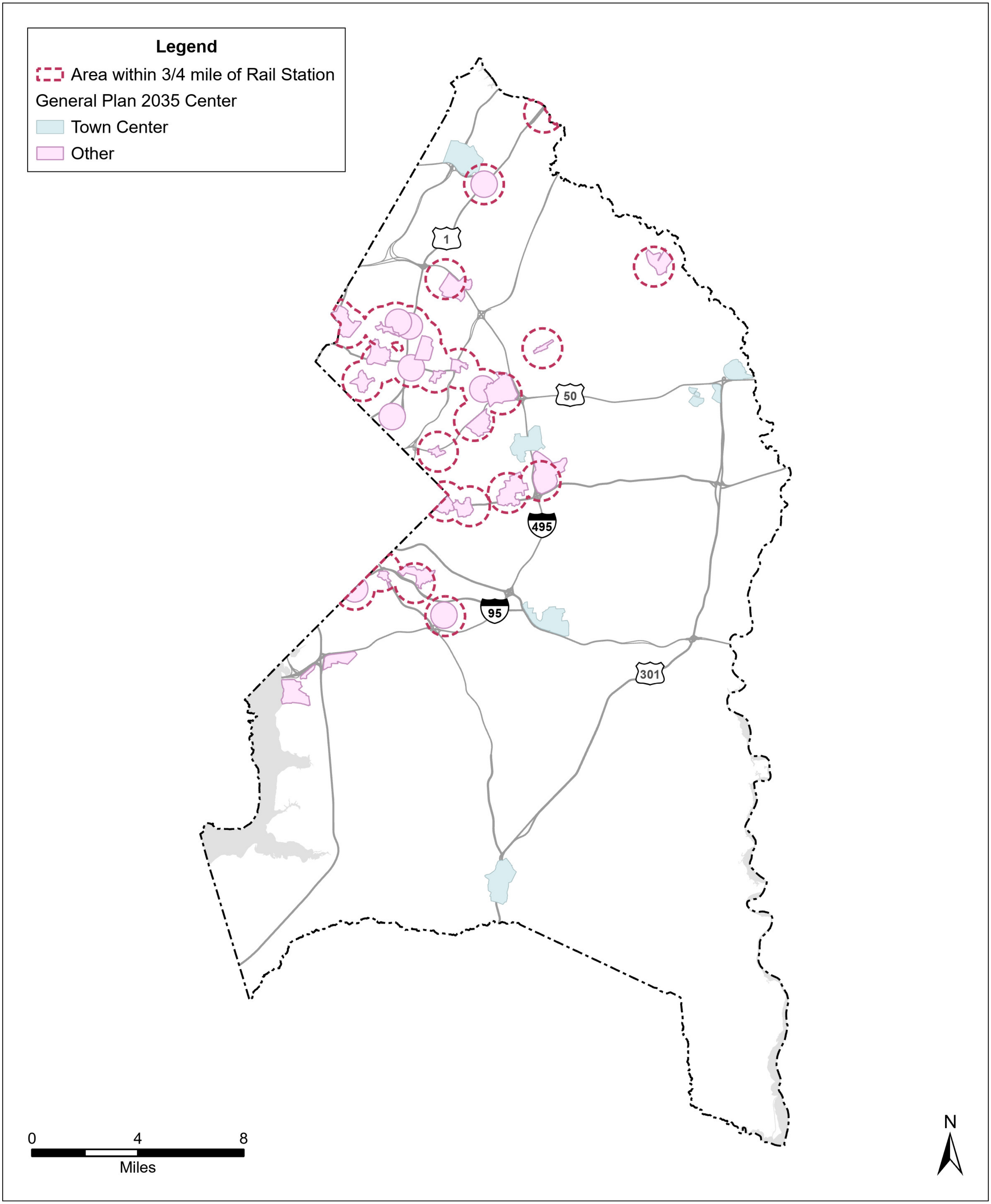
ATTACHMENT 1

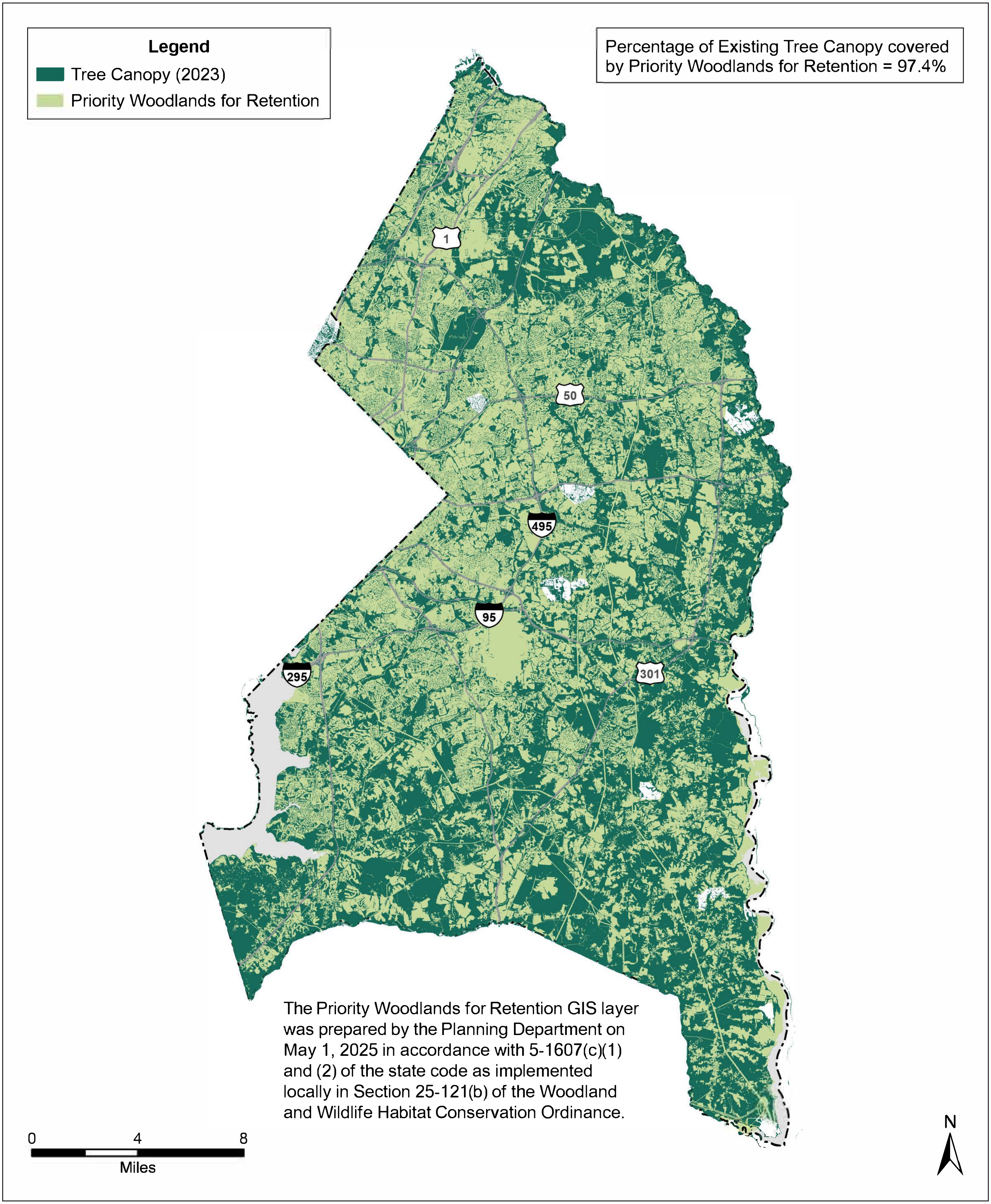


M-NCPPC

General Plan 2035 Centers and 3/4 Mile Rail Station Buffers

Prince George's County
Planning Department
Job #4551

ATTACHMENT
2



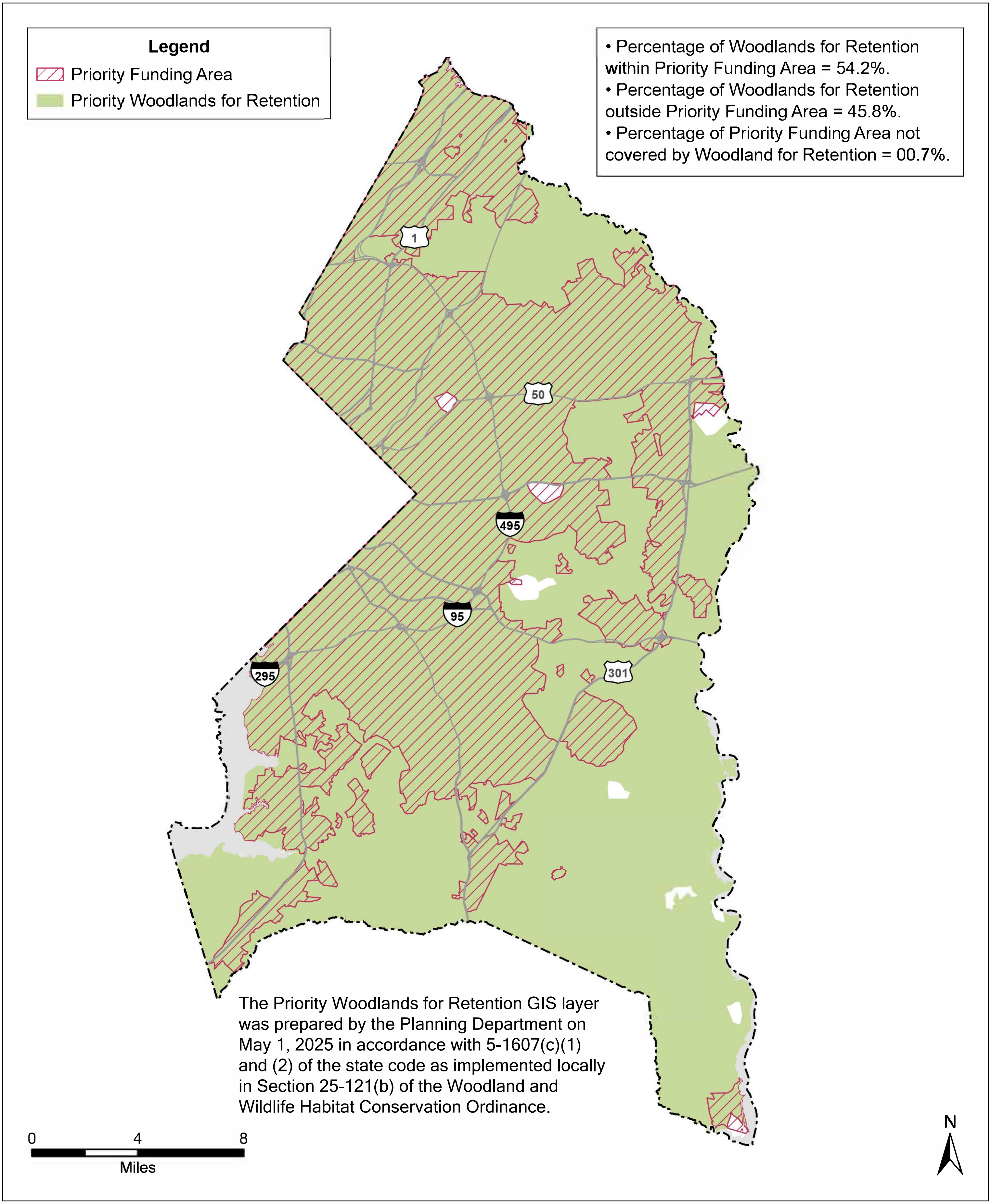
M-NCPPC

Priority Woodlands for Retention and Existing Tree Canopy

Prince George's County
Planning Department
Job #4551

ATTACHMENT

3



M-NCPPC

Priority Woodlands for Retention and Priority Funding Areas

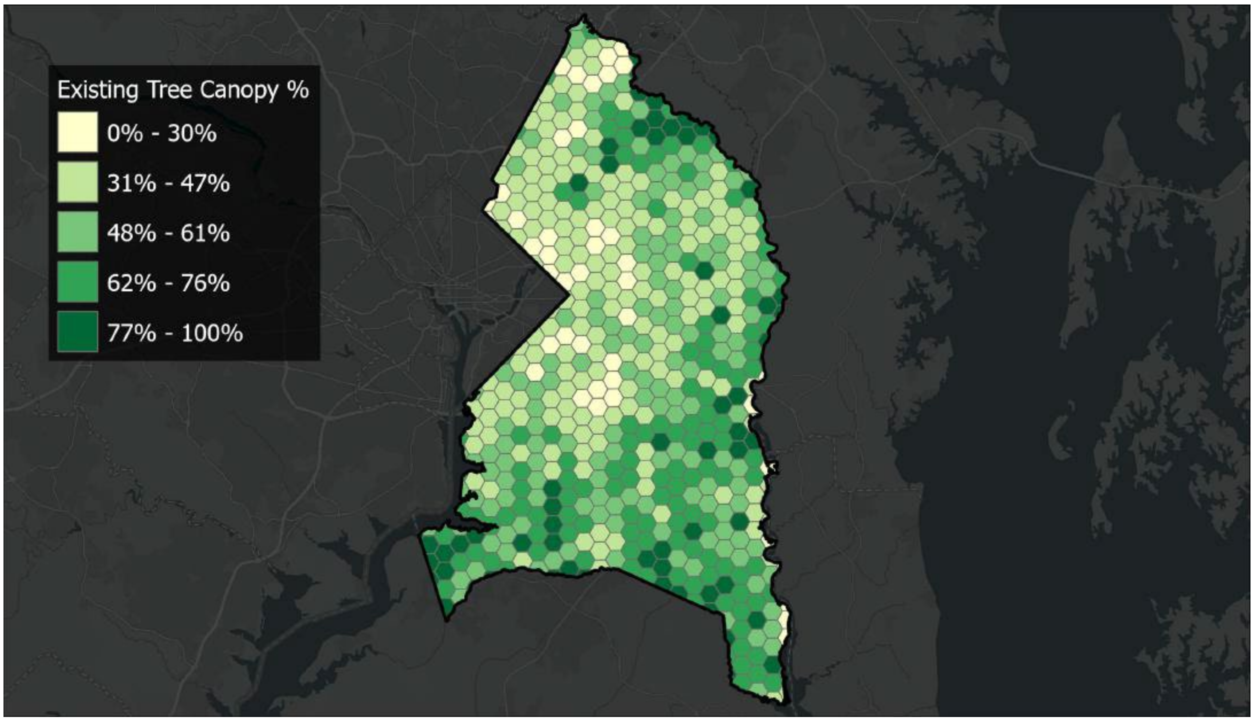
Prince George's County
Planning Department
Job #4551

ATTACHMENT

4

Attachment 4

Taken from page 11 of the Tree Canopy Assessment prepared for the Planning Department by the University of Vermont (2023) depicting existing tree canopy percentage for 2020 conditions summarized using 250-hectare hexagons.



ATTACHMENT

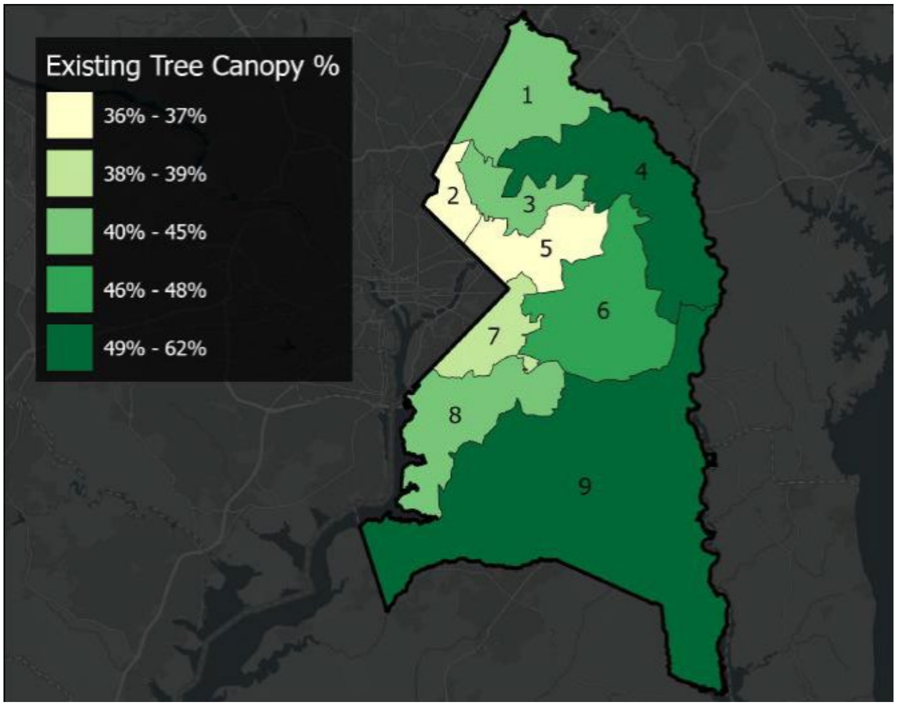
5

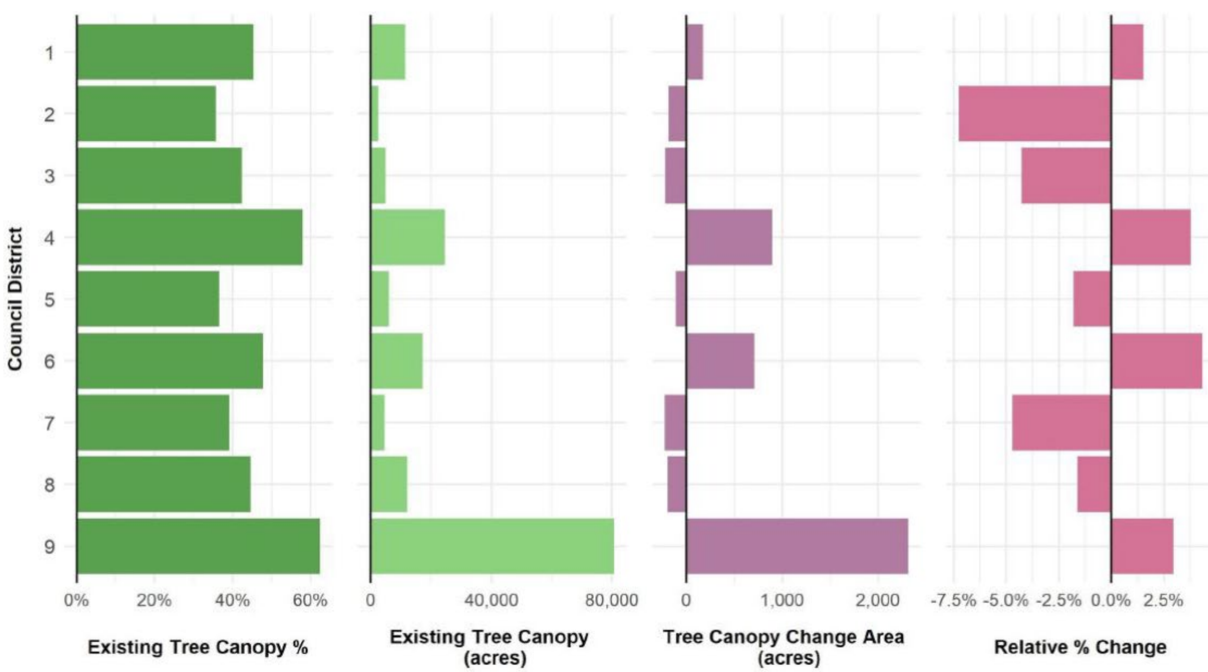
The following list summarizes the number of exemptions issued and the percentage of tree cover in the county under the prior ordinance when the Standard exemption for properties with less than 10,000 square feet of woodland was effective. The exemptions listed were taken from the Environmental Planning Section's (EPS) database.

Woodland Conservation Letter of Exemptions					
Standard Exemptions (EPS)		Numbered Exemptions (EPS)		%Countywide Forest and Tree Canopy (M-NCPPC Lidar)	% Forest and Tree Canopy (University of Vermont)
Year	Total	Year	Total		
2009					52.4
2010	215	2010	65		
2011	212	2011	62		
2012	226	2012	49		
2013	213	2013	50		
2014	176	2014	34	49%	
2015	226	2015	63		
2016	202	2016	60		
2017	211	2017	64	49.5	
2018	182	2018	34		
2019	185	2019	40		
2020	203	2020	62	49.7	53.4
2021	238	2021	37		
2022	213	2022	39		
2023	189	2023	30	48.7	pending
2024	151	2024	43		

ATTACHMENT
6

TREE CANOPY BY COUNCILMANIC DISTRICT
(Source: University of Vermont Draft Tree Canopy Assessment, released 2023)





NOTES:

- Attachments 2 and 3 used the following data:

  a. The Priority Retention (Woodland Conservation Priority Areas) on the map was created by the Planning Department on May 1, 2025, in accordance with 5-1607(c)(1) and (2) of the state code and Section 25-121(b) of the Woodland and Wildlife Habitat Conservation Ordinance. This data was captured for use in general mapping at a scale of 1:1200. The data was merged with the Priority Urban Forest feature class provided by DNR.

  b. The Priority Funding data is from the Maryland Department of Planning. https://imap.maryland.govMap. The last update was 8/28/2024.

  c. The Tree Canop Layer was created by the Prince George's Planning Department and contains woodland greater than 5000 square feet in the County. This data was captured for use in general mapping at a scale of 1:1200. The lasts update was in 2023 by the Sanborn Map Company, Inc.

- Attachment 4:

  The policy of the Prince George's County Countywide Green Infrastructure Plan is to maintain a 52 percent Tree Canopy Coverage in 2035 (Objective 2. Page 24). This is reiterated in the draft The Climate Action Plan (Page 28) and Plan 2035 (169). The draft Climate Action plan and Plan 2035 envisions more equitable coverage of tree canopy throughout the County focusing on 'underserved communities' as defined by the MD Department of Planning.

  Plan 2035, Page 165: "The Tree Canopy Coverage Ordinance was enacted in 2010 to address the need to increase tree canopy coverage countywide with a focus on existing communities where forest and tree canopy coverage is sparse."

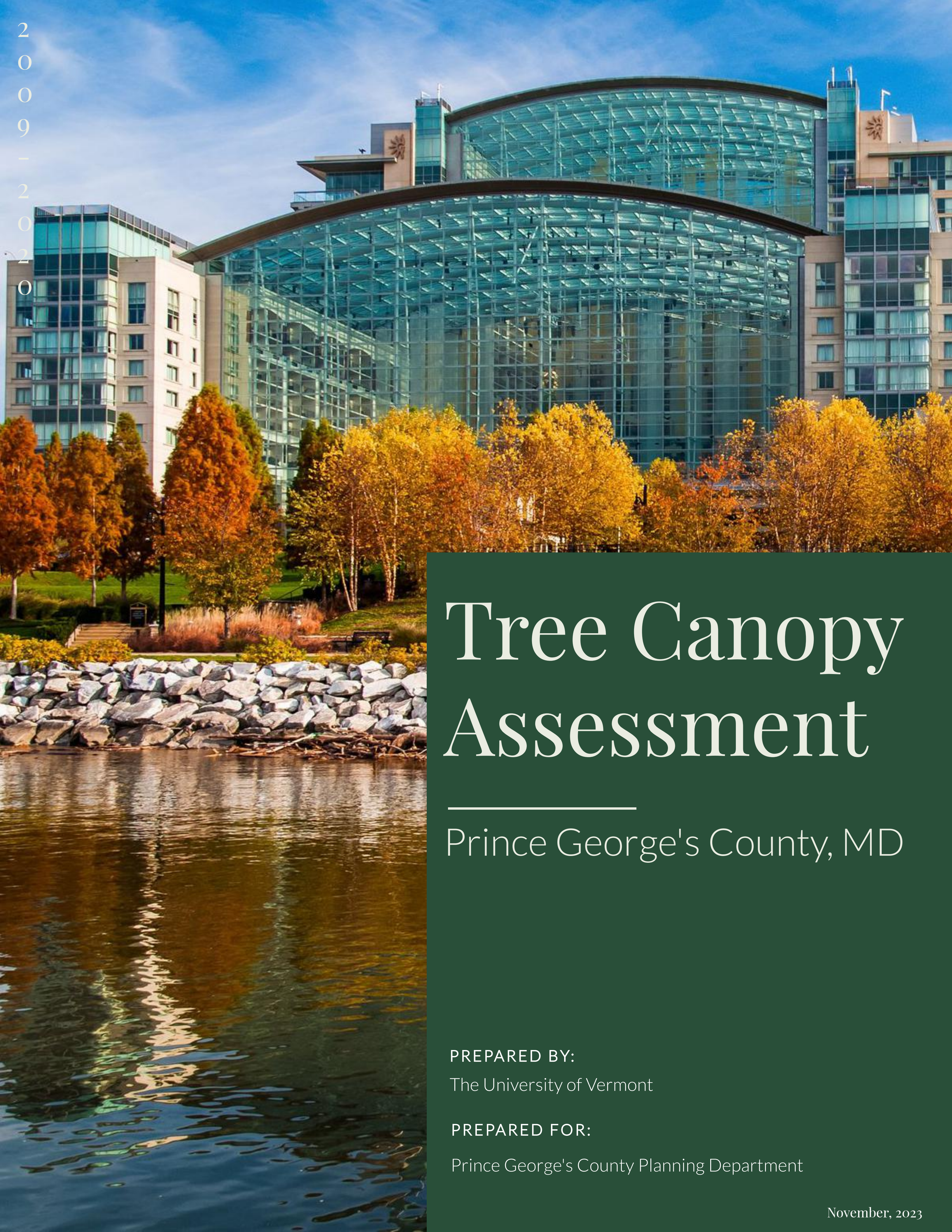
  The 2020 map is the most current (released in 2023) until the new study by UVM has been completed and released.

  Source draft Tree Canopy Assessment: Prince George's County Nov 2023 by University of Vermont.

- Attachment 5:

  Data from the Environmental Planning Section's Woodland Conservation Access Database, where staff tracks exemptions issued and uses it to report to the State annually.

Exemptions mean that no trees will be planted to meet the woodland conservation requirements because the site is exempt from that Ordinance, which allows the applicant to clear existing trees on the site. Trees could possibly be planted to meet other requirements, such as the Landscape manual and the Tree Canopy Coverage ordinance, which is addressed through the Zoning Ordinance Subtitle 25 Division 3, and permit review.



2009–2020

Tree Canopy Assessment

Prince George's County, MD

PREPARED BY:

The University of Vermont

PREPARED FOR:

Prince George's County Planning Department

November, 2023

THE NEED FOR GREEN

Trees provide essential ecosystem services in Prince George's County, like reducing stormwater runoff, cooling the pavement in the summer and providing wildlife habitat. Trees are an indispensable part of the region's infrastructure. Research shows that these green assets can improve social cohesion, reduce crime, and raise property values. A healthy and robust tree canopy is crucial to building a more livable and prosperous town.

As with any community, Prince George's County faces a host of environmental challenges while seeking to balance development and conservation. A healthy and robust tree canopy is crucial for maintaining this balance, providing Prince George's residents with a resource that will impact the health and well-being of generations to come.

TREE CANOPY ASSESSMENT

For decades governments have mapped and monitored their infrastructure to support effective management practices. Traditionally, that mapping has primarily focused on gray infrastructure, including features such as roads and buildings. Left out of this mapping has been an accounting of the green infrastructure.

The Tree Canopy Assessment protocols were developed by the USDA Forest Service to help communities better understand their green infrastructure through tree canopy mapping and analytics. Tree canopy is the layer of leaves, branches, and stems that provide tree coverage of the ground when viewed from above. A Tree Canopy Assessment can provide vital information to help governments and residents chart a greener future by helping them understand the tree canopy they have, how it has changed, and where there is room to plant trees. Tree Canopy Assessments have been carried out for over 90 communities in North America. This study assessed tree canopy for Prince George's County over the 2009 - 2020 period.

TREE CANOPY BY THE NUMBERS

Prince George's County is gaining tree canopy. Tree canopy change was computed by mapping the no change, gains, and losses in tree canopy from 2009 - 2020.

53%
2020 EXISTING TREE CANOPY

164,121
2020 EXISTING TREE CANOPY ACRES

+3,148
2009 - 2020 ACRES CHANGE

+2%
2009 - 2020 RELATIVE PERCENT CHANGE

Change in tree canopy from 2009 - 2020

2009 Tree Canopy % 52.4%

2020 Tree Canopy % 53.4%

20,490
Acres of Gain

17,342
Acres of Loss

Prince George's County was estimated to have 6,393,800 trees in 2020.

Gains in tree canopy are offsetting losses, resulting in a net increase in tree canopy.

Growth of existing tree canopy is the biggest contributor to tree canopy gains.

FINDINGS

Prince George's County tree canopy increased from 2009 to 2020, with an absolute gain of 1%.

To enhance urban resilience, Prince George's County can improve access to trees and the benefits that they provide.

Prince George's County can improve environmental equity by prioritizing tree plantings in neighborhoods most susceptible to environmental risk.

Land use history, urban forestry initiatives, natural processes, and landowner decisions, all play a role in influencing the current state of tree canopy in Prince George's County.

There were 20,490 acres of tree canopy gained and 17,342 acres of tree canopy lost from 2009 to 2020.

Tree canopy loss is neither evenly distributed nor similar. It varies from removal of individual trees in backyards to clearing of patches of trees for new construction.

The overall gain in tree canopy coverage was possible thanks to preservation and planting efforts.

58% of Prince George's existing tree canopy is located on land zoned as Rural and Agricultural. The next biggest contributor is Residential Zones with 32.5% of the county'stree canopy.

RECOMMENDATIONS

Preserving existing tree canopy is the most effective means for securing future tree canopy, as loss is an event but gain is a process.

Planting new trees in areas where tree canopy is low or in locations where there has been tree canopy removed will also help Prince George's County grow canopy.

Having trees with a broad age distribution and a variety of species will ensure that a robust and healthy tree canopy is possible over time.

Community education is crucial if tree canopy is to be maintained over time. Residents that are knowledgeable about the value of trees will help Prince George's County stay green for years to come.

Integrate the tree canopy change assessment data into planning decisions at all levels of government from individual park improvements, to comprehensive planning and zoning initiatives, to communitywide ordinances.

Reassess the tree canopy at 3-5 year intervals to monitor change and make strategic management decisions.

Tree canopy assessments require high-quality, high-resolution data. Continue to invest in LiDAR and imagery to support these assessments and other mapping needs.

Field data collection efforts should be used to compliment this assessment as information on tree species, size, and health can only be obtained through on-the-ground inventories.

THE TREE CANOPY ASSESSMENT PROCESS

This project employed the USDA Forest Service's Urban Tree Canopy assessment protocols and made use of federal, state, and local investments in geospatial data. Tree canopy assessments should be completed at regular intervals, every 3-5 years.

Remotely sensed data forms the foundation of the tree canopy assessment. We use high-resolution aerial imagery and LiDAR to map tree canopy and other land cover features.

The land cover data consist of tree canopy, grass/shrub, bare soil, water, buildings, roads/railroads, and other impervious features.

The land cover data are summarized by various geographical units, ranging from the property parcel to the watershed to the municipal boundary.

These summaries, in the form of tree canopy metrics, are an exhaustive geospatial database that enables the Existing and Possible Tree Canopy to be analyzed.

The tree canopy metrics data analytics provide basic summary statistics in addition to inferences on the relationship between tree canopy and other variables.

The report (this document) summarizes the project methods, results, and findings.

The presentation, given to partners and stakeholders in the region, provides the opportunity to ask questions about the assessment.

The Importance of Good Data

This assessment would not have been possible without Prince George’s County Planning Department investment in high-quality geospatial data, particularly LiDAR. These investments pay dividends for a variety of uses, from stormwater management to solar potential mapping. This LiDAR will help Prince George's County advance risk management plans by creating the tree centroids needed to run a risk analysis. Good data supports good governance.

COMPARISON TO CHESAPEAKE BAY WATERSHED ANALYSIS

This analysis differs substantially from the Chesapeake Bay Watershed mapping effort, both in scope and goals. While the Chesapeake Bay Watershed analysis involves a landscape change analysis across the seven states and jurisdictions that make up the Chesapeake Bay drainage area, this tree canopy assessment focuses on land cover and tree canopy change at a finer scale in Prince George's County.

This methodology used an approach that incorporated data with a higher spatial resolution enabling finer-scale changes to be detected. As the finer scale changes are primarily tree canopy gain on the edge of existing trees, more gain was detected than in the Chesapeake Bay Watershed project. In addition, a more robust budget allowed for a higher level of quality control.

Lastly, the mapping team for this project were able to spend time assessing the quality assurance and quality control (QA/QC) of the land cover, tree canopy, and tree canopy change results.

Accuracy Improvements

Due to the higher spatial resolution of this analysis, tree canopy numbers in this assessment may differ from previous analyses.

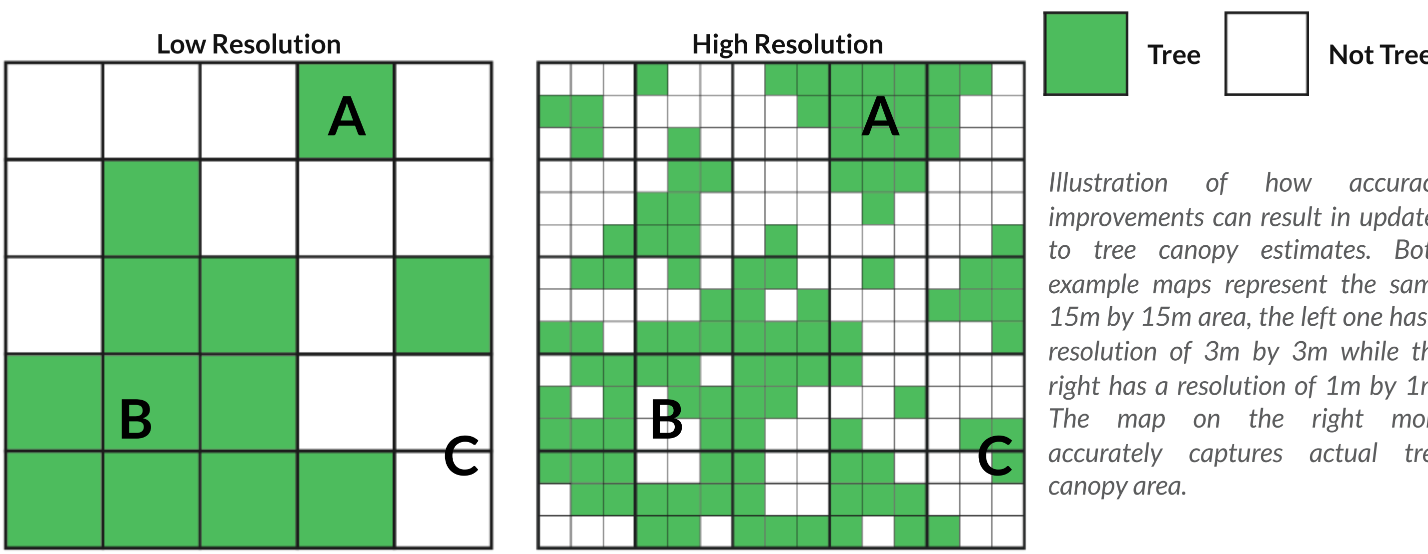


Illustration of how accuracy improvements can result in updates to tree canopy estimates. Both example maps represent the same 15m by 15m area, the left one has a resolution of 3m by 3m while the right has a resolution of 1m by 1m. The map on the right more accurately captures actual tree canopy area.

Higher resolution better captures:

A **Edge Growth.** Better detection of edge growth may add tree cover that was not previously mapped.

B **Forest Gaps.** Previous assessments may include overestimates of tree cover where tree canopy gaps were not detected.

C **Small Patches.** Tree patches that were previously too small for detection can now be mapped.

MAPPING THE TREE CANOPY FROM ABOVE

Tree canopy assessments rely on remotely sensed data in the form of aerial imagery and light detection and ranging (LiDAR) data. These datasets, which have been acquired by various governmental agencies in the region, are the foundational information for tree canopy mapping. Imagery provides information that enables features to be distinguished by their spectral (color) properties. As trees and shrubs can appear spectrally similar, or obscured by shadow, LiDAR, which consists of 3D height information, enhances the accuracy of the mapping. Tree canopy mapping is performed using a scientifically rigorous process that integrates cutting-edge automated feature extraction technologies with detailed manual reviews and editing. This combination of sensor and mapping technologies enabled Prince George's tree canopy to be mapped in greater detail and with better accuracy than ever before. From a single street tree along a roadside to a patch of trees in a park, every tree in Prince George's County was accounted for.

Tree Canopy Mapping

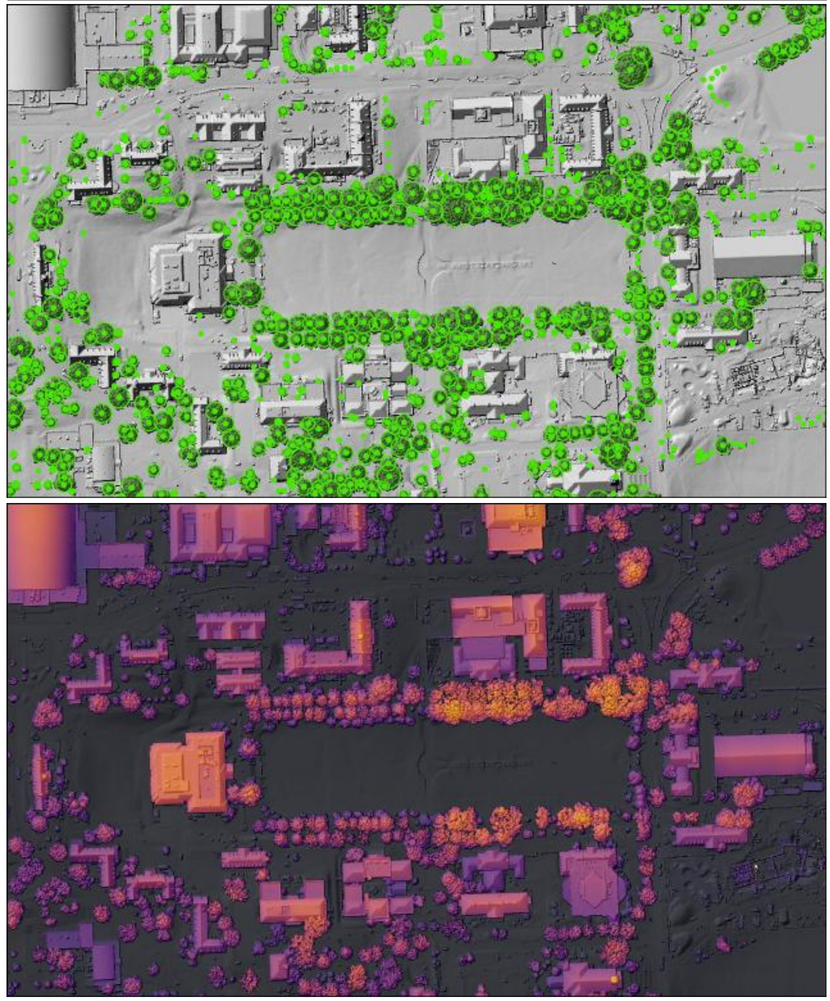


Figure 1. Locations of individual trees and their crowns (top) that were derived from the 2020 LiDAR (bottom).

The high-resolution land cover that forms the foundation of this project was generated from the most recent LiDAR, which was acquired in 2020. Compared to national tree canopy datasets, which map at a resolution of 30-meters, this project generated maps that were over 1,000 times more detailed and better account for all of Prince George's tree canopy.

Land Cover Mapping

Figure 2. High-resolution land cover developed for this project.

TREE COUNT

6,393,800+ Individual Trees

Prince George's County has over 6,393,800 individual trees, an estimate that was derived from the 2020 LiDAR data.

Tree Crowns & Centroids

Trees, particularly individual ones located in parks, on streets, on college greens, and on residential lands, require attention, care, and maintenance to thrive. In addition to quantifying the town's tree canopy acreage and percent coverage, this study produced an estimate of the number of individual trees in Prince George's County. This analysis was performed using the 2020 LiDAR data. While not a replacement for field-based inventories, LiDAR provides a unique advantage in that all of Prince George's trees can be counted. With the county having an estimated over 6,393,800 trees, it is important that tree maintenance remains a high priority for land managers. Tree maintenance and care activities will ensure that these critical green infrastructure assets thrive in a challenging urban environment.

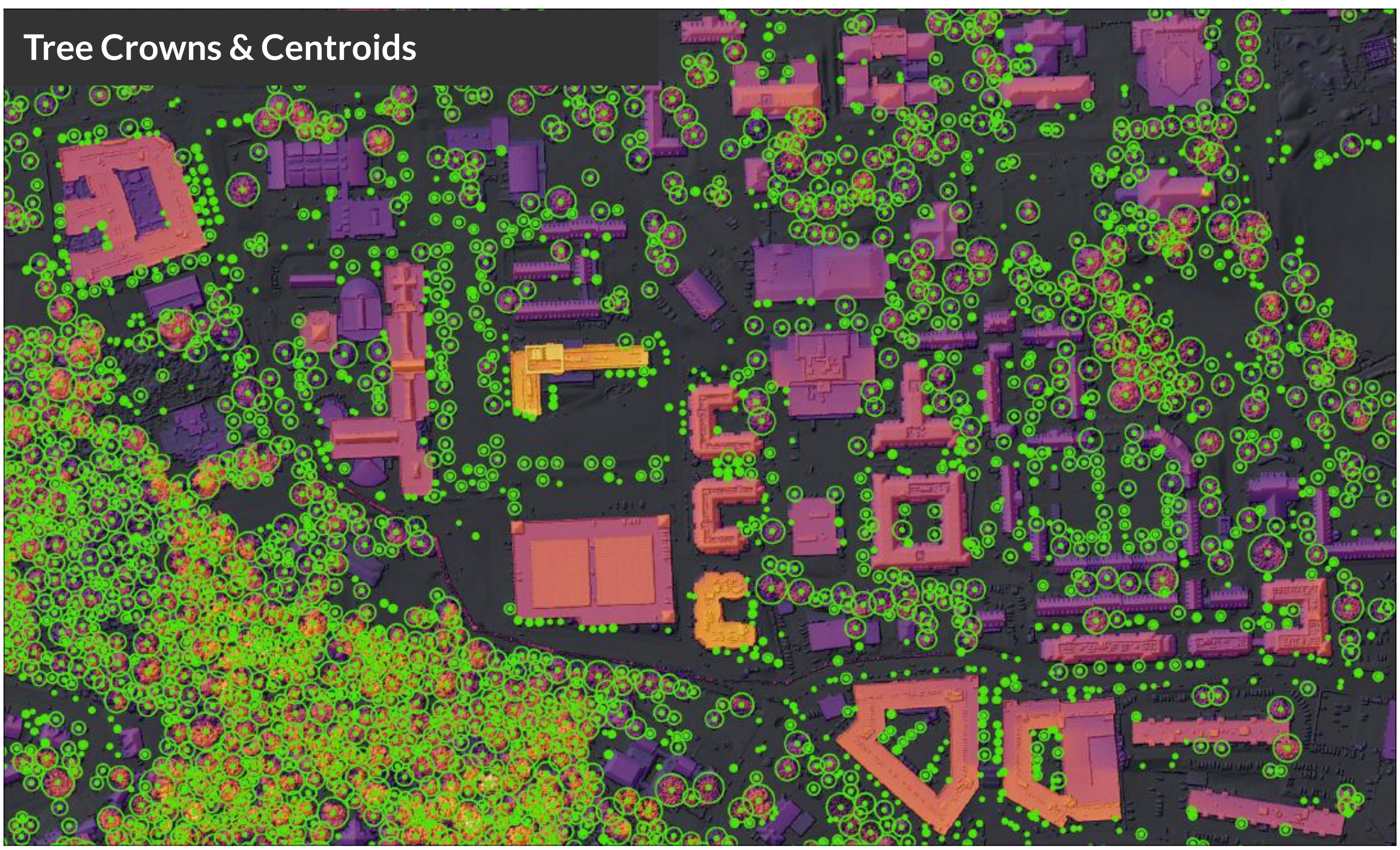


Figure 3. Tree centroids (dots) and tree crowns (circles) mapped from the 2020 LiDAR. Tree mapping from LiDAR involves finding relative high points for each tree, then tracing down until a height inflection point is reached, marking the edge of the crown. This approach to individual tree mapping is most accurate where there is a clear differentiation in tree crowns and is less accurate in forested stands where crowns may overlap.

LANDCOVER

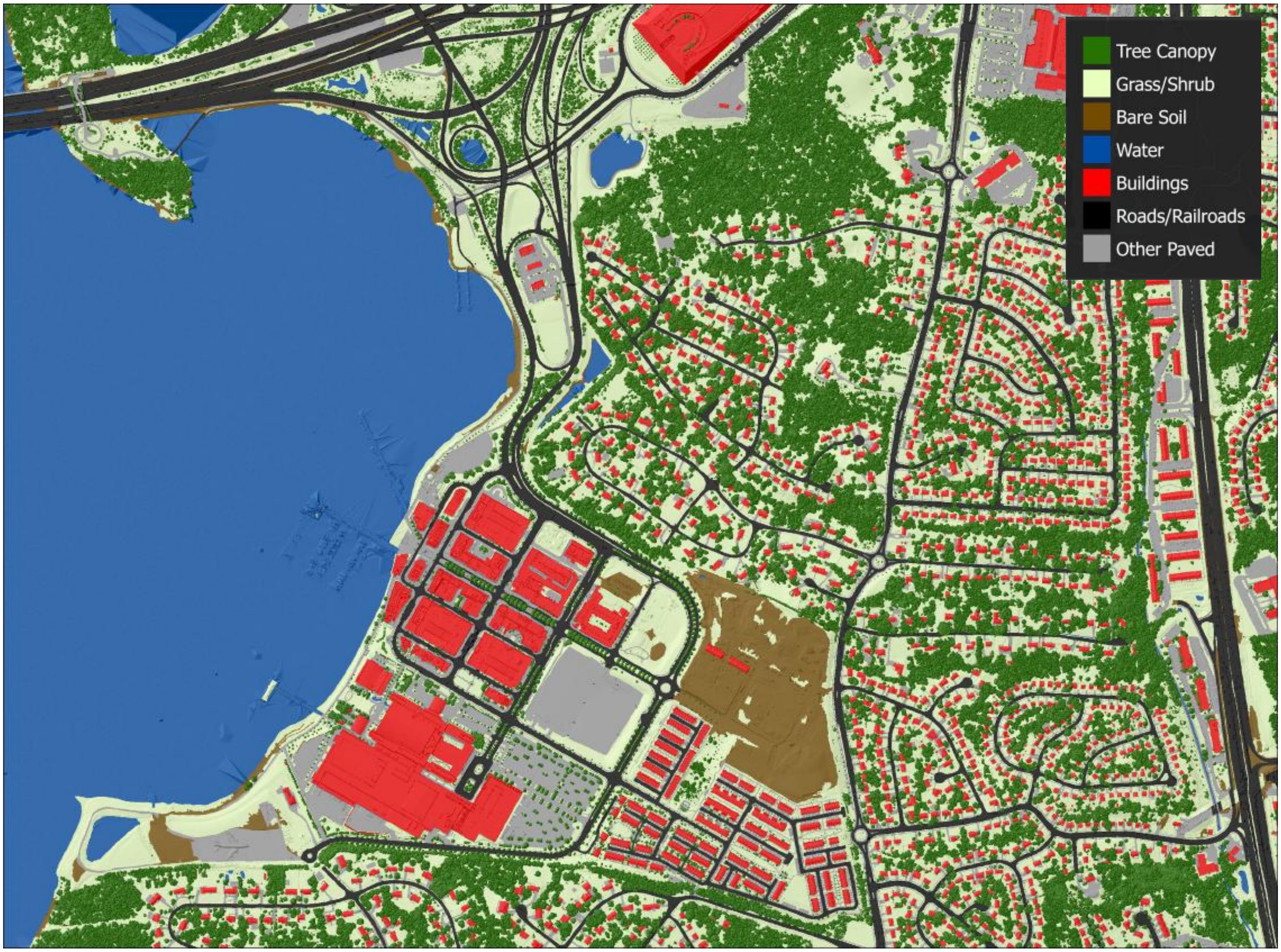


Figure 4. The new 2020 landcover for Prince George's was used in this assessment to quantify existing tree canopy, possible tree canopy - vegetated, possible tree canopy - impervious, and not suitable. The following terminology is used throughout this report.

Key Terms

Existing Tree Canopy: The amount of tree canopy present when viewed from above using aerial or satellite imagery. Tree canopy is defined as vegetation over 8ft in height, which can include some large shrubbery.

Possible Tree Canopy - Vegetated: Grass or shrub area that is theoretically available for **the** establishment of tree canopy.

Possible Tree Canopy - Impervious: Asphalt, **concrete** or bare soil surfaces, excluding roads and buildings, that are theoretically available for the establishment of tree canopy

Not Suitable: Areas where it is highly unlikely that new tree canopy could be established (primarily buildings and roads).

Measuring Tree Canopy Change

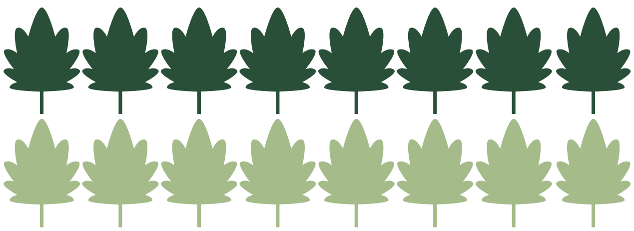
Area Change - the change in the **area of** tree canopy between the two time **periods.**

Relative % Change - the magnitude of change in tree canopy based on the amount of tree canopy in 2009.

Absolute % Change - the percentage point change between the two time periods.

TREE CANOPY METRICS

53% *of Prince George's County's land is covered by tree canopy*



Tree canopy and tree canopy change were summarized at various geographical units of analysis, ranging from land use and property parcels to council district boundaries. These tree canopy metrics provide information on the area of Existing and Possible Tree Canopy for each geographical unit.

Existing Tree Canopy

Cities commonly have uneven distribution of tree canopy, a pattern that applies to Prince George's County. There are some 250-hectare hexagons with less than 30% tree canopy and others with nearly 100% tree canopy (Figure 5). This unequal distribution can be traced back to the county's history of development patterns and open space planning. Those residents who live and work in more treed areas (darker green hexagons) benefit disproportionately from the ecosystem services that trees provide. Conversely, the more urbanized regions of Prince George's County have lower amounts of tree canopy and therefore receive fewer ecosystem services from trees.

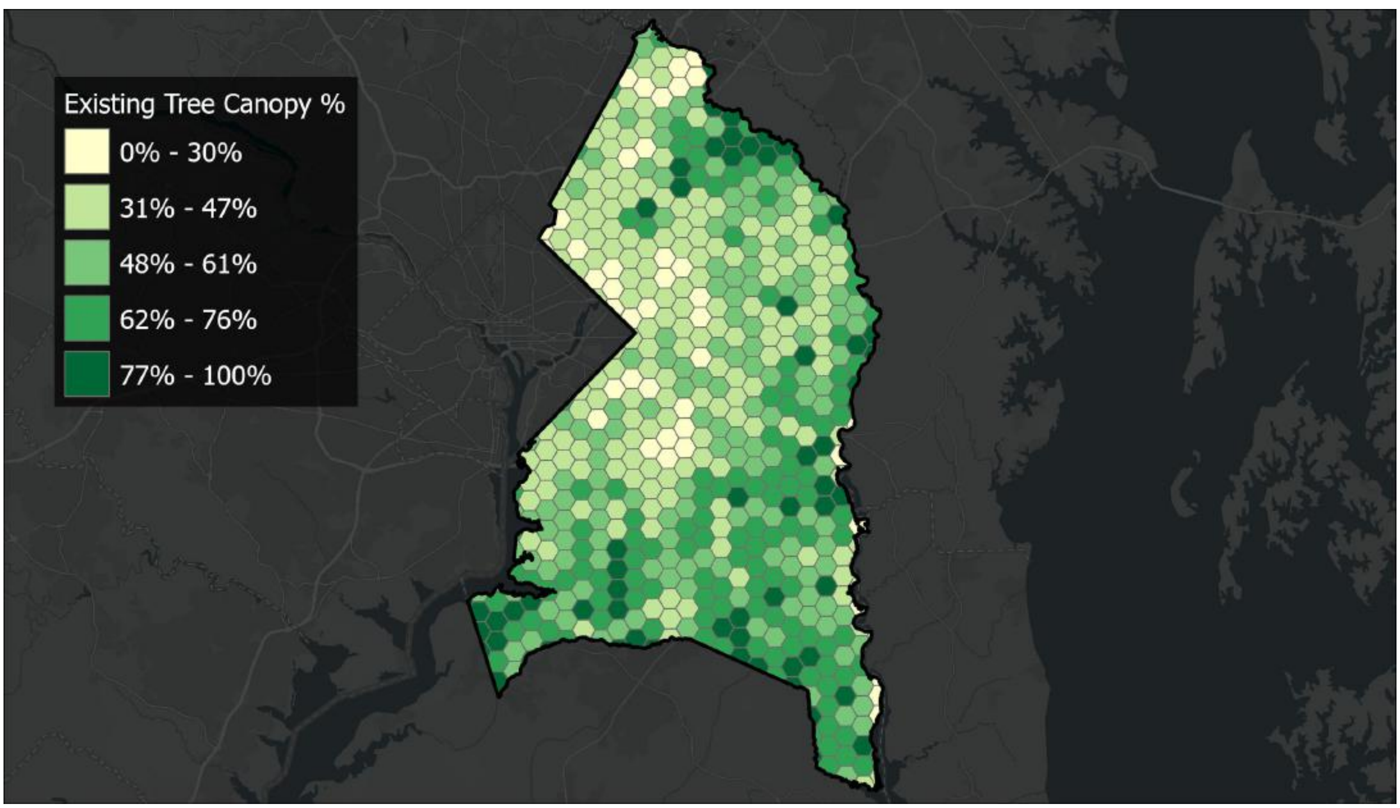


Figure 5. Existing tree canopy percentage for 2020 conditions summarized using 250-hectare hexagons. For each of the hexagons, the percent tree canopy was calculated by dividing the amount of tree canopy by the land area, which excludes water. Using hexagons as the unit of analysis provides a standard mechanism for visualizing the distribution of tree canopy without the constraints of other geographies that have unequal area (e.g., zip codes).

Possible New Tree Canopy

There is available space in Prince George's County to plant more trees. In this assessment, any areas with no trees, buildings, roads, or bodies of water are considered Possible-Vegetation and represent locations in which trees could theoretically be established without having to remove hard surfaces. Many factors go into deciding where a tree can be planted with the necessary conditions to flourish, including land use, landscape conditions, social attitudes towards trees, and financial considerations. Examples include golf courses and recreational fields. While there is open space to plant trees, there is a direct conflict in use; thus, the Possible-Vegetation category should serve as a guide for further field analysis, not a prescription of where to plant trees. With 91,902 acres of land (comprising 30% of the county's land base) falling into the Possible-Vegetation category, there remain significant opportunities for planting trees and preserving canopy that will improve the county's total tree canopy in the long term.

In the county's most densely urbanized areas, significantly increasing the tree canopy will be difficult; nevertheless, it remains vitally important to strive for canopy gains. In Prince George's residential areas, healthy natural regeneration of the existing tree canopy and planting new trees will be important. There is often a "plant and forget" cycle in residential areas, where trees are generally planted when homes are built, without the follow-up to replace trees as they decline to establish the next generation of canopy.

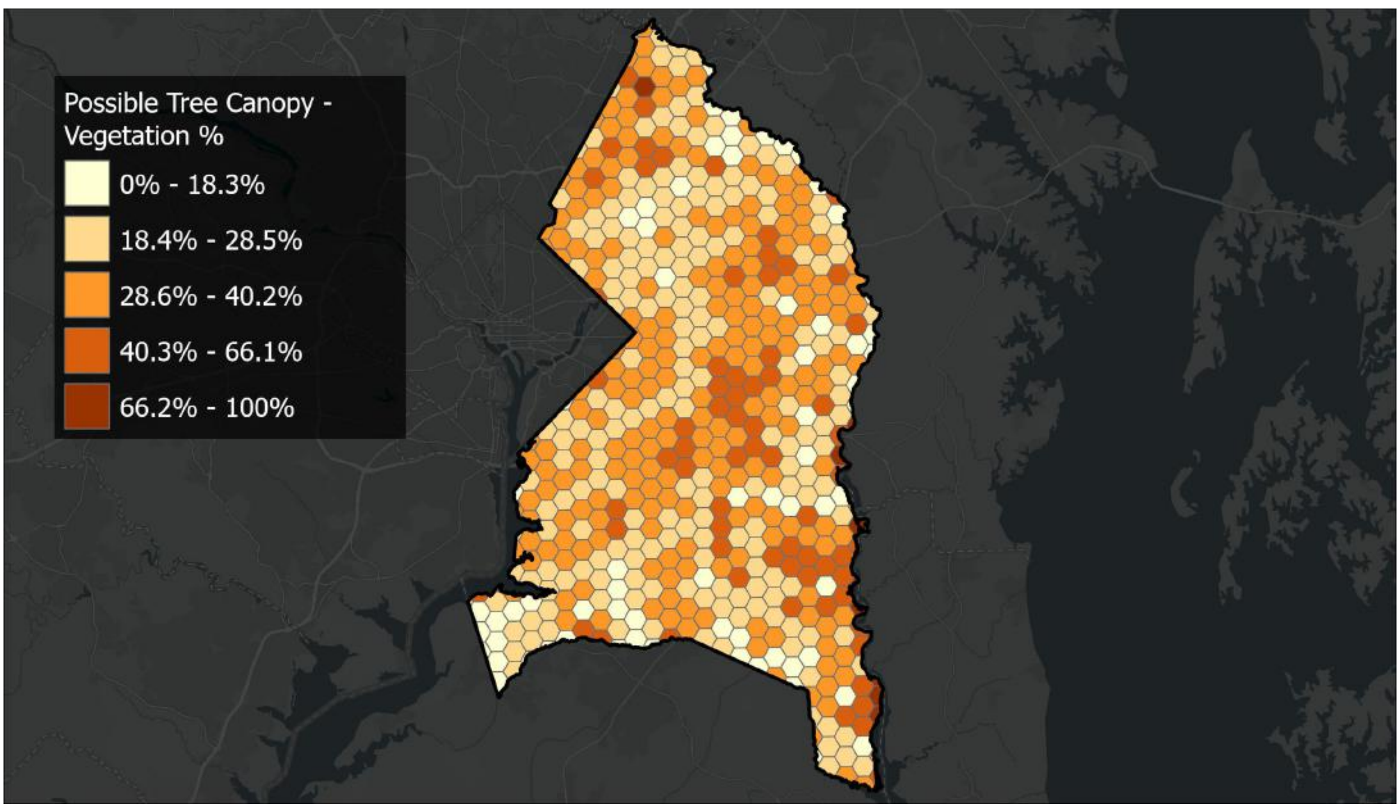


Figure 6. Possible Tree Canopy consisting of non-treed vegetated surfaces summarized by 250-hectare hexagons. These vegetated surfaces that are not currently covered by tree canopy represent areas where it is biophysically feasible to establish new tree canopy. It may be financially challenging or socially undesirable to establish new tree canopy on much of this land. Examples include golf courses, recreational and agricultural fields. Maps of the Possible Tree Canopy can assist in strategic planning, but decisions on where to plant trees should be made based on field verification. Surface, underground, and above surface factors ranging from sidewalks to utilities can affect the suitability of a site for tree canopy planting.

Canopy Change Distribution — Absolute % Change

Prince George's County has experienced a slight net increase in overall tree canopy over the 2009 to 2020 time period, but gains and losses were not distributed uniformly. All areas of the county experienced both gains and losses though some areas saw a net increase and others a net decrease in tree canopy. Removal and die off of mature trees resulted in the loss of large patches of tree canopy. Mature trees with large crowns contribute substantially to tree canopy and take decades to grow, so their loss creates large, localized declines in tree canopy. Even though there was evidence of tree loss throughout the county, planting efforts, preservation programs, and natural growth helped offset losses and stem decline. Canopy begets canopy as almost all trees gain canopy on an annual basis.

The trajectory of Prince George's tree canopy in the future is uncertain. There are both environmental and anthropogenic risks facing canopy cover. Invasive species could pose a serious threat if not identified and controlled early. Natural events such as storms can have a mixed impact on the canopy. In conserved areas, tree canopy will return through natural growth, but in urbanized areas, trees lost to storms will need to be replanted. Climate change may cause trees to grow more quickly but could also result in inhospitable conditions for native species. Anthropogenic factors include preservation and conservation efforts and the strength of tree ordinances. Managing these risks will be key to achieving canopy growth.

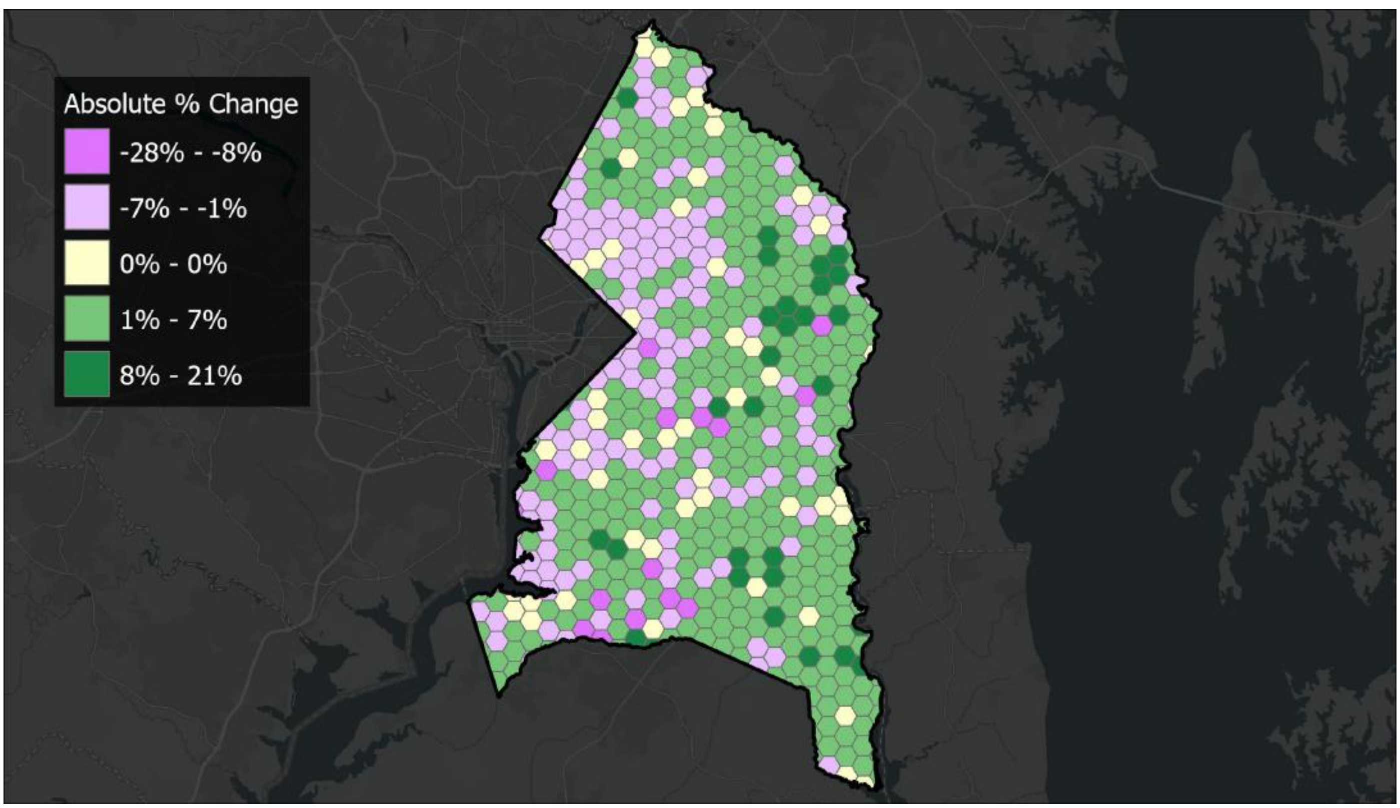


Figure 7: Tree canopy change summarized by 250-hectare hexagons. Darker greens indicate greater gain, while darker purple reflects higher amounts of loss.

Canopy Change Distribution

The magnitude of tree canopy change across Prince George's County can be measured by the relative tree canopy change over the 2009 - 2020 period. The relative change is calculated by taking the tree canopy area in 2009, subtracting the tree canopy area in 2020, then dividing this number by the area of tree canopy in 2009. Areas with the greatest change indicate that the canopy is markedly different in 2020 as compared to 2009. In some of the commercial and urbanized areas with little tree canopy in 2009, the growth of street trees resulted in a sizeable relative gain. Conversely, the removal of trees as a result of construction in sparsely treed areas resulted in substantial relative reductions in tree canopy.

Trees, when properly cared for, can mitigate environmental risks challenges relating to the urban environment such as flooding, air quality, and urban heat island. This makes tree canopy an important part of a the county's infrastructure. The greatest relative gains in tree canopy were in locations where new plantings were carried out on areas with little tree canopy to begin with. Just as forest patches provide valuable ecosystem services, such as wildlife habitat, so do individual trees. In areas with low tree canopy, an individual tree can provide a refuge from the sun while watching a baseball game, shade cars in a parking lot or help to reduce homeowner air conditioning costs. Though growing conditions in ROW areas can be tough, they are a tool to increase canopy in low coverage areas. Natural growth can provide gains in areas with robust canopy, but in areas with low canopy, such as commercial spaces, tree plantings are an important part of a long-term plan to increase tree canopy.

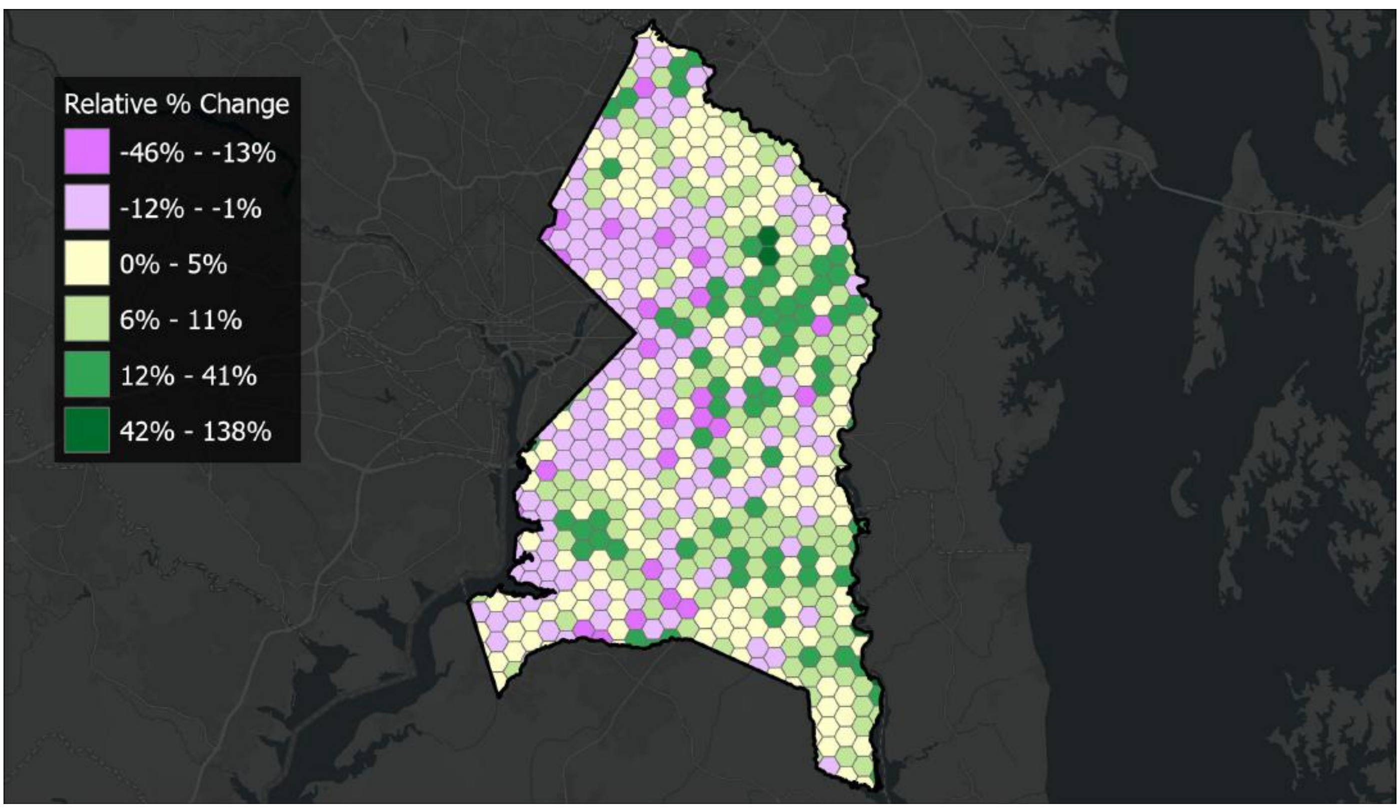


Figure 8: Tree canopy change metrics summarized by 250-hectare hexagons. Relative tree canopy is calculated by using the formula (2009-2020)/2020. Colors are categorized by data quantiles. Darker greens indicate greater relative gain, while darker purple reflects a higher magnitude of loss.

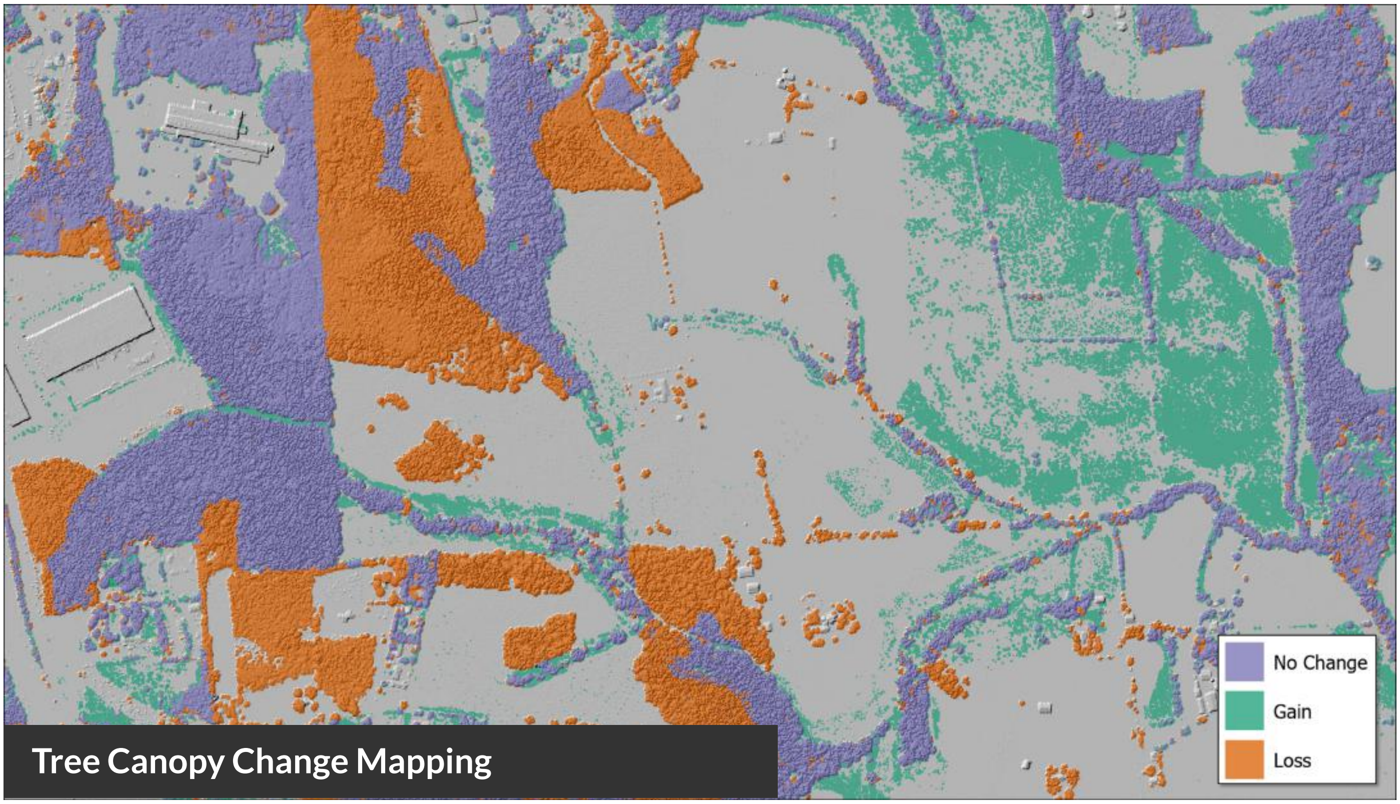


Figure 9: Tree canopy change mapping for the area surrounding Rock Spring Dr overlaid on 2009 LiDAR. This area experienced a mix of gain and loss.

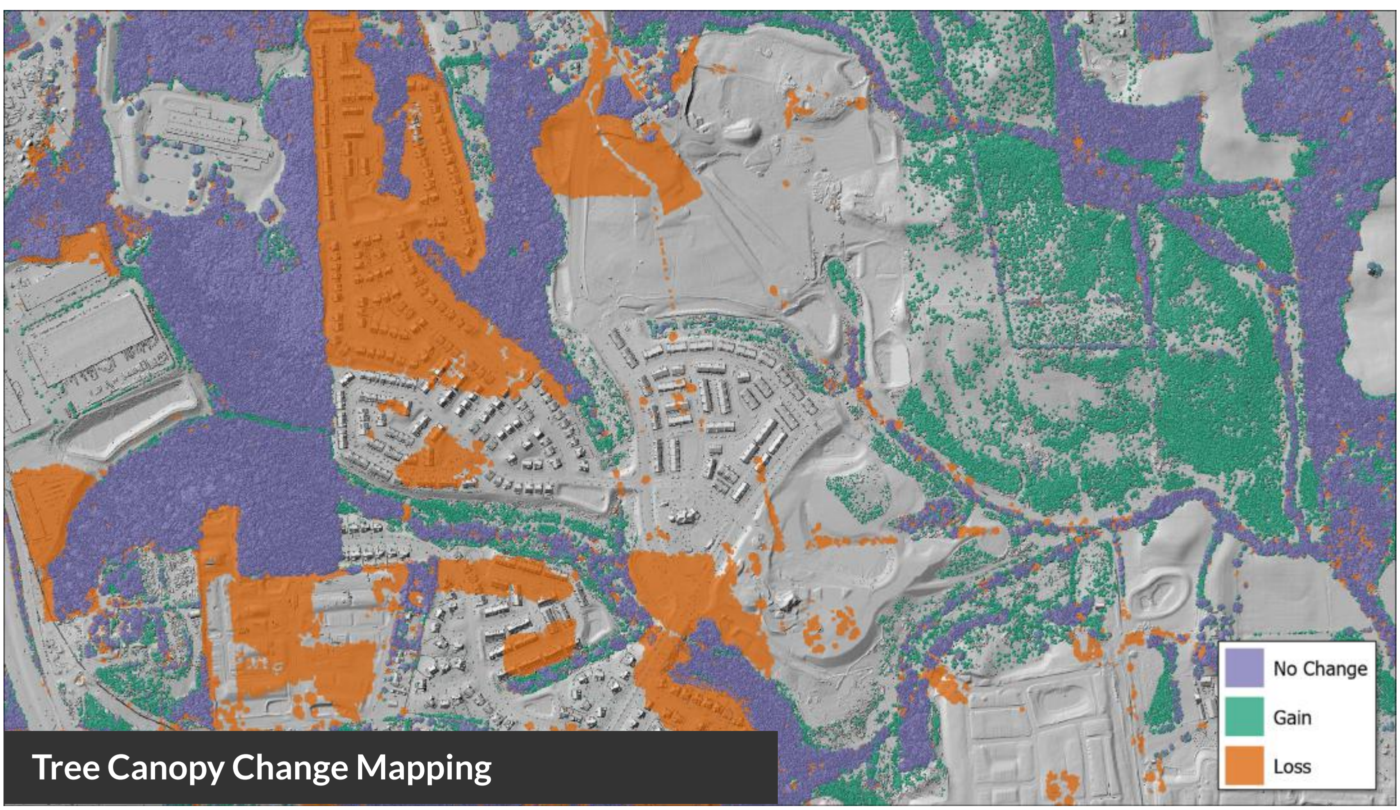


Figure 10: Tree canopy change for the same area above but overlaid on the 2020 LiDAR. The areas of gain appear rough now that tree canopy is present, and the areas of loss appear smooth due to the absence of tree canopy.

PATTERNS OF CHANGE

Numerous factors contribute to the wide range of tree canopy change patterns of Prince George's. These include zoning, land use history, urban density, and landowner decisions. The examples that follow illustrate how these factors influence canopy change. Examining patterns and processes over the past decade can provide insights into how the canopy may change in the future.

Forest Natural Succession

Growth of already existing canopy was the largest driver of the county's tree canopy gains.

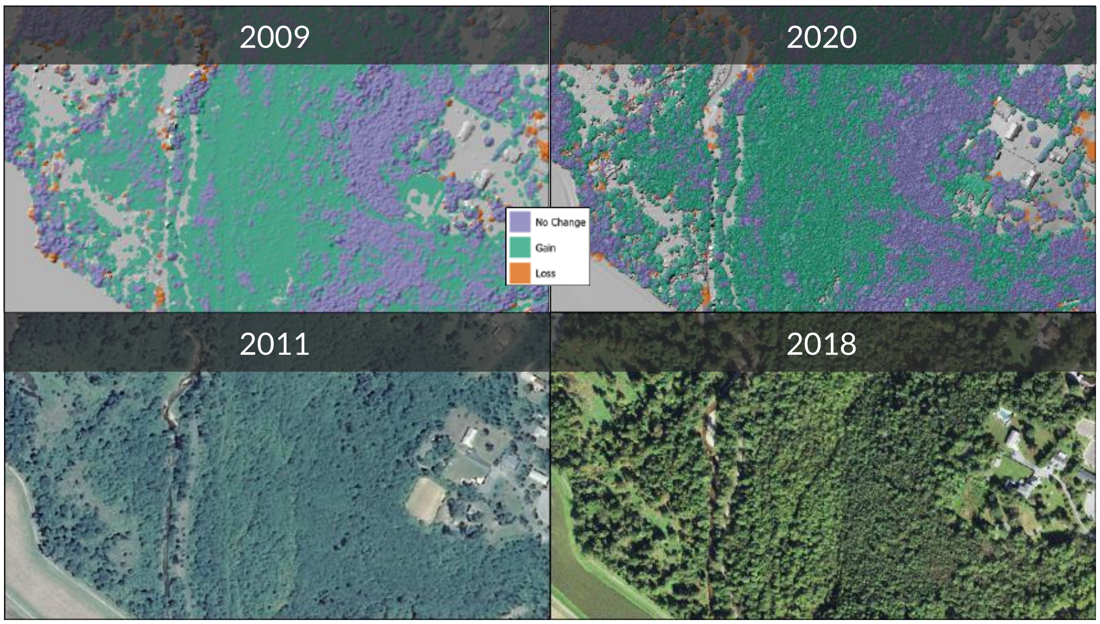


Figure 11. Natural growth in Cherry Hill Road Park resulted in tree canopy gains in the area. Large forest patches provide essential ecosystem services and habitat for wildlife.

Tree canopy gain

Park

Wildlife Habitat

Urban Forest Patch Development

Development needs should balance the essential ecosystem services that urban forest patches provide, including wildlife habitat and reduced stormwater runoff. Forest patches can be removed in a matter of days and take decades to rebuild.

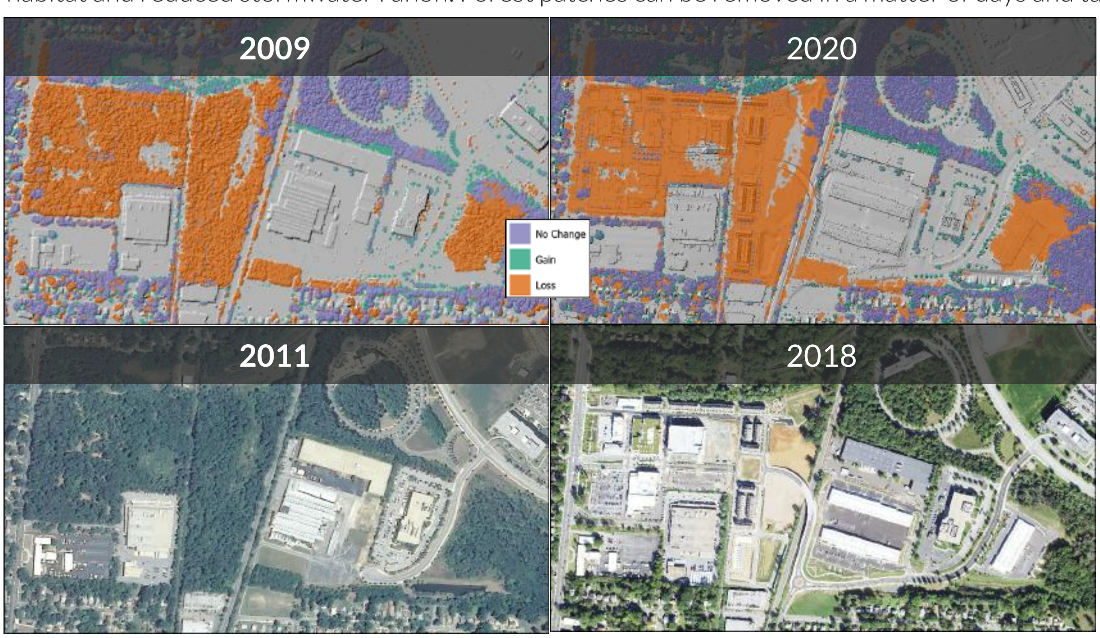


Figure 12. Large forest patch removal around Baltimore Ave resulted in an overall decrease in canopy coverage.

Forest Patch Loss

Commercial Area

New Construction

Residential Developments

Trees continue to grow and contribute canopy in more established neighborhoods, but age, disease, invasive species, storms, and changing landowner preferences all contribute to removals. As a result, losses may outpace gains over time if replacement trees are not planted.

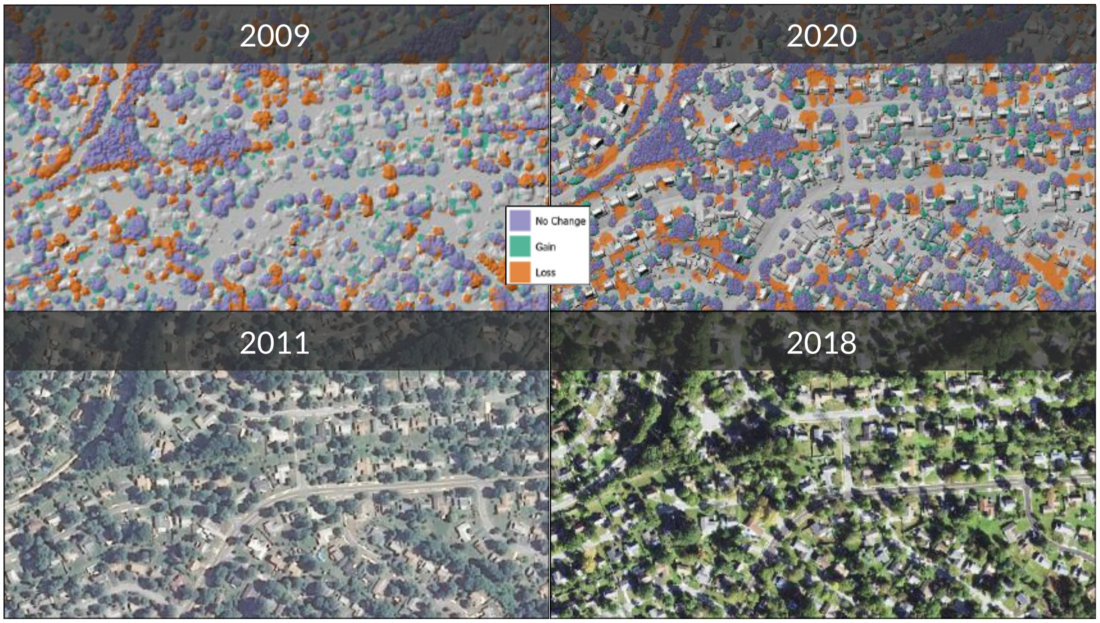


Figure 13. Natural succession helped mitigate tree canopy losses around Millstream Dr.

Mix of Loss and Gains

Residential Area

Natural Sucession

Street Tree Growth

There is substantially less tree canopy in the county's industrial and commercial areas. Trees are often removed to provide more room. Street trees are particularly important since they help reduce the urban heat island and stormwater runoff in impervious surface-dominated areas.

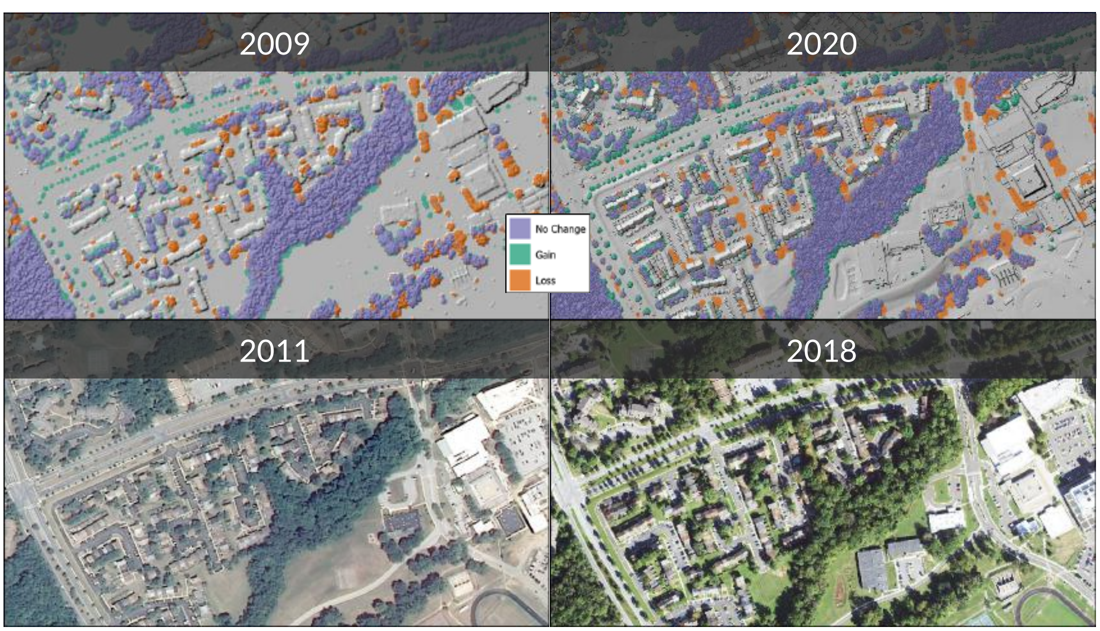


Figure 14. Natural growth and new plantings of street trees helped off-set canopy losses in the vicinity around Campus Way.

Tree canopy gain

Transportation Corridor

Tree Planting

Council Districts

All of Prince George's council districts experienced both gain and loss of tree canopy within their boundaries. Gains outpaced losses in Districts 1, 4, 6 and 9 resulting in a net gain in tree canopy while the other districts saw overall losses from 2009-2020. The severity of losses were buffered by gains through replanting efforts and natural succession. The differences in canopy is the result of land use history and changes to the built environment.

Areas with large parks and open space tend to have more canopy, while neighborhoods that are more dense with commercial or industrial use tend to have less tree canopy. Council District 9 contains the largest share of the county's 2020 tree canopy at about 80,676 acres. District 9 also saw the largest net tree canopy gains in terms of total area (2,317 acres). District 2 on the other hand, saw the largest tree canopy losses in terms of relative percent change with 7.5% and District 7 had the largest net loss in area at 227 acres of tree canopy lost 2009-2020.

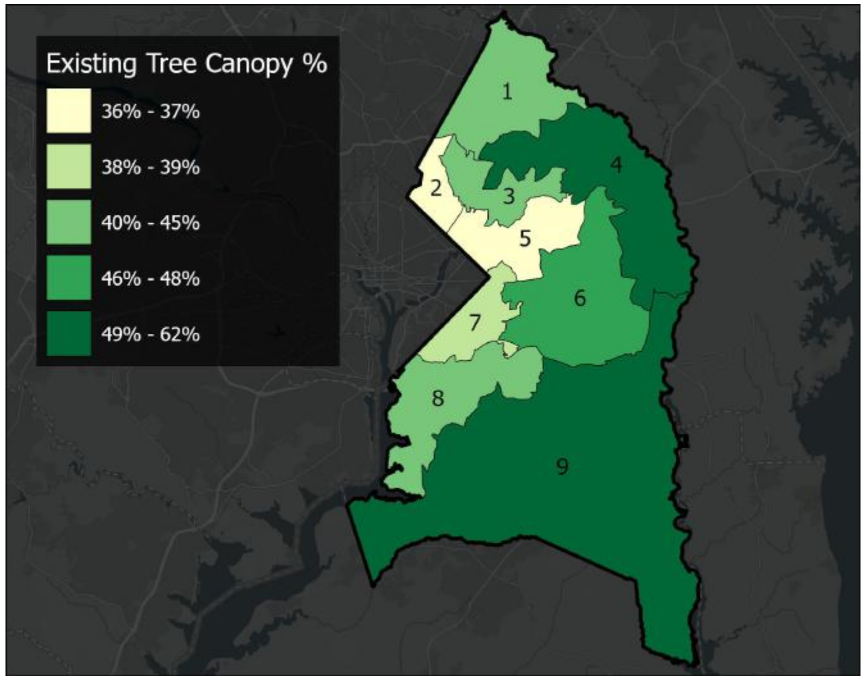


Figure 15: Existing tree canopy percentage for 2020 conditions summarized by council district.

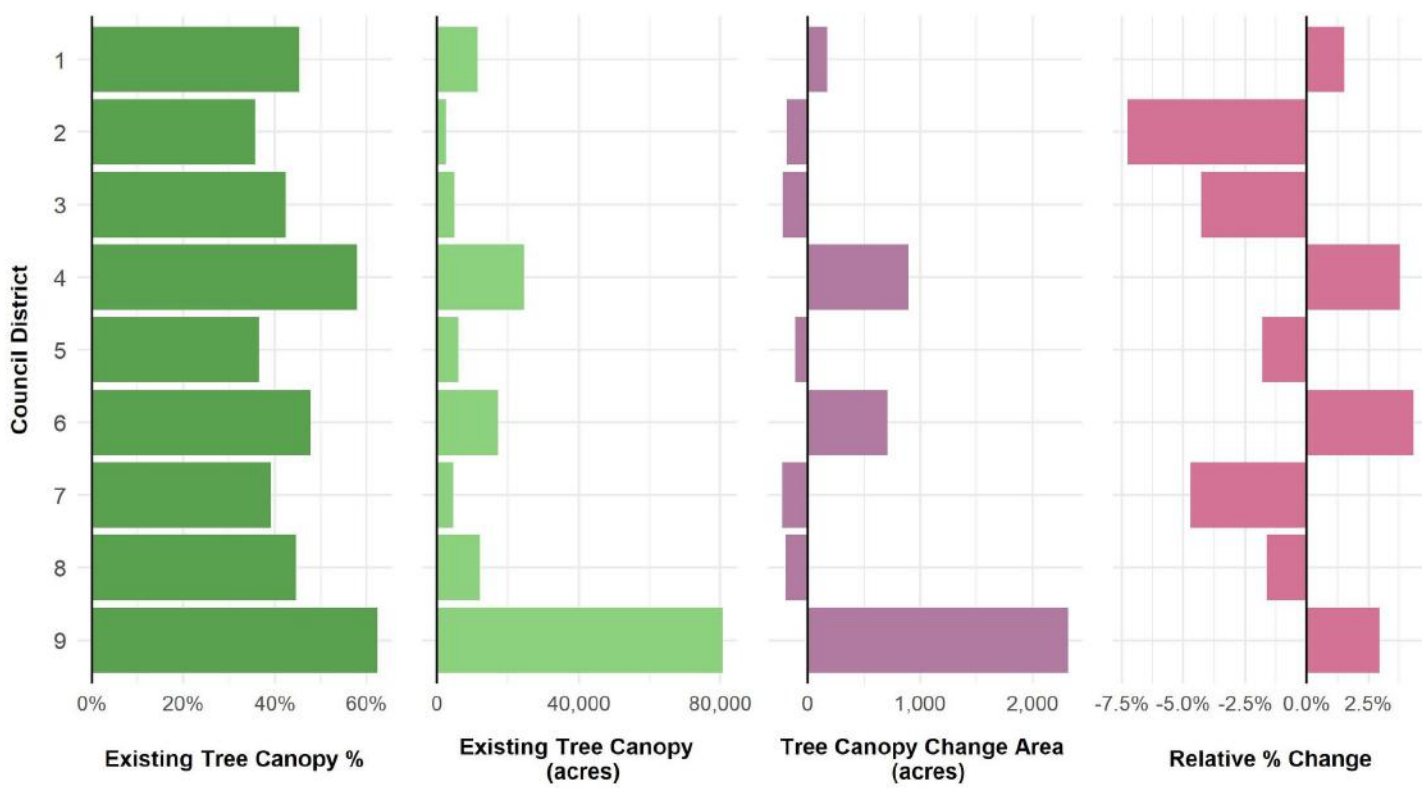


Figure 16: Tree canopy and change metrics summarized by council district.

Land Use

Land use is how humans make use of the land including the economic and cultural activities practiced there. Land use is not to be mistaken by land cover which refers to landscape features, such as trees, buildings, water and other classes mapped as part of this study. Land use can significantly influence the amount of tree canopy and the room available to establish new tree canopy. Tree canopy cover was calculated in terms of percent of the land area within each property land use type (Figure 19) to understand the proportion of each of each unit with canopy coverage, and as a percent of county-wide total tree canopy area (Figure 18) to determine contribution to the county's overall tree canopy. Nearly 29% of Prince George's tree canopy falls within one of the residential land use types (Single Family, Multi-Family, Townhouse, and Attached). Single Family residential on its own contains 40,256 acres of tree canopy, contributing 25.8% of the county's total tree canopy. Residential classes also experienced the most decline in tree canopy between 2009 and 2020 with Single Family being the only of the four residential categories to see a net increase. This underscores the importance of engaging with private land owners to preserve tree canopy.

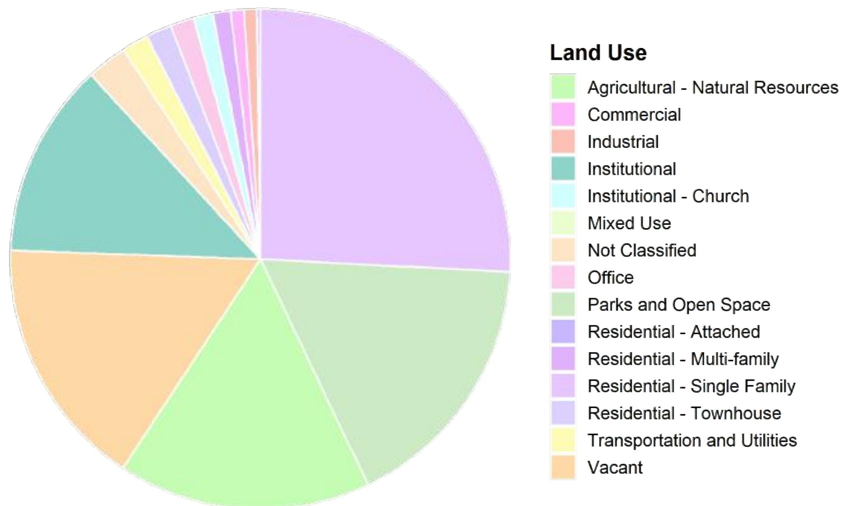


Figure 17: Tree Canopy Distribution by Property Land Use.

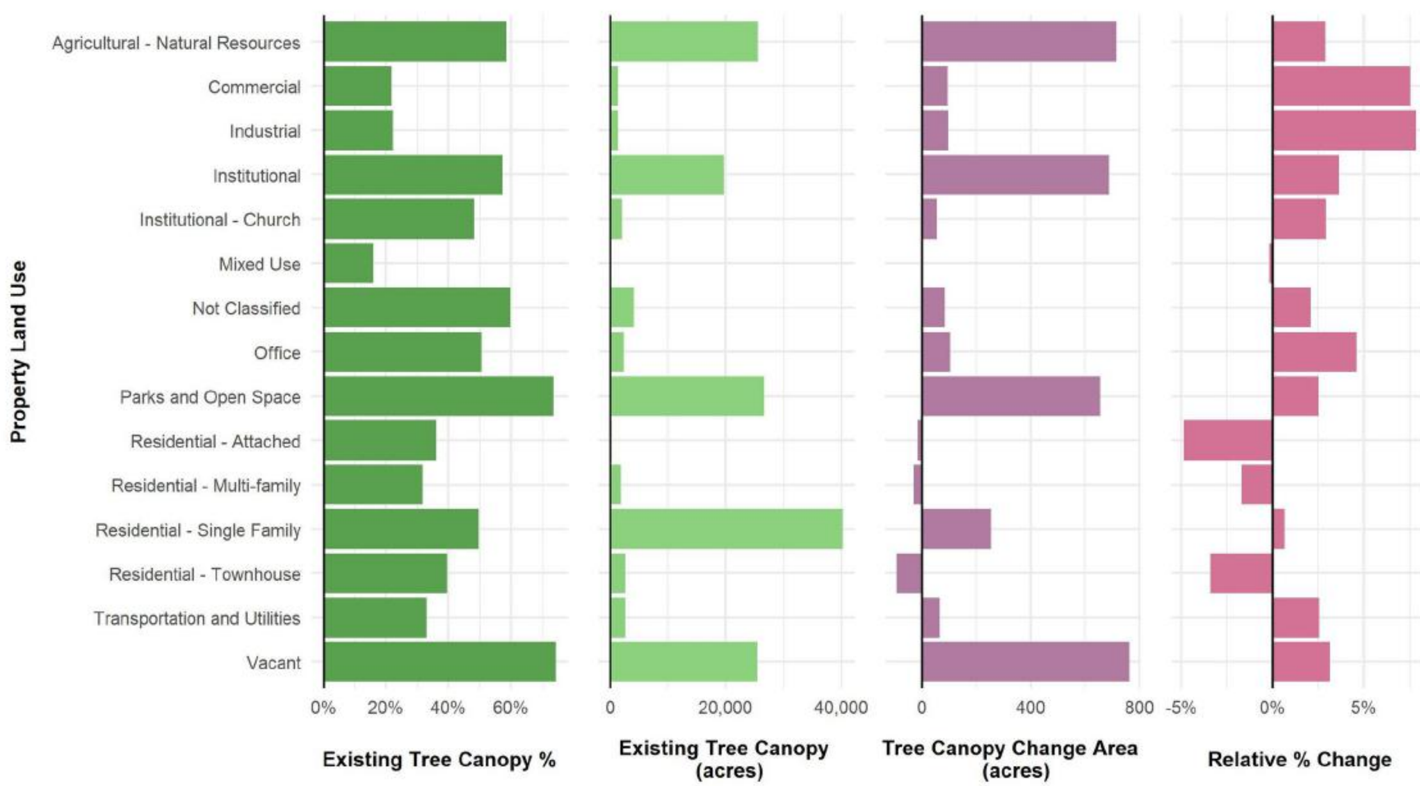


Figure 18 Tree canopy and change metrics by Management Unit

Zoning

Understanding the location and land-use types that tree canopy falls into is important for coordination and planning purposes. Land zoned for Rural and Agricultural contained a majority of Prince George's existing tree canopy (58%) in 2020. This zone type had the highest existing tree canopy percent with 67% of land in this zone covered by tree canopy. Between 2009 and 2020, land zoned for Rural and Agricultural saw a net gain of 2,770 acres of tree canopy amounting to a total 2020 area of 89,800 acres. The key role that Prince George's Rural and Agricultural areas play in the county's tree canopy underscores the need for thoughtful development as the county continues grow. Residential zones were the next biggest contributors of Prince George's tree canopy, representing almost one third (32.5%) of the county's tree canopy. Residential zones also saw net gains but not to the degree of Rural and Agricultural zones. The Transit-Oriented/Activity Center zones were the only zone type to see net losses in tree canopy.

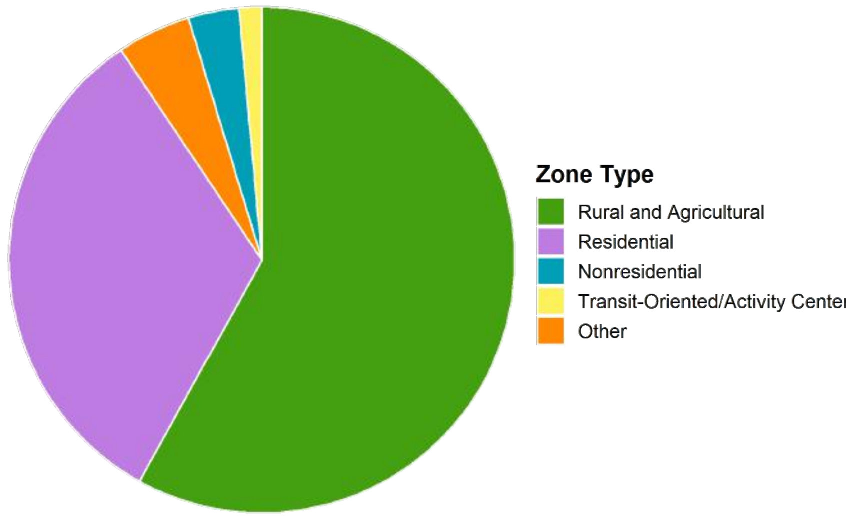


Figure 19: Tree Canopy Distribution by zone type.

Due to lower overall tree canopy cover in this zone, the 141 acres of tree canopy loss resulted in a substantial relative percent loss of 6%. Areas zoned as Other saw the highest magnitude of tree canopy gains with a relative percent increase of 6%.

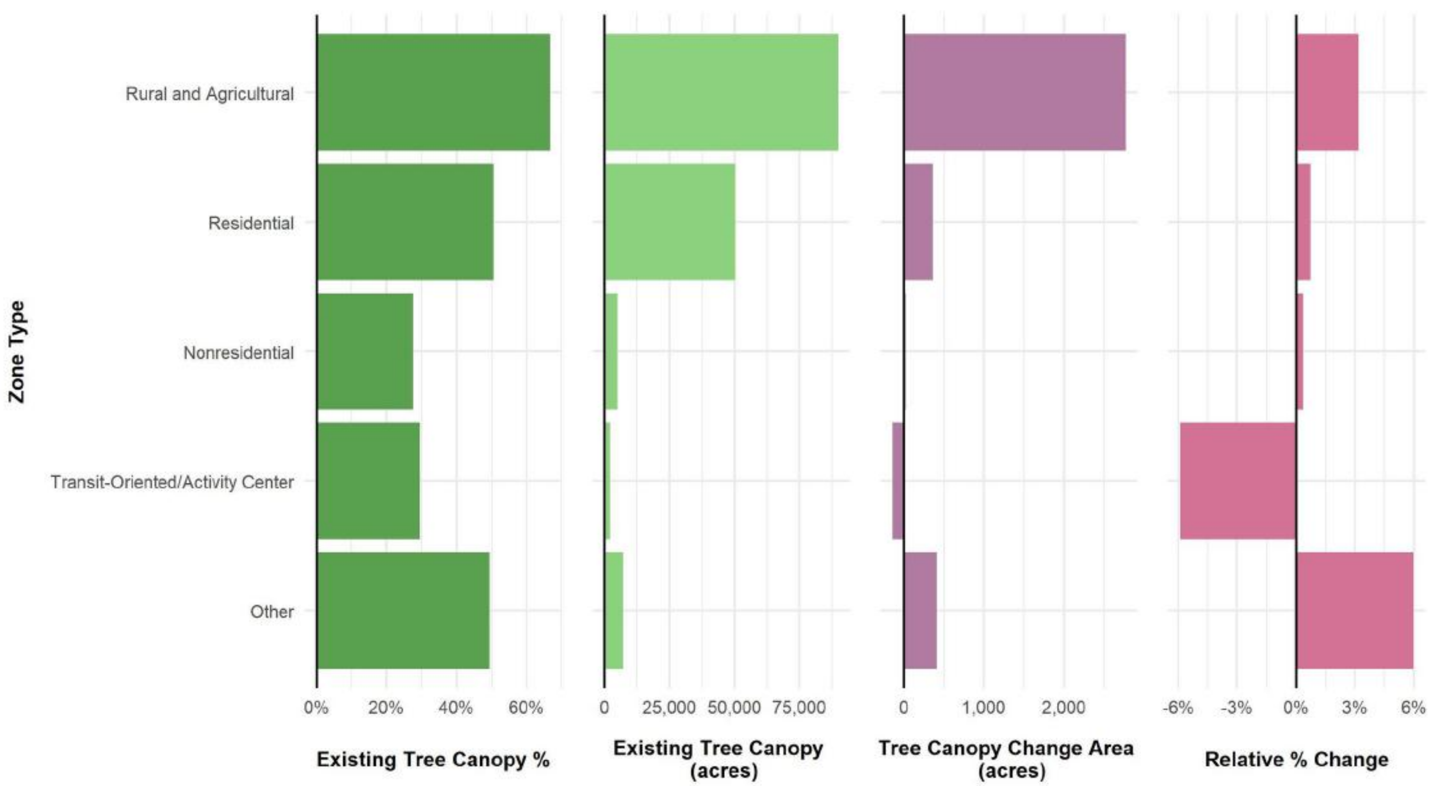


Figure 20: Tree canopy and change metrics summarized by zone type.

General Plan 2035

Prince George's 2035 General Plan provides recommended goals, policies, and strategies for future development within the county. This guidance has a focus on sustainability and managing tree canopy as key green infrastructure will be an important tool in reaching goals and achieving positive social, economic, and environmental impacts.

Of the areas designated in the General Plan, each group had fairly consistent canopy coverage ranging from 28% existing tree canopy percent (Regional Transit Districts) to 32.5% (Neighborhood Centers). In terms of change in tree canopy 2009-2020, Local Transit Centers and Regional Transit Districts saw modest net increases in tree canopy (gains of 20 and 33 acres respectively) while Campus Centers nearly broke even (1 acre of loss), Neighborhood Centers lost 44 acres, and Town Centers saw a net decrease of 295 acres of tree canopy, resulting in a dramatic relative percent loss of 23%.

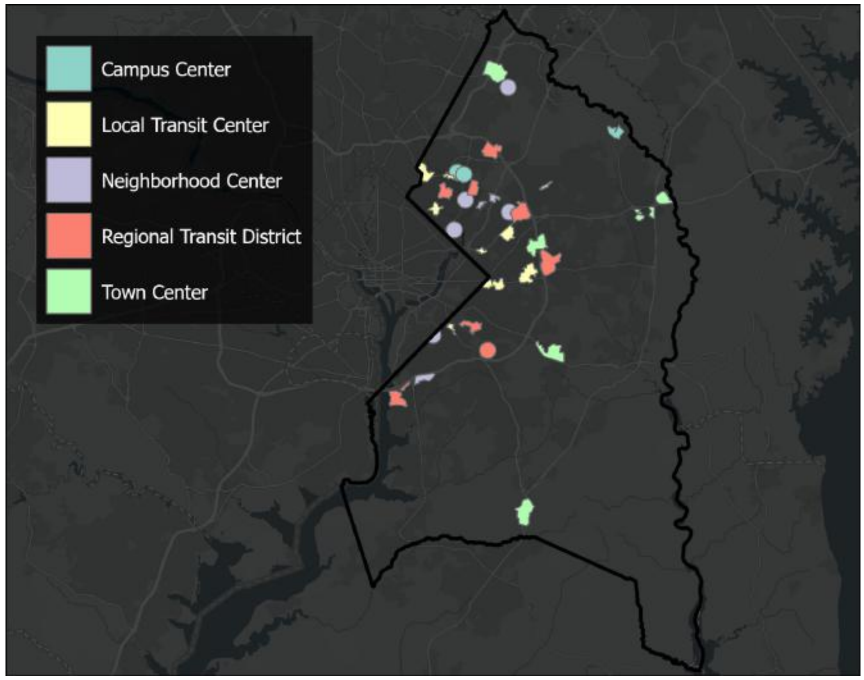


Figure 21: Existing tree canopy percentage for 2020 conditions summarized by council district.

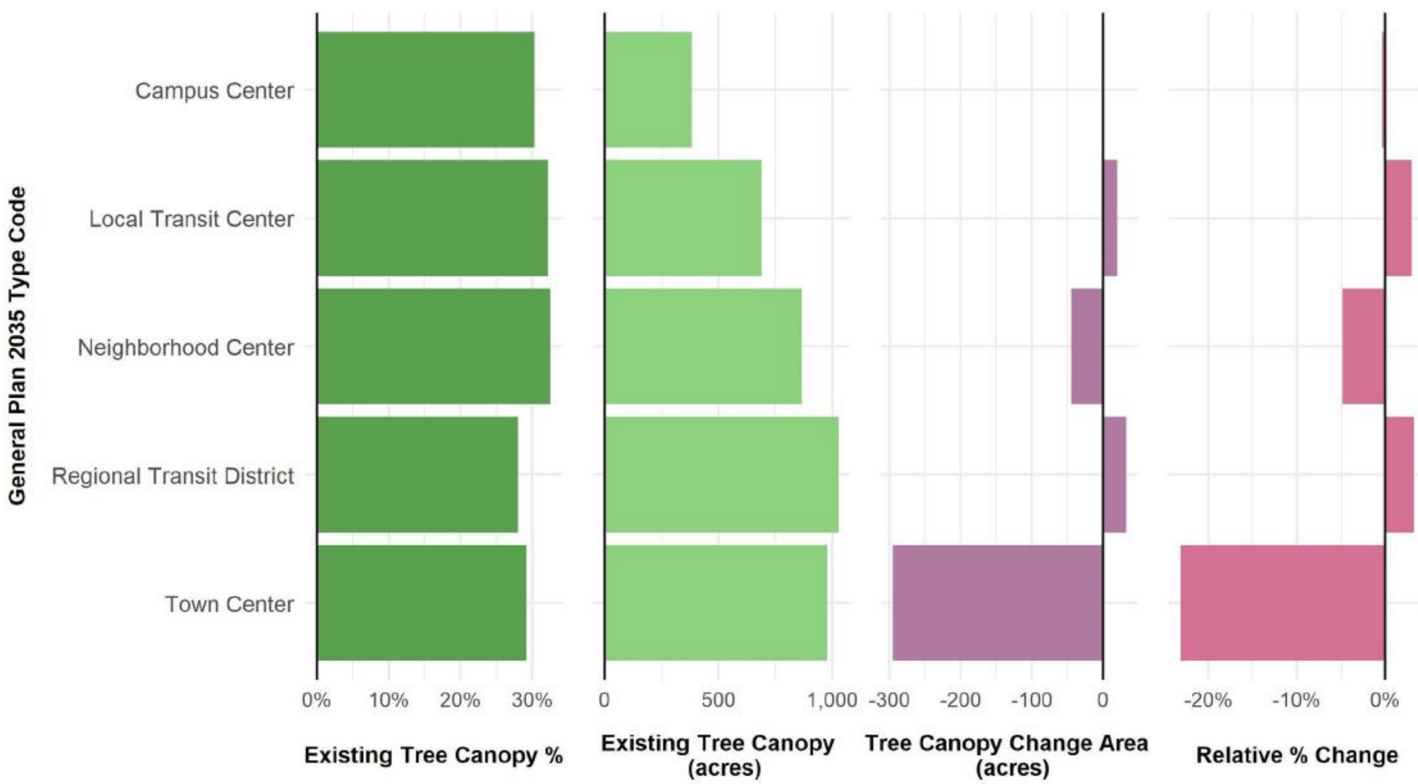


Figure 22: Tree canopy and change metrics summarized by council district.

Subwatershed DNR

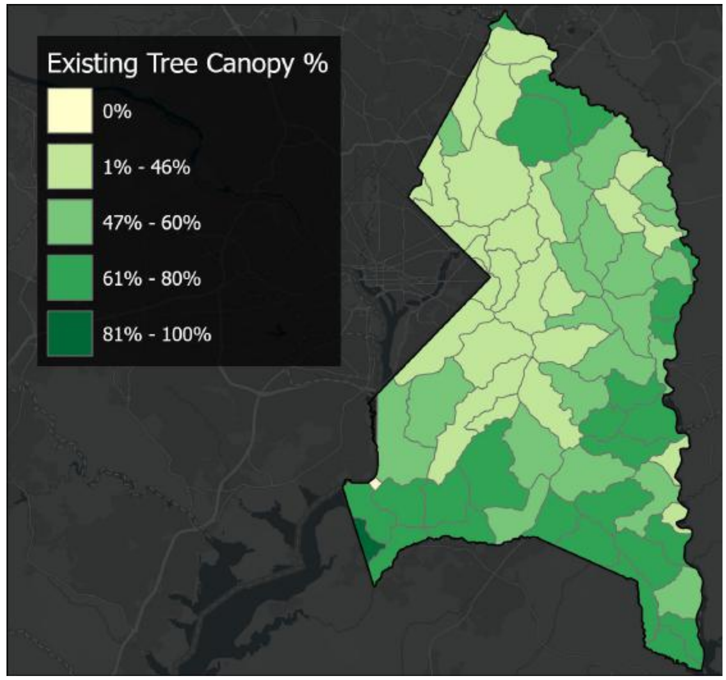


Figure 23: Existing tree canopy percentage for 2020 conditions summarized by sub watersheds.

Watersheds represent areas in which water moves and drains in order to reach streams, lakes, and other waterbodies. An increase in impervious surfaces, commonly due to increase development, impacts the water flow through a watershed. Water tends to flow faster over impervious land collecting pollutants leading to higher risks of flooding, contamination of waterways, and loss of fish habitat. Trees can reduce stormwater runoff by acting as a sponge, absorbing approximately 18 inches of rainfall and then gradually releasing it into the watershed. The stormwater runoff of one acre of impervious surface generates the equivalent amount of annual runoff as 36 acres of forested land. Maintaining tree canopy, especially in riparian areas, is an important tool for managing the health of watershed ecosystems. Watersheds closer to Washington, DC had the least amount of existing tree canopy as of 2020 (Figure 23) and experienced the largest decrease in relative tree canopy change over 11 year period (Figure 25). Most surrounding watersheds further from Washington, DC saw a relative small increase in tree canopy (2%-11% relative change).

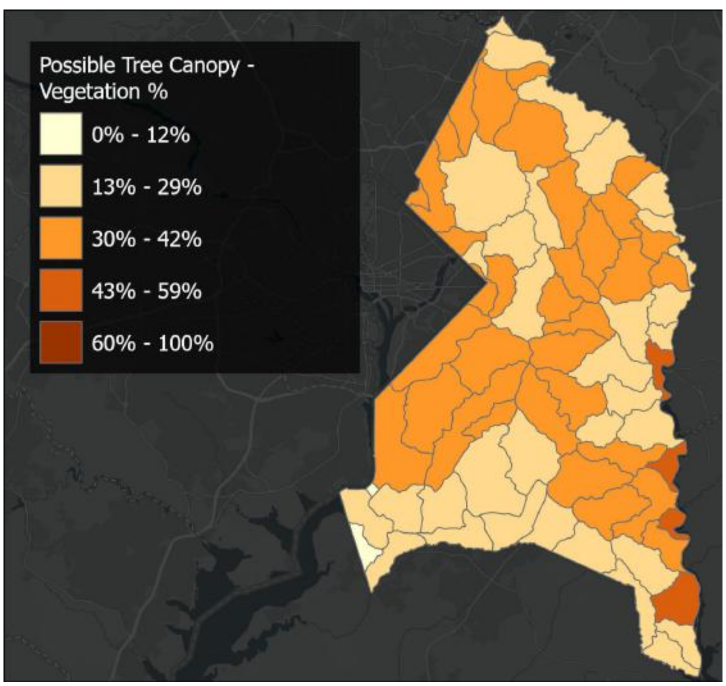


Figure 24: Possible tree canopy percentage for 2020 conditions summarized by sub watersheds.

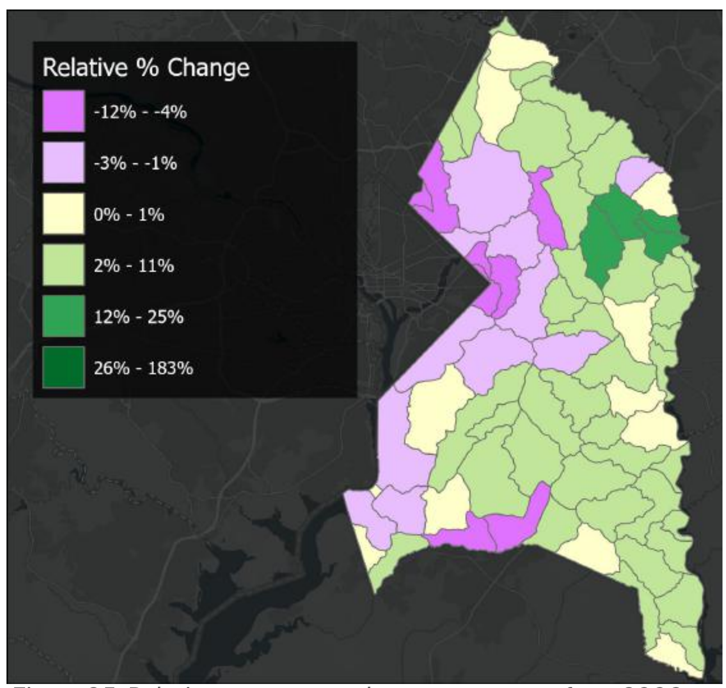


Figure 25: Relative tree canopy change percentage from 2009 to 2020 summarized by sub watersheds.

Figure 26: Tree canopy and change metrics summarized by subwatershed.

EQUITY & ENVIRONMENTAL JUSTICE

Environmental Equity & Urban Resilience

Like many communities in the United States, Prince George's County faces environmental risks and challenges relating to the urban environment. Trees, when properly cared for, can serve as a solution to create a sustainable and more resilient community. However, resiliency requires preparedness to overcome shocks to Prince George's County and a crucial component of its resiliency are its residents. Thus, to enhance urban resilience, we recommend Prince George's County targets neighborhoods lacking access to tree canopy cover and for tree planting prioritization to be further informed by the distribution of demographic groups that are typically more susceptible to environmental risks. These include historically marginalized populations like racial and ethnic minorities and residents living with a median annual income less than $25,000.

In Prince George's County, distributions of census tracts with greater presence of Non-White residents and little tree canopy cover closely resemble the distributions of census tracts with greater percent of population with a median income < $25,000 or less and little tree canopy. It is likely that these demographics, which are typically interrelated, are also more exposed to environmental challenges due to a lack of trees available to provide important benefits that mitigate them.

SUCEPTIBILITY AND INEQUITY

-

VARIOUS DEMOGRAPHICS* ARE AT GREATER RISK AGAINST ISSUES THAT IMPACT CITIES

*Other demographics at risk besides those illustrated include:

- Hispanic population
- Individuals that had strokes
- Children younger than 5
- Adults older than 65
- Individuals exposed through daily commuted (walking or public transportation)
- Individuals living in areas with hazard risk like sewage overflows

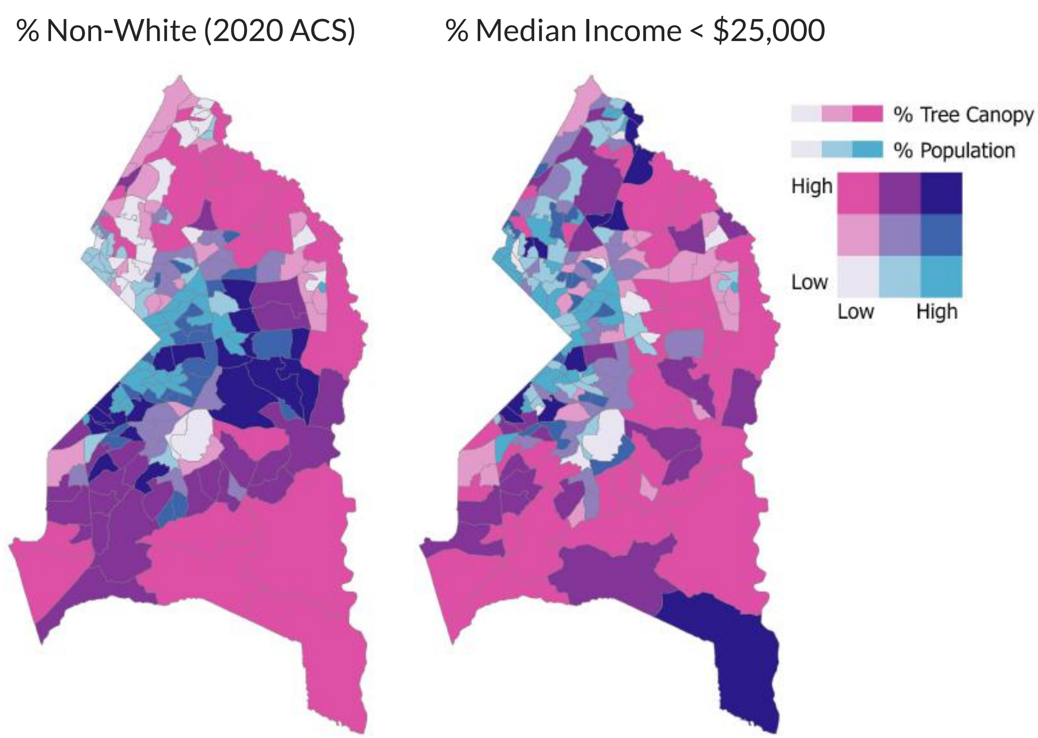


Figure 27: These maps show percent existing tree canopy cover in relation to two demographic groups that are highly interrelated and typically within the most susceptible groups against environmental challenges. Shades of pink indicate tree canopy percentage by block group, with the darkest shade indicating higher percentages. Meanwhile, shades of blue indicate percentage of residents within each of the demographic groups, with the darkest shade indicating higher percentages.

COMMUNITY RESILIENCE

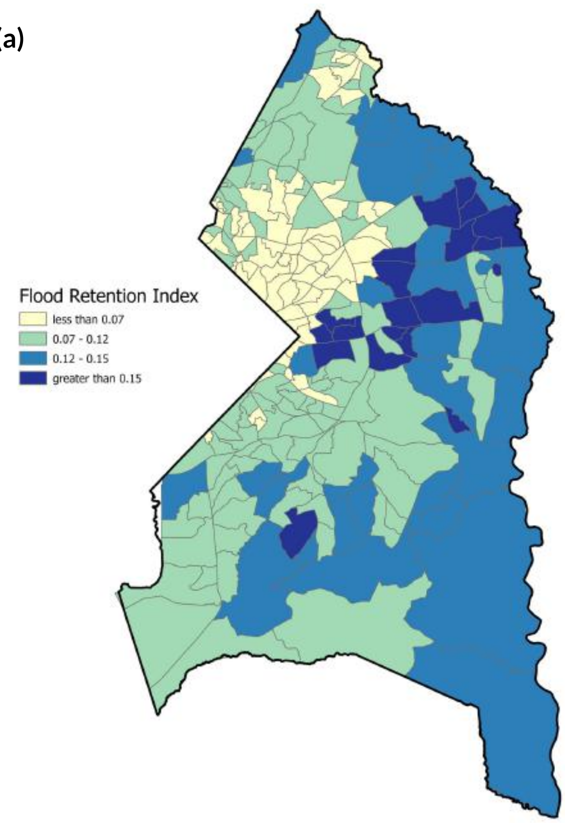
Environmental Stressors & Neighborhood Prioritization

With an increase in severe storms and extreme weather across the country, flooding and rising temperatures are two environmental challenges that impact Prince George's County. Using the Urban Cooling and Flood Retention modules from the Integrated Valuation of Ecosystem Services and Tradeoffs (InVEST) tool, we were able to identify census tracts that have higher potential to mitigate flooding (**Figure 28a**) and heat (**Figure 28b**). The maps below can be used to determine tree planting allocation to strengthen community resilience against flooding and rising temperatures.

Mitigation Capacity by Local Vegetation

Trees can be critical in bank stabilization, water quality protection, and absorbing water during high precipitation events. Flood retention **(a)** is mapped by census tracts and representing the capacity for the current vegetation and soil to retain water during rain events. Prince George's of vegetation acts as a riparian buffer filtering runoff and absorbing precipitation into the soil. The heat island effect considerably affects cities, and rising temperatures can result in fatalities (particularly among the elderly and those with cardiovascular diseases). Prince George's capacity of local vegetation to mitigate rising temperatures **(b)** varies throughout the urban landscape.

(a)



(b)

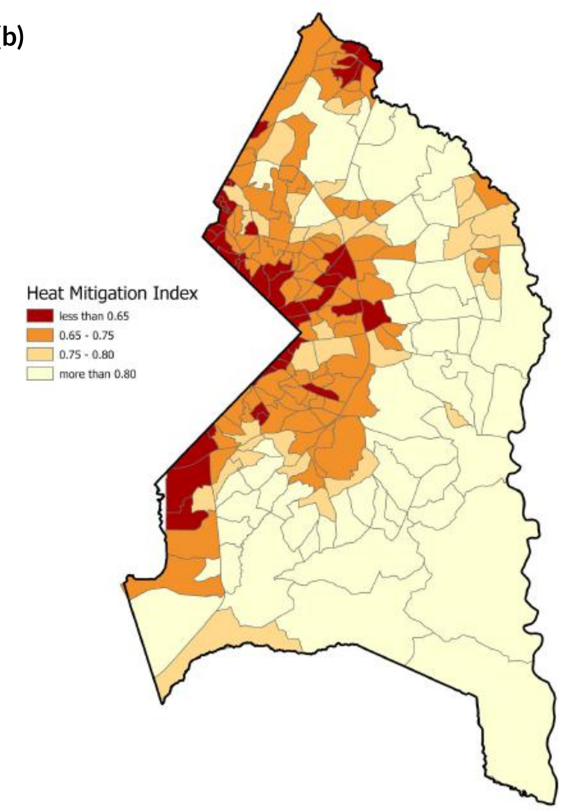


*Figure 28: **(a)** The flood retention index ranges from zero (low retention capacity) to one (high retention capacity) and was modeled with InVEST. **(b)** The heat mitigation index ranges from zero (low mitigation capacity) to one (high mitigation capacity) and was modeled with InVEST.*

Environmental Stressors & Neighborhood Prioritization (continued)

Exposure to traffic-related air pollutants (TRAPs) is an environmental challenge faced by many communities including Prince George's County. Exposure to air pollutants can cause a multitude of adverse health outcomes. Utilizing 2018 average annual daytime traffic counts (AADT) from the US Department of Transportation, classified into five categories of mean traffic volume by census tracts. Tree canopy, particularly street trees along roadways, have the potential to reduce exposure to TRAPs while mitigating other harmful environmental stressors such as noise pollution and heat.

These maps can be used to help inform tree planting allocation within census tracts with high traffic volume to reduce exposure to TRAPs while taking into account which tracts have the capacity for new trees.

Reducing Exposure to TRAPs

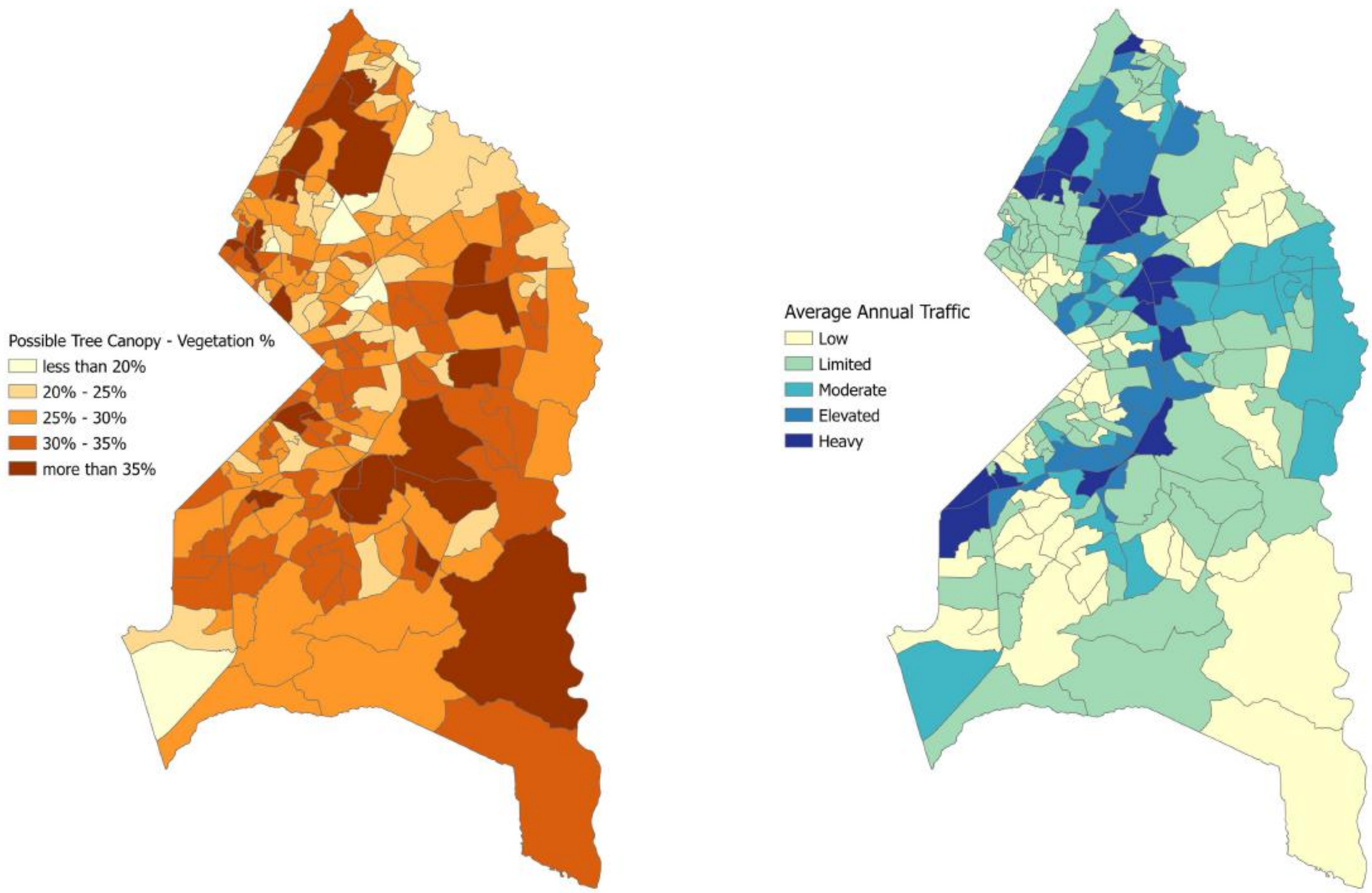


Figure 29: The possible tree canopy indicates that there is moderate potential for new tree planting throughout Prince George's County. There is the potential for trees to replace existing low-lying vegetation. Comparing possible tree canopy to the average annual traffic volume classes, the middle region of surrounding tracts closest to the Washington, DC boundary seems to have the heaviest traffic volume with approximately with varying percent possible tree canopy. These maps can be used to help inform where to plant new trees or preserve existing tree canopy to lower the potential exposure of individuals residing in the census tracts with the highest traffic volume.

This assessment was carried out by the University of Vermont Spatial Analysis Lab under contract with The Sanborn Map Company Inc, in collaboration with the Prince George's County Planning Department. The methods and tools used for this assessment were developed in partnership with the USDA Forest Service. The source data used for the mapping came from Prince George's County, the State of Maryland, and the USDA. The project was funded by Prince George's County. Additional support for this project was provided by the Gund Institute for Environment at the University of Vermont. Computations were performed on the Vermont Advanced Computing Core supported in part by NSF award No. OAC-1827314.

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