

**ATTACHMENT C  
HOUSING DISTRIBUTION IN PLAN AREA**

**Alternative Housing Geographic Distribution in Damascus Transition Areas**

<b>Housing Percentage</b>	<b>Neighborhood Transition Area</b>	<b>North Transition Area</b>	<b>East Transition Area</b>	<b>West Transition Area</b>
<i>Existing Development</i>	87%	12%	.003%	2%
<i>Current Master Plan</i>	79%	16%	1%	4%
<i>Public Hearing Draft Plan</i>	77%	15%	2%	6%
<i>Housing/TDR Alternatives</i>	69%	16%	4%	12%

**Alternative Housing Distribution in Transition Areas Tiers**

<b>Housing Percentage</b>	<b>Town Neighborhood</b>	<b>Neighborhood Transition</b>	<b>Rural Transition</b>
<i>Existing Development</i>	58%	28%	14%
<i>Current Master Plan</i>	56%	30%	14%
<i>Public Hearing Draft Plan</i>	55%	31%	15%
<i>Housing/TDR Alternatives</i>	51%	34%	15%

**Alternative Housing Distribution in Damascus Master Plan**

<b>Housing Percentage</b>	<b>Town Center</b>	<b>Transition Area</b>	<b>Rural Area</b>
<i>Existing Development</i>	6%	74%	20%
<i>Current Master Plan</i>	8%	73%	19%
<i>Public Hearing Draft Plan</i>	20%	64%	16%
<i>Housing/TDR Alternatives</i>	19%	66%	15%

**ATTACHMENT D:  
HOUSING/TDR DU POTENTIAL**

EXISTING ZONE POTENTIAL										PROPOSED DU POTENTIAL																																	
Acres	Existing DU	Existing Zoning Potential	Proposed Standard Zone	DU Potential	Proposed Optional Development Zone	TDR Yield	Density Bonus (up to 22%)	Total DUs	MPDUs (12.5%)	Proposed # of du over the existing Zoning potential	Acres	Existing DU	Existing Zoning Potential	Proposed Standard Zone	DU Potential	Proposed Optional Development Zone	TDR Yield	Density Bonus (up to 22%)	Total DUs	MPDUs (15%)	Proposed # of du over the existing Zoning potential																						
<b>TOWN CENTER</b>																																											
194	357	Various Commercial and Residential Zones	TC2-1 and TC2-2	992	-	0	0	992	124	992	<b>TOWN CENTER AREAS BREAKDOWN</b>																																
<b>Town Neighborhood Transition Area</b>																																											
36	47	RE-2C	R-200	53	-	0	0	53	0	4	27	27	RE-2C	R-200	33	-	0	0	33	0	5	58	74	77	86	0	9																
<b>Neighborhood Transition Area</b>																																											
82	4	RE-2C	RNC-4	32	RNC/TDR 1.0	50	16	100	15	68	21	0	RE-2C/DPD-5	RE-1	15	-	0	0	15	0	5	16	28	28	RE-2C	RE-1	33	0	5														
76	1	RE-2C	RNC-4	31	RNC/TDR 1.0	47	17	95	14	64	115	2	RDT	RNC-04	4	RNC/TDR .5	53	12	69	10	65	51	2	RE-2C	RNC-4	20	31	11	42														
50	2	RE-2C	RNC-4	20	RNC/TDR 1.0	31	11	62	9	42	50	2	RE-2C	RNC-4	20	RNC/TDR 1.0	30	11	61	9	41	3.7	4	RE-2C	R-90	14	0	0	9														
27	2	RE-2C	RNC-4	10	RNC/TDR 1.0	17	5	32	5	22	27	2	RE-2C	RNC-4	10	RNC/TDR 1.0	17	5	32	5	22	27	16	RE-2C	RE-1	23	0	0	5														
472.7	61	-	-	202	-	228	74	504	62	326	<b>RURAL AREAS BREAKDOWN</b>																																
<b>Rural Transition Area</b>																																											
590	230	RE-2C	RC	316	Proposed Optional Development Zone	TDR Yield	Density Bonus (up to 22%)	316	0	-46	138	2	RC/RE-2C to	RNC-4	55	RNC/TDR 1.0	83	30	168	25	142	718	232	368	371	83	25	96															
<b>Agricultural Reserve</b>																																											
-115	-2	RDT	n/a	0	Proposed Optional Development Zone	TDR Yield	Density Bonus (up to 22%)	-4	0	-4	57	26	R-200 and C-1	R-2C	34	-	0	0	34	0	0	15	12	R-200 and C-1	R-2C	13	0	0	0														
<b>Rural Hamlets</b>																																											
15	12	R-200 and C-1	R-2C	23	Proposed Optional Development Zone	TDR Yield	Density Bonus (up to 22%)	23	0	0	19	21	R-200 and C-1	R-2C	23	-	0	0	23	0	0	39	18	R-200 and C-1	R-2C	19	0	0	0														
130	77	89	-	78	-	0	0	69	0	0	1,458	789	-	-	1,727	-	311	104	2,151	211	1,940	<b>GRAND TOTALS</b>																					

\* Properties with a yield below 20 DUs are not required to provide MPDUs, unless voluntary or if assembled with adjoining property owner.  
 \*\* Properties not originally proposed for zoning change in the Public Hearing Draft Proposal.

ATTACHMENT E: PUBLIC HEARING DRAFT DU POTENTIAL												
EXISTING DU Potential						PROPOSED DU Potential						
TOWN CENTER	Acres	Existing DU	Existing Zoning Potential	Proposed Standard Zone	DU Potential	Proposed Optional Development Zone	TDR Yield	Density Bonus (up to 22%)	Total Dus	MPDUs (12.5%)	Proposed # of du over the existing Zoning potential	
TOWN CENTER	184	357	Various Com. and Res. Zones	TCE-1 and TCE-2	892	-	0	0	992	127	892	
<b>TRANSITION AREAS AREA DOWN</b>												
Town Neighborhood Transition Area	Acres	Existing DU	Existing Zoning Potential	Proposed Standard Zone	DU Potential	Proposed Optional Development Zone	TDR Yield	Density Bonus (up to 22%)	Total DU	MPDUs (15%)	Proposed # of du over the existing Zoning potential	
"NW Properties on Ridge	36	47	RE-2C	n/a	49	n/a	0	0	49	0	0	
"SW Properties on Ridge	22	27	RE-2C	n/a	28	n/a	0	0	28	0	0	
<b>TOTALS</b>	<b>58</b>	<b>74</b>	<b>-</b>	<b>-</b>	<b>77</b>	<b>-</b>	<b>0</b>	<b>0</b>	<b>77</b>	<b>0</b>	<b>0</b>	
Neighborhood Transition Area	Acres	Existing DU	Existing Zoning Potential	Proposed Standard Zone	DU Potential	Proposed Optional Development Zone	TDR Yield	Density Bonus (up to 22%)	Total Dus	MPDUs (15%)	Proposed # of du over the existing Zoning potential	
Burdette	82	4	RE-2C	RNC 4 (sewer)	32	-	0	0	32	4	0	
Miller	21	0	RE-ZCPD-5	RE-1 (water)	15	-	0	0	15	0	5	
"Town Spring Neighborhood	18	28	RE-2C	n/a	28	n/a	0	0	28	0	0	
Warfield	78	1	RE-2C	RNC 4 (sewer)	31	RNC/TDR 75	27	12	58	9	27	
"Stern/Miner	16	0	RE-2C	RNC 4 (sewer)	6	-	0	0	6	0	0	
"Casey/Lewis	50	2	RE-2C	n/a	20	n/a	0	0	20	0	0	
"Souder and Vicinity	3.7	5	RE-2C	n/a	5	n/a	0	0	5	0	0	
"Rock Colony (Associated with structure in current proposal)	35	2	RE-2C	n/a	14	n/a	0	0	14	0	0	
"Stanley/Lalshar/Day	27	2	RE-2C	n/a	10	n/a	0	0	10	0	0	
"Northern Ridge Properties	27	16	RE-2C	n/a	16	n/a	0	0	16	0	0	
<b>TOTALS</b>	<b>268.7</b>	<b>60</b>	<b>-</b>	<b>-</b>	<b>172</b>	<b>-</b>	<b>27</b>	<b>12</b>	<b>206</b>	<b>13</b>	<b>32</b>	
Rural Transition	Acres	Existing DU	Existing Zoning Potential	Proposed Standard Zone	DU Potential	Proposed Optional Development Zone	TDR Yield	Density Bonus (up to 22%)	Total Dus	MPDUs (15%)	Proposed # of du over the existing Zoning potential	
Pakuxent River Watershed Area	560	230	RE-2C	RC	316	-	0	0	316	0	-46	
Kingsteed/Lalshar	138	2	RC and RE-2C	RNC 21(sewer)	28	RNC/TDR 56	49	16	93	12	67	
<b>TOTALS</b>	<b>718</b>	<b>232</b>	<b>-</b>	<b>-</b>	<b>344</b>	<b>-</b>	<b>49</b>	<b>16</b>	<b>409</b>	<b>12</b>	<b>21</b>	
<b>AGRICULTURAL RESERVE AREA DOWN</b>												
Agricultural Reserve	Acres	Existing DU	Existing Zoning Potential	Proposed Standard Zone	DU Potential	Proposed Optional Development Zone	TDR Yield	Density Bonus (up to 22%)	Total Dus	MPDUs (15%)	Proposed # of du over the existing Zoning potential	
"Kings Valley LTD	115	2	RDT	n/a	4	n/a	0	0	4	0	0	
Rural Hermits	Acres	Existing DU	Existing Zoning Potential	Proposed Standard Zone	DU Potential	Proposed Optional Development Zone	TDR Yield	Density Bonus (up to 22%)	Total Dus	MPDUs (15%)	Proposed # of du over the existing Zoning potential	
Purdum	57	26	R-200 and C-1	-	34	-	0	0	34	0	0	
Lewisdale	15	12	R-200 and C-1	-	12	-	0	0	13	0	0	
Browningville	19	21	R-200 and C-1	RHZ	23	-	0	0	23	0	0	
Eichson	39	16	R-200 and C-1	RHZ	19	-	0	0	19	0	0	
<b>TOTALS</b>	<b>130</b>	<b>77</b>	<b>-</b>	<b>-</b>	<b>88</b>	<b>-</b>	<b>0</b>	<b>0</b>	<b>89</b>	<b>0</b>	<b>0</b>	
<b>GRAND TOTALS</b>	<b>1,484</b>	<b>802</b>	<b>-</b>	<b>-</b>	<b>1,231</b>	<b>-</b>	<b>76</b>	<b>28</b>	<b>1,777</b>	<b>152</b>	<b>1045</b>	

\* Properties with a yield below 20 DUs are not required to provide MPDUs, unless voluntary or if assembled with adjoining property owners.  
 \*\* Properties not originally proposed for zoning changes in the Public Hearing Draft Proposal.

**ATTACHMENT F  
SEWER SERVICE ISSUES  
COUNTYWIDE PLANNING DIVISION – ENVIRONMENTAL PLANNING UNIT**

**1. PATUXENT WATERSHED**

**A. Burdette Property**

The proposed development is unlikely to achieve its full potential via gravity sewer service, as proposed in the Public Hearing Draft Plan. Grinder pumps would likely be needed for the northern part of the development to reach the gravity sewer pump station that is currently on the Damascus Shopping Center property, but is planned to be relocated and may be expanded. Another pump station is not recommended in this watershed, although there is a possibility that the relocated pump station could be located on the Burdette property to serve more of that property.

The WSSC notes that while they see significant benefit in relocating the Damascus Center pump station east to the Burdette/Miller property to serve the shopping center and some areas of the Town Center, the developer's proposal to locate all development west of the proposed Woodfield Road extension is problematic. They believe that it will be difficult to implement gravity flow to a relocated pump station without extensions traversing the eastern portions of the properties in order to facilitate wastewater collection by gravity from the existing Damascus Center service area and any new development areas. While some modifications could be considered to lessen the impact to the stream valley, the location must be sited to capture as many properties by gravity as possible, which is why a location near the stream would be best. If the pump station is located near the stream, significant potential would be created for institutions or other facilities to propose developing additional property in these sensitive subwatersheds.

WSSC is also concerned that they cannot be exactly sure where new development will occur in the Town Center. Gravity sewer serves the existing Town Center, but assessing the amount and location of additional potential density that could need service from the current or relocated pump station service area is critical in determining its adequacy. At this time, they cannot assess whether there is a strategic advantage in relocating the pump station off the shopping center site, other than capturing additional flows from future development on the Burdette site.

**2. MAGRUDER BRANCH WATERSHED**

**A. Warfield Property**

At full density potential, the Housing/TDR proposal pushes the edge of service ability with grinder pumps, although there will be several sewer options since the property has several drainage areas. The higher density of the new proposal increases the likelihood that a new pump station could be required on the

Warfield property. The WSSC staff confirms that it is unlikely that they can accommodate the 95 units proposed on individual grinders.

Under WSSC's new Grinder Pump Policy (January 12, 2005) granting service via grinder systems is allowed only after other sewer methodologies have been determined to be infeasible. The policy requires an alternatives analysis to determine the best method for service for developments of more than 50 dwelling units. The preference in order would be for gravity service (from the highest elevations on the site to Magruder Branch), centralized pumping (from a collection point located at a low point on the property), or grinder systems if necessary. They also note that the developer may complain about the expense of using contour sewers due to the blasting and construction that may be required for rocky soil conditions.

#### **B. Stanley/Leishear Property Group**

The WSSC notes that the proposed development would require a pump station and force main to the existing main in Ridge Road (draining to Magruder Branch). While there are cost concerns with any proposal for a new pump station, as expressed in previous property discussions, pumping to Ridge Road is probably the most feasible option proposed, and extending sewer service in this area would be helpful with looming problems with failing septic systems in this area of Damascus.

This development is only possible with access to community sewer service. The proposed pump station for this site will serve not only this development but the Tune Avenue neighborhood, an area that has been identified by the Department of Environmental Protection and the WSSC as an area of failing septic systems that needs public relief. Creating one sewershed from all of these properties may be problematic due to the severe topography as the land falls away from Ridge Road. Also a stream nearly bisects the development area, making it difficult to serve all of the properties without multiple intrusions into the stream valley.

### **3. LITTLE BENNETT CREEK WATERSHED**

#### **A. Kingstead/Leishear Property Group**

Staff research indicates that the Housing/TDR proposal will require extending sewer to the northern area. It would have to extend 2,500 feet north within the watershed, including a stream crossing. This will include an approximately 1,000 feet of gravity sewer through the Little Bennett Creek stream valley. The 45-acre forested wetland associated with this area is the most unique and valuable resource identified in this watershed. It has long been designated as a natural feature to be protected within a conservation park. The only alternative to placing gravity sewer in the environmental buffer and wetlands is to build a small pump station to serve the northern area.

The WSSC staff notes that they would prefer adding approximately 9,000 feet of gravity sewer through the Little Bennett stream valley and modifying or replacing the Spring Garden WWPS to adding a new wastewater pumping station/force

main system for the properties proposed for development to the north (Kings Valley, Smart/Miner, Rice/Conway (that would be pumped into the Magruder Branch main). They believe that the capital costs would be higher for constructing a new facility than expanding or replacing the existing pump station; and that a new facility, rather than one larger facility, would require higher operating and maintenance costs and could impact future WSSC rates.

They acknowledge the complications and difficulty in constructing a gravity sewer extension through a sensitive environmental area, as well as county parkland, but from WSSC's perspective, the complications and hurdles can be overcome by cooperation and coordination with the county and the M-NCPPC, as well as implementation of innovative construction and restoration methods. The staff believes that this option would open other areas to potential development and undermine years of policy that has protected the Little Bennett Creek headwaters.

#### **B. Rice/Conway/Smart/Miner Property Group**

Increasing the development potential to the levels proposed will require community sewer service via a pump station or gravity sewer. The area could be served by adding a separate pump station higher in the watershed. The distribution of the proposed development may also require several different mains draining to the pump station along natural and created grades. The location of the sewer pump station to serve these properties at the headwater of Little Bennett Creek is an important consideration. The staff believes that the optimum location would be east of the stream valley, where it would have the least impact on the stream valley and forest stands.

As noted in the Kingstead/Leishear discussion above, the WSSC noted that they would prefer adding approximately 9,000 feet of gravity sewer through the Little Bennett stream valley and modifying or replacing the Spring Garden WWPS to adding a new wastewater pumping station/force main system for the properties proposed for development to the north (Kings Valley, Smart/Miner, Rice/Conway). They believe that the capital and long term maintenance costs would be higher for constructing a new facility than expanding or replacing the existing pump station. The staff strongly opposes this option due to the potential for damage to the Little Bennett stream valley.

#### **C. Kings Valley Property**

As noted previously, the WSSC staff would prefer adding approximately 9,000 feet of gravity sewer through the Little Bennett stream valley and modifying or replacing the Spring Garden WWPS to adding a new wastewater pumping station/force main system for the properties proposed for development to the north (Kings Valley, Smart/Miner, Rice/Conway). They believe that the capital costs would be higher for constructing and maintaining a new facility than expanding or replacing the existing pump station.

#### 4. BENNETT CREEK WATERSHED

##### A. Casey/Lewis Property Group

Housing/TDR Proposal – This option would require sewer service through the use of grinder pumps. If the alternative option is selected, the Master Plan will include language discussing the environmental concerns and indicating that full density potential may not be possible due to environmental constraints.

Developer Request - Mr. Casey requests an alternative with 100 dwelling units in the R-200 Zone. He proposes a new sewer pump station to be located in the stream tributary. The staff strongly opposes a pump station in this stream valley, which would entail significant environmental disruption in this headwater area.

The WSSC staff notes that there is an existing low-pressure system serving the developed properties along Lewis Drive, but this system is not sized to accommodate the Casey/Lewis 46 dwelling unit proposal at this location. The WSSC staff expressed the same comments when a property requested a service area/category change some years ago at this location [93A-DAM-02]. They state that while a separate grinder, low-pressure line in Lewis Drive is a conceptual possibility, there may be issues that will factor in the adequacy and realistic implementation potential of such a concept (including hydraulic considerations such as detention time/odor generation in the transition to the 12-inch gravity sewer, and site/construction considerations).

**ATTACHMENT G**  
**HOUSING/TDR ALTERNATIVE TRANSPORTATION ISSUES**  
**COUNTYWIDE PLANNING DIVISION – TRANSPORTATION PLANNING UNIT**

The Transportation Planning staff evaluated the effect of increasing the development potential in the Damascus Master Plan area per the changes currently described as the Housing/TDR Alternative. This alternative contemplates changes to development potential for roughly a dozen discrete properties and/or geographic areas, with an estimated potential increase of 374 dwelling units in the Master Plan area.

**SUMMARY OF FINDINGS**

- 1) On an individual property basis, none of the contemplated changes in development potential would affect the Master Plan transportation system. Each property is served by roadways with an appropriate functional classification for the ranges of dwelling units analyzed.
- 2) On an aggregate basis, the increase of 374 dwelling units would result in a change in congestion levels great enough to affect the overall balance between land use and transportation established in the Public Hearing Draft Plan. Staff concludes that an additional 200 dwelling units could be added to the development levels assumed in the Public Hearing Draft Plan without affecting the balance between land use and transportation.
- 3) The Planning Board should consider one or more of the following measures to address the balance between land use and transportation, listed below in descending order of staff preference:
  - a. Limit the amount of additional development to an aggregate of 200 dwelling units above the total of 7,100 dwelling units analyzed for the Public Hearing Draft Plan.
  - b. Revise the Master Plan recommendation to increase roadway network capacity, such as by increasing the recommended number of through travel lanes on the southernmost portion of Ridge Road (MD 27) from two lanes to four lanes.
  - c. Establish a staging plan, similar to the approved and adopted Olney Master Plan, that effectively caps development in the Damascus Master Plan area at 7,300 dwelling units for the first stage. A second stage would be allowed only if subsequent analysis at the end of the first stage demonstrates that additional transportation capacity remains needed and additional improvements can be identified and funded.



## DISCUSSION

The development of, and rationale for, the transportation recommendations in the Public Hearing Draft of the Damascus Master Plan were presented on pages 2 through 18 of the staff packet for Work Session No. 2 on January 13, 2005. This memorandum briefly describes the process and results of the sensitivity analysis for changes to assumed development potential for individual properties as described in Table 1.

**Table 1. Changes in Forecasted Dwelling Unit Potential**

Property Description	Housing/TDR Alternative Effect on Number of Future Dwelling Units
NW Properties on Ridge	4
SW Properties on Ridge	5
Burdette	68
Town Spring Neighborhood	5
Warfield	37
Kings Valley LTD	65
Smart/Miner and Rice/Conway	42
Casey/Lewis	41
Souder and Vicinity	9
Stanley/Leishear/Day	22
Northern Ridge Properties	5
Kingstead/Leishear	75
Kings Valley LTD	-4
TOTAL	374

The staff analysis considered three factors; roadway functional classification, average congestion index, and intersection congestion. In summary, the qualitative roadway classification is unaffected by the contemplated changes in the Housing/TDR Alternative. The Housing/TDR Alternative, however, does have a minor, yet measurable, effect on the quantitative analyses of transportation system performance. In general, the Housing/TDR Alternative increases the anticipated residential development yield in the Damascus Master Plan by approximately 5%, adding 374 dwelling units to an assumed yield of approximately 7,100 dwelling units in the Public Hearing Draft Plan.

The relationship between residential development yields and traffic congestion is indirect, due to the significant amount of congestion caused by through traffic, the influence of the relatively limited commercial traffic generators in the Plan area, and the locations of the contemplated development changes relative to the roadway network. In general, a 5% increase in housing results in a 1% to 2% increase in traffic congestion. Each of the three factors is discussed in additional detail in the following paragraphs.

### Roadway Functional Classification

The Damascus Master Plan contains a number of roadways classified either as rustic roads or country roads. The primary purpose of these two roadway classifications is to

preserve the rural characteristics of adjacent communities rather than to serve additional development. The Montgomery County Code indicates that neighborhoods of 200 or more dwelling units should be served by a primary residential road. Staff analysis of the Housing/TDR Alternative indicate that all of the analysis properties would remain consistent with Section 49 of the County Code using the roadway classifications recommended in the Public Hearing Draft Plan.

Therefore, adopting the Housing/TDR Alternative on any single individual property would be consistent with the transportation system recommendations described in the Public Hearing Draft Plan.

#### Average Congestion Index

For Master Plans conducted during the past several years, the primary determinant of transportation system adequacy is a tool called the Average Congestion Index (ACI). The ACI is a measure of average roadway congestion on roadway links within each of the county's 27 policy areas. The ACI is calculated as the average volume-to-capacity experienced by all peak hour traffic, weighted by vehicle-miles of travel.

The FY 2005 AGP eliminated the use of the ACI in the development review process. Planning Board and County Council staffs believe the tool remains useful in assessing Master Plan transportation adequacy. In spring 2005, the County Council endorsed the use of the ACI in determining a maximum ceiling for Stage One of the Olney Master Plan.

The Damascus Policy Area has an ACI standard of 0.57. Currently, the observed ACI is better than the standard, at 0.48. The forecast year 2025 ACI, given the land use and transportation recommendations of the Public Hearing Draft Plan, is 0.57; equal to the ACI standard. As long as the forecasted ACI is equal to or lower than the Policy Area standard, the Master Plan land use and transportation system can be found to be in balance. The 374 dwelling units would result in an ACI that would be rounded to 0.58, worse than the ACI standard. **Staff estimates that, absent any other changes to the Public Hearing Draft Plan, 200 additional dwelling units could be added to the forecast development potential without increasing the ACI to 0.58.** In other words, staff finds that the Public Hearing Draft Plan has the transportation system capacity to accommodate 7,300 total dwelling units.

Additional development, however, would increase the ACI to 0.58, resulting in the need to identify additional transportation capacity to retain the Public Hearing Draft Plan finding that the land use and transportation systems are in balance. Should the Planning Board choose to pursue this option in the Planning Board Draft Plan, staff proposes that one logical recommendation would be to change the recommended ultimate number of through travel lanes on Ridge Road (MD 27) from two to four near the southern Plan boundary, in the vicinity of Sweepstakes Road and the southern Oak Drive junction, where Ridge Road traffic volumes are highest.

In addition to limiting development potential and recommending additional transportation system capacity, a staging plan can be considered a third alternative to address the issue of land use and transportation balance. The 2005 Olney Master Plan incorporates a staging element that limits residential development to the total number of dwelling

units for which the plan can be said to remain in balance. Any additional development beyond that staging limit would require an assessment of current transportation conditions and, potentially, a Plan amendment to incorporate additional transportation capacity.

This staging concept, introduced during the County Council worksessions on the Olney Master Plan is not a preferred approach to master planning, as it defers identification of appropriate transportation improvements to accommodate the proposed zoning. However, staff concurs that the staging approach was appropriate in Olney given the range of opinions on the amount of zoning potential likely to be realized during the twenty-year Plan timeframe and the slight difference between the first stage capacity of 15,235 dwelling units and the Plan forecast potential of 15,487 dwelling units. Staff finds that the relationships between land use and transportation assumptions in Damascus are similar to those addressed in the Olney Master Plan.

### **Intersection Congestion**

The Public Hearing Draft Plan recommends the retention and augmentation of the two-lane arterial roadway system in Damascus. The Plan recommends that intersection congestion be addressed primarily by the addition of individual intersection improvements such as turn lanes on a case-by-case basis, rather than by a systematic widening of two-lane roadways to four lanes.

Table 2 presents a comparison of existing and forecasted year 2025 intersection congestion as measured by critical lane volumes (CLV) during the morning and evening weekday peak hour for 14 intersections staff studied as part of the Damascus Master Plan effort. Table 2 presents four columns of data describing four different scenarios:

- Column 1: *Existing* conditions reflect observed traffic counts and intersection geometry
- Column 2: *2025 Public Hearing Draft Plan* conditions reflect forecasted conditions including the 7,100 dwelling units assumed in the Damascus Master Plan area and the completion of the programmed roadway construction of Woodfield Road Extended and Valley Park Drive Extended, but no additional unprogrammed intersection improvements
- Column 3: *2025 Public Hearing Draft Plan (with turn lanes)* reflects the same demographic and master plan transportation scenario as shown in Column 2, but with additional turn lanes assumed at intersections where the V/C ratio exceeds 1.0 in Column 2
- Column 4: *Housing/TDR Proposal (with turn lanes)* reflects the addition of the 374 dwelling units contemplated in the current proposal.

The information in Columns 1 through 3 reflects materials previously presented (although in a somewhat different format) in the staff packet for Work Session No. 2. As described at that time, the addition of site-specific turn lanes (reflected in Column 3) addresses forecasted congestion levels at most locations identified as failing to meet

current Policy Area congestion standards. The additional 374 dwelling units reflected in Column 4 generally increase the V/C ratio at Plan area intersections by one or two percentage points, and a second intersection (Ridge Road at Bethesda Church Road) is forecasted to slightly exceed the congestion standard with a V/C ratio of 1.01.

In summary, the intersection analysis presents similar findings as the ACI analysis; a 5% increase in housing in the Damascus Plan area results in a 1% to 2% increase in forecast traffic congestion. The difference between the two levels of analysis is primarily procedural; the ACI test is used to establish the Master Plan balance between transportation and land use and the intersection analysis is presented primarily for informational purposes.

**Table 2. Effect on Intersection Performance**

Comparison of Existing and 2025 Forecast Intersection Volume-to-Capacity

	Existing	2025 Public Hearing Draft Plan	2025 Public Hearing Draft Plan (with turn lanes)	2025 Housing/TDR Proposal (with turn lanes)
Ridge (MD 27) at Main (MD 108)	0.63	0.46	0.46	0.48
Woodfield (MD 124) at Main (MD 108)	0.63	0.75	0.75	0.77
Main (MD 108) at Howard Chapel	0.34	0.58	0.58	0.59
Ridge (MD 27) at Woodfield Extended	0.00	0.90	0.78	0.78
Ridge (MD 27) at Kemptown (MD 80)	1.01	1.30	0.99	0.99
Ridge (MD 27) at Bethesda Church	0.90	1.08	0.99	1.01
Woodfield (MD 124) at Bethesda Church	0.77	1.17	0.74	0.74
Woodfield (MD 124) at Valley Park	0.57	1.04	0.84	0.86
Ridge (MD 27) at Sweepstakes	0.97	1.19	1.03	1.04
Woodfield (MD 124) at Sweepstakes	0.78	1.13	0.96	0.98
Woodfield (MD 124) at Hawkins Creamery	0.66	1.01	0.92	0.94
Damascus (MD 650) at Laytonsville (MD 108)	0.48	0.75	0.71	0.73
Ridge (MD 27) at Valley Park / Oak	0.73	0.96	0.96	0.97
Ridge (MD 27) at Oak (south)	0.84	1.03	0.92	0.94

# ATTACHMENT H: HOUSING/TDR PROPOSAL MAP

