

PHED COMMITTEE #1  
October 17, 2016

**MEMORANDUM**

October 14, 2016

TO: Planning, Housing, and Economic Development Committee  
FROM: <sup>60</sup> Glenn Orlin, Deputy Council Administrator  
SUBJECT: 2016-2020 Subdivision Staging Policy (SSP): school test follow-up; transportation test (continuation); grandfather clause/effective date; Council President Floreen's proposal

**Please bring the SSP Report and the Appendix to this worksession.**

**I. SCHOOL TEST FOLLOW-UP**

At the September 26 worksession the Committee reviewed the effect of implementing tighter cluster-and-level thresholds for moratoria and for the school facility payment, as well as effect of an individual school test. At that time it was pointed out that the effects would be on the school test during the current fiscal year (FY17), but that it was not yet possible to show the effects as of next July until the enrollment forecast for the 2022-2023 school year was available from MCPS.

MCPS released its new enrollment forecast to the Board of Education on October 10, and it has calculated the effects of the various school test options as of July 2017. The results are on ©1-3.

- If the cluster-level threshold of 120% of program capacity were retained, 4 clusters could go into moratorium because of projected deficiency at the HS level: Blair, Einstein, Northwood, and Walter Johnson. All are in facility planning, and 3 of them already have "solution" (placeholder) projects programmed. A solution project for Blair HS would be appropriate, as would enlarging the other 3 solution projects. If a cluster-level threshold of 110% were established, then 11 clusters could go into moratorium.
- If the school facility payment range were retained at 105-120%, then 13 cluster-levels would fall within it. If this range were to be 100-120%, then 25 cluster-levels would fall within it.
- If an individual school test moratoria were imposed where ES capacity will be exceeded by 110 seats and MS capacity will be exceeded by 180 seats, then 10 ES and 2 MS service areas would go into moratorium, unless the cluster as a whole were already in moratorium.
- If an individual school test school facility payment were imposed where ES capacity will be exceeded by 92-110 seats and MS capacity will be exceeded by 150-180 seats, then 4 ES and 1 MS service areas would be subject to the payment, unless the cluster as a whole were already in moratorium or the cluster-level would already be subject to a school facility payment.

## II. TRANSPORTATION TEST (Continuation)

**Proposed revisions to LATR.** The Planning Board recommends that LATR no longer be required in the Red areas (MSPAs). The Board notes that the combination of the current, congestion-tolerant standard of 1,800 CLV (actually 1.13 volume-to-capacity ratio using the Highway Capacity manual test), and the presence of a fine grid of streets within most MSPAs that distribute the traffic, has had the result that very few traffic studies for MSPA developments have shown a “failure” that needed to be addressed. The Board also wants to streamline the approval process for developments near Metro stations as they are most desirable in terms of transportation efficiency. Instead, the Board suggests a Comprehensive LATR be conducted biennially to identify trouble spots where the County should invest in improvements.

Opinion is divided on this. The business community generally supports the Planning Board’s recommendations, but civic groups and many individuals oppose dropping the LATR requirement for the Red areas. DOT had also expressed concern about this. Planning staff notes that very few traffic studies in MSPAs have resulted in findings that required intersection improvements or some other type of mitigation, and the concern is these studies incur considerable cost and review time. A consistent argument is that even if an intersection improvement were warranted, the resulting impact on pedestrian and bike accommodation might be severe: in other words, the cure is worse than the cause.

On this last point, it must be noted that most of the congestion generated by MSPA development is usually not at intersections within the MSPA where there is a grid of streets, but at the fewer “gateway” intersections to the MSPAs, through which the traffic is funneled. Five of the 10 most congested intersections in the county, according to the Planning Board’s most recent Highway Mobility Report, are “gateway” intersections:

- #1 - Rockville Pike at West Cedar Lane (gateway to Bethesda CBD)
- #5 - Shady Grove Rd at Choke Cherry Lane (gateway to Shady Grove)
- #6 - Connecticut Avenue at East West Highway (gateway to Bethesda CBD)
- #7 - Georgia Avenue at 16th Street (gateway to Silver Spring CBD)
- #10 - Rockville Pike at First Street/Wootton Parkway (gateway to Rockville Town Center)

Some of these intersections have improvements that are either under construction or master-planned; all of them could add turning lanes without deteriorating an urban, walkable environment. Only one intersection in the “Top 10” is within an MSPA: Rockville Pike and Nicholson Lane (White Flint), where there is no LATR test.

Planning Chair Anderson and DOT Director Roshdieh have ironed some differences between their departments relative positions on some issues (©4-5). DOT and Planning staff have recently agreed to using 750,000sf as the threshold for whether an LATR study would be required in a Red policy area. However, a large proposed MSPA development near its edge likely would have a greater impact: being further from the Metro station means it likely would have a lower NADMS, and it would be physically closer to a gateway intersection so more likely to pass trips through it.

**Council staff recommendation:** For the time being, continue to require the LATR test for MSPA developments, but only where the scope of the traffic study would carry out to gateway intersections. For several years the SSP has had the following directive on a study’s scope:

Each traffic study must examine, at a minimum, the number of signalized intersections in the following table, unless the Planning Board affirmatively finds that special circumstances warrant a more limited study.

Maximum Peak-Hour Trips Generated	Minimum Signalized Intersections in Each Direction
< 250	1
250 – 749	2
750 – 1,249	3
1,250 – 1,750	4
1,750-2,249	5
2,250 – 2749	6
>2,750	7

If a proposed development is large enough to warrant studying a large enough radius of signalized intersections to reach a gateway intersection, then a traffic study for that intersection—and its mitigation to meet the applicable LATR standard—should be required.

**However, in the SSP resolution the Council should also direct the Planning Board to develop, in concert with DOT, a comprehensive LATR for each County MSPA, leading to proportional cost-sharing of local area transportation improvements.** This model, approved in an earlier SSP amendment for the White Oak Policy Area, would identify all “local” transportation capital improvements that contribute to transportation capacity—such as new streets, intersection improvements, filling gaps in the local sidewalk and bikeway network, bikesharing stations, additional Ride On buses for local transit service, etc.—and divide their cumulative cost across the master-planned development yet to be built. Thus a per-trip fee would be calculated, which, if approved by the Council after a public hearing, would be required of any new development in lieu of the standard LATR test.

In the next few weeks the Executive Branch is anticipated to transmit its study on White Oak and the Executive’s recommended per-trip fee. In the meantime DOT has produced a memorandum describing how the White Oak model could be applied to MSPAs (©6-9). As with the TDM concept described earlier, this concept will also need more fleshing out and revisions<sup>1</sup>, and both DOT and Planning staff support developing a work program to do exactly that (©4, last bullet). This approach would produce an equitable means to generate the revenue for these improvements, which would be programmed by the Council as the need for them becomes evident. DOT estimates that concurrent studies were undertaken for all 8 MSPAs<sup>2</sup>, the White Oak model could be in place in 9-18 months, or in about 3 years if two or three MSPAs were undertaken at a time (©10).

*LATR standard in Clarksburg Town Center.* In the context of the Planning Board’s consideration of the SSP earlier this year, Planning staff initially proposed a 1,500 Critical Lane Volume (CLV) standard for the Town Center to distinguish this area from its “parent” Clarksburg policy area in recognition of the vision of the creation of a compact, mixed-use, walkable town center that serves as the primary civic focus for the surrounding community that will eventually be enhanced by Corridor

<sup>1</sup> One revision is that the per-trip fee should be paid at the same time impact taxes are: not at building permit issuance, but 6 or 12 months later (depending on whether the development is residential or commercial) or at final inspection, whichever is earlier.

<sup>2</sup> Except White Flint and Rockville Town Center, as they are forever exempt from LATR.

Cities Transitway (CCT) service. This proposal became moot when the Board directed staff not to consider the Town Center as a separate entity relative to the remainder of Clarksburg. Given Council staff's recommendation to carve out a new Clarksburg Town Center policy area from the existing Clarksburg policy area, and place it in the Orange group, Planning staff has reiterated its recommendation that a 1,500 CLV standard would be appropriate for this area. This proposal seems reasonable given that this standard is less than the 1,600 CLV standard adopted for the Germantown Town Center (served by the Germantown MARC rail station and express bus service to Shady Grove) and higher than the adopted 1,425 CLV standard for the "parent" Clarksburg policy area. **Council staff recommendation: If a Clarksburg Town Center policy area is created, give it a standard of 1,500 CLV: 0.94 volume/capacity using the HCM method.**

*LATR standards in Chevy Chase Lake, Long Branch and Takoma/Langley Crossroads policy areas.* The "parent" policy areas relevant to these Purple Line station areas are Silver Spring/Takoma Park and Bethesda/Chevy Chase, both of which have an adopted 1,600 CLV standard. While traffic capacity is certainly an important rationale for recommending new policy areas, there are other planning reasons beyond traffic capacity related to CLV or delay standards that warrant the creation of a unique policy area. For the Purple Line stations, Chevy Chase Lake, Long Branch, and Takoma/Langley, creation of an individual policy area can help track how goals for these places are being met. In particular, it may be valuable in evaluating the degree to which transit-oriented development that will support the Purple Line is being generated as the Purple Line nears reality. In addition, where transit accessibility has not been met, mitigation payments will remain in these policy areas to help support future infrastructure investment. **Council staff recommendation: Set the LATR standards for these new policy areas at the same level as their "parent" policy areas: 1,600 CLV, or 1.0 volume/capacity using the HCM method.**

*Traffic generation rates.* For many years the Planning staff has used some traffic generation rates that are based on county surveys for most major land use categories, and Institute of Transportation Engineers (ITE) rates when local data has not been collected. These rates have been applied countywide, however, even though actual trip generation often varies by how urban the setting is. The Planning Board recommends adjusting ITE rates—which are the nationwide average for suburban environments—to reflect the transportation character of each policy area. For example, in Damascus the ITE rates would be utilized for all land uses, but in the Bethesda CBD the rates would vary from 61% of the ITE rate for retail to 79% for residential. Table 2 on p. 26 of the SSP Report shows the adjustment factors by policy area and land use category that the Board would include in the next edition of its LATR Guidelines. **Council staff recommendation: Concur with the Planning Board.**

*Threshold for a traffic study.* Currently the rule is that an LATR study is required if a proposed subdivision will generate 30 or more peak-hour vehicle trips. The Board proposes amending the threshold to 50 peak-hour *person* trips. **Council staff recommendation: Concur with the Planning Board.**

*Type of intersection analysis.* Under Growth Policies prior to 2012, the County used the Critical Lane Volume (CLV) method of analyzing future conditions at an intersection. CLV has the advantage of being simple, transparent, and quick. However, the traffic engineering profession, over the past 20 years, has shifted steadily towards using more robust methods of estimating future delay, especially as operational analysis methods such as that described in the Transportation Research Board's Highway

Capacity Manual (HCM) and even network operational models such as Synchro and Corsim have developed and became easier to use.

For more than a decade the LATR studies conducted by the Planning staff have not relied solely on CLV in all circumstances. For example, if in the reviewer's judgement congestion at a nearby intersection would likely influence the forecasted congestion at the intersection under study, then a network analysis was used. In 2012 the Council decided that any intersection forecast to have a CLV worse than 1,600 (the borderline between Level of Service E and F) would require a second-tier test incorporating the HCM method.<sup>3</sup> The Planning staff, in its draft of the 2016-2020 SSP, recommended a 3-tier test:

1. Tier 1: If an intersection is to forecast to operate at 1,350 CLV (near the border between Levels of Service C and D) or better, no further analysis is required.
2. Tier 2: If the forecast is above 1,350 CLV, then require an operational analysis of the intersection using the HCM method. The intersection must operate better than the policy area's HCM standard for it to "pass" (for example, HCM=1.00 in Bethesda/Chevy Chase Policy Area).
3. Tier 3: Instead of the Tier 2 analysis, perform a modeling analysis of the network of intersections near the development if:
  - a. a future intersection projects to have a CLV greater than 1,600; or
  - b. a future intersection projects to have a CLV greater than 1,450, the development under study will add at least 10 CLV, and either:
    - i. the intersection is on a congested roadway with a travel time index greater than 2.0, or
    - ii. the intersection is within 600' of another traffic signal.

The Planning Board has recommended that the cut-off for the Tier 1 test be the applicable LATR standard for each policy area. For example, the cut-off would remain at 1,600 CLV for the downcounty policy areas, vary between 1,400 and 1,550 CLV for the upper- and mid-county policy areas, and 1,350 CLV for rural areas. The Board concurred with its staff on the Tier 2 and 3 tests.

Brian Krantz testified, with evidence of several national research efforts, that CLV is not a good predictor of delay. He recommends discontinuing the use of CLV altogether (©11-21). The Council has received some other correspondence from individuals in support of his recommendation. Mr. Krantz also decries the current LATR study practice of using very few, over even one, traffic count as the basis for measuring existing traffic at an intersection.

**Council staff recommendation: Concur with the Planning staff's proposal to shift the threshold for a higher tier test from 1,600 CLV down to 1,350 CLV.** It is difficult to imagine an intersection operating with a significant delay with a CLV of 1,350 or less, unless it is close to another, failing intersection; in such a case current practice allows the plan reviewer to require an operational analysis anyway. Retaining CLV (at 1,350) as a screening mechanism makes sense in order not to waste time and money evaluating an intersection that would not be a problem. The Planning Board's recommendation—using the policy area CLV standard as the test threshold—would be a tighter requirement than what is in effect now, but would not be nearly tight enough, especially in those policy

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<sup>3</sup> The Council was divided on this point. A minority wanted the threshold to be 1,800 CLV.

areas with 1,550-1,600 CLV as the CLV standard; the soft relationship between CLV and delay could easily result in underestimating the true delay.

**Council staff recommendation: Encourage the Planning Board to require more traffic counts for its LATR studies.** This is properly a subject for the Planning Board when it takes up its LATR Guidelines, which usually follows shortly after adoption of an updated SSP. But the Council has a role here, too: not only should more counts be required of a development applicant, but the Council should approve a higher budget for the Planning Board (and/or DOT) to conduct more frequent counts.

*Pedestrian, bicycling, and bus transit tests.* The SSP report describes recommended standards for measuring adequacy for pedestrian movement, bicycling, and bus transit (p. 30):

*Pedestrian system adequacy* is defined as providing LOS D capacity or better (at least 15 square feet per person) in any crosswalk. Any site that generates at least 100 peak hour pedestrians (including transit trips) must:

- Fix (or fund) ADA non-compliance issues within a 500' radius of site boundaries, and
- Ensure LOS D for crosswalk pedestrian space at LATR study intersections within 500' of site boundaries or within a Road Code Urban Area/Bicycle Pedestrian Priority Area (RCUA/BPPA). Regardless of the development size and location, if an intersection operational analysis (Tier 2 or 3) is triggered for any intersection within a RCUA/BPPA, mitigation must not increase average pedestrian crossing time at the intersection.

M-NCPPC and DOT would tighten the threshold to intersections where 50 peak hour bicycle/pedestrian trips are generated. They would also require that in Red area applicants fix deficiencies within 500 feet of the site boundary. Rather than defining pedestrian system adequacy as having sufficient crosswalk capacity, their recommendation is now use pedestrian crosswalk delay as the measure of adequacy (©5, third bullet).

*Bicycle system adequacy* is defined as providing a low Level of Traffic Stress (LTS). For any development generating at least 100 peak hour pedestrian volumes and within a quarter mile of an educational institution or existing/planned bikeshare station, the applicant must identify improvements needed to provide LTS=2 (or "Low") conditions to all destinations within 1,500 feet of site boundaries.

A Level of Traffic Stress 2 –better termed a “low stress” bicycling environment – is one where most adults would be comfortable bicycling. It would mostly consist of: (1) trails, side paths, or protected bike lanes, or (2) streets with a speed limit that does not exceed 30 mph, no more than 3 total traffic lanes, and low parking turnover.

*Transit system adequacy* for LATR is defined as providing a peak load of LOS D for bus routes (< 1.25 transit riders per seat) on routes during the peak period. 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 improvements that would be needed to address conditions worse than LOS D due to additional patrons generated by the development.

Rather than using 1,000 feet from the site as the strict distance to measure bus transit adequacy, Director Roshdieh and Chairman Anderson now recommend that the limit be extended to the nearest transfer point if it is reasonably close to 1,000 feet from the site (©5, second bullet).

Of these three tests, only the pedestrian system adequacy might require an applicant to make an improvement. The other two “tests” only require the applicant to make an inventory of improvements that should be made. **The Council should consider whether improvements should also be required if the bicycle system and transit system adequacy tests find deficiencies.**

### III. GRANDFATHER CLAUSE/EFFECTIVE DATE

The Planning Board’s Final Draft recommends that the new provisions of the SSP would apply to any application for a preliminary plan of subdivision filed on or after January 1, 2017, except that the school test provisions would apply to any subdivision plan filed after November 15, 2016. The past few SSPs have had the following grandfather clauses/effective dates:

- The 2012-2016 SSP (approved on November 13, 2012) applied to any application for a preliminary plan of subdivision filed on or after January 1, 2013, except that the school test provisions applied to any subdivision plan filed after November 15, 2012. Furthermore:

For any complete application for subdivision approval submitted before January 1, 2013, the applicant may meet its requirements under Transportation Policy Area Review by either complying with all applicable requirements of Transportation Policy Area Review under this resolution or all applicable requirements of Policy Area Mobility Review that were in force immediately before this resolution was amended in 2012. The applicant must decide, by the later of March 1, 2013, or 30 days after the Planning Board adopts guidelines to administer Transportation Policy Area Review, which set of requirements will apply to its application.

- The 2009-2011 Growth Policy (approved on November 10, 2009) applied to any application for a preliminary plan of subdivision filed on or after January 1, 2010, except that the school test provisions applied to any subdivision plan filed after November 15, 2009.
- The 2007-2009 Growth Policy (approved on November 13, 2007) applied to any application for a preliminary plan of subdivision filed on or after November 15, 2017.

In summary, the Planning Board’s proposal is consistent with the last two SSPs/Growth Policies. In 2007 the effective date was essentially right after the resolution’s adoption for both the transportation and school tests, that was because the development industry was given notice more than six months earlier that the Council had intended to tighten both tests considerably, and that whatever was approved would go into effect immediately.

**Council staff recommendation: Apply the 2016-2020 SSP to any application for a preliminary plan of subdivision filed on or after either (1) November 15, 2016 or (2) January 1, 2017. There is no obvious policy rationale for not applying a new transportation test at the same time as a new school test.**

#### **IV. COUNCIL PRESIDENT FLOREEN'S PROPOSAL**

On October 13 the Council President circulated her proposal regarding the SSP transportation test and transportation impact taxes (©22-24). In summary, she proposes to:

1. Eliminate TPAR.
2. Eliminate LATR.
3. Establish a package of specific projects—across all modes—for each planning area, and funding them with impact taxes collected in each area.
4. Apply the current General District impact tax rate—increased by 5% to offset the loss of traffic mitigation payment revenue—to all parts of the County, which would include MSPAs, Clarksburg, and areas within a ½-mile radius of certain MARC stations.
5. Eliminate the 5% rate increase once transportation management districts (TMDs) are established across most of the County and TMD fees are established for them.
6. Continue to exempt enterprise zones (but not former enterprise zones), affordable housing, bioscience projects, hospitals and social service agencies.
7. Discontinue impact taxes on places of worship and private schools.

The first two points apply to the SSP. Under this proposal, there would be no transportation adequate public facility test that a new subdivision would have to meet. If this, literally, were the policy approach the Council wishes, then it would need to remove “roads and public transportation facilities” from the public facilities and services to be examined for adequacy in the Adequate Public Facilities Ordinance, County Code §50-35(k). A variation, however, would meet the current requirement of the APFO:

1. Eliminate TPAR.
2. Establish a package of specific local area transportation projects—across all modes—for each area, just as is being done for White Oak. Calculate the per-trip fee of these local area improvements by dividing their cumulative cost by the trips that will be generated by the remaining development under the master plan there. Payment of this fee would be a “pay-and-go” means of passing the LATR test in these areas. After White Oak, this approach should be applied to MSPAs, and to all other parts of the county (except the rural areas) eventually.
3. Retain the current LATR approach in each policy area until the “White Oak” approach can be implemented there.

Council staff will review the impact tax aspects of Ms. Floreen's proposal (points #3-7) for the GO Committee on October 20.

**ES Level Cluster Tests**

<b>Facility Payment at the ES Level, 105% Threshold</b>		<b>Moratorium at the ES Level, 120% Threshold</b>	
Quince Orchard	109%	Clarksburg-	137% Relieved by new school 19-20 SY
<b>Facility Payment at the ES Level, 100% Threshold</b>		<b>Moratorium at the ES Level, 110% Threshold</b>	
Blake	103%	Northwood	116%
Clarksburg	106%	Gaithersburg	115%
Einstein	104%		
Walter Johnson	102%		
Springbrook	103%		
Quince Orchard	109%		
Seneca Valley	101%		
Watkins Mill	101%		

**MS Level Cluster Tests**

<b>Facility Payment at the MS Level, 105% Threshold</b>		<b>Moratorium at the MS Level, 120% Threshold</b>	
Kennedy	108%		
Wheaton	106%		
Gaithersburg	106%		
Rockville	117%		
<b>Facility Payment at the MS Level, 100% Threshold</b>		<b>Moratorium at the MS Level, 110% Threshold</b>	
Kennedy	108%	Rockville	117%
Wheaton	106%		
Gaithersburg	106%		
Springbrook	104%		
Watkins Mill	102%		

**HS Level Cluster Tests**

**Facility Payment at HS Level, 105% Threshold**

Kennedy	117% Affected by supplement
Gaithersburg	114%
Richard Montgomery	118%
Blake	106%
Paint Branch	110%
Poolesville	105%
Quince Orchard	115%
Rockville	107%

**Facility Payment at HS Level, 100% Threshold**

BCC	103%
Churchill	103%
Blake	106%
Poolesville	105%
Rockville	107%
Watkins Mill	104%

**Moratorium at HS Level, 120% Threshold**

Blair	123%
Einstein	129%
Northwood	124%
Walter Johnson	120%
Clarksburg	133% Relieved by Seneca Valley
Northwest	120% Relieved by Seneca Valley

**Moratorium at HS Level, 110% Threshold**

Blair	123%
Einstein	129%
Northwood	124%
Kennedy	117%
Gaithersburg	114%
Walter Johnson	120%
Richard Montgomery	118%
Paint Branch	110%
Quince Orchard	115%
Clarksburg	133% Relieved by Seneca Valley
Northwest	120% Relieved by Seneca Valley

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**School by School Test & HS Level Cluster Test**

**Elementary Schools in Facility Payment, 92 Seat Deficit**

<i>School</i>	<i>Deficit</i>	<i>CIP Notes</i>
Ashburton	98	Capacity affected by supplement
Captain James Daly	93	
Greencastle	93	
JoAnn Leleck	106	

**Elementary Schools in Moratorium, 110 Seat Deficit**

<i>School</i>	<i>Deficit</i>	<i>CIP Notes</i>
Beall	233	Relieved by new school 18-19 SY
Burnt Mills	174	
Rachel Carson	283	Relieved by DuFief 22-23 SY
Cedar Grove	201	Relieved by new school 19-20 SY
Clarksburg	269	Relieved by new school 19-20 SY
Clopper Mill	116	NW Placeholder project
College Gardens	153	Relieved by new school 18-19 SY
Farmland	121	
Forest Knolls	206	Relieved by others 20-21 SY
Garrett Park	118	
Highland View	135	
Kemp Mill	113	
Lake Seneca	165	
Ronald McNair	135	NW Placeholder project
Ritchie Park	114	Relieved by new school 18-19 SY
Rolling Terrace	133	Relieved by others 22-23 SY
Rosemont	290	
South Lake	139	
Strawberry Knoll	193	
Summit Hall	200	
Wilson Wims	549	Relieved by new school 19-20 SY

**Middle Schools in Facility Payment, 150 Seat Deficit**

Earle B. Wood	161
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**Middle Schools in Moratorium, 180 Seat Deficit**

Neelsville	184	
Parkland	197	
Westland	729	Affected by supplement-OK



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

OFFICE OF THE CHAIR

October 6, 2016

The Honorable Nancy Floreen  
Chair, Planning, Housing, and Economic  
Development Committee  
Montgomery County Council  
100 Maryland Avenue  
Rockville, Maryland 20850

Dear Chair Floreen:

The Planning Department and the Montgomery County Department of Transportation have worked together to address the concerns raised in Mr. Roshdieh's September 14 letter. We have concurred that the following changes are appropriate across both the SSP and the Board's LATR Guidelines and we expect that many of these changes will materially satisfy MCDOT's concerns.

- Proceeding with the transit accessibility approach as the preferred method for policy area review, but with a slightly refined list of planned BRT lines in 2040 to reflect the fact that not all master planned lines can reasonably be expected to be implemented by the horizon year.
- Reducing the threshold for quantitative pedestrian LATR analyses from 100 peak hour ped/bike trips generated (based on New York City and Washington DC thresholds) to 50 peak hour ped/bike trips generated.
- Including a requirement for improvement to sidewalk deficiencies within 500 feet of the site boundary for the Red Policy Areas as an applicant requirement (consistent with what is required in the other policy areas).
- Including a provision that will require a project-specific impact assessment for projects greater than 750,000 SF in the Red Policy Areas.
- Retaining a process to tie reduced parking to an adjustment in trip generation rates, or as an alternative adopt a fee structure that incentivizes reduced parking.

We are looking forward to further review and discussion with Councilmembers on defining the relationships of the following elements as related to LATR studies both within the Red Policy Areas and elsewhere in the County:

- Existing access/circulation studies, independent from the SSP, as required through Section 50 of the County Code to address independent M-NCPPC, MCDOT, and (where applicable) SHA assessment of access permits and site design,
- Requirements that may be developed through TDM and TMAs as a result of the ongoing interagency work group developing proposed conditions Countywide,
- Purpose and scope for biennial monitoring within the Red Policy Areas, to include both a Comprehensive Local Area Transportation Review of forecast growth and a performance assessment of observed multi-modal travel conditions, and
- Development of a work program to determine pro-rata share contribution needs with engagement of SHA in the Red Policy Areas (similar to the recently established approach in White Oak).

Chair Nancy Floreen, PHED Committee  
October 6, 2016  
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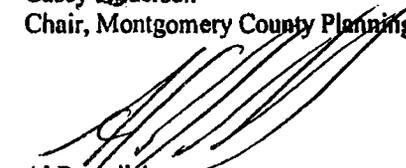
The Planning Department and MCDOT are in agreement regarding several elements of the LATR process that will be incorporated with the Planning Board's LATR Guidelines after the Council adopts the SSP. Continuing coordination on these elements will be enhanced by including MCDOT in the scoping process for LATR studies to address the following in a collaborative manner:

- Maintaining flexibility in whether or not a network approach is warranted for intersection operational assessments,
- Considering the extension of the assessment of transit capacity to the nearest major transfer point when such points are reasonably close to the suggested 1,000 ft distance from a site,
- Using pedestrian crosswalk delay rather than crosswalk capacity as the LATR measure for pedestrian system adequacy, and
- Modifying the LATR mitigation approach from "payment in lieu of construction" in Road Code Urban Areas and Bicycle Pedestrian Priority Areas to one in which payment in lieu of construction is an appropriate option only in cases where applicant coordination with public projects is anticipated; retaining the Planning Board's hierarchy of mitigation approach priorities.

Sincerely,



Casey Anderson  
Chair, Montgomery County Planning Board



Al Rosdich  
Director, Montgomery County Department  
of Transportation

cc: Councilmember Leventhal  
Councilmember Riemer

## MEMORANDUM

October 5, 2016

**TO:** Glenn Orlin  
Deputy Council Administrator

**FROM:** Chris Conklin, Deputy Director for Policy  
Department of Transportation

**SUBJECT:** Preliminary Technical Approach to Red Policy Area LATR Pro-Rata Analysis

Ongoing discussions on the Subdivision Staging Policy (SSP) have yielded an increased interest in the use of pro-rata fee structures to address LATR needs in Red policy areas. What follows is a summary of a potential scoping process, methodology, and implementation of such a concept, based on MCDOT's experience with White Oak Science Gateway (WOSG) pro-rata fee. The WOSG analysis is nearing completion and we anticipate completing the reporting in the next few weeks.

The Red Policy Areas differ from White Oak in many ways in terms of the current characteristics of the areas, the types of development generally proposed, and the transportation system serving the policy areas. This preliminary approach differs in several ways from the ongoing work on WOSG. For example:

- Use of a person-trip basis for pro-rata calculation instead of vehicle trips
- Assessment of local area transportation needs beyond intersection improvements
- More direct incorporation of transit, pedestrian, bicycle, and NADMS program needs

The approach outlined below is preliminary and intended to improve understanding of how this process could work. If the Council believes this type of approach will be beneficial for implementation of the SSP, MCDOT will work with the Planning Department and MDSHA to formalize these as LATR study guidelines for Red Policy areas, incorporating changes as appropriate.

### *TECHNICAL SCOPING & ANALYSIS*

The LATR assessment should be multimodal and, in addition to roadway capacity needs, should include local transit, pedestrian, and bicycle facilities that serve the policy area. For traffic analysis, the study area should span approximately 2 major intersections beyond the policy area boundary, with additional intersections added as deemed appropriate to make connections to other major facilities like interchanges. Similarly, non-auto infrastructure outside the policy area may be included in the scope to reach a major transfer point for transit or connection to major trail or other pedestrian/bicycle routes. Generally, the analysis should be scoped consistent with the master plan

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non-auto driver mode share (NADMS) goals for the policy area. A decision about to incorporate master plan phasing thresholds should also be determined during project scoping. The LATR-type analysis should include the following elements:

- Local transit capacity and quality of service;
- Local bikeways and pedestrian routes, including street crossings and sidewalk gaps;
- The need to supplement to Transportation Management District (TMD) operations to achieve NADMS goals; and
- Intersection capacity and traffic operations.

Scoping should be done with input from affected communities and partner agencies. This scoping process should include, at a minimum, the Maryland State Highway Administration (MDSHA), MDCOT, Montgomery County Planning staff, development community representatives, and citizen's groups identified by the Regional Service Center. Ideally, scoping would occur concurrent with the development of a new master plan, allowing for an existing process for public input. For those areas where plans are already complete, a separate scoping process should occur.

The analysis should assume an appropriate level of Master Plan Buildout. Full yield of master plans is very unusual, however, 100% development build-out (as compared to the 75% typically used in master planning analyses) may be the best assumption to use for these LATR-type analyses, due to the uncertainty of development progression. This assumption maximizes both the "numerator" (the amount of investment needed) and the "denominator" (the number of development units) in the pro-rata calculation.

For transit improvements, the required capital cost for new buses, stations, transit centers, etc. should be identified. For non-motorized facilities, conceptual plans for new links should be developed and included in traffic impact analyses (if they affect capacity). For traffic analysis, a regional model will evaluate the land use and infrastructure inputs across the entire analysis area. The outputs of this regional model are then applied to an intersection-by-intersection network. Mitigating treatments are identified at each intersection. In some cases, further adjustment to the NADMS and appropriate measures to achieve these goals may need to be substituted for physical improvements.

A determination should be made regarding the suitability of including large-scale projects (LRT, BRT, Metro Station improvements, interchanges, new highways, etc.). Generally, this scale of improvement should be excluded from a pro-rata calculation, or be limited to a fair-share contribution. It may be appropriate to identify alternative, short-term improvements for locations where large-scale projects are proposed.

## *COST ESTIMATING*

Preliminary concepts should be developed for pedestrian and bicycle improvements, preliminary service concepts should be developed for local transit, and preliminary intersection designs should be prepared for intersections that do not meet LATR metrics. Conceptual cost estimates should then be developed for each type of improvement using established methodologies such as SHA's Major Quantities Estimating methodology, or another accepted practice. Operating costs are not currently included in these estimates, though recurring costs over the lifetime of a plan (such as for replacement buses, Bikeshare, or TMD expenditures) could potentially be included.

At this stage, concurrence about the improvements identified and their costs among the transportation planning, management, and operating agencies (MCDOT, MDSHA, Montgomery Planning, others as appropriate) is needed.

## *POLICY AREA PRO-RATA FEE DETERMINATION*

Not all identified projects may necessarily be included in the pro-rata fee. Examples of cases where projects may be excluded from the fee could include pending capital projects that would address their needs (such as interchanges), pending developments that would build the project as a condition of development due to a high proportion of the benefits accruing to one development, projects that are located outside of the policy area, and/or projects considered to be “not feasible” to implement.

The total cost of all included projects provides for the numerator in the \$-per-trip fee. The denominator can be measured in any unit of trips or development but consideration should be given toward whether 100% of -person trips should be used, or a value between 75% and 100% to recognize that 100% of development potential is unlikely to be built-out.

## *IMPLEMENTATION*

Each policy area under a pro-rata structure could have its own dedicated CIP, as well as a dedicated account to receive the pro-rata fees. This CIP will identify the projects to be included, and may include some direction as to prioritization among these projects.

This CIP will be a mechanism to allow for forward-funding of projects, ensuring that design and construction can occur on schedule with development. Revenues from the pro-rata fee – acquired at building permit – would be used to pay down initial public investment associated with forward funding. Other fees (such as Impact Taxes, TPAR, TMD Fees, their successors, or new fees) may still apply normally, with no changes to how such revenues are spent. We assume that pro-rata fees would not be eligible for impact tax credit.

A cost-sharing agreement may be necessary with SHA to establish how the pro-rata fees would be contributed toward State projects included in the fee estimate. The State Transportation Participation CIP (P500722) may provide a potential framework for this need.

Monitoring and reassessment should occur periodically over the lifetime of the policy. These analyses will effectively repeat this initial process, with the intent of identifying changes in land use, rates of development, changes in traffic estimates, changes to what projects are needed or should/should not be included in the fee, and any other factors. These estimates may be used for prioritizing identified projects for implementation.

## ***OTHER CONSIDERATIONS***

Several other elements need to be considered in this approach, as described below.

### **SITE ACCESS**

This analysis is still largely rooted in large-area methodologies, and does not reflect the intricacies of individual developments, which may have a varying number of access points spread out across one or multiple roadways. New developments should still evaluate access points for any necessary treatments and mitigate as necessary.

### **POLICY-AREA-ADJACENT DEVELOPMENTS**

To address developments located outside the policy area but impacting intersections within the policy area, we suggest assessing the pro-rata fee on all trips originating from or destined into the study policy area.

### **MONITORING / REASSESSMENT**

Changes in the pace and nature of development as well as the need and palatability of transportation infrastructure will change over time. Regular reassessments of the pro-rata fee should be included. We suggest the analysis and fee be reassessed at 4-5 year intervals.

### **COLLECTION & APPLICATION**

We suggest that the pro-rata fee be due at Building Permit and that an account be setup for each applicable policy area to receive the fees. We suggest that a CIP be created for each policy area, into which funding can be allocated.

### **ESTIMATING BASIS**

Costs are likely to be developed in present value. Recurring costs can to be normalized to a present value as well. The expenditures will occur in future years. An agreed upon structure for adjusting the pro-rata fee to year of collection and/or use is needed.

### **FORWARD FUNDING**

Revenues from the pro-rata fee will not be generated quickly or early enough to allow for design and implementation of associated needs. Forward funding either individual projects or a policy area CIP will be critical to ensuring that necessary infrastructure and services are in place to serve the growing needs.

### **PRIORITIZATION**

A policy area may include multiple activity centers, each of which may be vying for what could be a limited supply of funding. A process for prioritization between competing needs as a part of the CIP process will be needed to implement this program.

Should you have any questions regarding this analysis, please feel free to contact me or Mr. Andrew Bossi, Senior Engineer, at 240-777-7200.

cc: Al Roshdieh, MCDOT  
Gary Erenrich, MCDOT  
Andrew Bossi, MCDOT

Casey Andersen, Montgomery Planning  
Pam Dunn, Montgomery Planning  
Eric Graye, Montgomery Planning

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Potential Red Policy Area LATR Workflow/Schedule:\*

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<u>Activity</u>	<u>Duration**</u>
• Agency Scoping	1 month
• Public Scoping Review	1 month
• Finalize Scope, Contracting & Kickoff	1-2 months
• Data Collection and Existing Conditions Assessment	1-3 months
• Future Conditions Assessment	1-3 months
• Mitigation Determination and Cost Estimating	1-3 months
• Draft Report and Agency Review	1-2 months
• Council Review	1 month
• <u>Final Report and Pro-Rata Fee Establishment</u>	<u>1-2 months</u>
<b><i>Total Study Duration</i></b>	<b><i>9 – 18 months***</i></b>

\* Policy area studies could occur concurrently. It is assumed that 8 of the 10 Red Policy Areas would need study (excluding White Flint and Rockville Town Center).

\*\* Small policy areas (Grosvenor/Friendship Heights) would probably be faster, larger policy areas, like Silver Spring/Wheaton/Shady Grove) would probably take longer. The magnitude of the plan will also have some influence on the schedule. Some plans, like Bethesda, may have substantial foundational work available, which could accelerate the study.

\*\*\* If 2 - 3 studies are conducted at a time; a complete cycle of the studies could be complete in +/- 3 years. Before a policy area study is complete, a typical LATR process, as modified through the proposed policy could apply.

# **Analysis of Critical Lane Volume in Local Area Transportation Review**

Brian Krantz, bskrantz@verizon.net, 301.571.4538

## **1 Summary**

The Local Area Transportation Review (LATR) portion of the 2016 Subdivision Staging Policy Planning Board Draft fails to meet the stated goal of calling for robust analytic assessments for those proposed projects where an LATR study is required. Specifically, the Planning Board Draft continues to utilize the Critical Lane Volume (CLV) metric in a similar manner as the existing 2012 SSP. To our knowledge, there are no data supporting the Planning Department's claims of a specific and significant relationship between CLV and intersection congestion. In fact, the only available data obtained demonstrate a fairly weak relationship, and also indicate intersection congestion can occur at significantly lower CLV values than those asserted by the Planning Department. Furthermore, most people recognize that congestion and delays vary day-to-day, and that the delays of any single day are not necessarily indicative of average conditions. However, the Planning Board Draft continues to allow single-day snapshots to assess existing intersection adequacy.

## **2 Background**

Successful growth in Montgomery County is reliant on meaningful and robust adequacy tests, which are supposed to be established in the County's Adequate Public Facilities Ordinance (SFPO), the Subdivision Staging Policy (SSP). The SSP is revisited and revised every four years. Currently, the 2016-2020 SSP process is underway, due to be adopted by the County Council in November 2016. On July 21, 2016, the Planning Board released their Draft to the County Council. Within the sections pertaining to Transportation, there is ample room for improvement across many different topics and levels of detail. However, the foremost issue at hand is that the actual adequacy tests are fundamentally flawed, defeating the main purpose of the SSP: a safety mechanism for unexpected growth spurts, allowing growth to be consistent with the public infrastructure.

## **3 Discussion**

### **3.1 Fundamental Flaws of the 2016 SSP Planning Board Draft**

This brief discussion provides supporting data and explanation of the claims that:

- Even if CLV was a perfect measure of congestion, any meaningful adequacy assessment is negated due to the fact that the policy does not mandate a statistical analysis of CLV over multiple days
- CLV, at best, is only weakly correlated to the delay of an isolated intersection, and the relationship that does exist is significantly different than that employed within the SSP

#### **3.1.1 Lack of Statistical Analysis**

Imagine if Major League Baseball proposed gauging the talent of a batter by his batting performance of a single game – or even more absurd, a single at-bat. Averages over a series: gone. Averages over a season: gone. Career averages: definitely gone. The entire country would outcry, and Major League Baseball would be ridiculed by their preposterous proposal. People would insist that batter performance varies game to game, and year to year – and that the only fair way to assess performance is by examining average performance over various lengths of time. The people would be correct, but the issue is that this is how existing traffic adequacy is assessed in Montgomery County; in transportation

impact studies, LATR mandates that applicant provide CLV data for only a single day for any particular intersection.

The vast majority of people understand that traffic delays vary day-to-day in the Metropolitan Washington area. Traffic delays can easily vary by  $\pm 16\%$  (e.g., a commute that is  $60 \pm 10$  minutes), and because we are assuming that CLV is a perfect indicator of intersection congestion (i.e., intersection delay), then CLV must vary in a similar manner as delay, such as  $\pm 16\%$ . Consider an SSP policy area such as Damascus with a CLV threshold of 1400. Let's say that the actual peak-hour average CLV for a particular intersection was 1500 (meaning that the intersection *should* fail the adequacy test). However, with a  $\pm 16\%$  window, the measured CLV for the intersection on any given day will be  $1500 \pm 240$ , or within the range of 1260-1740. Note that this encompasses the pass/fail threshold of 1400, meaning that the CLV test could easily pass on any single day.

This example is depicted in Figure 3-1, where a statistical distribution of 250 CLV measurements was created (Distribution: Gaussian, Mean: 1500, Standard Deviation: 16%). Note that the upper limit of CLV was clamped at 1800, in an attempt to represent that intersection CLVs saturate at about this level, as reported in various publications. As shown in this notional example, the total probability that a single CLV measurement would pass the adequacy test, *in error*, is 27%.

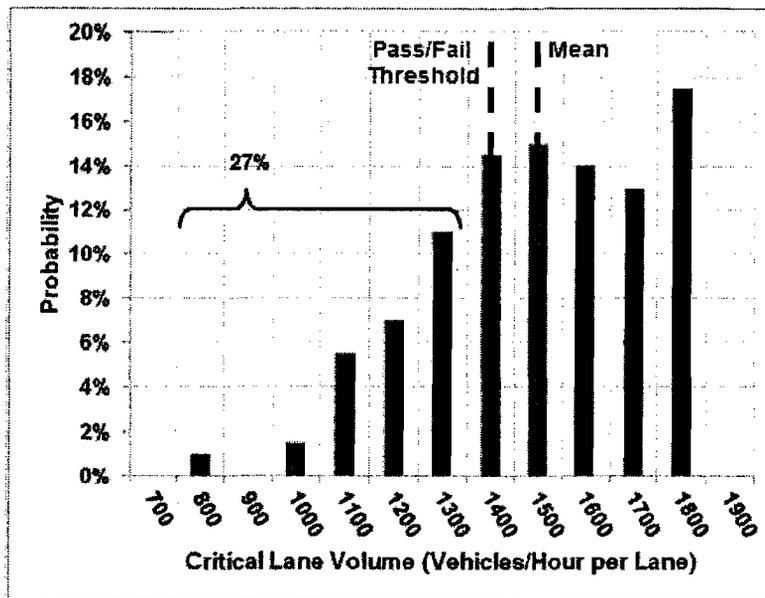


Figure 3-1: Example Statistical Analysis

### 3.1.2 Critical Lane Volume versus Congestion

The statistical discussion of Section 3.1.1 above assumed that CLV was a perfect indicator of intersection congestion. The nationwide standard for intersection congestion is the Average Control Delay, as defined by the Highway Capacity Manual (HCM). In the LATR, the Planning Department contends that CLV is a good enough indicator of HCM Delay, at least for CLV values up to 1600. The Planning Department's mapping of CLV to HCM Delay is shown below in Table 3-1, for the threshold levels between the different Levels of Service (LOS).

Level of Service (LOS)	CLV (veh/hr. per lane)	HCM Delay (secs)
A/B	1000	10
B/C	1150	20
C/D	1300	35
D/E	1450	55
E/F	1600	80

Table 3-1: Planning Department CLV/Delay Equivalency

The basic premise being asserted in the LATR is that CLV can be directly converted into HCM Delay by a formula based on a regression fit of Table 3-1. As such, LATR contends it is not necessary to directly measure the nationwide standard HCM Delay, unless the measured CLV is greater than or equal to 1600. As this is a departure from the nationwide methodology, it would be prudent to examine the legitimacy of the CLV/Delay equivalency that is claimed here. The Planning Department has been asked repeatedly for any data that supports the equivalency shown in Table 3-1, but has yet to be responsive on this particular subject. In a recent TISTWG meeting, Planning Department representatives acknowledged that they do not have any data that supports their claims.

As we were unable to obtain any supporting data from the Planning Department, we searched for any publically available data sets that could substantiate or refute the CLV/Delay equivalency asserted in the LATR. We were able to find only two recent traffic studies within Montgomery County that included values for both CLV and HCM Delay. One study included data for a series of intersections within the Bethesda Central Business District (CBD) [1], and the other assessed various intersections within Gaithersburg City [2]. Between the two studies, data from a total of eleven intersections are available.

Figure 3-2 shows the scatterplot of HCM Delay and CLV for the above datasets that were obtained via the Internet. Thresholds between LOS D/E and E/F are represented.

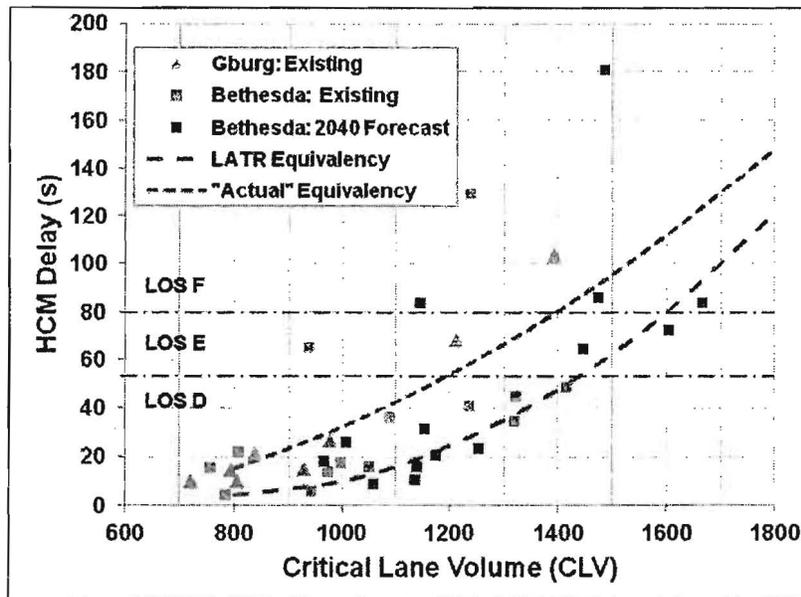


Figure 3-2: CLV/Delay Equivalency

Of note, two of the eleven existing intersections are heavily to severely congested - at moderately low CLVs, well below their respective CLV standards. The AM and PM data for these two intersections are summarized in Table 3-2. As shown, with Levels of Service at E and F, all conditions are still *deemed adequate* by the 2012 and 2016 LATR (although in the 2016 LATR, Bethesda CBD would be exempt from LATR). Clearly a disconnect between congestion and CLV is evident.

Intersection/ Peak Period	Policy Area	Peak Period	CLV Congestion Standard	HCM Delay (secs)	Measured CLV	Level of Service
Bradley Blvd & Arlington Road	Bethesda CBD	AM	1800	65.5	939	LOS E
		PM		129.3	1238	LOS F
MD 355 & MD 124	Gaithersburg City	AM	1425	68.9	1212	LOS E
		PM		103.8	1392	LOS F

Table 3-2: Examples of Congested Intersections with Acceptable CLVs

With regards to general trends of these study data, Figure 3-2 shows a line corresponding to the LATR CLV/Delay Equivalency. A 2<sup>nd</sup> order polynomial regression fit was calculated for the union of the two studies and is also shown, labeled as “Actual Equivalency”. There are two observations that can be made, based on the available data. First, the correlation coefficient of the data,  $r^2$ , is 0.46. What this means in simple terms is that less than 27% of the HCM Delay standard deviation can be attributed to CLV. Specifically, the standard deviation of HCM Delay is about 32 seconds per vehicle, and CLV only accounts for 8 seconds. In even simpler terms, it does not appear that relationship between CLV and HCM is particularly strong.

This analysis is not the first study to demonstrate that CLV does not correlate well with HCM Delay. In 1998, Rick Hawthorne, then Chief of Transportation Planning at the Montgomery County Park and Planning Department, published a paper [3] that analyzed the relationship between average delay and CLV, based on 27 intersections in 1993 and 1996 that had CLVs ranging from about 1000 to 2300. With a correlation coefficient of 0.14 (even less than the datasets presented above), the study conclude that “there is little relationship between delay and CLV”.

If an honest intersection assessment is desirable, why use CLV, an indirect and inferior method – as opposed to the direct and widely accepted HCM method? The Planning Board Draft references the fact that measuring CLV is less time consuming and more economical than the HCM nationwide standard. It appears that you get what you pay for.

The second observation is that these data do *not* substantiate the validity of the SSP’s LATR CLV/Delay equivalency. In fact, it appears as the LATR CLV/Delay Equivalency may describe the *minimum* HCM Delay, as opposed to the *average* delay as claimed in the LATR. That is, the datapoints are not centered about the “LATR Equivalency” line: instead, nearly all points are above it. To illustrate the impact of this flaw, consider the threshold between LOS E and LOS F. The nationwide standard, HCM, establishes this at a delay of 80 seconds; the LATR equates this to a CLV of 1600, which happens to be the threshold level in many policy areas (e.g., Bethesda/Chevy Chase, Kensington/Wheaton, Silver Spring/Takoma Park, Germantown Town Center, White Oak). However, based on *actual* data, the LOS E/F threshold probably equates to a CLV of ~1400, not 1600. Revising the LATR CLV Pass/Fail threshold from 1600 to 1400 would certainly result in many more intersection failures, but this decision would be supported by genuine data.

### 3.2 CLV as a “Screening” Tool

The 2016 SSP Planning Board Draft recommends the application of adequacy tests that are widely accepted nationwide (i.e., Intersection Operations Analysis and Network Operations Analysis), under certain conditions – but only if a CLV threshold is first surpassed. For reference, Table 3-3 summarizes and compares the traffic adequacy testing scheme for 2012 and the recommendations for 2016. It is essential to realize here that *neither* of the two “robust” adequacy tests is mandated unless the CLV condition is met. The 2016 recommendations make it slightly easier to trigger “Tier 2” tests in more rural portions of the County, but this is not sufficiently adequate. Recall the statistical analysis argument in Section 3.1; regardless of the policy area, if an intersection has an average CLV close to the policy area threshold, there will be a 50% chance that it will be surpassed, and a 50% chance it will not. There is no rational argument to justify the continued use of CLV in the adequacy tests – even as a “screening tool”.

	2012 SSP	2016 SSP Planning Board Draft
<b>Tier 1: CLV</b>	Calculate Future CLV	Calculate Future CLV
<b>Tier 2: Intersection Operations Analysis</b>	If CLV > 1600	If CLV > Policy Area Threshold (1350-1600)
<b>Tier 3: Network Operations Analysis</b>	N/A	1) If CLV > 1600 <b>OR</b> 2) CLV > 1450 <b>AND</b> Development Increases CLV by > 10 <b>AND</b> at least one of the below: <ul style="list-style-type: none"> <li>• Intersection is on a congested roadway with a travel time index greater than 2.0</li> <li>• Intersection is within 600’ of another traffic signal</li> </ul>

Table 3-3: Summary Comparison of 2012 and 2016 Traffic Adequacy Test

## 4 Conclusion

Continuing to use CLV “as is” in the Subdivision Staging Policy prevents honest, legitimate and robust assessment of transportation adequacy. As such, we recommend removing CLV from the policy entirely, and rely on HCM Delay, as well as Network Operations Analysis. Interestingly, a similar conclusion was determined as part of a consultant’s 2012 Literature Review [4] for Montgomery County as part of the 2012 SSP Process. We believe Montgomery County should heed the advice from its own subject matter experts and paid consultants.

## 5 References

- [1] Bethesda Purple Line Minor Master Plan Appendix - Traffic Analysis.
- [2] Appendix - Traffic Study for City of Gaithersburg, The Traffic Group, 2013.
- [3] R. Hawthorne, *Measuring Congestion and Delay: the Critical Lane Volume Method*, 68th Annual Meeting of the Institute of Transportation Engineers, 1998.
- [4] P. Silberman, *Literature Review of Local Area Traffic Impact Study Processes*, SABRA, WANG & ASSOCIATES, INC., Technical Memorandum, April 9, 2012.



**TECHNICAL MEMORANDUM**

**TO:** Mr. Eric Graye, Planning Supervisor, Functional Planning and Policy Division, Montgomery County Planning Department

**FROM:** Paul Silberman, P.E. PTOE, Senior Associate, Sabra, Wang & Associates, Inc.

**REFERENCE:** Literature Review of Local Area Traffic Impact Study Processes

**DATE:** April 9, 2012

**Introduction**

In order to evaluate current local area traffic impact policy, performance and analysis methodology, the Sabra Wang team developed a comprehensive questionnaire asking pertinent questions pertaining to the complete process of a traffic impact study (TIS) from triggering all the way through to mitigation. The survey was to be used as a tool to compare Montgomery County's local TIS process with that of other similar jurisdictions. The survey will be used to find the best practices, or at least to highlight alternative means for accomplishing similar goals within the TIS Process in order to make Montgomery County's more efficient and relevant.

Montgomery County, MD, along with the following 12 jurisdictions were successfully interviewed for this research:

1. Baltimore, Maryland
2. Seattle, Washington
3. Vancouver, Washington
4. Boston, Massachusetts
5. Miami-Dade County, Florida
6. Miami Beach, Florida
7. Alexandria, Virginia
8. King County, Washington
9. Orlando, Florida
10. Rockville, Maryland
11. Gaithersburg, Maryland
12. San Jose, California

Key staff from each jurisdiction were identified and asked to fill out a lengthy questionnaire on policy and procedure for submitting, performing, and reviewing traffic impact studies, from application submittal up to and including mitigation. Montgomery County staff completed the questionnaire in order to provide a baseline existing conditions scenario from which to compare the responses of other jurisdictions.

**Methodology**

The questionnaires covered the six main areas of a traffic impact study, starting with basic **background framework** questions, such as *Is there a formal policy in place?* and *Who is the governing authority over the traffic impact process?* Respondents were asked about staffing levels, frequency of policy updates, junior or senior governing agency coordination, and the presence and form of coordination between local site transportation review and area-wide transportation review. The questionnaire contained a small set of questions related to the conditions that **trigger** an applicant to file a formal traffic impact study such as zoning, development size or number of trips. In addition, respondents were asked about the **project scoping** (i.e. size, determining the number of intersections to include, etc.), study performance, determining the horizon year as well as how overlapping studies and multi-phased projects are handled and if there is an alternative review process such as pay-and-go. The fourth section of the questionnaire was the largest, as it covered **Data Collection and Analysis**. In this section, inquiries were directed toward topics such as what modes of data are collected; how and when the data is collected; how traffic data is validated; and future through traffic growth rates. From the analytical perspective, the questionnaire asked the practitioners about analysis method (e.g. Critical Lane Volume, Highway Capacity Manual, other); modes of travel analyzed, the inclusion of roadway segments in the local review; upstream queuing; traffic simulation; and the inclusion of unfunded or programmed transportation improvements. The respondents about required **forecasting** methods.

These questions focused on how trip generation rates were determined; modal split; internal capture; trip distribution and assignment; and trip credits (in the cases of redevelopment). The final section of questionnaire focused on **mitigation**. These questions probed acceptable levels of service; spillover traffic effects across jurisdictions; impact fees; negotiation parameters; Travel Demand Management; non-vehicle impacts; and the authority of the jurisdiction to deny permits based on inability to fully mitigate trips.

In addition to the questionnaires that we received back, many jurisdictions publish their formal procedures on-line as standalone documents.

### **Key Findings**

Respondents sent back individual filled-out questionnaires. In many cases, there were follow-on interviews to clarify responses. Individual responses were compiled into a large matrix, along with Montgomery County's responses, so that their answers to each question could be contrasted with answers from all of the other jurisdictions in a side-by-side comparison. While the key findings of this comparison are presented below, the entire matrix is included as Appendix A.

For clarity, key findings (or differences) are grouped by the following classification:

1. Process and Scoping
2. Data Collection and Analysis
3. Forecasting
4. Mitigation

#### *Process and Scoping*

A comparison of the other jurisdictions shows similar initial triggers for a traffic impact study. Every jurisdiction looks at net trips generated or development as the triggering mechanism for a study; the difference among jurisdictions is the details of that mechanism. For example, while most jurisdictions evaluate peak hour trips – like Montgomery, Orlando looks at daily trips generated (1000 is the threshold). Both Boston and Baltimore use 50,000 gross square feet as their threshold, though Baltimore has a much higher threshold for warehouses and a much lower threshold if the development was near an intersection that was already at level of service D.

More often than not, the developer hired their own consultant to perform the traffic impact study and submit to the local jurisdiction – similar to Montgomery County's requirements. However, a few jurisdictions – Orlando, Boston, and Baltimore utilize 3<sup>rd</sup> party consultants hired by the local agency authorized to review the TIS.

With regard to scoping of the traffic impact study, all jurisdictions used trip impact as the determining factor, although a couple of jurisdictions handled the scope on a case-by-case basis. Of the respondents, Vancouver appeared to have the most far reaching scope, with development generating only 250 trips requiring a 3-mile radius scope. As of this writing, they are looking at both increasing the thresholds and reducing the radii. Most jurisdictions, like Montgomery County, looked at *peak hour* trip impacts, although one Jurisdiction – Orlando – looked at total *daily* trips generated. In addition, Boston used a gross square footage of development as the triggering factor.

The horizon year for a development was typically consistent with project opening (assuming some 5 of occupancy). But for large projects, some jurisdictions looked at a horizon year 10 years out.

Like Montgomery County, a couple of the surveyed jurisdictions have alternative processes that involve an applicant paying a fee for every trip generated.

#### *Data Collection and Analysis*

Most jurisdictions, like Montgomery County allow data that is no older than one year old. A few jurisdictions allow data up to two years. All jurisdictions require AM and PM peak period data collection, though the actual peak period times vary from place to place. Like Montgomery County, other jurisdictions will require weekend peak period data collection for retail establishments, such as grocery stores. When a developer is redeveloping an active site, Montgomery County, like all jurisdictions surveyed, allow for trip credits based the trips generated by an existing use.

Montgomery County requires data collection for vehicles and pedestrians and for transit routes to be identified. Several other jurisdictions – for example Boston and Baltimore – also include counting of bikes, as well. Miami-Dade goes a step further and counts transit headway and ridership, while Vancouver, Washington counts vehicle delay and travel time.

Montgomery County validates counts through its own internal database, while most jurisdictions typically rely on the applicant's consultants. Some jurisdictions use their internal Synchro file both as a check or also to supply to applicant's traffic consultants in order for them to populate with projected traffic volumes.

Background developments are part of the data collection for Montgomery County and all surveyed jurisdictions. In addition, while Montgomery County does not account for regional growth in through-traffic (typically on Arterials only), most other jurisdictions do. Typical arterial growth rates vary from 0.25% annually (Boston) to 1.5-2% annually for Vancouver. Gaithersburg only requires this additional background growth for developments that have a build-out date exceeding 3 years. Almost all jurisdictions justify the additional annual percentage increase in traffic from regional growth, based on historical counts.

Unlike Montgomery County that uses CLV<sup>1</sup> for analysis of traffic counts, most jurisdictions utilized the Highway Capacity Manual 2000 methodology<sup>2</sup>. Montgomery County did utilize a CLV congestion standard that varied based on the local policy area. For example, a higher level of congestion is permissible in Central Business Districts (CBDs) and Metro Station Policy Areas than relative to suburban and rural areas of the County. Rockville utilizes a similar tiered CLV congestion standard, whereby it varies based on the signal cycle length and number of phases. Only Miami-Dade has reported using HCM 2010, while several of the jurisdictions say they are interested in switching or are researching it. Like most jurisdictions, Montgomery County does not require Synchro or other simulation software as part of the traffic impact analysis but recognizes that is often useful to study the effects of queuing. VISSIM was also cited by several jurisdictions as a software package that was used to provide additional information for a comprehensive traffic impact analysis. Like most jurisdictions, Montgomery County calculates level of service only for vehicles. However, Seattle reported calculating LOS for pedestrians at certain downtown locations.

Montgomery County typically evaluates intersection level of service, but occasionally will evaluate level of service on road segments, on a case-by-case basis. This practice is similar across all jurisdictions surveyed. Likewise, Montgomery County, similar to other jurisdictions, requires special studies on a case by case basis. Special studies would include crash data analysis, signal warrants and queuing analysis. Triggers for these studies are not formally spelled out, but are generally location-driven. In addition, for large developments, the City of Alexandria requires a formal transportation demand management (TDM) plan to reduce automobile trips. Vancouver Washington also measure arterial travel speeds.

When considering the existing roadway capacity, Montgomery County allows applicants' consultants to consider un-built but planned roadway assuming that they are fully funded and will be completed within the next six years. All jurisdictions had a similar policy, though the time frames varied from four to six years out. No jurisdiction surveyed allowed for unfunded transportation improvements to be counted in an analysis even if they were programmed into a Capital Improvement Program or Transportation Improvement Program.

- 
- 1- There is only one overriding measure for CLV analysis: the Critical Volume. This critical volume is correlated with preset values to calculate LOS and a v/c ratio. There is no relationship at all between the LOS and v/c ratios in the CLV and the HCM methods; their derivations are significantly different. It should also be noted that the CLV methodology differs from the HCM methodology because here, LOS and v/c ratio are the only 2 ways of representing the total intersection sufficiency. Unlike the HCM methods, CLV analysis calculates overall intersection Critical Volume, whereas the HCM aggregates each MOE on a lane group, approach, and then overall intersection basis, thus identifying failed movements and approaches. Additionally, in the CLV method, the maximum capacity of the intersection is fixed; i.e. it does not vary with signal timings, grades, lane widths, etc.
  - 2- There are two primary measures of effectiveness used to evaluate the performance of an intersection in the Highway Capacity Manual: intersection control delay (seconds per vehicle) and volume-to-capacity ratio (v/c). Level of Service is determined using control delay. As noted in the HCM, Level of Service (LOS) is a measure of the acceptability of delay levels to motorists at a given intersection, and is defined as a qualitative measure describing operational conditions within a traffic stream, based on service measures such as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. It is subjective in that levels that are considered acceptable in a large city might be unacceptable in a rural area. Volume-to-capacity (v/c) ratio is an approximate indicator of the overall sufficiency of an intersection. A v/c ratio of 1.0 indicates that an intersection or a movement has reached its theoretical capacity, i.e. demand volume equals maximum theoretical supply. A v/c ratio above 1.0 indicates that a residual queue (i.e., unserved demand) will be expected. In layman's terms, this means that the specific movement or intersection will fail to operate satisfactorily under such a condition.

### *Forecasting*

With regard to trip generation Montgomery County uses a combination of locally-derived trip generation rates and Institute of Transportation Engineers (ITE) trip generation rates. Approximately half of the jurisdictions surveyed utilized the same methodology, with the other half employing only ITE trip generation rates. ITE also is heavily used for pass-by and internal capture and mode split assumption, in conjunction with local knowledge. In addition, some jurisdictions cap internal capture and pass-by trip reductions. For example, internal capture is capped at 10% in transit-oriented area, while Miami-Dade caps pass-by trips at 10%. Boston's approach to mode split is unique in that they provide consultants with tables of modal split for each neighborhood in the City. Baltimore City also set's non-auto mode share at a neighborhood/ Traffic Analysis Zone level derived from the regional travel demand model. Consultants are required to utilize the tabular information.

Almost all jurisdictions use regional models for distribution/assignment of site-generated trips. Montgomery County has its own tabular data for trip distribution. The model divides the County into 11 "super districts" that each have their own distribution percentages both within the other super districts and outside the County to the surrounding locales. This approach is similar to the other jurisdictions surveyed, but used on a more refined manner that is specific to Montgomery County.

The length for which forecasting studies are valid varies greatly by jurisdiction from 1 year to up to 5 years. However, some jurisdictions have no formal limit, though these jurisdictions provided the caveat that if land use or traffic substantially changed prior to construction, then the forecast would no longer be valid. This is similar to Montgomery County, where the forecast is valid as long as the plan review is pending, with the caveat that background traffic conditions are still similar.

### *Mitigation*

Because most jurisdictions utilize HCM and delay, while Montgomery County uses a variable CLV congestion standard, comparing congestion levels is difficult. Montgomery County has a CLV standard based on policy areas within the County, other jurisdictions vary their allowable LOS based on other factors. For example, Baltimore and Seattle set LOS D as their standard city-wide, but other jurisdictions vary depending on road classification (Rockville) or pedestrian/transit accessibility (Alexandria). Both King County, Washington and Boston allow LOS E, but Boston will allow LOS F in some cases. It was noted in subsequent discussions that the City of Frederick uses CLV as a primary capacity analysis screening tool and then may require HCM.

While Montgomery County has a specific mitigation negotiation policy, it is typically negotiated in "good faith" by the other jurisdictions surveyed. Other localities have a laundry list of items that they typically ask for during negotiation.

Montgomery County requires TDM strategies in some locations, particularly around Metro stations. Periodic performance monitoring by Montgomery County and a Planning Board auditor will be required for Traffic Mitigation Agreements that are designed to mitigate at least 30 peak hour vehicle trips. Similarly, Alexandria City monitors car pools and transit usage annually as part of its TDM performance monitoring. Other jurisdictions request performance monitoring to be done by the applicant. Orlando noted in the survey that TDM is rarely verified and/or enforced. Gaithersburg has stated that its policy is for self-reporting by developers on a quarterly basis.

When recommended roadway improvements are not feasible (typically because the right-of-way does not exist), Montgomery County applies other non-auto mitigation measures or allow for a monetary contribution to be made in lieu of mitigation. The survey found similar responses across the other jurisdictions, however, some noted that the applicant will have to find a way to reduce their site-generated auto trips. Boston, for example, says that developers must consider reducing parking requirements or even look at reversible lanes. Similarly San Jose cited the need to reduce project size if LOS impacts were shown to be significant. However, most of the responses centered on the need to apply mitigation improvements to other transportation modes, such as pedestrian/bike or transit. The City of Baltimore and Boston include transportation system management (such as communications and ITS) and operating contributions (e.g. transit) as part of mitigation options.

Pedestrian and bike and transit improvements or amenities are not measured or credited on the local TIS level in Montgomery County. Similarly, in other jurisdictions, these amenities are not measured but are often required on-site. Off-site amenities for pedestrian bike and transit are often used to justify higher non-auto mode splits.

No jurisdiction was found to have a formal policy for mitigating spillover effects of traffic into neighboring jurisdictions. However, many localities surveyed said that they share traffic impact studies with their neighbors and offer the opportunity for written comments.

Finally, all jurisdictions surveyed, including Montgomery County, have the ability and authority to cap, delay or deny future development if mitigation cannot be agreed upon by all parties.

## Conclusion

The comparison between Montgomery County and the surveyed jurisdictions show many similarities in approach along with many differences – some of which are not substantial enough to be considered in an alternatives analysis. A detailed summary matrix of question-by-question responses is attached as an appendix to this memorandum. However, there are some key differences in the processes that are noteworthy in their approach. Several notable differences in TIS methodology between Montgomery County and other jurisdictions include *who* performs the TIS; *Type* of data collected in a TIS; TIS analysis method; alternative processes in lieu of a TIS; use of simulation software in as a validation tool; TDM management requirements and monitoring; local area mode split tables; and mitigation alternatives. In summary, the notable findings are as follows:

- o Several jurisdictions surveyed allow a third-party consultant to scope, review or perform the traffic impact study, funded by the developer
- o Several jurisdictions have an alternative review process that allows developers to pay a fee per trip and bypass performing a traffic study
- o Most jurisdictions collect traffic data on vehicles, pedestrian and bicycles. A few collect transit usage (headway and occupancy) and one jurisdiction surveyed collected travel time
- o Several jurisdictions use Synchro models to validate traffic count data, to account for oversaturated conditions (actual demand vs. throughput). At least one requests that consultants use the Synchro model in lieu of collecting new data.
- o Most jurisdictions do not use the CLV, but rather HCM methodology to determine level of service.
- o The most notable special study included in a local traffic impact study was a Transportation Demand Management plan, required by all developers in the City of Alexandria to identify specific methods to reduce site auto trips. No jurisdiction has a monitoring program specifically focused on development impact, however, Alexandria requires annual reports on a TDM plan which includes monitoring elements.
- o Most jurisdictions only require vehicle level of service. The City of Seattle has performed pedestrian level of service analysis, and the City of Boston is leaning towards implementing a complete street multi-modal analysis requirement
- o The City of Baltimore and Boston use mode share data from the regional travel demand model in accounting for discounts in raw vehicle trip generation rates for pedestrian, bicycle and transit site access.
- o Most jurisdictions use level of service as an operational measurement, however, Vancouver Washington also uses arterial travel speeds.
- o No jurisdiction had a formal policy for inter-jurisdictional coordination, good professional cooperation was the norm.
- o The City of Baltimore and Boston include transportation system management (such as communications and ITS) and operating contributions (e.g. transit) as part of mitigation options. Requesting reduced parking (parking maximums) was a notable tool used by Boston to reduce auto trips when recommended roadway improvements are not feasible.

Based on this list of key peer local transportation review practice, it is recommended to consider in subsequent Beta Tests the following:

- o Use of the Highway Capacity Manual (HCM) 2010 for capacity analysis
- o Documentation of relative arterial mobility including average vehicle vs. bus speeds
- o Analysis of pedestrian and bicycle level of service
- o Safety analysis
- o Consideration of growth in the traffic volumes
- o Documentation of projected non-auto trips

- o Non-auto travel shed analysis
- o Use of traffic analysis software (Synchro/ SimTraffic) for signal timing and queuing assessment
- o Use of person-throughput metrics and system-level operational measures of performance



MONTGOMERY COUNTY COUNCIL  
ROCKVILLE, MARYLAND

MEMORANDUM

NANCY FLOREEN  
COUNCIL PRESIDENT

October 13, 2016

**To:** Councilmembers  
**From:** Nancy Floreen, Council President  
**Subject:** Subdivision Staging Policy – Transportation Tests and Impact Taxes

Consistent with what I've recommended on the education side, and after having thought about this, frankly, for years, I propose that we confront reality, increase the transportation impact tax across the board, apply it consistently across the county, and impose a traffic management system across the county.

As far as I am concerned, the Planning Board's new Subdivision Staging Policy proposal of using "transit accessibility" and "vehicle miles traveled" as the basis for measuring transportation adequacy and calculating tax rates may fit squarely within the mainstream of modern planning practice, but it offers us little in the way of actual improvement. (Our staff has taken that concept further and has proposed a standard of "person miles travelled" to be used as a measure for tax rate calculation.) While I appreciate the seriousness and thoughtfulness that supports this work, I do not believe these well-intentioned standards advance our needs. Apart from the complexity of its analysis, the Planning Board's test assumes a pace of transit production that is highly unpredictable. Witness the Governor's recent removal of funds for the Corridor Cities Transitway from his capital budget.

In addition, what we have learned in the Planning, Housing and Economic Development Committee so far is that the existing policy area based test – Transportation Policy Area Review - is widely believed to be overly complex and primarily a revenue collection device. Many regard it as a multilayered "black box" of analysis and algorithms.

Similarly, we long have had a localized test, Local Area Traffic Review, designed to measure traffic congestion, although LATR is not particularly related to transit accessibility. As with the TPAR test, this process is elaborate and mysterious, using the questionable Critical Lane Volume and shifting Level of Service analyses, and is subject to discretionary standards and application.

Historic data reveals that we have collected \$1.457 million over five years in transportation mitigation revenues under TPAR, which is equivalent to two percent of our impact tax receipts during the same period. LATR also has produced an additional multitude of well-intentioned and varied ways of addressing congestion. At the same time, we do not know what transportation facilities have actually been constructed to meet our traffic adequacy requirements under all these tests, although I assume this information could be compiled. The total cost of all of these tests, not to mention staff and consultant time, has not been calculated.

So what do we have to show for all our work over all these years to address our adequate public facilities needs? A variety of ad hoc intersection, roadway, sidewalk and bicycle improvements, a number of traffic mitigation agreements, and about \$75 million in receipts, assigned to random transportation initiatives - NONE of which is particularly coordinated.

I propose we think differently.

I agree with staff's proposal, similar to what we did in White Oak, to establish a formal list of needed transportation facilities - whether they are based on car, bus, pedestrian or bicycle travel needs. (We already have a pretty comprehensive compendium.) This list would constitute our priorities for adequate public facilities needs for each planning area. While such a list may evolve over time, our master plans already detail much of what needs to be done and can be the starting resource. As projects come along, I would allocate their transportation impact tax to those projects, some of which might be funded entirely, others of which would only provide a drop in the bucket, but at least would constitute a start. I would substitute this process for the current policy area review proposal and eliminate LATR. This concept is consistent with the Planning Board's recommendations for the Road Code Urban areas and Bicycle Pedestrian Priority areas. Why not apply it everywhere?

Some might argue that the transportation impact tax has historically been applied to big network type projects. Maybe that is the case, but the amount raised has never been enough to fund any one big project. It makes far more sense to spend the revenue in the community receiving the impact of any development project. Others may argue that the State requires an LATR analysis for projects that seek access to state roads. I would point out that we are not the State, and, in any event, we would expect that whatever the State requires would be consistent with our master plans. We should permit credits against the impact tax in such cases, because such improvements achieve community goals.

I would establish the transportation impact tax at the 2015 General District Rate. (The Planning Board analysis concludes that it is at a reasonable level.) I would add an additional five percent to account for the replacement of LATR revenue. I would further proceed to apply the revised transportation impact tax to ALL projects that have not yet submitted an application for subdivision approval. Current applications could choose the new approach or be subject to the current requirements. I would exempt current enterprise zones (not former ones), affordable housing, bioscience projects, hospitals, social service agencies, churches and private schools. The transportation impact tax would increase annually based on the regional Consumer Price Index.

I would apply this tax equally to all projects in each of the Planning Board's use categories, without regard to location. For example, commercial projects in Bethesda would pay the same square footage base rate as those in Damascus. This approach is consistent with our staff's recommendation. While the dollars in Bethesda might be dedicated to bike lanes or Bus Rapid Transit stations, those in Damascus are more likely to go to roadway improvements. If a developer preferred to actually deliver a listed improvement instead of contributing to it, a credit against the impact tax due should be granted, whether or not the project involves a county or state facility.

The PHED and Transportation, Infrastructure, Energy & Environment committees have been briefed on an ongoing effort to establish Transportation Demand Management Districts across the county, with different levels of goals depending on the Planning Board's color coded districts. This plan would form the basis for an annual per square foot assessment of all commercial and medium to higher density residential projects to manage community based transportation demand. I applaud this effort. Once the plan's elements have been fleshed out for public review, amendment and adoption, I propose we eliminate the five percent increase to the transportation impact tax I propose above, and use the new TDM plan as a community based substitute for LATR.

These proposals would add simplicity, predictability, and rationality to our never-ending commitment to address transportation adequacy. What's more, it would add a new element of community based coordination. It would respect the fact that all communities have infrastructure needs, of varying types but of equal importance. And it would eliminate the current cost differentials between various parts of the county. Our zoning and parking policies already create strong incentives for locational choices, particularly at Metro stations. Encouraging a mix of uses throughout the county can help with vehicle miles travelled, and its demand for supporting infrastructure, everywhere.

I further point out that if we continue down the current path of tests and measurements, it is likely that the net revenue collected will be comparable to what I have outlined above, but that the actual experience of community transportation benefits will be even more marginal than it is today. The underlying objective of achieving adequacy of public facilities should be recognized as serving a far more local need that we have previously acknowledged, which my proposal does. At the end of the day, we should judge ourselves on what we have achieved for our community, not on how many numbers we have crunched.

I trust that you will find this approach simple, understandable, straightforward, community based and cost effective. I therefore ask for your support of this worthy approach.

cc: Isiah Leggett, Montgomery County Executive  
Casey Anderson, Chair Montgomery County Planning Board  
Gwen Wright, Planning Director  
Glenn Orlin, Deputy Staff Director  
Bob Drummer, Council Staff Attorney  
Al Roshdieh, Director, Montgomery County Department of Transportation  
Jeremy Criss, Director, Office of Agricultural Services  
Gigi Godwin, Montgomery County Chamber of Commerce  
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Ginanne Italiano, Bethesda-Chevy Chase Chamber of Commerce  
Jane Redicker, Greater Silver Spring Chamber of Commerce  
Frank Jamison, Charles H. Jamison, LLC  
Dan Wilhelm, Greater Colesville Civic Association  
Jim Zepp, President, Montgomery County Civic Federation