Adelphi Road-UMGC-UMD Purple Line Station Area Sector Plan

Scenario Development Report

January, 2022

THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION
Prince George's County Planning Department

Introduction

The Adelphi Road-UMGC-UMD Purple Line Station Area Sector Plan (ARSP) is the comprehensive community plan for UMD West Campus Center (Local Center identified by Plan 2035), adjacent to the Adelphi Road-UMGC-UMD Purple Line Station. The sector plan builds on Plan 2035's goal to focus new development in centers. The Maryland-National Capital Park and Planning Commission (M-NCPPC) Prince George's County Planning Department conducted a scenario planning exercise that evaluated different approaches to development within the ARSP study area.

This memorandum documents the development and associated outcomes of a scenario evaluation exercise that was used to estimate the development potential and associated impacts of alternative approaches to growth within the study area. The purpose of the tool is to provide relevant and meaningful information so that staff, stakeholders and the public can make informed recommendations on the development patterns for the sector plan.

Scenario Planning

Scenario planning is a technique to provide relevant and meaningful information about potential buildout and the effects of different types of growth in different locations so the project team could make better-informed decisions about plan policies and strategies.

Growth scenarios must be realistic and achievable. Scenarios cannot include unachievable or unlikely buildout numbers, nor can they include the unrealistic or unlikely preservation of developable property. Unrealistic scenarios can undermine a plan when they do not come to fruition.

Scenario planning identifies different ways a place can grow; it does not identify how a place necessarily will grow. How a place ultimately grows or does not grow is dependent on a number of factors, most importantly, the policy and regulatory environment, infrastructure investment, and the market.

Study area

The study area is the ARSP boundary. The scenario planning tool, underlying data, scenario alternatives and scenario results conform to this area. The study area is shown in Figure 1.

Figure 1. Study Area

Scenario Planning Process Overview

The scenario planning began with an understanding of the relevant information necessary to evaluate various development scenarios. This informed the development of placetypes, the building blocks of scenarios, and subsequently the development of the land use model, which is the tool used to develop scenarios and produce the evaluation criteria.

Evaluation Criteria

The ASRP evaluation criteria were derived from research on national best practices and in consultation with M-NCPPC. They focus on aspects of development relevant to the planning process and to stakeholders. The development of ASRP evaluation criteria is described in a separate report "Scenario Evaluation Criteria Report."

The evaluation criteria are summarized in Table 1.

Table 1. Scenario Evaluation Criteria

Criteria	Metric	How to Measure
Density	Units per acre (net)	Total dwelling units divided by total land area (net) or residential land area (net)
Public open space	Total open space	Sum of land area (acres) designated as (public) open space, open space set asides (5 percent), Green Infrastructure Regulated Areas, and constrained land
Tree preservation	Amount of tree canopy preserved	Total area of tree canopy layer minus area of overlap with new impervious surface (new roads/sidewalks, building footprints, parking, and other hardscape).
Impervious surface	Amount of impervious surface	Total square feet of impervious surface
Green infrastructure	Amount of "Evaluation Area" preserved[1]	Total acreage of Evaluation Area
Housing choice	Percent housing by type	Number of units by housing type divided by total number of units.

Placetypes

Placetypes are the "building blocks" of scenarios. They provide important information to estimate the development potential of a place and associated outcomes of that development. For example, to estimate the potential number of dwelling units possible within a given place, the placetype could inform the percentage of land use that is residential as well as the density (dwelling units per acre) of that land.

One of the major objectives of the scenario planning process is to estimate the development potential of the ARSP Study area under various applications of the new zoning code. Placetypes generally replicate land use, building, and other standards prescribed in the Prince George's County New Zoning Ordinance, including allowable land uses and housing types, density, building height, minimum lot coverage and parking.

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[1] According to the 2017 *Approved Resource Conservation Plan: A Countywide Functional Master Plan*, page 30:

"The Evaluation Areas [of the Countywide Green Infrastructure Network] will be considered during the [development] review process as areas of high priority for on-site woodland and wildlife habitat conservation and restoration of lost connectivity. These areas should be considered before the use of off-site conservation options. **Properties that contain evaluation areas will develop in keeping with the underlying zoning and in conformance with the other regulations of applicable ordinances; however, consideration must be given to the resources that exist and their priority for preservation, restoration, and permanent conservation**." [emphasis added]

The use of Evaluation Areas in this exercise is not intended to suggest, in any way, that such areas are "protected" by the Prince George's County Code or can be preserved through a master or sector plan. This is not the intent of the Evaluation Areas.

The Prince George's County Planning Department considers valid development approvals as a baseline planning consideration; approved development is considered an "entitlement" that a master or sector plan cannot undo. Accordingly, the 300 multifamily dwelling units at "Mosaic at Turtle Creek", approved pursuant to Detailed Site Plan DSP-08001 and Type Two Tree Conservation Plan TCP2-054-08, on the University of Maryland (UMD)-owned property at 7500 Mowatt Lane was identified as the baseline condition for the parcel for the scenario planning exercise. In addition, the Western Gateway development, planned on two parcels (the UMD owned parcel mentioned above and a privately owned property at 3623 Campus Drive), which was expected to include 300 apartment and 81 townhome units, was also considered by the project team in their assessment of the future growth concepts of the sector plan area during the scenario planning exercise (since the project was similar to the "Mosaic at Turtle Creek" previously approved for the 7500 Mowatt Lane property, was anticipated to receive Planning Board approval before sector plan approval, and, most importantly, was typical of projects expected within the ARSP area).[2] Two placetypes--"University Multifamily (Mosaic at Turtle Creek / Western Gateway Multifamily)" and "Western Gateway Townhome"--were developed to replicate the development characteristics on the scenario models (Placetype characteristics are summarized in Table 2. Detailed placetype definitions are provided in the Appendix).

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[2] Subsequent to the completion of this scenario planning exercise and the public release of the Preliminary Sector Plan on October 28, 2021, DSP-08001 expired. As of October 28, 2021, the anticipated "Western Gateway" project had not been submitted to the Planning Department as a development application.

Table 2. Table 1. ARSP Placetype Summary

	Passive Open Space*	Low-Rise Multifamily A	Low-Rise Multifamily and Townhome	Low- to Mid-Rise Multifamily	Low Rise Multi-Family B	Townhome	University Multifamily (Mosaic at Turtle Creek / Western Gateway Multifamily)	Western Gateway Townhome
Corresponding Zoning Category	NA	NAC	NAC	LTO-Core	LTO-Edge	RSF-A	NA	NA
Housing Mix	None	100% Apartment/ Condo	60% Apartment/ 40% Townhome	100% Apartment/ Condo	100% Apartment/ Condo	100% Townhome	100% Apartment/ Condo	100% Townhome
Net Density (units per acre)	NA	30	30/16	80	40	16	84	36
Building Height (stories)	NA	2-3	2-3	3-8	3	2	3-4	3-4
Lot Coverage	0%	40%	40%	70%	45%	45%	70%	80%
Parking Ratio (spaces per unit)	None	1.2	1.2/1.5	0.6	1.2	1.5	1.0	0.5

* Note: Passive Open Space includes entire parcels set aside for preservation and is separate from open space set asides for parcels to be developed.

Scenario Development

The ARSP scenarios were created by assigning placetypes to parcels within the study area. This section described the land use model that was used to develop and evaluate the scenarios, major assumptions, and the final scenarios developed for the study.

CommunityViz Land Use Model

A land use model is used to assign placetypes to parcels in the study area, estimate their development potential, and calculate the evaluation measures. CommunityViz Scenario 360 is the software tool used to develop the model. CommunityViz is a GIS-based scenario planning tool used across the country to develop and analyze transportation and land use scenarios.

Model Attributes

The CommunityViz land use model developed for the ARSP scenario evaluation uses the net developable area of each parcel, assigns placetype attributes, and estimates each of the model components necessary to calculate the evaluation measures. Major attributes of the land use model are identified in Table 3. A full data dictionary is provided in Appendix 9.

Table 3. Land Use Model Attributes

Model Attribute	How Estimated
Net Developable Area	Gross parcel area minus wetland area, approved Conservation Easements, and 2017 Countywide Green Infrastructure - Regulated Areas
New Land Use Mix	Mix of land uses (as percentages) for a placetype
Net New Dwelling Units by Type	Land area multiplied by per-acre density of new dwelling units (total dwelling units minus existing dwelling units)
New Floor Area by Type	Land area multiplied by floor area ratio (FAR)
New Parking Spaces by Type	Number of parking spaces generated by multiplying dwelling units and floor area by parking ratios
Building and Parking Footprints	Building and parking area divided by height (number of stories)
Net New Impervious Surface	Total lot coverage (building, parking and right-of-way) minus existing impervious surface area
Total Impervious Surface	New impervious surface plus existing impervious surface
Tree Canopy Loss	Total tree canopy area multiplied by percent total lot coverage (building, parking and right-of-way)

Evaluation Measures

The CommunityViz land use model uses the attribute data described in the previous section to calculate the evaluation measures described in Table 1. These evaluation measures are calculated for each scenario. The calculation methodology is described in Table 4.

Table 4. Evaluation Criteria Calculation Methodology

Evaluation Measure	How Calculated
Density	Sum of total dwelling units for each parcel divided by sum of the total area (gross) and residential area (net) for each parcel
Public open space	Sum of open space area for each parcel
Tree preservation	Sum of tree canopy area minus sum of tree canopy loss area
Impervious surface	Sum of building, parking and right-of-way areas minus sum of existing impervious surface area
Housing choice	Sum of dwelling units by type divided by sum of total dwelling units

Scenario Development and Evaluation

The final step in the scenario planning process is to use the placetypes, land use model, and evaluation criteria to develop and evaluate three distinct development scenarios for the ARSP study area. The results of this process are described in the following sections.

Proposed Scenario Alternatives

The ARSP project team worked through several iterations of proposed scenarios by assigning different variations of placetypes to parcels within the study area.

Each scenario is governed by the following major assumptions:

1. The recently completed multifamily developments (The Domain at Campus Drive and Mowatt Lane and South Campus Commons 7 at Mowatt Lane and Preinkert Drive) were assumed to stay unchanged for all scenarios.
2. All parcels in the study area are assumed to redevelop except the ones mentioned above and the parcels identified for passive open spaces.
3. Previously approved development, along with the associated number dwelling units, access road, and tree conservation plans (for the Mosaic at Turtle Creek - Detailed Site Plan approved in 2009) was identified as the baseline condition and remained constant under all scenarios.
4. A project in the final phases of planning and design, the Western Gateway Project, anticipated to get approved before this Sector Plan is approved, was also assessed as a future development option in the scenario analysis.
5. A minimum of 5 percent designated open space and 15 percent tree canopy preservation was included as a baseline assumption.
6. All Scenarios conformed to the 2018 Prince George's County Zoning Ordinance and other County, state and federal regulations.
7. The new access points and pedestrian and vehicular connections were uniform for all three scenarios
8. The building footprint area, form, height and placement of buildings and associated calculations were based upon the 2018 Prince George's County Zoning Ordinance.
9. Scenarios embodied Prince George County's transit-oriented development zoning tools.
10. Scenarios used multifamily and townhouse housing models appropriate to a Purple Line station area.
11. Scenarios were consistent with the preliminary market analysis.
12. Scenarios assumed the existing total number of dwelling units as the baseline threshold density for all the parcels identified for redevelopment.
13. All scenarios conformed to the following Sector Plan recommendations:
    a. Maximize preservation of existing trees.
    b. Encourage onsite/shared stormwater management systems.
    c. Create new passive/active open spaces, including a Neighborhood Amenity Square at the new Metro station.
    d. Concentrate the tallest buildings along Campus Drive/Mowatt Lane.

e. Expand bicycle/pedestrian/stormwater management/street trees along new and existing streets.
f. Provide buffers for the existing single-family detached residential homes along the southern edge from future development.
g. Reduce required and recommended parking to encourage walking/biking/transit use.
h. Implement a phasing plan: core to edges.
i. Understand Graduate Hills and St. Marks Church may not redevelop for 20+ years.

Ultimately, the team decided on three distinct scenarios:

Scenario 1: Baseline – Market Driven

This scenario assumes use of the Local Transit Oriented (LTO) Zones and their regulations. The greatest density, envisioned in the LTO-Core Zone, occurs immediately adjacent to the planned Adelphi Road-UMGC-UMD Purple Line station at the Graduate Hills property and the University of Maryland parking lot and University Baptist Church properties southeast of the intersection of Campus Drive and Adelphi Road. The remaining parcels along Campus Drive and Mowatt Lane assume the less dense LTO-Edge zoning designation. The St. Mark's Catholic Church and school property farther south on Adelphi Road, and the Catholic Student Center and Hope Lutheran Church and Student Center parcels at the southeast edge of the study area on Mowatt Lane assume the RSF-A zoning designation, which presumes townhome development.

Figure 2. Scenario 1: Baseline – Market Driven

Source: CommunityViz land use model developed for the Sector Plan

Source: ARSP Virtual Community Scenario Planning Workshop Presentation; Credits: Stantec

Scenario 2: Expanded Housing

Scenario 2: Expanded Housing is similar to the Baseline Scenario but expands the denser LTO-Core zoning designation to the remaining parcels further east along Campus Drive to The Domain, currently occupied by the University United Methodist Church. Additionally, the Catholic Student Center and Hope Lutheran Church and Student Center parcels assume the LTO-Edge designation.

Figure 3. Scenario 2: Expanded Housing

Source: CommunityViz land use model developed for the Sector Plan

Source: ARSP Virtual Community Scenario Planning Workshop Presentation; Credits: Stantec
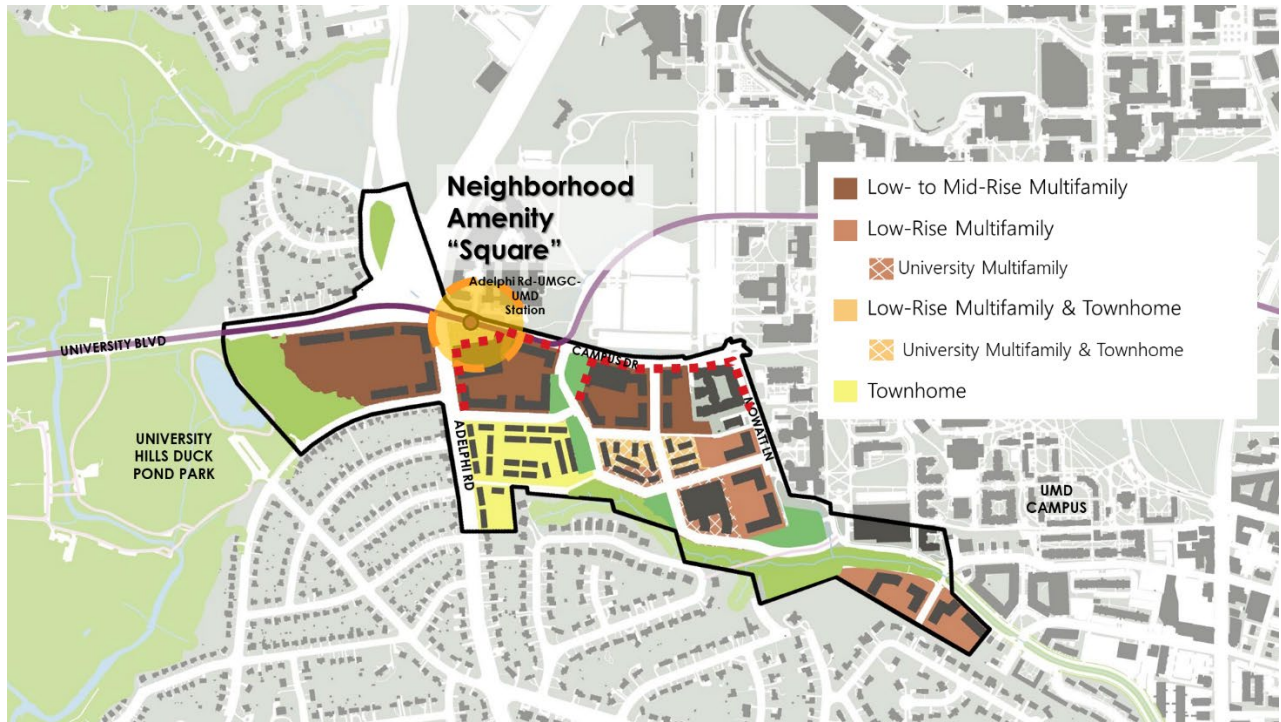
Scenario 3: Constrained Housing

Scenario 3: Constrained Housing assumes the study area will develop under the Neighborhood Activity Center (NAC) zoning designation recommended by the Countywide Map Amendment (CMA). Under this scenario, all eligible parcels will develop at the maximum allowable density (apartments), with the exception of the St. Mark's Catholic Church and school property, which will develop as a mix of apartments and townhomes. In order to achieve retain the baseline density on the Graduate Hills parcel, redevelopment of the whole parcel was required, hence preservation of the tree canopies on this parcel was not considered for this scenario.

Figure 4. Scenario 3: Constrained Housing

Source: CommunityViz land use model developed for the Sector Plan

Source: ARSP Virtual Community Scenario Planning Workshop Presentation; Credits: Stantec

Scenario Evaluation Measure Results

The CommunityViz land use model estimated the development potential and calculated the evaluation measures for the three scenarios. The results are shown in Table 5.

The Expanded Housing Scenario results in the greatest amount of potential dwelling units in the study area (2,130 units), about 350 more than the Baseline Scenario and more than 800 more than the Constrained Housing Scenario. The tradeoff is that the Constrained Housing Scenario results in less net impervious surface increase (just over 14 acres) compared to the Baseline (17.1 acres) and Expanded Housing (19.2 acres) scenarios. The Constrained Housing Scenario has less designated open space (15.3 acres) compared to the Baseline and Expanded Housing Scenarios (20.6 acres each) because it does not assume preservation of the tree canopy area on the Graduate Hills parcel, which counts toward the open space calculation.

Table 5. Scenario Evaluation Measure Results

	Scenario 1: Baseline – Market Driven Scenario	Scenario 2: Expanded Housing	Scenario 3: Constrained Housing Scenario
Average Density (units per acre)			
Net[3]	41.7	50.2	27.3
Gross[4]	28.0	32.6	22.0
Preservation			
Designated Open Space (acres preserved)	20.6	20.6	15.3
Tree Canopy Preserved (acres)[5]	14.5	13.8	15.5
Percent of Existing Tree Canopy Preserved[6]	42%	40%	45%
Impervious Surface			
New Impervious Surface (acres)	38.9	41.0	35.8
Net Impervious Surface (acres)[7]	17.1	19.2	14.1
Average Lot Coverage (percent)	55%	58%	51%
Housing Choice: New Housing Units			
Apartment/Condo	1,467	1,920	1,178
	83%	90%	90%
Townhome	311	211	131
	17%	10%	10%
Total New Units	**1,778**	**2,132**	**1,310**

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[3] Net Residential Density = Total dwelling units divided by total land area (net) or residential land area (net)

[4] Gross Residential Density = Total dwelling units divided by total land area in the study area (includes existing + new units)

[5] Tree Canopy Preserved = Acreage of existing tree canopy preserved after potential impacts from new development.

[6] Tree Canopy Preserved Percent = Percent of existing tree canopy preserved after potential impacts from new development.

[7] Net Impervious Surface = New impervious surface minus existing impervious surface

Note: The previous "Scenario Evaluation Measure Results" (presented by the project team at the "Virtual Scenario Planning Workshop" on June 3, 2021) contained several errors due to double counting of parcels. This table shows the corrected data for the models.

Summary

The ARSP seeks to establish a framework and recommendations for quality, sustainable transit-oriented development (TOD) through the Sector Plan goals. The scenario planning tool and process described in this memo provide three potential outcomes that can be achieved for the ARSP study area using available policy and regulatory tools. M-NCPPC staff used the information derived from this process to make informed recommendations in the preliminary Sector Plan, released October 28, 2021.

Appendix

Scenario 1: Baseline – Market Driven (3D Models)
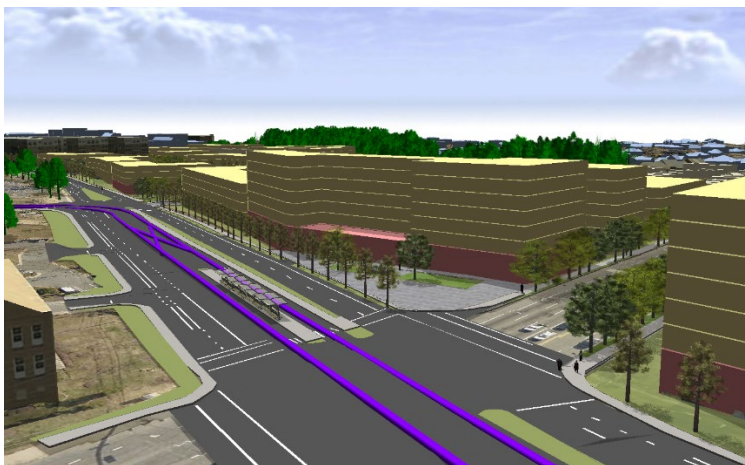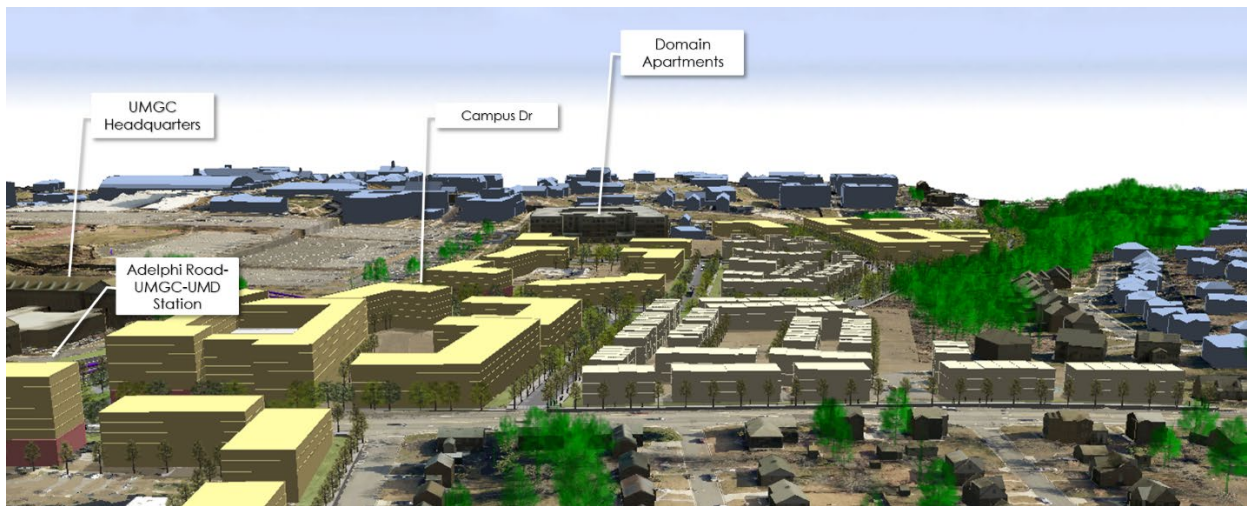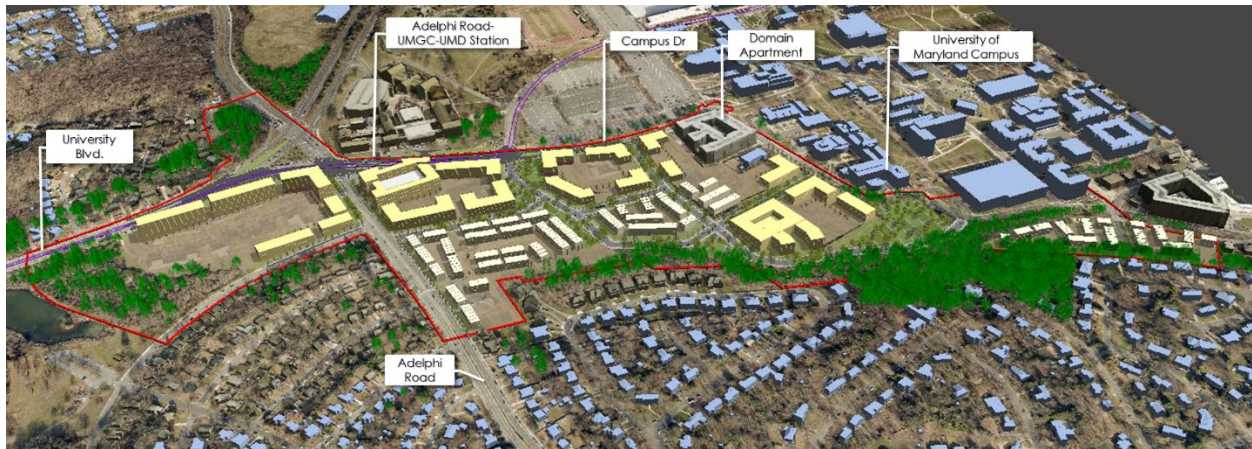
Scenario #1: 3D models. (Top) Sector Plan overview; (middle) view of the sector plan area looking east from the west side of the Adelphi Road; (left) view of the plaza looking south east from the northeast corner of the Adelphi Road, University Boulevard and Campus Drive intersection.

Source: ARSP Virtual Community Scenario Planning Workshop Presentation. Credits: M-NCPPC; Kimley-Horn; TG+P; Stantec.

Scenario 2: Expanded Housing (3D Models)
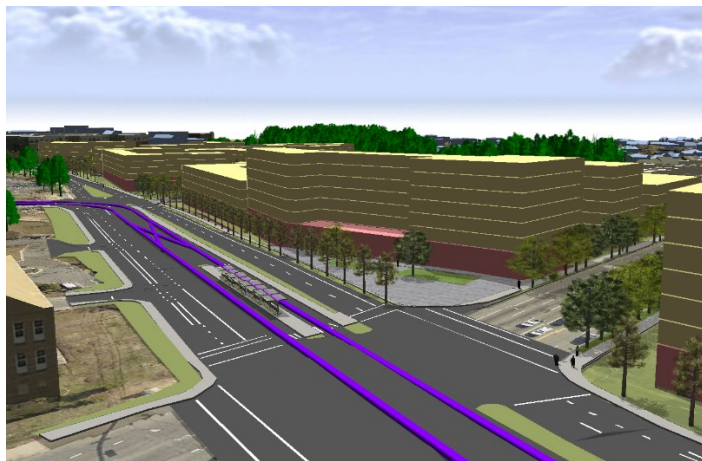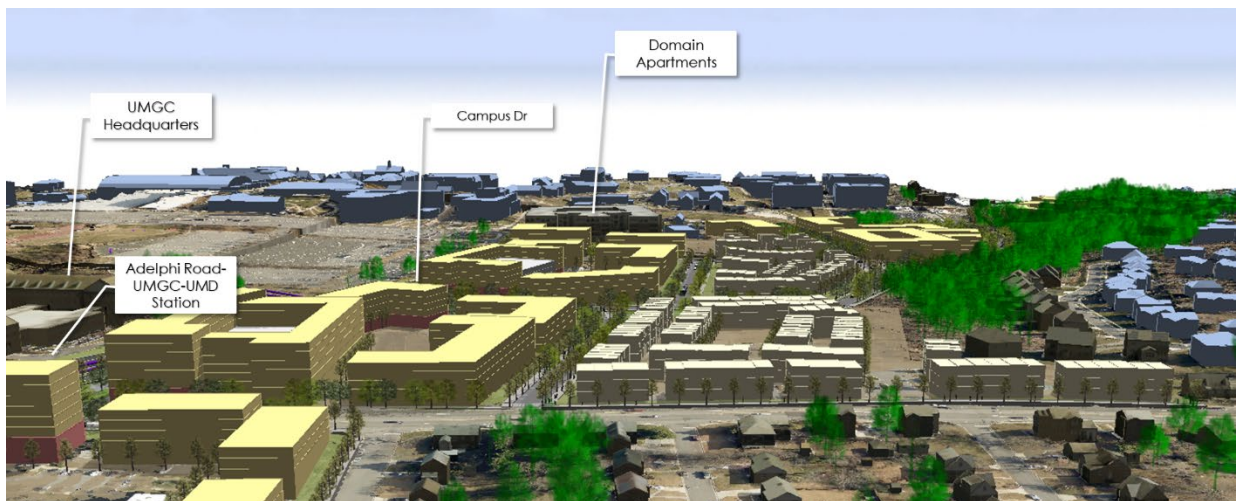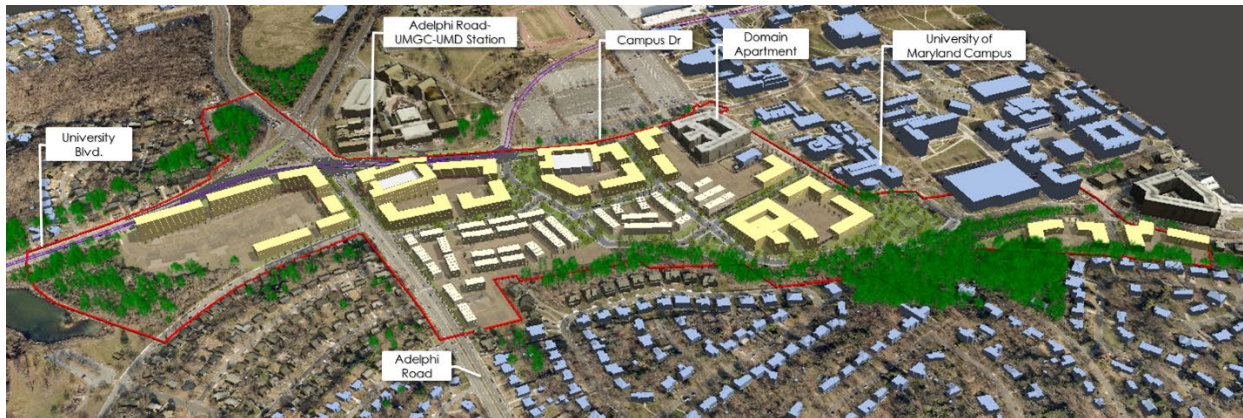
Scenario #2: 3D models. (Top) Sector Plan overview; (middle) view of the sector plan area looking east from the west side of the Adelphi Road; (left) view of the plaza looking south east from the northeast corner of the Adelphi Road, University Boulevard and Campus Drive intersection.

Source: ARSP Virtual Community Scenario Planning Workshop Presentation. Credits: M-NCPPC; Kimley-Horn; TG+P; Stantec.

Scenario 3: Constrained Housing (3D Models)
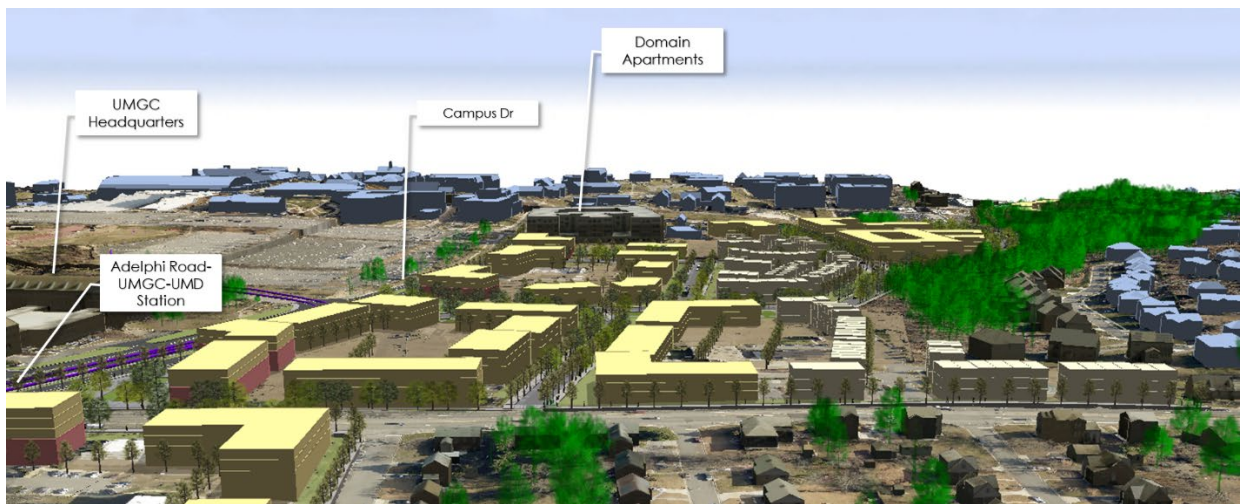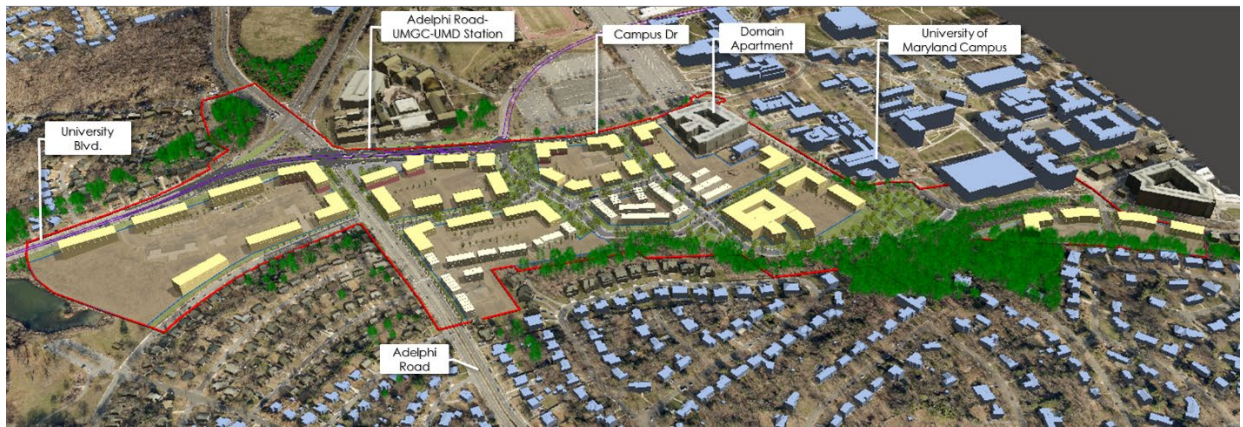
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Source: ARSP Virtual Community Scenario Planning Workshop Presentation. Credits: M-NCPPC; Kimley-Horn; TG+P; Stantec.
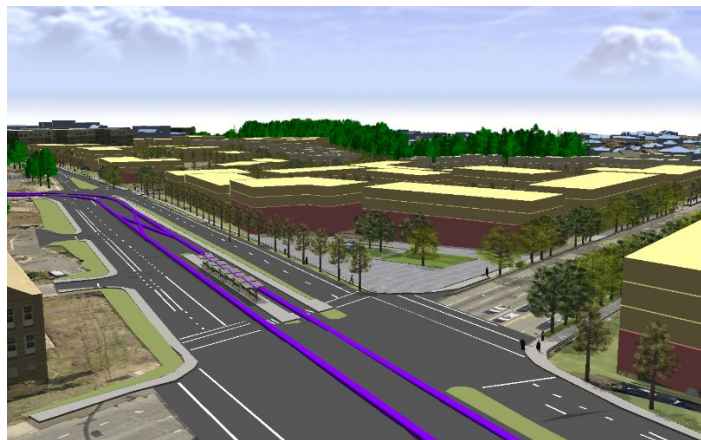
Appendix 1. Detailed Evaluation Criteria Summary

Criteria	Metric	How to Measure	Reference Data
Land Use and Activity			
Density	Units per acre (net)	Total dwelling units divided by total land area (net) or residential land area (net)	Proposed dwelling units Proposed residential land area (net)
Transportation and Mobility + Community Heritage, Culture and Design			
Scale and walkability	Average block size	Total land area divided by number of blocks (streets or pedestrian pathways).	Proposed street/pedestrian networks
Natural Environment			
Open space	Total open space	Sum of Total land area (acres) designated as (public) open space, open space set asides (5 percent), Green Infrastructure Regulated Areas and constrained land	Parcels/polygons designated as public space Green Infrastructure Regulated Areas Constrained land (wetlands)
Tree preservation	Amount of tree canopy preserved	Total area of tree canopy layer minus area of overlap with new impervious surface (new roads/sidewalks, building footprints, parking, other hardscape).	Impervious surface Proposed street/pedestrian networks
Impervious surface	Amount of impervious surface	Total square feet of impervious surface	Lot coverage based on zoning requirements for different uses (mixed use, multifamily, or townhouse) Anticipated parking footprint (or total parking area and average number of stories)
Green infrastructure	Amount of Evaluation Area preserved	Total acreage of Evaluation Area	Proposed acreage of Green Infrastructure Evaluation Area (existing and after scenario buildout)
Housing and Neighborhoods			
Housing choice	Percent housing by type	Number of units by housing type divided by total number of units.	Proposed housing units by type (such as single-family, townhome, high rise, lot size), pursuant to Zone requirements
Public Facilities			
No measures were selected for this theme because access to public facilities and/or presence of public facilities will not vary between scenarios. Access to and presence of public facilities will be addressed as part of the existing conditions analysis.			
Healthy Communities			
No measures were selected for this theme because attributes of healthy communities (access to healthy food, walk and bikesheds) will not vary between scenarios. Access to and presence of healthy communities attributes will be addressed as part of the existing conditions analysis.			

Appendix 2. Placetype Market Segment Mix

Placetype	Market Segment Mix (Land Use)[1]											Total
	Apartment/ Condo	Townhome	Senior Apartment	Senior Townhome	Student Apartment	Total Residential	Neighborhood Goods and Services	Food and Beverage	Total Retail	Open Space	Right of Way	
University Multifamily (Mosaic at Turtle Creek / Western Gateway Multifamily)	90%	0%	0%	0%	0%	90%	0.0%	0.0%	0%	5%	5%	100%
Western Gateway Townhome	0%	90%	0%	0%	0%	90%	0.0%	0.0%	0%	5%	5%	100%
Low-Rise Multifamily A Student Rental Focus	0%	0%	0%	0%	88%	88%	1.0%	1.0%	2%	5%	5%	100%
Low-Rise Multifamily and Townhome	55%	32%	0%	0%	0%	87%	1.0%	2.0%	3%	5%	5%	100%
Low-Rise Multifamily A	88%	0%	0%	0%	0%	88%	1.0%	1.0%	2%	5%	5%	100%
Passive Open Space	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	100%	0%	100%
Low- to Mid-Rise Multifamily	88%	0%	0%	0%	0%	88%	1.0%	1.0%	2%	5%	5%	100%
Low- to Mid-Rise Multifamily B	88%	0%	0%	0%	0%	88%	1.0%	1.0%	2%	5%	5%	100%
Townhome	0%	90%	0%	0%	0%	90%	0.0%	0.0%	0%	5%	5%	100%
Low- to Mid-Rise Multifamily Student Focus	0%	0%	0%	0%	88%	88%	1.0%	1.0%	2%	5%	5%	100%
Low- to Mid-Rise Multifamily B Student Focus	0%	0%	0%	0%	88%	88%	1.0%	1.0%	2%	5%	5%	100%

[1] Determined by allowable land uses within corresponding zoning district and in consultation with MNCPPC staff.

Placetype	Net Density (Units per Acre)[1]					FAR[2]	
	Apartment/ Condo	Townhome	Senior Apartment	Senior Townhome	Student Apartment	Neighborhood Goods and Services	Food and Beverage
University Multifamily (Mosaic at Turtle Creek / Western Gateway Multifamily)	37.0	0.0	0.0	0.0	0.0	0.00	0.00
Western Gateway Townhome	0.0	21.0	0.0	0.0	0.0	0.00	0.00
Low-Rise Multifamily A Student Rental Focus	0.0	0.0	0.0	0.0	30.0	1.00	1.00
Low-Rise Multifamily and Townhome	30.0	16.0	0.0	0.0	0.0	1.00	1.00
Low-Rise Multifamily A	30.0	0.0	0.0	0.0	0.0	1.00	1.00
Passive Open Space	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Low- to Mid-Rise Multifamily	80.0	0.0	0.0	0.0	0.0	3.00	3.00
Low- to Mid-Rise Multifamily B	40.0	0.0	0.0	0.0	0.0	2.00	2.00
Townhome	0.0	16.0	0.0	0.0	0.0	0.00	0.00
Low- to Mid-Rise Multifamily Student Focus	0.0	0.0	0.0	0.0	80.0	3.00	3.00
Low- to Mid-Rise Multifamily B Student Focus	0.0	0.0	0.0	0.0	40.0	2.00	2.00

[1] Minimum density is 10 and maximum density is 30 net du/ac in the NAC Zone.
Minimum density is 20 and maximum density is 80 net du/ac in the LTO-Core Zone
Minimum density is 10 and maximum density is 40 net du/ac in the LTO-Edge Zone (for Nonresidential & Mixed-Use) (Applies to the residential component of mixed-use development only)
Minimum density is 10 and maximum density is 40 net du/ac in the LTO-Edge Zone (for Residential uses)
Minimum density is 8.70 and maximum density is 32.66 net du/ac in the RSF-A Zone

[2] Minimum FAR is 0.25 and maximum FAR is 2.0 in the NAC Zone. (gross or net?)
Minimum FAR is 0.5 and maximum FAR is 3.0 in the LTO-Core Zone
Minimum FAR is 0.25 and maximum FAR is 2.0 in the LTO-Edge Zone (for Nonresidential & Mixed-Use)
There is no FAR requirement in the LTO-Edge Zone (for Residential uses)
Minimum FAR is 0 in the RSF-A Zone

Placetype	Average Unit Size (SF)					Employees per 1KSF	
	Apartment/ Condo	Townhome	Senior Apartment	Senior Townhome	Student Apartment	Neighborhood Goods and Services	Food and Beverage
University Multifamily (Mosaic at Turtle Creek / Western Gateway Multifamily)	900	0.0	0.0	0.0	0.0	0.00	0.00
Western Gateway Townhome	0.0	1,675	0.0	0.0	0.0	0.00	0.00
Low-Rise Multifamily A Student Rental Focus	0.0	0.0	0.0	0.0	1,000	2.0	2.0
Low-Rise Multifamily and Townhome	940	1,675	0.0	0.0	0.0	2.0	2.0
Low-Rise Multifamily A	940	0.0	0.0	0.0	0.0	2.0	2.0
Passive Open Space	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Low- to Mid-Rise Multifamily	940	0.0	0.0	0.0	0.0	2.0	2.0
Low- to Mid-Rise Multifamily B	940	0.0	0.0	0.0	0.0	2.0	2.0
Townhome	0.0	1,675	0.0	0.0	0.0	0.00	0.00
Low- to Mid-Rise Multifamily Student Focus	0.0	0.0	0.0	0.0	1,000	2.0	2.0
Low- to Mid-Rise Multifamily B Student Focus	0.0	0.0	0.0	0.0	1,000	2.0	2.0

Placetype	Spaces per Unit					Spaces per 1KSF		Avg. Size (SF)
	Apartment/ Condo	Townhome	Senior Apartment	Senior Townhome	Student Apartment	Neighborhood Goods & Services	Food & Beverage	
University Multifamily (Mosaic at Turtle Creek / Western Gateway Multifamily)	1.04	0.0	0.0	0.0	0.0	0.00	0.00	225.0
Western Gateway Townhome	0.0	2.40	0.0	0.0	0.0	0.00	0.00	225.0
Low-Rise Multifamily A Student Rental Focus	0.0	0.0	0.0	0.0	1.20	2.5	2.5	225.0
Low-Rise Multifamily and Townhome	1.20	1.50	0.0	0.0	0.0	2.5	2.5	225.0
Low-Rise Multifamily A	1.20	0.0	0.0	0.0	0.0	2.5	2.5	225.0
Passive Open Space	0.0	0.0	0.0	0.0	0.0	0.00	0.00	225.0
Low- to Mid-Rise Multifamily	0.60	0.0	0.0	0.0	0.0	1.3	1.3	225.0
Low- to Mid-Rise Multifamily B	1.20	0.0	0.0	0.0	0.0	1.0	1.0	225.0
Townhome	0.0	1.50	0.0	0.0	0.0	0.00	0.00	225.0
Low- to Mid-Rise Multifamily Student Focus	0.0	0.0	0.0	0.0	0.50	1.0	1.0	225.0
Low- to Mid-Rise Multifamily B Student Focus	0.0	0.0	0.0	0.0	1.20	1.0	1.0	225.0

Per PG County Zoning Code Sec. 27-6300

NAC, LTO-Edge and RSF-A Zones:

Multifamily: 1 space per DU for Studio and 1 BR; 1.35 spaces per DU all others = 1.2 spaces per unit @ 45%/55% mix

Townhome: 1.5 spaces per unit

      1.0 spaces per unit (LTO-Edge Zone)

Senior housing: 0.5 spaces per unit (continuing care retirement community)

      1.0 spaces per 5 residents (LTO-Edge Zone)

NAC Zone

Retail: 2.5 spaces per 1,000 SF GFA

LTO-Edge Zone:

Retail: 1.0 space per 1,000 SF GFA

LTE-Core Zone:

No minimums

Appendix 6. Placetype Average Building Heights

Placetype	Building Height[1]							Parking Height	Free-standing?[2]
	Apartment/ Condo	Townhome	Senior Apartment	Senior Townhome	Student Apartment	Retail	Free-standing?[2]		
University Multifamily (Mosaic at Turtle Creek / Western Gateway Multifamily)	3.5	2.0	2.0	1.2	3.0	0.0	0.0	2.0	Y
Western Gateway Townhome	0.0	3.5	0.0	0.0	0.0	0.0	0.0	1.0	Y
Low-Rise Multifamily A Student Rental Focus	0.0	0.0	0.0	0.0	3.0	1.0	N	1.0	Y
Low-Rise Multifamily and Townhome	3.0	2.0	2.0	1.2	3.0	1.0	N	1.0	Y
NAC Senior Housing	0.0	0.0	2.0	1.2	0.0	0.0	0.0	1.0	Y
Low-Rise Multifamily A	3.0	0.0	0.0	0.0	0.0	1.0	N	1.0	Y
Passive Open Space	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	Y
Low- to Mid-Rise Multifamily	4.0	0.0	0.0	0.0	0.0	1.0	N	1.0	Y
Low- to Mid-Rise Multifamily B	4.0	0.0	0.0	0.0	0.0	1.0	N	1.0	Y
Townhome	0.0	2.0	0.0	0.0	0.0	0.0	0.0	1.0	Y
Low- to Mid-Rise Multifamily Student Focus	0.0	0.0	0.0	0.0	3.0	1.0	N	1.5	Y
Low- to Mid-Rise Multifamily B Student Focus	0.0	0.0	0.0	0.0	3.0	1.0	N	1.5	Y

[1] Maximum building height is 50 feet in the NAC Zone. A five-story building is used as an equivalent for a 50 foot-tall building for the purposes of this exercise.

Maximum building height 80 feet (8-story equivalent) in the LTO-Core Zone (for all uses)

Maximum building height is 70 feet (7-story equivalent) in the LTO-Edge Zone (for all uses)

Maximum building height is 50 feet in the RSF-A Zone

Building heights are limited to 4 stories for parcels within 200 feet of a single family residential structure and 3 stories wihtin 150 feet of a single family residential structure

[2] Y indicates that it will contribute to the building footprint in the Yield calculation.

Placetype[3]	Site Size (acres)	Units per Site						Square Feet per Site			Parking Spaces per Site			
		Apartment/ Condo	Townhome	Senior Apartment	Senior Townhome	Student Apartment	Total Units	Neighborhood Goods & Services	Food & Beverage	Total Square Feet	Apartment/ Condo	Townhome	Retail	Total
University Multifamily (Mosaic at Turtle Creek / Western Gateway Multifamily)	1.0	34	0	0	0	0	NA	0	0	0	40.0	0.0	0.0	NA
Western Gateway Townhome	1.0	0	19	0	0	0	NA	0	0	0	0.0	50.0	0.0	NA
Low-Rise Multifamily A Student Rental Focus	1.0	0	0	0	0	27	NA	0	0	0	30.0	0.0	0.0	NA
Low-Rise Multifamily and Townhome	1.0	17	6	0	0	0	NA	0	1,000	1,000	20.0	10.0	0.0	NA
Low-Rise Multifamily A	1.0	27	0	0	0	0	NA	0	0	0	30.0	0.0	0.0	NA
Passive Open Space	1.0	0	0	0	0	0	NA	0	0	0	0.0	0.0	0.0	NA
Low- to Mid-Rise Multifamily	1.0	71	0	0	0	0	NA	1,000	1,000	2,000	40.0	0.0	0.0	NA
Low- to Mid-Rise Multifamily B	1.0	36	0	0	0	0	NA	1,000	1,000	2,000	40.0	0.0	0.0	NA
Townhome	1.0	0	15	0	0	0	NA	0	0	0	0.0	20.0	0.0	NA
Low- to Mid-Rise Multifamily Student Focus	1.0	0	0	0	0	71	NA	1,000	1,000	2,000	40.0	0.0	0.0	NA
Low- to Mid-Rise Multifamily B Student Focus	1.0	0	0	0	0	36	NA	1,000	1,000	2,000	40.0	0.0	0.0	NA

[1] A value of zero indicates that parking is included with the main structure.

[2] Minimum lot coverage is 40% for NAC Zone.

Minimum lot coverage is 65% for LTO-Core Zone.

Minimum lot coverage is 50% for LTO-Edge Zone (for Nonresidential and Mixed-Use)

There is no minimum lot coverage for LTO-Edge Zone (for Residential use)

Maximum lot coverage is 40% for RSF-A Zone

[3] The yields for the Western Gateway project placetypes are based upon the initial concept yields on the Western Gateway project website (300 apartment and 81 townhome units).

Appendix 8. Placetype Yield per Acre: Lot Coverage

Placetype[3]	Site Size (acres)	Parking Spaces per Site			Lot Coverage (SF per Site)									Total Lot Coverage/Impervious Surface[2]	
		Apartment/ Condo	Townhome	Retail	Building Footprint		Parking Footprint[1]	Yard/ Landscaping		ROW		Dedicated Open Space				
University Multifamily (Mosaic at Turtle Creek / Western Gateway Multifamily)	1.0	40.0	0.0	0.0	0%	0	0%	39,204	90%	2,178	5%	2,178	5%	1,634	4%
Western Gateway Townhome	1.0	0.0	50.0	0.0	0%	0	0%	39,204	90%	2,178	5%	2,178	5%	1,634	4%
Low-Rise Multifamily A Student Rental Focus	1.0	30.0	0.0	0.0	0%	0	0%	39,204	90%	2,178	5%	2,178	5%	1,634	4%
Low-Rise Multifamily and Townhome	1.0	20.0	10.0	0.0	0%	0	0%	39,204	90%	2,178	5%	2,178	5%	1,634	4%
Low-Rise Multifamily A	1.0	30.0	0.0	0.0	0%	0	0%	39,204	90%	2,178	5%	2,178	5%	1,634	4%
Passive Open Space	1.0	0.0	0.0	0.0	0%	0	0%	0	0%	0	0%	43,560	100%	0	0%
Low- to Mid-Rise Multifamily	1.0	40.0	0.0	0.0	0%	0	0%	39,204	90%	2,178	5%	2,178	5%	1,634	4%
Low- to Mid-Rise Multifamily B	1.0	40.0	0.0	0.0	0%	0	0%	39,204	90%	2,178	5%	2,178	5%	1,634	4%
Townhome	1.0	0.0	20.0	0.0	0%	0	0%	39,204	90%	2,178	5%	2,178	5%	1,634	4%
Low- to Mid-Rise Multifamily Student Focus	1.0	40.0	0.0	0.0	0%	0	0%	39,204	90%	2,178	5%	2,178	5%	1,634	4%
Low- to Mid-Rise Multifamily B Student Focus	1.0	40.0	0.0	0.0	0%	0	0%	39,204	90%	2,178	5%	2,178	5%	1,634	4%

[1] A value of zero indicates that parking is included with the main structure.

[2] Minimum lot coverage is 40% for NAC Zone.

Minimum lot coverage is 65% for LTO-Core Zone.

Minimum lot coverage is 50% for LTO-Edge Zone (for Nonresidential and Mixed-Use)

There is no minimum lot coverage for LTO-Edge Zone (for Residential use)

Maximum lot coverage is 40% for RSF-A Zone

[3] The yields for the Western Gateway project placetypes are based upon the initial concept yields on the Western Gateway project website (300 apartment and 81 townhome units).

Figure 1. Study Area

Prince George's County Planning Department, *Building 2017*, Poly, February 1, 2021,
[https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Building_2020_P](https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Building_2020_Py.zip)[y.zip](https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Building_2020_Py.zip).

Prince George's County Planning Department, *Hydro Area 2017*, Poly, February 1,
2021, https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Hydro_Area_2020_Py.zip.

Prince George's County Planning Department, *Hydro Line 2017*, Line, February 1, 2021,
[https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Hydro_Line_202](https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Hydro_Line_2020_Ln.zip)[0_Ln.zip](https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Hydro_Line_2020_Ln.zip).

Prince George's County Planning Department, *Park*, Poly, February 1, 2021,
https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Park_Py.zip.

Prince George's County Planning Department, *Property Flattened*, Poly, February 1, 2021,
https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Property_Flattened_Py.zip.

Figure 2. Scenario 1: Baseline – Market Driven

Kimley-Horn, CommunityViz Land Use Model created for the Sector Plan, *LUM_Polygon*, July 6, 2021

Prince George's County Planning Department, *Hydro Area 2017*, Poly, February 1,
2021, https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Hydro_Area_2020_Py.zip.

Prince George's County Planning Department, *Hydro Line 2017*, Line, February 1, 2021,
[https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Hydro_Line_202](https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Hydro_Line_2020_Ln.zip)[0_Ln.zip](https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Hydro_Line_2020_Ln.zip).

Prince George's County Planning Department, *Park*, Poly, February 1, 2021,
https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Park_Py.zip.

Prince George's County Planning Department, *Building 2017*, Poly, February 1, 2021,
[https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Building_2020_P](https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Building_2020_Py.zip)[y.zip](https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Building_2020_Py.zip).

Prince George's County Planning Department, *Property Flattened*, Poly, February 1, 2021,
[https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Property_Flatten](https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Property_Flattened_Py.zip)[ed_Py.zip](https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Property_Flattened_Py.zip).

Prince George's County Planning Department, *Rail Transit*, Point, February 1, 2021,
[https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Rail_Transit_Pt.z](https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Rail_Transit_Pt.zip)[ip](https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Rail_Transit_Pt.zip).

Prince George's County Planning Department, *Rail Transit*, Line, February 1, 2021, https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Rail_Transit_Ln.zip.

Prince George's County Planning Department, *Tree Canopy 2017*, Poly, February 1, 2021, https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Tree_canopy_2017_Py.zip.

Torti Gallas & Partners, Building footprint layer created for the Sector Plan, *ARSP_Footprint_CampusDrUpdate_LTO_Baseline*, Poly, June 17, 2021

Torti Gallas & Partners, Park layer created for the Sector Plan, *ARSP-PARKS-LTO*, Poly, May 10, 2021

Torti Gallas & Partners, Street right-of-way layer created for the Sector Plan, *ARSP-ROW*, Line, May 11, 2021

Figure 3. Scenario 2: Expanded Housing

Kimley-Horn, CommunityViz Land Use Model created for the Sector Plan, *LUM_Polygon*, July 6, 2021

Prince George's County Planning Department, *Building 2017*, Poly, February 1, 2021, https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Building_2020_Py.zip.

Prince George's County Planning Department, *Hydro Area 2017*, Poly, February 1, 2021, https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Hydro_Area_2020_Py.zip.

Prince George's County Planning Department, *Hydro Line 2017*, Line, February 1, 2021, https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Hydro_Line_2020_Ln.zip.

Prince George's County Planning Department, *Park*, Poly, February 1, 2021, https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Park_Py.zip.

Prince George's County Planning Department, *Property Flattened*, Poly, February 1, 2021, https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Property_Flattened_Py.zip.

Prince George's County Planning Department, *Rail Transit*, Point, February 1, 2021, https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Rail_Transit_Pt.zip.

Prince George's County Planning Department, *Rail Transit*, Line, February 1, 2021, https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Rail_Transit_Ln.zip.

Prince George's County Planning Department, *Tree Canopy 2017*, Poly, February 1, 2021, https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Tree_canopy_2017_Py.zip.

Torti Gallas & Partners, Building footprint layer created for the Sector Plan, *ARSP_Footprint_CampusDrUpdate_LTO_HiDensity*, Poly, June 17, 2021

Torti Gallas & Partners, Park layer created for the Sector Plan, *ARSP-PARKS-LTO*, Poly, May 10, 2021

Torti Gallas & Partners, Street right-of-way layer created for the Sector Plan, *ARSP-ROW*, Line, May 11, 2021

Figure 4. Scenario 3: Constrained Housing

Kimley-Horn, CommunityViz Land Use Model created for the Sector Plan, *LUM_Polygon*, July 6, 2021

Prince George's County Planning Department, *Building 2017*, Poly, February 1, 2021, https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Building_2020_Py.zip.

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Prince George's County Planning Department, *Hydro Line 2017*, Line, February 1, 2021, https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Hydro_Line_2020_Ln.zip.

Prince George's County Planning Department, *Park*, Poly, February 1, 2021, https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Park_Py.zip.

Prince George's County Planning Department, *Property Flattened*, Poly, February 1, 2021, https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Property_Flattened_Py.zip.

Prince George's County Planning Department, *Rail Transit*, Point, February 1, 2021, https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Rail_Transit_Pt.zip.

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Torti Gallas & Partners, Building footprint layer created for the Sector Plan, *ARSP_Footprint_CampusDrUpdate_NAC*, Poly, June 17, 2021

Torti Gallas & Partners, Park layer created for the Sector Plan, *ARSP-PARKS-NAC*, Poly, May 10, 2021

Torti Gallas & Partners, Street right-of-way layer created for the Sector Plan, *ARSP-ROW*, Line, May 11, 2021

Table 5. Scenario Evaluation Measure Results

Kimley-Horn, CommunityViz Land Use Model created for the Sector Plan, *LUM_Polygon*, July 6, 2021

Prince George's County Planning Department, Green Infrastructure Plan, Poly, February 1, 2021, https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/GI_Pln_2017_Py.zip.

Prince George's County Planning Department, Impervious Surface, Poly, February 1, 2021, https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Impervious_Surface_2017_Py.zip.

Prince George's County Planning Department, *Park*, Poly, February 1, 2021, https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Park_Py.zip.

Prince George's County Planning Department, *Property Flattened*, Poly, February 1, 2021, https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Property_Flattened_Py.zip.

Prince George's County Planning Department, *Tree Canopy 2017*, Poly, February 1, 2021, https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Tree_canopy_2017_Py.zip.

Torti Gallas & Partners, Building footprint layer created for the Sector Plan, *ARSP_Footprint_CampusDrUpdate_LTO_HiDensity*, Poly, June 17, 2021

Torti Gallas & Partners, Park layer created for the Sector Plan, *ARSP-PARKS-LTO*, Poly, May 10, 2021

Torti Gallas & Partners, Street right-of-way layer created for the Sector Plan, *ARSP-ROW*, Line, May 11, 2021

Figure 6. Open Space

Kimley-Horn, CommunityViz Land Use Model created for the Sector Plan, LUM_Polygon, July 6, 2021

Prince George's County Planning Department, Green Infrastructure Plan, Poly, February 1, 2021, https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/GI_Pln_2017_Py.zip.

Figure 7. Tree Canopy Impacts

Kimley-Horn, CommunityViz Land Use Model created for the Sector Plan, LUM_Polygon, July 6, 2021

Prince George's County Planning Department, *Tree Canopy 2017*, Poly, February 1, 2021, https://gisdata.pgplanning.org/opendata/downloadzip.asp?FileName=/data/ShapeFile/Tree_canopy_2017_Py.zip.

Figure 8. New Housing Mix

Kimley-Horn, CommunityViz Land Use Model created for the Sector Plan, LUM_Polygon, July 6, 2021