stop and carry 70 passengers for a peak load of 0.875. The site generates 60 transit passengers with 75 percent (or 45 passengers) traveling in the peak direction. The total passenger load is increased to 115 and the peak load factor increases to 115/80 = 1.44. To reduce the peak load to 1.25, there would need to be 92 seats at capacity, which would equal another 0.3 of a bus. The applicant would work with the interagency staff to define capital improvements with the same functional or cost value of 0.3 of an additional bus.

# VIII. Appendices

## Appendix 1a: Institute of Transportation Engineers Vehicle-Trip Generation Rate Adjustment Factors

| Appendix Table 1a: ITE Vehicle-Trip Generation Rate Adjustment Factors | | | | | |
|---|---|---|---|---|---|
| Policy Area # | | Residential | Office | Retail | Other |
| 1 | Aspen Hill | 97% | 98% | 99% | 97% |
| 2 | Bethesda CBD | 79% | 63% | 61% | 62% |
| 3 | Bethesda/Chevy Chase | 87% | 81% | 85% | 79% |
| 4 | Burtonsville Town Center | 96% | 96% | 99% | 97% |
| 5 | Chevy Chase Lake | 87% | 81% | 85% | 79% |
| 6 | Clarksburg | 100% | 101% | 100% | 100% |
| 7 | Clarksburg Town Center | 100% | 101% | 100% | 100% |
| 8 | Cloverly | 99% | 101% | 100% | 101% |
| 9 | Damascus | 101% | 100% | 100% | 100% |
| 10 | Derwood | 94% | 94% | 87% | 94% |
| 11 | Fairland/Colesville | 96% | 96% | 99% | 97% |
| 12 | Friendship Heights | 78% | 70% | 73% | 70% |
| 13 | Gaithersburg City | 88% | 86% | 76% | 85% |
| 14 | Germantown East | 95% | 95% | 97% | 91% |
| 15 | Germantown Town Center | 89% | 91% | 89% | 90% |
| 16 | Germantown West | 93% | 90% | 92% | 88% |
| 17 | Glenmont | 90% | 91% | 96% | 91% |
| 18 | Grosvenor | 81% | 84% | 75% | 80% |
| 19 | Kensington/Wheaton | 91% | 92% | 96% | 92% |
| 20 | Long Branch | 91% | 92% | 96% | 92% |
| 21 | Montgomery Village/Airpark | 93% | 102% | 93% | 102% |
| 22 | North Bethesda | 83% | 87% | 71% | 82% |
| 23 | North Potomac | 97% | 100% | 100% | 100% |
| 24 | Olney | 99% | 100% | 99% | 100% |
| 25 | Potomac | 97% | 98% | 96% | 98% |
| 26 | R&D Village | 89% | 88% | 80% | 90% |
| 27 | Rockville City | 88% | 94% | 87% | 98% |
| 28 | Rockville Town Center | 79% | 80% | 70% | 79% |
| 29 | Rural East | 99% | 99% | 98% | 100% |
| 30 | Rural West | 100% | 100% | 100% | 100% |
| 31 | Shady Grove Metro Station | 89% | 88% | 77% | 88% |
| 32 | Silver Spring CBD | 77% | 65% | 58% | 65% |
| 33 | Silver Spring/Takoma Park | 83% | 83% | 82% | 84% |
| 34 | Takoma/Langley | 83% | 83% | 82% | 84% |
| 35 | Twinbrook | 81% | 80% | 74% | 79% |
| 36 | Wheaton CBD | 85% | 85% | 76% | 84% |
| 37 | White Flint | 79% | 78% | 72% | 78% |
| 38 | White Oak | 89% | 90% | 91% | 88% |

| Appendix Table 1b: Mode Split Assumptions by Policy Area | | | | | | |
|---|---|---|---|---|---|---|
| **Policy Area #** | **Development Type** | **Auto Driver** | **Auto Passenger** | **Transit** | **Non-Motorized** | **Total** |
| 1 Aspen Hill | Residential | 62.5% | 25.8% | 5.3% | 6.4% | 100% |
| | Office | 74.2% | 18.2% | 2.9% | 4.7% | 100% |
| | Retail | 72.1% | 23.4% | 1.3% | 3.2% | 100% |
| | Other | 74.0% | 18.2% | 2.5% | 5.2% | 100% |
| 2 Bethesda CBD | Residential | 50.9% | 20.8% | 11.7% | 16.6% | 100% |
| | Office | 47.9% | 12.6% | 23.8% | 15.7% | 100% |
| | Retail | 44.2% | 16.9% | 10.9% | 27.9% | 100% |
| | Other | 47.3% | 13.2% | 23.0% | 16.5% | 100% |
| 3 Bethesda/Chevy Chase | Residential | 56.1% | 23.6% | 7.6% | 12.6% | 100% |
| | Office | 61.8% | 17.4% | 11.5% | 9.3% | 100% |
| | Retail | 61.6% | 24.7% | 3.2% | 10.5% | 100% |
| | Other | 60.5% | 17.1% | 12.6% | 9.9% | 100% |
| 4 Burtonsville Town Center | Residential | 62.3% | 25.9% | 4.9% | 6.9% | 100% |
| | Office | 73.0% | 19.8% | 2.8% | 4.3% | 100% |
| | Retail | 71.6% | 24.3% | 1.0% | 3.1% | 100% |
| | Other | 73.9% | 19.4% | 2.5% | 4.2% | 100% |
| 5 Chevy Chase Lake | Residential | 56.1% | 23.6% | 7.6% | 12.6% | 100% |
| | Office | 61.8% | 17.4% | 11.5% | 9.3% | 100% |
| | Retail | 61.6% | 24.7% | 3.2% | 10.5% | 100% |
| | Other | 60.5% | 17.1% | 12.6% | 9.9% | 100% |
| 6 Clarksburg | Residential | 64.5% | 27.1% | 2.5% | 5.9% | 100% |
| | Office | 76.5% | 20.0% | 0.0% | 3.5% | 100% |
| | Retail | 72.3% | 25.7% | 0.0% | 2.0% | 100% |
| | Other | 76.2% | 20.3% | 0.0% | 3.5% | 100% |
| 7 Clarksburg Town Center | Residential | 64.5% | 27.1% | 2.5% | 5.9% | 100% |
| | Office | 76.5% | 20.0% | 0.0% | 3.5% | 100% |
| | Retail | 72.3% | 25.7% | 0.0% | 2.0% | 100% |
| | Other | 76.2% | 20.3% | 0.0% | 3.5% | 100% |
| 8 Cloverly | Residential | 64.1% | 26.4% | 3.5% | 5.9% | 100% |
| | Office | 76.8% | 19.0% | 0.7% | 3.5% | 100% |
| | Retail | 72.8% | 25.1% | 0.2% | 2.0% | 100% |
| | Other | 76.5% | 19.2% | 0.8% | 3.4% | 100% |
| 9 Damascus | Residential | 65.4% | 26.6% | 2.2% | 5.8% | 100% |
| | Office | 76.1% | 20.3% | 0.1% | 3.5% | 100% |
| | Retail | 72.5% | 25.5% | 0.0% | 1.9% | 100% |
| | Other | 76.1% | 20.4% | 0.1% | 3.5% | 100% |
| 10 Derwood | Residential | 61.0% | 26.6% | 5.6% | 6.8% | 100% |
| | Office | 71.4% | 20.4% | 3.6% | 4.5% | 100% |
| | Retail | 63.4% | 28.7% | 2.2% | 5.7% | 100% |
| | Other | 71.3% | 20.4% | 3.7% | 4.6% | 100% |
| 11 Fairland/Colesville | Residential | 62.3% | 25.9% | 4.9% | 6.9% | 100% |
| | Office | 73.0% | 19.8% | 2.8% | 4.3% | 100% |
| | Retail | 71.6% | 24.3% | 1.0% | 3.1% | 100% |
| | Other | 73.9% | 19.4% | 2.5% | 4.2% | 100% |
| 12 Friendship Heights | Residential | 50.3% | 19.4% | 15.4% | 14.8% | 100% |
| | Office | 53.0% | 9.9% | 24.5% | 12.6% | 100% |
| | Retail | 52.8% | 15.4% | 11.8% | 19.9% | 100% |
| | Other | 53.4% | 9.7% | 23.9% | 13.0% | 100% |
| 13 Gaithersburg City | Residential | 56.7% | 26.8% | 5.4% | 11.1% | 100% |
| | Office | 65.4% | 23.5% | 4.1% | 7.1% | 100% |
| | Retail | 55.0% | 32.7% | 2.4% | 10.0% | 100% |
| | Other | 64.4% | 24.5% | 3.8% | 7.3% | 100% |

| Appendix Table 1b: Mode Split Assumptions by Policy Area | | | | | | |
|---|---|---|---|---|---|---|
| **Policy Area #** | **Development Type** | **Auto Driver** | **Auto Passenger** | **Transit** | **Non-Motorized** | **Total** |
| 14 Germantown East | Residential | 61.5% | 26.9% | 4.3% | 7.4% | 100% |
| | Office | 72.1% | 21.1% | 1.8% | 5.0% | 100% |
| | Retail | 70.1% | 25.3% | 1.1% | 3.5% | 100% |
| | Other | 69.5% | 23.2% | 2.5% | 4.8% | 100% |
| 15 Germantown Town Center | Residential | 57.7% | 27.0% | 5.4% | 9.9% | 100% |
| | Office | 69.2% | 20.4% | 4.5% | 5.8% | 100% |
| | Retail | 64.5% | 26.5% | 2.5% | 6.4% | 100% |
| | Other | 68.2% | 20.1% | 5.3% | 6.4% | 100% |
| 16 Germantown West | Residential | 60.4% | 26.9% | 4.1% | 8.6% | 100% |
| | Office | 68.2% | 22.9% | 3.2% | 5.8% | 100% |
| | Retail | 66.4% | 27.6% | 1.2% | 4.8% | 100% |
| | Other | 67.0% | 23.5% | 3.3% | 6.2% | 100% |
| 17 Glenmont | Residential | 58.4% | 24.8% | 10.0% | 6.8% | 100% |
| | Office | 69.5% | 16.8% | 8.2% | 5.6% | 100% |
| | Retail | 69.5% | 22.7% | 4.0% | 3.9% | 100% |
| | Other | 69.1% | 16.9% | 8.4% | 5.6% | 100% |
| 18 Grosvenor | Residential | 52.3% | 25.8% | 11.9% | 10.0% | 100% |
| | Office | 63.4% | 16.5% | 13.3% | 6.8% | 100% |
| | Retail | 54.7% | 27.5% | 8.4% | 9.5% | 100% |
| | Other | 61.0% | 17.2% | 15.4% | 6.3% | 100% |
| 19 Kensington/Wheaton | Residential | 59.1% | 25.4% | 8.1% | 7.4% | 100% |
| | Office | 69.6% | 18.6% | 6.1% | 5.7% | 100% |
| | Retail | 69.8% | 23.8% | 2.1% | 4.3% | 100% |
| | Other | 69.8% | 18.7% | 5.6% | 5.9% | 100% |
| 20 Long Branch | Residential | 54.0% | 21.0% | 10.1% | 14.9% | 100% |
| | Office | 63.0% | 10.7% | 15.1% | 11.2% | 100% |
| | Retail | 59.5% | 17.2% | 6.9% | 16.4% | 100% |
| | Other | 63.8% | 10.5% | 14.0% | 11.6% | 100% |
| 21 Montgomery Village/Airpark | Residential | 59.9% | 26.8% | 4.6% | 8.6% | 100% |
| | Office | 77.7% | 15.1% | 2.9% | 4.3% | 100% |
| | Retail | 67.7% | 25.1% | 1.7% | 5.4% | 100% |
| | Other | 77.4% | 15.1% | 2.8% | 4.7% | 100% |
| 22 North Bethesda | Residential | 53.8% | 25.9% | 8.0% | 12.3% | 100% |
| | Office | 65.8% | 18.4% | 8.6% | 7.3% | 100% |
| | Retail | 51.6% | 28.4% | 6.1% | 14.0% | 100% |
| | Other | 62.4% | 19.5% | 9.4% | 8.7% | 100% |
| 23 North Potomac | Residential | 63.0% | 27.1% | 3.0% | 7.0% | 100% |
| | Office | 75.7% | 18.6% | 0.8% | 4.8% | 100% |
| | Retail | 72.4% | 24.1% | 0.6% | 2.9% | 100% |
| | Other | 75.8% | 18.8% | 1.0% | 4.4% | 100% |
| 24 Olney | Residential | 64.3% | 26.4% | 3.3% | 6.1% | 100% |
| | Office | 76.3% | 19.4% | 0.7% | 3.6% | 100% |
| | Retail | 72.1% | 24.8% | 0.5% | 2.6% | 100% |
| | Other | 76.3% | 19.5% | 0.7% | 3.5% | 100% |
| 25 Potomac | Residential | 62.6% | 26.8% | 4.1% | 6.5% | 100% |
| | Office | 74.4% | 19.3% | 2.2% | 4.1% | 100% |
| | Retail | 69.8% | 25.7% | 1.8% | 2.7% | 100% |
| | Other | 74.8% | 19.5% | 2.1% | 3.7% | 100% |
| 26 R&D Village | Residential | 57.3% | 27.3% | 5.7% | 9.7% | 100% |
| | Office | 66.7% | 23.5% | 4.4% | 5.4% | 100% |
| | Retail | 58.0% | 34.1% | 2.0% | 6.0% | 100% |
| | Other | 68.8% | 22.4% | 3.8% | 5.1% | 100% |

| Appendix Table 1b: Mode Split Assumptions by Policy Area | | | | | | |
|---|---|---|---|---|---|---|
| **Policy Area #** | **Development Type** | **Auto Driver** | **Auto Passenger** | **Transit** | **Non-Motorized** | **Total** |
| 27 Rockville City | Residential | 56.8% | 26.6% | 6.3% | 10.2% | 100% |
| | Office | 71.7% | 17.4% | 5.4% | 5.5% | 100% |
| | Retail | 62.8% | 25.6% | 3.3% | 8.2% | 100% |
| | Other | 74.7% | 15.3% | 4.8% | 5.1% | 100% |
| 28 Rockville Town Center | Residential | 51.3% | 25.3% | 8.9% | 14.5% | 100% |
| | Office | 60.5% | 16.7% | 12.3% | 10.5% | 100% |
| | Retail | 51.0% | 26.5% | 6.8% | 15.6% | 100% |
| | Other | 59.9% | 16.9% | 12.4% | 10.8% | 100% |
| 29 Rural East | Residential | 64.0% | 28.2% | 2.6% | 5.3% | 100% |
| | Office | 75.4% | 20.6% | 0.3% | 3.7% | 100% |
| | Retail | 71.2% | 26.8% | 0.1% | 1.9% | 100% |
| | Other | 75.8% | 20.2% | 0.5% | 3.6% | 100% |
| 30 Rural West | Residential | 64.8% | 28.2% | 1.8% | 5.2% | 100% |
| | Office | 76.0% | 20.4% | 0.0% | 3.6% | 100% |
| | Retail | 72.6% | 25.7% | 0.0% | 1.7% | 100% |
| | Other | 76.1% | 20.3% | 0.1% | 3.5% | 100% |
| 31 Shady Grove Metro Station | Residential | 57.7% | 26.4% | 8.7% | 7.1% | 100% |
| | Office | 67.0% | 20.6% | 6.8% | 5.5% | 100% |
| | Retail | 55.9% | 29.2% | 3.8% | 11.1% | 100% |
| | Other | 66.9% | 20.6% | 7.2% | 5.2% | 100% |
| 32 Silver Spring CBD | Residential | 50.1% | 18.8% | 13.6% | 17.5% | 100% |
| | Office | 49.6% | 9.0% | 26.6% | 14.9% | 100% |
| | Retail | 42.4% | 12.6% | 20.9% | 24.0% | 100% |
| | Other | 49.2% | 8.7% | 26.8% | 15.2% | 100% |
| 33 Silver Spring/Takoma Park | Residential | 54.0% | 21.0% | 10.1% | 14.9% | 100% |
| | Office | 63.0% | 10.7% | 15.1% | 11.2% | 100% |
| | Retail | 59.5% | 17.2% | 6.9% | 16.4% | 100% |
| | Other | 63.8% | 10.5% | 14.0% | 11.6% | 100% |
| 34 Takoma/Langley | Residential | 54.0% | 21.0% | 10.1% | 14.9% | 100% |
| | Office | 63.0% | 10.7% | 15.1% | 11.2% | 100% |
| | Retail | 59.5% | 17.2% | 6.9% | 16.4% | 100% |
| | Other | 63.8% | 10.5% | 14.0% | 11.6% | 100% |
| 35 Twinbrook | Residential | 52.3% | 26.2% | 9.7% | 11.8% | 100% |
| | Office | 60.8% | 17.2% | 13.7% | 8.3% | 100% |
| | Retail | 53.6% | 27.8% | 7.2% | 11.4% | 100% |
| | Other | 60.2% | 17.5% | 13.9% | 8.5% | 100% |
| 36 Wheaton CBD | Residential | 55.3% | 24.9% | 11.6% | 8.2% | 100% |
| | Office | 64.3% | 15.0% | 13.1% | 7.5% | 100% |
| | Retail | 54.8% | 25.2% | 7.6% | 12.4% | 100% |
| | Other | 64.2% | 15.1% | 13.1% | 7.6% | 100% |
| 37 White Flint | Residential | 51.4% | 26.3% | 10.7% | 11.6% | 100% |
| | Office | 59.2% | 17.8% | 14.4% | 8.5% | 100% |
| | Retail | 52.2% | 28.3% | 8.2% | 11.3% | 100% |
| | Other | 59.5% | 17.9% | 14.0% | 8.6% | 100% |
| 38 White Oak | Residential | 57.9% | 25.8% | 7.8% | 8.5% | 100% |
| | Office | 68.7% | 22.6% | 3.3% | 5.4% | 100% |
| | Retail | 65.7% | 28.0% | 2.0% | 4.3% | 100% |
| | Other | 66.9% | 23.9% | 3.4% | 5.8% | 100% |

## Appendix 2: Trip Distribution and Trip Assignment Guidelines

### Introduction

This appendix provides trip distribution guidance to be used in all transportation studies prepared for development sites in Montgomery County. Vehicle trip distribution and trip assignment are described in Section IV.C of the LATR Guidelines. For most development sites, the process is a combination of trip distribution and assignment.

### Definitions

Trip distribution specifies the destination of trips that originate from a development site. Similarly, trip distribution specifies the origin of trips that are destined to a development site.

Trip assignment specifies the individual local area intersections used to access (enter and leave) a development site.

### Discussion

The tables in this appendix provide generalized assumptions for trip distribution for both background development(s) and the development site. For the purposes of reviewing trip distribution, the Washington, DC metropolitan region is divided into 16 geographic areas, called super districts. Eleven of these super districts are in Montgomery County, as shown in Map 2-1. The remaining five super districts are situated in neighboring jurisdictions.

The trip distribution assumptions are provided in Tables 2-3 through 2-12 for developments within each of the eleven super districts in Montgomery County. For each super district, the assumed distribution of trips for general office development and for residential development is listed. For instance, 10.9 percent of trips generated by a general office development in Germantown (see Appendix Table 2-11) would be expected to travel to or from Frederick County. However, only 1.8 percent of trips generated by a residential development in Germantown would be expected to travel to or from Frederick County.

The trip distribution assumptions in these tables are based on information derived from the year 2010 application of the Planning Department's Travel/4 regional travel demand model. Travel/4 is a Montgomery County-focused adaptation of the Version 2.3.52 regional travel demand model developed by the Metropolitan Washington Council of Governments (MWCOG).

The Version 2.3.52 model is validated using information derived from the 2007-2008 Household Travel Survey (HTS) also developed by MWCOG. The distribution for **residential** development for each super district is based on the model estimated distribution of morning peak period auto driver home-based work trips **from** each super district. Similarly, the distribution for **office** development for each super district is based on the model estimated distribution of morning peak period auto driver home-based work trips **to** each super district. **Trip distribution for other land uses will be decided based on consultation with Planning Department staff and the applicant prior to submission of the transportation study.**

The application of the trip distribution information in Tables 2-3 through 2-12 is straightforward in cases where a transportation study has a limited number of alternate routes. In other cases, judgment is required to convert the trip distribution information into traffic assignment information useful for conducting the Local Area Transportation Review.

Appendix Tables 2-1a, 2-1b, 2-2a and 2-2b provide an example of how the trip distribution information can be converted to traffic assignment information for a hypothetical case in the Rockville/North Bethesda super district with both office and residential components.

The elements of the office component trip distribution and assignment are shown in Appendix Tables 2-1a and 2-1b. The leftmost column of data in Appendix Table 2-1a shows the office trip distribution by super-district as found in Appendix Table 2-6 (used for development in the Rockville/North Bethesda super district). The trip assignment for origin by super district is provided in the remaining columns of Appendix Table 2-1a describing the assumed route, or assignment, taken for trips between the site and each super district. **The data inside the cells of this table must be developed using judgment and confirmed by Planning Department staff.**

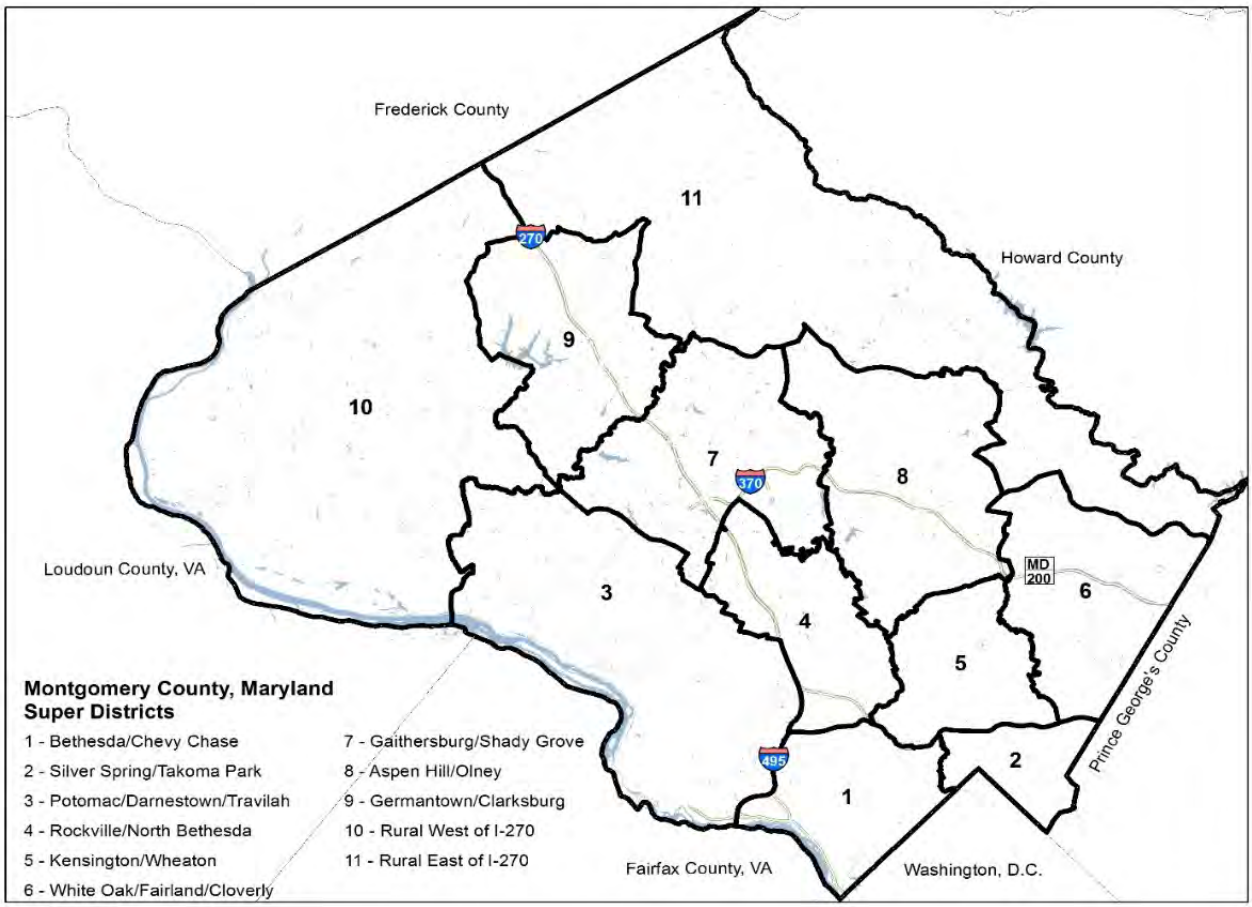
The leftmost column of Appendix Table 2-1b shows the trip distribution by super district as found in Appendix Table 2-6. The data shown in the remaining columns of the table multiplies the percent of trips distributed to each super district by the percent of trips from that super district assigned to each route to calculate the percent of total site-generated trips using each combination of distribution and assignment.

The data describing the elements of the residential component trip distribution and assignment are shown in Appendix Tables 2-2a and 2-2b. The leftmost column of data in Appendix Table 2-2a shows the residential trip distribution by super district as found in Appendix Table 2-6. The trip assignment for origin by super district is provided in the remaining columns of Appendix Table 2-2a describing the assumed route, or assignment, taken for trips between the site and each super district. **The data inside the cells of this table must be developed using judgment and confirmed by Planning Department staff.**

The leftmost column of Appendix Table 2-2b shows the trip distribution by super district as found in Appendix Table 2-6. The data shown in the remaining columns of the table multiplies the percent of trips distributed to each super district by the percent of trips from that super district assigned to each route to calculate the percent of total site-generated trips using each combination of distribution and assignment.

The assignment data described above is then summed to develop an aggregate trip assignment for the trips generated by the office and residential components of the site, respectively.

## Map 2-1: Super Districts in Montgomery County



**Trip Distribution/Assignment Matrix**

Hypothetical Case North Bethesda with both Office and Residential Components

**Appendix Table 2-1a:**
**Part 1 - Office Component**

| | | | Trip assignment for origin by super district | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Trip Distribution by Super District** | | **Office Development** | **Montrose Road/Parkway west** | **MD 355 north** | **Randolph Road east** | **MD 355 south** | **MD 187 south** | **TOTAL** |
| 1 | Bethesda/Chevy Chase | 4.6% | | | | 50% | 50% | 100% |
| 2 | Silver Spring/Takoma Park | 1.9% | | | | 100% | | 100% |
| 3 | Potomac/Darnestown/Travilah | 8.7% | 80% | | | | 20% | 100% |
| 4 | Rockville/North Bethesda | 20.5% | 25% | 75% | | | | 100% |
| 5 | Kensington/Wheaton | 5.4% | | | 80% | 20% | | 100% |
| 6 | White Oak/Fairland/Cloverly | 2.7% | | | 80% | 20% | | 100% |
| 7 | Gaithersburg/Shady Grove | 10.8% | 75% | 25% | | | | 100% |
| 8 | Aspen Hill/Olney | 6.9% | 20% | 50% | 30% | | | 100% |
| 9 | Germantown/Clarksburg | 4.8% | 90% | 10% | | | | 100% |
| 10 | Rural West of I-270 | 0.4% | 100% | | | | | 100% |
| 11 | Rural East of I-270 | 1.5% | 40% | 40% | 20% | | | 100% |
| 12 | Washington, DC | 2.3% | 70% | | | | 30% | 100% |
| 13 | PG /AA/Cal/St.M/Chls Cos., MD | 10.2% | | | | 100% | | 100% |
| 14 | VA / WV | 9.3% | 80% | | 10% | | 10% | 100% |
| 15 | Frederick Co., MD | 4.3% | 100% | | | | | 100% |
| 16 | Howard Co./Carroll Co., MD | 5.7% | | 10% | 10% | 80% | | 100% |
| **TOTAL** | | 100.0% | | | | | | |

**Appendix Table 2-1b:**
**Part 1 - Office Component**

| Trip Distribution by Super District | | Office Development | Trip assignment for development case | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Montrose Road/Parkway west | MD 355 north | Randolph Road east | MD 355 south | MD 187 south | TOTAL |
| 1 | Bethesda/Chevy Chase | 4.6% | 0.0% | 0.0% | 0.0% | 2.3% | 2.3% | 4.6% |
| 2 | Silver Spring/Takoma Park | 1.9% | 0.0% | 0.0% | 0.0% | 1.9% | 0.0% | 1.9% |
| 3 | Potomac/Darnestown/Travilah | 8.7% | 7.0% | 0.0% | 0.0% | 0.0% | 1.7% | 8.7% |
| 4 | Rockville/North Bethesda | 20.5% | 5.1% | 15.4% | 0.0% | 0.0% | 0.0% | 20.5% |
| 5 | Kensington/Wheaton | 5.4% | 0.0% | 0.0% | 4.3% | 1.1% | 0.0% | 5.4% |
| 6 | White Oak/Fairland/Cloverly | 2.7% | 0.0% | 0.0% | 2.2% | 0.5% | 0.0% | 2.7% |
| 7 | Gaithersburg/Shady Grove | 10.8% | 8.1% | 2.7% | 0.0% | 0.0% | 0.0% | 10.8% |
| 8 | Aspen Hill/Olney | 6.9% | 1.4% | 3.5% | 2.1% | 0.0% | 0.0% | 6.9% |
| 9 | Germantown/Clarksburg | 4.8% | 4.3% | 0.5% | 0.0% | 0.0% | 0.0% | 4.8% |
| 10 | Rural West of I-270 | 0.4% | 0.4% | 0.0% | 0.0% | 0.0% | 0.0% | 0.4% |
| 11 | Rural East of I-270 | 1.5% | 0.6% | 0.6% | 0.3% | 0.0% | 0.0% | 1.5% |
| 12 | Washington, DC | 2.3% | 1.6% | 0.0% | 0.0% | 0.0% | 0.7% | 2.3% |
| 13 | PG /AA/Cal/St.M/Chls Cos., MD | 10.2% | 0.0% | 0.0% | 0.0% | 10.2% | 0.0% | 10.2% |
| 14 | VA / WV | 9.3% | 7.4% | 0.0% | 0.9% | 0.0% | 0.9% | 9.3% |
| 15 | Frederick Co., MD | 4.3% | 4.3% | 0.0% | 0.0% | 0.0% | 0.0% | 4.3% |
| 16 | Howard Co./Carroll Co., MD | 5.7% | 0.0% | 0.6% | 0.6% | 4.6% | 0.0% | 5.7% |
| **TOTAL** | | 100.0% | 40.2% | 23.2% | 10.4% | 20.6% | 5.7% | 100.0% |
| | **USE -->** | | 40% | 23% | 10% | 21% | 6% | 100.0% |

**Appendix Table 2-2a:**
**Part 2 - Residential Component**

| Trip Distribution by Super District | | Residential Development | Trip assignment for origin by super district: Montrose Road/Parkway west | MD 355 north | Randolph Road east | MD 355 south | MD 187 south | TOTAL |
|---|---|---|---|---|---|---|---|---|
| 1 | Bethesda/Chevy Chase | 7.4% | | | | 50% | 50% | 100% |
| 2 | Silver Spring/Takoma Park | 2.3% | | | | 100% | | 100% |
| 3 | Potomac/Darnestown/Travilah | 5.4% | 80% | | | | 20% | 100% |
| 4 | Rockville/North Bethesda | 38.2% | 25% | 75% | | | | 100% |
| 5 | Kensington/Wheaton | 4.1% | | | 80% | 20% | | 100% |
| 6 | White Oak/Fairland/Cloverly | 1.6% | | | 80% | 20% | | 100% |
| 7 | Gaithersburg/Shady Grove | 13.4% | 75% | 25% | | | | 100% |
| 8 | Aspen Hill/Olney | 2.8% | 20% | 50% | 30% | | | 100% |
| 9 | Germantown/Clarksburg | 1.7% | 90% | 10% | | | | 100% |
| 10 | Rural West of I-270 | 0.1% | 100% | | | | | 100% |
| 11 | Rural East of I-270 | 0.3% | 40% | 40% | 20% | | | 100% |
| 12 | Washington, DC | 11.0% | 70% | | | | 30% | 100% |
| 13 | PG /AA/Cal/St.M/Chls Cos., MD | 4.4% | | | | 100% | | 100% |
| 14 | VA / WV | 6.5% | 80% | | 10% | | 10% | 100% |
| 15 | Frederick Co., MD | 0.3% | 100% | | | | | 100% |
| 16 | Howard Co./Carroll Co., MD | 0.5% | | 10% | 10% | 80% | | 100% |
| **TOTAL** | | 100.0% | | | | | | |

**Appendix Table 2-2b:**
**Part 2 - Residential Component**

| Trip Distribution by Super District | | Residential Development | Trip assignment for development case | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Montrose Road/Parkway west | MD 355 north | Randolph Road east | MD 355 south | MD 187 south | TOTAL |
| 1 | Bethesda/Chevy Chase | 7.4% | 0.0% | 0.0% | 0.0% | 3.7% | 3.7% | 7.4% |
| 2 | Silver Spring/Takoma Park | 2.3% | 0.0% | 0.0% | 0.0% | 2.3% | 0.0% | 2.3% |
| 3 | Potomac/Darnestown/Travilah | 5.4% | 4.3% | 0.0% | 0.0% | 0.0% | 1.1% | 5.4% |
| 4 | Rockville/North Bethesda | 38.2% | 9.6% | 28.7% | 0.0% | 0.0% | 0.0% | 38.2% |
| 5 | Kensington/Wheaton | 4.1% | 0.0% | 0.0% | 3.3% | 0.8% | 0.0% | 4.1% |
| 6 | White Oak/Fairland/Cloverly | 1.6% | 0.0% | 0.0% | 1.3% | 0.3% | 0.0% | 1.6% |
| 7 | Gaithersburg/Shady Grove | 13.4% | 10.1% | 3.4% | 0.0% | 0.0% | 0.0% | 13.4% |
| 8 | Aspen Hill/Olney | 2.8% | 0.6% | 1.4% | 0.8% | 0.0% | 0.0% | 2.8% |
| 9 | Germantown/Clarksburg | 1.7% | 1.5% | 0.2% | 0.0% | 0.0% | 0.0% | 1.7% |
| 10 | Rural West of I-270 | 0.1% | 0.1% | 0.0% | 0.0% | 0.0% | 0.0% | 0.1% |
| 11 | Rural East of I-270 | 0.3% | 0.1% | 0.1% | 0.1% | 0.0% | 0.0% | 0.3% |
| 12 | Washington, DC | 11.0% | 7.7% | 0.0% | 0.0% | 0.0% | 3.3% | 11.0% |
| 13 | PG /AA/Cal/St.M/Chls Cos., MD | 4.4% | 0.0% | 0.0% | 0.0% | 4.4% | 0.0% | 4.4% |
| 14 | VA / WV | 6.5% | 5.2% | 0.0% | 0.7% | 0.0% | 0.7% | 6.5% |
| 15 | Frederick Co., MD | 0.3% | 0.3% | 0.0% | 0.0% | 0.0% | 0.0% | 0.3% |
| 16 | Howard Co./Carroll Co., MD | 0.5% | 0.0% | 0.1% | 0.1% | 0.4% | 0.0% | 0.5% |
| | **TOTAL** | 100.0% | 39.4% | 33.7% | 6.2% | 11.9% | 8.7% | 100.0% |
| | | **USE -->** | 39% | 34% | 6% | 12% | 9% | 100.0% |

**Appendix Table 2-3:**
**Auto-Driver A.M. Trip Distribution in Super District 1: Bethesda/Chevy Chase**

| Trip Distribution to Super District | | Office Development | Residential Development |
|---|---|---|---|
| 1 | Bethesda/Chevy Chase | 24.0% | 31.4% |
| 2 | Silver Spring/Takoma Park | 4.1% | 4.5% |
| 3 | Potomac/Darnestown/Travilah | 5.4% | 3.1% |
| 4 | Rockville/North Bethesda | 6.2% | 9.8% |
| 5 | Kensington/Wheaton | 5.2% | 2.9% |
| 6 | White Oak/Fairland/Cloverly | 2.4% | 1.1% |
| 7 | Gaithersburg/Shady Grove | 3.4% | 2.8% |
| 8 | Aspen Hill/Olney | 3.2% | 0.7% |
| 9 | Germantown/Clarksburg | 2.1% | 0.5% |
| 10 | Rural West of I-270 | 0.2% | 0.0% |
| 11 | Rural East of I-270 | 0.8% | 0.1% |
| 12 | DC | 6.6% | 29.6% |
| 13 | PG /AA/Cal/St.M/Chls, MD | 15.2% | 5.5% |
| 14 | VA / WV | 13.5% | 7.6% |
| 15 | Frederick, MD | 2.8% | 0.1% |
| 16 | Howard/Carroll, MD | 4.9% | 0.3% |
| **TOTAL** | | 100.0% | 100.0% |

**Appendix Table 2-4:**
**Auto-Driver A.M. Trip Distribution in Super District 2: Silver Spring/Takoma Park**

| Trip Distribution to Super District | | Office Development | Residential Development |
|---|---|---|---|
| 1 | Bethesda/Chevy Chase | 6.8% | 8.9% |
| 2 | Silver Spring/Takoma Park | 21.9% | 22.7% |
| 3 | Potomac/Darnestown/Travilah | 2.8% | 1.7% |
| 4 | Rockville/North Bethesda | 3.9% | 6.5% |
| 5 | Kensington/Wheaton | 8.7% | 6.9% |
| 6 | White Oak/Fairland/Cloverly | 5.5% | 5.0% |
| 7 | Gaithersburg/Shady Grove | 2.2% | 2.2% |
| 8 | Aspen Hill/Olney | 3.7% | 1.6% |
| 9 | Germantown/Clarksburg | 1.3% | 0.3% |
| 10 | Rural West of I-270 | 0.1% | 0.0% |
| 11 | Rural East of I-270 | 0.8% | 0.3% |
| 12 | DC | 6.4% | 23.8% |
| 13 | PG /AA/Cal/St.M/Chls, MD | 22.1% | 13.0% |
| 14 | VA / WV | 7.5% | 6.2% |
| 15 | Frederick, MD | 1.6% | 0.1% |
| 16 | Howard/Carroll, MD | 4.7% | 0.8% |
| **TOTAL** | | 100.0% | 100.0% |

**Appendix Table 2-5:**
**Auto-Driver A.M. Trip Distribution in Super District 3: Potomac/Darnestown/Travilah**

| Trip Distribution to Super District | | Office Development | Residential Development |
|---|---|---|---|
| 1 | Bethesda/Chevy Chase | 5.9% | 7.7% |
| 2 | Silver Spring/Takoma Park | 2.0% | 2.0% |
| 3 | Potomac/Darnestown/Travilah | 32.8% | 18.0% |
| 4 | Rockville/North Bethesda | 11.6% | 19.5% |
| 5 | Kensington/Wheaton | 3.3% | 1.7% |
| 6 | White Oak/Fairland/Cloverly | 1.6% | 0.9% |
| 7 | Gaithersburg/Shady Grove | 10.9% | 15.0% |
| 8 | Aspen Hill/Olney | 2.8% | 0.9% |
| 9 | Germantown/Clarksburg | 5.6% | 2.6% |
| 10 | Rural West of I-270 | 0.6% | 0.1% |
| 11 | Rural East of I-270 | 0.9% | 0.2% |
| 12 | DC | 3.8% | 18.4% |
| 13 | PG /AA/Cal/St.M/Chls, MD | 6.2% | 4.2% |
| 14 | VA / WV | 5.6% | 7.9% |
| 15 | Frederick, MD | 3.8% | 0.5% |
| 16 | Howard/Carroll, MD | 2.6% | 0.4% |
| **TOTAL** | | 100.0% | 100.0% |

**Appendix Table 2-6:**
**Auto-Driver A.M. Trip Distribution in Super District 4: Rockville/North Bethesda**

| Trip Distribution to Super District | | Office Development | Residential Development |
|---|---|---|---|
| 1 | Bethesda/Chevy Chase | 4.6% | 7.4% |
| 2 | Silver Spring/Takoma Park | 1.9% | 2.3% |
| 3 | Potomac/Darnestown/Travilah | 8.7% | 5.4% |
| 4 | Rockville/North Bethesda | 20.5% | 38.2% |
| 5 | Kensington/Wheaton | 5.4% | 4.1% |
| 6 | White Oak/Fairland/Cloverly | 2.7% | 1.6% |
| 7 | Gaithersburg/Shady Grove | 10.8% | 13.4% |
| 8 | Aspen Hill/Olney | 6.9% | 2.8% |
| 9 | Germantown/Clarksburg | 4.8% | 1.7% |
| 10 | Rural West of I-270 | 0.4% | 0.1% |
| 11 | Rural East of I-270 | 1.5% | 0.3% |
| 12 | DC | 2.3% | 11.0% |
| 13 | PG /AA/Cal/St.M/Chls, MD | 10.2% | 4.4% |
| 14 | VA / WV | 9.3% | 6.5% |
| 15 | Frederick, MD | 4.3% | 0.3% |
| 16 | Howard/Carroll, MD | 5.7% | 0.5% |
| **TOTAL** | | 100.0% | 100.0% |

**Appendix Table 2-7:**
**Auto-Driver A.M. Trip Distribution in Super District 5: Kensington/Wheaton**

| Trip Distribution to Super District | | Office Development | Residential Development |
|---|---|---|---|
| 1 | Bethesda/Chevy Chase | 5.1% | 8.6% |
| 2 | Silver Spring/Takoma Park | 7.2% | 6.9% |
| 3 | Potomac/Darnestown/Travilah | 2.7% | 2.2% |
| 4 | Rockville/North Bethesda | 7.6% | 13.9% |
| 5 | Kensington/Wheaton | 28.3% | 20.7% |
| 6 | White Oak/Fairland/Cloverly | 7.8% | 5.8% |
| 7 | Gaithersburg/Shady Grove | 2.9% | 3.9% |
| 8 | Aspen Hill/Olney | 9.7% | 5.3% |
| 9 | Germantown/Clarksburg | 1.3% | 0.5% |
| 10 | Rural West of I-270 | 0.1% | 0.0% |
| 11 | Rural East of I-270 | 1.0% | 0.5% |
| 12 | DC | 3.9% | 16.6% |
| 13 | PG /AA/Cal/St.M/Chls, MD | 13.3% | 8.6% |
| 14 | VA / WV | 3.9% | 5.5% |
| 15 | Frederick, MD | 1.4% | 0.1% |
| 16 | Howard/Carroll, MD | 3.8% | 0.9% |
| **TOTAL** | | 100.0% | 100.0% |

**Appendix Table 2-8:**
**Auto-Driver A.M. Trip Distribution in Super District 6: White Oak/Fairland/Cloverly**

| Trip Distribution to Super District | | Office Development | Residential Development |
|---|---|---|---|
| 1 | Bethesda/Chevy Chase | 1.6% | 3.6% |
| 2 | Silver Spring/Takoma Park | 4.1% | 4.0% |
| 3 | Potomac/Darnestown/Travilah | 1.1% | 1.0% |
| 4 | Rockville/North Bethesda | 2.4% | 6.6% |
| 5 | Kensington/Wheaton | 6.2% | 5.3% |
| 6 | White Oak/Fairland/Cloverly | 37.2% | 30.8% |
| 7 | Gaithersburg/Shady Grove | 1.7% | 2.9% |
| 8 | Aspen Hill/Olney | 5.4% | 3.7% |
| 9 | Germantown/Clarksburg | 0.8% | 0.4% |
| 10 | Rural West of I-270 | 0.1% | 0.0% |
| 11 | Rural East of I-270 | 1.8% | 1.8% |
| 12 | DC | 2.8% | 15.6% |
| 13 | PG /AA/Cal/St.M/Chls, MD | 22.9% | 16.4% |
| 14 | VA / WV | 3.2% | 4.7% |
| 15 | Frederick, MD | 1.4% | 0.1% |
| 16 | Howard/Carroll, MD | 7.3% | 3.1% |
| **TOTAL** | | 100.0% | 100.0% |

**Appendix Table 2-9:**
**Auto-Driver A.M. Trip Distribution in Super District 7: Gaithersburg/Shady Grove**

| Trip Distribution to Super District | | Office Development | Residential Development |
|---|---|---|---|
| 1 | Bethesda/Chevy Chase | 1.5% | 3.2% |
| 2 | Silver Spring/Takoma Park | 0.7% | 1.0% |
| 3 | Potomac/Darnestown/Travilah | 7.4% | 4.0% |
| 4 | Rockville/North Bethesda | 8.0% | 15.7% |
| 5 | Kensington/Wheaton | 1.7% | 1.2% |
| 6 | White Oak/Fairland/Cloverly | 1.4% | 0.9% |
| 7 | Gaithersburg/Shady Grove | 35.2% | 45.4% |
| 8 | Aspen Hill/Olney | 4.8% | 2.1% |
| 9 | Germantown/Clarksburg | 11.7% | 6.5% |
| 10 | Rural West of I-270 | 0.7% | 0.2% |
| 11 | Rural East of I-270 | 3.2% | 1.1% |
| 12 | DC | 1.2% | 8.7% |
| 13 | PG /AA/Cal/St.M/Chls, MD | 5.3% | 3.0% |
| 14 | VA / WV | 5.3% | 5.6% |
| 15 | Frederick, MD | 6.4% | 0.7% |
| 16 | Howard/Carroll, MD | 5.5% | 0.7% |
| **TOTAL** | | 100.0% | 100.0% |

**Appendix Table 2-10:**
**Auto-Driver A.M. Trip Distribution in Super District 8: Aspen Hill/Olney**

| Trip Distribution to Super District | | Office Development | Residential Development |
|---|---|---|---|
| 1 | Bethesda/Chevy Chase | 1.4% | 4.5% |
| 2 | Silver Spring/Takoma Park | 1.9% | 2.5% |
| 3 | Potomac/Darnestown/Travilah | 1.6% | 1.6% |
| 4 | Rockville/North Bethesda | 5.9% | 14.9% |
| 5 | Kensington/Wheaton | 8.0% | 6.0% |
| 6 | White Oak/Fairland/Cloverly | 6.0% | 4.2% |
| 7 | Gaithersburg/Shady Grove | 5.5% | 9.4% |
| 8 | Aspen Hill/Olney | 47.4% | 26.2% |
| 9 | Germantown/Clarksburg | 1.7% | 1.2% |
| 10 | Rural West of I-270 | 0.1% | 0.0% |
| 11 | Rural East of I-270 | 3.1% | 1.7% |
| 12 | DC | 1.6% | 13.9% |
| 13 | PG /AA/Cal/St.M/Chls, MD | 7.3% | 6.9% |
| 14 | VA / WV | 1.6% | 5.0% |
| 15 | Frederick, MD | 2.0% | 0.3% |
| 16 | Howard/Carroll, MD | 4.9% | 1.7% |
| **TOTAL** | | 100.0% | 100.0% |

**Appendix Table 2-11:**
**Auto-Driver A.M. Trip Distribution in Super District 9: Germantown/Clarksburg**

| Trip Distribution to Super District | | Office Development | Residential Development |
|---|---|---|---|
| 1 | Bethesda/Chevy Chase | 0.7% | 2.9% |
| 2 | Silver Spring/Takoma Park | 0.3% | 0.9% |
| 3 | Potomac/Darnestown/Travilah | 3.6% | 3.1% |
| 4 | Rockville/North Bethesda | 2.8% | 10.5% |
| 5 | Kensington/Wheaton | 0.7% | 0.8% |
| 6 | White Oak/Fairland/Cloverly | 0.5% | 0.6% |
| 7 | Gaithersburg/Shady Grove | 13.7% | 22.7% |
| 8 | Aspen Hill/Olney | 1.6% | 1.0% |
| 9 | Germantown/Clarksburg | 50.2% | 35.0% |
| 10 | Rural West of I-270 | 1.2% | 0.6% |
| 11 | Rural East of I-270 | 4.2% | 1.6% |
| 12 | DC | 0.5% | 9.2% |
| 13 | PG /AA/Cal/St.M/Chls, MD | 2.3% | 2.7% |
| 14 | VA / WV | 2.7% | 5.9% |
| 15 | Frederick, MD | 10.3% | 1.8% |
| 16 | Howard/Carroll, MD | 4.7% | 0.7% |
| **TOTAL** | | 100.0% | 100.0% |

**Appendix Table 2-12:**
**Auto-Driver A.M. Trip Distribution in Super District 10: Rural West of I-270**

| Trip Distribution to Super District | | Office Development | Residential Development |
|---|---|---|---|
| 1 | Bethesda/Chevy Chase | 0.4% | 3.7% |
| 2 | Silver Spring/Takoma Park | 0.2% | 1.0% |
| 3 | Potomac/Darnestown/Travilah | 2.5% | 3.6% |
| 4 | Rockville/North Bethesda | 1.4% | 9.8% |
| 5 | Kensington/Wheaton | 0.3% | 0.8% |
| 6 | White Oak/Fairland/Cloverly | 0.2% | 0.6% |
| 7 | Gaithersburg/Shady Grove | 5.5% | 14.0% |
| 8 | Aspen Hill/Olney | 0.7% | 0.7% |
| 9 | Germantown/Clarksburg | 11.0% | 9.2% |
| 10 | Rural West of I-270 | 45.5% | 24.2% |
| 11 | Rural East of I-270 | 2.0% | 0.8% |
| 12 | DC | 0.2% | 15.0% |
| 13 | PG /AA/Cal/St.M/Chls, MD | 1.1% | 3.0% |
| 14 | VA / WV | 2.5% | 8.3% |
| 15 | Frederick, MD | 21.2% | 4.6% |
| 16 | Howard/Carroll, MD | 5.3% | 0.7% |
| **TOTAL** | | 100.0% | 100.0% |

**Table 2-13: Auto-Driver A.M. Trip Distribution in Super District 11: Rural East of I-270**

| Trip Distribution to Super District | | Office Development | Residential Development |
|---|---|---|---|
| 1 | Bethesda/Chevy Chase | 0.5% | 3.1% |
| 2 | Silver Spring/Takoma Park | 0.8% | 1.4% |
| 3 | Potomac/Darnestown/Travilah | 0.8% | 1.3% |
| 4 | Rockville/North Bethesda | 1.8% | 8.7% |
| 5 | Kensington/Wheaton | 1.7% | 1.6% |
| 6 | White Oak/Fairland/Cloverly | 7.0% | 3.4% |
| 7 | Gaithersburg/Shady Grove | 6.9% | 16.1% |
| 8 | Aspen Hill/Olney | 7.2% | 4.5% |
| 9 | Germantown/Clarksburg | 7.1% | 7.9% |
| 10 | Rural West of I-270 | 0.3% | 0.3% |
| 11 | Rural East of I-270 | 33.6% | 19.9% |
| 12 | DC | 0.8% | 13.4% |
| 13 | PG /AA/Cal/St.M/Chls, MD | 8.2% | 6.5% |
| 14 | VA / WV | 1.5% | 6.1% |
| 15 | Frederick, MD | 10.7% | 2.5% |
| 16 | Howard/Carroll, MD | 11.1% | 3.3% |
| **TOTAL** | | 100.0% | 100.0% |

## Appendix 3: Interagency Transportation Study Memorandum of Understanding

**MEMORANDUM OF UNDERSTANDING BETWEEN**

**THE CITY OF GAITHERSBURG**

**AND**

**THE CITY OF ROCKVILLE**

**AND**

**THE MONTGOMERY COUNTY PLANNING BOARD OF THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION**

**FOR**

**THE COORDINATION OF TRAFFIC IMPACT STUDIES FOR PROPOSED DEVELOPMENT PROJECTS**

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This Memorandum of Understanding (MOU) is entered into by and between Montgomery County Planning Department of The Maryland-National Capital Park and Planning Commission, the City of Gaithersburg, and the City of Rockville (collectively, the Parties)

WHEREAS, the purpose of this MOU is for the Parties to work cooperatively to better manage traffic conditions given the inter-jurisdictional impact of traffic generated by development in close proximity to nearby jurisdictions through the exchange of information regarding traffic reports (traffic impact study or applicable traffic statement) of proposed development and through the coordination and review of such reports; and

WHEREAS, the parties acknowledge that each has a different set of standards for traffic reports within their jurisdiction.

NOW, THEREFORE, the Parties agree to the following:

1. The methodology for determining the scope of traffic reports for proposed development projects, and also for analyzing the intersections included in such reports, will be determined in accordance with the standards set by the approving jurisdiction.

2. If a proposed development project has a signalized intersection within the scope's study area and located in a neighboring jurisdiction (one of the other parties to this MOU), that such intersection will be analyzed as part of the required traffic reports in accordance with the standards set by the approving jurisdiction.

3. Each Party will notify their neighboring jurisdiction when a project is submitted for review that includes a signalized intersection within the scope's study area and located in that neighboring jurisdiction. This includes notification of pre-Development Review Committee/Development Review Team (DRC/DRT) meetings and regular DRC/DRT meetings for such project.

4. When a signalized intersection falls within a neighboring jurisdiction, the approving jurisdiction will provide the neighboring jurisdiction with a copy of the applicable traffic report scope between the applicant and the approving jurisdiction. The approving jurisdiction will also provide the accepted traffic report to the neighboring jurisdiction. The neighboring jurisdiction will then be allowed up to thirty (30) days to review and submit comments back to the approving jurisdiction regarding the proposed development's traffic report.

**IN WITNESS WHEREOF**, the undersigned being duly authorized by the respective agencies, has signed this MOU.

**City of Gaithersburg, Maryland**:

John Schlichting, Director, Planning and Code Administration

Date: 10/10/12

**City of Rockville, Maryland**:

Susan Swift, Director, Community Planning & Development Services

Date: 10-2-12

**Montgomery County Planning Department**:

Rose Krasnow, Acting Director

Date: 9-27-12

## Appendix 4: White Oak Local Area Transportation Improvement Program Mitigation Payments

**Introduction**

This appendix provides information pertaining to the mitigation fee payment schedule requirements for the White Oak Local Area Transportation Improvement Program (LATIP). These fees are paid by applicants to the Department of Permitting Services (DPS) at the same time and in the same manner as the transportation impact tax for new development in the White Oak policy area.

**Discussion**

Under County Code 52-51(a), an applicant for a building permit for any building must pay to the Department of Finance a Mitigation Payment if this payment is required for a building included in a preliminary plan of subdivision that was approved under the Local Area Transportation Review provisions in the county Subdivision Staging Policy (SSP).

The 2016-2020 SSP adopted in Council Resolution 18-671 on November 15, 2016 states that the Planning Board may approve a subdivision in the White Oak Policy Area conditioned on the applicant paying a fee to the county commensurate with the applicant's proportion of the cost of a White Oak Local Area Transportation Improvement Program, including the costs of design, land acquisition, construction, site improvements and utility relocation. The proportion is based on a subdivision's share of net additional peak-hour vehicle trips generated by all master-planned development in the White Oak Policy Area approved after January 1, 2016.

Council Resolution 18-726, adopted on February 14, 2017, established the fee described above at $5,010 per peak hour vehicle trip. This fee, the Local Area Transportation Improvement Program (LATIP) fee, was calculated as follows:

LATIP fee = Total Infrastructure Costs in the Plan Area/Total Number of New P.M. Peak-Hour Vehicle Trips

The *Total Infrastructure Costs in the Plan Area* were determined by a forecast estimate of the local area transportation needs and associated costs approved by the County Council. The *Total Number of New P.M. Peak-Hour Vehicle Trips* was determined by a forecast estimate of the travel demand associated with the full build-out of the White Oak Science Gateway (WOSG) Master Plan.

The fee must be paid at a time and manner consistent with Local Area Transportation Mitigation Payments as prescribed in Section 52-51 of the County Code. The Department of Finance must retain funds collected from this fee in an account to be appropriated for transportation improvements that result in transportation capacity and mobility for the specific projects in the White Oak (LATIP).

The trip generation rates used in support of the White Oak LATIP calculation is provided in the chart below. The trip generation rates are based on the peak-hour trip rates used in support of the WOSG Master Plan local area traffic analysis which are customized to reflect existing conditions and future changes in both land use and travel behavior. These trip rates have been disaggregated relative to those applied in the master plan to match the impact tax land use categories. Development resulting in increments of less than a trip will have the fee applied proportionally (no rounding). The resultant fees are paid at the same time and in the same manner as the transportation impact tax and apply to new applications for residential and commercial development in the White Oak policy area.

The process by which applicants may receive a credit against the LATIP is described in Bill 51-16 found here:

http://www.montgomerycountymd.gov/COUNCIL/Resources/Files/bill/2016/20170214_51-16.pdf

**White Oak Local Area Transportation Improvement Program (LATIP)**

**Trip Generation Rate Schedule**

**Effective January 1, 2016**

| White Oak Local Area Model Trip Generation Rates | | |
|---|---|---|
| **Land Use** | **Trips per Unit of Development** | **Units** |
| Office | 1.20 | 1,000 SF |
| Retail | 3.00 | 1,000 SF |
| Industrial | 1.00 | 1,000 SF |
| BioScience | 0.99 | 1,000 SF |
| Hospital | 1.07 | 1,000 SF |
| Other Non-residential | 0.92 | 1,000 SF |
| Single Family Detached | 1.28 | Dwelling Unit |
| Single Family Attached | 0.65 | Dwelling Unit |
| Multi Family Low Rise | 0.52 | Dwelling Unit |
| Multi Family High Rise | 0.34 | Dwelling Unit |

# Glossary

**Background conditions:** Conditions based on the addition of traffic generated by existing conditions plus any auto traffic generated by an approved but unbuilt or substantially vacant development.

**Bicycle trip:** Trip by a single individual entering or leaving a study site by bicycling to and from a destination.

**BPPA:** Abbreviation for Bicycle-Pedestrian Priority Area, jointly designated by the Maryland Department of Transportation (MDOT) and local jurisdiction. For the purposes of LATR analysis, locally designated BPPAs not yet confirmed by MDOT are considered BPPAs (See Map 3, in these Guidelines).

https://www.montgomerycountymd.gov/dot-dte/projects/BicycleandPedestrianPriorityAreas/index.html

**CLV:** Critical lane volume, an intersection capacity analysis tool described in Transportation Research Circular 212 published by the Transportation Research Board of Washington, DC.

**Existing conditions:** Transportation system conditions based on recent observations.

**ITE:** Institute of Transportation Engineers.

**LATR peak periods:** Local Area Transportation Review study times of 6:30 – 9:30 a.m. and 4:00 – 7:00 p.m. on typical non-holiday weekdays when school is in session.

**LOS:** Level of service, a qualitative measure of transportation system performance described in the Highway Capacity Manual.

**LTS:** Level of traffic stress, a qualitative measure of bicyclist comfort developed by the Mineta Transportation Institute and applied by the Montgomery County Planning Department to developing the Bicycle Master Plan.

**HCM:** Highway Capacity Manual used to denote the suite of products published by Transportation Research Board. The citation may be followed by a term defining the HCM edition (i.e., HCM 2000, HCM 2010, HCM 6$^{th}$ Edition)

**Methodology memoranda:** LATR Guidelines maintained as living documents by Montgomery County Planning Department as a resource for subsequent scoping meetings.

**MWCOG:** Metropolitan Washington Council of Governments, a non-profit association responsible for the regional household travel survey and travel demand model relationships applied in the person-trip generation approach in Appendix Tables 1A and 1B. MWCOG also developed the region's Congestion Management Process, which is referenced as an available source for identifying congested arterials.

**Net new trips:** Site trips (excluding pass-by, diverted link, and existing land use trip generation credits) generated by a site, considering only those net additional trips proposed by the current development application. (See "total trips".)

**Non-motorized trip:** Trip by a single individual entering or leaving a study site by either walking or bicycling to/from a destination (see also: bicycle trip, pedestrian trip).

**Pedestrian trip:** Trip by a single individual entering or leaving a study site by walking to/from a destination (see also: bicycle trip, non-motorized trip).

**Person trip:** Trip by a single individual entering or leaving a study site regardless of the mode of travel. Determined using the conversion rates set forth in Appendix Table 1a, LATR Guidelines.

**RCUA:** Road Code Urban Area, designated by the Montgomery County Council in Chapter 49 of the Montgomery County Code and applicable master plans:

http://www.montgomeryplanning.org/transportation/highways/RoadCode.shtm

**TMAg:** Traffic Mitigation Agreement, a legal document for implementing transportation demand management activities as described in Section 42-A of the County Code.

**Total trips:** Site trips (including pass-by and diverted link) generated by a site, including existing or previously approved uses on the site (see "new trips").

**Total future conditions:** Conditions based on the sum of auto trips from background conditions plus development site-generated traffic, prior to mitigation for any findings of inadequacy.

**Total future with mitigation conditions:** Conditions based on the total future conditions plus mitigation for any findings of inadequacy.

**Transit trip:** Trip by a single individual entering or leaving a study site for whom the predominant mode of travel to/from the site will be via transit. The Subdivision Staging Policy and LATR Guidelines presume that these trips will travel between the site and a transit station/stop as a non-motorized trip.

**TDM:** Transportation demand management (also known as travel demand management), a term describing a set of actions to reduce crowding by actions and strategies that shift demand by mode and/or time of day away from crowded facilities and services.

**TRB:** Transportation Research Board of the National Academy of Sciences, Engineering and Medicine in Washington, DC.

**Trip Generation Handbook:** Recommended practice for application of the Trip Generation Manual published by the Institute of Transportation Engineers.

**Trip Generation Manual:** Repository of vehicle-trip generation rates published by the Institute of Transportation Engineers that form initial starting points for person-trip estimates in Appendix Tables 1a and 1b. Suggested starting points for equivalencies between Trip Generation Manual and land uses in Appendix Tables 1a and 1b include:

- Port/Terminal (Land uses 000-099): Use site-specific rates reflecting site-specific intermodal trip-making characteristics.
- Industrial (Land uses 100-199): Use Other category.
- Residential (Land uses 200-299): Use Residential category.

- Lodging (Land uses 300-399): Use Residential category.
- Recreational (Land uses 400-499): Use Retail category.
- Institutional (Land uses 500-599): Use site-specific rates reflecting customized TDM programs (including but not limited to school buses).
- Medical (Land uses 600-699): Use Retail category.
- Office (Land uses 700-799): Use Office category.
- Retail (Land uses 800-899): Use Retail category.
- Services (Land uses 900-999): Use Retail category.
- Site-specific assumptions for both vehicle trips and mode split may be proposed for any use.

**Vehicle trip:** Trip by a single vehicle entering or leaving a study site. For the purposes of LATR trip generation, vehicle trips are assumed to be equivalent to auto-driver trips.

**Walking distance to transit:** Measured as the shortest distance along public sidewalks between the closest transit station entrance (including elevator and escalator portals) and the closest publicly-available site building entrance (unless specified otherwise in text).

# LATR

## Local Area Transportation Review Guidelines

SPRING 2017

MotorVehicleMetrorailBicycleBusRapidTransitMARCTrainPedestrian

MARYLAND - NATIONAL CAPTIAL PARK AND PLANNING COMMISSION