

Amendment 116 to Council Bill No. 28 -2023

BY: Liz Walsh

Legislative Day 11

Date: October 2, 2023

Amendment No. 116

(This Amendment amends HoCo by Design by removing charts, graphs, tables, and maps which contain data older than 2020 or do not contain a citation. Chapters are amended as follows:

- Chapter 2: Growth and Conservation Framework* - *Removes Map 2-2: HoCo By Design Growth Tiers and reference to this map;*

- Chapter 3: Ecological Health* - *Removes Map 3-1: Environmental Resources and reference to the map;*
 - *Removes Map 3-3: Tree Canopy Map and reference to the map;*
 - *Removes Map 3-4: Tree Canopy and Area with Low Annual Median Income Map and reference to the map;*
 - *Removes Map 3-5: Potential Heat Island and Area with Low Annual Median Income Map and reference to the map;*
 - *Removes Map 3-6: Green Infrastructure Network & Natural Resources and reference to the map;*
 - *Removes Map 3-7: Green Infrastructure Network and Protected Lands Map and reference to the map;*
 - *Removes Map 3-8: Preservation Easements Map and reference to the map;*

- Chapter 4: County In Motion* - *Removes Map 4-1: Complete Streets Policy Equity Emphasis Areas and reference to the map;*
 - *Removes Map 4-3: Functional Road Classifications and reference to the map;*
 - *Removes Table 4-1: Significant Transportation Investments to Support Growth & Redevelopment and reference to the table;*

- Chapter 5: Economic Prosperity* - *Removes Table 5-2: Howard County's Largest Private Employers (2022) and reference to the table;*
 - *Removes Table 5-3: Summary of Demand 2020-2040 and reference to the table;*
 - *Removes Table 5-4: Non-residential Jobs and Building Square Feet Potential Under Current Zoning and Undeveloped Land Capacity in Howard County;*
 - *Removes Map 5-3: Thriving Business Districts and reference to the map;*
 - *Removes Map 5-5: Housing Types Near Activity Center Locations and reference to the map;*

- Chapter 6: Dynamic Neighborhoods - Removes Map 6-3: Housing Types and Percent Nonwhite population by census tract and reference to the map;
- Chapter 9: Supporting Infrastructure
 - Removes Map 8-1: Police Patrol Districts;
 - Removes Map 8-2: Fire Response Areas;
 - Removes Map 8-3: Water Pressure Zones and reference to Map 9-3;
 - Removes Table 8-1: Public Drinking Water Supply and Demand and reference to the table;
 - Removes Map 8-4: Sewer Service Areas and reference to the map;
 - Removes Table 8-2: Wastewater Treatment Plant Use and Capacity and reference to the table;
 - Removes Table 8-3: Wastewater Treatment Plant Nutrient Loads and Loading Caps and reference to the table;
- Chapter 10: Managing Growth
 - Removes Table 10-2: Total Units on Hold Allocations & School Capacity Waiting Bin and reference to the table;
 - Removes Map 10-2: Adopted APFO School Capacity Chart and reference to the map;
 - Removes Graph 10-1: Residential Building Permits Issued 2001 through 2022 Howard County and reference to the graph;
 - Removes Graph 10-2: Residential Building Permits Issued – by Unit Type Howard County and reference to the graph;
- Technical Appendix A:
 - Removes Map A-1: Stream Use Classifications and reference to the map;
 - Removes Table A-2: Watersheds and Impervious Cover and reference to the table;
 - Removes Table A-3: Projected Change in Impervious Cover by Major Watershed and reference to the table;
 - Removes Table A-4: Projected Change in Forest Cover by Major Watershed and reference to the table;
 - Removes Table A-5: Projected Change in Impervious Cover By Stronghold Watershed and reference to the table;
 - Removes Table A-6: Projected Change in Forest Cover by Stronghold Watershed and reference to the table;
- Route 1 Corridor Plan
 - Removes Table RTE 1-1; Estimated 2040 Demand, Square Feet and Units and reference to the table; and
 - Removes Map 1-9: Route 1 Corridor Environmental Resources and reference to the map.)

1 In the *HoCo By Design* General Plan, attached to this Act as Exhibit A, amend the following
 2 page as indicated in this Amendment:

- 1 • Chapter 2: Growth and Conservation Framework: 18, 19, 20;
- 2 • Chapter 3: Ecological Health: 7, 9, 10, 33, 34, 35, 36, 37, 38, 39, 40, 43, 45, 46, 47, 48,
- 3 50, 51, 52;
- 4 • Chapter 4: County in Motion: 12, 15, 16, 20, 33, 34, 37, 38, 39, 40;
- 5 • Chapter 5: Economic Prosperity: 11, 12, 13, 21, 23, 24, 34, 37, 39, 40;
- 6 • Chapter 6: Dynamic Neighborhoods: 23, 24, 25;
- 7 • Chapter 9: Supporting Infrastructure: 15, 16, 21, 22, 35, 36, 37, 38, 40, 41, 42, 43, 44;
- 8 • Chapter 10: Managing Growth: 11, 12, 13, 14, 17, 18;
- 9 • Technical Appendix A: 4, 5, 6, 13, 14, 15, 16, 17, 18;
- 10 • Route 1 Corridor Plan: 23, 48, 49

11

12 Correct all page numbers, numbering, and formatting within this Act to accommodate this
13 amendment.

14



Expansions to the PSA for water and sewer service since 1990 have been very limited. In 1993, the County Council voted to extend water service to include the area around the Alpha Ridge Landfill. This extension was done solely out of concern for potential future groundwater contamination that might originate from the landfill; therefore, only water service is provided in this area. No sewer service is allowed and no change from rural land uses or zoning was authorized in this location.

Throughout the planning process, many community members expressed a desire to expand housing opportunities, especially for affordable housing, west of the PSA. The Housing Opportunities Master Plan recommends the County explore strategic locations in the Rural West (and other undeveloped, non-preserved areas of the County), where it may be feasible to accommodate increased development for more affordable housing opportunities while balancing other priorities such as water and sewer capacity, historical context, and agricultural preservation goals. HoCo By Design used CommunityViz to evaluate parcels outside the PSA that could accommodate higher-density residential development if zoning changes were made¹. County agencies explored a wholesale expansion that moved the PSA to the western edge of the Rural Residential zone, since most of the land immediately adjacent to the PSA is already either preserved by easements or subdivided into smaller lots accommodating homes under separate ownership. Additionally, the scenario planning process looked at an expansion west of Maple Lawn, where there are fewer acres of permanently preserved land west of the PSA, so there is land that could accommodate residential development requiring water and sewer infrastructure.²

In both expansion cases, moving the PSA presented several challenges, including:

- **Delivery of public services** – Given that most of the available parcels are not adjacent to the PSA line, additional development at higher-densities would take on a scattered geographical pattern, which would not allow for efficient delivery of public services. Schools, fire, police, recreation and aging services, transportation, and public utilities would need to accommodate a larger and more dispersed population. This type of service delivery is counter to Smart Growth efforts where such services have been planned for in a more efficient and economical manner within the existing PSA.
- **Environmental impacts** – Significant development, especially that which would require new roadway construction, would have detrimental impacts to water quality and stream health in the Rocky Gorge Dam watershed in the southeastern portion of the County. This would run counter to the County’s participation in an interjurisdictional agreement designed to protect WSSC drinking water supply reservoirs. More information on the interjurisdictional agreement can be found in Technical Appendix A: Environment.
- **Limited multi-modal transportation options** – Disbursed development patterns would be difficult to serve with transit, which generally requires housing developments to be clustered in nodes or hubs accessible to transit riders. Additionally, due to rights-of-way (ROW) acquisition challenges, there are limited opportunities for bike and pedestrian infrastructure.
- **Fiscal impact** – The cost of expanding the PSA is significant. The estimated cost of new water/sewer infrastructure is approximately \$2 million per mile. This cost estimate does not include the cost of ROW acquisitions or the cost of new treatment plants and other water/sewer infrastructure that would be required to accommodate the significant new growth in this area.
- **Land preservation in the Rural West** – The County has a 50-year history of preserving agricultural and environmental land in the Rural West through the Agricultural Land Preservation Program (ALPP) and the Zoning Regulations. Much of the land west of the PSA is now permanently preserved or already developed in a low-density residential subdivision context. Throughout the Rural West, residential and agricultural land abut or are within proximity to each other. A wholesale expansion of the PSA could fundamentally change the rural character of the West and exacerbate land use conflicts between farms and nearby residences.

Given these implications, the County will maintain the public water/sewer boundary in its existing location and small incremental changes can be assessed on a case-by-case basis if supported by General Plan policies. However, there are opportunities for additional housing in the Rural West that may achieve affordable housing goals, as outlined in this Plan, such as missing middle housing, detached accessory dwelling units, and rural crossroads development. Additionally, in the policy below, piecemeal PSA expansions can be considered for low- and moderate-income housing, such as missing middle or older adult housing.

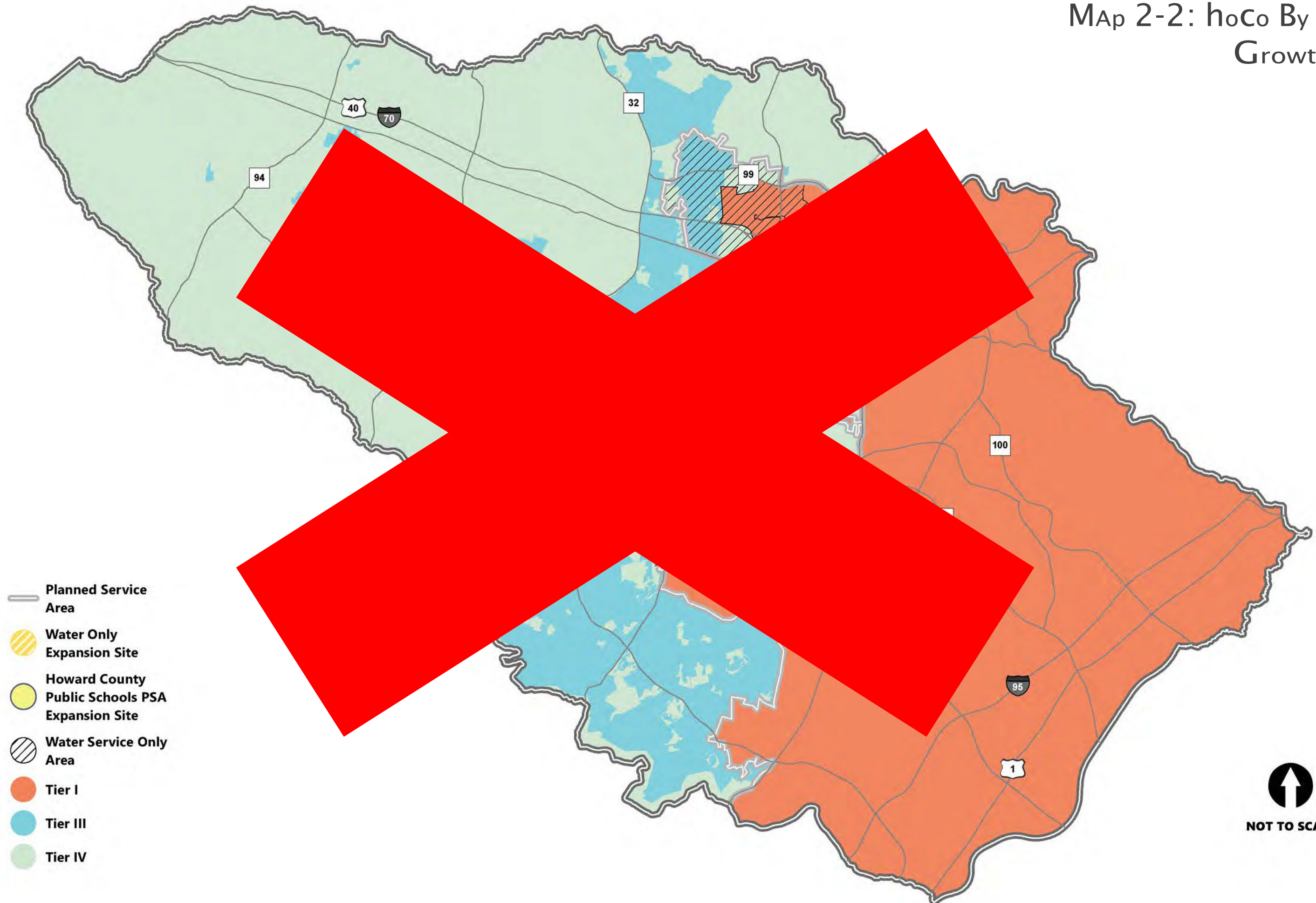
HoCo By Design proposes one minor expansion of the PSA—adjoining the Board of Education property on Route 108. Because of its location at the interface of the Rural Residential zone and the Planned Service Area, this property should be designed to establish a transition that is compatible with and enhances surrounding communities. Additionally, one property proposes an expansion to the water service only area of the PSA, located at the intersection of Frederick Road and Triadelphia Road.

[Map 2-2 outlines HoCo By Design’s proposed Growth Tiers and PSA boundary, including a minor expansion for a future school site adjoining the Board of Education property along Route 108.](#)

¹ More information on the CommunityViz model methodology can be found in the CommunityViz Methodology for Scenario Planning document, which is available from the Department of Planning & Zoning.

² More information about the PSA wholesale expansion can be found in the Planned Service Area Expansion Report: Growth Choices Workshop, March 2021; more information about the Maple Lawn expansion can be found in Scenario D in the Scenario Planning Guide, a copy of which is available from the Department of Planning and Zoning.

MAP 2-2: HoCo By Design Growth tiers



SuPPorting tHE County's Ecological HEalth

Howard County contains a wealth of natural resources, including forests, meadows, wetlands, streams, and lakes, which are linked together through ecosystems ~~(see Map 3-1)~~. Ecosystems are comprised of all living organisms, the physical environment, and the relationships between the living and inanimate elements within a particular area. Ecosystems provide a wide variety of services that benefit humans and other species, including food production, clean water, flood control, temperature regulation, recreational opportunities, and aesthetic value. However, their monetary values are often overlooked, until human intervention is needed to repair or replace them. It is generally far more cost-effective to protect a healthy ecosystem than to try and restore one that has been degraded.

The health of these ecosystems—ecological health—is the foundation that supports economic and community health and personal well-being. Human activities can negatively affect ecological health by removing or degrading natural resources, but people can also help restore and protect these resources. The challenge is to meet current human needs while ensuring actions protect and restore ecological health so that it may continue to support future life.

Through the January 27, 2021 Executive Order 14008 on Tackling the Climate Crises at Home and Abroad, the United States joined an international movement by countries to pledge conservation of at least 30% of their land and water by 2030. This pledge is intended to help protect biodiversity and mitigate climate change through locally led conservation efforts. Howard County already has 39% of its land and water conserved in parkland, open space, and easements. The County should continue to support this movement by establishing a goal for natural resource conservation. This goal could be for the County as a whole and each major watershed.

EH-1 Policy Statement

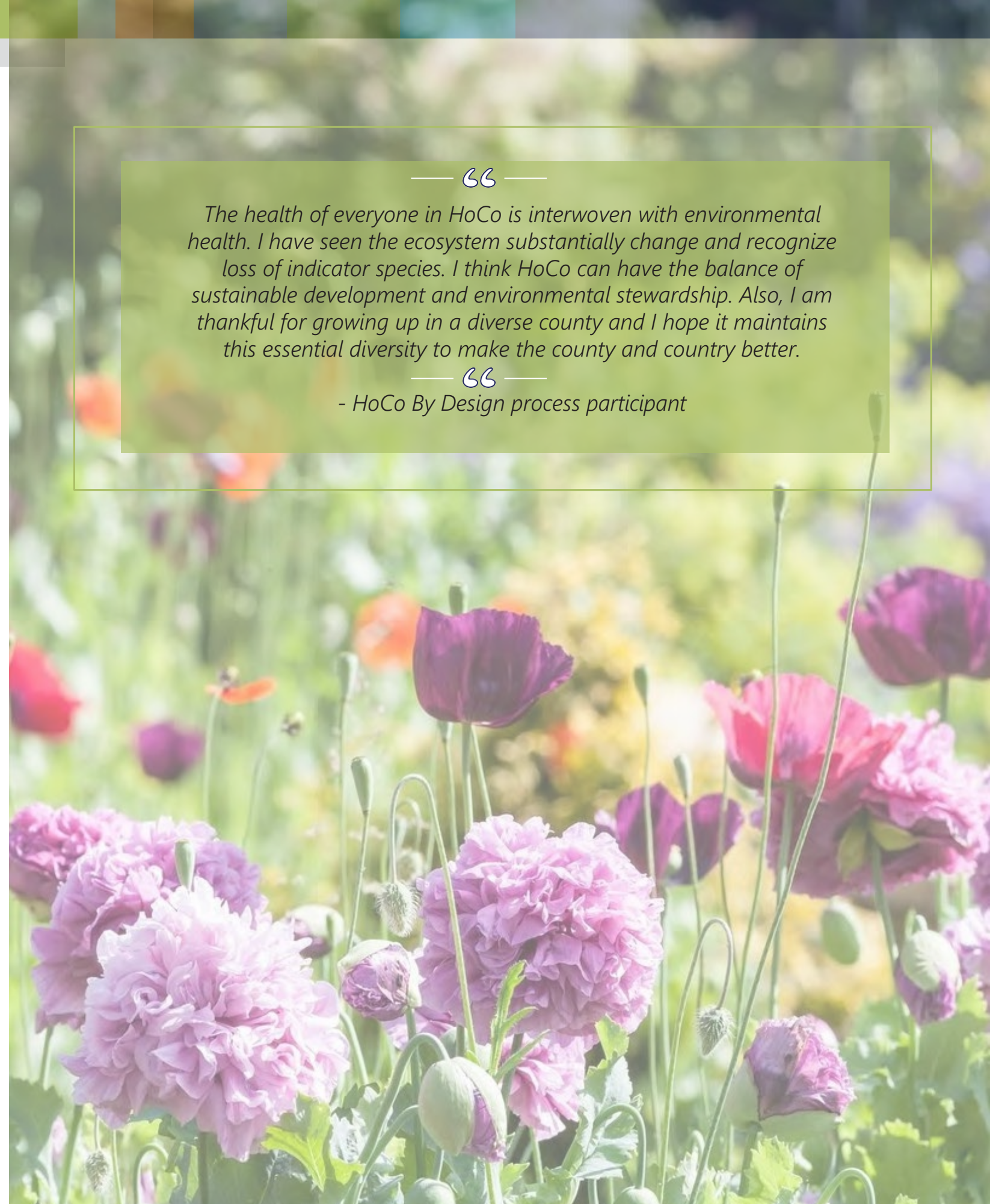
Continue to support the County's ecological health.

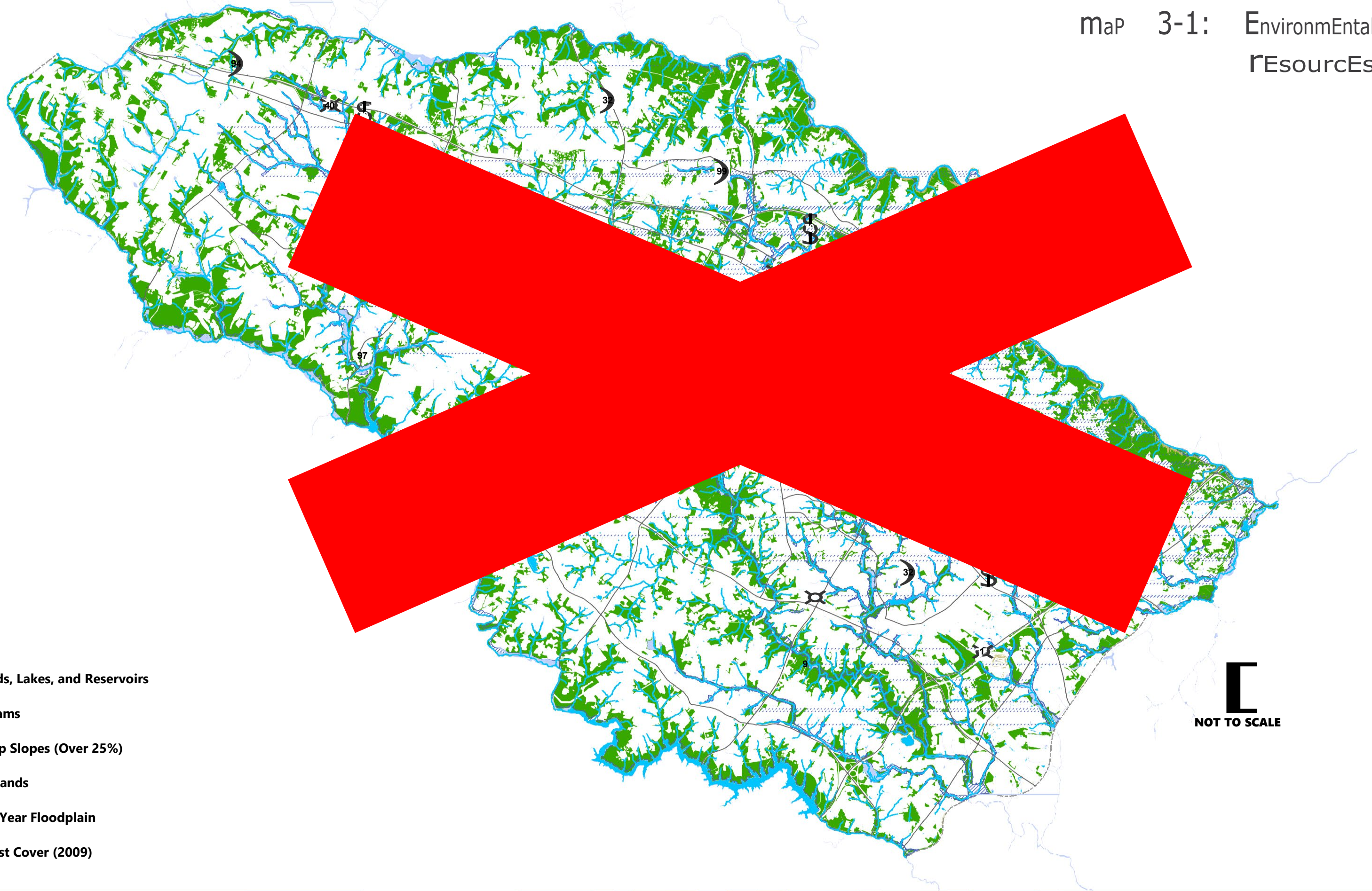
Implementing Actions

1. Integrate the goals of protecting and restoring the County's ecological health when updating county programs and policies.
2. Ensure adequate funding for programs and measures to protect and restore the County's ecological health.
3. Create a dedicated funding source, as was done for the Agricultural Land Preservation Program, for environmental programs.
4. Establish a natural resource protection goal for the County and each major watershed to help protect biodiversity and mitigate climate change.

— “ —
The health of everyone in HoCo is interwoven with environmental health. I have seen the ecosystem substantially change and recognize loss of indicator species. I think HoCo can have the balance of sustainable development and environmental stewardship. Also, I am thankful for growing up in a diverse county and I hope it maintains this essential diversity to make the county and country better.

— “ —
- HoCo By Design process participant





- Ponds, Lakes, and Reservoirs
- Streams
- Steep Slopes (Over 25%)
- Wetlands
- 100-Year Floodplain
- Forest Cover (2009)

NOT TO SCALE

— CC —
Trees are infrastructure.
— CC —
- HoCo By Design process participant

Expanding trEE CanOPY and ForEst CovEr

Tree canopy and forest cover help reduce and filter stormwater runoff, minimize erosion and sedimentation of streams, create wildlife habitats, sequester carbon, improve air quality, provide health benefits, and moderate local temperatures. They form visual buffers and are scenic in their own right. Increasing tree and forest cover is also an effective measure for climate change mitigation and adaptation. For these reasons, establishing goals for forest cover and forested stream buffers by watershed helps to achieve multiple objectives. In more developed watersheds, it may be more appropriate to establish a tree canopy goal.

Existing Tree Canopy and Forest Cover

A Report on Howard County, Maryland's Existing and Possible Tree Canopy was published in 2011 by the U.S. Forest Service and the University of Vermont. This report defined tree canopy as the layer of leaves, branches and stems of trees that cover the ground when viewed from above. Tree canopy includes individual trees, such as those found within a parking lot or residential lawn, as well as trees within a forest. Using 2007 tree canopy data, the report found that the County contained approximately 80,000 acres of tree canopy or 50% of the County had tree canopy cover. ~~The County tree canopy cover in 2007 is shown in Map 3-3.~~

A forest is a natural ecological community dominated by trees, generally including woody understory plants such as shrubs and young trees, and herbaceous vegetation such as grasses and flowers. To be fully effective as a complex environmental community, forest areas need to be large enough to provide space for a variety of native plant and animal species, to afford protection from outside intrusions, and to be able to mature and regenerate themselves.

Based on a separate analysis by the County of 2009 forest cover data, the County contained approximately 45,460 acres of forest or 28% of the County was in forest cover (distinctive from tree canopy). Forest cover in the eastern portion of the County is prevalent primarily within stream valley areas where sensitive resources have discouraged development or within publicly-owned conservation areas, such as the Patapsco Valley State Park and the Middle Patuxent Environmental Area. In the Rural West, upland and stream valley forests are more extensive. County forest cover in 2009, the most recent data available when the HoCo By Design scenarios were developed, is shown in Map 3-1. Countywide forest cover data should be updated on a regular and consistent basis to help assess changes in forest cover and manage forest resources over time.

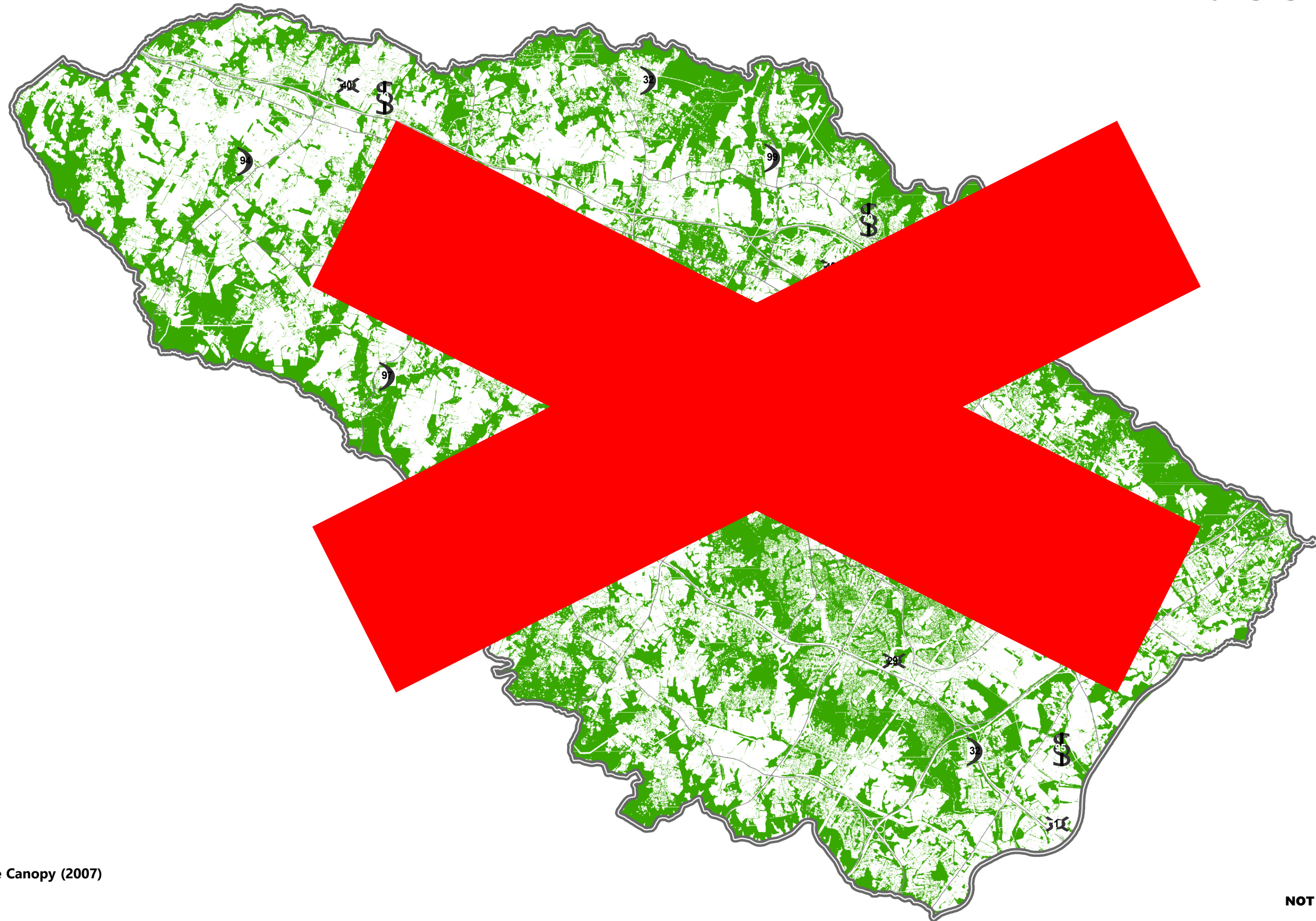
Forest loss and fragmentation result in a continuing decline in forest interior habitat, which is generally defined as forest at least 300 feet from the forest edge. Forest interior habitat is generally more isolated from disturbance than forest edge habitat, and has a closed canopy that creates moist, shaded growing conditions, with less predation by forest edge species (raccoons, crows, cats) and fewer invasive species. In 2009, only 17% of the forest cover in the County was forest interior habitat. The loss of forest interior habitat threatens the survival of species that require this type of habitat, such as reptiles, amphibians and migratory songbirds.

Tree Planting Priorities for Economically-Vulnerable Communities

Howard County does not have an overall goal for tree canopy or forest cover, but Maryland has a policy that 40% of all land in the State should be covered by tree canopy. The County has several programs that provide free native trees to help increase tree canopy cover on qualifying residential properties, including the Stream ReLeaf and Turf to Trees Programs, along with an annual tree giveaway.

~~Map 3-4 shows tree canopy cover by subwatershed and census tracts with average household annual median income under \$50,000.~~ There are four subwatersheds with less than 40% tree canopy coverage that contain one or more of these census tracts. ~~Map 3-5 shows subwatersheds that have less than 40% tree canopy cover and impervious cover over 25%, along with census tracts with average household annual median income under \$50,000.~~ Watersheds with higher levels of impervious cover and lower levels of tree canopy cover will experience greater heat island impacts, and households in these census tracts may have economic difficulty addressing these impacts. There are three subwatersheds that reflect these conditions and contain one or more of these census tracts. These subwatersheds should be prioritized for native tree planting programs, with a focus on residential areas within these census tracts, where there are willing participants.

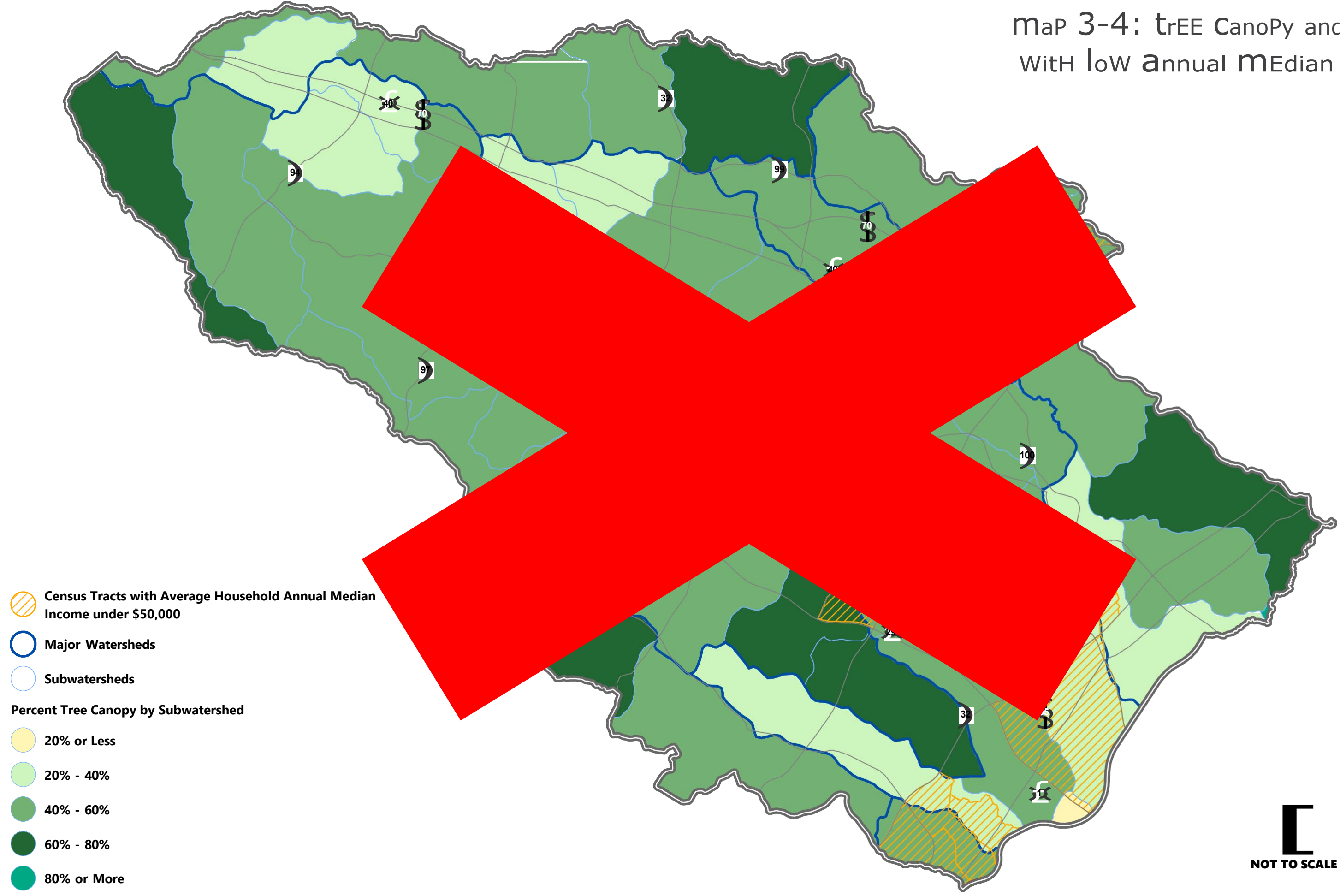




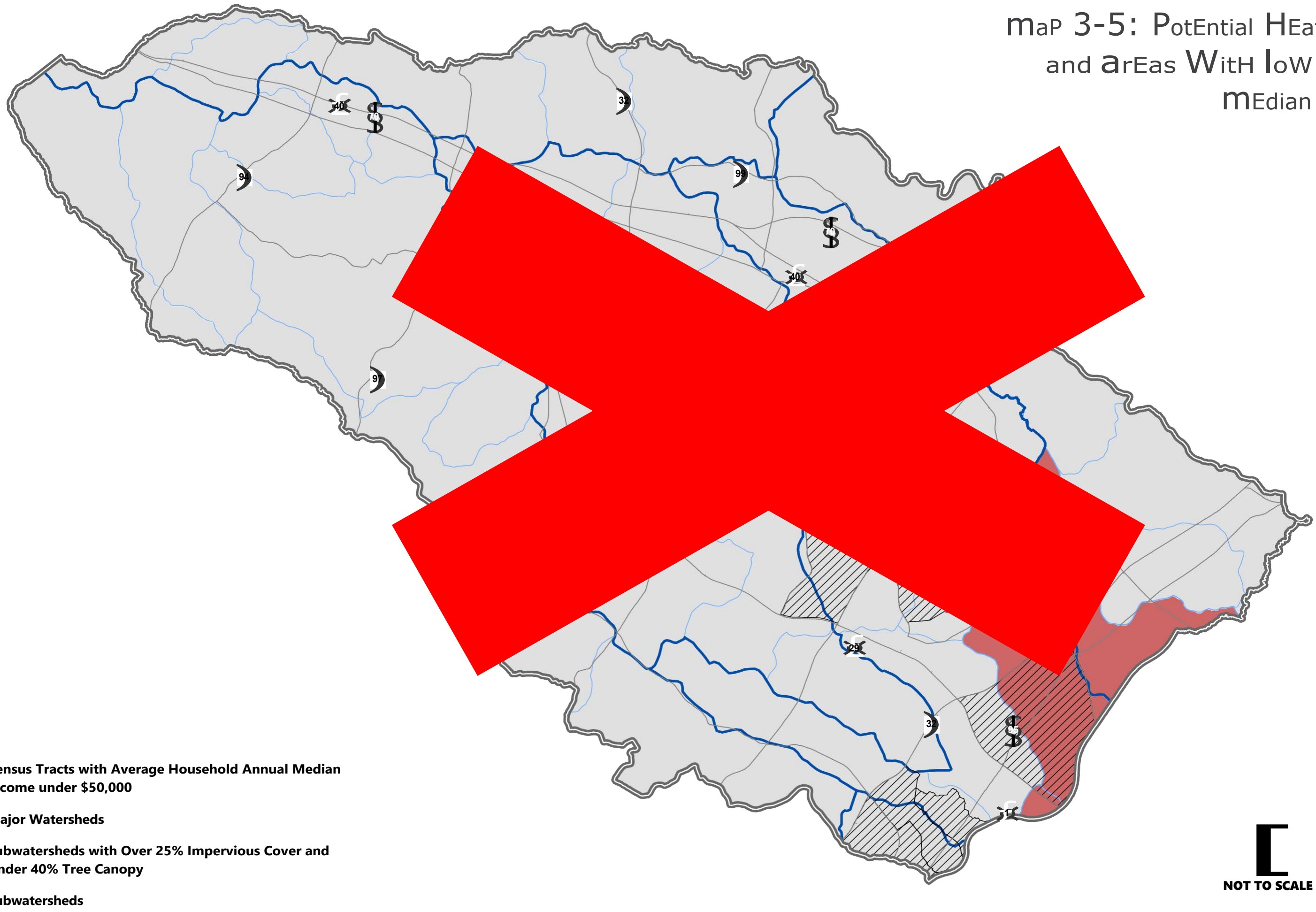
Tree Canopy (2007)

NOT TO SCALE

map 3-4: trEE CanoPy and arEas with low annual mEdian Income



map 3-5: PotEntial HEat Islands and arEas With low annual mEdian income



Implementing the Green Infrastructure Network Plan

Howard County's Green Infrastructure Network is comprised of a mapped system of hubs and corridors that includes and links the most ecologically significant natural areas in the County, ~~as shown in Map 3-6~~. Hubs are large, natural areas that provide valuable habitat for plants and wildlife. Large contiguous blocks of interior forest and sizable wetland complexes are essential components of hubs. Corridors are linear features that tie hubs together and they may include rivers and streams, narrow sections of forest, and other upland areas.

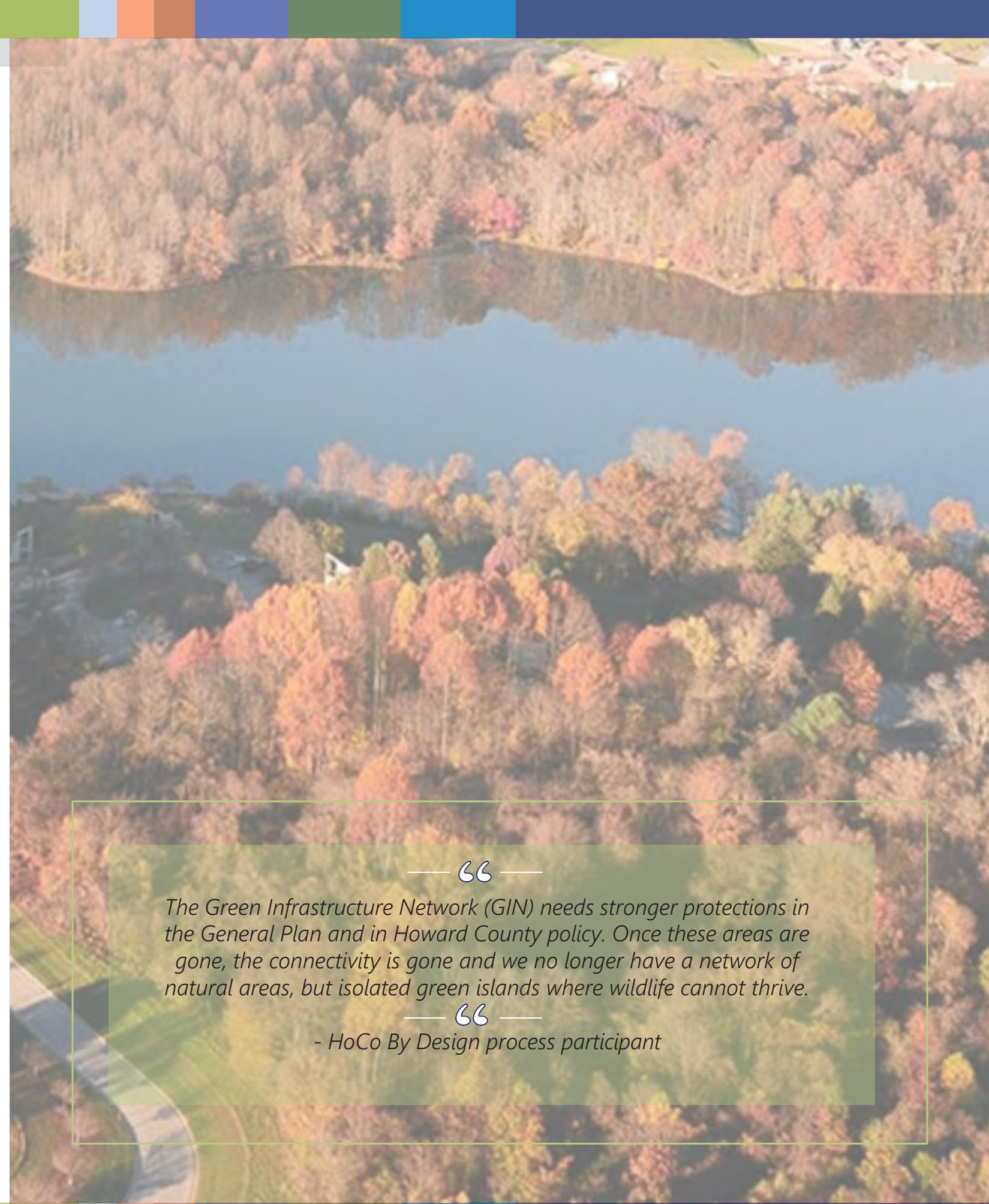
The intent of the Green Infrastructure Network is to provide a protected system of interconnected waterways, wetlands, forests, meadows, and other natural areas. The network helps support native plant and animal species, maintain natural ecological processes, sustain air and water resources, and contribute to the health and quality of life of Howard County's communities. A protected network of continuous habitat is a valuable resource for plant and animal species now and in the future, especially if they need to shift their habitat range due to climate change.

According to the 2012 Green Infrastructure Network (GIN) Plan, there are 51 hubs that contain approximately 22,148 acres or 14% of the County's total land area. Approximately 76% of the land in the hubs is protected in parkland or open space, and 11% is under an agricultural, environmental, or historic easement. The remaining 13% of the land is in a variety of uses and approximately 6% is uncommitted, which is land that still has development potential based on the zoning.

According to the 2012 GIN Plan, there are 48 corridor connections in the network. The corridor system contains approximately 6,173 acres or 4% of the County's total land area. Approximately 26% of this system is protected in parkland or open space, and 26% is under an agricultural or environmental easement. The remaining 48% of the land is in a variety of uses and approximately 11% is uncommitted. ~~Protected land within the GIN is shown in Map 3-7.~~

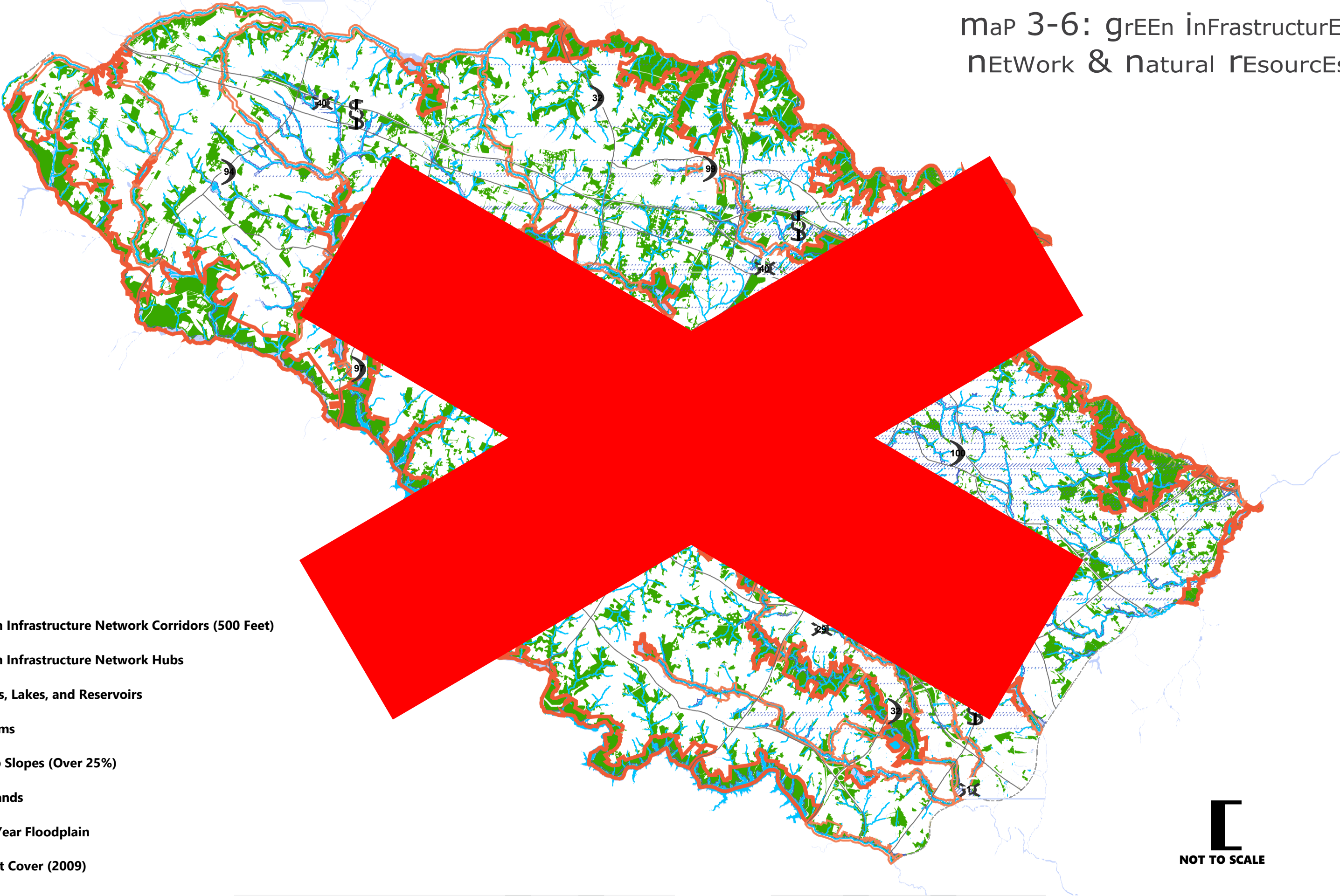
Since development of the GIN Plan, the County conducted site visits to confirm the viability of the corridors for safe wildlife passage, with a focus on road crossings and areas close to existing development. Based on this assessment, two corridors (Cattail Creek – Friendship North and South) were removed from the GIN because they were not viable for wildlife passage. A mapping update of the network is needed to reflect these and other changes, such as corridor realignments and new development.









The GIN Plan defines goals and objectives to protect and enhance the network. It also contains a comprehensive toolkit for implementation that includes stewardship, financial incentives, regulatory protection, easements, acquisition, and indicator monitoring. The HoCo By Design public engagement process and the Environment Strategic Advisory Group (SAG) provided extensive comments on the importance of the GIN to identify and protect the County's most sensitive and ecologically beneficial resources. Further, the Environment SAG reported that "the Green Infrastructure Network is a valuable resource for the County, but implementation of the Green Infrastructure Network Plan has been slow." While the County has made some progress with plan implementation,



— “ —
The Green Infrastructure Network (GIN) needs stronger protections in the General Plan and in Howard County policy. Once these areas are gone, the connectivity is gone and we no longer have a network of natural areas, but isolated green islands where wildlife cannot thrive.
— “ —
- HoCo By Design process participant

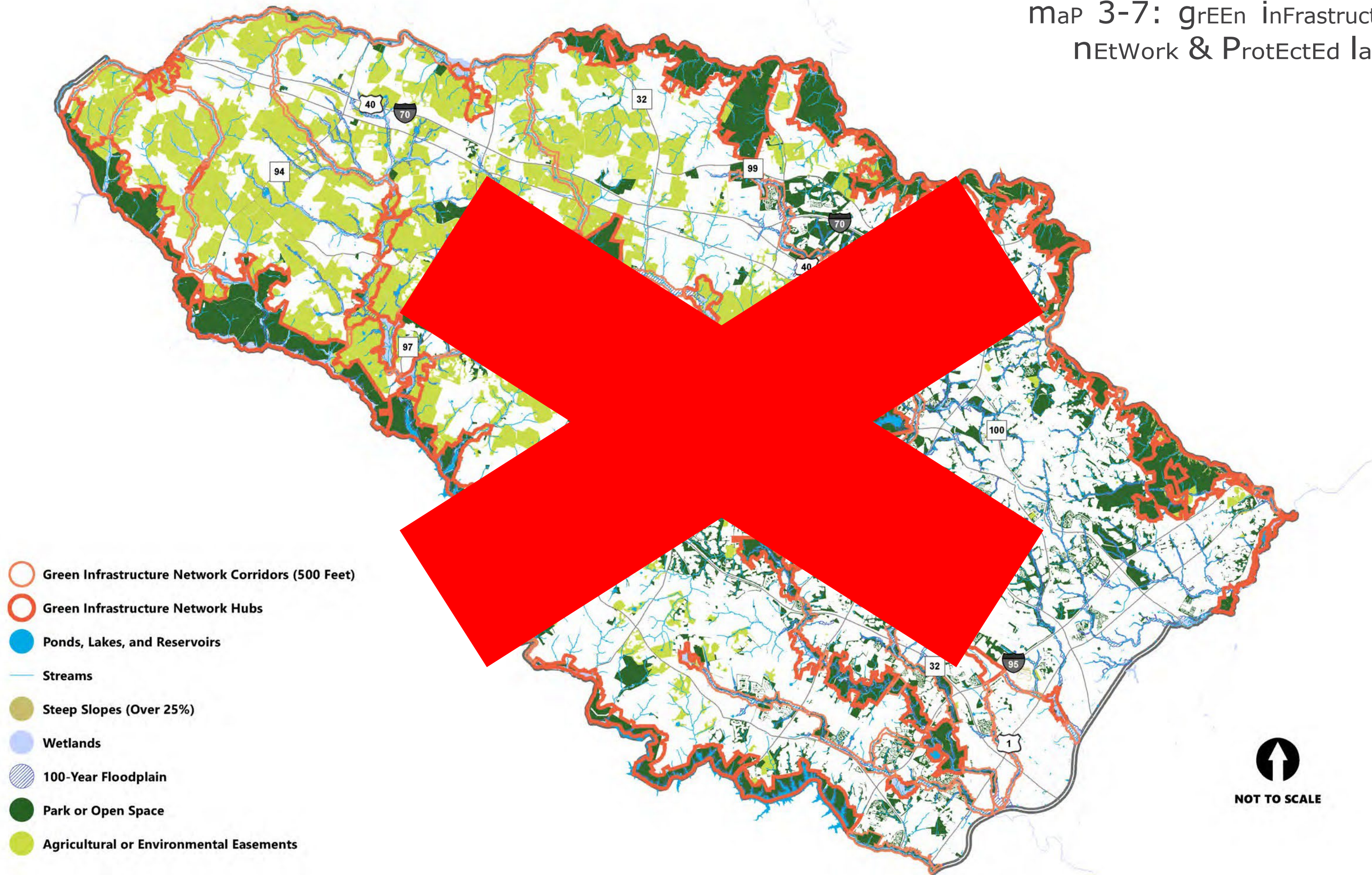
map 3-6: grEEEn InFrastructurE
nEtWork & nAturAl rEsources



-  Green Infrastructure Network Corridors (500 Feet)
-  Green Infrastructure Network Hubs
-  Ponds, Lakes, and Reservoirs
-  Streams
-  Steep Slopes (Over 25%)
-  Wetlands
-  100-Year Floodplain
-  Forest Cover (2009)


NOT TO SCALE

map 3-7: grEEEn InFrastructurE nEtWork & ProtEctEd lAnds



additional actions are still needed, such as integrating the GIN Plan into county planning processes, establishing a new easement/land acquisition program, amending development regulations and design standards for increased protection, and instituting financial incentives to support more costly best management practices on private property. Additional studies are also needed on existing resource conditions and on how wildlife use the GIN, so that informed management of the network helps optimize the many benefits provided by the GIN.

While the GIN is intended to provide a connected system of large areas of significant habitat that supports native plants and wildlife, other natural resources and habitats outside the network are also valuable and worthy of protection and restoration. The GIN is part of the larger ecosystems in the County, so the health of these ecosystems supports the health of the network. There may also be value in protecting smaller forest and wetland habitats that could provide 'stepping stones' to the network to strengthen the ecological function of the GIN.

EH-8 Policy Statement

Expand implementation of the Green Infrastructure Network Plan.

Implementing Actions

1. Integrate the Green Infrastructure Network Plan implementation actions into the relevant county plans and programs.
2. Consider use of an overlay zoning district or other regulatory measures to target resource protection measures for the Green Infrastructure Network.
3. Establish an easement or land purchase program to protect uncommitted parcels within the Green Infrastructure Network.
4. Amend county design standards for roads, bridges, and culverts to facilitate safe passage for wildlife at county road crossings within the Green Infrastructure Network.
5. Conduct studies of existing resource conditions and wildlife use within the network to enhance management of the Green Infrastructure Network.
6. Consider expansion of the Green Infrastructure Network to include smaller habitat areas that provide 'stepping stones' to the primary network.



PrEsErving Farmland

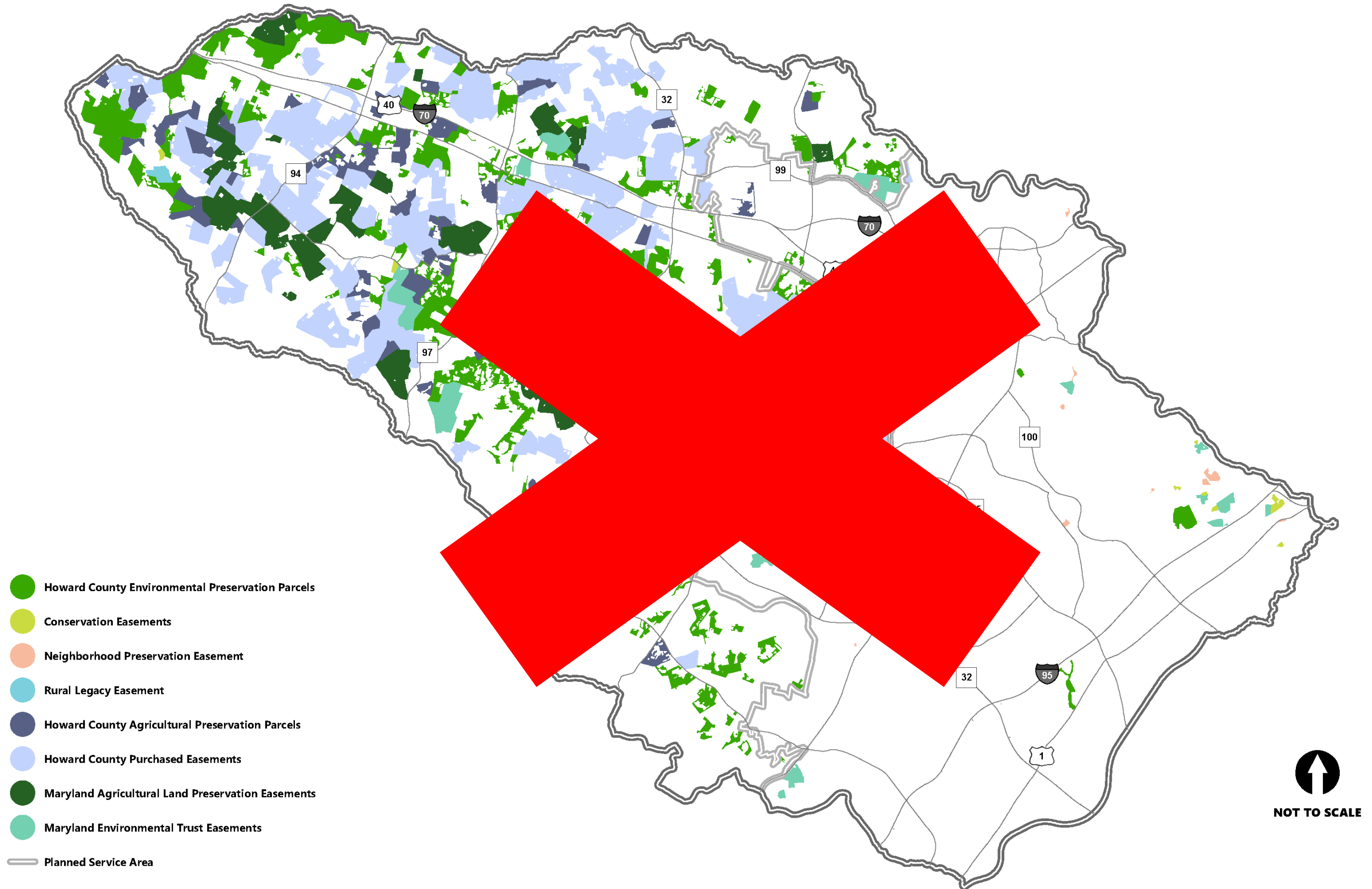
Howard County preserves farmland in the Rural West primarily through its Agricultural Land Preservation Program (ALPP), in which a property owner, whose land meets certain size and soil criteria, can offer to sell a perpetual easement to the County, while holding fee simple title to the land. The land may be sold, but the easement, which restricts the development of the property, remains with the land and binds future owners. Howard County had one of the first local purchase of development rights programs in the nation and began acquiring agricultural preservation easements in 1984.

The Maryland Agricultural Land Preservation Foundation (MALPF) program also purchases agricultural easements and was particularly active in Howard County in the early 1980s, prior to the establishment of the ALPP. As of September 2022, there were 4,046 acres under a MALPF easement in the County. MALPF easements established since 2004 are perpetual. MALPF easements established prior to 2004 allow a property owner to petition to terminate their easement and buy back their development rights from MALPF after 25 years. To terminate their easement, the property owner must demonstrate that profitable farming is no longer feasible on the property and both MALPF and the Howard County Council must approve the owner's request. When reviewing the request, MALPF considers the economic feasibility of farming and the County considers local land use priorities, including consistency with comprehensive planning goals and impacts to vicinal properties.

As provided for in the Zoning Regulations, land may be dedicated to the ALPP by way of preservation parcels created through the cluster subdivision or Density Exchange process. No county funds are used to acquire the dedicated easements because they result from private market transactions between the property owner and a developer. Like the ALPP purchased easements, the restrictions on the dedicated parcels against development remain with the land and bind all future owners.

As of September 2022, there were 18,979 acres of preserved farmland through the ALPP Purchased and ALPP Dedicated programs. There is additional farmland that is protected as county-dedicated environmental preservation parcels and some that is held under conservation easements between the landowner and one or more local land trusts, though many of these parcels contain more environmentally sensitive areas than active agricultural land. Local land trusts, such as the Howard County Conservancy and the Rockburn Land Trust, accept donated easements from private property owners and the property owner may receive tax benefits based on the value of the donation. The County recently entered into a partnership with the Howard County Conservancy to create a new purchased easement program for nonprofit landowners with environmentally sensitive areas on their land who cannot derive tax benefits from a donated easement. The Preservation Easements Map (see [Map 3-8](#)) shows farmland and other lands preserved in the County through the diverse options available to landowners seeking to preserve their land.

For information about efforts to support the agricultural economy, including agriculture in the East, please see the Economic Prosperity chapter.



To ensure the long-term viability of the transportation system, policies and actions should advance national best practices. In 2021, Howard County participated in the Capital Improvement Program Development and Promoting Healthy Communities Study (CIP Study) with the Baltimore Metropolitan Council. The study's recommendations were developed by comparing the state of the practice across the Baltimore region's jurisdictions with the best practices found nationwide. The recommendations include specific actions that can be taken, barriers to implementation, and metrics to determine success. For example, the study recommends incorporating an equity lens in the capital planning process. Howard County has begun to adopt this approach for transportation with the inclusion of an Equity Emphasis Area index in the Complete Streets Policy (detailed in the next section of this chapter). The CIP Study's recommendations have been used to guide this chapter's implementing actions. The Supporting Infrastructure chapter also references the CIP Study; please refer to the "Equity in Capital Planning" section of the Supporting Infrastructure chapter for details.

CIM-1 Policy Statement

Maintain transportation system assets to ensure the viability of the system and safety of users.

Implementing Actions

1. Develop and regularly update a risk-based asset inventory and management program for all transportation assets and ensure adequate maintenance funding.
2. Closely coordinate system maintenance activities with utilities and private development to minimize future roadway damage.
3. Develop fiscally unconstrained plans for each asset class to communicate the deferred maintenance needs and a pipeline of unfunded projects for consideration.
4. Consider equity emphasis areas in the prioritization of maintenance needs.

— ☺ —
Pedestrian safety must be improved—I keep seeing pedestrians walking down the middle of Broken Land or Snowden because there's no reasonable public transit or walking paths for them to safely get where they're going.
 — ☺ —
 - HoCo By Design process participant

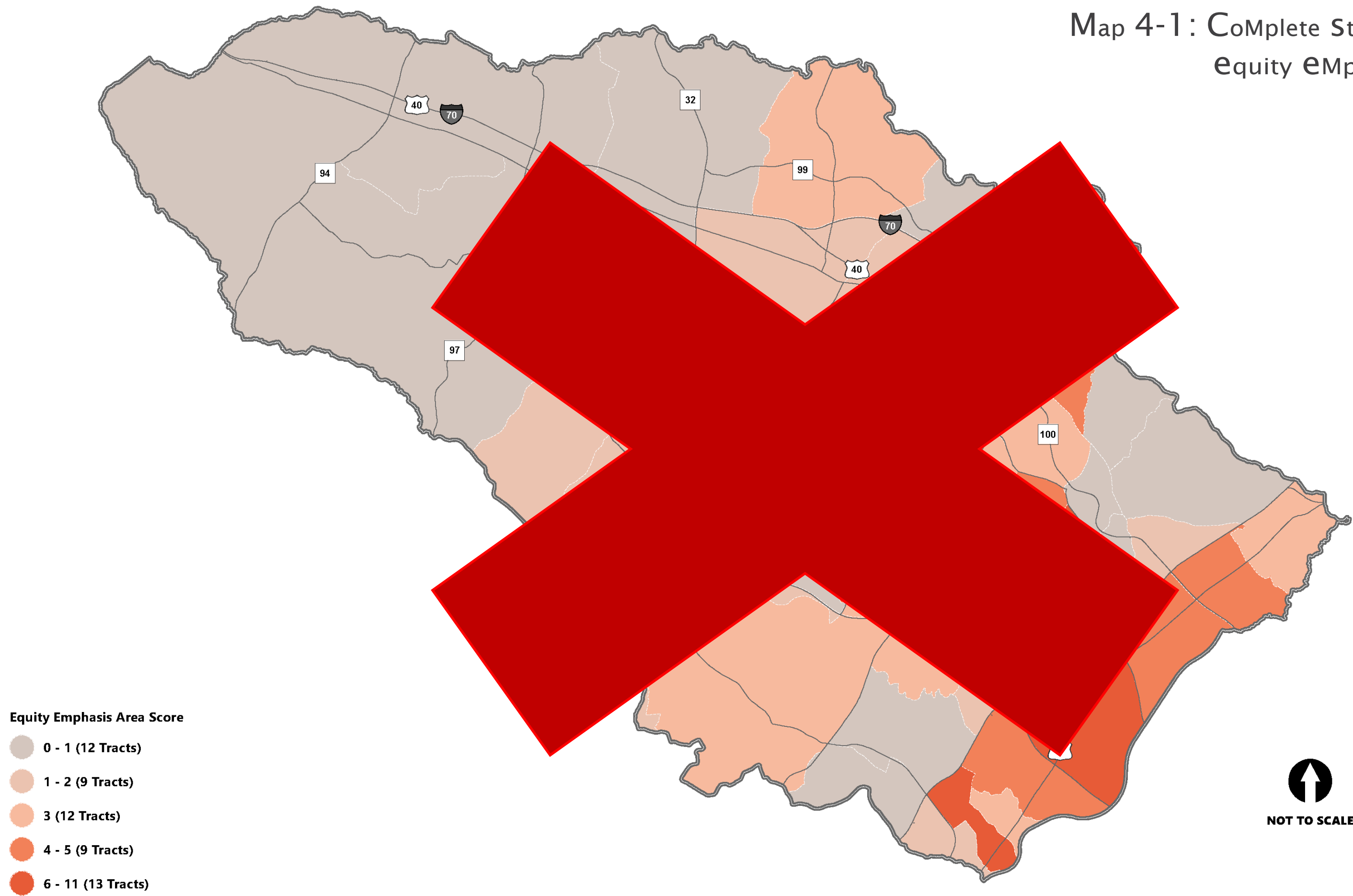
SaFety and the transportation System

Howard County is recognized as one of the best places to live in the United States and is one of the safest jurisdictions in the state to drive, take the bus, walk, and bike. However, crashes continue to be one of the leading causes of death and injuries for pedestrians, cyclists, and motorists. Improving the county transportation system's safety is critical to ensuring Howard County remains an attractive and desirable location to live.

In 2020, Howard County completed its Strategic Road Safety Plan with the goal "to prevent all traffic crash-related fatalities and serious injuries, and to reduce the number and severity of crashes" by articulating realistic, achievable, and data-driven goals and actions. Between 2014 and 2018—the five-year period of data that informed the Strategic Road Safety Plan—Howard County averaged more than 3,900 reported crashes per year for an average of 1,499 people injured per year. During this same time period, 95 community members and visitors died in crashes on roads in the County. As detailed in the plan, of the approximately 19,500 crashes during that time period, the most prevalent factor was distracted driving (involved in 8,800 crashes, or 45%). Another 3,100 crashes involved improper driving behaviors, such as speeding and aggressive driving, and 1,200 crashes involved impaired driving. Finally, 280 crashes involved cyclists or pedestrians. Notably, while two-thirds of all bicycle and pedestrian crashes occurred on local roadways, 85% of all bicycle and pedestrian fatalities occurred on state roadways, which typically have greater traffic volume and higher speeds.

In 2019, the County Council adopted a Complete Streets Policy to ensure that community members using any transportation mode can travel freely, safely, and comfortably throughout the County. The Complete Streets Policy uses an Equity Emphasis Area Index to track implementation, prioritize projects, and evaluate designs. The index uses methodology developed by the Baltimore Metropolitan Council (BMC), which assigns scores to census tracts in Howard County based on multiple factors, including the percent of households in poverty, transit dependent households, non-Hispanic minority individuals, low English-proficiency individuals, Hispanic or Latino individuals, individuals 75 years and older, and disabled individuals. [Map 4-1 shows the Equity Emphasis Areas and index scores.](#)

Map 4-1: Complete Streets Policy Equity Emphasis Areas



Equity Emphasis Area Score

- 0 - 1 (12 Tracts)
- 1 - 2 (9 Tracts)
- 3 (12 Tracts)
- 4 - 5 (9 Tracts)
- 6 - 11 (13 Tracts)



NOT TO SCALE

Best practices that support a balanced and fiscally-driven approach to managing congestion include the following:

- Prioritizing and advocating for road improvements funded by the State, with a focus on Transportation Systems Management and Operations (TSMO) solutions. TSMO is an integrated approach to planning, engineering, operating, and maintaining the transportation network. TSMO looks at improving the performance of the existing system for all modes and can deliver more cost-effective congestion relief than adding new capacity along county roads.
- Advocating to federal, state, and regional partners regional transit solutions that improve Howard County's access to regional job centers.
- Coordinating with state, regional, and local partners to efficiently deploy resources to address recurring and non-recurring congestion.

Bicycle and Pedestrian Access

The Howard County Bicycle Master Plan, BikeHoward, provides a framework to improve conditions for bicyclists and promote bicycling as a safe and convenient travel option for people of all ages and abilities. BikeHoward offers guidance in the following general categories: 1) policy updates; 2) programs providing education, encouragement, and enforcement; and 3) infrastructure improvements to create a connected bicycle network. BikeHoward has been implemented and funded through aggressive efforts to secure grants, in-kind contributions, county investments, and coordination with the County's road resurfacing program and schedule. Since 2016, 35 of 95 miles in BikeHoward's recommended short-term network plan have been completed. New projects that implement BikeHoward's infrastructure recommendations and policy improvements—such as the introduction of a bikeshare pilot, bicycle parking improvements, and a police bicycle pathway patrol unit—have advanced into final design and construction.



WalkHoward sets forth a plan for implementing a connected, comfortable, and safe pedestrian network that accommodates all users and provides a framework to rethink walking as more than a recreational trip in the County. It especially emphasizes improving and expanding pedestrian infrastructure to serve the daily needs of community members, businesses, and visitors. Like BikeHoward, WalkHoward recommends the following: 1) updating policies; 2) providing programs that would allow more residents to walk, support safety goals, and track walking rates; 3) continuing to allocate resources to maintain the existing pedestrian network; and 4) constructing 60 structured projects and high priority connections. As part of the implementation of WalkHoward, county staff also partner with the Howard County Public School System to coordinate WalkHoward projects with efforts to expand and improve the safety of school walking routes.

The Howard County Design Manual, Complete Streets and Bridges, provides guidance on the design of pedestrian and cycling infrastructure by requiring sidewalks on all streets where there is demand for walking and bicycle facilities that operate at a Level of Traffic Stress (LTS) of two or better.

Local and Regional Public Transit

Howard County provides local and some regional public transit service through the Regional Transportation Agency of Central Maryland (RTA). After the adoption of PlanHoward 2030, the County created RTA by joining with Anne Arundel County, the City of Laurel, and Prince George's County to operate shared bus service throughout the four jurisdictions. RTA operates 15 routes, 12 of which serve Columbia, Ellicott City, ElkrIDGE, Jessup, Savage, and North Laurel. The highest ridership stop in the RTA system is the Columbia Mall transit center, which accounts for 500 trips daily—two-thirds of all trip origins and destinations. This location is the pulse point or hub of nearly all services in Howard County. ~~A significant investment to construct a Downtown Columbia Transit Center to replace the existing center is listed at the end of this chapter as part of Table 4-1.~~ Of the remaining highest-ridership stops in the County, six are at apartment complexes, five are at commercial or retail centers, and four are at village centers in Columbia. The RTA service mostly provides access to jobs for those with few mobility options. More than 65% of all trips on RTA are for work-related purposes, and 85% of RTA riders do not own a vehicle. Seventy-six percent of all riders have an average annual income of \$40,000 or less. In addition to providing fixed-route service, RTA also provides ADA-complementary paratransit and demand-response service for seniors and persons with disabilities. This ridership market is expected to grow significantly as the County's population ages.

hoWard County's age-Friendly aCtion plan

The County's Age-Friendly Action Plan (2021) envisions a varied, efficient, and sustainable multi-modal transportation system that provides safe and affordable transportation for users of all ages and abilities. The system is further described as facilitating active transportation, such as walking, bicycling, and using scooters and similar devices. The plan promotes alternative transportation options and supports implementation of the Complete Streets Policy, WalkHoward, BikeHoward, and the Strategic Road Safety Plan.

transportation InvestMent Priorities

Howard County's transportation needs and preferences have changed significantly over the last three decades. Travel demands and commuting patterns have settled along major corridors that are now generally built to their ultimate size and configuration.

While automobile travel will continue to dominate travel patterns for the near future, there is growing and demonstrated community interest in improving the safety and efficiency of the transit, bicycle, and pedestrian networks. Many community members continue to express their desires to replace their work, shopping, or other automobile trips with more economic and environmentally-conscious choices. These preferences are starting to be reflected in the County's shift to building a transportation system focused on travel time reliability, safety, and travel choices for all members of the community. Since the adoption of PlanHoward 2030, substantial investments have been made in transit, bicycle, and pedestrian facilities. Eleven percent of capital transportation spending is focused on these three non-automobile categories while operational and capital investments for the transit system are also increasing dramatically. The future mixed-use activity centers envisioned in HoCo By Design complement this shift to greater walking, bicycling, and transit use. Refer to the Quality By Design chapter and Focus Areas appendix for details on how design can facilitate increased use of non-automobile modes.

To continue to support this shift in direction, the County should use the Significant Transportation Investments to Support Growth & Redevelopment Map and Table (Map 4-2 and Table 4-1) to guide county investments in, and support of, transportation projects and activities. The selection of projects is not intended be exclusive since many county projects are focused on specific operational issues and might not be shown on the map. Further, projects are not listed in priority order (they have not been prioritized). The projects shown were selected based on travel trends and forecasts, PlanHoward 2030 transportation projects, and more recent functional planning projects—including the Regional Transit Plan for Central Maryland, Walk Howard, the Strategic Road Safety Plan, and the Complete Streets Policy.

The map and table will not only guide county priorities but also support the County's partnerships and advocacy for large regional transportation projects and initiatives. These regional efforts could be funded and implemented by the Maryland Department of Transportation in the Consolidated Transportation Program or advanced in the Baltimore Metropolitan Council's Long-Range Transportation Plan, which is critical to ensuring projects are eligible for federal funding.

Howard County's transportation investment priorities should also be informed by the reality of county transportation funding. County spending for transportation is divided between operating costs, such as transit services and routine maintenance costs, and capital costs, such as engineering intersections, resurfacing roads, rehabilitating bridges, installing traffic signals, maintaining bicycle and pedestrian facilities, and replacing transit vehicles. Both operating and capital funding in the County are limited and can change significantly from year to year, which makes it difficult to sustain a steady pipeline of projects to plan, engineer, and construct over time. As a result, many projects identified for implementation in the CIP have been delayed due to funding constraints, and some older projects may not advance the policies and goals in HoCo By Design. The County should reevaluate the purpose and need of these delayed projects to ensure they are consistent with HoCo By Design.

~~Map 4-3 shows the current road system in~~ Howard County road system categorized by functional ROAD class. ~~These functional~~ classifications, coupled with design guidance in the Howard County Design Manual, are used to determine the right-of-way and road improvements required for both private development projects and county capital projects. The ~~map divides~~ roads are divided into five functional classifications, primarily organized based on vehicle throughout. New roads, as they are built and accepted into the county road system, are assigned a functional classification based on their design. These five classifications are matched to multi-modal street types in the Howard County Design Manual, which details the process to design a road based on its full context to meet the goals of the Complete Streets Policy (see pages 39-40 below).

To further identify transportation investment priorities, the County should develop a countywide transportation plan that:

- Results from a comprehensive process that engages the County's diverse population, including users of all transportation modes.
- Builds upon the Significant Transportation Investments to Support Growth & Redevelopment Map (Map 4-2), functional plans, and corridor master plans.
- Incorporates complete streets typologies.
- Reevaluates the purpose and need of the existing transportation system and proposed transportation projects to ensure consistency with county goals and funding.
- Aligns with the equity in capital planning approach described in HoCo By Design's Supporting Infrastructure chapter, and the emission reduction goals in the County's Climate Action Plan.

CIM-10 Policy Statement

Advance transportation planning and transportation investments to support an economically and environmentally sustainable transportation system that moves people safely and efficiently throughout the County and supports the land use and equity goals in HoCo By Design, including its emphasis on mixed-use activity centers.

Implementing Actions



1. Develop a countywide transportation plan and conduct a focused transportation study for each activity center in the Route 1 Corridor.
2. Continue to use the Functional Road Classification Map to guide the design, capacity, and function of roads as they are built or improved.
-  3. Implement HoCo By Design's recommendations for transit service through future transit service functional plans or master plans.
-  4. Continue to implement recommendations from WalkHoward and BikeHoward as methods to advance the broad concepts and recommendations in the General Plan.
5. Ensure the Design Manual is consistent with the General Plan as part of the regular update process for the Design Manual.

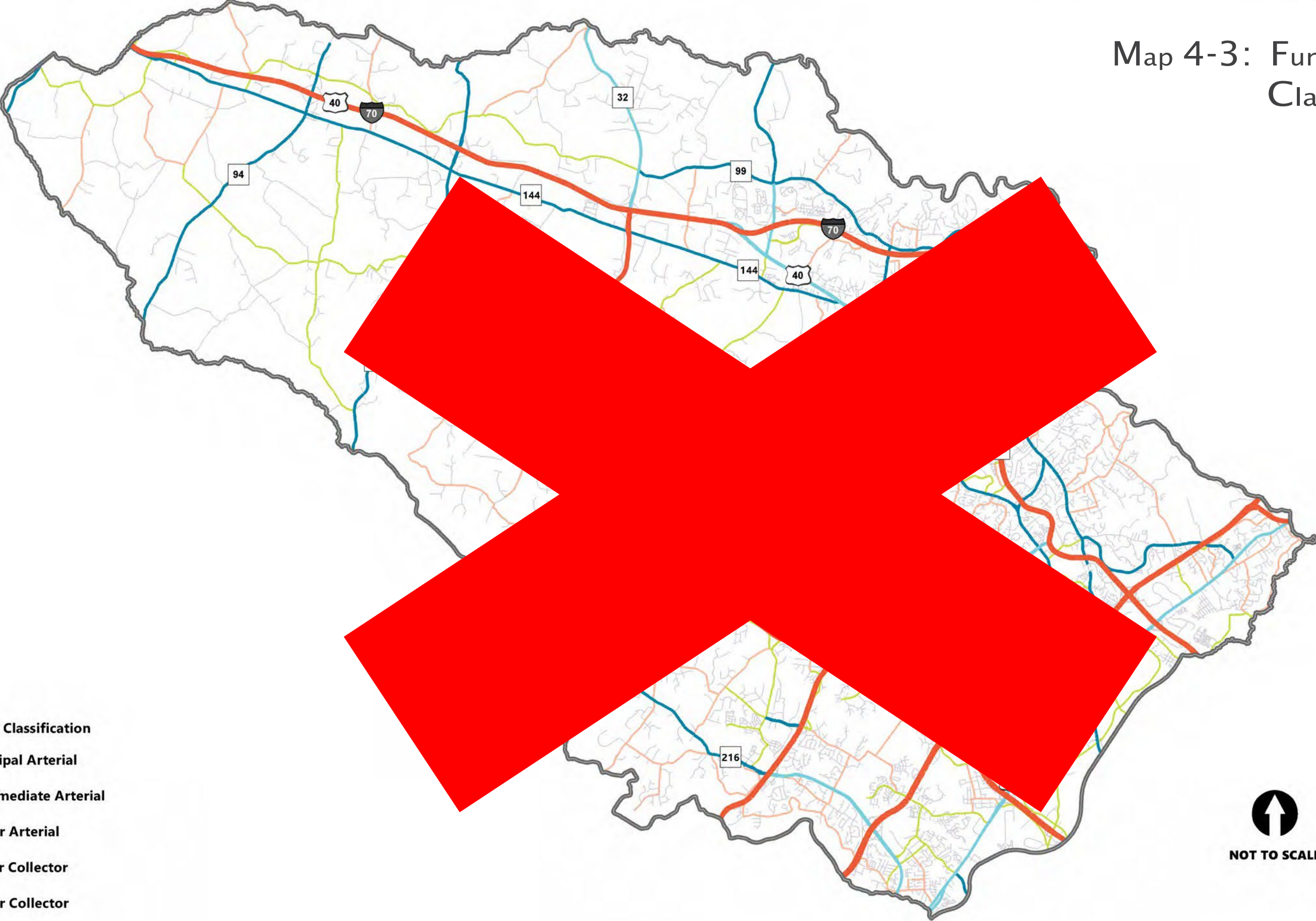
Table 4-1: Significant Transportation Investments to Support Growth & Redevelopment

Project Number	Project Description
1	Sanner Road: Johns Hopkins Road to Guilford Road – improve safety and operations for all modes, along with stormwater management improvements.
2	Snowden River Parkway: Oakland Mills Road to Broken Land Parkway – widen Snowden River Parkway from four to six lanes from Oakland Mills Road to Broken Land Parkway to match segment north of Oakland Mills Road.
3	Gateway Regional Activity Center: Create new eastern access point to Gateway and Berger Road via CSX right of way.
4	US 1: MD 100 to Prince George's County Line – continue operational, safety, and streetscape improvements between MD 100 and Prince George's County line, along with advancing regional transit efforts.
5	MD 108: Trotter Road to MD 32 – expand section to accommodate left turns, improve safety, and complete the Clarksville-River Hill Streetscape Project.
6	MD 103/104/108 Corridor: Construct operational and safety improvements along MD 103, 104, and 108, including continuous sidewalk and pedestrian connections between neighborhoods and schools in the corridors.
7	US 40: Chatham Road to Baltimore County Line – construct operational, safety, and access management improvements along US 40, including improved pedestrian connections and regional transit connections.
8	US 29: US 29 from Ellicott City to Burtonsville via Downtown Columbia and Maple Lawn – extend Montgomery County Flash service to provide direct connection to WMATA Red Line and MTA Purple Line with high-quality BRT service.
9	Downtown Columbia: Construct Downtown Columbia Transit Center to improve transit operations, customer services, and service expansion.
10	Downtown Columbia: Establish Downtown Columbia Circulator.
11	MD 99/US 29: Construct Park and Ride lot to create northern terminus for US 29 BRT service and provide capacity for rideshare vanpools.
12	East/West Corridor between Downtown Columbia and Odenton MARC Station: Create new enhanced bus service connecting MARC station via Gateway Regional Activity Center and Fort Meade with eventual regional extension to Annapolis.
13	US 1 East County Transit Center – construct new transit center to improve transit operations and customer service.
14	MARC Camden Line: Infrastructure, frequency, and service improvements and support MTA efforts to construct third track, sidings, and other infrastructure improvements to allow for mid-day and weekend service.
15	Laurel Park MARC Station: Support MDOT and Howard County efforts to create a mixed-use transit-oriented community.
16	Dorsey MARC Station: Support MDOT and Howard County efforts to create a mixed-use transit-oriented community.
17	Park and Ride Lots: Leverage park and ride lots for co-location of residential and commercial development.
18	Bus Stop Improvements: Continue investments to upgrade rider amenities and access to bus stops.
19	US 1: Montevideo Road and Port Capital Drive – realign intersection for safety and access management and widen Montevideo Road to accommodate truck traffic from Dorsey Run Road.

Table 4-1: Significant Transportation Investments to Support Growth & Redevelopment

Project Number	Project Description
20	US 29: Middle Patuxent River to MD 175 – widen southbound US 29 from Middle Patuxent River from four to six lanes to accommodate bus rapid transit and improve travel time reliability.
21	MD 108: Woodland Road to Centennial Lane – expand to continuous five-lane section to accommodate left turns, improve safety, and add continuous pathway and landscaping.
22	MD 175: Anne Arundel County line to US 1 – establish a coordinated roadway design in conjunction with Anne Arundel County efforts to improve access management, safety, and operations along MD 175 between the county line and US 1.
23	Kit Kat Road/Brookdale Road: Develop unified link to Dorsey Run Road.
24	Patapsco Regional Greenway: Construct new regional trail from Elkridge to Ellicott City in coordination with Carroll and Baltimore Counties.
25	US 1: US 1 access and safety projects – retrofit roadways and construct new pathways to neighborhoods, community centers, and schools in the US 1 corridor to support safety and access.
26	Hickory Ridge Road: Hickory Ridge Bicycle Corridor project will retrofit roadways and construct new pathways from the Hickory Ridge, Owen Brown, and Atholton communities to Howard Community College and Downtown Columbia.
27	Dobbin, Snowden River, and Oakland Mill road corridors: Retrofit roadways and construct new shared use paths to connect corridors to Gateway Regional Activity Center.
28	Columbia to North Laurel Corridor: construct South Entrance, Patuxent Branch, and North Laurel Connections pathway projects to provide high-quality four-season connections.
29	BikeHoward: Construct structured projects recommended in the Bicycle Master Plan.
30	WalkHoward: Construct structured projects recommended in the Pedestrian Master Plan.
31	MD 175: Oakland Mills Road and MD 175 – create limited access interchange to enable access to Blandair Park North.
32	US 29: Extend Symphony Woods Road to Broken Land Parkway and modify the US 29 interchange to create additional southern access to Downtown Columbia.
33	MD 216: MD 216 at Leisher Road, Sky Lark Boulevard Extended, and Gorman Road – realign Gorman Road and Leisher Road to improve mobility and safety in consideration of development patterns and future extension of Skylark Boulevard from Emerson.
34	Broken Land Parkway: At Snowden River Parkway – improve intersection safety and capacity, including alignments with ramps to MD 32.
35	US 29 / I 70: Improve safety and operations at congested interchange.
36	US 1: US 1 at MD 175 – create urban interchange to improve traffic safety and operations.
37	Gateway Regional Activity Center: At MD 175/MD 108/Columbia Gateway Drive – construct new northern access point to Gateway Regional Activity Center and improve traffic safety and operations with partially grade-separated interchange.
38	MD 100: At MD 100, MD 108, and Snowden River Parkway – construct operational and safety improvements for traffic exiting MD 100 to MD 108 and Snowden River Parkway.
39	I-70 and Marriottsville Road: Construct capacity, ramp, and bridge improvements over I-70, expansion of Marriottsville Road from MD 99 to US 40.

Map 4-3: FunCtional road ClassiFiCations



Functional Classification

- Principal Arterial
- Intermediate Arterial
- Minor Arterial
- Major Collector
- Minor Collector



NOT TO SCALE

Current Jobs and Unemployment

According to the Maryland Department of Labor, there were over 174,000 jobs in Howard County in 2020. As indicated in Table 5-1, Howard County had the 6th greatest number of jobs in Central Maryland and the 2nd greatest 10-year job growth rate at 23.5%, just behind the 24.5% growth rate experienced in Anne Arundel County. Montgomery County had the greatest number of jobs in Central Maryland, followed by Baltimore City and the other large counties surrounding Howard County.

	2010		2020		2010 to 2020	
	Jobs	Percent	Jobs	Percent	Jobs	% Increase
Montgomery County	433,226	22%	469,462	21%	36,236	8.4%
Baltimore City	320,403	16%	389,738	17%	69,335	21.6%
Baltimore County	355,189	18%	374,165	17%	18,976	5.3%
Prince George's County	292,271	15%	318,755	14%	26,484	9.1%
Anne Arundel County	220,228	11%	274,102	12%	53,874	24.5%
Howard County	141,169	7%	174,390	8%	33,221	23.5%
Frederick County	89,106	4%	104,013	5%	14,907	16.7%
Harford County	78,828	4%	93,784	4%	14,956	19.0%
Carroll County	52,772	3%	57,571	3%	4,799	9.1%
TOTAL	1,983,192	100%	2,255,980	100%	272,788	13.8%

Source: Maryland Department of Labor (1st quarter)

Table 5-2 shows the major employers in Howard County, based on information provided by the Howard County Economic Development Authority (HCEA). Howard County continues to be an attractive place for large businesses. However, as important as large companies may be, HCEA's Strategic Plan suggests that fostering small to mid-size companies should be prioritized to achieve maximum future job growth. As new businesses expand, new job opportunities will arise, particularly in the professional and business services and technology sectors.

Given the highly-educated workforce in Howard County, the unemployment rate is typically among the lowest in Maryland. As of August 2021, the unemployment rate in Howard County was 4.3%, compared to 5.8% in Maryland and 5.2% in the US. It is anticipated that the unemployment rate will remain low in Howard County over the next 20 years as the County's job base and population continue to grow. Howard County's location in the middle of the Baltimore and Washington regions will continue to be an asset, attracting new businesses and offering opportunities for residents to find work that matches their education and skills.

Market Demand Conditions

In addition to projecting the need for 30,000 new housing units, the Market Research and Demand Forecast projected the need for 16.5 million square feet of commercial space and 1,000 hotel rooms. ~~The commercial space needs are broken down by industry in Table 5-3 and housing units are broken down by type.¹~~

Table 5-2: Howard County's Largest Private Employers (2022)

Employer	Estimated Employees	Product/Service
Johns Hopkins Applied Physics Laboratory	7,200	R&D systems engineering
Howard County General Hospital	1,800	Medical services
Verizon	1,700	Telecommunications
Howard Community College	1,400	Higher education
The Columbia Association	1,200	Nonprofit civic organization
Lorien Health Systems	1,190	Nursing care
Coastal Sunbelt Produce	1,050	Food products distribution
Nestle Dreyer's Ice Cream	835	Frozen desserts
Freshly	820	Prepared meals manufacturing
Wells Fargo	810	Financial services
Maxim Healthcare Services	675	HQ/Medical staffing, wellness
Oracle	650	Software development
W.R. Grace & Co.	600	HQ/Chemical R&D
Sysco Food Services	515	Food products distribution
Enterprise Community Partners	505	HQ/Community development

Note: Excludes post offices and state and local governments
Source: HCEA Research

Table 5-3: Summary of Demand 2020-2040

	Cumulative Demand By 5-Year Increment			
	2025	2030	2035	2040
Single-Family Detached (units)	3,428	5,808	7,996	9,807
Single-Family Attached (units)	2,743	4,685	6,502	8,033
Rental Apartment (units)	3,626	6,320	8,947	11,249
For-Sale Condominium (units)	437	859	1,361	1,884
Office (sf)	1,828,711	3,289,007	4,741,323	6,315,129
Flex (sf)	317,406	564,815	792,410	1,030,921
Industrial (sf)	2,358,227	4,164,086	5,570,199	7,150,158
Retail (sf)	642,400	1,125,800	1,603,300	2,037,600
Hotel (keys)	246	509	752	1,019

¹ As previously noted, RCLCO's Market Research and Demand Forecast projected a 59,000 increase in jobs by 2040. To arrive at this figure, RCLCO first examined Baltimore Metropolitan Council (BMC) projections for the region, then used Moody's Analytics projections to distribute regional growth by industry (adjusting for COVID-19 impacts), and finally determined the County's future share of regional industry growth using historical trends. RCLCO then projected household growth based on this projected employment growth, arriving at a projected need for 31,000 new housing units in the County. In addition to projecting the need for 31,000 new housing units, the Market Research and Demand Forecast projected the need for 16.5 million square feet of commercial space and 1,000 hotel rooms. RCLCO projected demand for office, flex, and industrial space by estimating the type of space and square footage needed to accommodate each new employee by industry; projections for hotel rooms were based on the current ratio between jobs in the County and hotel rooms. RCLCO projected demand for retail space based on estimated spending from new households and employees (adjusting for online spending).

CommErciaL

Commercial land uses comprise 3%, or approximately 6.9 square miles, of land in the County. Included in this category are retail, office, hotel, and service-oriented business uses. As shown in Map 5-1, these uses are primarily concentrated along major roads—Route 29, Route 1, and Route 40—or in suburban activity centers such as Downtown Columbia, Maple Lawn (including the neighboring Johns Hopkins Applied Physics Laboratory), and the Columbia Gateway area. Other locations are scattered throughout the County.

Most residents and employees will shop in-person near their home or place of work, while certain destinations are likely to draw users from across Howard County for specific shopping needs. Commercial uses are expected to be heavily concentrated in denser and/or more accessible parts of the County, such as Columbia, where office and retail demand is likely to be strongest. However, declining demand for “brick and mortar” retail and the changing needs of office users may lead to workplace transformations.

Based on the Department of Planning and Zoning (DPZ) land use database and CommunityViz modeling, it is estimated that there is potential to build about 10.1 million square feet of new non-residential building space in Howard County under current zoning, as shown in Table 5-4. This figure includes an additional 4.7 million square feet planned for Downtown Columbia. The Market Research and Demand Forecast indicated that there is a potential market demand in Howard County for 16.5 million square feet of new non-residential building space through the year 2040. As such, a shortfall of about 6.4 million square feet, or 38%, exists.

Table 5-4: Non-residential Jobs and Building Square Feet Potential Under Current Zoning and Undeveloped Land Capacity in Howard County

Non-Residential Building Type	Square Feet (X 1,000)	Estimated Jobs
Retail	1,700	4,100
A/B+ Office	5,200	17,300
B/C/Flex Office	800	2,600
Total	10,100	28,300

Source: DPZ Land Use Database and CommunityViz modeling

The existing capacity of 10.1 million square feet of non-residential space is estimated to accommodate 28,300 jobs, based on current jobs to building space ratios. This is less than half of the market demand of 59,000 new jobs over 20 years. This additional job demand could be accommodated through redevelopment opportunities in the activity centers and other non-residential character areas as identified on the Future Land Use Map (FLUM). These places can meet the greater market demand for non-residential space.

The greatest opportunity to accommodate the additional job demand would be the redevelopment of the large Regional Activity Center shown on the FLUM (the current Gateway office park). A master plan for Gateway could explore a variety of mixed-use development opportunities. Development in Gateway will extend beyond 2040 and could therefore accommodate additional demand after the 20-year timeframe of this Plan.



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This is a turning point in the future of economic development. The more people commute, work, and live in Columbia and surrounding cities within Howard County, the better off economically we will be in the future. Taking this opportunity to address where potential office space could be built and how well-equipped surrounding neighborhoods are to grow can help us retain more high paying jobs.

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- HoCo By Design process participant

KEY Business Districts and Corridors

Seven business districts (shown in Map 5-3) represent opportunities for employment growth at different scales. Each area presents diverse prospects for business to thrive and contributes different levels of economic impact. However, they all work together to maintain Howard County's regional status and high quality of life.

Main Streets

Howard County's main streets are anchored in areas with rich histories, featuring historic buildings of significance within unique built environments and landscapes. The County's only state-designated Main Street, Old Ellicott City, is an economic engine and boasts a collection of independent merchants and restaurants in an historic environment. As such, it is a regional tourism destination, a center for entrepreneurial endeavors, and an active, nationally-significant historic commercial district. The Ellicott City Watershed Master Plan (ECWMP), while a stand-alone document, is incorporated by reference in HoCo By Design and includes an economic development framework of policies and actions that are based on a market assessment and community engagement conducted through that planning process. These policies and actions guide new construction, redevelopment, existing business support, attraction and retention, and branding and marketing efforts along Main Street in Ellicott City.

While not designated as Main Streets or historic districts, smaller commercial districts also exist in Elkridge and Savage Mill. Both areas host a growing presence of small businesses that embrace the character of a typical main street and possess the potential to become destinations through deliberate placemaking, partnerships, and marketing.



Maryland Main Street Program

In 1988, the Maryland Department of Housing and Community Development established Main Street Maryland, a comprehensive program for traditional downtown revitalization. This program follows similar tenants to the National Trust for Historic Preservation's Main Street approach, focusing on economic development through activities such as historic building rehabilitation, organizational partnerships, marketing and promotion, special events, and improvements to public areas. Old Ellicott City became a state-designated Main Street in 2015.



Route 1 Corridor

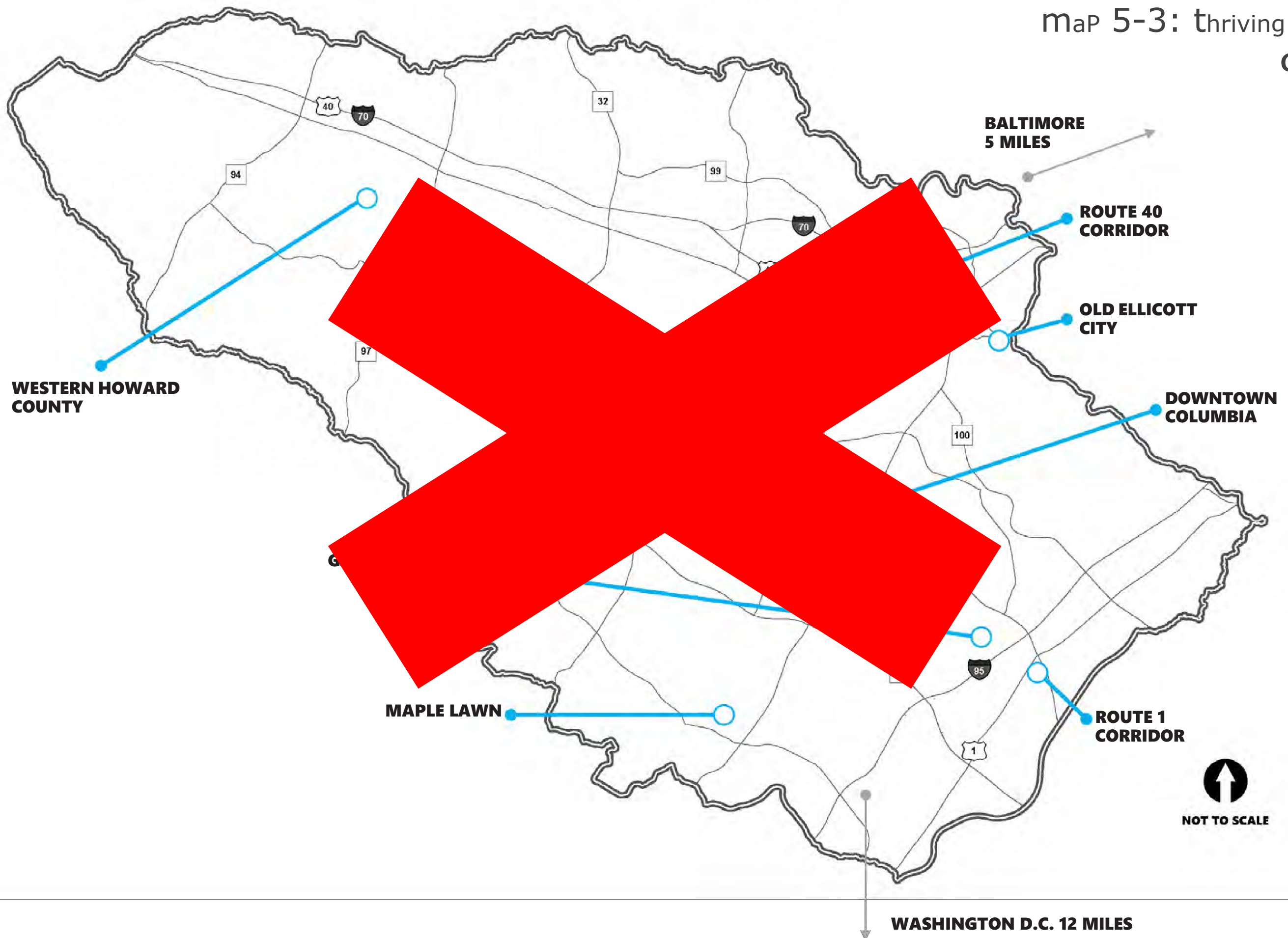
The Route 1 Corridor is located a few miles from the Baltimore Washington International Thurgood Marshall Airport (BWI), Fort Meade, the National Security Agency (NSA), the Port of Baltimore, and other important federal institutions. First known as the Washington and Baltimore Turnpike in the early 1800s, Route 1 currently serves as a critical eastern transportation corridor connecting major employment centers in Baltimore and Washington, DC. The nearly 12-mile stretch of Route 1 is an essential part of the vibrant neighborhoods and economy of Howard County. In 2020, the Route 1 Corridor's total employment accounted for 25.2% of all jobs in Howard County, according to the Maryland Department of Labor data, and is projected to grow an additional 1,000 jobs by 2025.

The Route 1 Corridor is characterized by a mix of heavy industrial, warehouse/distribution, and pockets of residential uses. Additional legacy uses include motels, trucking facilities, car repair businesses, fueling stations, and storage facilities. The Corridor also has a considerable number of underutilized properties woven into these various active uses, which have potential for redevelopment. The Corridor is also home to several historic communities, stable single-family subdivisions, and newer multi-family developments. The Corridor has four Transit Oriented Development (TOD) Districts—Oxford Square, Dorsey, Annapolis Junction, and Laurel Park—that allow for employment center opportunities within walking distance of public transportation.


The success of this industrial Corridor hinges on key economic trends, consumer preferences, and the changing retail climate. One trend is industrial space expansion from manufacturing to distribution and warehousing in submarkets along the Corridor—the southeast and east Elkridge. This expansion is partially driven by location and the profound shifts occurring in consumer spending patterns from point-of-sale locations to e-commerce sites. Retaining industrial land is of primary importance and often competes with efforts to create a safer, more attractive, and higher-functioning corridor. With the limited availability of large industrially-zoned properties, these limited resources must be closely managed and retained over time. Ground floor retail along the Corridor is struggling and will require regulatory changes to remain viable. Many parcels along the Route 1 Corridor are zoned Corridor Activity Center (CAC). The purpose of the CAC District, as stated in the Zoning Regulations, is to "...provide for the development of pedestrian-oriented, urban activity centers with a mix of uses which may include retail, service, office, and residential uses." This intended purpose has not been realized. As noted in the 2018 Land Development Regulations Assessment, many stakeholders indicated the 50% retail requirement was difficult to meet given retail market conditions along the Corridor. While the goals of this district remain desirable, the locations of these centers and incentives to create them must be revisited.

HoCo By Design's Future Land Use Map (FLUM) identifies focused activity centers throughout the Corridor to create compact, walkable environments that serve broader economic, entertainment, and housing needs in the community, including an Industrial Mixed-Use Activity Center character area. More information on the CAC district and activity centers in the Route 1 Corridor can be found in Route 1 Corridor: A Plan for Washington Boulevard.

map 5-3: thriving Business districts



EP-1 Policy Statement

 Retain and expand the use of industrial land to support employment opportunities that pay a living wage.

Implementing Actions

1. As part of the Zoning Regulations update, consider protective measures to ensure an adequate long-term supply of industrial land, such as additional requirements or impact statements for rezoning industrial land, zoning that discourages incompatible uses in heavy industrial areas, heavy buffer requirements for non-industrial users locating near heavy industrial land, or industrial overlay zoning for prime industrial land.
2. Determine how compatible uses can co-locate in designated Industrial Mixed-Use character areas to support industrial operations and create an active sense of place.
3. Prioritize for retention industrial land that is uniquely accessible to regional highways for continued industrial use.
4. During the Zoning Regulations update or via Zoning Amendments, favorably consider context-sensitive industrial uses along the Interstate 70 corridor.

EP-2 Policy Statement

Ensure redevelopment is consistent with the character of industrial areas.

Implementing Actions

1. Update the Route 1 Design Manual to include Industrial Mixed-Use character areas and incorporate buffers between redevelopment areas and industrial areas.

— “ —

The Plan needs to anticipate a changing economy and create economic opportunities for new enterprises and a diverse economy.

— “ —

- HoCo By Design process participant

growing EmErGing and Significant IndustriEs

Howard County has a strong local economy and serves as a regional employer. [As shown in Table 5-2](#), Howard County’s major employers represent a diverse set of industries. Strong and significant industries in the County include cybersecurity, information security, information technology, green technology, higher education, research and development, and finance. The nonprofit sector also plays an important role in the County; according to Maryland Nonprofits, Howard County was home to 2,094 nonprofits in 2019 (the largest of which was the Columbia Association). To maximize Howard County’s economic competitiveness in the region, economic development should support emerging and significant industries to continue to diversify employment opportunities. By keeping apprised of changing economic trends, Howard County will be able to attract new and diverse industries that support expected job growth. This economic development focus should include the manufacturing, distribution, and logistics industries, which are responding to changes in consumer trends.


The green or environmental industry is another important and emerging employment sector. According to the Bureau of Labor Statistics, green jobs are “jobs in businesses that produce goods or provide services that benefit the environment or conserve natural resources” or “jobs in which workers’ duties involve making their establishment’s production processes more environmentally friendly or use fewer natural resources.” Investment in the environmental sector accomplishes multiple sustainability goals. The environmental sector tends to endure through economic downturns, bolstering a sustainable economy. This sector traverses multiple industries and creates a significant job pool accessible to a variety of skill sets. By creating opportunities for workers without a college degree, green jobs promote economic mobility and help to close the opportunity gap. Importantly, green jobs also promote environmental sustainability through more efficient energy consumption, reduced greenhouse gas emissions and waste, ecosystem protection, and climate mitigation and adaptation.

Policies and the Zoning Regulations should support these emerging and significant industries to ensure a healthy and diverse local economy. This support will ensure that the County will be able to meet the future job demand, as indicated in the market study conducted for this General Plan. Deliberate efforts and investments would demonstrate the County is committed to being competitive to attract and grow emerging industry sectors.

EP-3 Policy Statement

Support and diversify the local job market to maximize opportunities to grow regional employment.

Implementing Actions

1.  Develop tools and strategies to support long-term job diversity initiatives, emerging industries, and job opportunities accessible to a variety of skill and educational levels.
2. Promote green industries by creating incentives to attract new businesses demonstrating sustainable practices or developing sustainable technologies, materials, and products.
3. Support new investment and job creation in emerging markets, especially those that reveal new opportunities for renewable energy and green technologies, including but not limited to solar arrays and canopies.

Greater housing diversity increases economic diversity, contributes to wealth expansion, creates new investments, and drives community growth by attracting young professionals, entrepreneurs, and workers with varied educational and professional backgrounds. While housing is primarily provided by the private sector, public policies will help to ensure a healthy balance of housing at different price points located in the right places. ~~Map 5-5 shows the current locations of housing types relative to activity center locations.~~ As activity centers grow, they can serve as locations for both jobs and housing and can provide amenities and job opportunities to the existing communities surrounding them.

EP-4 Policy Statement

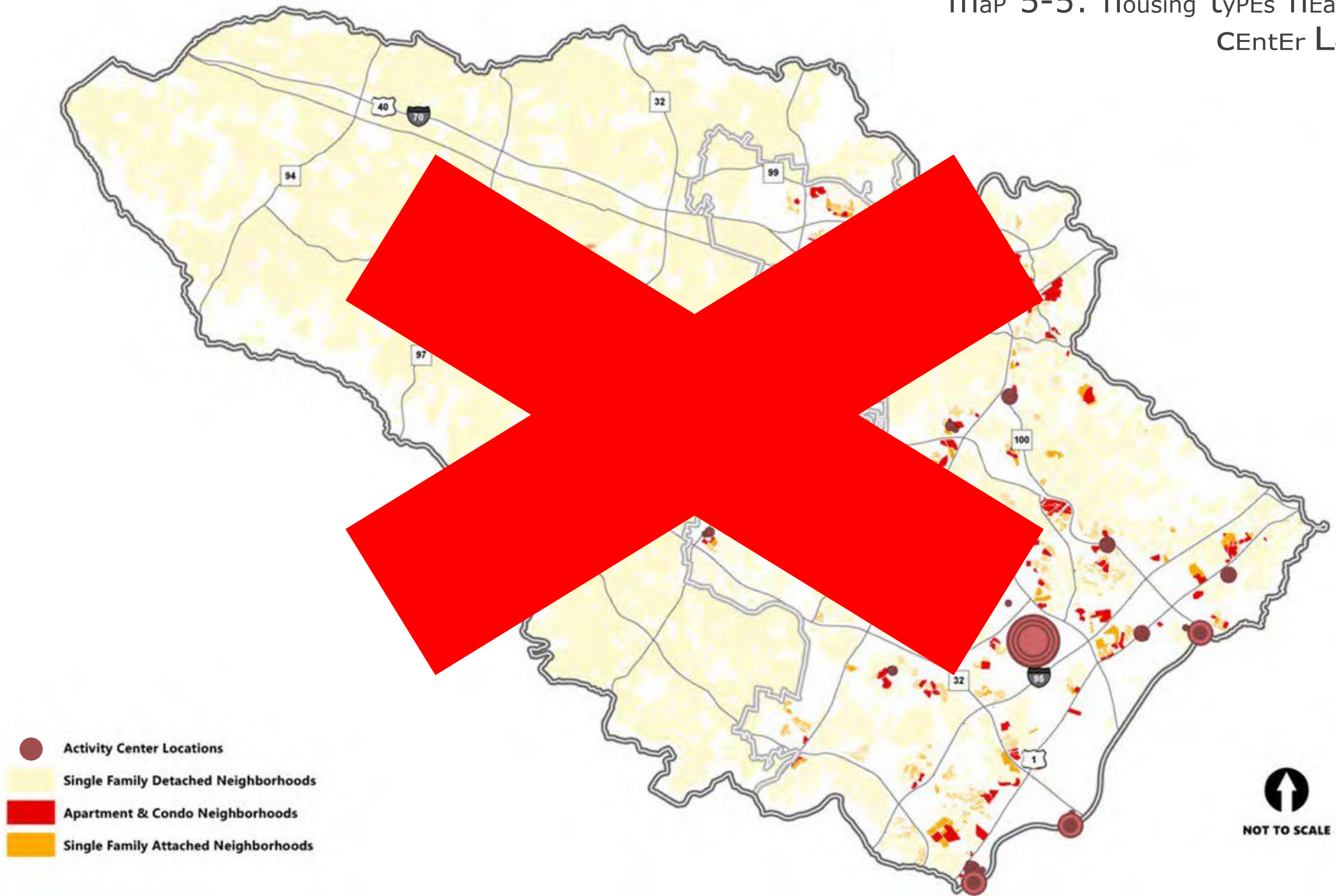
Create job opportunities through new mixed-use activity centers that serve as destinations and include a mix of uses that compliment and support one another and improve the jobs-housing balance.

Implementing Actions

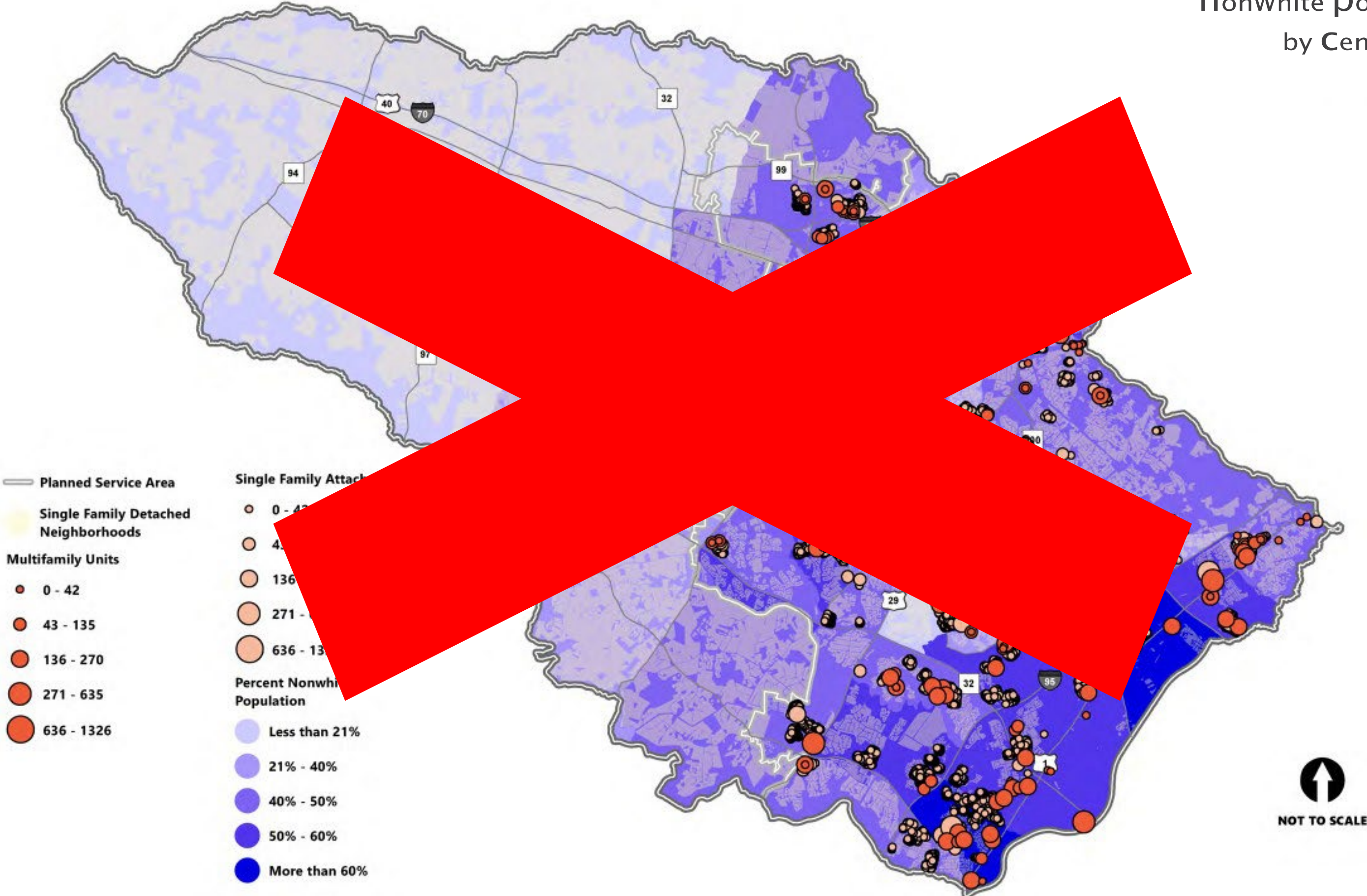
1. Revise the Zoning Regulations, Subdivision and Land Development Regulations, and other land use regulations and guidelines to ensure that mixed-use activity centers incorporate an array of housing types (possibly including goals for a specific percentage mix of housing types), walkable neighborhoods, open space, and compatible transitions between neighboring uses.
2. Allow sufficient densities in activity centers through the Zoning Regulations to make a wide range of uses economically viable. Encourage densities sufficient to support convenience retail and other local-serving amenities at the neighborhood level.
3. Plan for future transportation connections, including bicycle, pedestrian, and transit, among and between activity centers and other commercial centers.
4. Ensure that growth management tools consider the need for housing growth that keeps pace with employment growth in addition to infrastructure demands.
5. Develop a master plan for Gateway that describes the area's desired future mix of uses, open space network, development phasing and intensity, building height range, and infrastructure approach. Build upon the general considerations included in the HoCo By Design Focus Areas technical appendix.
6. Create opportunities to house the County's essential workers, including teachers, healthcare workers, and public safety personnel.



map 5-5: housing types near activity center locations



map 6-3: housing types and percent NonWhite population by Census tract



Map 6-3, on Pages 23-24, depicts the locations of existing multi-family buildings (both apartments and condos), single-family attached (SFA) neighborhoods, and single-family detached (SFD) neighborhoods. There is greater racial and ethnic diversity where there is a variety of housing types. While 36% of all census tracts have a nonwhite population that is 50% or greater, those same census tracts contain 60% of all apartment, townhome, and condominium units in the County.



Image 6-1 is an example of a modest-sized home, approximately 1,300 square feet, in the Cottages at Greenwood, a permanently affordable housing development that consists of 10 single-family homes on approximately 3.5 acres. This development provides homeownership opportunities for moderate-income households. In 2011 and 2012, homes in the neighborhood sold for \$252,400. In 2019, a home in the neighborhood sold for \$265,274.

Zoning Regulations and Missing Middle Housing

The Howard County Zoning Regulations and the Subdivision and Land Development Regulations govern the development and use of land in the County. The County has multiple zoning districts in which different uses are permitted, prohibited, or permitted with conditions. The Zoning Regulations dictate which housing types are permitted by-right, as an accessory use, or by conditional use in specific zoning districts. While the Zoning Regulations overall allow single-family detached, single-family attached, single-family semi-detached (homes that share a wall but have separate lots), and multi-family homes by-right, there are a limited number of zoning districts that allow single-family attached, single-family semi-detached, and multi-family homes by-right.

The series of zoning maps on the following pages depict where certain housing types are allowed by-right in the County. However, Map 6-7 reflects the locations in Columbia's New Town Zone that allow certain housing types because this zoning district is governed by Final Development Plans for small geographic areas that are more specific than the general residential zoning districts.

Map 6-4, on Pages 27-28, depicts where single-family detached homes are permitted by-right under the Zoning Regulations. Map 6-5, on Pages 29-30, shows where single-family attached and single-family semi-detached homes are permitted by-right under the Zoning Regulations. Map 6-6, on Pages 31-32, shows where multi-family and mixed-use residential homes are permitted by-right under the Zoning Regulations.

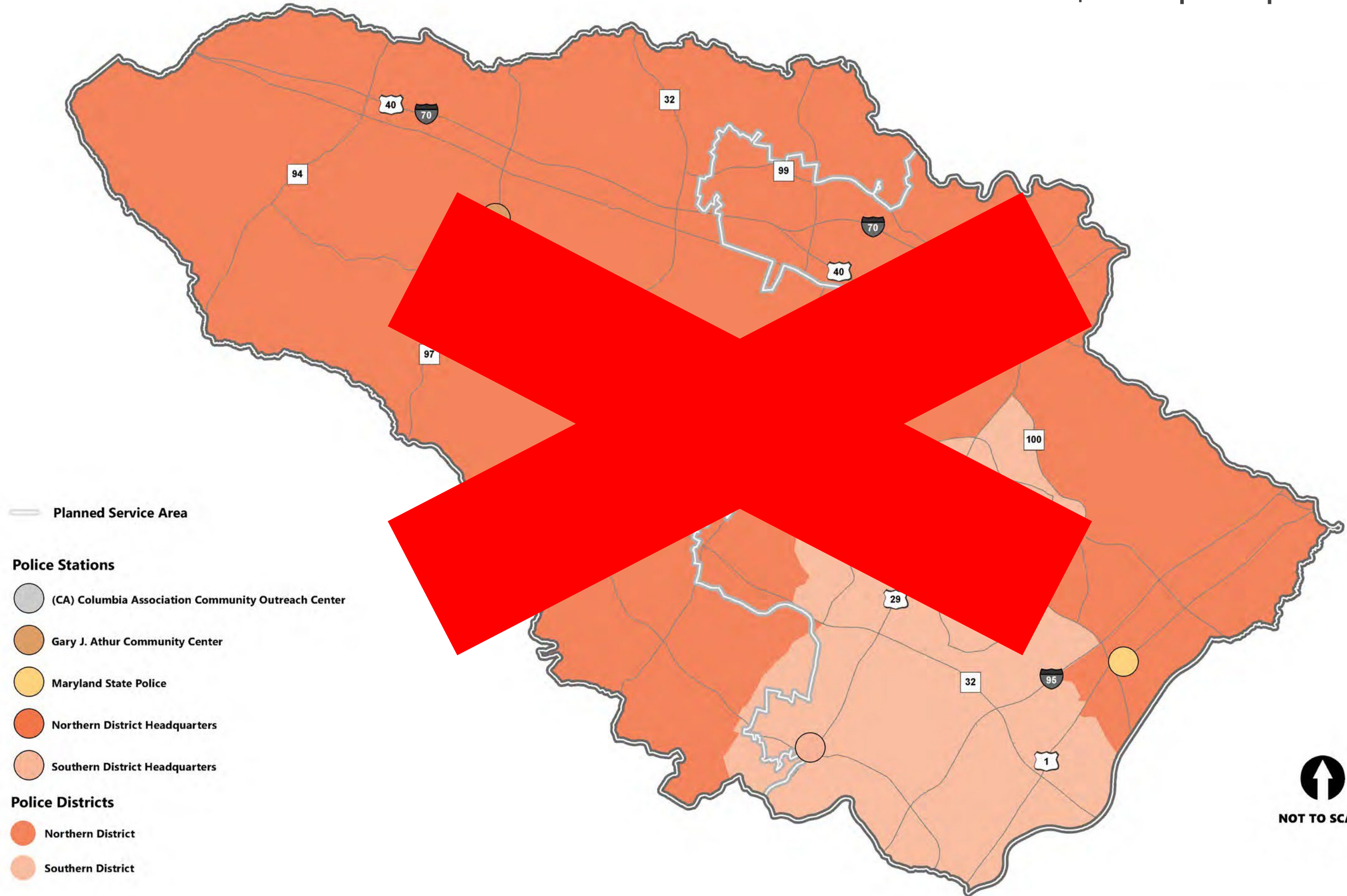


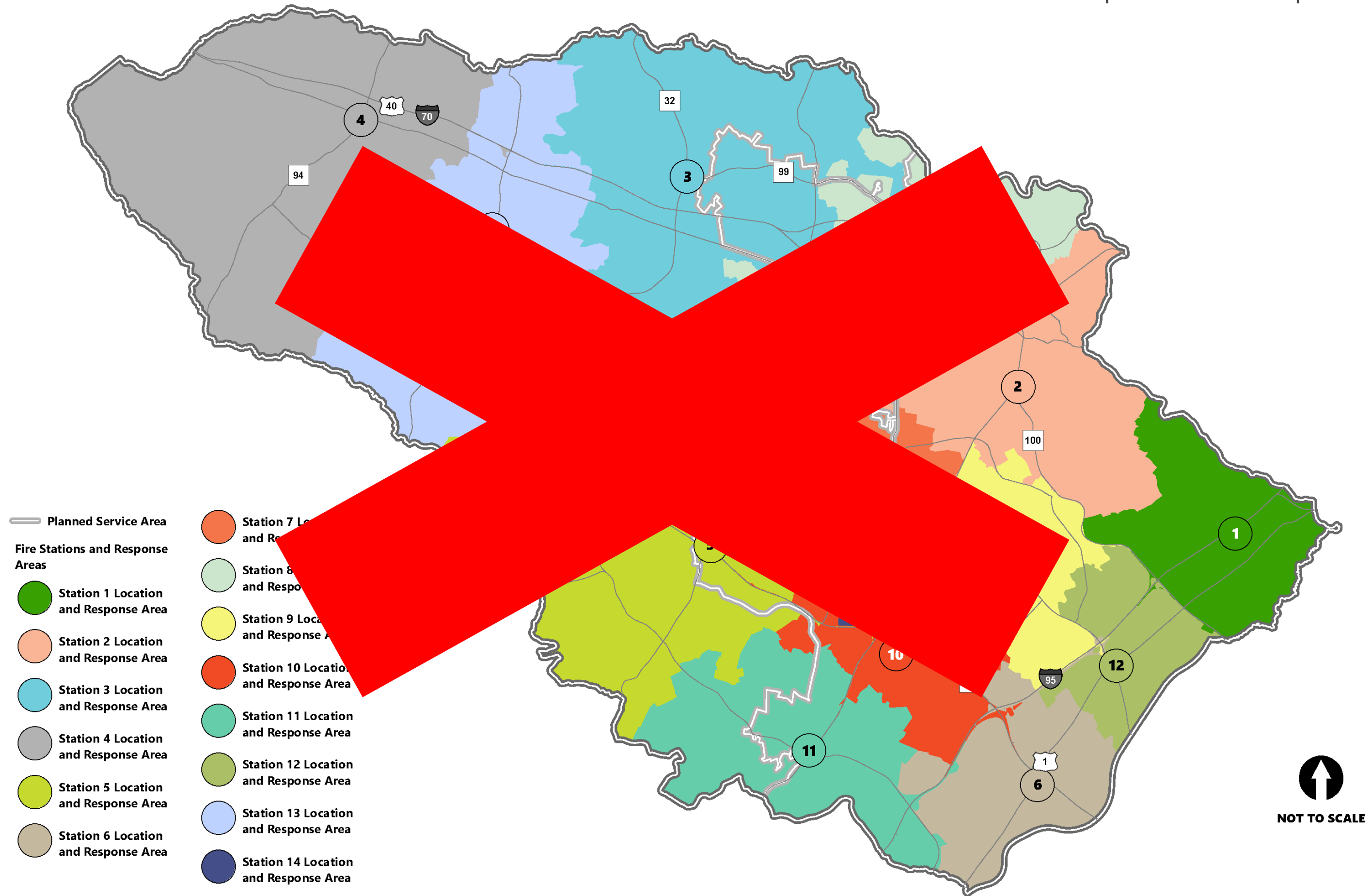
Image 6-2

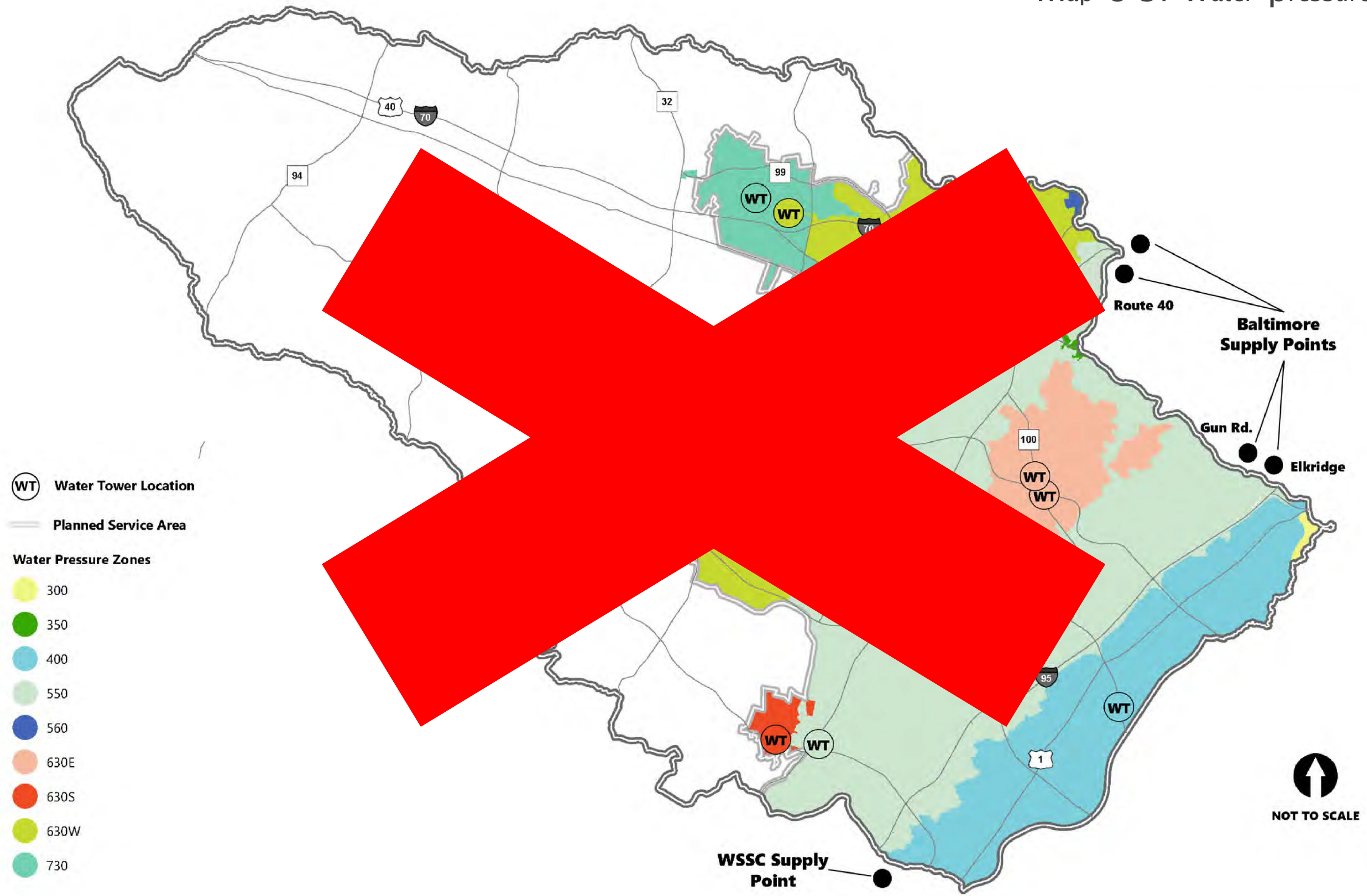


Image 6-3

Images 6-2 and 6-3 show examples of a duplex (semi-detached) and a two-family dwelling, both of which are allowed in limited areas under the Zoning Regulations. Homes in a duplex share a common wall but are divided by property lines (shown in yellow). A two-family dwelling has two separate living units but is on one parcel.







Public Water Supply

Howard County meets its bulk potable water needs from four connections with Baltimore City and one connection with the Washington Suburban Sanitary Commission (WSSC). Water is distributed to customers in the County by the Howard County Department of Public Works' Bureau of Utilities. In 2020, the public water system served 85% of Howard County residents and businesses. The remaining 15% were generally located in the Rural West and were served by private wells. Approximately 97% of residents and businesses located in the PSA were connected to public water.

The County's water system is divided into nine pressure zones, ~~as shown in Map 9-3~~. The water from WSSC is normally used in the County's water pressure zone located east of Interstate 95 between Laurel and Jessup. If needed, the County system can pump water from WSSC to other areas of the County, and water from Baltimore City can be substituted for water from WSSC.

The primary water sources for Baltimore City include Loch Raven, Prettyboy, and Liberty Reservoirs, with the Susquehanna River as a backup source. Baltimore City, in addition to supplying water to Howard County, also provides water to Anne Arundel, Baltimore, Carroll, and Harford Counties. Water sources for WSSC are the Triadelphia and Rocky Gorge Reservoirs and the Potomac River. WSSC, in addition to supplying water to Howard County, also provides water to Montgomery and Prince George's Counties.

Howard County purchases water from Baltimore City and WSSC through a series of negotiated legal agreements, which were most recently updated in 2017 and 2009, respectively. As shown in Table 8-1, in 2020, the County's average daily demand for water was 25.1 million gallons per day (MGD). The County's agreement with Baltimore City could provide the County with as much as 38.5 MGD of average daily flow, and the agreement with WSSC could provide as much as 3.0 MGD of average daily flow.

The County is currently in the process of expanding its capacity to purchase water from WSSC as added insurance in case of an emergency. This move was motivated, in part, by damage to a water main connected to the Baltimore City system that was made temporarily unavailable by a collapsed road in 2018. The County is currently negotiating and studying a second connection with WSSC for an additional 7.0 MGD of average daily flow, in case a similar emergency occurs (not to serve as added capacity for additional development).

~~As shown in Table 8-1, the~~ **THE** County's projected average daily water use in 2040 is 29.9 MGD and projected average daily flow is 48.5 MGD. The projected average daily water use was derived from growth projections modeled according to the Future Land Use Map (FLUM) and demand rates supplied by the Department of Public Works. Therefore, the supply of water is not expected to be a constraint on projected growth and development within the Planned Service Area through the year 2040. Considering the County is dependent upon outside sources for its public water supply, it should continue to closely monitor water consumption in relation to the rate of population growth and coordinate supply with bulk water service providers.

Table 8-1: Public Drinking Water Supply and Demand

Source	2020		2040	
	Average Daily Demand (MGD)	Capacity (MGD)	Projected Average Daily Use (MGD)	Projected Average Daily Flow (MGD)
Baltimore City	25.1	38.5	26.3	38.5
WSSC		3.0	3.6	10.0
Total	25.1	41.5	29.9	48.5

Groundwater

In the Rural West, drinking water is supplied by groundwater via individual wells that serve single lots, multi-use wells that serve a group of individuals on single lots and have a capacity greater than 1,500 gallons per day, and community wells that serve two or more lots. However, new privately owned or operated community wells or other community water supply systems are no longer permitted in the Rural West. There are also still a few areas within the PSA that are served by groundwater.

Howard County lies within the Piedmont Plateau and Atlantic Coastal Plain physiographic provinces. The Fall Zone forms a boundary between the two provinces and runs in a northeast to southwest direction roughly parallel with Interstate 95. Most wells in the County are in the Piedmont province.

The most recent study of groundwater quality and yield in the County is the Water Resources of Howard County, Maryland, published by the Maryland Geological Survey in 1995 as Bulletin 38. According to this study, there is generally an adequate supply of good-quality groundwater to serve projected ultimate development demand outside the PSA, even under drought conditions. However, this is a regional analysis that does not address individual well conditions. The ability to locate and tap groundwater in the Piedmont may vary significantly with well location because groundwater is stored in and travels through a network of fine cracks and fissures in the bedrock aquifer.

The withdrawal of water from groundwater supplies is regulated by the Maryland Department of the Environment (MDE), through the issuance of Water Appropriation Permits. Small water users, such as individual residences and agricultural users of less than 10,000 gallons per day, are exempt from permit requirements. Permit applications are reviewed to ensure that the quantity requested is available and reasonable, and that the withdrawal will not affect downstream or other users. To ensure the safety of well systems in the County, monitoring is conducted on a regular basis by the Health Department or the system owner, and the results are reported to MDE. Education for system owners is part of this monitoring process. The Health Department also regularly mails information to private residential and nonresidential property owners with wells about the need for routine well testing.



Source Water Assessments

The federal Safe Drinking Water Act Amendments of 1996 require source water assessments (SWA) for public water supplies. The SWA evaluates the susceptibility of the public water supply source to various contaminants and contains recommendations to protect the source from these contaminants. Source water assessments are designed to promote local, voluntary source water protection programs. For more information about SWAs and other water quality issues, please see Technical Appendix A: Environment.

Water Conservation

Clean safe drinking water is a valuable resource that should be used as wisely as possible. Potable water is currently used to flush toilets, water lawns and gardens, and wash vehicles, when non-potable water would suffice. To help conserve water, the State requires low-flow toilets and showerheads in all new residential construction. As a result of these fixture requirements and other water saving measures, such as new water efficient dishwashers and washing machines, per capita water consumption continues to decrease in the County.

Hot dry summer days place the greatest demand and strain on the public drinking water supply, as large volumes of water are used for landscape irrigation and other outdoor uses, such as pools, spas, and vehicle washing. Climate change is projected to bring warmer temperatures and more intense droughts, which could further increase demand for outdoor water use. Additional water conservation in homes, gardens, and businesses would help the County manage water resources more sustainably. Public outreach and education, as well as financial incentives, can encourage increased water conservation by residents and businesses.

Relatively easy conservation measures include using rain barrels to collect rainwater for outdoor watering, replacing lawns with native plants that require less watering once established, and installing water conserving fixtures and appliances. More complex measures include using cisterns to collect rainwater for irrigation of commercial landscapes and playing fields, or for indoor non-potable uses, and reusing greywater. Greywater reuse or recycling takes water from washing machines, sinks, and bathtubs for non-potable uses, such as flushing toilets and irrigation. Rainwater harvesting and greywater reuse for non-potable indoor uses have been discouraged or prohibited due to human health concerns. Building codes and regulations should be reviewed and modified where necessary to remove impediments for retrofitting existing and building new homes and businesses with water conservation and reuse practices and technology.

INF-9 Policy Statement

Ensure the safety and adequacy of the drinking water supply and promote water conservation and reuse.

Implementing Actions

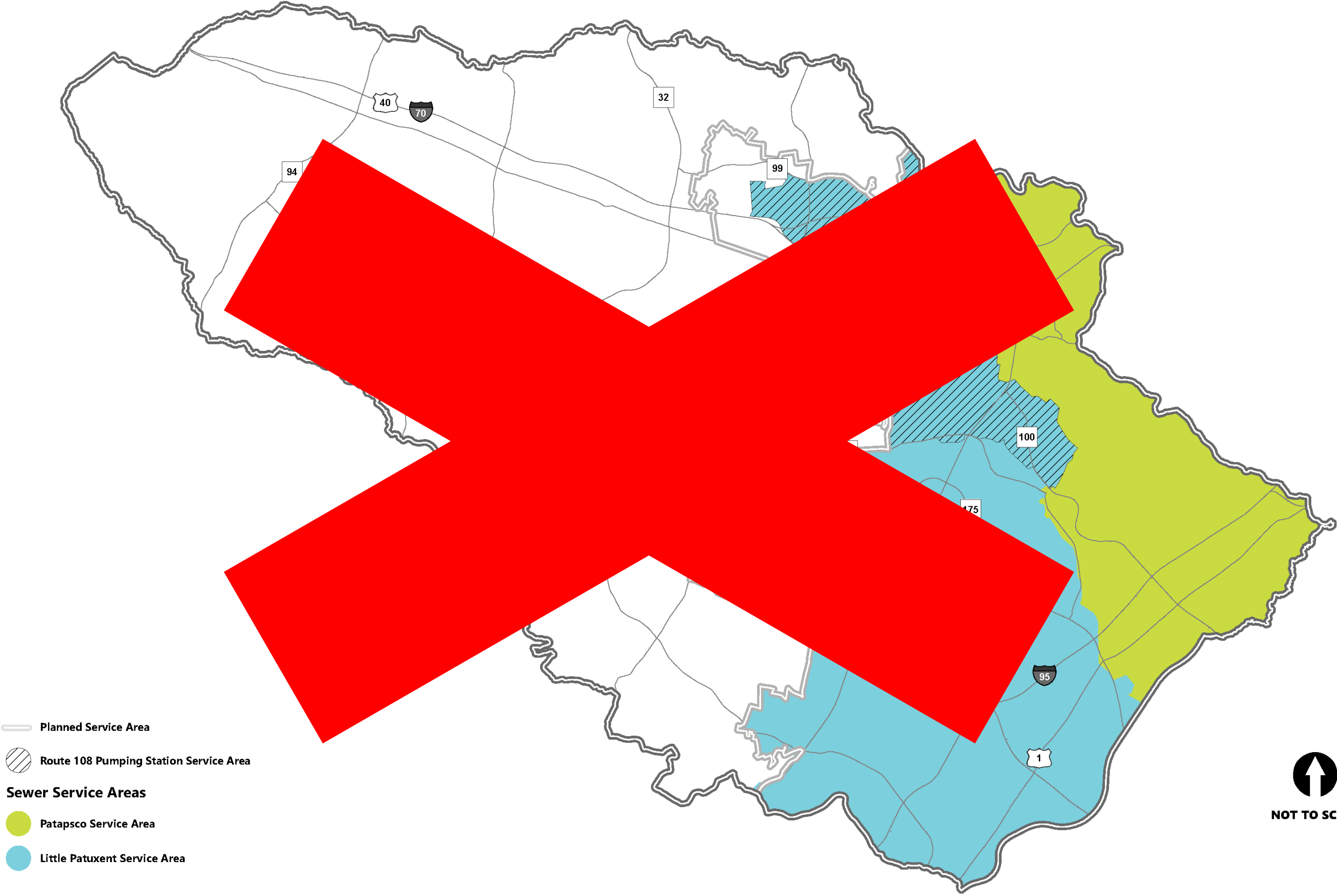
1. Continue to program capital projects for capacity expansion and systemic renovations in the public drinking water system through the Master Plan for Water and Sewerage.
2. Encourage large development sites added to the current Planned Service Area (PSA) and large redevelopment sites within the PSA to implement water conservation and reuse practices and technology.
3. Modify codes and regulations, as needed, to remove impediments for existing development, new development, and redevelopment to implement water conservation and reuse practices and technology.
4. Allow and promote greywater reuse for non-potable uses.
5. Conduct public outreach and education to encourage greater water conservation in homes, gardens, and businesses.
6. Provide incentives to encourage property owners to install water conserving fixtures and appliances.

Wastewater Treatment Plant Capacity

Howard County's public wastewater treatment system is managed by the Department of Public Works' Bureau of Utilities, which manages both the collection system and the Little Patuxent Water Reclamation Plant. In 2020, approximately 84% of the County's residences and businesses were served by the public sewer system. The remaining 16% were generally located in the Rural West and were served by private septic systems.

Howard County is split between two major river watersheds. Approximately 75% of the County falls inside the Patuxent River watershed, and the remaining 25% falls inside the Patapsco River watershed. Where possible, the County uses the natural topography of the Patuxent River and Patapsco River watersheds to provide sewer service, and relies on a gravity-fed system of smaller pipes to collect and convey wastewater into progressively larger main collector lines. If needed, a pumping station is used to convey wastewater over hills or difficult terrain. Depending on the watershed where the wastewater originated, the wastewater will end up at either the Little Patuxent Water Reclamation Plant (WRP) in Savage or Baltimore City's Patapsco Wastewater Treatment Plant (WWTP) for treatment.

The Route 108 Pumping Station service area, ~~as shown in Map 8-4~~, is a large sub-service area that provides system flexibility. This area is geographically part of the Little Patuxent WRP service area but, if needed, the County may divert flows from this area to the Patapsco WWTP service area.



-  Planned Service Area
-  Route 108 Pumping Station Service Area
- Sewer Service Areas**
-  Patapsco Service Area
-  Little Patuxent Service Area



As shown in Table 8-2, average AVERAGE daily use at the Little Patuxent WRP in 2020 was 21.0 MGD, and the plant has a treatment capacity of 29.0 MGD. The projected average daily use at the plant in 2040 is 24.6 MGD. The projected average daily use was derived from growth projections modeled according to the Future Land Use Map (FLUM) and demand rates supplied by the Department of Public Works. So at present, the plant's permitted treatment capacity is adequate through 2040.

The Patapsco WWTP is shared by Howard, Baltimore, and Anne Arundel Counties, and Baltimore City. As shown in Table 8-2, Howard County's share of total capacity at the plant (73.0 MGD) is 12.4 MGD. The County's share of capacity at the plant is secured through a negotiated legal agreement with its neighboring jurisdictions, which was most recently updated in 1984.

As shown in Table 8-2, County homes and businesses in the Patapsco River watershed generated 8.2 MGD of wastewater in 2020. Growth projections indicate that the County's average daily use at the Patapsco WWTP in 2040 will be 9.7 MGD. Howard County's share of the plant's treatment capacity in 2040 is adequate to meet future needs.

Table 8-2: Wastewater Treatment Plant Use and Capacity

Treatment Plant	2020		2040	
	Average Daily Usage (MGD)	Planned Average Daily Capacity (MGD)	Average Daily Usage (MGD)	Planned Average Daily Capacity (MGD)
Patapsco	8.2	12.4	9.7	12.4
Little Patuxent	21.0	29.0	24.6	29.0
Total	29.2	41.4	34.3	41.4

National Pollutant Discharge Elimination System Permits

Wastewater treatment plant capacity, including the expansion of existing plants or the addition of new plants, is controlled by the National Pollutant Discharge Elimination System (NPDES) through permits issued by the Maryland Department of the Environment in accordance with the federal Clean Water Act. As part of Maryland's commitment to meet Chesapeake Bay cleanup goals established in the Chesapeake 2000 Agreement, annual nutrient (nitrogen and phosphorus) loading caps were established for all major (design capacity greater than 0.5 MGD) wastewater treatment plants in the State. These nutrient loading caps were incorporated into Maryland's portion of the 2010 Chesapeake Bay Total Maximum Daily Load (TMDL) and are enforced through the NPDES permit for the plant. (For additional information about TMDLs, please see the Ecological Health chapter.)

The Little Patuxent WRP has an annual nutrient loading cap that is based on a flow of 25 MGD and the use of enhanced nutrient removal (ENR), a biological treatment process. The plant also has an additional nutrient loading allowance for the retirement of the Milk Producers WWTP. As shown in Table 8-3, this THIS gives the Little Patuxent WRP a total nutrient loading cap of 309,715 lbs/yr of nitrogen and 23,358 lbs/yr of phosphorus. The plant was within the nutrient loading cap for flows in 2020 and, based on projected demand, the plant will still meet its nutrient loading cap in 2040.

The Patapsco WWTP also has an annual nutrient loading cap that is based on a plant design capacity of 73 MGD and the use of ENR treatment. In January 2020, Baltimore City completed the addition of ENR facilities at the plant. This addition reduced planned capacity at the plant from 87.5 to 81.0 MGD. Table 8-3 gives the proportionate share of the nutrient loading cap that is available to Howard County, based on the County's allocation of 12.4 MGD. The County was within the nutrient loading cap for flows in 2020 and, based on projected demand, the County will still be within its nutrient loading cap at the plant in 2040.

Table 8-3: Wastewater Treatment Plant Nutrient Loads and Loading Caps

Treatment Plant	2020 Usage (MGD)	2020 Nutrient Load (lbs/yr)		2040 Usage (MGD)	2040 Nutrient Load (lbs/yr)		Nutrient Loading Cap (lbs/yr)	
		Nitrogen	Phos.		Nitrogen	Phos.	Nitrogen	Phos.
Patapsco	8.2	15,205	1,205	9.7	18,000	1,400	151,057	11,334
Little Patuxent	21.0	309,715	23,358	24.6	224,655	17,000	309,715	23,358



After a development project receives housing allocations, it then takes the school capacity test. To pass this test, the elementary school district, the elementary school region, the middle school district, and the high school district where the project is located must each be under 105%, 105%, 110%, and 115% local rated capacity utilization, respectively. If school capacity is not available at any level (elementary, middle, or high), then the project is placed on hold. The school capacity test is retaken annually, based on the new school capacity chart approved by the Howard County Board of Education (BOE) and then adopted by the County Council, typically each July. Once the school districts in which the development project is located have adequate capacity, the project can proceed. If not, the project remains on hold for another year. Projects can be held up to a maximum of five tests due to closed schools (generally three to four years). This means that even if the schools still do not have adequate capacity after five tests, the development project may proceed nonetheless. This period, when projects are on hold, allows the Howard County Public School System (HCPSS) to plan, fund, and build new schools and additions. Redistricting may also occur to allow the efficient use of systemwide capacity that may be available.

[Map 10-2 shows the school districts closed to development as of July 2022.](#)

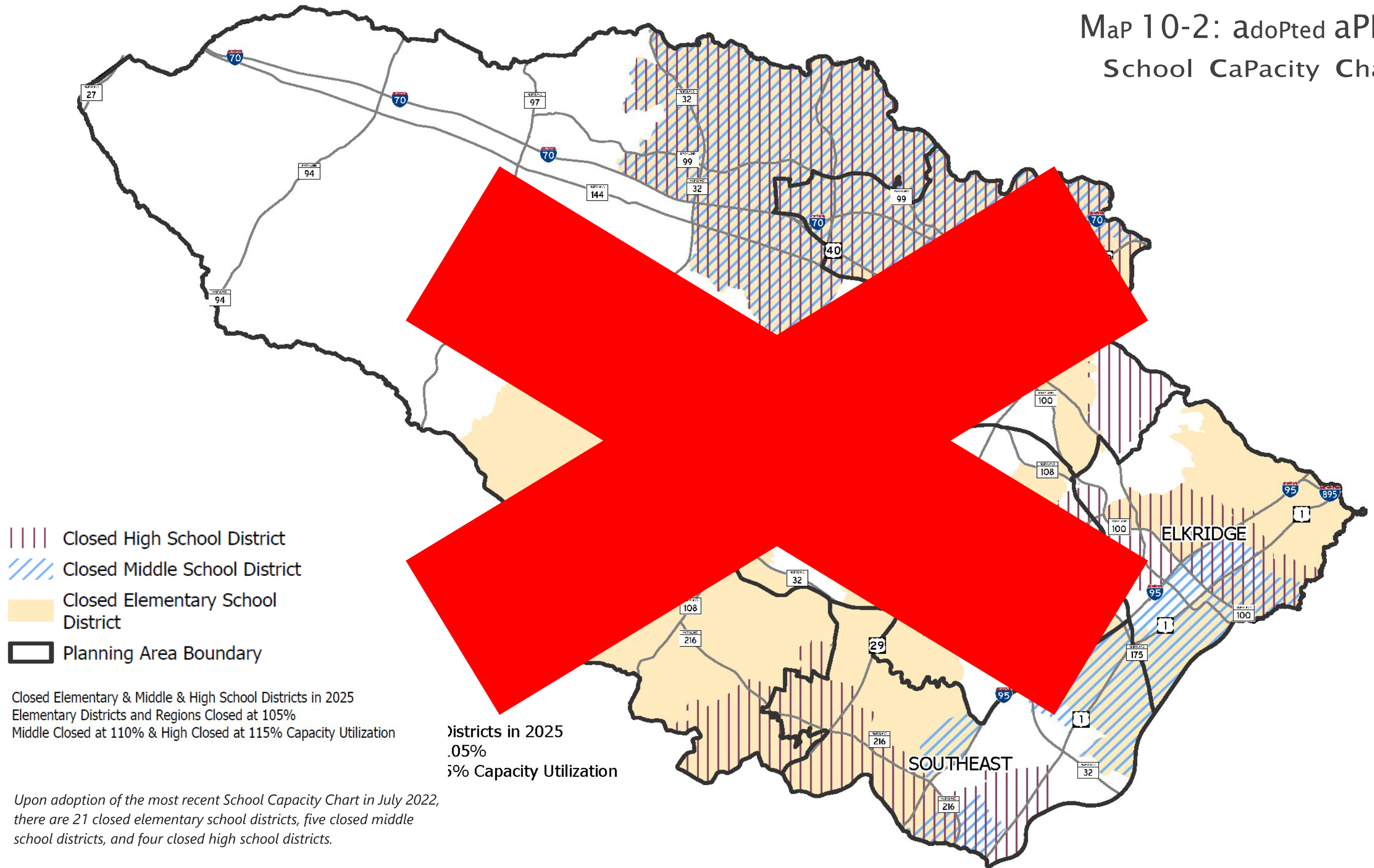
~~Table 10-2 shows the number of housing units that have been placed on hold (paused) since APFO was first adopted in 1992. This includes units that have been placed on hold due to a lack of available allocations and units on hold due to school capacity restrictions. (Note that APFO is designed to be forward looking. The allocation year is three years ahead of the time the plan is first submitted to the Department of Planning and Zoning (DPZ) for review, as it typically takes about three years for a plan to move through the development review process and be completely built. Hence, 1995 is the first allocation year.) As indicated in Table 10-2, more than 23,000 housing units have been placed on hold since APFO first began.~~



Table 10-2: Total Units on Hold Allocations & School Capacity Waiting Bin

Allocation Year	Allocations	School Capacity	Total
1995	0	0	0
1996	63	0	63
1997	832	62	894
1998	688	533	1,221
1999	869	0	869
2000	109	0	109
2001	74	51	125
2002	484	154	638
2003	360		360
Plan 2000 Additions			
Allocation Year	Allocations	School Capacity	Total
2003			536
2004			873
2005			1,360
2006		2	1,458
2007		966	1,960
2009		756	1,758
2010		363	3,288
2011		0	553
2012		0	261
2013		16	264
2014		50	1,061
2015			50
Plan 2015 Additions			
Allocation Year	Allocations	School Capacity	Total
2015			168
2016	11		171
2017	485		667
2018	0	59	509
2019	0	851	851
2020	0	804	804
2021	0	662	662
2022	0	411	411
2023	0	533	533
2024	0	736	736
Total Units Paused Since Beginning of APFO			23,358

Map 10-2: adopted aPfo School CaPacity Chart



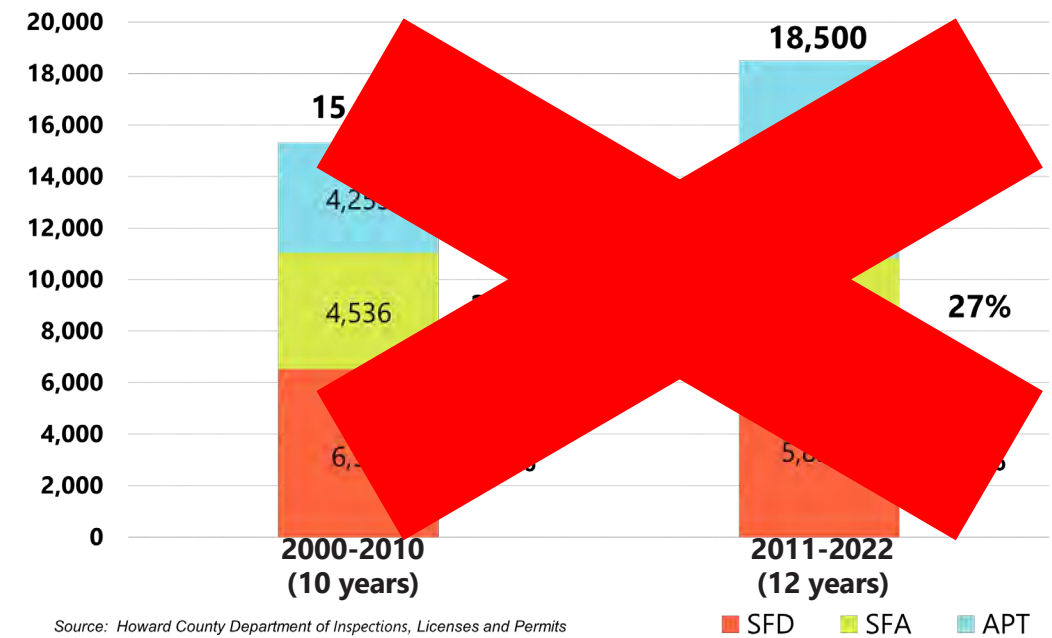
Residential Growth Trends

While APFO is not perfect, it has succeeded in pacing residential growth according to General Plan projections and goals. Over the last 20 years, there has been an annual average of 1,537 new housing units built in the County. However, of the past six years, the annual average has decreased to 1,300 units a year. Consequently, a surplus of unused allocations has ensued, resulting in a gradual buildup of available housing allocations in recent years. ~~Graph 10-1 shows building permits issued since 2001 and reflects the decline in residential construction in recent years. Graph 10-1 also shows development by unit type.~~ The years with the greatest housing growth are attributed to large numbers of multi-family units coming on-line, typically associated with large apartment projects in Downtown Columbia and the Transit Oriented Development (TOD) and Corridor Activity Center (CAC) zones along the Route 1 Corridor. ~~As further depicted in Graph 10-2, in~~ more recent years a greater number of apartment units have been built with less single-family detached and single-family attached units built.

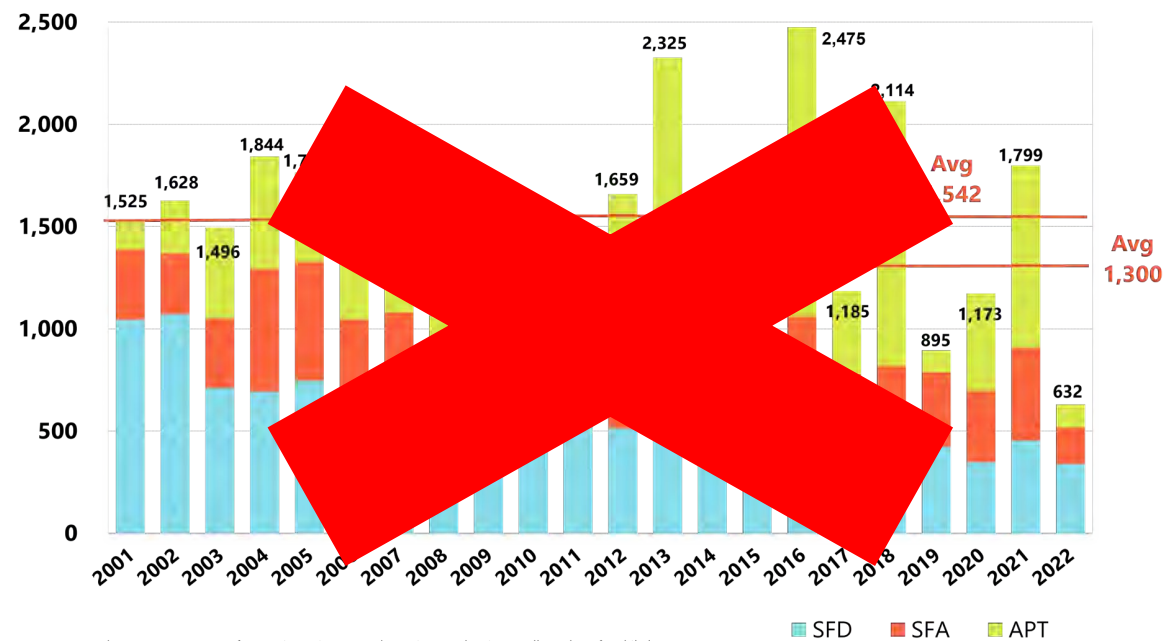
The surplus in allocations may be attributed in part to APFO amendments adopted in early 2018, which have resulted in more school districts being closed to development, as reflected in Map 10-2. A significant change to the law included lowering the capacity utilization percentages when elementary districts and regions are closed to development from 115% to 105% and middle school districts from 115% to 110%, and adding a high school district test at a 115% threshold. This change has had an impact on proposed new residential development, given the extent of the closed areas in the County.

This recent trend of slower residential development is also a result of a limited land supply in Howard County. Much of the new residential development opportunities in the future in Howard County will come from redevelopment, as reflected in the Future Land Use Map.

**Graph 10-2: Residential Building Permits Issued - By Unit Type
Howard County**



**Graph 10-1: Residential Building Permits Issued
2001 through 2022 Howard County**



Nonresidential Market Demand

According to the Maryland Department of Labor 2nd Quarter 2019 Quarterly Census of Employment and Wages (QCEW), businesses in the Route 1 Corridor employed a total of 43,239 employees in 2019. The wholesale trade industry is the largest employer in the Corridor. Other significant employment sectors include manufacturing, trucking, construction, retail trade, transportation and warehousing, storage facilities, food production, and accommodation and food services. These employers are anchored by industrial, manufacturing, and flex space offered along the Corridor. However, several underutilized properties in the area offer opportunities to support existing or attract new employers. Retaining industrial land and creating opportunities for expansion—while a chief goal—should be balanced with efforts to create a safer and more attractive Corridor.

Table RTE 1-1 - Estimated 2040 Demand, Square Feet and Units								
	Road	Office SF	Industrial SF	Flex SF	Hotel	SFA Units	APT (Rental) Units	Condo Units
Elkridge East (Bounded by 95 to West, 175 to South)	237,000					1,356	2,067	257
Southeast (Bounded by 95 to West, 175 to North)	203,200					955	1,686	135
Total Route 1	440,200	5,261,890	503,486			2,311	3,753	392

Source: RCLCO Market Assessment

Industrial and Manufacturing Base

Based on QCEW data, it is estimated that there were roughly 28,698 industrial/manufacturing/warehouse jobs located within the Route 1 Corridor in the second quarter of 2019. According to CoStar commercial reality data from 2022, the industrial building inventory in the Route 1 Corridor was 29,050,000 square feet. According to RCLCO's Market Research and Demand Forecast completed in 2020, the Corridor could expect demand for an additional 5,261,890 square feet of new building space through 2040 (See Table RTE 1-1 above). With the limited availability of large industrially-zoned properties, the County should closely manage how this limited resource is developed over time, including zoning for multi-story facilities to expand capacity.

Demand for warehouse and distribution space will continue, especially given the burgeoning e-commerce industry and regional opportunities to capture this sector. New distribution spaces have located within a 15-mile radius of the Route 1 Corridor, with international facilities at BWI Airport and over 15 million square feet of new warehouse/distribution slated for Tradepoint Atlantic, formerly the Sparrows Point steel mill. Regional distribution facilities for Under Armour, Home Depot, Floor & Décor, Federal Express, and Amazon are completed. As e-commerce continues to acquire market share from traditional retailers, Howard County should expect demand to increase. While limited land is available for large distribution facilities, opportunities exist to repurpose underutilized land for such facilities. One example of such opportunities is land used by vehicle remarketing service companies adjacent to Dorsey Run Road.

Commercial: Office and Flex Space

Historically, the Route 1 Corridor has not been conducive to traditional office development even though it is positioned between, and benefits from, the economic activities generated by Baltimore, the District of Columbia, Fort Meade, other major employment cores in Montgomery County, and the BWI Airport area of Anne Arundel County. As discussed earlier, the Corridor is dominated by industrial, warehouse distribution, industrial flex, and other land uses not typically considered attractive, and it lacks a draw for office development. With this broad mix of uses, the Corridor has not produced a location with a concentration of the types of amenities that attract traditional office users—such as walking paths, nearby restaurants, and transit. Additionally, the Corridor competes with the office market in nearby Downtown Columbia and Gateway. However, the employment sectors most likely to generate demand for future office space include: 1) Information; 2) Finance & Insurance; 3) Real Estate, Rental & Leasing; 4) Professional, Scientific, & Tech Services; 5) Management of Companies & Enterprises; 6) Administrative & Support & Waste Management & Remediation Services; and 7) Public Administration (Source: EMSI, US labor market analytics and economic data). According to the Maryland Department of Labor data from 2nd Quarter 2019, the total employment in office jobs along the Route 1 Corridor is 11,675.

The concentration of secure operation centers in the Baltimore-Washington corridor is one of the highest in the nation and is comparable to regions such as San Francisco, Seattle, and Boston. Fort Meade, in neighboring Anne Arundel County, is the nation's epicenter of national security. Fort Meade houses approximately 55,000 jobs on-site and another 110,000 jobs off the base. In 2019, over 13,000 County residents worked at the Fort Meade campus. Extensive growth is projected to continue at Fort Meade in support of the National Security Agency, Defense Cyber Command, and Service Cyber Headquarters. From 2010–2020, this growth added 10,000 jobs and is projected to add upwards of 10,000 more positions to the Fort Meade workforce. Many secure operation center jobs in the County are located within the Route 1 Corridor or nearby. As this office sector continues to grow, the County should capitalize on its expansion and encourage firms to make Howard County their home.

To support a diverse economic development strategy for Howard County, the Route 1 Corridor must sustain a thriving industrial and warehouse base. County regulations and guidelines should be updated to promote new light industrial, warehouse, and flex spaces. Strategies to protect, promote, and expand existing industrial uses must be developed and implemented in coordination with the County's Economic Development Authority (HCEDA) and Office of Workforce Development (HCOWD). The Howard County Workforce Development Area 2020-2024 Local Workforce Plan identifies manufacturing and wholesale trade as priority industries. HCOWD also acknowledges that manufacturing, transportation and logistics, and data center jobs are in-demand in the County. The HCOWD has sponsored job fairs and events, including an introductory workshop on artificial intelligence (AI) in manufacturing, warehousing, and logistics, which many businesses attended.



RTE 1-7 Policy Statement

Create recognizable entrances (gateways) that distinguish the Route 1 Corridor from adjacent areas.

Implementing Actions

1. Evaluate signage, landscaping, public art, and streetscape improvements at various gateways along the Corridor and explore Sustainable Communities funding for entrance gateway signage.
2. Work with property owners and the community to implement appropriate elements.
3. Prioritize gateways at bridge crossings for the Patuxent and Patapsco Rivers and activity center areas.

RTE 1-8 Policy Statement

Create a uniform brand, marketing, and signage plan for the Route 1 Corridor.

Implementing Actions

1. Encourage signage consistent with a branding plan.
2. Work with community and property owners on placement of branding elements along the Route 1 Corridor.
3. Evaluate the County's sign ordinance and Route 1 Manual to allow signage in the Corridor that implements the branding, signage, or marketing plan.

RTE 1-9 Policy Statement

Revise the Route 1 Manual and County regulations to implement the HoCo By Design and Route 1 Corridor Plan development and redevelopment recommendations.

Implementing Actions

1. Revise the Zoning Regulations and Subdivision and Land Development Regulations to support corridor-wide new development and redevelopment.
2. Update the Route 1 Manual after County regulations are updated to implement recommendations and clarify inconsistencies outlined in the 2018 Development Regulations Assessment.
3. Update the Design Advisory Panel Rules of Procedures and County Code to include criteria for the Route 1 activity center areas.

Protecting Environmental Health in the Corridor

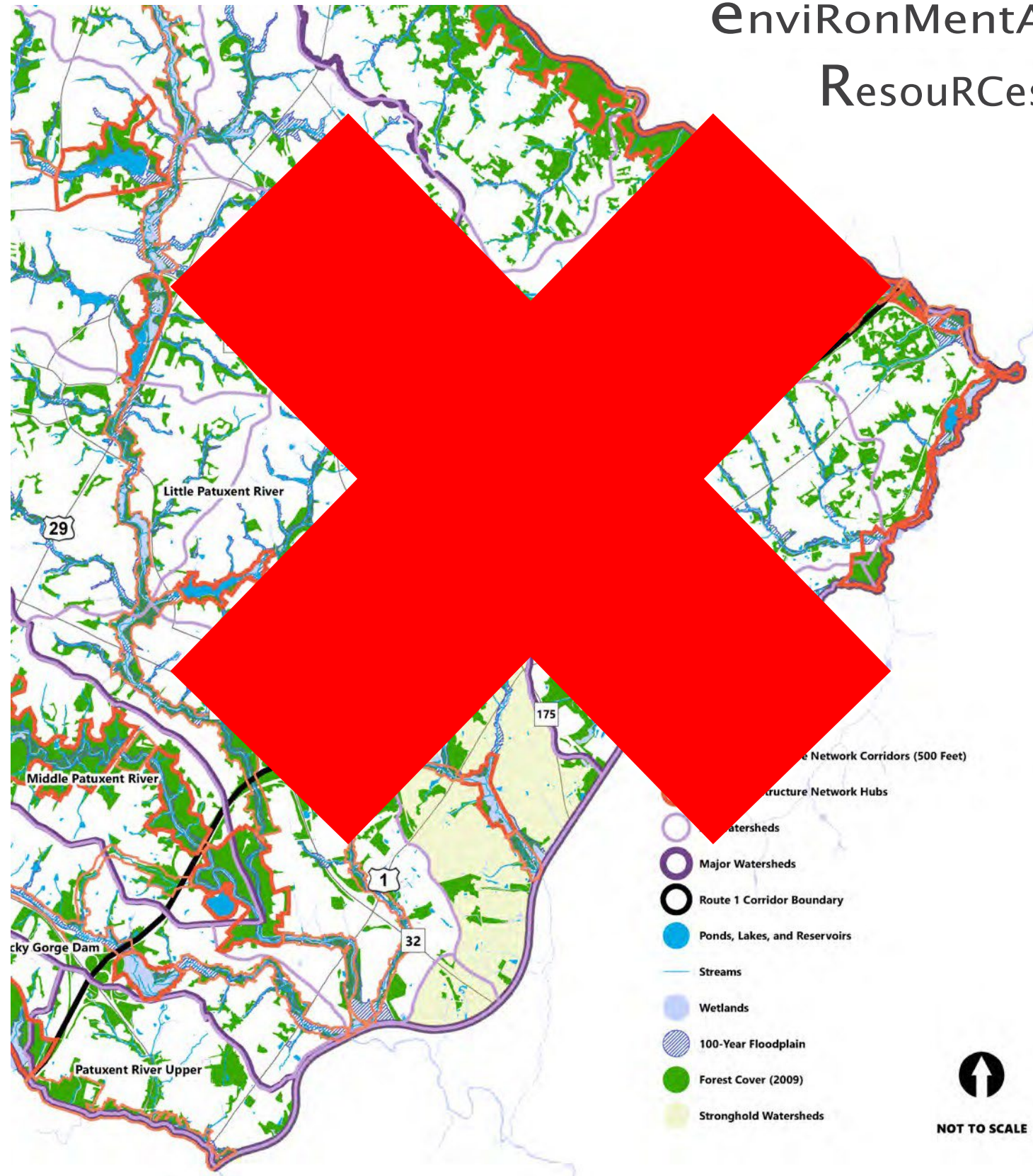
The Route 1 Corridor is located within and near significant natural resource areas. ~~As shown in Map RTE 1-9, the~~ The Corridor contains portions of the Patapsco River Lower North Branch, Little Patuxent River, Middle Patuxent River, and Patuxent River Upper watersheds. Bookended by the Patapsco River at the northern boundary and the Patuxent River to the south, the 12-mile Corridor crosses numerous other streams that flow perpendicular to the alignment of Route 1. Many of these streams have forested or partially forested buffers, and larger streams have 100-year floodplains that may also contain wetlands. The Corridor has 18% open space and parkland, and approximately 25% forest cover.

The Corridor contains portions of the County's Green Infrastructure Network (GIN), including nine hubs with significant forest and wetland resources and nine stream-based corridors. Most of the land in the hubs is protected from development because it is located within parkland, open space, and/or the 100-year floodplain. The Corridor contains several sensitive species project review areas (SSPRAs) that are indicative of habitat for rare, threatened, or endangered species. Two of these SSPRAs are located within the GIN. The Dorsey Run and Junction Industrial Park subwatersheds of the Little Patuxent River are designated as Stronghold Watersheds because they have high aquatic biodiversity. The Patuxent River watershed is a Tier II watershed because there is a Tier II segment of the river downstream in Anne Arundel County.

The County's current development regulations protect sensitive environmental resources, including 100-year floodplains, streams, wetlands, larger areas of steep slopes, and rare, threatened, or endangered species habitat. The Forest Conservation Act requires mitigation for forest clearing and stormwater management regulations require redevelopment improves water quality management.

HoCo By Design's Ecological Health chapter contains policies and actions intended to protect and restore ecological health in the County. Protection and restoration measures that could be considered for the Route 1 Corridor as it redevelops include restoring forested stream and wetland buffers to meet current minimum width requirements, ensuring forest clearing mitigation is provided within the Corridor, exceeding minimum stormwater management requirements, increasing native tree canopy, protecting the GIN through an easement or land purchase program, and increasing private property owner stewardship.

MAP Rte 1 -9: Route 1 CoRRidoR enviRonMentAl ResouRCes



tRAnSPoRtAtion in the Route 1 CoRRidoR

The Route 1 Corridor features a wide mix of land uses and functions, including residential, commercial, industrial, institutional, and lodging. Residential and industrial uses dominate the Corridor, with residential uses concentrated west of Route 1 and industrial uses concentrated east of Route 1. The Route 1 Corridor is bisected by major arterials (Routes 32, 175, and 100) that—together with industrial and commercial land uses—result in a transportation network primarily comprised of commercial vehicles and freight movements.

Route 1 serves both regional and local transportation needs and modes by providing access for residents' day-to-day travel while also serving as a linkage between regional transportation corridors for regional and national travel. A significant portion of this regional and national travel is associated with industrial uses along the Route 1 Corridor and is characterized by a wide variety of truck classes, from box trucks delivering goods to business in the region to tractor trailers serving national distribution centers in the Corridor. These vehicles have specific design demands and limitations, such as turning radii, stopping distances, and vertical clearances. These two roles are often in conflict with one another and balancing the needs of each is an important objective in HoCo By Design.

The Route 1 Corridor's rail and public transit infrastructure is an outcome of the Corridor's historic north-south alignment. The Corridor has strong freight rail connections and hubs, and peak-hour passenger rail to Baltimore and Washington, DC at Maryland Area Rail Commuter (MARC) stations in Dorsey, Jessup, Savage, and Laurel Park (formally known as the Laurel Racetrack). Bus service is provided by the Maryland Transit Administration (MTA) and Regional Transportation Agency (RTA) systems, but service is limited with low frequency routes and few transit hubs. This service pattern, coupled with limited and scattered high-density development along the entire Corridor, has not created the conditions necessary for investment in more frequent transit service. Infrastructure for walking and biking in the Corridor is poor and disconnected, a reflection of the automobile-centric built environment. These conditions have impacted safety for pedestrians and cyclists, and made public transit a less useful and effective transportation option.



Climate Change Mitigation and Adaptation

In addition to developing climate action plans, Maryland and Howard County have taken other actions to address climate change mitigation and adaptation. Maryland established a Renewable Energy Portfolio Standard in 2004 that was amended in 2019 to set a goal of having 50% of the energy generated or sold in Maryland be from renewable sources, including 14.5% from solar by 2030 and up to 10% from offshore wind by 2025. Maryland also passed the Greenhouse Gas Emissions Reduction Act in 2009, with an update in 2016, that set a goal of reducing statewide greenhouse gas (GHG) emissions by a minimum of 60% from 2006 levels by 2031, while improving the State’s economy and creating jobs. The State’s Climate Solutions Now Act of 2022 increased this goal to reducing statewide GHG emissions by a minimum of 60% from 2006 levels by 2031 and to net-zero emissions by 2045.

Howard County issued an Executive Order in 2019 setting a goal to reduce GHG emissions from County government operations to 45% below 2010 levels by 2030 and to reach zero emissions by 2050. The Executive Order sets several objectives to meet this goal, including: meet 20% of the electricity demand for local government operations with distributed, renewable energy generation on County-owned properties by 2024; reduce on- road vehicle petroleum consumption by the County fleet by 20% by 2024; and reduce electricity consumption by government operations by 25% by June 2023. In 2022, a new Howard County Executive Order was issued increasing this goal to reduce GHG emissions from all public and private sectors in the County to 60% below 2005 levels by 2030 and to reach net-zero emissions by 2045

In 2019, Howard County became the first county in the nation to formally accept the United States Climate Alliance’s Natural and Working Lands Challenge. That program commits communities to reduce GHG emissions and increase carbon sequestration in forests, farms, and other land, and to incorporate these strategies into GHG mitigation plans by 2020. The County is also a signatory to the “We Are Still In” declaration, a commitment from numerous communities, institutions, and businesses to continue to support the global pact to reduce emissions.



Water Quality In Local Streams

Water resources are linked together through the hydrologic cycle, which circulates water from the atmosphere to the land, groundwater, and surface water, and then back to the atmosphere. This linkage means that impacts on one water resource can have successive impacts on others.

Human activities can impact water resources by removing vegetation, disturbing and compacting the soil, and covering the land with impervious surfaces, such as buildings, roads, and parking lots. When the land’s capacity to absorb and hold water is decreased, the water available for groundwater recharge is also decreased. In addition, the land generates more stormwater runoff, which flows at a faster rate into local streams.

These changes in groundwater recharge and runoff degrade water quality and habitat in local streams. Groundwater supplies the low flow or base flow in streams. As groundwater recharge decreases, groundwater levels drop, which subsequently lowers base flow levels in streams. If base flow levels drop too much, stream channels can dry up in times of low precipitation. Conversely, increased runoff flowing at a faster rate increases the frequency and magnitude of flooding and increases stream channel erosion. Increased channel erosion generates more sediment loading in the stream and undercuts banks, often toppling trees and other vegetation along the stream banks.

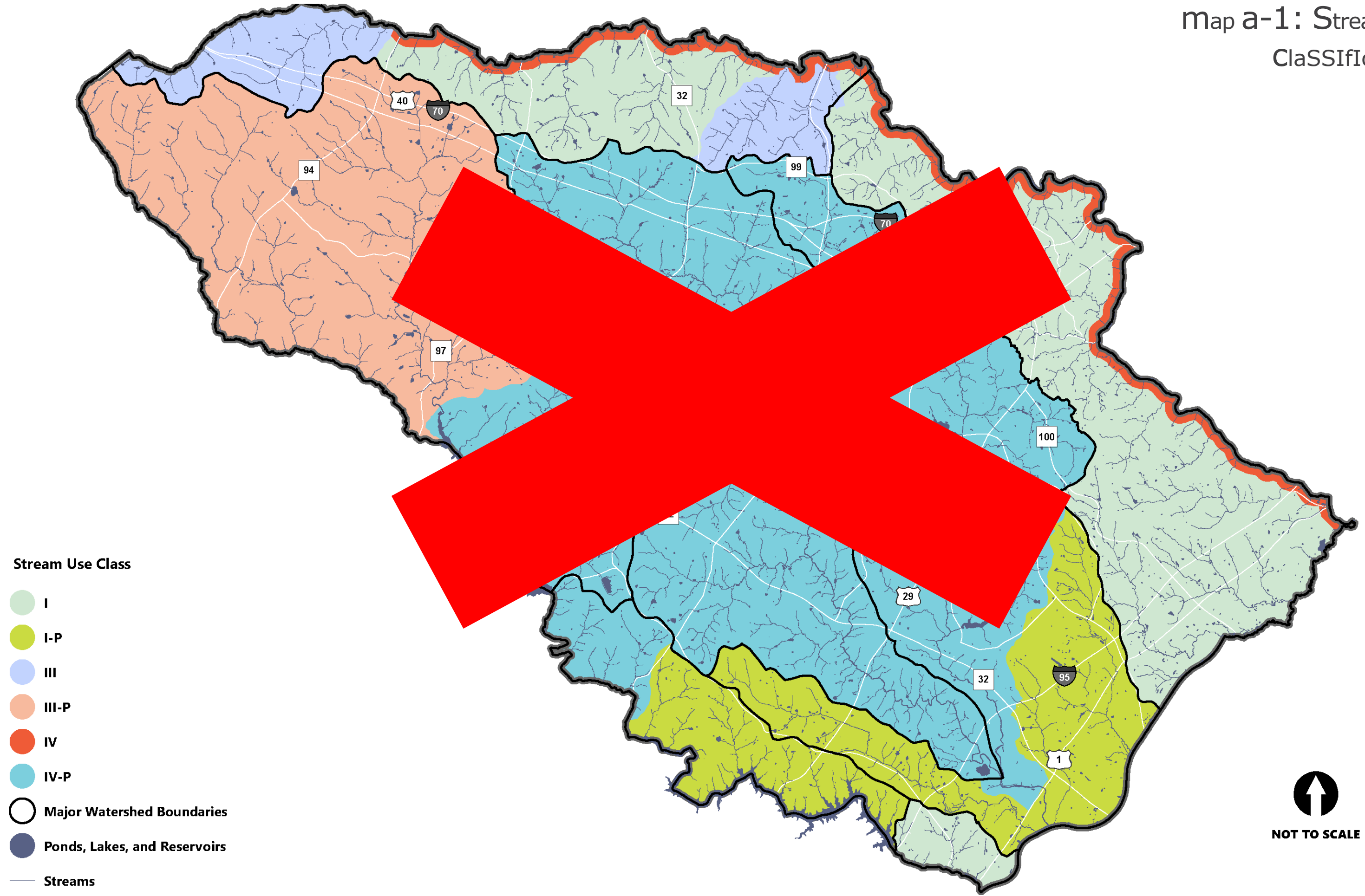
Stormwater runoff also carries many pollutants from the land, including: oil, grease, salts, and metals from roads and driveways; sediment, fertilizers, animal waste, and pesticides from lawns and agricultural fields; and nutrients and metals deposited from air pollution. In addition, during warmer weather runoff can pick up heat from impervious surfaces. This warmer runoff can raise the water temperature in nearby streams, which is particularly harmful to aquatic species that need cool or cold water habitat. This type of pollution is called nonpoint source pollution, because it comes from many diffuse sources on the land. This pollution degrades water quality and habitat in our wetlands, local streams, and lakes, and, subsequently, in the Chesapeake Bay.

In accordance with the federal Clean Water Act, Maryland has designated use classifications for all water bodies in the State, as listed in Table A-1. ~~The use classifications for the streams in Howard County are shown in Map A-1.~~ There are no Class II waters in Howard County.

Table A-1: Stream Use Classification

Use Classification	Designated Use
Class I	Water contact recreation and protection of nontidal warm water aquatic life
Class II	Support of estuarine and marine aquatic life and shellfish harvesting
Class III	Nontidal cold water (Natural trout waters)
Class IV	Recreational trout waters
Note: A “P” after a use classification number indicates an additional use for public water supply.	

Map a-1: Stream Use Classification



Stream Use Class

- I
- I-P
- III
- III-P
- IV
- IV-P
- Major Watershed Boundaries
- Ponds, Lakes, and Reservoirs
- Streams



NOT TO SCALE

Projected Changes to Impervious Cover and Forest Cover

The County is required to have adequate land and water capacity for the treatment of stormwater runoff, meaning that current and future stormwater management will maintain or improve water quality in local streams receiving stormwater runoff. To provide an indirect assessment of expected impacts to water quality from future growth, changes to impervious cover and forest cover were estimated, based on projected future land use changes.

Impervious Cover

In general, as impervious cover increases with increasing development, stream health is expected to decline as forests are cleared, groundwater recharge is reduced, and polluted runoff into local streams increases in volume and frequency. This makes impervious cover a useful predictor of expected water quality and stream habitat conditions in a watershed.

The County uses a system first developed by the Center for Watershed Protection to place watersheds into one of four categories—sensitive, impacted, non-supporting (of biological diversity) and urban drainage—based on the level of impervious cover (Table A-2). Lower levels of impervious cover are not a guarantee of healthy stream conditions, because other factors, such as land use, stream channelization, and the location of the impervious cover within the watershed, can also impact stream health. However, this system can be used to prioritize healthy watersheds for actions that will protect water quality and habitat, and to prioritize degraded watersheds for efforts to restore water quality and habitat. It is easier and more cost effective to protect high quality resources in a watershed than to restore degraded resources. The more degraded conditions are within a watershed, the more difficult and expensive restoration efforts become.

Watershed Category	Percent Impervious Cover	Expected Water Quality and Stream Health
Sensitive	Less than 10%	Excellent
Impacted	Greater than 10% and less than 20%	Fair to good
Non-supporting	Greater than 20% and less than or equal to 40%	Fair to poor
Urban Drainage	Greater than 60%	Poor to very poor

~~Table A-3 shows projected changes to impervious cover by major watershed, and Table A-5 shows projected changes by Stronghold Watershed, based on projected land use changes associated with the Future Land Use Map.~~ Because much of the projected growth in the County will occur as redevelopment, there are only minor increases in the percent impervious cover for all but one watershed.

For the major watersheds, the Brighton Dam, Middle Patuxent River, Patapsco River South Branch, and Rocky Gorge Dam watersheds will see an increase in impervious cover ranging from 0.6 to 1.6% and will all remain in the sensitive category. The Little Patuxent River and Patapsco River Lower North Branch watersheds, each with a little less than a 1% increase in impervious cover, will remain in the impacted category. The Patuxent River Upper watershed, with a less than 1% increase, will remain in the non-supporting category.

For the Stronghold Watersheds, the Davis Branch and North Branch Patapsco to Daniels Mill, and Dorsey Run watersheds will have less than a 1% increase in impervious cover. The Davis Branch and North Branch Patapsco to Daniels Mill watershed will remain in the sensitive category and the Dorsey Run watershed will remain in the non-supporting category. The Junction Industrial Park Tributary to Little Patuxent River watershed will have a 6.2% increase in impervious cover but will remain in the non-supporting category.

The current environmental site design regulations for stormwater management can achieve a pollution reduction of 50 to 90%, depending on the pollutant. However, the regulations also require redevelopment to reduce impervious cover by 50% or provide an equivalent water quality treatment. Since the majority of future new development in the County will be 'redevelopment,' this provides an important opportunity to improve water quality and mitigate the increase in nonpoint source pollution generated by the projected increase in impervious cover.

Forest Cover

~~Table A-4 shows projected changes to forest cover by major watershed and for the County overall, and Table A-6 shows projected change by Stronghold Watershed, based on projected land use changes associated with the Future Land Use Map.~~ Because much of the projected growth in the County will occur as redevelopment, in the major watersheds forest loss as a percentage ranges from 1.0% for the Brighton Dam watershed to 3.8% for the Rocky Gorge Dam watershed. For the Stronghold Watersheds, forest loss as a percentage ranges from 0% for the Junction Industrial Park Tributary to Little Patuxent River watershed to less than 1% for the remaining watersheds. The County overall will see a 1.5% loss in forest cover or 2,449 acres, and just over half of this will be interior forest (the interior forest itself and the 300' buffer). Forest interior losses in the major watersheds range from a low of 33.5% of the overall forest loss in the Patuxent River Upper to a high of 70.4% in the Little Patuxent River.

This estimate of forest loss is based on 2009 existing forest cover data (the most recent available), which provides a higher baseline for forest cover than currently exists. This estimate also includes a conservative assumption that all forest on a parcel designated for development will be removed, with the exception of forest within the 100-year floodplain and a 75-foot stream buffer. The 2019 update of the Forest Conservation Act will help minimize and mitigate actual forest loss through the addition of site design requirements and higher replacement ratios for forest cleared. Site design requirements include that residential developments of more than 10 lots must meet a minimum of 75% of their obligation on-site, which encourages forest retention rather than clearing and replanting. In addition, HoCo by Design includes policies and actions intended to protect and increase forest cover in the County.

Table A-3: Projected Change In Impervious Cover By Major Watershed

Major Watershed	Watershed Area (acres)	Existing Impervious Area (acres)	Existing Impervious Area (%)	Impervious Surface Added (Sq Ft)	Impervious Surface Added (Acres)	Future Impervious Area (acres)	Future Impervious Area (%)	Change in Impervious Area (%)
Brighton Dam	36,929	1,640	4.4	10,013,851	230	1,870	5.1	0.6
Little Patuxent River	38,039	8,811	23.5	11,192,171	254	9,192	24.2	0.7
Middle Patuxent River	37,073	4,000	11.1	11,192,171	254	5,534	9.5	0.7
Patapsco River L N Br	24,210	4,354	18.0	11,192,171	254	4,565	18.9	0.9
Patapsco South Branch	16,060	854	5.3	11,192,171	254	874	5.4	1.1
Patuxent River upper	1,726	546	31.6	11,192,171	254	481	27.9	0.7
Rocky Gorge Dam	8,007	540	6.8	5,584,833	127	670	8.4	1.6
Countywide	162,044	19,909	12.3	55,641,341	1,277	21,186	13.1	0.8

Table A-4: Projected Change in Forest Cover by Major Watershed

Major Watershed	Watershed Area (acres)	Existing Forest Cover (Acres)	Existing Forest Cover (%)	Forest Loss (acres)	Future Forest Cover (acres)	Future Forest Cover (%)	Change in Forest Cover (%)	Interior Forest Loss (acres)	Forest Loss that is Interior Forest (%)
Brighton Dam	36,929	10,993	29.8	366	10,627	28.8	-1.0	187	51.1
Little Patuxent River	38,039	7,170	18.8	443	6,727	17.7	-1.2	312	70.4
Middle Patuxent River	37,073	2,777	7.5	1,000	1,777	25.9	-1.4	252	48.8
Patapsco River L N Br	24,210	8,037	33.2	2,736	5,301	32.5	-1.7	145	34.8
Patapsco River S Br	16,060	5,043	31.4	1,537	3,506	31.4	-2.4	186	48.3
Patuxent River Upper	1,726	546	31.6	170	376	23.4	-1.1	7	33.5
Rocky Gorge Dam	8,007	2,957	36.9	1,000	1,957	33.1	-3.8	177	58.4
Countywide	162,044	45,392	28.0	2,449	42,943	26.5	-1.5	1,265	51.6

Table A-5: Projected Change In Impervious Cover By Stronghold Watershed

Stronghold Watershed	Watershed Area (acres)	Existing Impervious Area (%)	Impervious Surface Added (Sq Ft)	Impervious Surface Added (Acres)	Future Impervious Area (%)	Change in Impervious Area (%)
Davis Branch and NBr Patapsco to Daniels Mill	5,216.3	17.8	810,895.8	2,343.8	18.1	0.4
Dorsey Run	5,087.9	36.1	1,923.0	5.5	37.8	0.9
Junction Industrial Park Tributary to Little Patuxent River	279.5	18.6	147.9	0.4	20.5	6.2

Table A-6: Projected Change in Forest Cover by Stronghold Watershed

Stronghold Watershed	Watershed Area (acres)	Existing Forest Cover (%)	Existing Forest Cover (acres)	Forest Loss (acres)	Future Forest Cover (acres)	Future Forest Cover (%)	Change in Forest Cover (%)	Interior Forest Loss (acres)	Forest Loss that is Interior Forest (%)
Davis Branch and NBr Patapsco to Daniels Mill	5,216.3	40.7	2,143.0	29.5	2,093.9	39.9	-0.6	187.0	51.1
Dorsey Run	5,087.9	17.3	868.5	13.9	854.6	16.8	-0.3	312.0	70.4
Junction Industrial Park Tributary to Little Patuxent River	279.5	2.8	7.8	2.8	5.0	1.8	0.0	252.0	48.8