

# CLIMATE ASSESSMENT OF ZONING TEXT AMENDMENTS AND MASTER PLANS

## Description

On July 25, 2022, the Montgomery County Council signed Bill 3-22, “Climate Assessments” into law. The bill requires assessments of climate impacts of County bills, zoning text amendments and master plans and master plan amendments (collectively referred to as master plans). The Bill requires Montgomery Planning to conduct climate assessments of zoning text amendments (ZTAs) and master plans starting March 1, 2023, and the Office of Legislative Oversight (OLO) to conduct assessments for County bills starting January 1, 2023.

Montgomery Planning hired a consultant, ICF, Inc., to help develop a template for climate assessment of ZTAs and master plans. This report describes the process and a draft template for Planning Board’s review and approval for staff to start conducting climate assessment of ZTAs and master plans using this template, as required by Bill 3-22.

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MCPB  
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## RECOMMENDATIONS

1. Staff recommends approval of the proposed template for staff use to conduct climate assessment of ZTAs and master plans to satisfy the requirements of County [Bill 3-22](#).

## ATTACHMENTS

Attachment A: Consultant report with the proposed template for conducting climate assessment of ZTAs and master plans.

Attachment B: County Bill 3-22 (also accessible at [https://apps.montgomerycountymd.gov/ccllims/DownloadFilePage?FileName=2744\\_1\\_21388\\_Bill\\_3-22\\_Signed\\_20220725.pdf](https://apps.montgomerycountymd.gov/ccllims/DownloadFilePage?FileName=2744_1_21388_Bill_3-22_Signed_20220725.pdf))

Attachment C: Council staff report on Bill 3-22 (also available at [https://www.montgomerycountymd.gov/council/Resources/Files/agenda/col/2022/20220712/20220712\\_11C.pdf](https://www.montgomerycountymd.gov/council/Resources/Files/agenda/col/2022/20220712/20220712_11C.pdf))

Attachment D: Planning Board's comments on Bill-3-22 to the County Council

## PROJECT DESCRIPTION

### Background and context

Montgomery County is known for its leadership in environmental preservation and sustainable development. It has always placed great emphasis on protecting the county's natural and environmental resources. Starting in 2007, Montgomery County established a goal to stop increasing GHG emissions by the year 2010, and to reduce emissions to 20 percent of 2005 levels by the year 2050 ([Bill 32-07](#)). Another county law ([Bill 34-07](#)) required the Planning Board to estimate the carbon footprint of master plan recommendations, and to make recommendations for carbon emissions reductions. Montgomery County also completed its [Climate Action Plan \(CAP\)](#) in 2021 which presents a wide range of strategies to reduce climate-related risk to county residents, businesses and the built and natural environment. The CAP's strategies are intended to cut GHG emissions 80% by 2027 and 100% by 2035, compared to 2005 levels to achieve the goals of [Council Resolution 18-974](#). However, climate change has created a new challenge for the county to make its future land use and development as sustainable and resilient as possible and meet the County's goal of eliminating greenhouse gas (GHG) emissions by 2035.

Since 2008, [Section 33A-14](#) (Greenhouse Gas Emissions and Racial Equity and Social Justice) of the Montgomery County Code requires the Planning Board to:

- assess a master plan's potential impact on greenhouse gas emissions in the county, including a carbon footprint analysis;
- consider ways to reduce vehicle miles traveled (VMT) in the county;
- consider options that would minimize GHG emissions; and
- consider the plan's impact on racial equity and social justice in the county.

On July 25, 2022, the Montgomery County Council signed [Bill 3-22](#), "Climate Assessments" into law, which replaces the requirements of Section 33-A14. Bill 3-22 requires the Office of Legislative Oversight (OLO) to conduct climate assessment for bills starting January 1, 2023 and the Planning Board to submit to the County

Council climate assessments of zoning text amendments (ZTAs) and master plans and master plan amendments (collectively referred to as master plans) starting March 1, 2023. Bill 3-22 as originally proposed required the Office of Legislative Oversight (OLO) to prepare climate assessment of all bills, ZTAs and master plans. However, the Planning Board recommended (see Attachment D) that climate assessment of ZTAs and master plans be done by the Planning Department as it already prepares carbon footprint analyses for master plans as required by Section 33A-14 of the county Code and has land use planning expertise. The County Council accepted the Board's recommendation and made that change in the final adopted bill. This report focuses only on the bill's requirements as applicable to ZTAs and master plans.

### **Requirements of Bill 3-22**

Bill 3-22 specifically requires that for ZTAs and master plans:

- The Planning Board must submit an assessment to the District Council describing the climate impact, if any, of each ZTA and master plan under consideration by the District Council.
- A climate assessment should be submitted to the Council, at least 7 days prior to a public hearing on a ZTA or master plan.
- If the Planning Board is unable to submit the assessment within the required time, the Planning Board must notify the Council President in writing of the delay, the reason for the delay, and the revised delivery date.

Each climate assessment must include:

1. the sources of information, assumptions, and methodologies used;
2. a description of variables that could affect the assessment;
3. if a ZTA or master plan is likely to have no climate impact, why that is the case;
4. the potential positive or negative effects, if any, of the ZTA or master plan upon climate change;
5. quantitative or qualitative evaluations of the identified effects upon greenhouse gas emissions, sequestration, and carbon drawdown;
6. quantitative or qualitative evaluations of the identified effects upon community resilience and adaptive capacity; and
7. each climate assessment must identify amendments or other recommendations, if any, that would reduce or eliminate any anticipated negative effects of the ZTA or master plan upon carbon dioxide removal, sequestration, carbon drawdown, community climate resilience, and adaptive capacity.

Bill 3-22 also requires that:

- The Planning Board must develop and publish online a climate assessment template to guide the development of climate assessments for ZTAs and master plans; and
- At least every two years, the Planning Board must review the template and update the template as needed.

### **Process for developing a template for Climate Assessment of ZTAs and master plans**

The Montgomery County Planning Department hired ICF Incorporated, L.L.C. (ICF) to help develop a template for climate assessments of ZTAs and master plans. Planning Staff convened a stakeholders group and consulted with staff at the Montgomery County Department of Environmental Protection who have been involved in the County's Climate Action Plan. Planning Staff also shared its findings and draft methodology with the staff at OLO who are developing their template for conducting climate assessment of county bill as required by Bill 3-22.

### **Stakeholders Group**

During the County Council's public hearing on Bill 3-22, representatives of Climate Action Plan Coalition; The Climate Mobilization, Montgomery County Chapter; Environmental Justice Ministry, Cedar Lane Unitarian

Universalist Church; the Maryland Building Industry Association; and one individual submitted testimony (see Attachment C). Some of these stakeholders also participated in the Transportation & Environment Committee and the Council worksessions on Bill 3-22. During the Council deliberations, the Planning staff offered to convene a stakeholder's group and seek their input in creating a methodology and a template for conducting climate assessment of ZTAs and master plans, instead of including such a requirement in the bill, as some of the stakeholders had requested. The Council agreed with the Planning staff. Accordingly, Planning staff convened a stakeholders group including those who had testified at the Council on Bill 3-22 and others who expressed an interest in participating in developing a methodology and a template for climate assessment for ZTAs and master plans. The stakeholders group included the following:

1. Karen Metchis, **CAP Coalition, Stormwater Partners Network.**
2. Adam Roberts, **Bethesda Green**
3. Karl Held: **The Climate Mobilization**
4. Christine Pendzich, **350 MoCo**
5. Jeffrey Weisner, **350 MoCo**
6. Doneby Smith, **Green Sanctuary Committee of the Unitarian-Universalist Church of Silver Spring**
7. Kevin Teichman, individual
8. Lee McNair, **Cedar Lane Universalist Unitarian Church, Environmental Justice Ministry**
9. Herb Simmens, individual, **Author: *A Climate Vocabulary of the Future***
10. Ana Martinez, **Impact Silver Spring, MORE Network**
11. Pia Iolster (replaced by Anne Cottingham after the first stakeholders meeting), **Nature Forward** (previously Audubon Naturalist Society)
12. Philip Bogdonoff, **Director of Biodiversity for a Livable Climate**

Planning staff and the ICF team met monthly with the stakeholders group during the months of September, October and November 2022, and shared the ICF's research pertaining to existing, similar practices by other jurisdictions across the country; exploration of alternatives; and draft recommendations for a template to conduct climate assessment of ZTAs and master plans. The Maryland Building Industry Association opted to have one briefing on the final draft of the proposed template, which was held in November 2022. Planning staff and the ICF team received valuable feedback from the stakeholders and used it to refine the proposed template.

### **Proposed methodology and Template**

The consultant team was asked to help explore a variety of innovative approaches ranging from a more conceptual framework to a well-defined data driven methodology to assess the potential impacts of proposed ZTAs and master plans on climate change. Montgomery Planning was open to the possibility of two different frameworks/methodologies, one for ZTAs and one for master plans, since master plans are typically broader in scope than ZTAs and their recommendations can encompass several land use and development related impacts on climate, whose full assessment can be more time consuming. The longer time allowed for development of master plans (typically 18-24 months) also allows for a more detailed climate assessment to be conducted as part of the analyses and recommendations phase of the master plan development process. Most ZTAs, on the other hand, may be limited in scope as they typically address very specific issues. Additionally, the Planning Department and the Planning Board have a very limited time, two to three weeks, to review and provide comments on proposed ZTAs to the County Council prior to the Council's public hearing. Therefore, the climate assessment of ZTAs should be designed to enable the Planning staff to triage ZTAs to determine which ones are appropriate for a simplified determination of no or limited impact due to insignificant, immeasurable, or no climate-related factors, and those that may involve significant climate-related factors and require a full analysis. In all cases, the ZTA climate assessment process will need to be streamlined to allow the assessment to be completed within the quick turnaround time allowed in the typical ZTA review process.

Montgomery Planning encouraged the consultant to investigate best practices and present a range of options that they thought would best meet the requirements of Bill 3-22. This could include pros and cons of each option based on the complexity of the methodology involved, the need for any additional staff and other resources to implement the new process, and the ability to present easy to understand choices to the decision makers (Planning Board and the Council). The consultant's work encompassed three major products:

1. Literature search and exploration of how other jurisdictions in the U.S. and Canada are conducting climate assessments;
2. A range of frameworks/methodologies for conducting climate assessments of ZTAs as required by Bill 3-22; and
3. A range of frameworks/methodologies for conducting climate assessments of proposed master plans as required by Bill 3-22.

### **Current Carbon Footprint analysis and greenhouse gas emission assessment**

Since 2010, the Planning Board has included a carbon footprint analysis and recommendations to reduce VMT and GHG emissions in each master plan. The analysis has relied primarily on the use of a GHG emissions modeling spreadsheet created by King County, Washington, and adjusted for use in Montgomery County. It estimates GHG emissions from embodied energy, building energy use, and transportation used by residents and workers in the master plan area. It uses existing and projected square feet of non-residential development, numbers of existing and projected single-family and multifamily residential units, current and future VMT, pavement, average building lifetime, and population changes to estimate the change in both total and per capita emissions that may occur as a result of the master plan recommendations. Some functional Master Plans, such as the [Bicycle Master Plan](#) and [Countywide Transit Corridors Functional Master Plan](#), have used a modified approach focused exclusively on changes in VMT in the carbon footprint analysis, since these plans did not include specific land use and zoning recommendations that would generate data on projected square feet of non-residential development or numbers of residential units.

### **Proposed Template for Climate Assessment of ZTAs and master plans**

The climate assessment requirements of Bill 3-22 can be grouped into two major areas:

1. quantitative or qualitative evaluations of the identified effects upon greenhouse gas emissions, sequestration, and carbon drawdown; and
2. quantitative or qualitative evaluations of the of the identified effects upon community resilience and adaptative capacity.

The proposed methodology and draft template aim to allow Planning staff to assess the emissions, sequestration, and resilience impacts of a ZTA or master plan and strike a balance between qualitative and quantitative assessment to achieve the Bill 3-22 objectives. The draft recommendations provide both quantitative and qualitative approaches for estimating these effects that consider timing, data quality and availability, and existing methods and tools. This approach is a recommended starting point for the assessments and should evolve over time as additional data or methods become available, and as Montgomery Planning learns lessons through conducting the assessments over time.

### **Greenhouse gas emissions, sequestration, and carbon drawdown**

For the purposes of developing climate assessment of greenhouse gas emissions, sequestration, and carbon drawdown for ZTAs and master plans, Montgomery Planning and the ICF team have used the following definitions, which are generally used interchangeably:

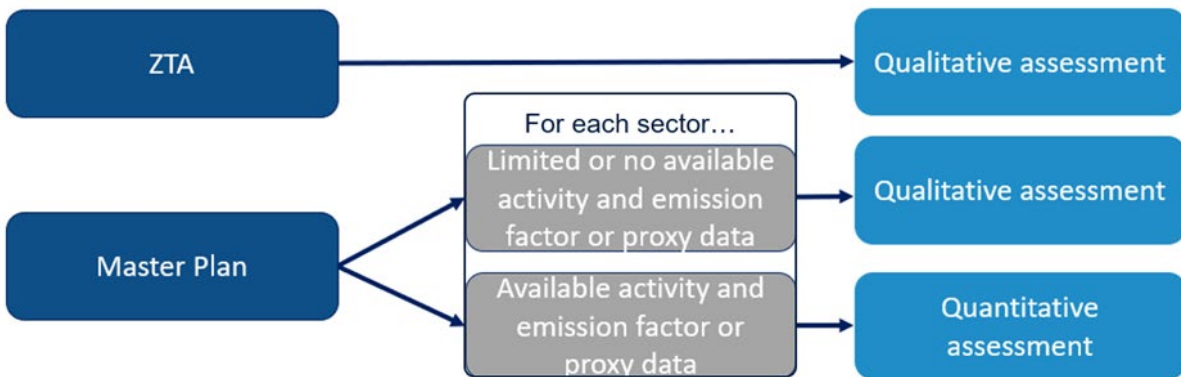
**Carbon dioxide removal:** Anthropogenic activities removing CO<sub>2</sub> from the atmosphere and durably storing it in geological, terrestrial, or ocean reservoirs, or in products.<sup>1</sup>

**Carbon dioxide sequestration:** the process of capturing and storing atmospheric carbon dioxide.<sup>2</sup>

**Carbon dioxide drawdown:** usually used as a synonym for carbon removal. It sometimes refers specifically to the use of carbon removal to reduce the atmospheric concentration of carbon dioxide, as opposed to simply slowing its increase<sup>3</sup>.

Inherently, new or changed development leads to additional emissions. However, new or changed development also provides multiple benefits, such as economic benefits, increased resilience and adaptive capacity (in some instances), and the ability to meet growing and changing needs in a community. The climate assessments as required by Bill 3-22 will be used as tools to help plan for how to reduce or mitigate increases in emissions due to new or changed developments. They would also help identify additional opportunities for sequestration. Therefore, one of the primary outcomes and largest factors that will drive change as a result of Bill 3-22 climate assessments will not necessarily be a specific estimate of GHG emissions or sequestration but will be the GHG mitigation options that are identified as a result of directionally assessing emission and sequestration potentials.

ICF has recommended a mixed qualitative and quantitative approach to assessing ZTA and master plan GHG emissions and sequestration. This approach provides an overarching framework that allows for directional change estimates of carbon stocks, even in the absence of appropriate data to create quantitative assessment of carbon stock impacts.



### GHG Assessment for ZTAs

Because there is a two-to-three-week window for ZTA reviews, a quantitative assessment of the GHG emissions associated with ZTAs is not feasible. Instead, ICF is recommending Montgomery Planning undertake a qualitative review to identify the directional change in the GHG emissions associated with a ZTA. This qualitative review asks Montgomery Planning to identify changes in activities that impact GHG emissions. The relative

<sup>1</sup> IPCC, 2018: Annex I: Glossary [Matthews, J.B.R. (ed.)]. In: *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty* [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 541-562, doi:[10.1017/9781009157940.008](https://doi.org/10.1017/9781009157940.008).

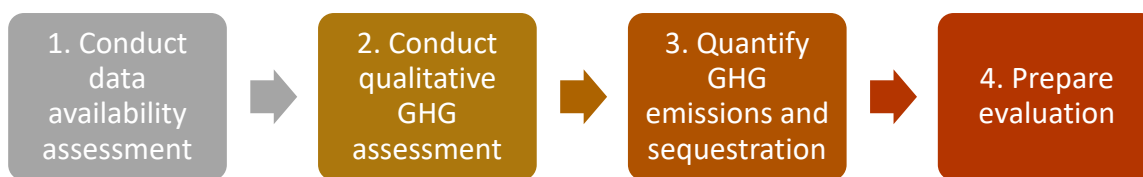
<sup>2</sup> American University Washington, DC, Carbon Removal Law & Policy. "Carbon Removal Glossary," April 15, 2020. <https://www.american.edu/sis/centers/carbon-removal/carbon-removal-glossary.cfm>.

<sup>3</sup> U.S. Geological Survey. "What Is Carbon Sequestration?" Accessed September 27, 2022. <https://www.usgs.gov/faqs/what-carbon-sequestration>.

changes in these activities will allow Montgomery Planning to make an informed decision on the directional change in GHG emissions resulting from a ZTA. For example, a change in vehicle miles travelled (VMT) by type would affect the overall GHG emissions associated with transportation such that a ZTA that would cause VMT to increase would likely increase overall GHG emissions. For each activity change, ICF has provided guidance that identifies key indicators of activity changes for users to reference when developing the climate assessment. In the qualitative approach for ZTAs, Montgomery Planning will follow a simplified checklist to determine the directional change in GHG emissions and prepare a narrative summarizing any impacts of the ZTA.

### GHG Assessment for Master Plans

To assess emissions impacts of master plans, ICF recommends a combined qualitative and quantitative approach, in which quantification is recommended for as many components of the assessment as possible pending data availability. For sectors without applicable data, the same qualitative approach as used for ZTAs can apply. ICF recommends a 4-step approach to these master plan assessments, presented in the figure below.



ICF recommends that Montgomery Planning build on existing tools and data sources to develop a new tool to quantify GHG emissions and sequestration for the master plan climate assessments. This new tool is referenced as the “GHG Quant Tool”. ICF recommends Montgomery Planning heavily leverage the King County GHG Tool, which the Department currently uses to quantify GHG emissions for carbon footprint analysis of master plans, with the following modifications to suit the specific needs of climate assessment per Bill 3-22:

1. Revisions and additions to current sector calculations and emission factors
2. Addition of sequestration calculations to cover the land cover change and management sector
3. Other recommendations (e.g., improvements in how the tool documents assumptions and data sources, summary dashboard).

### Community Resilience and Adaptive Capacity

For the purposes of this climate assessment, Montgomery Planning is using the following definitions for community resilience and adaptive capacity:

- **Community resilience:** The sustained ability of a network of people to use available resources to withstand, respond, recover, and adapt to future climate hazards
- **Adaptive capacity:** The capacity of people, systems, and a network of assets to cope with a climate hazard

In other words, adaptive capacity is one component of community resilience, and community resilience is the inverse of vulnerability. Therefore, ICF has organized the checklist of considerations into the core components of vulnerability (and resilience), namely *exposure* (the level of contact people, systems, and assets have with a climate hazard), *sensitivity* (the level of negative impact to people, systems, and assets from a climate hazard), and *adaptive capacity*. The list of factors in the checklist is not intended to be comprehensive, but prompt Montgomery Planning staff to consider how any ZTA or master plan could influence community resilience and adaptive capacity from multiple angles.



ICF recommends a two-step approach to assess the potential impacts of ZTAs or master plans on community resilience and adaptive capacity. The recommended approach is primarily qualitative but allows for quantification where possible.

The proposed approach strives to simultaneously enable:

- Efficient assessment of ‘no impacts’ in the case of potential ZTAs unrelated to climate resilience issues
- Thorough consideration of potential impacts where they occur
- A range of qualitative and quantitative approaches to evaluate those potential impacts

With these goals in mind, ICF recommends a structure to the climate assessment templates that provides:

- A streamlined checklist of considerations for Montgomery Planning to review to quickly determine potential positive or negative impacts to community resilience and adaptive capacity impacts from proposed ZTAs and master plans, paired with
- More detailed guidance and example climate assessment text Montgomery Planning can build upon to craft a narrative explaining each ZTA or master plan’s effects on community resilience and adaptive capacity.

### **Recommended approach for ZTAs and master plans**

For both ZTAs and master plans, ICF recommends the Planning Department complete the following two-step process.

**Step 1. Complete the community resilience and adaptive capacity checklist:**

To determine potential positive or negative impacts to community resilience and adaptive capacity, Montgomery Planning staff would use the checklist and accompanying guidance to determine whether a change might positively or negatively influence community resilience and adaptive capacity.

**Step 2. Prepare an assessment narrative:**

For any ‘yes’ statements, Montgomery Planning would provide additional narrative describing the potential impacts on community resilience and adaptive capacity and document assumptions, drawing from the explanations of resilience factors below as appropriate. The narrative should describe:

- Overall potential impacts on community resilience and adaptive capacity, and rationale for the assessment
- Consideration of potential timing of impacts as known and appropriate
- Any assumptions driving the consideration of potential impacts, with sources cited as appropriate
- Knowledge gaps or limitations related to the impact assessment
- Options to reduce potential negative impacts

ICF’s work also includes recommendations to incorporate climate assessment principles into the master planning process. Master planning is a multi-year process, and thus presents an opportunity for Montgomery Planning to use the climate assessments as a tool in the planning process to evaluate alternatives and otherwise craft a master plan that maximizes climate benefits, both in terms of greenhouse gas emissions and community resilience. This would not only benefit the master plan but would also position Montgomery Planning staff to more easily and efficiently assess climate impacts of the final draft master plan in compliance with Bill 3-22.

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### **Appendix A: Examples of ZTAs**

1. [Zoning Text Amendment No. 19-01: Concerning: Accessory Residential Uses – Accessory Apartments](#)
2. [Zoning Text Amendment No. 17-03: Concerning: Accessory Residential Uses - Short-Term Rental](#)
3. [Zoning Text Amendment No. 20-04: --Concerning: Farming Defined –Accessory Mulching and Composting](#)  
[Zoning Text Amendment No. 21-10: Concerning: Accessory Structures –Use Standards](#)
4. [Zoning Text Amendment No. 20-08: Concerning: Residential Care Facility– Continuing Care Retirement Community](#)
5. [Zoning Text Amendment No. 21-11: Sandy Spring/Ashton Rural Village Overlay Zone - Amendments](#)
6. [Zoning Text Amendment N. 21-04: Germantown-Churchill Village Overlay Zone](#)
7. [Zoning Text Amendment No. 21-01: Sign Ordinance – Bus Shelter Advertising](#)

### **Appendix B: Examples of Carbon Footprint Analyses conducted by Montgomery Planning for master plans**

1. [Ten Mile Creek Amendment Carbon Footprint Analysis](#)
2. [Montgomery county Bicycle Master Plan Carbon Footprint Analysis](#)
3. [Bethesda Downtown Sector Plan Carbon Footprint Analysis](#)
4. [Gaithersburg West carbon footprint Analysis](#)
5. [Environmental analysis—Bethesda Downtown Sector Plan](#)
6. [Grosvenor-Strathmore Metro Area Minor Master Plan- Environmental Analysis](#)
7. [Thrive Montgomery 2050 Planning Board Draft—Carbon Footprint Analysis](#)