

CLIMATE ASSESSMENT FOR THE FAIRLAND AND BRIGGS CHANEY MASTER PLAN



Fairland and Briggs Chaney MASTER PLAN

PURPOSE OF THE CLIMATE ASSESSMENT

The purpose of this climate assessment is to evaluate the anticipated impacts of the Fairland and Briggs Chaney Master Plan Planning Board Draft (“Master Plan”) on the County’s contribution to addressing climate change. The assessment will provide the County Council with a better understanding of the potential climate impacts and implications of the Master Plan compared to the projected climate impacts and implications if the Master Plan were not adopted.

The scope of this climate assessment is focused primarily on the effects of the land use, transportation, and environmental recommendations in the proposed Master Plan on greenhouse gas (GHG) emissions and carbon sequestration, and how actions proposed by the Master Plan could improve the County’s adaptive capacity to climate change and increase community resilience. While co-benefits and ancillary impacts on topics such as public health, smart growth, and cost savings may be discussed, the focus is on how the proposed Master Plan may directly impact GHG emissions and community resilience.

This climate assessment was conducted in accordance with the *Climate Assessment Recommendations for Master Plans and Zoning Text Amendments in Montgomery County, December 1, 2022*, prepared by ICF, which offers a recommended approach for conducting a climate assessment of the potential impacts to GHG emissions, sequestration, community resilience, and adaptive capacity for proposed zoning text amendments and master plan updates through both a qualitative and quantitative approach.

SUMMARY

Montgomery Planning anticipates that the Master Plan will have a **slightly negative** (increased) impact on GHG emissions, a **slightly positive** (increased) impact on carbon sequestration, and a **moderately positive** impact on ensuring resilience and adaptive capacity in the Fairland and Briggs Chaney community than if the Master Plan were not adopted.

Based on analysis by the GHG Quantification Tool (“GHG Quant Tool”), if the Master Plan is adopted as approved by the Planning Board (“Master Plan scenario”), there is a projected increase in GHG emissions by the year 2045 of approximately 30 percent compared to if the Master Plan were not adopted (“Existing Policy scenario”). This moderately anticipated increase is due in large part to a forecasted increase in apartments in

buildings with five or more units and their significantly higher association emissions from building occupant waste.

BACKGROUND OF THE FAIRLAND AND BRIGGS CHANEY MASTER PLAN

The Montgomery County Planning Department (“Montgomery Planning”) initiated a multi-year planning process to update a portion of the 1997 *Fairland Master Plan* starting in the spring of 2021. The Fairland and Briggs Chaney Master Plan is a corridor-focused master plan that seeks to establish a renewed vision for a portion of the Columbia Pike (U.S. 29) corridor over the next 10 to 20 years. The Plan serves as the updated guide for future growth and development, transportation investments, community facilities, parks, and recreation amenities, historic preservation, and environmental features specific to this community, while simultaneously advancing the goals and objectives initiated by other related county plans.

Introduction of the Colesville Road/Columbia Pike (U.S. 29) Flash Bus Rapid Transit (BRT) service in 2020 is one of several recent indicators that this community is shifting from an auto-dependent, suburban community into an evolving suburb that encourages the development of compact, mixed-use Activity Centers and shared public spaces near transit. Compact development is defined in this Plan as a pattern of land development focused on centers of activity where site elements including buildings, circulation, parking, environmental features, and gathering spaces are configured efficiently on a site and located close to nearby sites to allow safe and comfortable access by a range of travel modes (driving, walking, biking, rolling, and transit). This Plan seeks to build upon the early successes of the U.S. 29 Flash BRT service by embracing a future for a more complete, equitable, transit-oriented, and compact community.

The Plan also seeks to build upon the vision of the 2014 *White Oak Science Gateway Master Plan* and 2012 *Burtonsville Crossroads Neighborhood Plan*, whose plan areas book-end this master plan area and are intrinsically linked along the U.S. 29 corridor. The updated vision for this community keeps pace with market demands, while prioritizing linkages to other related strategic plans.

Anticipating potential significant impacts from future development and a growing population in the eastern region of the county, this Plan also seeks to address inequities pertaining to housing opportunities, impacts from and resiliency to climate change, enhancements to underutilized properties through infill development and redevelopment, and improvements to existing systems (e.g., parks, circulation, and food) to meet the needs of residents, workers, and visitors. This Plan also incorporates the goals and policies of Thrive Montgomery Plan 2050, the General Plan for Montgomery County.

The main objectives of this Master Plan are to realize:

- 1. Equitable Communities:** The Plan considers racial equity and social justice as essential themes of its purpose and implementation. Attention to past injustices in planning policy and public investment, particularly in the East county, as well as present inequities in the public and personal realm, informed the development of the Plan to support a stronger social network that embraces the advantages of a multi-racial and multi-cultural community.

2. **Economic Health:** The Plan seeks to ensure a vibrant, strong, and competitive economy by attracting and maintaining major employers, continuing to enhance nearby federal and institutional campuses, supporting local small businesses and innovation, and attracting and retaining a high-quality, diverse workforce.
3. **Environmental Resilience:** The Plan seeks to apply the best available strategies to fight climate change and mitigate the impacts of both planned changes and unexpected events in the community while continuing to preserve and enhance our natural resources.

VARIABLES THAT COULD AFFECT THE ASSESSMENT

The following climate-related variables were considered in this assessment as impacted by the Master Plan. Climate related variables include the various GHG reduction, sequestration, resilience, and adaptive capacity activities in the climate assessment qualitative checklists (Tables 1 and 8) contained in the *Climate Assessment Recommendations for Master Plans and Zoning Text Amendments in Montgomery County*.

Greenhouse Gas Emissions and Sequestration

- Transportation – Vehicle Miles Traveled, Number of Trips, Non-Vehicle Modes of Transportation, Public Transportation Use, Electric Vehicle Infrastructure Access
- Building Embodied Emissions – Building Square Footage, Pavement Infrastructure, Material Waste Produced, Use of Green Building Materials
- Energy – Electricity Usage
- Land Cover Change & Management – Area of Forest, Area of Non-Forest Tree Canopy, Area of Green Cover, Implementation of Nature-Based Solutions

Community Resilience and Adaptive Capacity



- Exposure-Related Factors – Activity in Flood Risk Areas, Activity in Urban Heat Island
- Sensitivity-Related Factors – Change to Forest Cover, Change to Non-Forest Tree Canopy, Change to Impacts of Heat, Change in Perviousness, Change in Stormwater Management System Treatments, Change to Water Quality and Quantity, Change to Air Quality, Infrastructure Design Decisions
- Adaptive Capacity Factors – Change to Accessibility or Prevalence of Community and Public Spaces, Change to Emergency Response and Recovery Capabilities, Change in Access to Transportation, Change to Accessibility or Prevalence of Local Food Sources and Other Goods, Change to Community Connectivity, Change in Distribution of Resources and Support

ANTICIPATED IMPACTS

This section details the anticipated impacts of the Fairland and Briggs Chaney Master Plan on GHG emissions, sequestration, community resilience, and adaptive capacity. Impacts are projected based on a quantitative analysis of an Existing Policy scenario and a Master Plan scenario, projected out to the year 2045, using the

GHG Quant Tool, prepared for Montgomery Planning by the consultant, ICF. The GHG Quant Tool calculates estimates of embodied, energy, waste, transportation, and land cover and management emissions for master plans. For detail on the methodology and assumptions used for the GHG Quant Tool, see Sources of Information, Assumptions, and Methodologies Used, below.



Qualitative analysis was also considered to anticipate GHG emissions, sequestration, community resilience, and adaptive capacity impacts of the Master Plan scenario, derived from the checklists prepared by the consultant, ICF, and provided as Tables 1 and 8 in the *Climate Assessment Recommendations for Master Plans and Zoning Text Amendments in Montgomery County, December 1, 2022*.






The following sections detail impacts that are anticipated to have a positive impact as , while impacts that are anticipated to have a negative impact are represented as .







GREENHOUSE GAS EMISSIONS AND CARBON SEQUESTRATION



Overall, the Fairland and Briggs Chaney Master Plan is anticipated to have a **slightly negative** (increased) impact on GHG emissions and a **slightly positive** (increased) impact on carbon sequestration. For further explanation of the anticipated impacts of the Master Plan on GHG emissions and carbon sequestration by individual activity, see Table 1 below.

Table 1: Anticipated Impacts on Greenhouse Gas Emissions and Sequestration

Impact Activity	Type of Impact	Explanation
Transportation		
Vehicle Miles Traveled (VMT)		<p>Despite a small projected increase in total annual VMT by the year 2045 (about 1.8%) from the Existing Policy scenario to the Master Plan scenario prepared as GHG Quant Tool inputs, total lifetime transportation GHG emissions by the year 2045 are expected to be lower under the Master Plan scenario. A major factor for this reduction is an estimated electric vehicle market penetration rate in the GHG Quant Tool of 90% by the year 2035. This estimate is based on the Montgomery County goal for 100% of electric vehicle trips by 2035, adjusted down 10% to allow for a possible slower market uptake. However, assuming just a 29% electric vehicle market share by 2035 results in no change to total lifetime transportation GHG emissions between the Existing Policy and Master Plan scenarios.</p> <p>Not captured by the quantitative analysis of the GHG Quant Tool is the anticipated increase in land use diversity, multi-modal transportation access, and convenience expected because of Master Plan recommendations that are expected to increase accessibility for residents, resulting in a reduction in future GHGs (see Plan Sections 3.A.2, 3.B.2, 3.C.3, 3.C.4, 4.A, 4.B).</p>
Number of Trips		<p>Master Plan recommendations seek to increase accessibility for residents and decrease the overall number of trips made solely by automobile (see Plan Sections 3.A.2, 3.C.3, 3.C.4, 4.A, 4.B). Therefore, the number of trips is expected to decrease and result in a slightly positive impact on GHG emissions.</p>

Impact Activity	Type of Impact	Explanation
Non-Vehicle Modes of Transportation		<p>The Master Plan recommends establishment of more complete streets, greater neighborhood connectivity for non-vehicular travel, enhanced public transit service, and increased bicycle and pedestrian comfort and safety, the plan’s impact on non-vehicular modes of travel is expected to be moderately positive, with more community residents, workers, and visitors traveling throughout the plan area by modes other than a single-occupancy vehicle (see Plan Sections 3.C.2, 3.C.3, 3.C.4, 4.A, 4.B).</p> <p>Furthermore, calculation of low-stress bicycle accessibility for the transportation policy area in which the plan area is located (Fairland/Colesville) based on Master Plan recommendations projected an increase by 3% over that of existing bicycle infrastructure policy under the adopted Montgomery County Bicycle Master Plan (92% to 95%).</p>
Public Transportation Use		<p>The Master Plan’s recommendations for establishing dedicated Bus Rapid Transit (BRT) lanes on U.S. 29 and East Randolph Road, establishing additional BRT stations on transit corridors as land use development occurs, and enhancing existing BRT stations and park-and-ride facilities as “mobility hubs for multi-modal, last-mile connectivity options is expected to increase use of public transportation within and through the plan area and result in a positive impact on GHG emissions (see Plan Section 3.C.4).</p>
Electric Vehicle Infrastructure Access		<p>The Master Plan recommends adding electric vehicle charging stations at BRT park-and-ride lots and establishing a network of electric vehicle charging stations that are evenly distributed throughout the plan area. An increase in electric vehicle infrastructure access would result in a significantly positive impact to GHG emissions (see Plan Sections 3.C.2, 3.C.4, 3.E.2, 4.B.3.5).</p>
Building Embodied Emissions		
Building Square Footage		<p>Because of the projected increase in development density and redevelopment over time through the realization of the Master Plan’s recommendations, particularly with a higher proportion of residential buildings of 5 units or more, total building square footage is expected to increase under the GHG Quant Tool’s Master Plan scenario (see Plan Section 3.A.2). This increased residential square footage is expected to result in a higher amount of GHG emissions from both total lifetime embodied building emissions (approximately 6%) and total lifetime building energy emissions (approximately 47%), resulting in a moderately negative impact on GHG emissions.</p>
Pavement Infrastructure		<p>While the plan area is approximately 40% public parkland or private open space, and therefore largely covered by natural, pervious surfaces in these areas, certain properties in the plan area have high levels of impervious surface from paved parking lots and buildings. U.S. 29 (Columbia Pike) and other area roadways also represent a significant amount of impervious pavement within the plan area. Data inputs prepared for the GHG Quant Tool estimated a reduction in impervious surface within the plan area by approximately 45%.</p> <p>The Master Plan recommends that properties with high levels of impervious surface, especially within designated Activity Centers, be converted to landscaped areas, stormwater management areas, and other pervious surfaces that reduce urban heat effect, reduce localized flooding, improve community safety, comfort, and experience, increase stormwater infiltration, and improve water quality (see Plan Sections 3.F.2, 4.B.4). The</p>


Impact Activity	Type of Impact	Explanation
		plan also recommends that road rights-of-way be retrofitted to incorporate more pervious surfaces. Reduction of paved surfaces has the added benefit of reducing embodied GHG emissions from the reduced production and application of asphalt and concrete materials (see Plan Section 4.B.2.8).
Material Waste Produced		<p>For apartment buildings with 5 or more units, there is a projected increase of about 9,800 new residential units by 2045, as compared to the Existing Policy scenario. This increase anticipates that the total lifetime building waste emissions may also increase by as much as 150%.</p> <p><u>Note:</u> The GHG Quant Tool assigns a much higher rate of building waste emissions to apartments in buildings with 5 or more units compared to other building types, with about 13,100 total annual metric tons of carbon dioxide equivalent (MTCO_{2e}) emissions, compared to about 4,800 MTCO_{2e} for single-family attached homes, about 420 for single-family detached homes, and about 4 MTCO_{2e} for both office and retail commercial uses.</p>
Use of Green Building Materials		The Master Plan is expected to result in a slightly positive impact on GHG emissions from the use of green building materials due to recommendations to incorporate green building standards and sustainable construction materials for certain priority properties (see Plan Sections 3.F.2, 4.B.3). These recommendations would be above and beyond the green building standards and practices already in place in the county's building construction codes.
Energy		
Electricity Usage		The Master Plan recommends that new and redeveloping buildings and sites within the plan area reduce the use of energy and install on-site energy generation systems, such as wind, solar, and geothermal technologies, resulting in a potentially major positive impact on GHG emissions in so far as these recommendations are implemented (see Plan Section 3.F.2.6).
Land Cover Change & Management		
Area of Forest	 	<p>A forest is considered a biological community dominated by trees and understory plantings, including but not limited to a plant community with woody plantings all resting on a forest floor of 10,000 square feet or greater and at least 50 feet wide. A loss of even a small area of forest within the plan area, likely due redevelopment, would result in a negative impact on GHG emissions due to the loss of carbon sequestration potential.</p> <p>Projected development on properties with areas of existing forest may account for an approximate loss of 1.63 hectares of forest stand. However, the plan encourages design efforts to retain small forests and large individual trees as development takes place (section 3.F.2.2), as well as increasing tree canopy coverage through planting trees and forest stands on private property (section 3.F.2.1). Retention of this existing forest cover within the plan area will provide significant GHG reduction benefits by sequestering carbon higher quality forest..</p>
Area of Non-Forest Tree Canopy		The Master Plan recommends a significant increase in the percentage of tree canopy coverage within the plan area, with priority given to areas with excessive impervious surface (e.g., a minimum 50% on surface parking lots) and within the public realm (e.g., a minimum 60% in all public gathering spaces on private property and pedestrian corridors in the public right-of-way) (see Plan Sections 3.F.2, 4.B.2, 4.B.3, 4.B.4). These recommendations help explain the estimated increase of approximately 12 hectares of non-





Impact Activity	Type of Impact	Explanation
		<p>forest tree canopy in the Master Plan scenario based on GHG Quant Tool analysis.</p> <p>Master Plan recommendations also seek to support the health and vitality of planted trees by further recommending adequate soil volume levels, appropriate tree selections, and water access within planted areas, as well as encouraging shade trees to be planted within stormwater treatment areas or other areas not otherwise required by code to count toward the Master Plan's non-forest tree canopy coverage targets (see Plan Section 3.F.2).</p>
Area of Green Cover		The Master Plan is expected to result in a positive impact on carbon sequestration potential stemming from areas of green cover due to recommendations for significant public open space on properties proposed for major development (e.g., a minimum 3-acre contiguous area on select large properties) (see Plan Sections 3.E.2, 4.A.5, 4.B.3, 4.B.4).
Implementation of Nature-Based Solutions		In addition to a recommended increase in tree canopy and 'cool', reflective surfaces to reduce urban heat effects, the Master Plan recommends requiring modern green infrastructure practices using nature-based solutions on all newly developing and redeveloping properties, particularly for properties in the Auto Sales Park where urban heat effects and impervious surfaces are among the highest in the plan area (see Plan Sections 3.F.2, 4.B.4).




COMMUNITY RESILIENCE AND ADAPTIVE CAPACITY







Overall, the Fairland and Briggs Chaney Master Plan is anticipated to have a **moderately positive** impact on community resilience and adaptive capacity. For an explanation of the anticipated impacts of the Master Plan on community resilience and adaptive capacity by individual activity, see Table 2.



Table 2: Anticipated Impacts on Community Resilience and Adaptive Capacity

Impact Activity	Type of Impact	Explanation
Exposure-Related Factors		
Activity in Flood Risk Areas		<p>Except for a portion of a residential property on Castle Boulevard mapped in a 500-year (5% chance) flood hazard area (FEMA, DFIRM 2011), 100- and 500-year flood hazard areas mapped elsewhere in the plan area are limited to undeveloped public parkland and private common area open space that is not expected to accommodate development. The Castle Boulevard property is also located within one of the county's Equity Focus Areas, as is much of the plan area itself, indicating a particular interest in protecting existing and future residents from potential flood risk.</p> <p>The Master Plan's recommendations to reduce impervious surfaces and treat the quantity and quality of stormwater is anticipated to have a positive impact on activity in flood risk areas, as well as areas outside of mapped flood risk areas that experience localized flooding (see Plan Sections 3.F.2, 4.B.4). This impact is not easily quantified due to the variability of storm events and the complexity of determining hydrologic conditions in relation to incremental reductions in impervious surface, yet better managing on-</p>

Impact Activity	Type of Impact	Explanation
		site stormwater will lead to greater protection for downstream waterways, habitats, and structures.
Activity in Urban Heat Island		Several areas within the plan area experience a high degree of urban heat effects during the summer season. Urban heat effects present a myriad of harmful effects to human health, environmental quality, structural integrity, and property values. While the Master Plan recommends infill development and redevelopment of properties with existing surface parking lots and low-rise buildings, this development is recommended to include heat-reducing techniques, such as shade trees and reflective shade structures, ‘cool’ pavement surfaces and roof tops, and additional and expanded areas of parks and green spaces (see Plan Sections 3.F.2, 4.B.4).
Sensitivity-Related Factors		
Change to Forest Cover		<p>A forest is considered a biological community dominated by trees and understory plantings, including but not limited to a plant community with woody plantings all resting on a forest floor of 10,000 square feet or greater and at least 50 feet wide. A loss of even a small area of forest within the plan area, likely due to redevelopment, results in a negative impact on the community's sensitivity to climate change.</p> <p>Projected development on properties with areas of existing forest may account for an approximate loss of 1.63 hectares of forest stand. However, the plan encourages design efforts to retain small forests and large individual trees as development takes place (section 3.F.2.2), as well as increasing tree canopy coverage through planting trees and forest stands on private property (section 3.F.2.1). Retention of this existing forest cover within the plan area improves the community's resilience by reducing impacts related to extreme heat (e.g., by reducing local temperatures and improving air quality).</p>
Change to Non-Forest Tree Canopy		<p>The Master Plan recommends a significant increase in the percentage of tree canopy coverage within the plan area, with priority given to areas with excessive impervious surface (e.g., a minimum 50% on surface parking lots) and within the public realm (e.g., a minimum 60% in all public gathering spaces on private property and pedestrian corridors in the public right-of-way) (see Plan Sections 3.F.2, 4.B.2, 4.B.3, 4.B.4). These recommendations help explain the estimated increase of approximately 12 hectares of non-forest tree canopy in the Master Plan scenario based on GHG Quant Tool analysis.</p> <p>Master Plan recommendations also seek to support the health and vitality of planted trees by further recommending adequate soil volume levels, appropriate tree selections, and water access within planted areas, as well as encouraging shade trees to be planted within stormwater treatment areas or other areas not otherwise required by code to count toward the Master Plan's non-forest tree canopy coverage targets. Increases in non-forest tree canopy can increase community resilience by reducing impacts related to extreme heat and the urban heat effect (see Plan Section 3.F.2).</p>
Change to Impacts of Heat		The Master Plan recommends that areas with high incidents of urban heat effects be mitigated, particularly within designated Activity Centers, by retaining stormwater within landscaped areas, increasing tree canopy and shade structures, converting impervious surfaces and hardscapes to micro-infiltration areas, and requiring ‘cool’, (i.e., light-colored or reflective) rooftops, pavements, cool streets, cool facades, and other heat-reducing

Impact Activity	Type of Impact	Explanation
		<p>construction techniques in the public realm (see Plan Sections 3.F.2, 4.B.4).</p> <p>The plan recommends the establishment of a Resiliency Hub and Environmental Learning Center in East County, which would further support community resiliency, especially during high heat emergency events (see Plan Section 3.G.2.1). The Resiliency Hub serves as a community destination for reliable electricity, water, temporary shelter, food, indoor heating and cooling, social services, and fellowship during public emergencies. This Resiliency Hub is a net zero public facility that has its own power source without heavy reliance on public utilities in case of emergencies.</p>
Change in Perviousness		<p>While the plan area is approximately 40% public parkland or private open space, and therefore largely covered by pervious surfaces in these areas, certain properties in the plan area have high levels of impervious surface from paved parking lots and buildings. U.S. 29 (Columbia Pike) and other area roadways also represent a significant amount of impervious pavement within the plan area. Data inputs prepared for the GHG Quant Tool estimated a reduction in impervious surface within the plan area by approximately 45%.</p> <p>The Master Plan recommends that properties with high levels of impervious surface, especially within designated Activity Centers, be converted to landscaped areas, stormwater management areas, and other pervious surfaces that reduce urban heat effect, reduce localized flooding, improve community safety, comfort, and experience, and increase stormwater infiltration (see Plan Sections 3.F.2, 4.B.4). The plan also recommends that road rights-of-way be retrofitted to incorporate more pervious surfaces. Increases in pervious surfaces within the plan area will contribute to greater community resilience by increasing capacity to absorb water underground and, as a result, reduce local area flooding (see Plan Section 4.B.2.8).</p> <p>Plan recommendations for increased neighborhood connections and active transportation loop connections will increase impervious surfaces to some degree (see Plan Sections 3.C.3, 3.E.2). While these surfaces were not captured in quantitative analysis, they are expected to be minor compared to anticipated decreases in impervious surfaces on properties in the plan area through redevelopment.</p>
Change in Stormwater Management System Treatments		<p>The Master Plan recommends requiring modern green infrastructure practices using nature-based solutions on all newly developing and redeveloping properties, particularly for properties in the Auto Sales Park where urban heat effects and impervious surfaces are among the highest in the plan area (see Plan Sections 3.F.2, 4.B.4). Improvements in stormwater management systems treatments can increase community resilience by reducing impacts related to extreme precipitation and flooding.</p>
Change to Water Quality and Quantity		<p>The Master Plan recommends requiring modern green infrastructure practices using nature-based solutions on all newly developing and redeveloping properties, particularly for properties in the Auto Sales Park where urban heat effects and impervious surfaces are among the highest in the plan area (see Plan Sections 3.F.2, 4.B.4). More green infrastructure practices would have the effect of retaining, filtering, and slowing stormwater flows and improving water quality within the plan area. Improvements in water quality can increase community resilience by reducing a variety of climate change impacts, including extreme heat, drought, and heavy precipitation.</p>

Impact Activity	Type of Impact	Explanation
Change to Air Quality		<p>The Master Plan’s recommendations to increase tree canopy and landscape plantings, especially in existing commercial areas with limited coverage today, is expected to improve air quality in the plan area and increase community resilience (see Plan Sections 3.F.2, 4.B.2, 4.B.3, 4.B.4). Plan recommendations to expand and enhance public transit in the plan area are also expected to improve air quality by encouraging more trips by transit rather than gas-powered personal vehicles (see Plan Section 3.C.4).</p> <p>The Master Plan’s vision and support for increased residential housing in and around Activity Centers along U.S. 29 has the potential to introduce residents to negative impacts of harmful air quality due to their closer proximity to highway traffic. However, greater penetration of electric vehicles as a share of regional vehicle trips could ameliorate this impact as trips by gas-powered, internal-combustion engine cars decrease.</p>
Infrastructure Design Decisions		<p>Master Plan recommendations to promote the use of nature-based solutions or green infrastructure to reduce heat and flood risk and promote the use of cooling materials and other solutions to reduce urban heat effects have the potential to increase community resilience to the effects of climate change (see Plan Sections 3.F.2, 4.B.4).</p>
Adaptive Capacity Factors		
Change to Accessibility or Prevalence of Community and Public Spaces		<p>Master Plan recommendations for new or expanded public open spaces on properties that redevelop within designated Activity Centers would bring more natural, shaded, and restful places that are closer to community residents, workers, and visitors (see Plan Sections 3.E.2, 4.A.5, 4.B.3, 4.B.4). New and enhanced pedestrian pathways recommended by the Master Plan through neighborhoods and connecting to natural and hard surface trails and parklands would also positively impact the adaptive capacity of the Fairland and Briggs Chaney community (see Plan Sections 3.C.3, 3.E.4, 4.A, 4.B).</p>
Change to Emergency Response and Recovery Capabilities		<p>The Master Plan’s recommendation for a Resiliency Hub in East County would improve emergency response and recovery capabilities in the face of extreme weather events by serving as a destination for reliable electricity, water, temporary shelter, food, indoor heating and cooling, social services, medical care, and fellowship (see Plan Section 3.G.2.1).</p>
Change in Access to Transportation		<p>The Master Plan’s vision and recommendations for U.S. 29 (Columbia Pike) as a ‘transit first’ corridor prioritizes transit movement over single-occupancy vehicles (see Plan Section 3.C.4). This approach would greatly improve access to public transportation for communities within the plan area and beyond. Recommendations for achieving this goal include building high-quality, dedicated Bus Rapid Transit (BRT) lanes on U.S. 29, Briggs Chaney Road, and (for the future BRT route) East Randolph Road; extending the U.S. 29 Flash BRT service north to Howard County; adding new BRT stations at key U.S. 29 intersections; and enhancing existing BRT stations and park-and-ride facilities as ‘mobility hubs’ for greater multi-modal, last-mile connectivity options. Expanding affordability and access to public transit stops will further enhance community resilience and help the County reduce community GHG emissions.</p>
Change to Accessibility or Prevalence of Local		<p>The Master Plan recommends developing a more sustainable and supportive healthy food system in the plan area by providing space for local food production, manufacturing, distributing, community-scale composting, public training facilities, drinking fountains, wayfinding,</p>

Impact Activity	Type of Impact	Explanation
Food Sources and Other Goods		signage, solar panels, and greenhouses. The Plan also seeks to support a healthy community by encouraging the establishment of healthy grocery and dining destinations, farmers' markets, and community gardens (see Plan Sections 3.D.2, 3.E.2, 3.G.2).
Change to Community Connectivity		The Master Plan seeks to increase community connectivity by establishing new bicycle and pedestrian pathways through and between neighborhoods, activity centers, public gathering spaces, and public parks (see Plan Sections 3.C.3, 3.E.2). Plan recommendations to increase public art installations, unique architectural elements, community gathering spaces, and historical and cultural exhibits will also increase community understanding, appreciation, and cohesion (see Plan Sections 3.A.2, 4.A.2, 4.B.2, 4.B.3).
Change in Distribution of Resources and Support		By recommending greater development diversity and density through zoning changes, greater investment in public transit in BRT and local bus service, and establishment of Complete Street design, the Master Plan seeks to bring attention to the economic and social needs of the Fairland and Briggs Chaney community in East County (see Plan Sections 3.A.2, 3.B.2, 3.C.3, 3.C.4, 4.A, 4.B). These investments are anticipated to 'lift up' the residents and property owners in the plan area and increase their capacity to adapt and thrive in the face of climate change. The Master Plan also supports the establishment of a Community Advisory Committee to help realize community building, learning, and cooperation and the establishment of a pilot program for community education and engagement in the planning process (see Plan Section 3.D.2.4, 5.D).

RELATIONSHIP TO THE MONTGOMERY COUNTY CLIMATE ACTION PLAN (CAP)

The following greenhouse gas emission or sequestration actions of the Montgomery County Climate Action Plan (CAP) are applicable to the GHG activities considered for the Fairland and Briggs Chaney Master Plan.

Climate Action Plan (CAP) action	CAP-assessed GHG reduction potential	Relevant master plan checklist GHG activities
E-3: Promote Private Solar Photovoltaic Systems	Medium	Electricity usage
E-4: Public Facility Solar Photovoltaic Installations and Groundwork	Low	Electricity usage
S-1: Retain and Increase Forests	Not assessed (NA)	Area of forest
S-2: Retain and Increase Tree Canopy	NA	Area of non-forest tree canopy
S-3: Restore and Enhance Meadows and Wetlands	NA	Area of green cover, Nature-based solutions
S-4: Regenerative Agriculture	NA	Not assessed for ZTAs and master plans
S-5: Restore Soil Fertility, Microbial Activity, and Moisture Holding Capacity	NA	Not assessed for ZTAs and master plans
T-1: Expand Public Transit	Medium	Vehicle miles traveled, number of trips, Public transportation use
T-2: Expand Active Transportation and Micro-mobility Network	Medium	Vehicle miles traveled, number of trips, Non-vehicle modes of transportation
T-3: Private Vehicle Electrification Incentives and Disincentives	Medium	Electric vehicle infrastructure access, Electricity usage

T-4: Constrain Cars in Urban Areas, Limit Major New Road Construction	Medium	Vehicle miles traveled, number of trips
T-7: Expand the Electric Vehicle Charging Network	Medium	Electric vehicle infrastructure access, Electricity usage

The following resiliency and adaptation actions of the Montgomery County Climate Action Plan (CAP) are applicable to the GHG activities assessed for the Fairland and Briggs Chaney Master Plan.

Climate Action Plan (CAP) action	CAP-assessed primary benefit to climate risk reduction potential	Relevant master plan checklist Resilience and Adaptation activities
A-2: Repair and Enhancement of Stormwater Conveyance Systems	Extreme Precipitation	Stormwater Management System Treatments, Infrastructure Design Decisions, Perviousness, Water Quality or Quantity
A-7: Green Public Spaces	Extreme Precipitation	Urban Heat Island, Accessibility of Community & Public Spaces, Community Connectivity
A-8: Harden Emergency Shelters and Install Resilience Hubs	Extreme Heat	Accessibility of Community & Public Spaces, Emergency Response and Recovery Capabilities
A-10: Green Infrastructure	Extreme Precipitation	Flood Risk Areas, Stormwater Management System Treatments, Water Quality or Quantity
A-18: Expanded Community Gardens	Drought	Accessibility of Local Food Sources and Other Goods, Community Connectivity

RECOMMENDED AMENDMENTS

The Climate Assessment Act requires the climate assessment to offer appropriate recommendations such as amendments to the proposed Fairland and Briggs Chaney Master Plan (approved by the Montgomery County Planning Board in June 2023) or other mitigating measures that could help counter any identified negative impacts anticipated by the Master Plan. Some of the following recommendations were considered during the plan’s preparation, but were deemed either overly burdensome to residents, tenants, or property owners or beyond the scope of the plan area (i.e., worthy of consideration as countywide policy and not specific to the Fairland and Briggs Chaney community). The County Council may wish to consider whether the potential benefits to GHG emissions reduction measures outweigh any trade-offs impacting affordability or economic feasibility in the Fairland and Briggs Chaney community.

Recommended Master Plan Amendments

- Create a Community Choice Energy Program pilot program in East County to benefit plan area residents.
- Adopt electrification requirements and/or incentives for existing commercial, public, and residential buildings within the plan area.
- Include a goal and recommendation to retain and/or expand existing forest areas.
- Increase minimum requirements for non-forest tree canopy coverage for existing properties and/or properties proposed for development above what the Master Plan already recommends.
- Strengthen the recommendation to encourage on-site energy generation systems, such as wind, solar, and geothermal technologies to new and redeveloping buildings and sites.

- Recommend public facility solar photovoltaic installations and groundwork on all public properties within the plan area.
- Expand recommendations for construction of ‘green’ building standards and sustainable construction materials beyond the properties identified by the Master Plan.

Other Recommended Countywide Actions

- Reduce household waste and increase recycling and composting rates, especially for apartments with 5 or more units, to mitigate the anticipated increases in GHG emissions from the growth of these building types in the master plan area.
- Accelerate the countywide transition to electric vehicles by county residents, businesses, and government fleets and support expansion of electric vehicle charging stations through a mix of incentives and requirements to reduce the impacts of GHG emissions from internal-combustion vehicles.

SOURCES OF INFORMATION, ASSUMPTIONS, AND METHODOLOGIES USED

This climate assessment for the Fairland and Briggs Chaney Master Plan uses the methodology for master plans from the *Climate Assessment Recommendations for Master Plans and Zoning Text Amendments in Montgomery County, December 1, 2022*. The approach for projecting GHG emissions from future land use and transportation growth calculates total lifetime emissions for an Existing Policy scenario and Master Plan scenario by the year 2045 using the GHG Quant Tool, prepared by consultants ICF. The GHG Quant Tool analysis references and assumes the following information.

Sources of Information

- *Climate Assessment Recommendations for Master Plans and Zoning Text Amendments in Montgomery County*, December 2022
- *Montgomery County Climate Action Plan*, June 2021
- GHG Quant Tool inputs:
 - **Land Use** – Master Plan Parcel GIS, 2023 (land use attributes from original county parcel layer re-assigned to match GHG Quant Tool inputs; residential units and commercial floor area values adjusted for the Existing Policy and Master Plan scenarios based on theoretical maximum possible build-out for each scenario’s zoning allowances)
 - **Renewable Energy** – Verizon Maryland, LLC Annual Solar Photovoltaic Generation Capacity, 2023 (the sole large-scale solar PV installation in the plan area)
 - **Pavement** – Montgomery County Planimetric GIS, 2020 (coverage values adjusted for projected Master Plan build-out)
 - **Transportation (VMT)** – Calculated from Travel4 analysis of forecasted growth under the Existing Policy and Master Plan scenarios, 2022.
 - **Land Cover** – Forest area (Montgomery County GIS, 2015), Non-forest tree canopy (Montgomery County Planimetric GIS, 2020), Turf (Montgomery County Planimetric GIS, 2020)

GHG Quant Tool Assumptions

- The Existing Policy scenario calculates GHG emissions for a theoretical maximum possible build-out by 2045 of land use development (i.e., residential units and commercial building area) and resulting vehicle miles traveled consistent with the existing allowable development potential for current zoning districts.
- The Existing Policy scenario assumes that existing pavement and land cover areas (e.g., forest, non-forest tree canopy, turf, etc.) remain constant with existing conditions by the year 2045.
- The Master Plan scenario calculates GHG emissions for a theoretical maximum possible build-out by 2045 of land use development (i.e., residential units and commercial building area) and resulting vehicle miles traveled consistent with the theoretical maximum build-out for zoning districts as recommended by the Master Plan.
- The Master Plan scenario assumes an electric vehicle market penetration rate in the GHG Quant Tool of 90% by the year 2035. This estimate is consistent with the Montgomery County goal for 100% of electric vehicle trips by 2035, adjusts down 10% to allow for a possible slower market uptake.
- The Master Plan scenario assumes a pavement area with a maximum of 30 percent for properties with a higher percentage of existing pavement area and likely will experience development by the year 2045. Pavement area is held constant for all other properties in the plan area.
- The Master Plan scenario assumes non-forest tree cover area as an average of 30 percent for properties that are likely to experience development by the year 2045. Non-forest tree cover area is held constant for all other properties in the plan area.