

TOWNSHIP OF LOWER MERION

PUBLIC WORKS COMMITTEE

**WEDNESDAY, NOVEMBER 5, 2025
6:00 PM (Approximately)**

AGENDA

- 1. RECEIPT OF TREE CANOPY MANAGEMENT PLAN**
- 2. AUTHORIZATION TO PROCEED WITH DESIGN AND BIDDING FOR SELECT HIGH PRIORITY SIDEWALK SEGMENTS**



Township of Lower Merion
A FIRST CLASS TOWNSHIP

AGENDA ITEM INFORMATION

COMMITTEE: Public Works

ITEM: RECEIPT OF TREE CANOPY MANAGEMENT PLAN

Consider for recommendation to the Board of Commissioners receipt of the Tree Canopy Management Plan prepared by the F.A. Bartlett Tree Expert Company dated June 12, 2025.

PUBLIC COMMENT

ATTACHMENT(S):

[Tree Canopy Assessment Issue Briefing 10-31-2025.docx](#)

[Lower Merion Tree Canopy Management Plan 2025.pdf](#)

[Public Works Shade Tree Presentation 10.31.25.pdf](#)

TOWNSHIP OF LOWER MERION

Public Works Committee

Issue Briefing

Topic: Tree Canopy Management Plan

Prepared by: Paul McElhaney, Director of Public Works
Joe Marco, Township Arborist

Date: October 31, 2025

I. Action To Be Considered By The Board:

Review and receive the Tree Canopy Management Plan prepared by Bartlett Tree Expert Company as part of Township's urban greening and sustainability initiatives.

II. Why This Issue Requires Board Consideration:

The Board of Commissioners receives consultant reports for future considerations.

III. Current Policy Or Practice (If Applicable):

As an older suburban community of Philadelphia, Lower Merion Township is home to an extensive and mature urban forest canopy threaded between public and private lands. The Township is responsible for the care of approximately 70,000 trees that are located within its 176 miles of public right of way and 705 acres of public parkland. In support of Township-wide sustainability planning and goals, the Township is developing a historical tree canopy assessment and a tree canopy management plan to continue to grow, protect, and care for the public elements of our urban forest.

IV. Other Relevant Background Information:

To strengthen the foundation for future policy decisions and maximize the benefits of the Township's urban forest, the Township authorized a historical analysis of tree canopy conditions and the development of a long-term Tree Canopy Management Plan. To obtain these professional services, Township staff issued a Request for Proposals (RFP) and received two submissions. After evaluation, Bartlett Tree Experts was recommended for selection, as their proposal provided the most comprehensive scope and methodology to meet the Township's objectives.

The RFP outlined a two-phase approach: first to analyze and quantify the Township's tree canopy, and second to develop practical strategies for its long-term management.

Phase 1: Data Collection and Assessment

During this initial phase, Bartlett gathered and analyzed data from diverse sources, including the Township, County, Delaware Valley Regional Planning Commission (DVRPC), and other relevant entities. The primary focus was on creating maps that evaluated the historical and current tree canopy coverage within Lower Merion Township. This analysis extended beyond basic canopy metrics, encompassing comprehensive comparisons with census data, socioeconomic conditions, property values, land cover, land use and zoning, urban heat, air quality, watershed and flood information, and other relevant parameters. Bartlett conducted a thorough examination of existing and historical tree canopy information, establishing a baseline for future analysis.

Phase 2: Program Evaluation and Management Planning

In the subsequent phase, Bartlett conducted a detailed evaluation of existing Township policies, departmental procedures, staff and equipment allocations, and budget allocations related to tree management. This evaluation was informed by interviews with Township staff and a comprehensive review of asset databases and historical documents, including prior tree inventories. Building on the insights gained in Phase 1, Bartlett collaborated closely with Township staff to develop a comprehensive Tree Canopy Management Plan tailored to the Township's specific tree management activities. The plan aimed to preserve and enhance the tree canopy over the next decade, with Township input sought to refine its details. Public engagement played a pivotal role and included meetings with the Shade Tree Commission (STC) and the Environmental Advisory Council (EAC). Bartlett delivered a final Phase 1 & 2 report, along with electronic files, to the Township.

Phase 1& 2 Findings:

Overall Canopy Declines, Gains, and Distribution

Lower Merion Township's tree canopy decreased slightly—from 54.7% in 2010 to 53.5% in 2022 across the Township's 24 square miles. The most significant declines occurred in Belmont Hills/College Park (-7.5%), Bala (-7.1%), Merion (-6.3%), Cynwyd (-6.1%), and North Penn Valley (-6.0%), reflecting areas heavily impacted by Emerald Ash Borer (EAB) infestation (first detected locally around 2015), ongoing redevelopment pressure, and natural mortality of mature canopy trees. Despite these localized declines, canopy coverage remains robust overall—eight communities still exceed 50% canopy cover, with Gladwyne (62.4%), Rosemont (56.5%), and Haverford (57.1%) maintaining some of the highest coverage levels in the region.

Encouragingly, the data show a modest rebound in canopy coverage since 2015, when coverage had fallen to 52.8%. The gain between 2015 and 2022 signals that the Township's replanting and proactive maintenance programs—including the planting of approximately 200 new street trees annually and the removal of diseased or structurally unsound trees—are beginning to stabilize and reverse earlier losses. Several communities such as Gladwyne, Rosemont, West Bryn Mawr, East Bryn Mawr, and Haverford recorded measurable canopy

increases, demonstrating that consistent municipal reinvestment and long-term species diversification are strengthening the Township’s urban forest resilience.

Canopy Distribution & Land-Use Findings

The 2022 canopy assessment revealed that Lower Merion’s tree canopy is broadly and equitably distributed, with Tree Equity Scores exceeding 90 in nearly all census tracts—an indication that residents township-wide enjoy comparable access to the environmental, health, and aesthetic benefits of tree cover. Only a few census blocks, primarily in Bala (scores 83–84) and East/West Ardmore (scores around 86), scored below 90, suggesting limited need for targeted canopy expansion.

By land use, residential properties support the greatest canopy density at 56.2%, followed by industrial parcels (50.0%), institutional/exempt properties (43.4%), and commercial areas (41.9%). These findings underscore both the maturity of the Township’s residential tree stock and the opportunity to enhance canopy on commercial corridors, institutional campuses, and parking-dominated parcels through incentive programs, planting partnerships, and ordinance updates.

Strategic Recommendations

The Plan outlines a 10-year strategic framework for sustaining and expanding the Township’s urban forest through 2034, with a midterm reassessment in 2029 to measure progress. Key recommendations include:

- Establishing Township-wide canopy cover goals, supported by five-year monitoring intervals using updated aerial and GIS analysis.
- Adopting a species diversity policy following the 30/20/10 guideline (no more than 30% of trees from one family, 20% from one genus, and 10% from a single species) to protect against future pest and disease vulnerabilities.
- Expanding replanting recommendations to include replacement ratios (e.g., five small-maturing trees for each large tree removed), ecosystem service prioritization (e.g., stormwater reduction, heat mitigation), and species performance tracking.
- Fully integrating the Township’s tree inventory into the Traisr GIS/Asset Management System, allowing real-time updates from field crews and seamless linkage to work orders and inspection records.

Operational and Administrative Recommendations

Building on the Township’s existing policies, procedures, and well-established tree management practices, the plan recommends that staff compile a comprehensive Shade Tree Division Operations Manual that will consolidate current protocols into a single, structured reference.

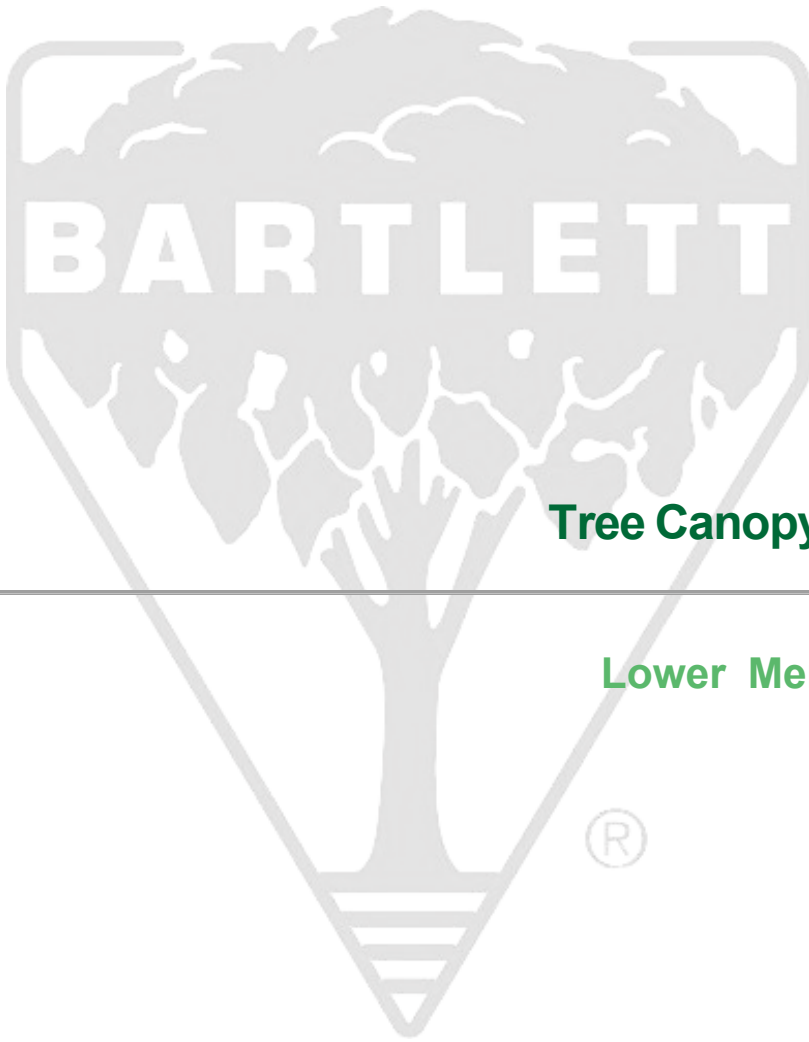
V. Impact On Township Finances:

The RFP outlined five project phases, but funding was budgeted for only the initial two phases at that time. A budget of \$40,000 was designated to cover expenses related to these

first two phases. Bartlett Tree Experts submitted a bid of \$15,000 for the first phase and \$25,000 for the second phase, aligning precisely with the allocated project budget of \$40,000.

VI. Staff Recommendation:

Staff recommends receipt of the Tree Canopy Management Plan prepared by the Bartlett Tree Expert Company addressing the initial two phases as outlined in the Urban Tree Canopy Assessment and Management Plan RFP.



Tree Canopy Management Plan

Lower Merion Township, PA



Tree Canopy Management Plan

Lower Merion Township, PA
75 E. Lancaster Ave.
Ardmore, PA 19003

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Project Team

Lower Merion Township

Joe Marco
Township Arborist
jmarco@lowermerion.org

Bartlett Tree Experts

Thomas McCarthy
Arborist Representative & Local Manager
Bartlett Tree Experts
152 Montgomery Avenue
Bala Cynwyd, PA 19004
www.bartlett.com

Bartlett Consulting

Nick Martin
Vice President-Consulting
Bartlett Tree Experts
1901 N. Roselle Road
Schaumburg, IL 60195
www.bartlett.com

Andrew Mink
Consulting Advisor
152 Montgomery Avenue
Bala Cynwyd, PA 19004
www.bartlett.com

Eocene(SM) Environmental Group

Richard J. Hauer, PhD
Director of Urban Forestry
P.O. Box 818
Des Moines, IA 50304
rhauer@eocene.com

Matt Johns
Consulting Urban Forester
5930 Grand Avenue
West Des Moines, IA 50266
mjohns1@eocene.com

Thank You

We want to thank Steve Curry, Lower Merion Township Tree Crew Foreman, for his responses to the project survey.

Introduction & Overview

Lower Merion Township's trees provide many benefits, including shade for cooling and reduced energy consumption, reduction of air pollutants, stormwater runoff reduction, and water quality improvements. The trees also increase property values and aesthetics and are linked to the mental and physical health of local residents. However, to realize these benefits, managers need to know what they have, where it is, what condition it is in, and how to proactively manage the resource so it remains sustainable for the future.

Lower Merion Township

Lower Merion Township (The Township) within Montgomery County, in the southeastern section of Pennsylvania (Figure 1). The Township covers approximately 24 square miles and is bordered by the City of Philadelphia and Haverford, Radnor, and Upper Merion Townships. According to the U.S. Census Bureau's 2023 population estimate, Lower Merion Township had 64,157 residents

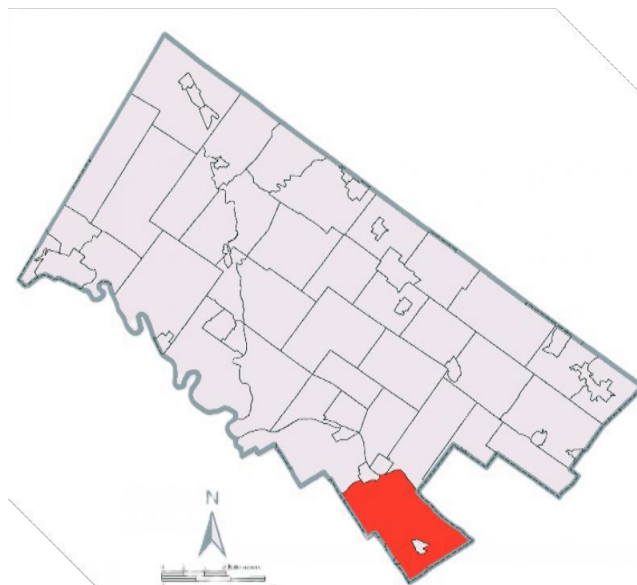


Figure 1. Lower Merion Township occurs within Montgomery County, Pennsylvania. Image attribution: Grant98 from Wiki CC BY-SA 4.

([U.S. Census Bureau QuickFacts: Lower Merion township, Montgomery County, Pennsylvania](#)).

The Township oversees approximately 70,000 trees, which are located in over 289 miles of public rights-of-way and over 700 acres of land within the Township Parks system.

The Township has maintained the Tree City USA status through the Arbor Day Foundation for 47 years. They have also been awarded the Tree City Growth Award for the last 11 years.

Background

Shade Tree Ordinance

Lower Merion Township's first tree-related ordinance was Ordinance Number 404 in Chapter 125, Shade Trees, adopted on September 16, 1931. The Board of Commissioners adopted a new ordinance, Ordinance Number 1926, on November 19, 1980, which repealed the 1931 ordinance. The last amendment to the ordinance was adopted on October 16, 1991. The current ordinance is Ordinance Number 3261.

While the ordinance has 15 sections, Section 128-2 outlines the Establishment of Commission. The commission is known as the Shade Tree Commission. The Shade Tree Commission is made up of not more than nine resident members. According to the ordinance, “The Commission shall have exclusive custody and control of all shade trees on Township property and is authorized to plant, remove, maintain and protect all shade trees on the public streets and highways in accordance with the published rules and regulation of the Township.”

The 2023 Lower Merion Township Sustainability Plan

In 2023, the Lower Merion Township Sustainability Plan was finalized. A broad array of topics were explored, resulting in many recommendations to implement. One aspect of the sustainability plan was a report recommending a Tree Canopy Management Plan, which included a recommendation to conduct a new tree canopy assessment. The sustainability plan can be found at: <https://www.lowermerion.org/departments/sustainability/sustainability-plan>.

The 2023 Urban Tree Canopy Assessment & Management Plan RFP

In September 2023, Lower Merion Township released a Request for Proposals (RFP) for *An Urban Tree Canopy Assessment and Management Plan*. The primary focuses of the RFP were to assess the existing tree canopy, develop a long-term tree canopy management plan, and recommend strategies for incentivizing tree planting on private property. The development of an Urban Tree Canopy Management Plan was part of the Township’s urban greening and sustainability initiatives.

The specific goals and objectives of the project were:

- Review and utilize existing publicly available data for a 10-year historical review of the tree canopy cover and establish a tree canopy baseline for future measuring and monitoring.
- Develop recommendations to prioritize planting efforts in support of goals outlined within the Lower Merion Township Sustainability Plan.
- Provide recommendations to assist staff with building upon current policies and operations practices to prepare a tree canopy management plan for implementation over the next 10 years.
- Tailor a tree canopy management plan to specifically address the trees within Township rights-of-way, trees surrounding active park elements, and the Township woodland that are preserved in the passive park system.
- Review and make recommendations on current ordinances and codes for legal opportunities to strengthen the requirements to further enhance and preserve tree canopy on private properties.
- Recommend tree planting incentives and opportunities to promote tree care on private property to enhance the overall tree canopy.

The Township decided only to pursue Phases 1 and 2 to begin. The primary deliverables for Phases 1 and 2 included:

- A historical and current tree canopy assessment, analysis, and report.
- Review of the existing Township program, including policies, departmental procedures, equipment allotments, and budget allocations.
- Develop a tree canopy management plan to build upon current operational activities with the goal of preserving and increasing tree canopy over the next 10 years. The plan would include recommendations for enhancing the management of trees within Township rights-of-way, trees within 250 feet of active elements of the park system, and trees contained within the passive park systems that have a goal of woodland preservation.

The project was broken into phases:

- Phase 1: Historical and Current Tree Canopy Assessment
- Phase 2: Tree Canopy Management Plan
- Phase 3: Selective Tree Inventory
- Phase 4: Ordinance/Code Review and Recommendations
- Phase 5: Educational Outreach and Incentive Recommendations

In February 2024, Bartlett Tree Experts (Bartlett), including members of the Bartlett Consulting team, was awarded the contract. Bartlett partnered with CNUC (now known as Eocene) to complete the Historical and Current Tree Canopy Assessment, Analysis, and Report deliverables.

Existing & Historical Tree Canopy Assessment Analysis Results

The following sections summarize the approach and findings from the assessment. The complete Historical and Current Tree Canopy Assessment Report can be found in the Appendix.

Data from multiple sources, including color imagery from the National Agriculture Imagery Program (NAIP), and leaf-on imagery from the USDA NAIP GeoHub (<https://naip-usdaonline.hub.arcgis.com/>), were used to perform the assessment.

Current (2022) and historic (2010 and 2015) tree canopy assessments were performed and compared to identify canopy coverage changes. Assessments were performed at the township and community level (16 communities: Bala, Belmont Hills/College Park, Cynwyd, East Ardmore, East Bryn Mawr, Gladwyne, Haverford, Merion, North Ardmore, North Penn Valley, Penn Wynne, Rosemont, South Penn Valley, West Ardmore, West Bryn Mawr, and Wynnewood).

Multiple land cover features (bare soil, grass and herbaceous, impervious surface, tree canopy, water, and wetland) were assessed using a 10,000-sample point system. Then, a 10% sample of locations was assessed by a second evaluator as a quality control measure.

Findings

Land cover percentages and the changes from 2015 to 2022 are provided below in Table 1.

Table 1: Land Cover Percentages and Changes

Land Cover Type	2010 (%)	2015 (%)	2022 (%)	Land Cover % Change from 2010 to 2022	Land Cover % Change from 2015 to 2022
Wetland	0	0	0	0	0
Water	0.9	0.9	1.0	+11.1	+11
Bare Soil	1.3	1.2	1.5	+15.4	+25
Grass/Herbaceous	20.2	22.8	20.5	+1.5	-10.1
Impervious Surface	22.9	22.3	23.5	+2.6	+5.38
Tree Cover	54.7	52.8	53.5	-2.2	+1.3

Tree canopy cover was estimated for the township and community level based on 2022 data. At the township level, Lower Merion was estimated to have 53.5% tree cover. Canopy cover decreases slightly (2.2%) between 2010 and 2022. Possible reasons for the decrease could be the loss of ash trees (*Fraxinus* spp.) due to Emerald Ash Borer (EAB), land development and redevelopment, and/or the natural loss of mature trees.

Tree canopy cover change between 2010 and 2022 varied among the communities. Canopy cover decreased in six communities. The Belmont Hills/College Park community was estimated to have the most significant decrease (7.5%). No changes in tree canopy cover were estimated for the remaining communities. Tree canopy cover was estimated to be lowest in Bala (28.3%). Tree canopy cover was estimated to exceed 50% in Gladwyne, Haverford, North Ardmore, North Penn Valley, Rosemont, South Penn Valley, West Bryn Mawr, and Wynnewood. Please see Table 2 (Tree Canopy Change By Community):

Table 2

Community Name	Change (Overall)	Change (%)
Bala	Decreased	-7.1
Belmont Hills/College Park	Decreased	-7.5
Cynwyd	Decreased	-6.1
East Ardmore	No change	+3.4
East Bryn Mawr	No change	+1.3
Gladwyne	No change	+0.8
Haverford	No change	-2.2
Merion	Decreased	-6.3
North Ardmore	No change	+0.7
North Penn Valley	Decreased	-6.0
Penn Wynne	No change	+1.2
Rosemont	No change	+0.4
South Penn Valley	Decreased	-4.5
West Ardmore	No change	+1.0
West Bryn Mawr	No change	+2.8
Wynnewood	No change	+2.5
Total	Slight decrease	-2.2

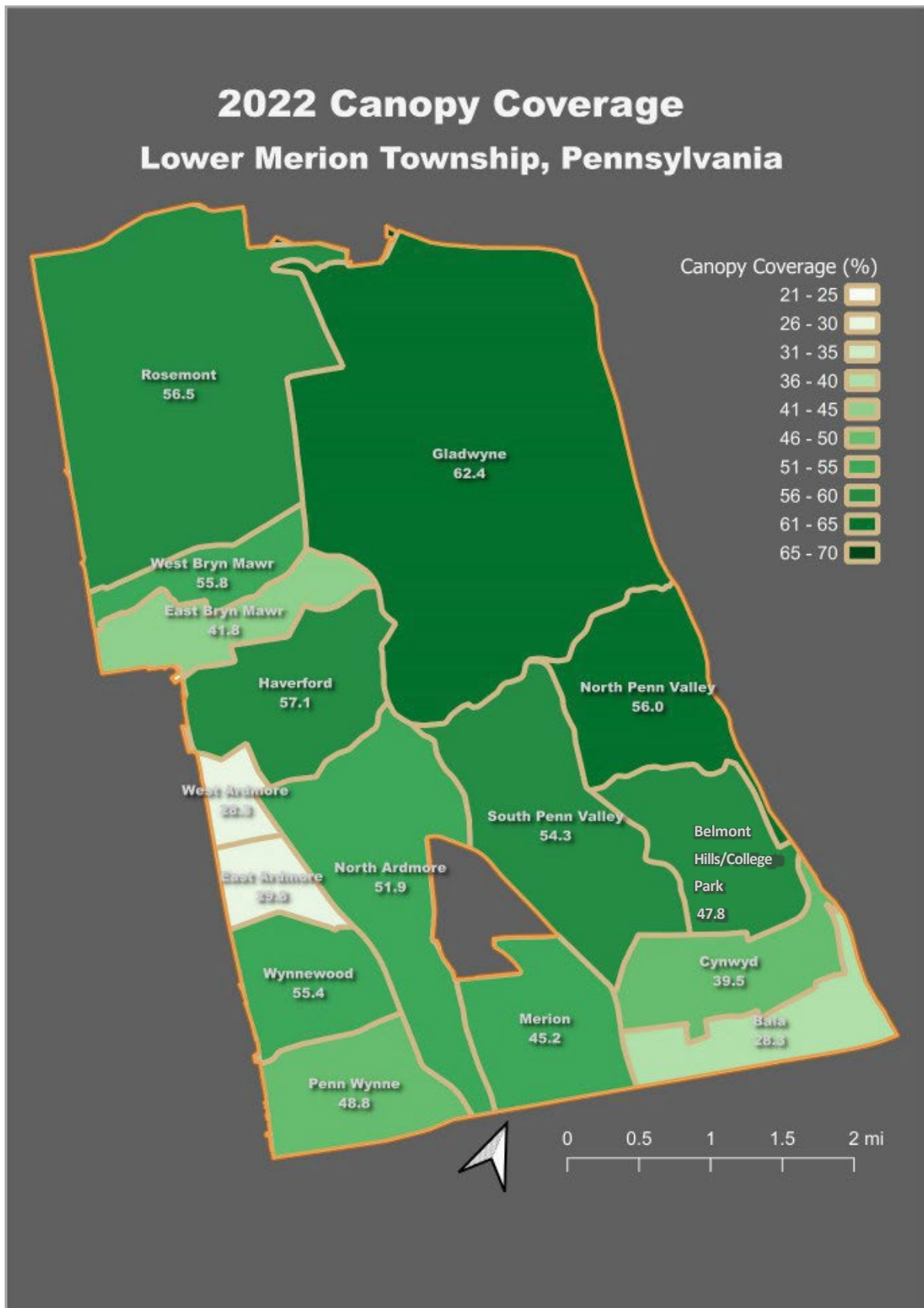


Figure 1. Tree canopy cover in 2022 within 16 communities in Lower Merion Township.

Tree canopy cover was greatest on residential properties (56.2%), followed by industrial (50.0%), exempt (e.g., schools, government buildings, religious institutions) (43.4%), and then commercial (41.9%).

An assessment of tree equity by census block and tract occurred to determine if and where locations of concern with lower canopy might exist. Tree equity scores used an index ranging from 0 to 100 (the location has enough trees from an equity perspective). Most census tract locations in Lower Merion Township showed tree equity scores exceeding 90. The lowest tree equity scores were found in Bala (two census blocks rating 83 and 84) and East Ardmore and West Ardmore (both with census blocks rating 86). Scores below 70 are more concerning for places to increase tree canopy for community members.

The assessment of the 2022 data showed that Lower Merion is currently well-treed across many areas of the township. However, what is unknown and a limitation of a tree canopy assessment is the health and potential longevity of the tree population. A tree inventory tree is the best way to identify the current state of the urban forest. The tree inventory would also be a way to identify potential tree planting locations today. The land use and tree equity assessments showed no major census block or track areas to focus on tree planting from the spatial assessment. Rather, the findings suggest a finer-scale tree planting evaluation is needed at the parcel level.

Existing Program Review Summary

Overview

The Shade Tree Division falls under Lower Merion's Public Works Department. The Shade Tree Division's mission is:

“Preserve the health of the existing tree canopy through maintenance, targeted removal and new planting of trees along Township streets and within park systems.”

The township oversees trees along 840 lane miles of road, trees within 200 acres of active park areas, trees within 500 acres of natural parkland, and trees planted on Township property that includes Township buildings. There is also an estimated 10 miles of trails that run through the Township.

Shade Tree Division Goals

The Department's goals were established to support the Township's Environmental Stewardship Initiatives and Public Safety Initiatives.

Goals to support the **Township's Environmental Stewardship Initiatives:**

- Review Tree Canopy Maintenance Plan and consider next steps (Ongoing) in 2025 budget.
- Continue to survey and monitor the Township's park and street trees for preservation. Systematically remove any weak, dead, or structurally unsound trees (Ongoing).

Goals to support the **Township's Public Safety Initiatives:**

- Continue to identify and improve sight distance issues by removing vegetation near traffic signals, streetlights, and regulatory signs throughout the Township (Ongoing).
- Utilize tree inventory to prioritize and plan daily activities (Ongoing).
- Assist the Parks & Recreation Department in their maintenance of park trees (Ongoing).

Shade Tree Division Responsibilities include:

- Providing tree inspection services
- Removing trees
- Pruning and trimming trees to ensure safety
- Trimming curbside growth for traffic safety
- Planting trees
- Cleaning up storm damage and removing debris on an emergency basis
- Providing insect control
- Assisting with snow and ice removal
- Providing clearance for signs, traffic lights and intersections
- Reviewing and evaluating subdivision and landscaping plans
- Collect and chip Christmas trees to decrease total volume of material being disposed of as municipal waste

- Utilize the Asset Management System for scheduling work and maintaining tree inventory (Ongoing).
- Continue to maintain the health and safety of trees in the Township's Urban Forest (Ongoing).
- Preserve and improve the tree canopy in Lower Merion Township through ongoing maintenance and increased tree planting (Ongoing).

The Shade Tree Division's 2023 accomplishments included:

- planting 205 trees
- removing approximately 195 diseased or damaged street trees
- Responding to approximately 1,000 tree-related service requests
- Responding to approximately 75 requests for trees blocking roads during storms
- Participating in approximately 70 land development site inspections involving tree protection and technical advice
- Participating in approximately 80 plan reviews for the Building & Planning Department
- Working with the Parks & Recreation Department to remove larger trees as needed.

- Word usage; definitions
- Establishment of the Commission
- Composition; appointments; terms; vacancies
- Powers
- Annual report and budget
- Planting, maintaining and removal of shade trees

Township Policies & Departmental Procedures

Township Policies

The Township is responsible for and manages trees located within the public rights-of-way, Township Parks, and Township properties. However, The Township does not maintain trees along the PennDOT ROW (unless a tree is blocking traffic). The Township does not manage trees on private property or along private roads.

Lower Merion's current tree ordinance contains the following sections:

- Maintenance and removal of trees on private property
- Emergency situations
- Regulations on planting and removal
- Acts injurious to shade trees prohibited
- Termination of electricity required upon notice
- Enforcement
- Violations and penalties
- Disposition of penalties and assessments
- Meetings of Shade Tree Commission

Departmental Procedures

Currently, the Shade Tree Division has documented procedures that need to be updated according to ANSI standards. The Shade Tree Division completes all tree pruning. Requests from the public drive most of the work conducted by the Division. This reactive approach accounts for ~75% of tree care-related work. The remaining ~25% of tree care is conducted in a proactive manner. The Division also handles ~85-90% of tree removals, and an external contractor conducts the remaining 10-15%.

The general procedures that the Shade Tree Division operates under include:

- Annual pruning is performed in specific areas. All pruning is completed within a specific area before moving on to another area.
- Prune trees to elevate over roads and clear traffic signals and streetlights.
- Tree hazard maintenance to remove dead branches and trees required to be removed.
 - Contract with outside vendors to remove large, high difficulty and hazardous trees.
- Tree planting:
 - Contract with an external vendor to plant 200 trees annually.
 - Plant a new tree every time a tree is removed.
 - Stump grinding is performed when a tree is removed and a new tree will be replanted.
- Perform storm cleanup and clear roadways of downed trees and limbs from Township and private trees.
- Clear waterways that the Township's storm systems drain into when tree debris blocks drainage flow.
- In emergency situations, they have access to additional Public Works employees; however, they are only allowed to perform work from the ground.
- Shade Tree Crew Leader updates the existing tree inventory data.

Township Staff & Equipment Allocations

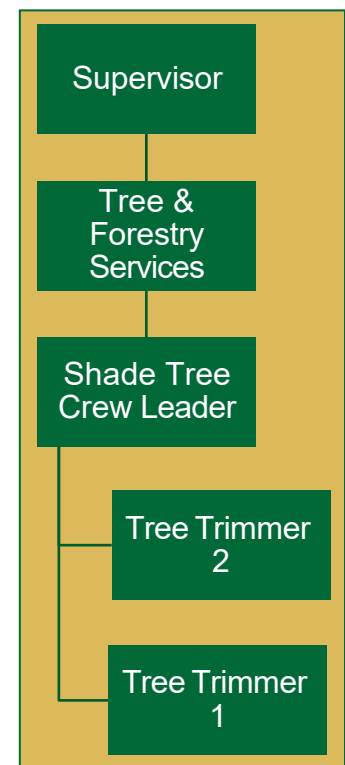
The Shade Tree Division falls under Lower Merion's Public Works Department. The Shade Tree Division has nine (9) team members. Within the Shade Tree Division, the Supervisor oversees Tree and Forestry Services. The Tree & Forestry Services staff include:

- Shade Tree Crew Leader: 1
- Tree Trimmer 2: 3
- Tree Trimmer 1: 4

Work experience for the current team ranges from 5 to 20+ years.

Credentials for the existing team include:

- Two certified crane operators
- One ISA Board Certified Master Arborist
- Two ISA Certified Arborists
- Two Pennsylvania Pesticide Applicators



Equipment

Equipment owned by Lower Merion is summarized in Table 3. Two new Altec bucket trucks are expected to arrive in 2026.

Table 3:

Equipment
B.B. Chipper 2013
69' Int. Bucket 2014
72' Int. Bucket 2014
102' Mack/Fassi/Mecanil Crane.
Belmont Trailer
Anderson Trailer
Dodge Ram 5500 W/P & Sp. Dump
Stump Grinder - Bandit 2900T
B.B. Chipper 255XP
B.B. Chipper 255XP
Dodge Ram 3500 W/P & Sp.
Int. Crew Cab Forestry Truck
Cat Loader
2 John Deere Loaders
International Ten Wheeler
Bandit Horizontal Grinder

Staff members who responded to the survey felt that the existing equipment matches the current needs of the trees they can manage each year.

Township Budget Allocations

The Shade Tree Division is funded through Lower Merion's General Fund. A breakdown of the major accounts is provided in Table 4.

Table 4:

Major Accounts	2022 Actual	2023 Estimated Actual	2024 Budget
Salaries	\$658,522	\$736,076	\$784,490
Other Compensation	\$62,734	\$58,700	\$57,000
Employee Benefits	\$279,097	\$299,240	\$307,394
Other Personal Services	\$11,894	\$11,950	\$15,700
Uniforms and Clothing	\$829	\$1,500	\$1,500
Materials and Operating Supplies	\$6,641	\$6,600	\$6,650
General Business/ Operating Expenses	\$2,565	\$2,565	\$2,600
Communication Expenses	\$17,426	\$20,506	\$25,408
Contracted Services	\$170,019	\$205,000	\$225,000
Dues	\$270	\$750	\$1,050
Professional Technical Service	\$-	\$10,000	\$30,000
Maintenance – Machinery and Equipment	\$714	\$1,500	\$1,500
Township Equipment Rental	\$183,625	\$200,752	\$278,986
Machinery and Equipment	\$2,870	\$7,000	\$3,500
Other Charges and Transfers	\$(409)	\$(3,137)	\$(1,500)
Total	\$1,396,798	\$1,559,002	\$1,739,278

The Division has seen a 12% budget increase in each of the past two years because of increased staffing costs, higher equipment rental expenses and an increase in contracted services which includes funding for this study. The Shade Tree Supervisor feels the current budget is adequate for their needs.

Lower Merion Township has no programs or policies (e.g., tree removal permit fees, ordinance violation fines, etc.) in place to provide additional funding for the Shade Tree Division.

Previously Performed Tree Inventory

The Township's last tree inventory was performed in 2017. According to The Township, tree inventories are conducted approximately every 10 years. The TreeKeeper software was being

The most populous tree genera were:

- *Acer* (22%)
- *Quercus* (11%)
- *Cornus* (5%)
- *Picea* (5%)
- *Pinus* (5%)
- *Platanus* (5%)
- *Prunus* (5%)

used for the current tree inventory, which included ~25,300 trees. Maple (*Acer*) trees were the most populous (4,738 trees) genera (Figure 1). The most common tree species were Norway and red maple (Figure 2).

The most populous tree species were:

- Norway maple (*Acer platanoides*) (6%)
- Red maple (*Acer rubrum*) (6%)
- Sugar maple (*Acer saccharum*) (5%)
- Northern red oak (*Quercus rubra*) (5%)
- Eastern white pine (*Pinus strobus*) (5%)

According to the 2017 tree inventory database, 20% of trees are in good, excellent, or very good condition, while 2% are either dead or in critical, declining, or very poor condition. The complete tree condition breakdown is as follows:

- 138 dead
- 318 critical, declining, or very poor
- 2,328 poor
- 16,374 fair
- 4,931 good, excellent, or very good

The 2017 tree inventory also included 3,452 vacant sites, 1,311 stumps, and 1,440 trees recommended for removal. With a few exceptions, the Division has removed the majority of trees that were recommended for removal in this study.

Long-range Tree Canopy Management Recommendations

Overview

Lower Merion Township's overarching goal for this project was:

“How to preserve and increase our tree canopy over the next 10 years.”

This Tree Canopy Management Plan was developed to provide a long-range plan to build upon the current operational activities.

Administrative Recommendations

Establish Goals

Recommended goals to establish:

- Determine the desired tree canopy cover goal (%) for Lower Merion Township to achieve by 2034.
 - Sub-goals:
 - Determine a desired tree canopy cover goal (%) for only Township properties. Urban tree canopy cover goals vary widely depending on a city's climate, development patterns, and specific environmental and social objectives. While there's no single "industry standard," several organizations and municipalities have established benchmarks and guidelines to help cities set realistic and impactful canopy targets. One example is the 3+30+300 rule. These numbers vary widely so will need to be determined by the township. For example, Austin, TX has a goal of 50% canopy cover by 2050 while Seattle, WA has a goal of 30% canopy cover by 2037.
 - Determine a halfway tree canopy cover target (%) for both Township properties and the Township as a whole to be achieved by 2029.
 - Conduct a new tree canopy assessment in 2029 to determine progress toward the 2034 goal for both Township properties and the Township as a whole.
- Conduct tree canopy assessments on five (5) year intervals. This interval is widely adopted as a best practice by municipalities and organizations aiming to monitor and manage their urban forests effectively. Examples of large cities that follow this protocol are Tampa, FL, Nashville, TN and Boston, MA.
- Building on the Township's ongoing efforts to promote a healthy and resilient urban forest, species selection should follow established diversity guidelines. The desired tree family, genus and species quantity limitations should be determined to ensure a well balanced population. As a general best practice, no more than 30% of trees should belong to the same family, 20% to the same genus, and no more than 10% to a single species. These thresholds reinforce the Township's proactive approach to safeguarding tree health and ecological stability.

- Expand upon the Township’s existing replanting guidelines to account for tree removals and long term goals for canopy coverage, sustainability, and resilience. To effectively balance the desired canopy cover-while acknowledging practical limitations such as budget, staffing capacity, site conditions, development activity, and the predominance of privately owned trees, annual replanting targets should remain flexible. These refined guidelines may include specifications such as:
 - Replace large tree species with other large maturing tree species when practical. When this is not practical, establish a multiplying factor scheme to follow (e.g., five small maturing trees for each large tree removed).
 - Replace small or medium-maturing trees with large-maturing species when practical.
 - Replant with tree species that are best suited to provide the ecosystem services that a specific area needs (e.g., pollution removal).
 - Select a tree species that will align with the Township’s family, genus, and species diversification goals.
 - Evaluate the performance of tree species within the Township to determine the best-performing species.
- Annual benchmarks for all activities tied to future goals. Benchmarks should be measurable, obtainable, and trackable.
- Determine a pruning cycle so all trees within the Township rights-of-way, Park Properties, and specified trees within Passive Park Systems can be addressed.
- Determine the desired number and percentage of trees to manage proactively annually.
- Based upon the goals established by Lower Merion Township, recruit and hire the additional staff members needed to obtain the goals within the desired time frame.
- Since the heat island effect (more formally, the urban heat island effect, or UHI, a phenomenon where urban or developed areas are significantly warmer than surrounding rural areas) is a real concern, determine benchmarks to prioritize mitigation of the negative effects. Beyond tree planting, municipalities have sought cool roof systems (code instituted in Philadelphia in 2010 and New York City in 2012), and encouraged alternate paving materials through a Permeable Surface Rebate system for homeowners (instituted in Washington D.C. in 2022).

Policy Review & Development

The existing tree ordinance and land development policy components related to trees should be reviewed. The review should entail benchmarking against local municipalities along with other nationally recognized programs. Lower Merion Township staff, residents, and tree care contractors should be interviewed/surveyed to solicit feedback. A public meeting should also be held before finalizing any ordinance or policy modifications.

- Develop a tree risk policy for Township maintained trees.
 - The policy should clearly state Lower Merion’s goals, how Lower Merion will achieve those goals, and who is responsible for each aspect of the policy, including who will be responsible for oversight and enforcement.
 - The policy should include, but is not limited to:
 - Who will be responsible for each aspect of the tree risk program.
 - The tree risk assessment procedures and practices that will be followed (e.g., International Society of Arboriculture and American National Standards Institute).
 - Who is able to request a tree risk assessment, to whom will the

- request be made, and the allotted amount of time to respond and inspect the tree should be detailed.
- Lower Merion's acceptable tree risk threshold(s).
- Township and tree inspection frequency and intervals.
- Tree risk mitigation thresholds and accepted mitigation activities.
- Identify and define time frames, targets, occupancy rates, and consequences of failure, where possible.
- Development, modification, and management of a tree risk management plan (could be included within a larger tree management plan based on a tree inventory if tree risk assessment information was recorded).
- Develop tree risk procedures for Township maintained trees in accordance with ANSI A300 (Part 9)-2023 Clause 13 Tree Risk Assessment and Tree Structure Assessment.
 - The procedures will turn the policy aspects into actionable steps to be followed throughout the year.
 - Typically, the procedures should include these items:
 - How tree risk assessment requests will be made, received, documented, acted on, and resolved.
 - Who will receive the requests, inspect the trees, and determine the next steps.
 - Required qualifications for any person conducting a tree risk assessment (e.g., ISA Certified Arborist, ISA Tree Risk Assessment Qualification)
 - Detailed list of all tree and site attributes to be documented and how they should be documented.
 - Steps for trees that require a more detailed level of assessment that may require advanced equipment or knowledge.
 - Re-assessment and inspection interval requirements based on the specific tree and site.

Township-level Recommendations

Tree Inventory

We recommend completing an up-to-date tree inventory. The inventory should be broken down into these approaches:

- A complete inventory of all individual trees located within the Township rights-of-way and within park properties near active elements. These trees would be considered “actively managed” and would not include trees or groups of trees located within natural or unmaintained areas.
- Inventory of individual trees located within passive park systems, along wooded trails, or within wooded areas in close proximity to infrastructure or people, where the tree is recommended for maintenance to address a concern that could impact infrastructure or people.
- A plot-based inventory of wooded areas in passive park systems and other natural unmaintained areas. Random plots should be created and inventoried to be used as representative samples. The plots should be used to help determine the total number of trees on Lower Merion Township property, along with estimated conditions, species, and existence of invasive species.

The tree inventory should be fully integrated into Lower Merion Township’s existing GIS/Asset Management System, Traisr, to ensure consistency with current workflows and data management practices. All inventory data, whether collected in the field or updated administratively, should be structured to allow Township staff to easily add, remove and modify tree records within Traisr. The system must support input from multiple device types, including mobile phones, tablets and desktop computers, and maintain compatibility with GIS mapping and reporting functions.

Lower Merion Township will need to decide which attributes to collect, but the following attributes will be crucial when it comes to management:

- Species
- Size [diameter at breast height (DBH)]
- Location (latitude and longitude)
- Condition
 - Utilize one scale
 - Example: Good, Fair, Poor, Dead

- Age class
 - Utilize one scale
 - Example: New planting, Young, Semi-mature, Mature, Over-mature
- Maintenance recommendations
 - Pruning
 - Remove
 - Wildlife Snag
 - Lightning Protection
 - Supplemental Support
 - Plant Health Care
 - Soil Care
- Maintenance Priority
 - Priority of ASAP, 1, 2 or 3
 - The priority rating would correspond to a pruning cycle
- Observed Pests and Diseases
- Observations and Concerns
- Invasive Species (according to local authorities)

Tree risk assessments can also be included as part of the tree inventory within Lower Merion Township's asset management system, Traisr. While formal risk assessments can offer valuable insight into which trees may need to be prioritized, they can significantly increase the time and cost of conducting an inventory. As such, it is not recommended that a formal risk assessment be performed for every tree. However, if the Township is interested in capturing risk related information, a Level 1 Limited Visual Assessment, conducted in accordance with ISA Best Management practices, could be selectively included and linked directly to tree records in Traisr for on-going monitoring and observation.

Consistency and accuracy are critical when performing any inventory. While volunteer participation can offer cost savings, decisions about who should conduct the inventory should be based on the attributes being collected and the desired completion timeline. When accurate data on species, condition, or maintenance needs is required, we recommend using professional or consulting arborists. These professionals can also ensure the collected data is properly structured and uploaded into Traisr.

In addition to live tree data, the inventory should include empty planting sites, stumps, and potential new planting locations, all of which should be geo-referenced and categorized in Traisr. As noted in the tree canopy assessment, field verification is the most effective way to identify viable planting locations. Each potential site should be documented not only by its coordinates but also by the mature size class of tree it can support (e.g., small, medium, or large maturing tree), allowing the Township to plan appropriately and maintain canopy diversity over time.

If it is not financially feasible to complete the entire inventory at one time, the inventory should be broken into phases, beginning in the areas where tree and people interactions are the highest. If the tree inventory cost must come from the Shade Tree Division's normal operating budget, the inventory phases should remain small enough to allow other management tasks to be completed to a specified level.

In general, tree inventories should be redone every three to five years, depending on how well and often the inventory database is updated. Cornell University recommends re-inventorying all trees once every five years to maintain accuracy and support effective management. The Society of Municipal Arborists (SMA) encourages cities to adopt a rotational inventory update cycle — where 20% of the city is re-inventoried annually — achieving full inventory updates every five years.

Ecosystem Services Analysis

Ecosystem services, or the benefits that trees provide to people, can be quantified from tree inventory data. Using only tree species and diameter, the i-Tree Eco application can provide benefit quantification for carbon storage and sequestration, air pollution removal, avoided runoff (aiding in stormwater management), and other ecosystem services.

While the ecosystem services that an individual tree provides may not impact tree management every time, knowing the benefits provided by the tree can help in decision-making. Knowing the benefits provided by an individual tree can allow for a cost-benefit analysis to be performed before deciding to remove a tree completely. Knowing the benefits can also help educate the public, leading to more trees being retained and actively managed.

We recommend using the information collected during the new inventory to quantify ecosystem services using the i-Tree Eco application.

Tree Management Plan

An updated tree management plan should be written based on the information from the updated tree inventory. While the tree inventory information provides the baseline, the management plan should expand on what was observed to detail what the information means and guide tree managers.

Key aspects that should be in the tree management plan include:

- Breakdowns and locations by species, condition, and age class
- Trees recommended for pruning, including location and priority
- Trees recommended for removal, including their species, location, and priority
- Potential tree loss based on condition, age, removal recommendation, and location
- Summary of trees performing well in the Township, including by species and location

A primary component of the plan should be focused on tree planting. Locations to consider for tree planting should include:

- Empty planting wells/locations
- Stumps
- Trees recommended for removal
- Trees recorded as over-mature or in poor condition but not recommended for removal

All potential planting locations need to consider the size and location of the planting location. The current size and species of any tree to be removed should also be considered. These considerations, along with the current tree species breakdown, should be compared against known and anticipated pest and disease threats, desired tree species, and desired ecosystem services to produce a list of possible tree species to plant.

Finally, the number of trees recommended for removal, and anticipated additional removals due to age, location, development, etc., should be compared to the average number of trees planted annually by Lower Merion Township. The plan should recommend an appropriate number of trees to plant annually to compensate for removals and the desired tree canopy cover percentage.

Operational Recommendations

Shade Tree Division Operations Manual

The Shade Tree Division should compile its operational procedures into a comprehensive manual to inform and educate existing employees and managers while serving as a training manual for new team members. Key elements of the manual should include, but not be limited to:

- Safety
- Daily operations
- Best Management Practices and Standards
- Training
- Positions, specified requirements, and advancement pathways
- Continuing education
- Equipment usage and maintenance
- Tree risk

Safety

The Shade Tree Division currently follows a range of safety practices and protocols as part of its daily Operations. To strengthen and formalize these efforts, a formal safety program and procedures should be implemented. The safety of each staff member should come first.

- Health and safety according to local, state, and federal regulations
- CPR and First Aid
- Specific training tailored to each type of equipment
- ANSI Z133 Standard
- Operating motor vehicles

We recommend that a Safety Coordinator be identified to manage the safety aspects of the Division. The Safety Coordinator should be trained and knowledgeable in all safety-related areas pertinent to the Division. They should coordinate and lead all safety-related training and events, but other staff members should also be involved in providing specific safety training. They should also be the individual who oversees all safety-related training for new staff members.

The Shade Tree Division already follows Lower Merion Township's accident reporting policy and procedures. They also already perform daily safety-related inspections. Documenting a job site safety analysis before sending crews where all potential safety hazards, access issues, signage, etc., are detailed and then provided to the crew before leaving for the job site are steps that should be followed. Each crew should review the job details and safety analysis before beginning any work. If conditions change on a job site, all work should stop, and a team meeting should occur where the changes are discussed and a new plan is created moving forward.

Training

Regular training, outside of safety-related topics, should occur for all Shade Tree Division staff members. While training is currently occurring, a structured training program and schedule should be established. The primary training categories should include, but are not limited to:

- Tree care best management practices
- Equipment usage and maintenance

- Operating motor vehicles
- Community engagement and communication

Training topics should be spread throughout the year. Topics should also be covered when most pertinent to a specific time of year. Training should not happen all at once or for an extended period of time during a single day. The best training programs include short educational sessions and open feedback and interactions. A dedicated training program and schedule for new staff members should also be created. The program should outline the sequence of training events and requirements to pass each component.

External training opportunities should also be utilized. Industry approved training is required to obtain and maintain industry credentials and qualifications. We recommend establishing an annual budget for training and continuing educational units on an individual staff member level. The budget should be determined by the staff member's position within the Division, their current industry credential requirements, and the desired industry credentials that Lower Merion can support.

Tree Care Operations

Implementing work plans based on desired goals and outcomes is the most successful. When staff members know where leadership wants the program to go, they can then determine how they can best help. Work plans need to be based on accurate information obtained from a full accounting of what the team is being asked to manage.

The Shade Tree Division should implement a work plan system based on an updated tree inventory. The driving factor for the work plan should be the prioritization of tree care activities. A tree's location, size, condition, risk (if recorded), and recommended tree care should be the basis for the priority it is given within the Township's pruning cycle. Allowances will need to be made for risk and storm response-related events. Trees that are not able to be addressed within their recommended phase should be added to the list of trees for the next phase.

Additional recommendations include:

- Update all tree work in the current tree inventory management program. Pruning, removal, planting, inspection, and tree risk assessment dates should be recorded along with who conducted the activity.
- On a daily basis, the Shade Tree Division should continue to track and document how many trees are managed, including by work type (pruned, removed, planted). This tracking should also include the hours associated with the work project and the estimated cost (\$).
- On a quarterly basis, review all work that has been completed, including the total number of trees, hours, and costs.

- According to the University of Wisconsin, an “ideal” budget would be based on 45-50% pruning and maintenance, 20% removals, 20-25% planting, and 10% of the budget for administration and supervision. The additional tracking of costs per work project will allow the Shade Tree Division to understand where they are in comparison to this suggested budget “ideal.”

Lower Merion Township categorizes its trees based on location. The locations and recommended routine tree care activities are outlined below.

- Township Rights-of-Way
- Trees within the Township rights-of-way are the closest in proximity to people, vehicles, and infrastructure. These are also the trees that are most likely to be damaged or cause damage during significant weather events.
- Typically, these trees have higher tree care priority ratings and require a higher level of maintenance throughout their life.
- Trees identified as likely to fail, or have tree parts that are likely to fail, within the Township’s designated tree risk time frame, should be addressed first. Street lights, signs, and road, parking, and sidewalk clearance should come next on the list. Younger trees need to be in the pruning cycle so structural concerns can be addressed when it is easier and more cost-effective.
- Pest, disease, and soil-related issues should be addressed when practical. When left untreated or uncorrected, these issues can cause continued tree decline.
- When trees need to be removed, more than likely the entire tree will need to come down, the stump ground out, and the resulting hole filled in or a new planted. It is unlikely that wildlife snags will be suited for within the rights-of-way.
- When removing a tree, the ability to use sections for wood products should be considered. Debris that can’t be used for wood products should be chipped and used as mulch for Lower Merion Township properties or provided to the public.
- All vacant tree wells, stumps, trees recommended for removal, and new planting locations need to be closely monitored within the Township’s tree management program. Before planting a new tree, the current breakdown of tree species, their location, site conditions (e.g., tree well size, overhead lines present, etc.), and Lower Merion’s desired ecosystem services need to be weighed so that new tree

- plantings are moving Lower Merion toward their sustainability goals while also putting the right tree in the right place to reduce negative future interactions.
- Trees within the Township rights-of-way should be inspected multiple times a year (e.g., quarterly), but at least annually and after significant weather events. These inspections should serve to identify trees and tree parts that have already failed, are in the process of failing, or are likely to fail within the Township's designated tree risk time frame. Any tree identified as needing work or a higher level of assessment should be inventoried, documented, and added to the work plan following the Division's tree care prioritization schedule (e.g., ASAP, Priority 1, Priority 2, etc.).
 - Trees within Park Properties (within 250 feet of active park system elements)
 - Trees within the Park Properties that are located within 250 feet of active park system elements are key features of the parks, but do not have the same amount of people and infrastructure interactions as trees located within Township rights-of-way.
 - Trees identified as likely to fail, or have tree parts that are likely to fail, within the Township's designated tree risk time frame, should be addressed first. Street lights, signs, and road, parking, and sidewalk clearance should come next on the list. Younger trees need to be in the pruning cycle so structural concerns can be addressed when it is easier and more cost-effective.
 - Pest, disease, and soil-related issues should be addressed when practical. When left untreated or uncorrected, these issues can cause continued tree decline.
 - When the trees are located in a larger open area, and when practical, the use of wider mulch rings can help create a better growing environment for the tree and reduce the risk of damage to the tree.
 - The Park Properties create a scenario where trees that need to be removed can either be removed completely or potentially left as wildlife snags. If wildlife snags are desired, the tree height may need to be reduced so if failure occurs, it is not likely to impact people or infrastructure. Or, the trees could be sectioned off so people can only get so close to the tree. If the tree is removed completely, the stump should be ground out and the whole filled in unless a new tree will be planted in the same location. The same planting and tree selection criteria for the rights-of-way should be used in the Park Properties. However, the advantage of the Park Properties is that larger maturing tree species can be used.
 - Within the Park Properties, trees that are in close proximity to people and infrastructure should be inspected at least twice a year, but at least annually and after significant weather events. Any tree identified as needing work should be inventoried, documented, and added to the work plan following the Division's tree care prioritization schedule (e.g., ASAP, Priority 1, Priority 2, etc.).
 - Trees within Passive Park Systems
 - The Township's goal in these areas is woodland preservation.
 - Individual tree management should not be the goal. Rather, these areas should be managed as a collective feature.
 - However, more routine inspections should occur for all trees located along woodland edges, property borders, when within one average tree height from any kind of infrastructure, and trees along any paths or roads within the passive park.

- These “edge” trees should be inspected at least annually and after significant weather events to identify new concerns that have an elevated chance of failure. Any tree identified as needing work or a higher level of assessment should be inventoried, documented, and added to the work plan following the Division’s tree care prioritization schedule (e.g., ASAP, Priority 1, Priority 2, etc.).
- The larger passive park system should be inspected annually to identify any new pests, diseases, or invasive plant issues. If any woodland areas are disturbed, either naturally or by design, they will need to be monitored for invasive plant issues, and a management program may need to be implemented. Trees that are significant in size or condition, or are a rarer species, should be documented and monitored more regularly. These trees may need to be put on a watch list and managed more regularly than other trees within the passive park systems.
- When trees within the passive park systems need to be removed, the ability to create wildlife snags and leave resulting debris on the woodland floor should be evaluated and implemented when practical.
- Using the plot-based inventory, the individual passive park systems should also be evaluated to determine if traditional forestry-related operations, such as thinning, should be implemented to maintain a healthy and self-sustaining woodland. Natural regeneration should be used to establish the next cohort of trees within these areas; however, tree planting activities may sometimes be needed.
- While the work with the passive park system will not be to the same level as other Township locations, they still need to be actively managed, just on a longer time frame.

Any new procedures that are outlined in an adopted Tree Risk Policy and Procedures should also be implemented.



Work Cited

Accessed December, 2024

[U.S. Census Bureau QuickFacts: Lower Merion township, Montgomery County, Pennsylvania](#)

Hauer, R. J., & Peterson, W. D. (2016). Municipal Tree Care and Management in the United States: A 2014 Urban & Community Forestry Census of Tree Activities. Special Publication 16-1, College of Natural Resources, University of Wisconsin – Stevens Point. 71 pp.

Glossary

3+30+300 Rule: a guideline developed by Dr. Cecil Konijnendijk in urban planning and forestry that promotes healthy, sustainable, and climate-resilient cities by encouraging the presence of trees in people's surroundings. Everyone should be able to see at least **3** trees from their home, school or workplace. Every neighborhood should aim to achieve at least **30%** canopy cover and everyone should live within **300** meters of a quality public green space.

Active Park: a park that is focused on recreational activities such as sports fields, playgrounds, and fitness equipment to encourage physical activity and social interaction.

Passive Park: a park that is designed for relaxation, reflection, and enjoying nature with features like green spaces, trails, and picnic areas.

Tree Canopy Assessment: a process used to measure and analyze the amount of land area covered by the branches and leaves of trees (i.e., the "canopy") when viewed from above.

Tree Canopy Cover: the percentage of land area covered by the leaves, branches, and stems of trees when viewed from above.

Tree Equity Score: a metric that measures whether all people in a city or community have equal access to tree canopy—especially those in neighborhoods that are historically underserved or more vulnerable to climate impacts.

Tree Inventory: a detailed survey and record of trees in a specific area, like a city, park, campus, or neighborhood. It may include characteristics for each tree within a specified perimeter such as species, ID tag number, location, size, condition, maintenance needs, etc.

Tree Canopy Management Plan: a strategic plan focused specifically on maintaining, enhancing, and expanding tree canopy cover in a defined area—like a city, campus, or neighborhood. This plan focuses on the actual tree canopy, how much there is, who has access, how it's changing, and how to grow it smartly and equitably.

Tree Risk Assessment: a process used to identify, evaluate, and manage potential risks posed by trees to people, property, and infrastructure. It helps prioritize tree care actions—like pruning, bracing, or removal

Appendices

Municipal Tree Care Policies, Procedures, and Program Operations – Self-assessment

The following form was used for the self assessment.

Program Overview Questions

Question
Why are you conducting a program review?
What do you hope to achieve from this process?
What do you “need” from this process?
What aspects of the program work well?
What aspects of the program could use improvement, and how?
What would success look like for this process?
Who would you consider your “municipal peers” when it comes to size/area, number of trees, size of staff, and size of budget?
Is there another municipality/program that you want to be like? Who? Why? Note. This does not have to be one of the above-mentioned peers
How would you describe your working relationship with other municipal departments in your city/town?
What have been the most difficult situations concerning the trees or their management in the past?
How would the community/residents describe the quality of tree management and the overall program?
What current/recent tree-related issues/concerns have the community/residents raised?
Are there issues with how privately owned trees are managed/not managed that are impacting the larger urban forest?

Policies

Planning and Development

Question
Do you have an active climate action plan, climate-related goals or policies, PROS plan, or urban forest management plan?
Are there larger jurisdictional climate-related plans or regulations that impact your community?

Question
Are there any local regulations in the process of development that may impact trees or their management?
Are trees included in local building or development codes? To what extent?
Do you have a current strategic, management, development, stormwater, parks, canopy, or master plan?
Do you have maps for zoning districts, parks, public spaces, and watersheds that you manage?
Is there a tree ordinance? When was it written and last reviewed/updated?
Is there a tree /code? (Identify Chapters)
Do portions of the ordinance/code apply to privately owned trees? Identify Chapters
Is there a tree removal permit/process?

City Tree Management Programming

Question
Do you have a current tree inventory?
Do you have an active tree management plan?
Do you have a risk policy?
To what extent does each department want to perform tree care-related activities? 100% in-house? 100% contractor-based? 50/50?
Are trees included in a city asset management system? If so, what is the system? If not, what forms or tree care-related records are kept?
Is there a safety policy related to tree care operations? Do you have a storm response or Public safety policy that includes trees?
How is your tree management program funded? Has this funding varied, or has it remained fairly consistent over the last five years?
Is there a public service request system used to help determine tree care activities?
How are day-to-day tree care activities determined and planned?
Are tree care activities prioritized in any manner? Required tree care? Location?
Is there an established Public tree removal policy/procedure? When was it written and last reviewed/updated?
Would you describe your tree care approach as proactive or reactive? What percentage would you assign to each?
Are all tree care activities determined internally?
On average, how many trees are pruned each year? Removed? Planted? Treated for pests/diseases? Soil care?
Are TRAs performed internally?
Are current industry standards and best management practices promoted and implemented?

Departmental Procedures

Overall

Question
How large is your municipality? (Square miles)

Question
How many miles of streets do you maintain? Define Centerline miles or edge.
How many acres of municipal-owned property do you maintain? What is the distribution of these acres (large parks, small parks, natural areas, etc.)
How many miles of trails/paths do you maintain?
Does the city have any established tree-related goals (e.g., tree canopy cover, yearly plantings, etc.) that are not associated with a management plan
Is your community currently a Tree City USA through the ArborDay Foundation? If so, for how long?
Is the community interested in becoming a Tree City USA?
How does your municipality manage Wood waste? Are there current or potential partners to work with for wood utilization? What hurdles impact these partnerships?

Budget

Question
What is the total municipal budget?
Where does funding for tree care operations come from?
How does the funding for tree care operations compare to that for other departments? How has this changed over the last five years?
How is your budget broken down?
What amount and percentage of the budget is dedicated to each area of tree care (e.g., street tree pruning, tree removal, park tree pruning, etc.)?
Do you feel your current budget is adequate to meet the community's needs?
Are there additional procedures in place to provide funding (e.g., tree removal permit fees, ordinance violation fines, etc.)?
Do you apply for/receive any funding from grant resources?
Are there other forms of funding for tree care operations?

Staff and training

Question
How many personnel does the department employ that work with trees and vegetation?
What is the breakdown of full-time to part-time, salary to hourly employees?
What position titles are currently used?
What tree-related qualifications/certifications do current team members have?
What training/credentials/qualifications are required for each position?
Are there any established internal tree-related training programs for staff

Equipment

Question
What equipment does the Department currently own?
What equipment does the Department currently rent?
Is there an equipment/vehicle maintenance department and inspection procedures?

Question
Is equipment usage tracked?
How/when is new/replacement equipment selected?
How are crews and equipment determined for a given day/project?
Do you feel your existing equipment matches the needs of the trees managed?

Operations

Question
<u>Pruning</u>
Do you have an established pruning cycle?
Are you responsible for electrical infrastructure pruning?
Are current industry standards/best management practices used and adhered to?
Main focuses
<u>Removal</u>
Is a tree planted every time a tree is removed?
<u>Planting</u>
How many trees are planted each year?
<u>Inspections</u>
Do you have a regular inspection process?
How often are inspections performed?
Who performs inspections?
What training do inspectors receive?
How are inspections documented?

Administrative/Management/Oversight

Question
What Department is primarily responsible for tree maintenance?
Do other Departments/Individuals have some management responsibility too?
Is there a documented organization chart outlining who is responsible for specific tree care operations?
Where are all Departments/Individuals responsible for some aspect of tree care operations physically located? (e.g., City Hall, Operations Yard, etc.)
Is the municipality responsible for all street tree/rights-of-way tree maintenance?
If not the municipality, who is responsible?
Does the municipality own all street trees/rights-of-way trees?
Who makes the final decisions when it comes to tree care operations?
Please describe the decision-making process.
Who establishes tree-related policies and procedures?
Who investigates suspected/reported tree/ordinance-related infractions?
Who is responsible for enforcing ordinance-related infractions?

Volunteers/Committees/Commissions

Question
Is there a local tree commission, advisory board, etc., that is partnered with?
How many people are involved in the groups listed above?
What tree-related activities are volunteers used for (e.g., planting, watering)?
Are volunteers trained prior to participating in tree-related activities?
Are there other organizations contributing to tree-related activities (e.g., beautification committee, nonprofits, etc.)?

Contractors

Question
Are contractors used for any tree care?
Are contractors used on a regular basis?
What tree care activities do contractors perform on a regular basis/are responsible for?
Are contractors used for on-call or emergency services?
What qualifications, certifications, or experience are required for contractors?
How are contractors evaluated and selected?
Who is responsible for overseeing, monitoring, and reporting on a contractor's work?

Inventory

Question
How many municipal-owned street trees do you manage?
How many municipal-owned park trees do you manage?
How many trees on other municipal-owned land do you manage? What are these areas?
Do you have an existing tree inventory?
When was the most current tree inventory completed?
Who completed the most recent tree inventory?
How often is the inventory and data updated?
Who is responsible for updating the tree inventory data?
What system/program is used for the tree inventory and updates?
How is the tree inventory and data used?
Is the tree inventory data available to the public?
What gaps do you see in your current inventory?
What improvements would you like to see in your tree inventory, including the data, and how it is used and updated?
Are stumps included in the inventory?
Are empty tree wells included in the inventory?
Are potential planting locations included in the inventory?

Safety

Question
Do field/job-based safety/equipment inspections occur? If so, how often?
Is there an accident reporting procedure?

Question
Is each vehicle equipped with the required safety items and equipment?
Is personal protective equipment used? Required? What forms?

Historical and Current Tree Canopy Assessment for Lower Merion Township, Pennsylvania

Prepared for: Township of Lower Merion, Pennsylvania

Prepared by: Eocene Environmental Group

December 2024

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Project Staf **f**

BARTLET TREE EXPERT COMPANY

NICK MARTIN | PROJECT MANAGER

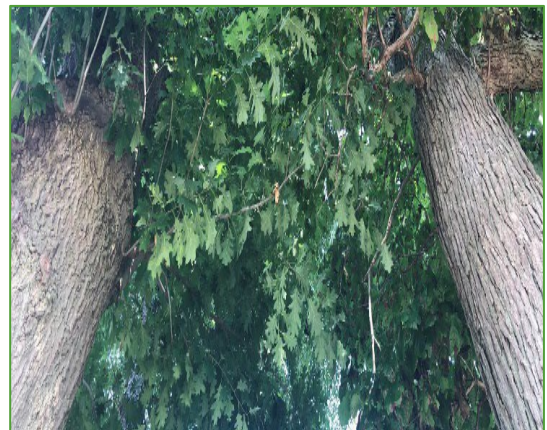
EOCENE ENVIRONMENTAL GROUP

MATT JOHNS | GIS ANALYST

RICHARD HAUER, PH.D. | SUBJECT MATTER EXPERT

SARAH LILLEY | CONSULTING URBAN FORESTER

LIZ LINGO | CONSULTING URBAN FORESTER



INTRODUCTION

Trees within Lower Merion Township help to define spaces and places that people occupy. This group of trees forms the urban forest which provides many benefits (e.g., shade, aesthetics, air pollution reduction, holding water, energy conservation, and health benefits). An urban tree canopy (UTC) assessment is an approach to quantify the land cover within a region, specifically the trees that occur in that area. Other land cover such as agricultural land, bare soil, grass and herbaceous plants, impervious surface, water, and wetlands are important to classify. Depicting land cover leads to developing a baseline and to provide a historic perspective, especially when planning for places to grow and plant trees in the urban forest.

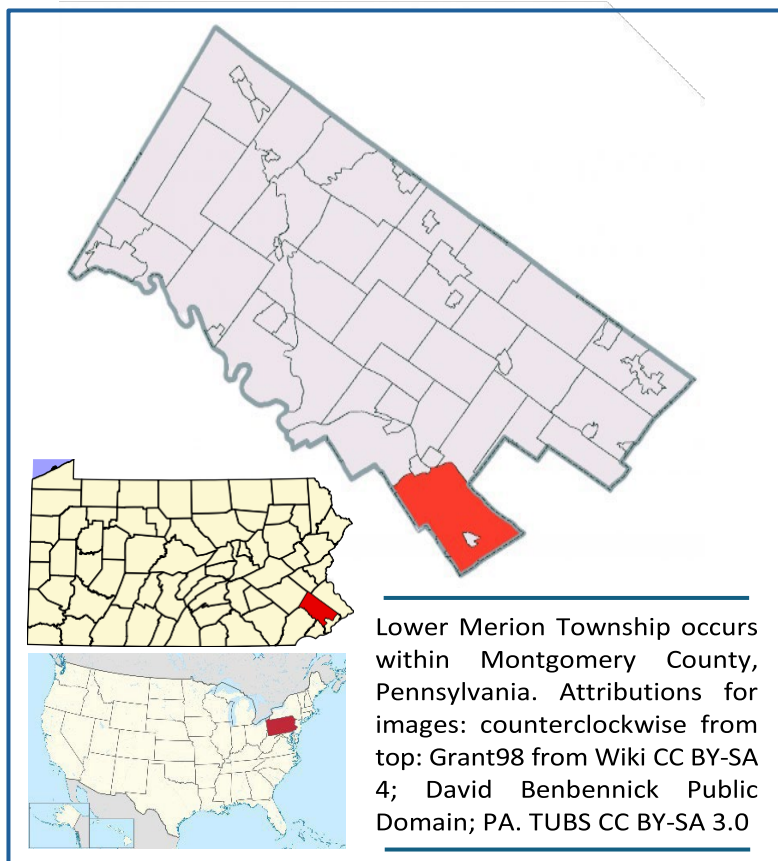
The urban forest changes over time. Quantifying this change and understanding factors that explain the difference is important for planning. How far back to go historically to assess forest change is predicated on making meaningful conclusions. Certainly, the most recent time provides an important baseline to compare against. Previous periods such as five to ten years in the past provide for a perspective to assess for differences or an unchanged situation.

The tree canopy assessment for Lower Merion Township was completed for an approximate 24 square mile area. Lower Merion Township includes more than 64,000 residents who comprise a diverse set of demographics. As a first-ring suburb of Philadelphia, many established neighborhoods exist with interspersed commercial, educational, and industrial land uses. As an established built-

upon area, many mature trees exist on private and public lands. Developing plans to understand the health and attrition of trees is also important for planning the future urban forest.

Lower Merion Township has a strong history of undertaking various tree-related activities. As a part of these activities, they have met the requirements for Tree City USA status for over 45 years. To achieve this status, the Township cares for over 70,000 trees along 289 miles of public right-of-way and within 700 acres of parks within the Township Parks system.

The outcome of this report is a description of the land cover and a tree canopy assessment across Lower Merion Township. Three time periods provide a historical depiction if and where changes occurred. A tree canopy baseline was developed to measure and monitor canopy cover moving forward.



Lower Merion Township occurs within Montgomery County, Pennsylvania. Attributions for images: counterclockwise from top: Grant98 from Wiki CC BY-SA 4; David Benbennick Public Domain; PA. TUBS CC BY-SA 3.0

METHODS

This section describes the approaches and sources of information for the land cover assessment used to develop our findings. A land cover assessment describes the landscape features that occur at a location on the ground. Tree canopy cover was the feature of interest, however, other features (e.g., bare soil, grass, and impervious surfaces) are important to determine potential areas to plant trees.

Data Collection, Evaluation and Analysis

Data used to conduct the Tree Canopy Assessment (TCA) included multiple sources. Color imagery from the National Agriculture Imagery Program (NAIP) was the basis to create the land cover mapping for three periods (2010, 2015, and 2022). Leaf-on imagery was at 1 m or better resolution and came from the USDA NAIP GeoHub (<https://naip-usdaonline.hub.arcgis.com/>).

The NAIP imagery was selected as it is readily available and is at a resolution that allows an accurate TCA. The current tree canopy from 2022 was disaggregated into 16 communities (Bala, Belmont Hills/College Park, Cynwyd, East Ardmore, East Bryn Mawr, Gladwyne, Haverford, Merion, North Ardmore, North Penn Valley, Penn Wynne, Rosemont, South Penn Valley, West Ardmore, West Bryn Mawr, Wynnewood). Lower Merion Township provided these geographical areas. The TCA gave an overall perspective of current and historic tree canopy and if this feature changed. A similar assessment was done for each of the 16 communities.

Existing and Historical Tree Canopy Assessment Analysis

The TCA provides a baseline metric to assess what percent of the land is covered by any feature such as tree canopy. Tree canopy is the area of the ground that is covered by trees' foliage, twigs, branches, and trunk. The tree canopy metric helps identify the variation of tree canopy across the landscape and also over time. There are many factors that explain variation in tree canopy such as past policy, storms, pest issues, land use changes, and other socioeconomic factors.

Seven land cover features (agricultural land, bare soil, grass and herbaceous, impervious surface, tree canopy, water, and wetland) were assessed (Figure 1). A 10,000 sample point system was used to identify each land cover feature under a sample location (Figure 2). This level of sampling will generate a $\pm 0.5\%$ standard error (SE) of the mean level of accuracy (Nowak and Greenfield 2010, Hilbert et al. 2019, Hauer and Schulz 2023). The SE is explained as how far the sample mean (e.g., average) from the assessment is likely to be within the true population mean value. Thus, at this intensity if the tree canopy estimate

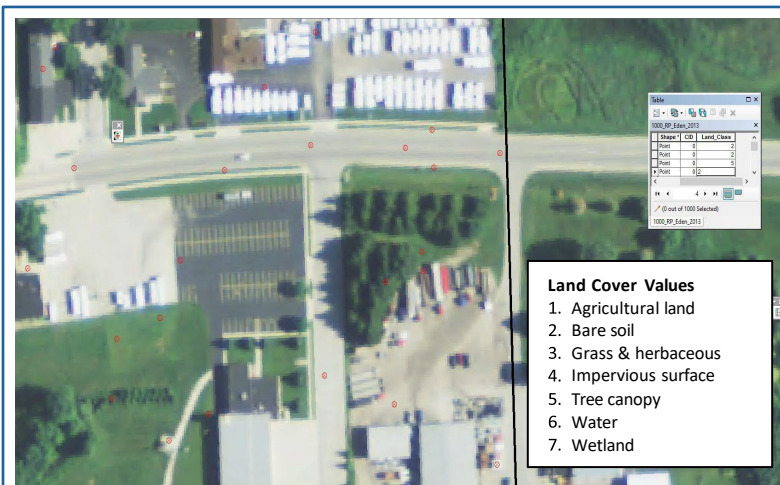


Figure 1. Assessment of land cover features involved the random placement of points with the center of the point used to depict the landscape feature.

was 33.2%, then we would expect the true value to be between 32.7% and 33.7%.

A 10% sample of locations were assessed by a second evaluator as part of quality control. An accuracy assessment, typically ~ 90% to 95% between two evaluators is expected for tree canopy. A user and producer assessment was used to classify how two different evaluators compare for an assessment of each point. In this approach the user is assessor one and producer is assessor two. In all cases, the tree canopy accuracy assessment exceeded a desired 95% user accuracy for 2010 (98.0% accurate), 2015 (96.6% accurate), and 2022 (97.4% accurate).

FINDINGS

Changes in tree canopy cover are presented at the township level and also the community level. A differing outcome between these two spatial scales is evident. While the township level showed an overall slight change in land cover, changes were apparent at the community level.

Township Level Extent

A slight change in tree canopy occurred between 2010 and 2022 for the entire Lower Merion Township assessment area (Table 1, Figure 3). Tree canopy cover decreased by a net 1.2% from 2010 (54.7%, ± 0.50 SE) to 2022 (53.5%, ± 0.50 SE). The relative change was a 2.3% decrease. The loss of ash trees from emerald ash borer (EAB) is one plausible reason. The EAB insect was first detected in Montgomery County in 2013 (Pennsylvania DCNR, 2017). Neighboring locations (Chester and Delaware County; City of Philadelphia)

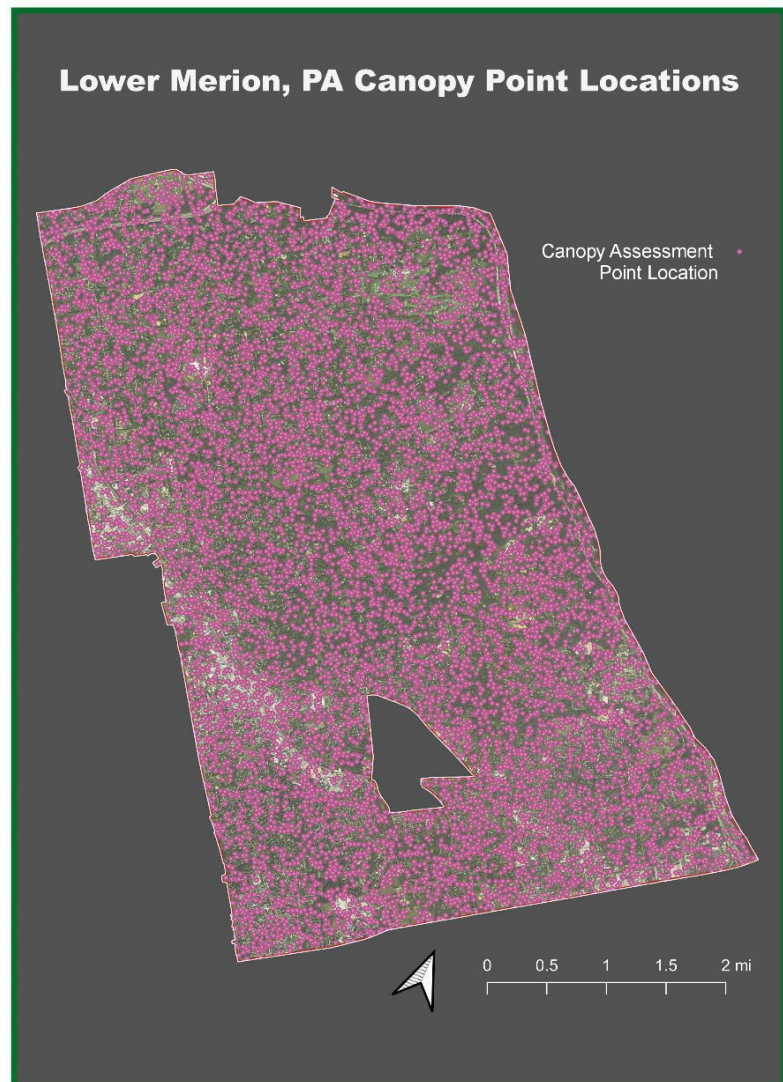


Figure 2. The random distribution of 10,000 sample points throughout Lower Merion Township.

had EAB detections in 2016 (Figure 4). Thus,

EAB was likely not in Lower Merion Township in 2010, with initial isolated infestations occurring by 2015. It takes EAB about 5 to 7 years to become epidemic once in a location (Herms and McCullough 2014). Thus, by 2022 the loss of ash tree would likely occur. However, even if infested, it is possible even dead and declining trees remain and would be detected as tree canopy if a sample point were over a tree. Land development and redevelopment are other explanations for a slight tree canopy reduction. Some sample

Table 1. Percentage land cover over three periods (2010, 2015, and 2025) by land cover type.

	2022 Land Cover			2015 Land Cover			2010 Land Cover		
Land Cover Type	Sample Points	Percent Cover	Cover % SE	Sample Points	Percent Cover	Cover % SE	Sample Points	Percent Cover	Cover % SE
Bare Soil	154	1.5	0.12	123	1.2	0.11	133	1.3	0.11
Grass / Herbaceous	2,052	20.5	0.40	2,284	22.8	0.42	2,019	20.2	0.40
Impervious Surface	2,348	23.5	0.42	2,226	22.3	0.42	2,291	22.9	0.42
Tree Cover	5,346	53.5	0.50	5,281	52.8	0.50	5,469	54.7	0.50
Water	100	1	0.10	86	0.9	0.09	86	0.9	0.09
Wetland	0	0	0.00	0	0	0.00	0	0	0.00
Total Count	10,000	100	0.50	10,000	100	0.50	10,000	100	0.50

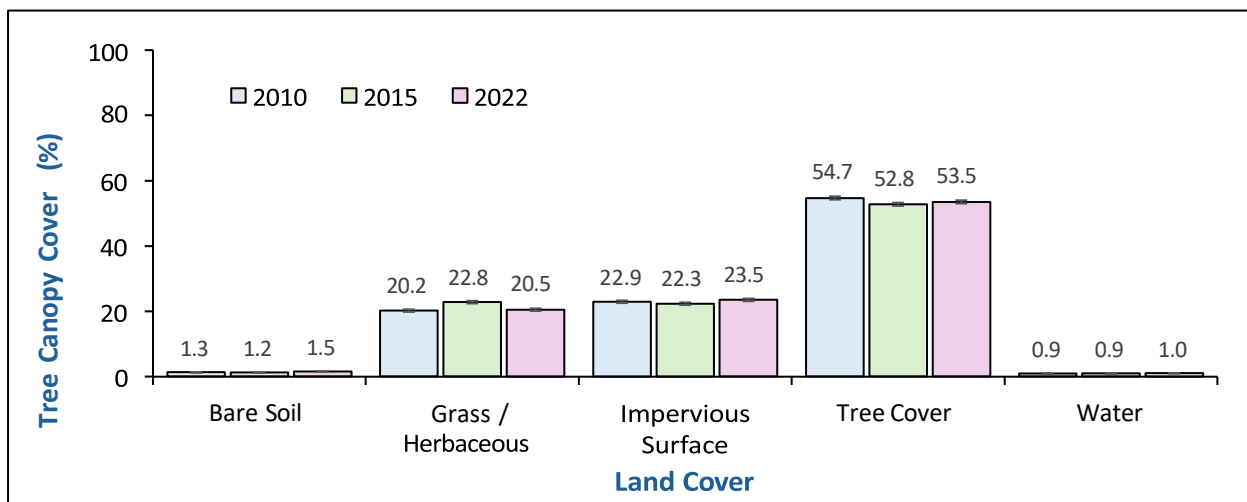


Figure3. Percent land cover within Lower Merion Township. (Bars are the Standard Error of the Mean, bars not overlapping are considered to be different)

points were observed over trees in an early time period, but later were replaced by buildings. Lower Merion Township is relatively well-developed and individual trees are maturing and reaching the end of their lifespan (Township of Lower Merion Undated). Thus, natural mortality of mature trees is expected as is a potential loss of tree canopy at a location.

The loss of tree canopy led to a collective increase in the other land covers combined. Interestingly, no one land cover alone was detected to change between 2010 and 2022

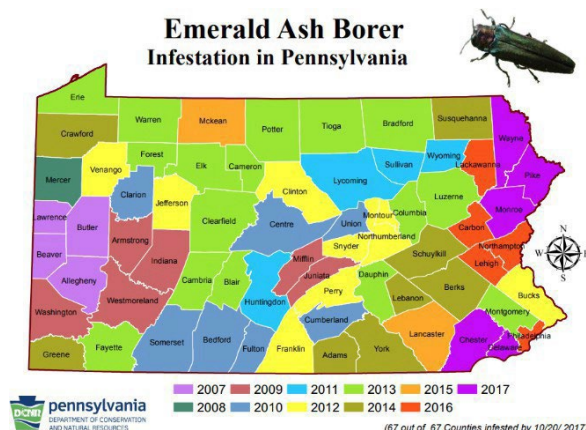


Figure 4. Detection of emerald ash borer by location in Pennsylvania.

with consideration to the estimate variability and the associated SE. While some small- scale agriculture activities may occur in the Township and certainly comprise a historic activity, no agricultural points were observed for any of the sample points over the three time periods. This is expected given the predominantly suburban nature of Lower Merion Township today. Only two of the sample points were classified as wetland and these were later combined into the water land cover category. Key findings for the other four land covers include:

- Bare soil remained constant over the three time periods and was 1.5% (0.12 SE) in 2022,
- Grass & herbaceous and impervious surface also showed no detectable change and were 20.5% (0.40 SE) and 23.5% (0.42 SE), respectively, of the total land area in 2022 , and
- Water covered little total land area at 1.0% (0.09 SE) in 2022.

Community Level Extent

While a slight decrease (1.2%, 0.50 SE) in tree canopy was found overall in Lower Merion Township, changes in tree canopy varied among communities (Table 2, Figure 5). A decrease in tree canopy occurred in six communities (Bala, Belmont Hills/College Park, Cynwyd, Merion, North Penn Valley, South Penn Valley). The net reductions ranged from 4.5% (1.5% SE) for South Penn Valley to 7.5% (2.4% SE) in Belmont Hills/College Park. Relative decreases ranged from 7.6% (South Penn Valley) to 20.2% (Bala). No changes were found for ten communities. This outcome was based on the two tree canopy measurements (2010 and 2022) within the sampling standard error of the mean. Or in other words, these communities may have a slight change in tree canopy between two periods, however, the change was not statistically detectable given

Table 2. Changes in tree canopy between 2010 and 2022. Communities rated as decreased were statistically outside the sampling standard error of the mean, thus interpreted as different.

Table 2. Changes in tree canopy between 2010 and 2022.

Community Name	Change	Net Change (%)	Relative Change (%)
Bala	Decrease	-7.1	-20.2
Belmont Hills/College Park	Decrease	-7.5	-14.5
Cynwyd	Decrease	-6.1	-14.6
East Ardmore	No Change	3.4	12.1
East Bryn Mawr	No Change	1.3	3.2
Gladwyne	No Change	0.8	1.3
Haverford	No Change	-2.2	-3.8
Merion	Decrease	-6.3	-13
North Ardmore	No Change	0.7	1.4
North Penn Valley	Decrease	-6.0	-10.2
Penn Wynne	No Change	1.2	2.7
Rosemont	No Change	0.4	0.9
South Penn Valley	Decrease	-4.5	-8
West Ardmore	No Change	1.0	3.6
West Bryn Mawr	No Change	2.8	5.1
Wynnewood	No Change	2.5	4.6
Grand Totals	Slight Decrease	-1.5	-2.2

the sample point intensity within a community. Figures 6 – 8 depict further spatial representation of tree canopy in a community. Consistent with the TCA from 2003 (Figure 9), tree canopy is lowest in Bala (28.3%) East Ardmore (29.8%), and West Ardmore (28.3%). In contrast, tree canopy exceeding 50% was found in Gladwyne, Haverford, North Ardmore, North Penn Valley, Rosemont, South Penn Valley, West Bryn Mawr, and Wynnewood. Further details by community for all land covers in found in Appendix A, Tables A-1 through A-4.

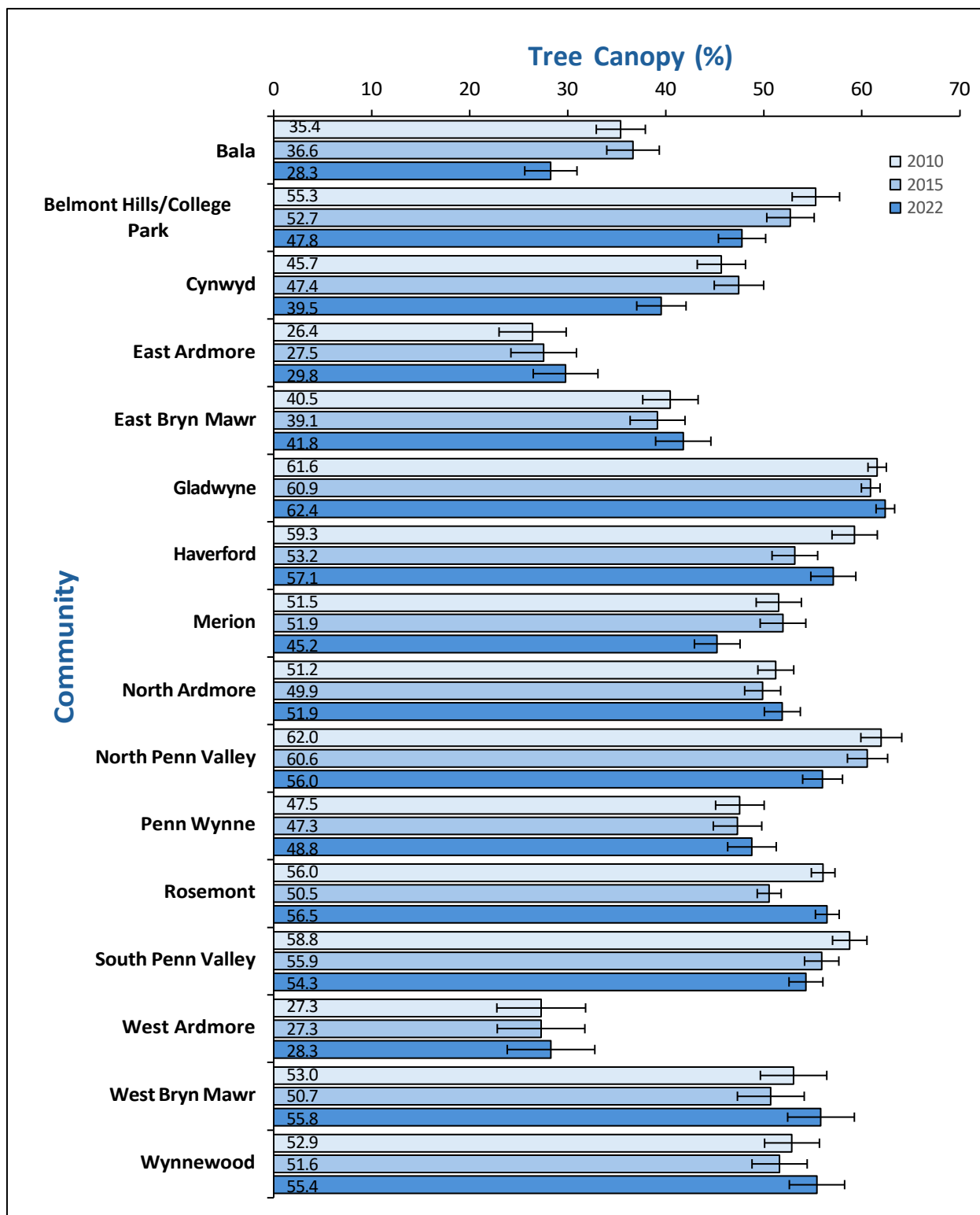


Figure 5. Change in tree canopy cover within 16 communities in Lower Merion Township. (Bars are the Standard Error of the Mean, bars not overlapping are considered to be different)

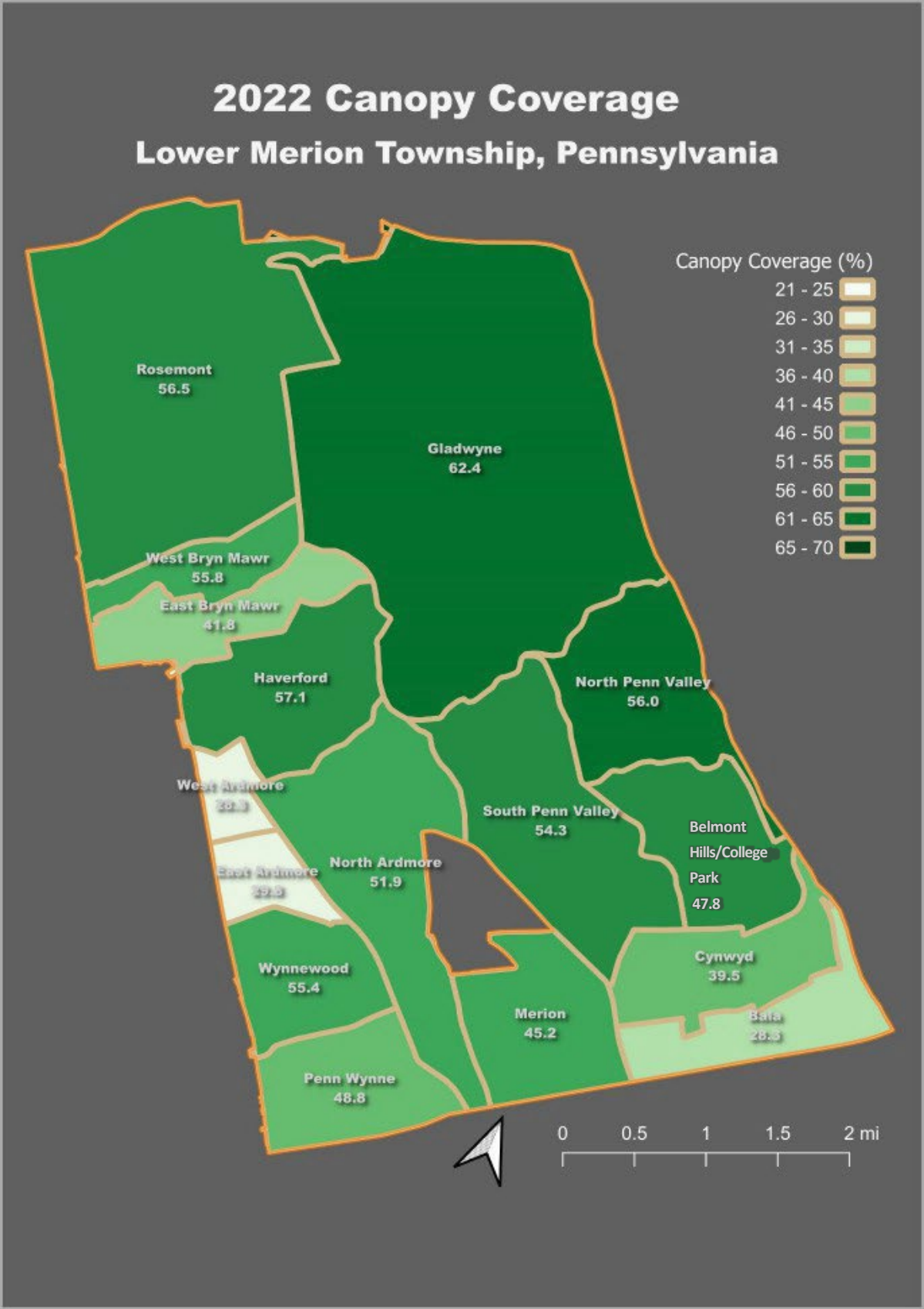


Figure 6. Tree canopy cover in 2022 within 16 communities in Lower Merion Township.

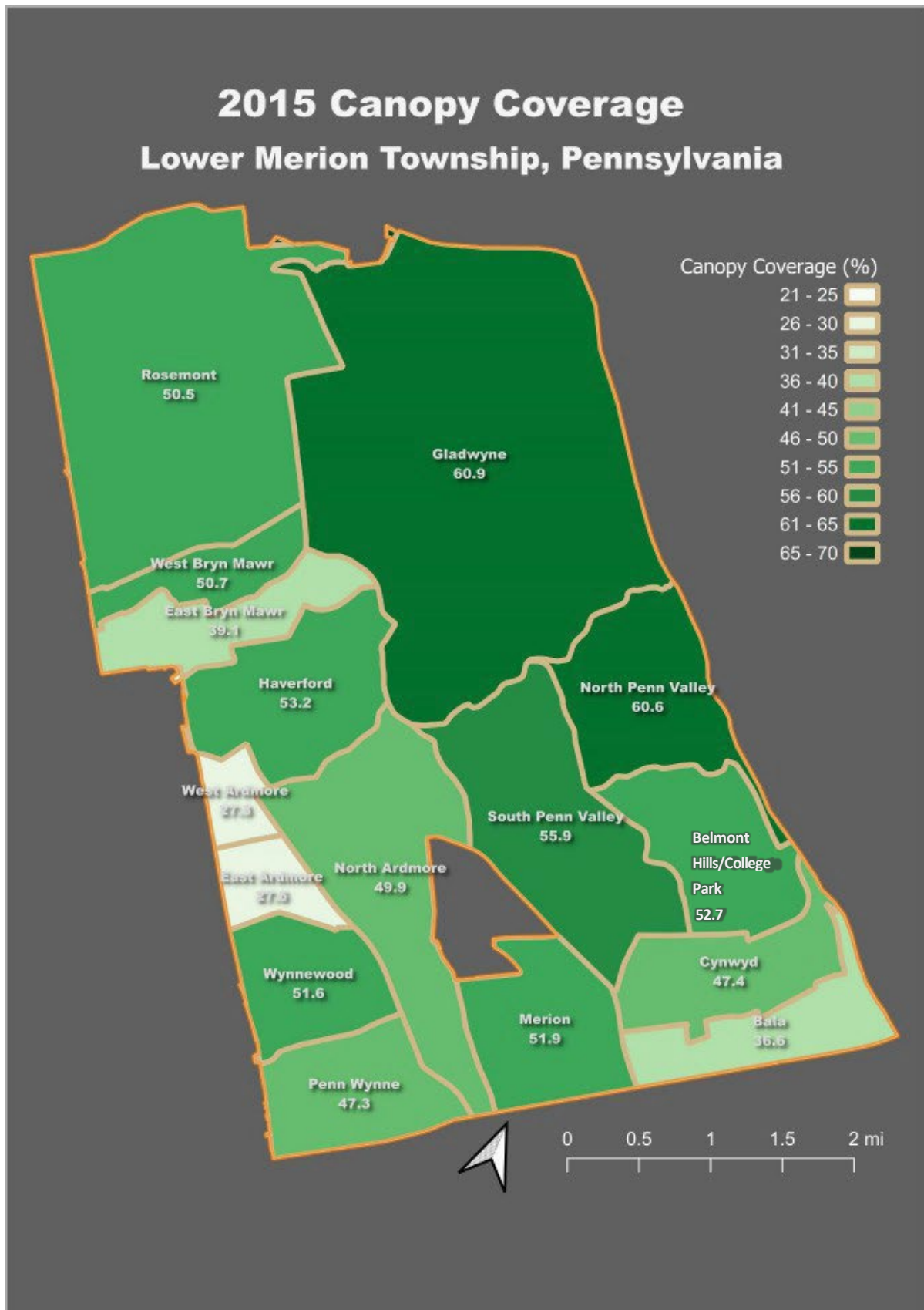


Figure 7. Tree canopy cover in 2015 within 16 communities in Lower Merion Township.

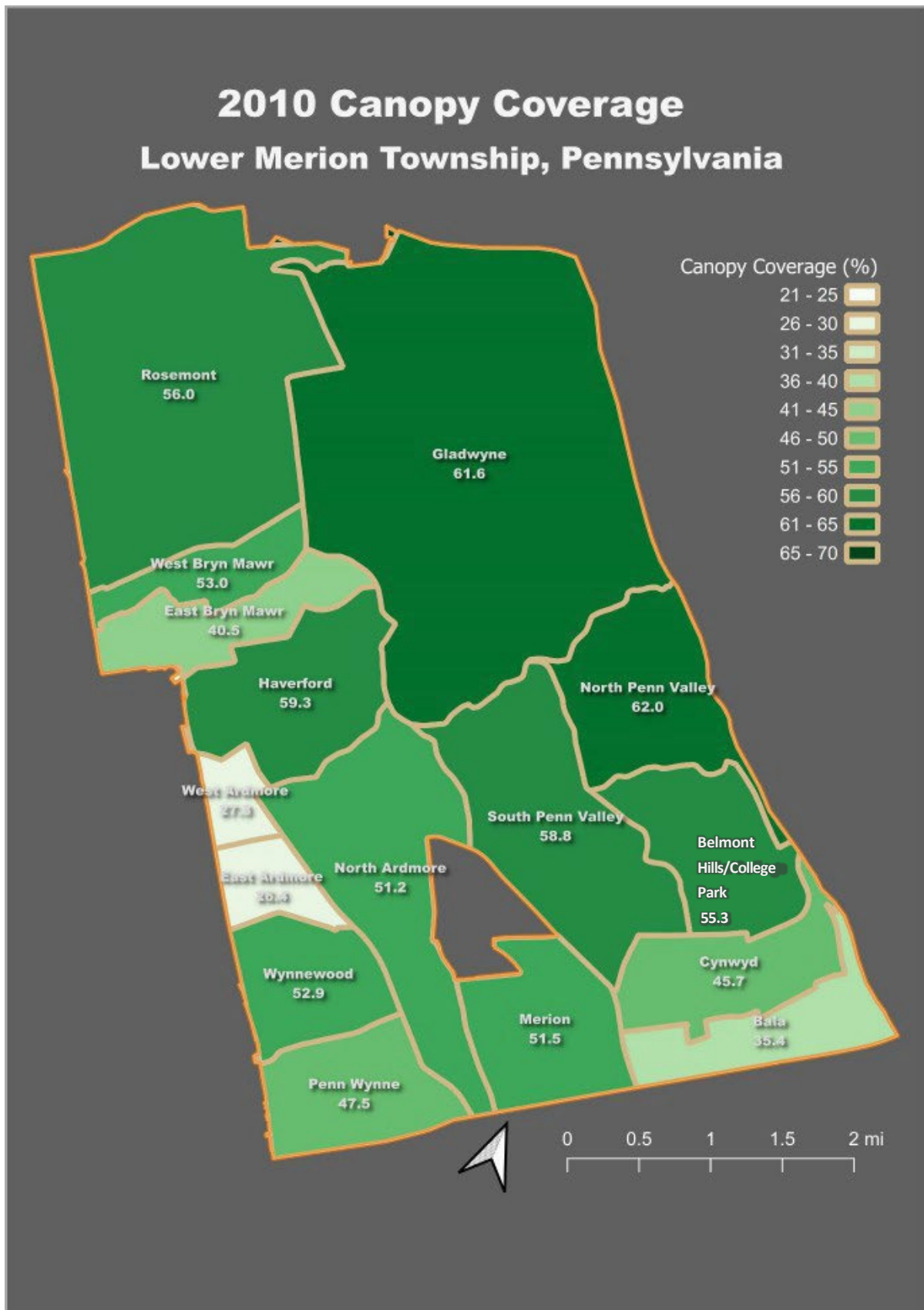


Figure 8. Tree canopy cover in 2010 within 16 communities in Lower Merion Township.



Figure 9. Spatial variation in tree canopy in 2003, 2010, 2015, and 2022 in Lower Merion Township.

Tree Canopy by Land Use

Tree canopy often varies across land uses. Tree canopy is often lower in locations with greater density of people and buildings. Land parcels in Lower Merion were classified into residential, commercial, and industrial land uses using zoning codes from Montgomery County. Land is also classified as exempt for parcels not subject to standard property taxes such as schools, government buildings, and religious institutions. Tree canopy was greatest on residential properties at 56.2% (Figure 10). Industrial land use had 50.0% tree canopy. Commercial and exempt land use had the least tree canopy at 41.9% and 43.4% respectively.

Tree Canopy and Equity

Access to trees and tree canopy is important for people. Promotion of human health is one fundamental outcome of the access to trees and tree canopy. An assessment of tree equity by census block and tract occurred to determine if and where locations of concern with lower canopy might exist. Tree equity issues occur in places with low tree canopy, underlying soci-economic issues, and can be exacerbated in locales with increased air pollution and increased urban heat.

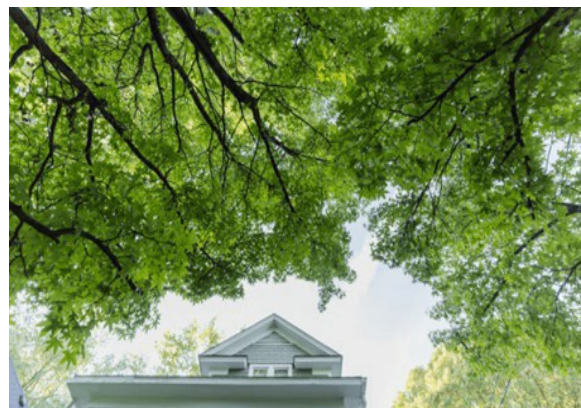
Tree equity scores used an index ranging from 0 to 100, with 100 suggesting the location has enough trees from an equity assessment perspective. The vast majority of census tract locations in Lower Merion Township showed high tree equity scores exceeding 90 (Figure 11). The lowest tree equity scores were found in Bala (two census blocks rating 83 and 84) and East Ardmore and West Ardmore (both with census blocks rating 86). However, tree equity scores of 83 to 86 are relatively positive and of low concern. Scores below 70 are more concerning for places to increase tree canopy for community members.

Inventory Recommendation

A major finding from the tree canopy assessment showed Lower Merion is currently well treed across many areas of the township. However, what is unknown and a limitation of a tree canopy assessment is the health and potential longevity of the tree population. Understanding the current tree population is important to make recommendations today to promote tree canopy in the future.

An on the ground assessment of trees is an approach to identify the current state of the urban forest. The tree inventory would describe the tree taxa (common name and botanical family), age of trees (using trunk diameter as an age proxy), and tree health (e.g., determine structural and health issues and potential tree longevity). The tree inventory would provide information to determine the tree population today and identify potential interventions to retain trees through active management. The inventory would also show trees that likely are better removed for tree risk and tree health reasons.

The on the ground tree inventory would also be a way to identify potential tree planting locations today. The land use and tree equity assessments showed no major census block or tract areas to focus tree planting from the spatial assessment. Rather, the findings suggest a finer scale assessment of tree planting needs at the parcel level is important.



Parcel Land Use Overview Lower Merion Township, Pennsylvania



Figure 10. Tree canopy cover by land use for Lower Merion Township, Pennsylvania.

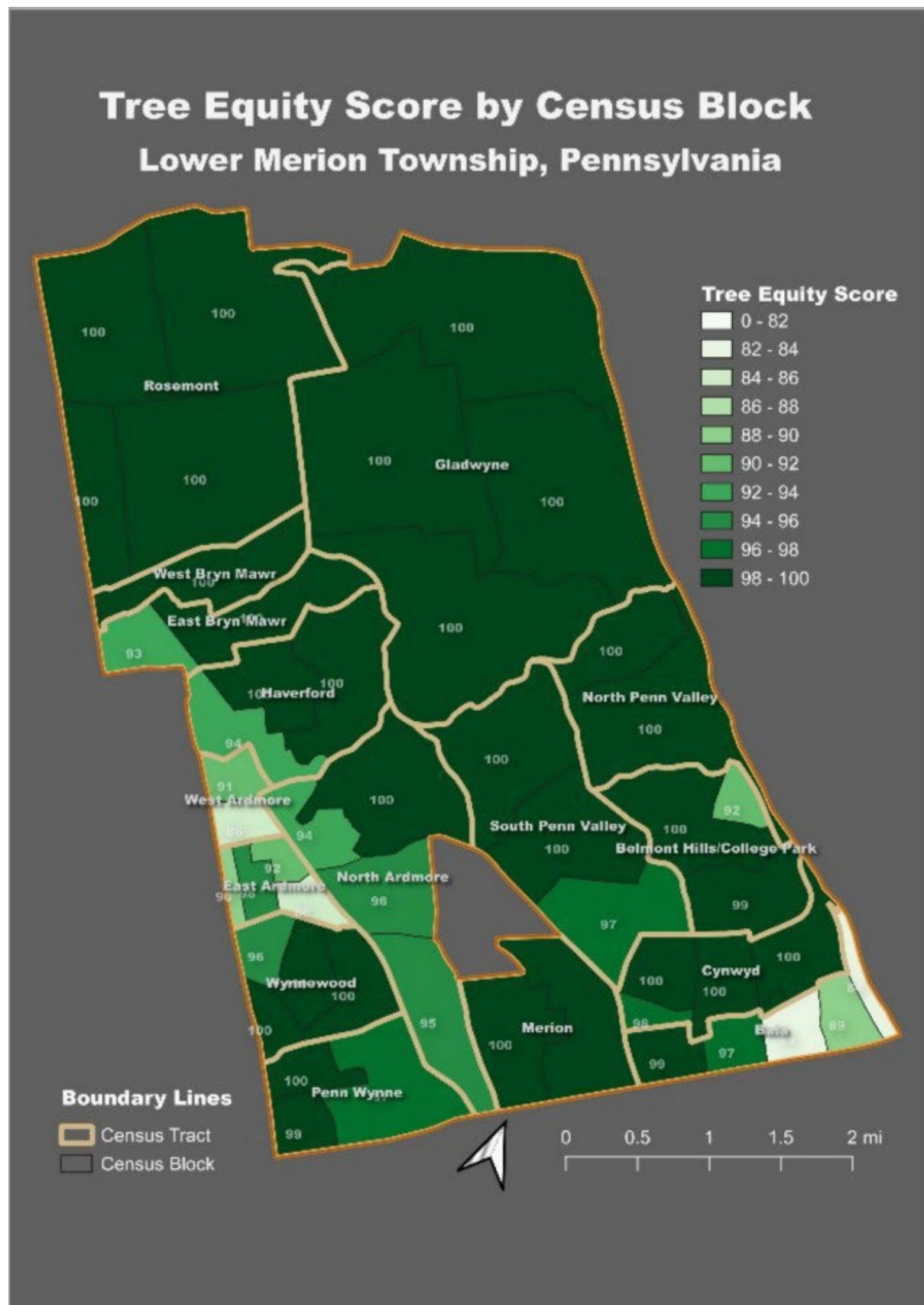


Figure 11. Tree equity scores by census tract and census block for Lower Merion Township, Pennsylvania.

SUMMARY & CONCLUSIONS

A land cover assessment was undertaken for Lower Merion Township, Pennsylvania. An overall finding for tree canopy was a slight decrease (1.2% net and 2.3% relative) overall between 2010 and 2022 at the township level. Tree canopy cover was 54.7% (± 0.50 SE) in 2010 and 53.5% (± 0.50 SE) in 2022. At the community level, six communities (Bala, Belmont Hills/College Park, Cynwyd, Merion, North Penn Valley, South Penn Valley) had net reductions ranging from 4.5% (7.6% relative) for South Penn Valley to 7.5% (13.6% relative) for Belmont Hills/College Park. The other ten communities showed no statistically significant change in tree canopy. The reasons for tree canopy change were not ascertained during the TCA. Future phases of this project such as a tree inventory will provide likely reasons for changes in tree canopy. Plausible reasons include emerald ash borer, construction activities associated with development and redevelopment, and a maturing tree population and natural attrition.

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Appendix A

Absolute Changes in Landcover for 2010, 2015, and 2022

	2022 Lower Merion Township, PA Land Cover Analysis Summary Findings											Sample Allocation		Physical Characteristics	
Community Name	Census Tract Number	Bare Soil / Gravel (# Points)	Bare Soil / Gravel (%)	Grass / Herbaceous (# Points)	Grass / Herbaceous (%)	Impervious Surface (# Points)	Impervious Surface (%)	Tree Canopy (# Points)	Tree Canopy (%)	Water (# Points)	Water (%)	Overall (# Points)	Overall (%)	Land Area (Square Meters)	Land Area (% of Total)
Bala	2043	12	3.7	45	14.0	163	50.6	91	28.3	11	3.4	322	3.2	2,025,918	3.3
Belmont Hills/College Park	2047.02	11	2.6	97	22.8	113	26.6	203	47.8	1	0.2	425	4.3	2,737,875	4.4
Cynwyd	2044	8	2.0	87	22.2	141	36.0	155	39.5	1	0.3	392	3.9	2,438,775	3.9
East Ardmore	2055.01	0	0.0	29	16.3	96	53.9	53	29.8	0	0.0	178	1.8	974,037	1.6
East Bryn Mawr	2051	4	1.3	67	22.0	106	34.9	127	41.8	0	0.0	304	3.0	1,901,209	3.1
Gladwyne	2048	49	1.9	561	21.4	323	12.3	1634	62.4	52	2.0	2619	26.2	15,953,178	25.8
Haverford	2052	4	0.9	80	17.4	112	24.4	262	57.1	1	0.2	459	4.6	3,249,905	5.3
Merion	2045	8	1.7	96	20.8	149	32.3	209	45.2	0	0.0	462	4.6	2,736,006	4.4
North Ardmore	2054.02	13	1.8	126	17.0	218	29.4	385	51.9	0	0.0	742	7.4	4,763,296	7.7
North Penn Valley	2047.01	9	1.6	101	17.8	108	19.0	318	56.0	32	5.6	568	5.7	3,275,249	5.3
Penn Wynne	2055.03	1	0.2	74	18.1	134	32.8	199	48.8	0	0.0	408	4.1	2,408,430	3.9
Rosemont	2049	20	1.2	400	23.9	307	18.4	944	56.5	1	0.1	1672	16.7	10,272,580	16.6
South Penn Valley	2046	6	0.7	167	20.7	195	24.2	437	54.3	0	0.0	805	8.1	4,877,735	7.9
West Ardmore	2053	4	4.0	12	12.1	55	55.6	28	28.3	0	0.0	99	1.0	671,475	1.1
WestBryn Mawr	2050	0	0.0	47	21.9	48	22.3	120	55.8	0	0.0	215	2.2	1,315,104	2.1
Wynnewood	2055.02	4	1.3	62	19.7	74	23.6	174	55.4	0	0.0	314	3.1	2,116,510	3.4
N/A	2042	0	0.0	0	0.0	1	33.3	2	66.7	0	0.0	3	0.0	45,559	0.1
N/A	4083	0	0.0	0	0.0	3	100.0	0	0.0	0	0.0	3	0.0	43,954	0.1
N/A	4089	0	0.0	0	0.0	0	0.0	2	100.0	0	0.0	2	0.0	12,723	0.0
N/A	Unassigned	1	12.5	2	25.0	3	37.5	2	25.0	0	0.0	8	0.1	0	0.0
Grand Totals		154	1.5	2053	20.5	2349	23.5	5345	53.5	99	1.0	10,000	100	61,819,518	100

Table A-1. 2022 Land cover summary findings by community for Lower Merion Township, Pennsylvania.

Community Name	Census Tract Number	2015 Lower Merion Township, PA Land Cover Analysis Summary Findings										Sample Allocation		Physical Characteristics	
		Bare Soil / Gravel (# Points)	Bare Soil / Gravel (%)	Grass / Herbaceous (# Points)	Grass / Herbaceous (%)	Impervious Surface (# Points)	Impervious Surface (%)	Tree Canopy (# Points)	Tree Canopy (%)	Water (# Points)	Water (%)	Overall (# Points)	Overall (%)	Land Area (Square Meters)	Land Area (% of Total)
Bala	2043	12	3.7	34	10.6	151	46.9	118	36.6	7	2.2	322	3.2	2,025,918	3.3
Belmont Hills/College Park	2047.02	10	2.4	92	21.6	98	23.1	224	52.7	1	0.2	425	4.3	2,737,875	4.4
Cynwyd	2044	7	1.8	88	22.4	110	28.1	186	47.4	1	0.3	392	3.9	2,438,775	3.9
East Ardmore	2055.01	0	0.0	32	18.0	97	54.5	49	27.5	0	0.0	178	1.8	974,037	1.6
East Bryn Mawr	2051	1	0.3	86	28.3	98	32.2	119	39.1	0	0.0	304	3.0	1,901,209	3.1
Gladwyne	2048	35	1.3	597	22.8	346	13.2	1595	60.9	46	1.8	2619	26.2	15,953,178	25.8
Haverford	2052	7	1.5	94	20.5	113	24.6	244	53.2	1	0.2	459	4.6	3,249,905	5.3
Merion	2045	6	1.3	102	22.1	114	24.7	240	51.9	0	0.0	462	4.6	2,736,006	4.4
North Ardmore	2054.01&.02	11	1.5	137	18.5	224	30.2	370	49.9	0	0.0	742	7.4	4,763,296	7.7
North Penn Valley	2047.01	7	1.2	95	16.7	94	16.5	344	60.6	28	4.9	568	5.7	3,275,249	5.3
Penn Wynne	2055.03	3	0.7	87	21.3	124	30.4	193	47.3	1	0.2	408	4.1	2,408,430	3.9
Rosemont	2049	17	1.0	499	29.8	310	18.5	845	50.5	1	0.1	1672	16.7	10,272,580	16.6
South Penn Valley	2046	2	0.2	190	23.6	163	20.2	450	55.9	0	0.0	805	8.1	4,877,735	7.9
West Ardmore	2053	1	1.0	17	17.2	54	54.5	27	27.3	0	0.0	99	1.0	671,475	1.1
WestBryn Mawr	2050	1	0.5	53	24.7	52	24.2	109	50.7	0	0.0	215	2.2	1,315,104	2.1
Wynnewood	2055.02	2	0.6	80	25.5	70	22.3	162	51.6	0	0.0	314	3.1	2,116,510	3.4
N/A	2042	0	0.0	0	0.0	1	33.3	2	66.7	0	0.0	3	0.0	45,559	0.1
N/A	4083	0	0.0	0	0.0	3	100.0	0	0.0	0	0.0	3	0.0	43,954	0.1
N/A	4089	0	0.0	0	0.0	1	50.0	1	50.0	0	0.0	2	0.0	12,723	0.0
N/A	Unassigned	1	12.5	1	12.5	3	37.5	3	37.5	0	0.0	8	0.1	0	0.0
Grand Totals		123	1.2	2284	22.8	2226	22.3	5281	52.8	86	0.9	10,000	100	61,819,518	100

Table A-2. 2015 Land cover summary findings by community for Lower Merion Township, Pennsylvania.

Community Name	Census Tract Number	2010 Lower Merion Township, PA Land Cover Analysis Summary Findings										Sample Allocation		Physical Characteristics	
		Bare Soil / Gravel (# Points)	Bare Soil / Gravel (%)	Grass / Herbaceous (# Points)	Grass / Herbaceous (%)	Impervious Surface (# Points)	Impervious Surface (%)	Tree Canopy (# Points)	Tree Canopy (%)	Water (# Points)	Water (%)	Overall (# Points)	Overall (%)	Land Area (Square Meters)	Land Area (% of Total)
Bala	2043	12	3.7	35	10.9	153	47.5	114	35.4	8	2.5	322	3.2	2,025,918	3.3
Belmont Hills/College Park	2047.02	6	1.4	77	18.1	106	24.9	235	55.3	1	0.2	425	4.3	2,737,875	4.4
Cynwyd	2044	5	1.3	88	22.4	119	30.4	179	45.7	1	0.3	392	3.9	2,438,775	3.9
East Ardmore	2055.01	0	0.0	36	20.2	95	53.4	47	26.4	0	0.0	178	1.8	974,037	1.6
East Bryn Mawr	2051	4	1.3	73	24.0	104	34.2	123	40.5	0	0.0	304	3.0	1,901,209	3.1
Gladwyne	2048	34	1.3	584	22.3	343	13.1	1612	61.6	46	1.8	2619	26.2	15,953,178	25.8
Haverford	2052	4	0.9	67	14.6	115	25.1	272	59.3	1	0.2	459	4.6	3,249,905	5.3
Merion	2045	10	2.2	87	18.8	127	27.5	238	51.5	0	0.0	462	4.6	2,736,006	4.4
North Ardmore	2054.01&.02	15	2.0	119	16.0	228	30.7	380	51.2	0	0.0	742	7.4	4,763,296	7.7
North Penn Valley	2047.01	4	0.7	82	14.4	103	18.1	352	62.0	27	4.8	568	5.7	3,275,249	5.3
Penn Wynne	2055.03	5	1.2	76	18.6	132	32.4	194	47.5	1	0.2	408	4.1	2,408,430	3.9
Rosemont	2049	26	1.6	403	24.1	304	18.2	937	56.0	2	0.1	1672	16.7	10,272,580	16.6
South Penn Valley	2046	1	0.1	158	19.6	173	21.5	473	58.8	0	0.0	805	8.1	4,877,735	7.9
West Ardmore	2053	1	1.0	14	14.1	56	56.6	27	27.3	1	1.0	99	1.0	671,475	1.1
WestBryn Mawr	2050	3	1.4	45	20.9	53	24.7	114	53.0	0	0.0	215	2.2	1,315,104	2.1
Wynnewood	2055.02	2	0.6	74	23.6	72	22.9	166	52.9	0	0.0	314	3.1	2,116,510	3.4
N/A	2042	0	0.0	0	0.0	1	33.3	2	66.7	0	0.0	3	0.0	45,559	0.1
N/A	4083	0	0.0	0	0.0	3	100.0	0	0.0	0	0.0	3	0.0	43,954	0.1
N/A	4089	0	0.0	0	0.0	1	50.0	1	50.0	0	0.0	2	0.0	12,723	0.0
N/A	Unassigned	1	12.5	1	12.5	3	37.5	3	37.5	0	0.0	8	0.1	0	0.0
Grand Totals		133	1.3	2019	20.2	2291	22.9	5469	54.7	88	0.9	10,000	100	61,819,518	100

Table A-3. 2010 Land cover summary findings by community for Lower Merion Township, Pennsylvania.

Community Name	Census Tract Number	Absolute Change in Landcover between 2010 and 2022 in Lower Merion Township, PA Summary Findings										Sample Allocation		Physical Characteristics	
		Bare Soil / Gravel (# Points)	Bare Soil / Gravel (%)	Grass / Herbaceous (# Points)	Grass / Herbaceous (%)	Impervious Surface (# Points)	Impervious Surface (%)	Tree Canopy (# Points)	Tree Canopy (%)	Water (# Points)	Water (# Points)	Overall (# Points)	Overall (%)	Land Area (Square Meters)	Land Area (% of Total)
Bala	2043	12	0.0	40	3.1	158	3.1	102.5	-7.1	9.5	0.9	322	0.0	2,025,918	3.3
Belmont Hills/College Park	2047.02	8.5	1.2	87	4.7	109.5	1.6	219	-7.5	1	0.0	425	0.0	2,737,875	4.4
Cynwyd	2044	6.5	0.8	87.5	-0.3	130	5.6	167	-6.1	1	0.0	392	0.0	2,438,775	3.9
East Ardmore	2055.01	0	0.0	32.5	-3.9	95.5	0.6	50	3.4	0	0.0	178	0.0	974,037	1.6
East Bryn Mawr	2051	4	0.0	70	-2.0	105	0.7	125	1.3	0	0.0	304	0.0	1,901,209	3.1
Gladwyne	2048	41.5	0.6	572.5	-0.9	333	-0.8	1623	0.8	49	0.2	2619	0.0	15,953,178	25.8
Haverford	2052	4	0.0	73.5	2.8	113.5	-0.7	267	-2.2	1	0.0	459	0.0	3,249,905	5.3
Merion	2045	9	-0.4	91.5	1.9	138	4.8	223.5	-6.3	0	0.0	462	0.0	2,736,006	4.4
North Ardmore	2054.02	14	-0.3	122.5	0.9	223	-1.3	382.5	0.7	0	0.0	742	0.0	4,763,296	7.7
North Penn Valley	2047.01	6.5	0.9	91.5	3.3	105.5	0.9	335	-6.0	29.5	0.9	568	0.0	3,275,249	5.3
Penn Wynne	2055.03	3	-1.0	75	-0.5	133	0.5	196.5	1.2	0.5	-0.2	408	0.0	2,408,430	3.9
Rosemont	2049	23	-0.4	401.5	-0.2	305.5	0.2	940.5	0.4	1.5	-0.1	1672	0.0	10,272,580	16.6
South Penn Valley	2046	3.5	0.6	162.5	1.1	184	2.7	455	-4.5	0	0.0	805	0.0	4,877,735	7.9
West Ardmore	2053	2.5	3.0	13	-2.0	55.5	-1.0	27.5	1.0	0.5	-1.0	99	0.0	671,475	1.1
West Bryn Mawr	2050	1.5	-1.4	46	0.9	50.5	-2.3	117	2.8	0	0.0	215	0.0	1,315,104	2.1
Wynnewood	2055.02	3	0.6	68	-3.8	73	0.6	170	2.5	0	0.0	314	0.0	2,116,510	3.4
N/A	2042	0	0.0	0	0.0	1	0.0	2	0.0	0	0.0	3	0.0	45,559	0.1
N/A	4083	0	0.0	0	0.0	3	0.0	0	0.0	0	0.0	3	0.0	43,954	0.1
N/A	4089	0	0.0	0	0.0	0.5	-50.0	1.5	50.0	0	0.0	2	0.0	12,723	0.0
N/A	Unassigned	1	0.0	1.5	12.5	3	0.0	2.5	-12.5	0	0.0	8	0.0	0	0.0
Grand Totals		143.5	0.2	2036	0.3	2320	0.6	5407	-1.2	93.5	0.1	10,000	0	61,819,518	100

Table A-4. Changes in land cover between 2010 and 2022 by community for Lower Merion Township, PA.



////////////////////
Thank you for your partnership.
////////////////////

Bartlett Tree Experts
1290 East Main Street
Stamford, CT 06906
www.bartlett.com

Township of Lower Merion Tree Canopy Assessment & Management Plan



Public Works Committee
November 5, 2025





Overview of Presentation

- I. Background & Objectives**
- II. Tree Canopy Coverage and Percentage Changes**
- III. Management Plan Recommendations**



Background & Objectives

Background

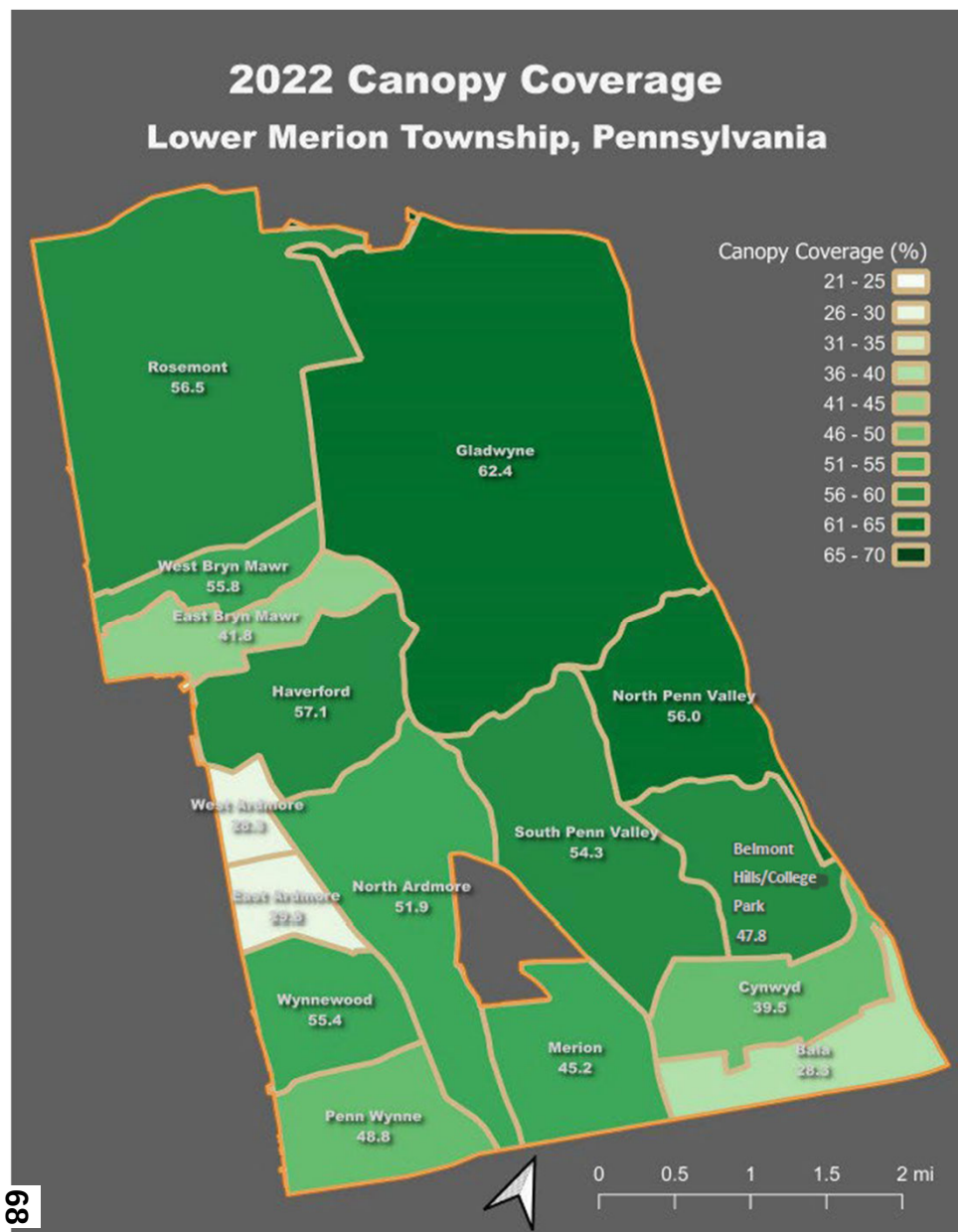
- The Township maintains approximately **70,000 public trees across 176 miles of right-of-way and 705 acres of parkland.**
- To sustain this vital resource, the Township initiated a **Tree Canopy Assessment and Management Plan** to better understand long-term canopy trends and management needs.

Objectives

- **Analyze and quantify** historical and current tree canopy coverage to identify changes, gaps, and growth opportunities.
- **Develop practical strategies** to preserve, enhance, and manage the Township's tree canopy through data-driven policies, staffing, and investment priorities.



Canopy Coverage by Geographic Area



Eight out of Sixteen communities exceed 50% canopy coverage.

Highest Coverage Areas Include:

- Gladwyne (62.4%)
- Rosemont (56.5%)
- Haverford (57.1%)

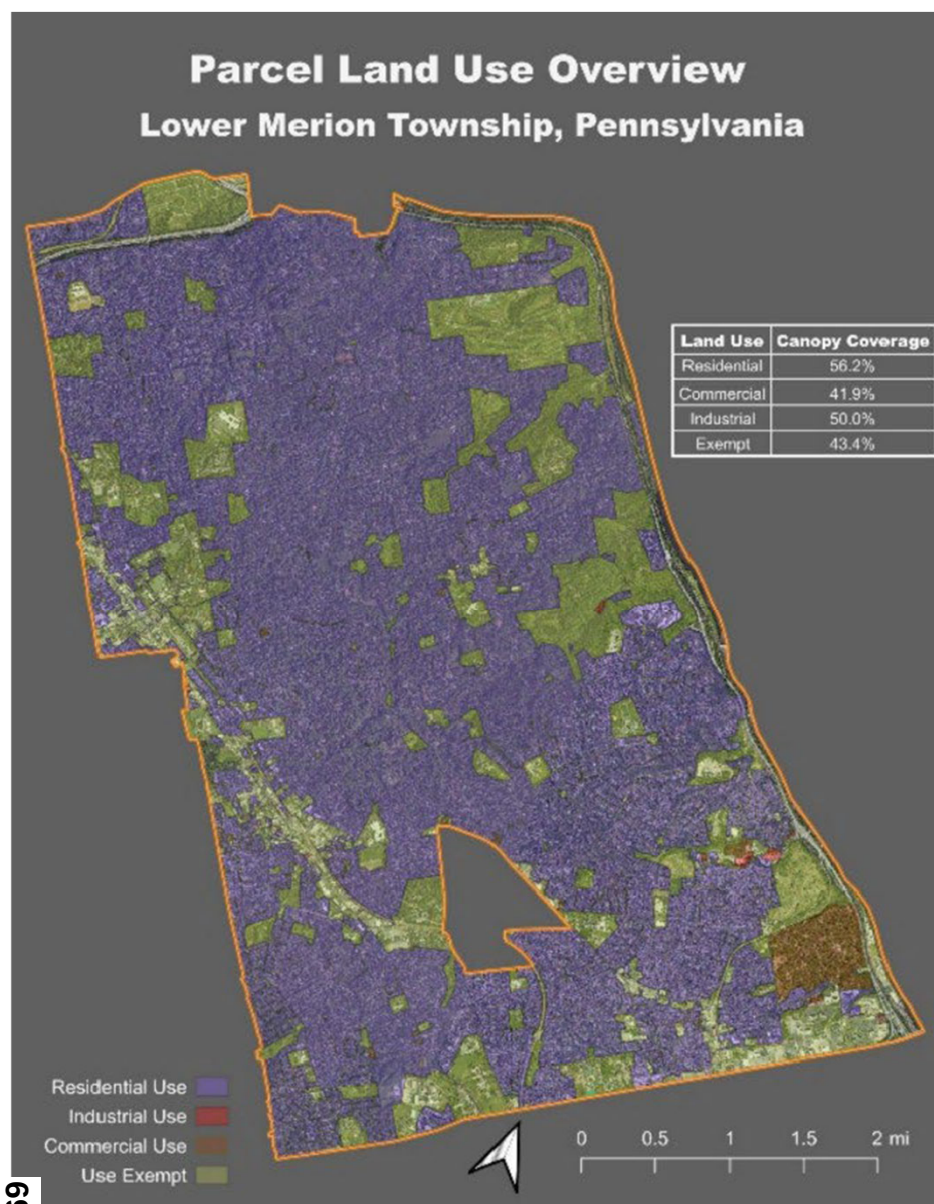
Lowest Coverage Areas Include:

- East Ardmore (29.6%)
- West Ardmore (28.8%)
- Bala (28.3%)

Tree canopy cover was greatest on residential properties (56.2%), followed by industrial (50.0%), exempt (e.g., schools, government buildings, religious institutions) (43.4%), and then commercial (41.9%).



Canopy Coverage by Use



Canopy Coverage by Use:

- **Residential Properties** (56.2%),
- **Industrial** (50.0%),
- **Exempt** (e.g., schools, government buildings, religious institutions) (43.4%),
- **Commercial** (41.9%).



Land Cover and Percentage Changes

Land Cover Type	2010 (%)	2015 (%)	2022 (%)
Wetland	0	0	0
Water	0.9	0.9	1.0
Bare Soil	1.3	1.2	1.5
Grass/Herbaceous	20.2	22.8	20.5
Impervious Surface	22.9	22.3	23.5
Tree Cover	54.7	52.8	53.5

- **Decrease in Canopy Coverage from 2010 to 2022 (54.7% to 53.5%)**
- **Increase in Canopy Coverage from 2015 to 2022 (52.8% to 53.5%)**
- **Possible Reasons for the decrease include:**
 - Emerald Ash Borer
 - Land Development/Redevelopment
 - Natural Loss of Mature Trees

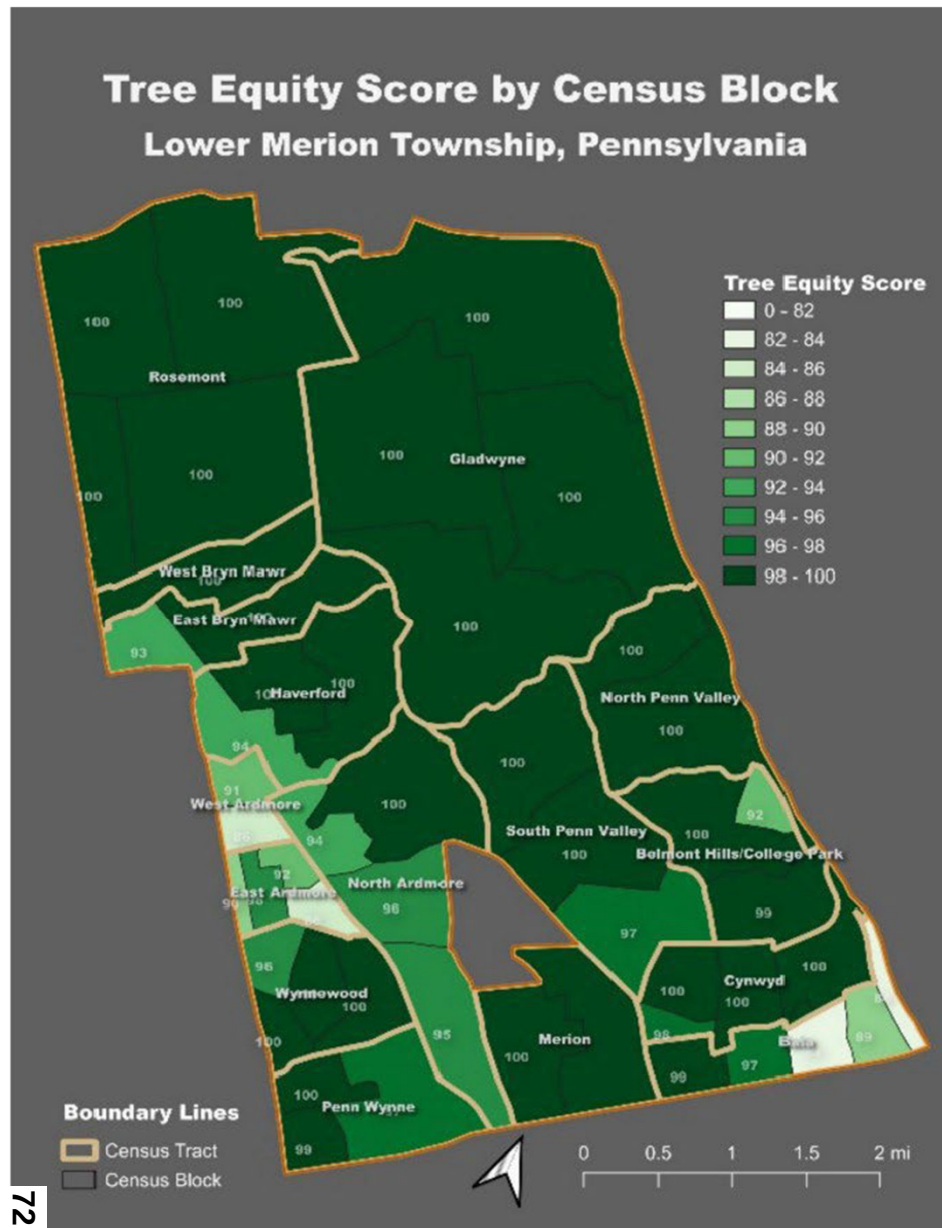


Land Cover and Percentage Changes (2010-2022)

Community Name	Change (Overall)	Change (%)
Bala	Decreased	-7.1
Belmont Hills/College Park	Decreased	-7.5
Cynwyd	Decreased	-6.1
East Ardmore	No change	+3.4
East Bryn Mawr	No change	+1.3
Gladwyne	No change	+0.8
Haverford	No change	-2.2
Merion	Decreased	-6.3
North Ardmore	No change	+0.7
North Penn Valley	Decreased	-6.0
Penn Wynne	No change	+1.2
Rosemont	No change	+0.4
South Penn Valley	Decreased	-4.5
West Ardmore	No change	+1.0
West Bryn Mawr	No change	+2.8
Wynnewood	No change	+2.5



Tree Equity Score by Census Block



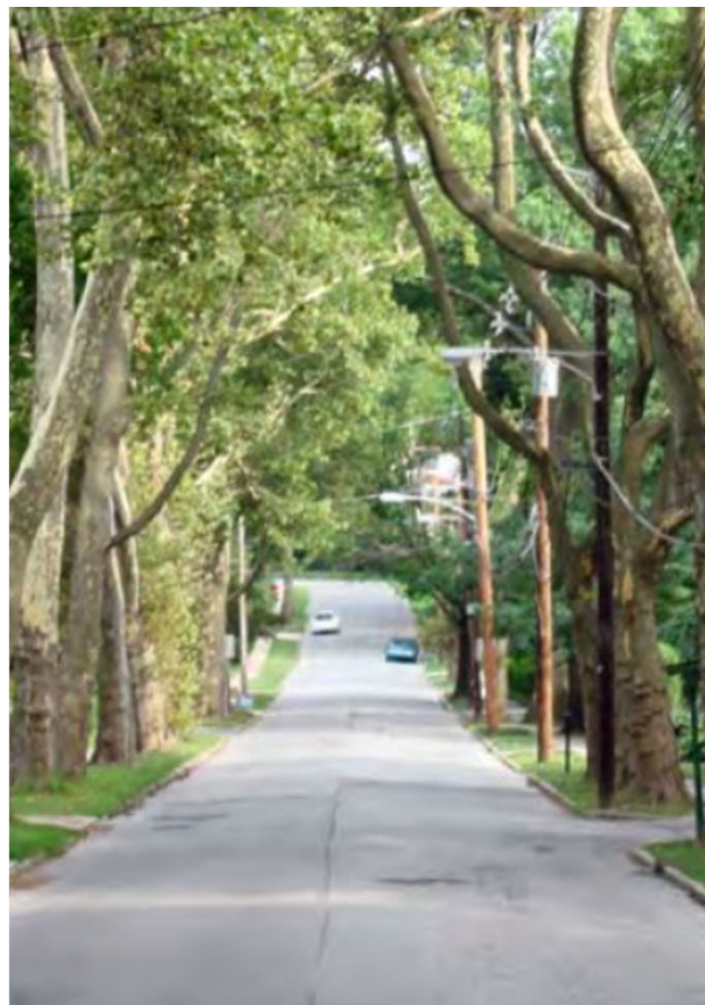
- Tree equity scores use an index ranging from 0 to 100
- Scores of 100 mean the location has a sufficient number of trees from an equity assessment perspective
- Scores below 70 are areas of concern that would need more trees.
- The majority of census tract locations in Lower Merion Township have tree equity scores that exceed 90
- The lowest tree equity scores were found in Bala (two census blocks rating 83 and 84) and East Ardmore and West Ardmore (both with census blocks rating 86).



Strategic Recommendations

Canopy Goals & Diversity Policy

- Establishing Township-wide canopy cover goals, supported by five-year monitoring intervals using updated aerial and GIS analysis.
- Adopting a species diversity policy following the 30/20/10 guideline (no more than 30% of trees from one family, 20% from one genus, and 10% from a single species) to protect against future pest and disease vulnerabilities.





Strategic Recommendations



Replanting Recommendations & GIS Integration

- Expanding replanting recommendations to include replacement ratios (e.g., five small-maturing trees for each large tree removed), ecosystem service prioritization (e.g., stormwater reduction, heat mitigation), and species performance tracking.
- Fully integrating the Township's tree inventory into the Traisr GIS/Asset Management System, allowing real-time updates from field crews and seamless linkage to work orders and inspection records.



Township of Lower Merion
A FIRST CLASS TOWNSHIP

AGENDA ITEM INFORMATION

COMMITTEE: Public Works

ITEM: AUTHORIZATION TO PROCEED WITH DESIGN AND BIDDING FOR SELECT HIGH PRIORITY SIDEWALK SEGMENTS

Consider for recommendation to the Board of Commissioners authorizing staff to proceed to Final Design and public bidding for the high-priority sidewalk segments identified and funded by CIP 4297 and listed below and authorization to initiate the design process for the remaining high-priority sidewalk segments:

- East Spring Avenue (*Grandview Road to Sutton Road*)
- Llanfair Road (*Existing Sidewalk to Coulter Avenue*)
- Clothier Road (*Morris Road to Ballytore Road*)
- Cloverhill Road (*Morris Road to Lancaster Avenue*)
- Remington Road (*Trent Road to Tomkenn Road*)

PUBLIC COMMENT

ATTACHMENT(S):

[2025-10-31 Sidewalk Program Update - Issues Briefing.docx](#)
[October 2025 Ad hoc Sidewalk Installation-Final.pdf](#)

TOWNSHIP OF LOWER MERION

Building and Planning Committee

Issue Briefing

Topic: Township-wide Sidewalk Program Update

Prepared By: Paul McElhaney, Director of Public Works
Joseph Mastronardo, PE, Township Engineer

Date: October 31, 2025

I. Action To Be Considered By The Board:

Authorization to proceed to Final Design and public bidding for select high-priority sidewalk segments identified and funded by CIP4297; and direction to initiate the design process for remaining high-priority sidewalk segments.

II. Why This Issue Requires Board Consideration:

The established sidewalk policy requires the Board of Commissioners to select sidewalk segments for design and public bidding.

III. Current Policy Or Practice (If Applicable):

N/A

IV. Other Relevant Background Information:

The Sidewalk Installations Program was established as part of the CIP in 2023. When the program was established, the Board adopted a policy and selection criteria to identify specific locations where public funding and construction of sidewalks on non-township property would be in the public interest. The Board also reviewed a preliminary list of high priority sidewalks and directed staff to refine and finalize the list through public outreach and engagement prior to finalization of the CIP in 2025.

In October 2023, staff presented a preliminary list of high priority sidewalk projects to implement the Sidewalk Installation Policy established by the Board. The preliminary list had been developed based upon recommendations from the 2016 Comprehensive Plan and had been refined through discussions with Ward Commissioners, the Ad Hoc Sidewalk Committee, and Civic Associations and vetted by Township staff for physical and economic constructability.

In September 2024, the Board of Commissioners authorized work for the preliminary design of High Priority Sidewalk projects at an approximate cost of \$8M (CIP 4297). Preliminary Design plans are complete for sidewalk segments on East Spring Avenue, Llanfair Road, Clothier Road, Cloverhill Road, and Remington Road.

The Preliminary Plans for sidewalks along these initial high-priority segments are designed to close critical pedestrian gaps, provide ADA-compliant curb ramps and introduce crosswalks to enhance accessibility and safety. In alignment with Township standards and tailored to neighborhood-specific conditions, the designs introduce new 4- to 5-foot-wide sidewalks with grassed verge where feasible, while minimizing disruption to existing residential property features.

Construction is anticipated to occur mainly within the existing Township right-of-way. However, minor right-of-way acquisitions will be necessary primarily to accommodate ADA ramp construction at intersections. Additionally, temporary construction easements will be required to ensure smooth transitions at driveway entrances and to achieve appropriate grading within adjacent yard areas.

V. Impact On Township Finances:

The preliminary estimate of probable construction cost, including allocations for right-of-way acquisition, for the initial high priority sidewalk segments is as follows:

• East Spring Avenue (<i>Grandview Road to Sutton Road</i>)	\$132,000
• Llanfair Road (<i>Existing Sidewalk to Coulter Avenue</i>)	\$188,000
• Clothier Road (<i>Morris Road to Ballytore Road</i>)	\$272,000
• Cloverhill Road (<i>Morris Road to Lancaster Avenue</i>)	\$749,000
• Remington Road (<i>Trent Road to Tomkenn Road</i>)	<u>\$927,000</u>
Total:	\$2,268,000

VI. Staff Recommendation:

Staff recommends that the Board of Commissioners authorize proceeding to final design and public bidding subject to Ward Commissioner and resident outreach for the Final Design of the East Spring Avenue, Llanfair Road, Clothier Road, Cloverhill Road, and Remington Road sidewalk segments. Staff also recommends the Board authorize initiating the design for the next grouping of high priority segments.

SIDEWALK INSTALLATION PROGRAM

Project Status Update

November 2025



General Project Schedule



- ▶ Preliminary Design review with the Township staff
- ▶ Preliminary Design review with the Committee/ Ward Commissioner
- ▶ Engage Property Owners to review options and/or stakeout sidewalk alignment
- ▶ Procure temporary/ permanent easements and/or right-of-way (if needed) to support chosen sidewalk option
- ▶ Finalize construction documents
- ▶ Bidding process to award & purchase order issuance

2025

List of High Priority Sidewalks

1 - East Spring Avenue

2 - Llanfair Road

3 - Clothier Road

4 - Cloverhill Road

5 - Remington Road



Township of Lower Merion SALDO – Sidewalk Standards



F. Sidewalks and Verges. Sidewalks, and other pedestrian amenities, shall be installed along all existing and proposed public and private streets, common driveways, and common parking areas according to the following standards;

- (1) Sidewalks shall be provided along all existing and proposed public and private streets according to the dimensions in Table 4.9.1 Road Design Standards, based on the functional classification of the road, or Table 4.9.3 Single-Access Street Design Standards. Any sidewalk not described in Table 4.9.1 or Table 4.9.3 shall be a minimum of five (5) feet wide.

TABLE 4.9.1 ROAD DESIGN STANDARDS

FUNCTIONAL CLASSIFICATION OF ROAD	MINIMUM RIGHT-OF-WAY WIDTH	MINIMUM CARTWAY WIDTH	VERGE	PEDESTRIAN AMENITIES ^{1,2}
PRIMARY ARTERIAL STREET	80 ft.	46 ft.	4 ft. min.	Sidewalk; 8 ft. min.
SECONDARY ARTERIAL STREET	60 ft.	38 ft.	5 ft. min.	Sidewalk; 5 ft. min.
TERTIARY ARTERIAL STREET	60 ft.	27 to 38 ft.	4 ft. min.	Sidewalk; 5 ft. min.
LOCAL (MINOR) STREET	50 ft.	27 to 30 ft.	3 ft. min.	Sidewalk; 5 ft. min.
LOCAL (MINOR) STREET IN OPEN SPACE OVERLAY DISTRICT	34 ft. (45 ft. required for public dedication)	20 ft.	3 ft. min.	Sidewalk; 5 ft. min.
ALLEY	33 ft. ³	16 ft. ³	N/A	N/A

1. Additional sidewalk width may be required in areas where higher volumes of pedestrian traffic are anticipated.
2. A sidewalk and/or verge of the minimum width specified shall be provided unless otherwise required by Chapter 155, Zoning.
3. Greater widths may be required if necessitated by the proposed use in the opinion of the Township Engineer.

- (4) In addition to the required sidewalk, a verge shall be provided along all existing and proposed public and private streets according to the dimensions in Table 4.9.1 Road Design Standards, based on the functional classification of the road, or Table 4.9.3 Single-Access Street Design Standards.
 - (a) The verge shall be provided between the curb line, or edge of the cartway, and the sidewalk.

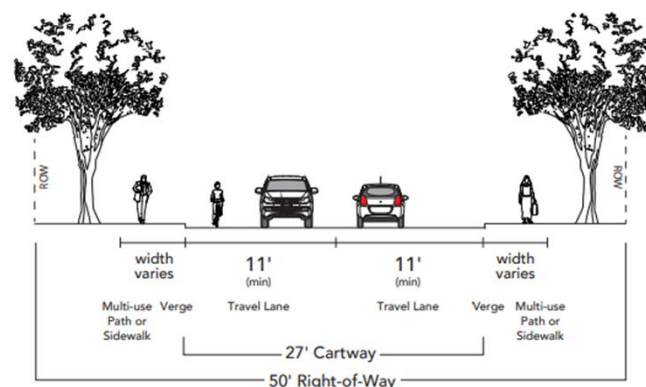
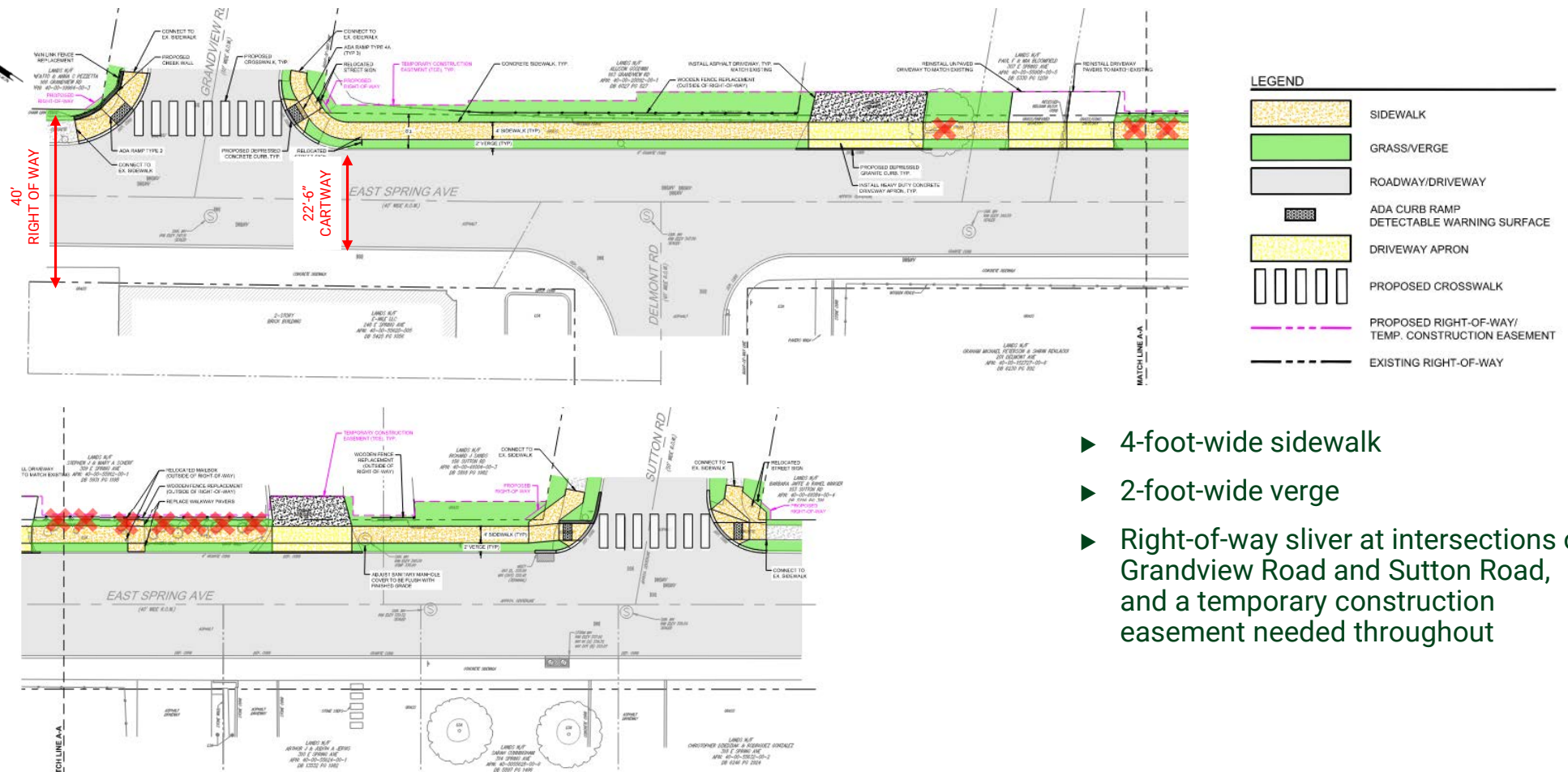


Figure 4.9.4 Section: Local (Minor) Streets

AD-HOC COMMITTEE RECOMMENDATION:

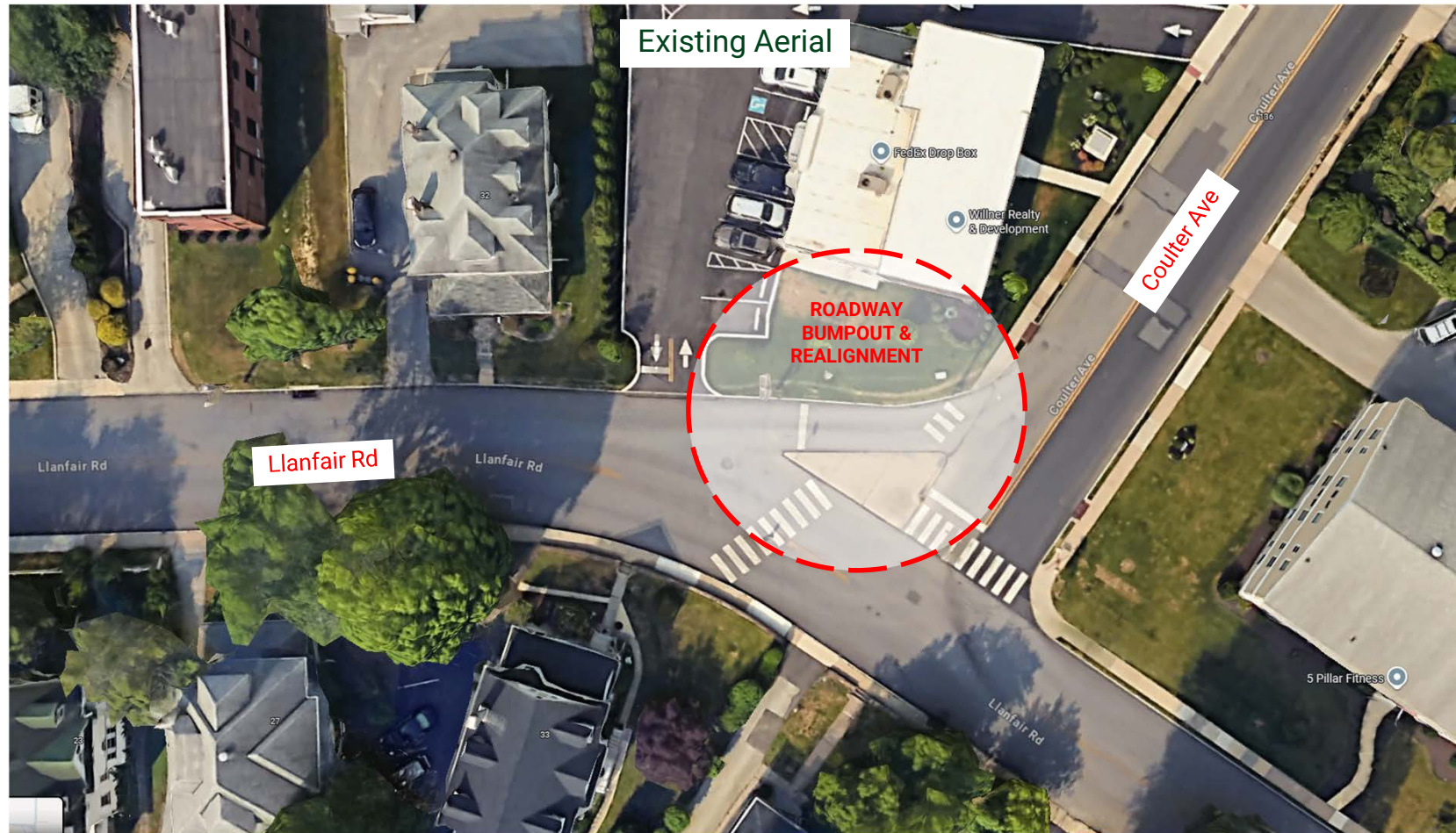
Accommodate the existing occupation within the right-of-way. Township standard may be adapted where it is more restrictive than the Public Right-of-Way Accessibility Guidelines (PROWAG). These guidelines are issued by the US Access Board and are to be applied to any new or altered portions of existing sidewalks within the public ROW. Sidewalks are required to have a minimum 4-foot width with a 5-foot by 5-foot section spaced at 200-foot maximum intervals and no verge requirement.

1 – East Spring Avenue (Grandview Road to Sutton Road)

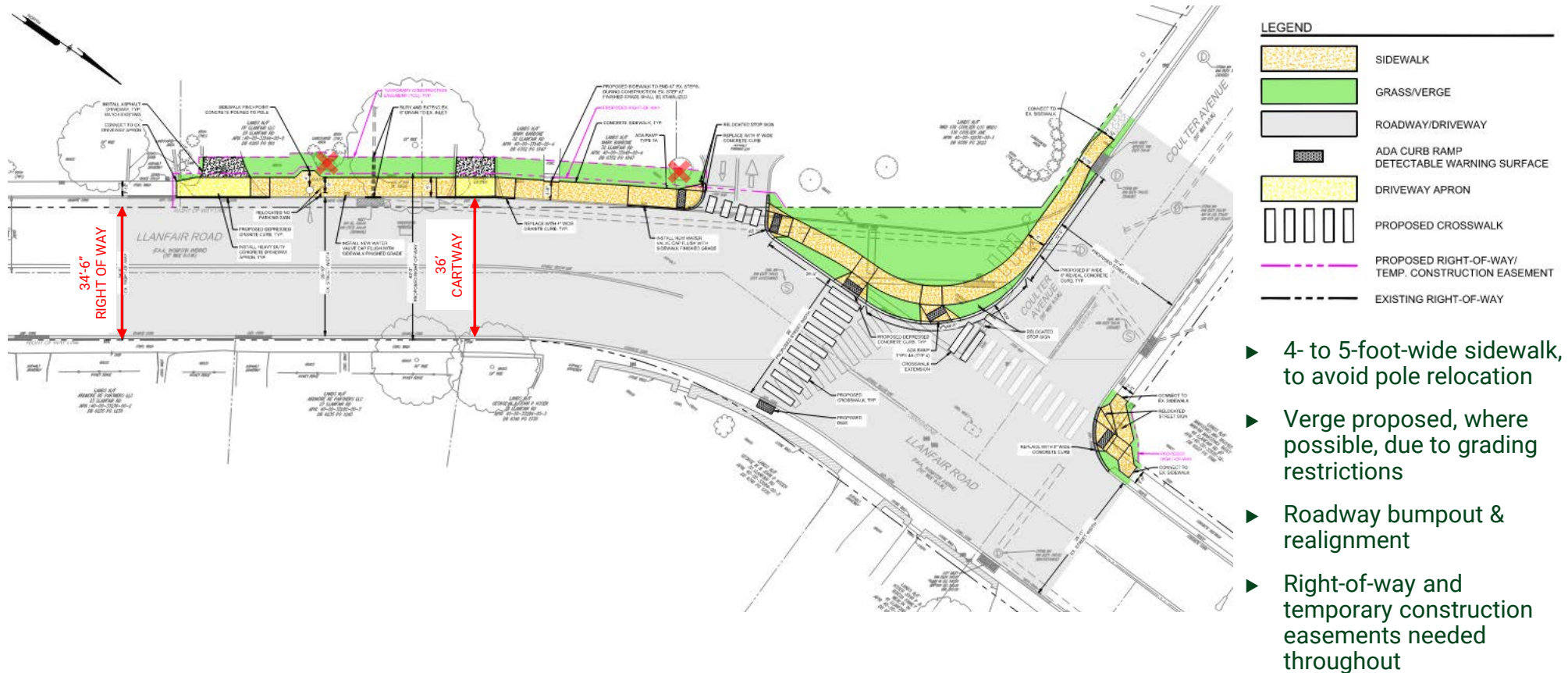


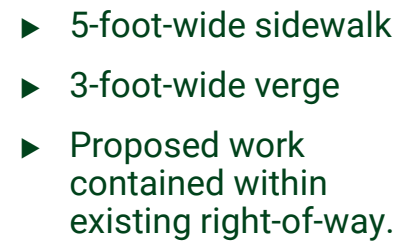
- ▶ 4-foot-wide sidewalk
- ▶ 2-foot-wide verge
- ▶ Right-of-way sliver at intersections of Grandview Road and Sutton Road, and a temporary construction easement needed throughout

2 – Llanfair Road (Existing Sidewalk to Coulter Avenue)

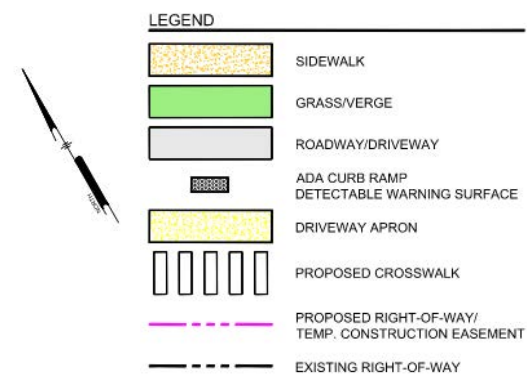


2 – Llanfair Road (Existing Sidewalk to Coulter Avenue)



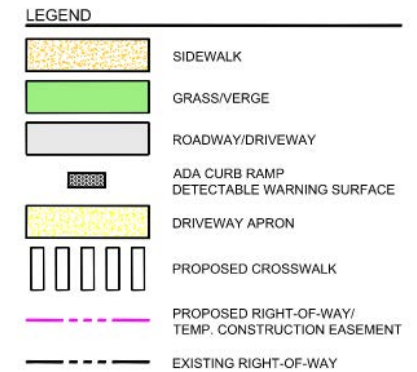
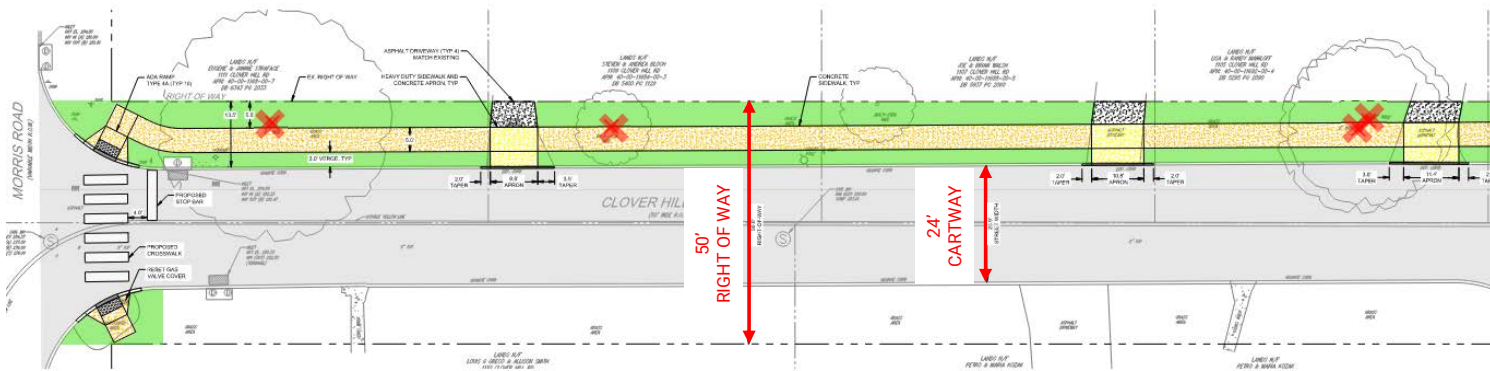


3 – Clothier Road (Morris Road to Ballytore Road)



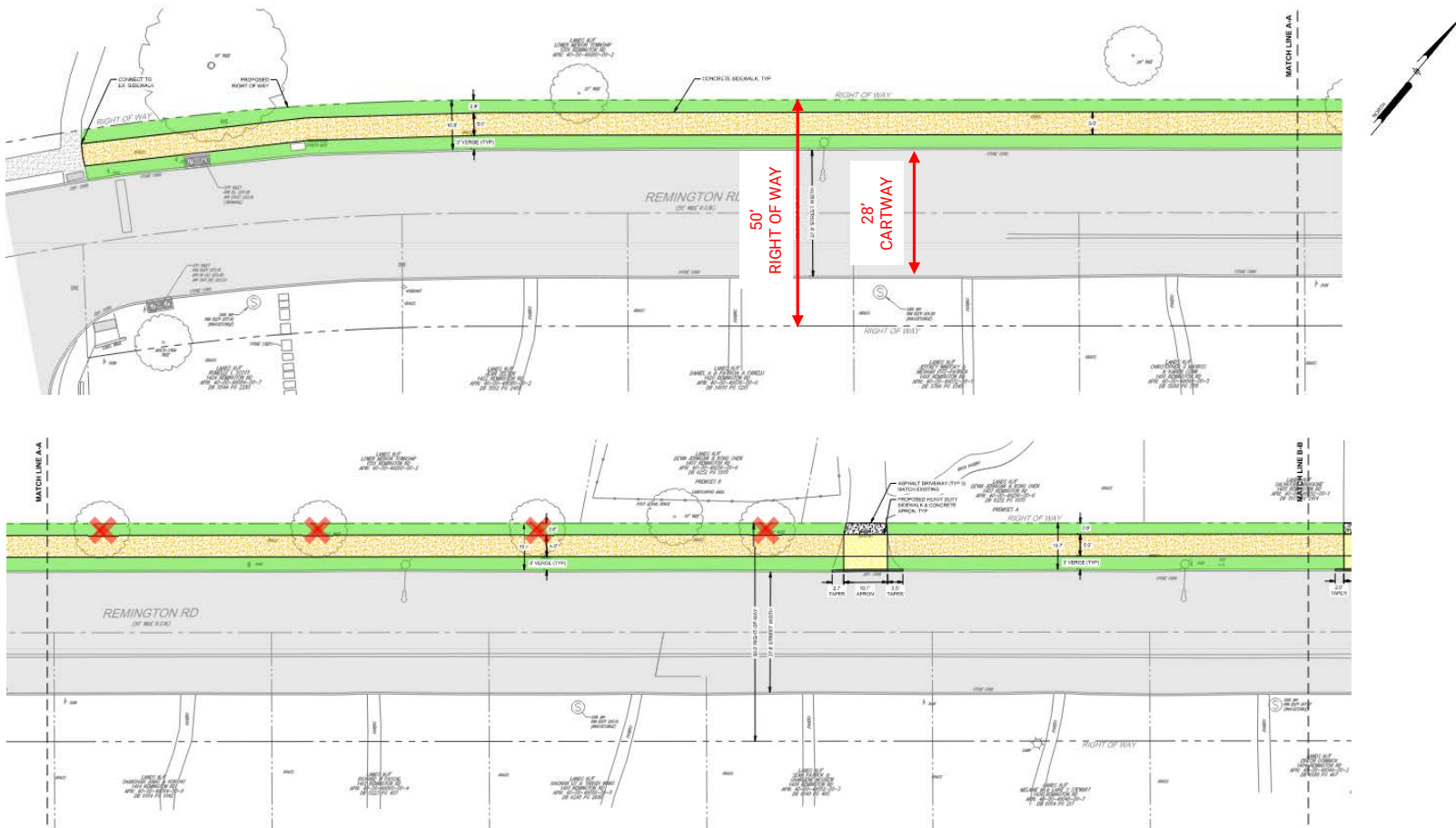
- ▶ 4- to 5-foot-wide sidewalk
- ▶ 3-foot-wide verge
- ▶ Right-of-way sliver at the intersection of Ashton Road and Clothier Road.

4 – Cloverhill Road (Lancaster Avenue to Morris Road)



- ▶ 5-foot-wide sidewalk
- ▶ 3.5-foot-wide verge
- ▶ Most of the work is contained within the right-of-way, except at the intersection of Cloverhill Road and Lancaster Avenue
- ▶ Road realignment along the southside of Cloverhill Road and Lancaster Avenue
- ▶ Pedestrian improvements at Lancaster Avenue intersection and Morris Road

5 – Remington Road (Trent Road to Haverford Road)



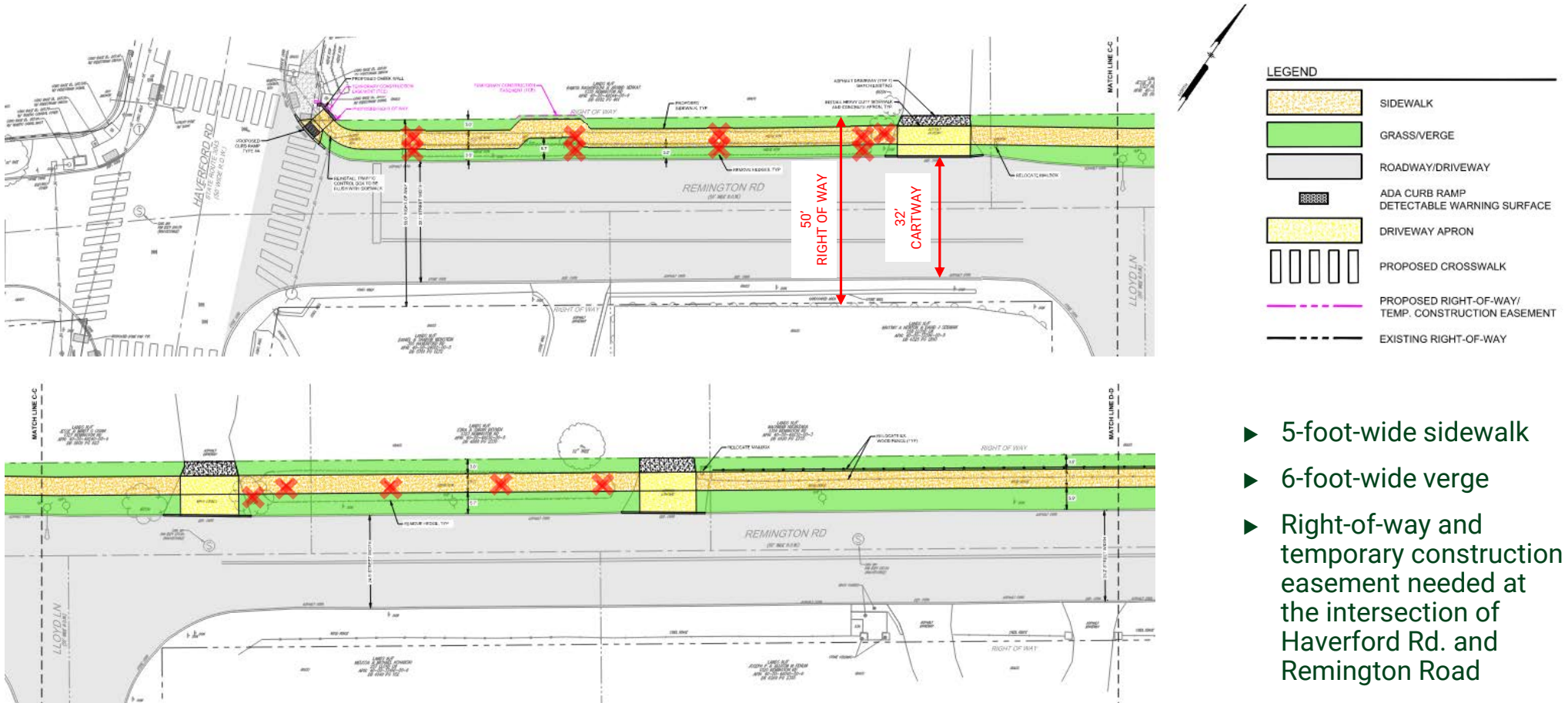
- 5-foot-wide sidewalk
- 3-foot-wide verge
- Proposed work contained within existing right-of-way

5 – Remington Road (Trent Road to Haverford Road)



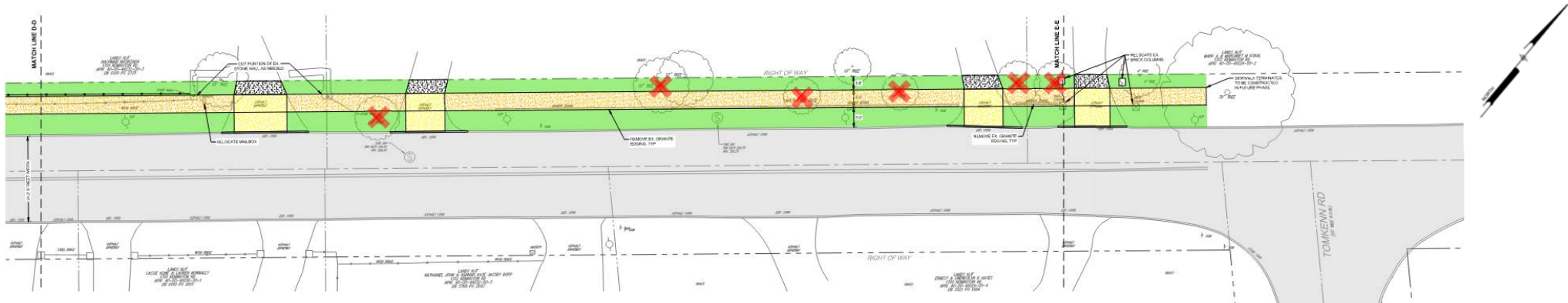
- ▶ 5-foot-wide sidewalk
- ▶ 3-foot-wide verge
- ▶ Right-of-way and temporary construction easements at the intersection of Haverford Avenue and Remington Road.

5 – Remington Road (Haverford Road to Tomkenn Road)



- 5-foot-wide sidewalk
- 6-foot-wide verge
- Right-of-way and temporary construction easement needed at the intersection of Haverford Rd. and Remington Road

5 – Remington Road (Haverford Road to Tomkenn Road)



LEGEND

	SIDEWALK
	GRASS/VERGE
	ROADWAY/DRIVEWAY
	ADA CURB RAMP DETECTABLE WARNING SURFACE
	DRIVEWAY APRON
	PROPOSED CROSSWALK
	PROPOSED RIGHT-OF-WAY/ TEMP. CONSTRUCTION EASEMENT
	EXISTING RIGHT-OF-WAY

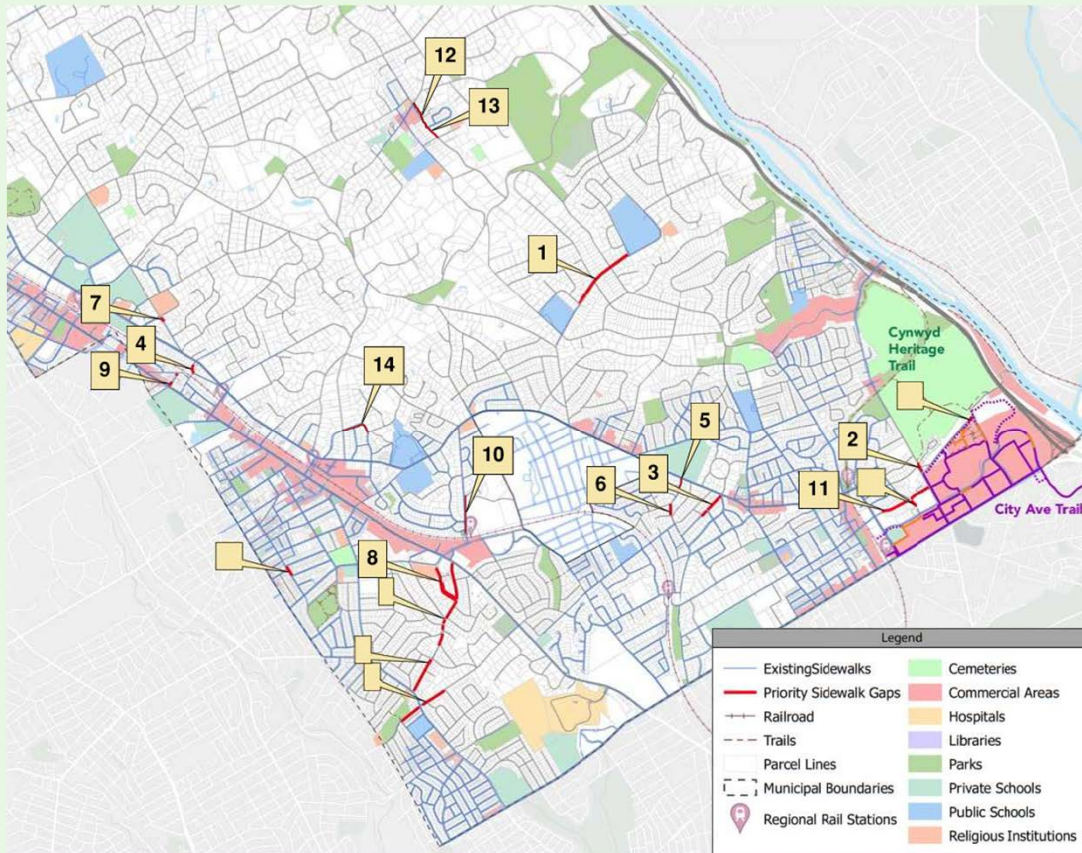
- 5-foot-wide sidewalk
- 5.5- to 6-foot-wide verge
- Proposed work contained within existing right-of-way

Updated Cost Estimate



- ▶ **East Spring Avenue** (*Grandview Road to Sutton Road*) ~ \$132,000
- ▶ **Llanfair Road** (*Existing Sidewalk to Coulter Avenue*) ~ \$188,000
- ▶ **Clothier Road** (*Morris Road to Ballytore Road*) ~ \$272,000
- ▶ **Cloverhill Road** (*Morris Road to Lancaster Avenue*) ~ \$749,000
- ▶ **Remington Road** (*Trent Road to Tomkenn Road*) ~ \$927,000

Remaining High Priority Sidewalks



1 - Hagys Ford Road (Penn Valley Elementary School to Welsh Valley Middle School)

2 - Belmont Avenue (Righters Ferry Road to West Laurel Hill Cemetery)

3 - Bowman Avenue (Linden Lane to Montgomery Avenue)

4 - Booth Lane (South side of Montgomery Avenue to Old Lancaster Road)

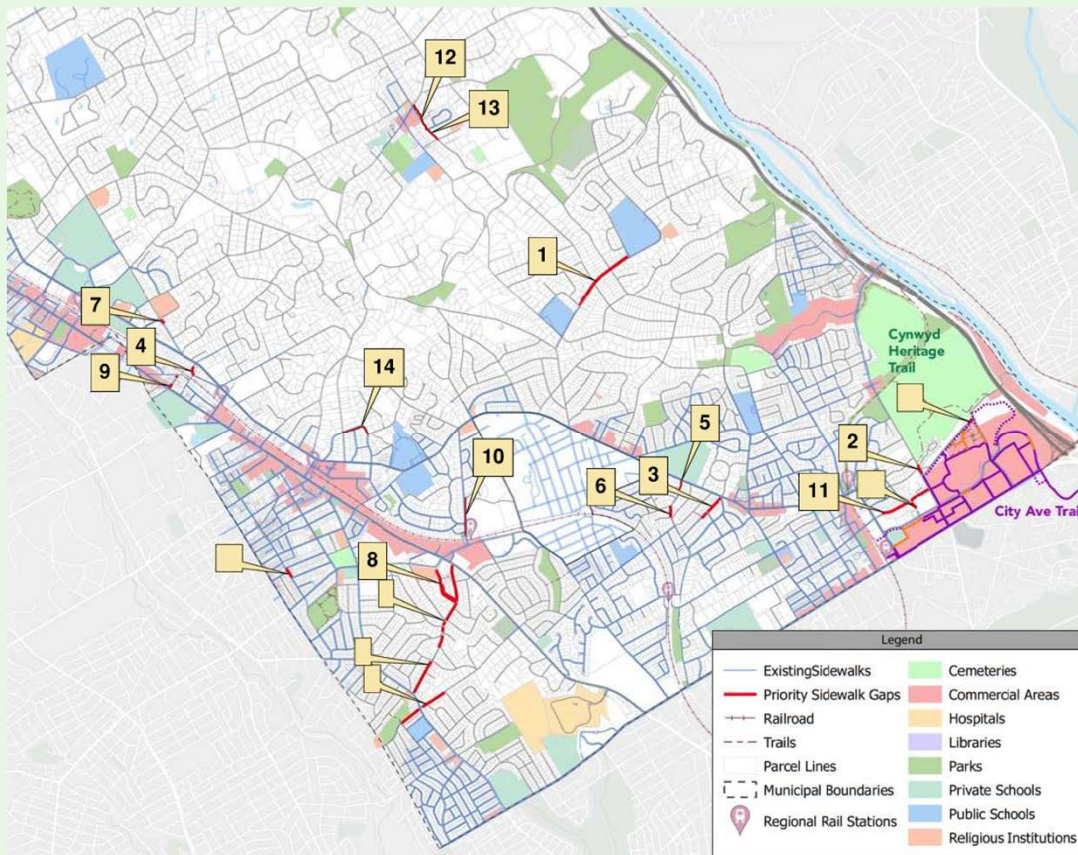
5 - Merion Road (Existing Sidewalk to Montgomery Avenue)

6 - Merion Road (Meadow Lane to Rockland Avenue)

7 - New Gulph Road (To Pennswood Road from Existing SW coming from Avon Road)



Remaining High Priority Sidewalks



8 – Clothier Road (Morris Road to Wynnnewood Road)

9 – N. Buck Lane (Lancaster Avenue to Old Lancaster Road)

10 – Penn Road (Train Station to Maybrook Sidewalk Slope Issue)

11 – Saint Asaph Road (Saint Asaphs Church to Bala Cynwyd Shopping Center)

12 – Conshohocken State Road (Maplecrest Circle to Youngs Ford Road – North Side of CSR)

13 – Conshohocken State Road (Vaughans Lane to Maplecrest Circle - North Side of CSR)

14 – Saint Georges Road (Glenn Road to Llanfair Road)



THANK YOU!

