
The Hudson County Urban Forestry Initiative: Initial Community Forestry Management Plan 2017-2021 was prepared by the Hudson County Division of Planning in accordance with the County Planning Act. Appendix 1 was prepared by CME Associates with assistance from the Hudson County Division of Planning. The plan was approved by the Hudson County Planning Board on 09/19/2017. The Plan was approved the State of New Jersey Department of Environmental Protection State Forestry Service on ______________.

The Hudson County Urban Forestry Initiative: Initial Community Forestry Management Plan 2017-2021 will be effective through December 31st, 2021 and Appendix 1 will remain effective until otherwise amended and beyond the life of this plan.

HUDSON COUNTY URBAN FORESTRY INITIATIVE: INITIAL COMMUNITY FORESTRY MANAGEMENT PLAN 2017-2021

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1880 County Wall Map. Spielmann & Brush, Sanitary & Topographic Map of Hudson County, NJ.

The original of this plan was signed and sealed in accordance with NJSA 40:27-2; NJSA 45-14A-12; and NJAC 13:41-1.2.

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  - Appendix 1A – Hudson County Tree Planting Requirements
  - Appendix 1B – Five (5) Year Maintenance Plan
- Appendix 2 – Tree Hazard Assessment Scale
- Appendix 3 – History of Revisions
The Hudson County Urban Forestry Initiative: Initial Community Forestry Management Plan 2017-2021 establishes a plan and guidelines for the proper maintenance and expansion of the County’s urban forestry program and resources. The benefits of establishing a community forestry management plan include bringing the County into compliance with the New Jersey Shade Tree and Community Forestry Assistance Act which provides liability protection from hazardous tree situations and affords the County grant opportunities to assist in the implementation of this plan.

Hudson County is one of the most densely populated and urbanized counties in the country. With a population of nearly 675,000 people in just 46 square miles, Hudson County is the sixth most densely populated in the County behind four of New York City’s five boroughs and San Francisco. In such a highly populated urban environment, it is important that the County take steps to improve the quality of life for its residents. Trees provide numerous benefits, whether they are street or shade trees as well as those within the County Park System. By promoting a healthy urban forest, the County is able to improve streetscapes, mitigate stormwater, and most importantly, address environmental health issues.

This plan follows the guidelines established by the New Jersey Department of Environmental Protection State Forestry Service Community Forestry Program (March 2017) as well as the recommended Community Forestry Management Plan outline. As such, this document includes an introduction establishing the programs mission statement, goals and objectives, as well as a liability statement. Additionally, an overview of Hudson County is presented along with the envisioned programs administration makeup, training plans, public education and outreach goals, a program budget, and a statement of plan implementation. It will be effective through December 31, 2021, and the County must maintain annual requirements in order to keep the plan in approved status by the New Jersey Department of Environmental Protection State Forestry Service.

This plan will also serve as the regulatory document to work in tandem with the Hudson County Land Development Regulations regarding shade trees. Planting and ‘payment in-lieu-of’ requirements for those developments requiring approval from the Hudson County Planning Board are presented within this document and represents the regulatory framework for shade tree related issues.
SECTION 2 - INTRODUCTION

Hudson County is the smallest, most urbanized and most densely populated county in the State of New Jersey. The County is home to more than 600,000 residents in just 46 square miles making it the sixth most densely populated county in the country. The Hudson County Division of Planning seeks to create a Community Forestry Management Plan that is focused on almost sixty miles of county roads, over 700 acres of county park land, and other county-owned property. Hudson County recognizes that a management plan is essential to a healthy urban forest, which will result in long-term health, environmental and economic benefits as well as reducing the County’s public liability.

During the 2007 State of the County Address, Hudson County Executive Thomas A. DeGise declared a goal of planting 1,000 trees along county roads and in parks and facilities during the next five years with 10,000 total trees over ten years. In order to achieve this objective, a well-organized and comprehensive plan is necessary which will serve as a guide to reaching this target. It is the goal of Hudson County to create a state-approved urban forestry management plan to ensure success of this program.

MISSION STATEMENT
To promote a progressive urban forest and shade tree plan that fosters the sustainable development and maintenance of Hudson County’s forest resources, which will benefit the environment, improve human health and psychological well-being, provide economic advantages, minimize County liability and enhance the overall quality of life for residents, workers, visitors, pedestrians and motorists alike.

SCOPE
This five-year management plan serves to identify the issues confronting street trees and urban woodlands located in county parks and properties, and to develop a plan for the County to better protect and enhance existing forest resources. In addition, this plan addresses the declining health of shade trees along county roads and makes recommendations for “best management” practices regarding the placement and continued maintenance of trees throughout the county. This management plan aims to promote a sustainable and productive urban forest and shade tree resource that will improve the quality of life for residents, while making Hudson County eligible for future grant opportunities to continue maintenance and development of the shade tree and forestry management plan. The five primary goals of this plan include: 1. Tree inventory and assessment; 2. Hazard tree identification and management; 3. Tree maintenance and care; 4. Tree planting; and 5. Public Education and Outreach.
GOALS AND OBJECTIVES

GOAL - TREE INVENTORY AND ASSESSMENT
To minimize the liability of the County and maximize the benefits of existing community forest resources by recognizing shade trees and green space’s as essential components of the County’s infrastructure that need to be proactively managed.

Objectives
- Develop an Urban Forestry Management Plan that is future oriented with specific milestones and measurements of success designed to adapt to changing conditions efficiently within existing budgetary constraints.
- Create a complete tree inventory with a focus on hazard tree identification and management.
- Create a maintenance schedule that is linked to the inventory to improve the efficiency of the County’s tree management efforts.
- Develop better methods and analytical models that will quantify the health and economic benefits generated by the County’s tree resources.
- To maximize public safety in relation to trees on County roads and properties by conducting bi-annual visual inspections to identify hazard trees.
- Identify and inventory tree planting locations, including empty tree pits, as a means of identifying gaps in tree coverage and better plan future plantings.

GOAL - HAZARD TREE IDENTIFICATION & MANAGEMENT
Identify hazard trees through a regular inspection schedule and become more proactive towards mitigating potential risks associated with hazard trees.

Objectives
- Minimize the risks trees pose to public safety and infrastructure through regularly scheduled, bi-annual visual inspections.
- Develop a tree hazard survey program that will aid in identifying hazardous trees on all County roads and properties.
- Establish an efficient procedure for tree maintenance requests.
- Coordinate with Hudson County Parks Forestry Unit to perform visual inspections on Hudson County forestry assets after major storms.

GOAL - TREE MAINTENANCE AND CARE
To create an environment where the County’s urban forest resources can thrive and to create a tree pruning and maintenance schedule beyond responding and mitigating risks on an emergency basis.
Objectives

• Develop a working database of all trees and planting spaces along county owned roads and on county properties.
• To analyze data collected to aid the prioritization of future plantings and forestry related projects.
• Improve program administration and better define roles and responsibilities.
• To create an inventory of equipment for tree planting and maintenance as well as identifying additional equipment required to make the program more efficient.

TREE SELECTION AND PLANTING
Plant 1,000 trees in the next five (5) years and 10,000 trees over ten (10) years. This includes plantings by the County along County roads or on County owned properties as well as plantings associated with development requiring approval by the Hudson County Planning Board. The County seeks to reach this goal utilizing widely accepted best management practices in accordance with this plan and the regulations set forth in the Land Development Regulations pertaining to shade trees.

Objectives

• Ensure trees are planted to minimize conflicts with overhead and underground utilities, structures, streetscaping and traffic.
• Increase the number of trees planted along County roads and on County properties.
• Increase tree species diversity while ensuring that tree plantings are site appropriate.
• Improve growing conditions, planting techniques, and tree protection/maintenance to minimize the long-term costs associated with hazard trees and liability.
• Engage local school and civic groups in planting events.
• Create a list of County recommended tree species based on location (on-site or street trees).

PUBLIC EDUCATION & OUTREACH
To promote public awareness and involvement in the “greening” of Hudson County by stimulating interest in general tree awareness and involving community members in collective efforts to maintain a healthy urban forest.

Objectives
• Submit articles on shade tree care to the Hudson County Improvement Authority (HCIA) to be included in their quarterly newsletter.
• Include program updates in the Hudson County Division of Planning’s annual review.
• Inform local newspapers and media outlets of major County events or activities, such as the HCIA’s annual Earth Day event, during which shade tree educational materials or other related activities are distributed.
• Offer free resident tree plantings to those who live along County roads in exchange for a commitment to tree care and preservation.
• Create an Urban Forestry Initiative section on the Hudson County Division of Planning’s website which will include interactive maps illustrating the County’s tree inventory, images and narratives covering the most prevalent tree species in the County, tree maintenance and care information, shade tree planting request forms, and County contact information.
• Promote the involvement of various local groups throughout the County, including but not limited to appropriate local government agencies and/or commissions, local environmental groups, and local schools.

LIABILITY STATEMENT

Although the County’s urban forest resources are an asset, it is inevitable that they will mature and require care, maintenance and eventually replacement. Care and maintenance, in addition to planting “the right tree in the right place” can help insure that county trees not only contribute to the environmental and economic vitality of the area, but also reduce the potential hazards to public safety. Hudson County must work within a reasonable budget that may not be able to meet each and every need of our community forest immediately. Therefore, it is the intent of this plan to focus available resources to the greatest need and step-by-step work towards a healthy forest with commensurate reduced risks to public safety.

By taking logical steps outlined in this Management Plan, Hudson County will garner public support for plan implementation and demonstrate the long-term benefits to the environment and public safety. Hudson County will also become more pro-active in the management and care of its trees. Through inventory and hazard assessment, the County will position the Division of Planning, the County Parks Department, and the Urban Forestry Division to take corrective action prior to structural tree failure and other hazardous tree related conditions. It is acknowledged that not all hazardous tree conditions will be predicted. By implementing good maintenance and care procedures the County can reduce the probability of such conditions, summarily reducing the risk associated with the County’s urban tree sources and potential risk to the public health and property, but unexpected events may still occur.
Following this Management Plan will demonstrate that Hudson County is devoting reasonable levels of resources in a planned manner to reduce the number of tree related accidents and thereby reduce its exposure to liabilities and increase public safety.

SECTION 3 - HUDSON COUNTY OVERVIEW

HUDSON COUNTY HISTORY, ENVIRONMENTAL SETTING, AND POLITICAL GEOGRAPHY

In 1840, Hudson County was created by a separation from Bergen County and annexation of some Essex County lands. During the 1800’s areas in Hudson County along the Hudson River were vacation spots for well-off New Yorkers. The beautiful riverfront communities led to pastures and green lands inland that were a peaceful refuge from the urbanity of Manhattan. Hudson County experienced a period of intense population and industrial growth during the latter part of the 19th and early part of the 20th centuries. The optimal location of Hudson County adjacent to the economic hub of New York City made the areas along the waterfront and undeveloped inland pastures prime real estate for a rapidly expanding industrial economy. Further fueling the demand of intense development in the county was the construction of Port Newark and Port Elizabeth in the 1950’s, located along the County’s western edge. This intense demand for both manufacturing space and residential units to house the influx of blue collar workers resulted in the clear cutting of forests for open pastures and intense development of waterfront locations as receiving docks for inland manufacturing operations. The pasture lands were quickly replaced with high density residential units and large industrial complexes to support the growing demand for textiles and goods consumed both locally and overseas via regional ports. As the County approached a state of “max build out”, pockets of open space were preserved as County and municipal parks.

Hudson County is the smallest, most densely populated county in the State of New Jersey. The County is comprised of twelve (12) municipalities; Bayonne, East Newark, Guttenberg, Harrison, Hoboken, Jersey City, Kearny, North Bergen, Secaucus, Union City, Weehawken, and West New York. A large portion of the County also falls under the jurisdiction of the New Jersey Sports & Exposition Authority (NJSEA), formerly the New Jersey Meadowlands Commission, which manages land use within the district and imposes additional environmental regulations associated with development. Historically, Hudson County has served as a “gateway community” for generations of immigrants who passed through Ellis Island in pursuit of the “American Dream” and as a major component of the New York City metropolitan region’s economic activity.

Recent County ordinances have been passed in an attempt to ‘green’ the county and to ensure that future development is constructed in a sustainable manner that will continue to enhance...
the existing urban fabric and urban forestry resources within the county. This includes the introduction of the Hudson County Open Space, Recreation & Historic Preservation Trust Fund (OSTF) in 2003. Moving forward, Hudson County is making sustainable development a priority and this Initial Community Forestry Management Plan is one of the components of that sustainability pledge.

Hudson County has a land area of approximately 46 square miles, 6.7 square miles of which is open space (excluding landfills). The County’s municipalities maintain approximately 1,131 acres of open space and the State of New Jersey owns and maintains 2,371 acres of open space (including marshes/wetlands). The largest park in the County is Liberty State Park, the State’s most visited state park, which hosts upwards of 5 million visitors per year.

The Hudson County Park System includes 10 parks totaling approximately 690 acres spread throughout the County. The parks offer a variety of passive and active recreational opportunities for County residents and visitors ranging from simple walking paths and nature walks to boat launches; recreational fields/courts of all types including cricket; fishing; as well as nature preserves. For more information on the County Park System, please refer to the 2013 Hudson County Open Space Reexamination Report.

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<tr>
<td>Stephen R. Gregg Park</td>
<td>Bayonne</td>
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<tr>
<td>West Hudson Park</td>
<td>Harrison/Kearny</td>
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<tr>
<td>Columbus Park</td>
<td>Hoboken</td>
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<td>14th St. Viaduct Park</td>
<td>Hoboken</td>
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<td>Washington Park</td>
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<td>North Bergen</td>
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<td>Laurel Hill Park</td>
<td>Secaucus</td>
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Table 1-Hudson County Park System

The Hudson County Open Space, Recreation & Historic Preservation Trust Fund (OSTF) is a program focused on preserving, improving, and creating new open spaces to benefit the County’s residents and visitors alike while also serving to decrease impervious coverage throughout the county and ‘green’ one of the State’s most urban environments. To date, the County has awarded nearly $50 million dollars in grant monies to 129 projects throughout the County, enabling municipalities and non-profits to create new open spaces as well as expand and improve upon existing resources.
Figure 1 - Hudson County Park System
Figure 2 - Hudson County Roads and Properties
RELATION TO OTHER COUNTY PLANS

All aspects of the Initial Community Forestry Management Plan (CFMP) are consistent and compatible with the goals and objectives of other County Plans, including the 2002 County Master Plan, the 2004 Hudson County Stormwater Management Plan, the 2005 Hudson County Open Space and Recreation Plan, the 2007 Hudson County Park Master Plan Update, the 2008 Reexamination of the Master Plan, the 2008 Land Development Regulations for Smart Growth and Sustainable Development, the 2013 Hudson County Open Space Reexamination Report, and the Hudson County Regional Comprehensive Economic Development Strategy 2010-2014. The CFMP has also been written to be compatible with the 2016 update to the County Master Plan, 2016 Parks Master Plan, and the 2016 Update to the County’s Land Development Regulations (LDR). The Initial Community Forestry Management Plan will serve as the guiding regulatory document as it pertains to the requirements associated with the management of the County’s tree resources; including planting, removal, and maintenance; or ‘payments in lieu of’ for all developments under the jurisdiction of the County.

This Plan links to the land use component of the 2002 County Master Plan and the 2008 Reexamination of the Master Plans’ general goals, specifically:

- “To improve the overall quality of life in Hudson County” 1
- “To maintain and Improve areas that provide centers for employment, education, entertainment facilities, services, shopping and other resources” 2
- “To preserve and protect the natural environment” 3
- “To reduce “greenhouse gas” emissions and mitigate the local effects of climate change” 4
- “Encourage municipalities to consider design standards for new construction that create a sense of unity and order in the design of buildings, streets, sidewalks, shade trees, signage and other structures” 5
- “Reduce the negative effects of stormwater run-off including non-point source pollution through BMPs (best management practices)” 6

This Plan links to the conservation component of the 2002 Hudson County Master Plan and the 2008 Reexamination of the Master Plans’ general goals, specifically:

2 ibid
4 ibid
5 ibid
6 ibid
• “To reduce the “urban heat island” effect through reduction of impervious coverage, utilization of green building technologies and installation of shade trees”\(^7\)

This Plan links to The 2007 Hudson County Parks Master Plan general goals and objectives, specifically:

• “To improve the overall quality of life in Hudson County”\(^8\)
• “To expand existing parks and encourage development of new parks where feasible”\(^9\)

This Plan links to The Hudson County Regional Comprehensive Economic Development Strategy 2010-2014 general goals and objectives, specifically:

• “Assist in the development of Quality of Life factors that make Hudson County a more attractive place for businesses and people to work and live.”\(^10\)
• “Reduce the “urban heat island effect” by reducing impervious coverage, increasing trees and park spaces and implementing sustainable building practices.” \(^11\)

This Plan links to The 2015 Hudson County All Hazard Mitigation Plan\(^{12}\) overall goals and objectives of mitigation planning, including:

• “Strengthen County and local planning, building codes, ordinances, and enforcement.”
• “Increase resilience of (or protect and maintain) infrastructure and critical facilities” and “Reduce the risk of utility failure.”
• “Identify and pursue funding opportunities to develop and implement local and county mitigation activities.”
• “Protect the environment.”
• “Educate the public on the risk from natural and man-made hazards and increase public awareness of personal hazard preparation, mitigation, response, and recovery activities.”

\(^7\) ibid
\(^8\) “The Hudson County Park Master Plan Update April 2007”. Prepared by T&M Associates, Middletown, NJ. P.2
\(^10\) “The Hudson County Regional CEDS 2010-2014”. Prepared by The Hudson County Division of Planning. Adopted February 2010. P.63
\(^12\) “2015 Hudson County All Hazard Mitigation Plan.” Prepared by Tetra Tech, Inc.
This Plan links to the 20013 Hudson County Open Space Reexamination Report general goals, specifically:

- “To recognize that improving the quality of life for Hudson County residents is a unique challenge due to its urbanized form and should be treated as a social justice issue.”\(^1\)
- “To encourage environmental resiliency by protecting and strengthening areas of critical open space resources, including wetlands, floodplains, steep slopes, wildlife habitat, open waters and waterfronts.”\(^2\)
- “To educate the citizenry about existing and future Open Space and recreation opportunities, and continue efforts to increase support for these activities.”\(^3\)

The Goals and Objectives associated with Urban Ecosystems, as outlined in the 2013 Hudson County Open Space Reexamination Report, establish a number of priorities specific to urban forestry and the development of the Initial Community Forestry Plan. \(^4\) Specifically, objectives 19 through 27 outline the following priorities:

- “Develop an initial Community Forestry Management Plan to implement at the county level.”
- “Encourage municipalities without forestry plans to consider developing them.”
- “Create a Shade Tree Commission for Hudson County.”
- “Develop a database to analyze tree data and determine proper maintenance procedures.”
- “Increase the number of trees planted throughout Hudson County.”
- “Improve soil conditions, maintenance techniques and protection of trees to minimize future maintenance costs.”
- “Engage the community in forestry initiatives by providing specific training and communicate clear tree request and maintenance processes.”
- “Identify and manage hazardous trees.”
- “Educate those involved in the forestry initiative to select trees that best handle Hudson County’s unique ecological conditions and provide adequate shade. Promote education and certification for urban arborists and master gardeners.”

In addition, this Community Forestry Management Plan will further reinforce the Design Standards detailed in “Hudson County’s Land Development Regulations for Smart Growth and

\(^1\) “Hudson County Open Reexamination Report 2013”. Prepared by the Hudson County Division of Planning.  P.3
\(^2\) “Hudson County Open Reexamination Report 2013”. Prepared by the Hudson County Division of Planning. P.6
\(^3\) “Hudson County Open Reexamination Report 2013”. Prepared by the Hudson County Division of Planning. P.8
\(^4\) “Hudson County Open Reexamination Report 2013”. Prepared by the Hudson County Division of Planning. P.6
Sustainable Development (The Land Development Plan)”, as well as the soon to be completed update to the Land Development Regulations, which was originally approved on October 23, 2008. The stated purpose of the design standards for traffic and roadway design in The Land Development Plan is to “create a functional and attractive development, to minimize adverse impacts affecting county roads and drainage facilities, to protect the County’s natural resources and to ensure development is sustainable and will be a long term asset to the community. 17 Specifically, Section VII- Design Standards: Traffic and Roadway Design, Section 15 “Street Trees” outlines the specifications for the “planting and maintenance of healthy trees and vegetation throughout Hudson County and along County rights-of-way [to] further the County’s conservation goals and commitment to sustainability.” 18

The Update to the County’s Land Development Regulations will further develop and reinforce the connection between development in Hudson County and the County’s goals to promote a healthy and sustainable urban environment.

The 2016 update to the County’s Land Development Regulations will reference this document, the Initial Community Forestry Management Plan, as the regulatory document guiding the requirements associated with the planting of shade trees for those developments falling under the jurisdiction of the County and requiring review and approval by the Hudson County Planning Board.

THE IMPORTANCE OF MAINTAINING A HEALTHY URBAN FOREST

The urban forest has multiple functions in an urban system including serving as infrastructure, as an acting force on economic development, as an integral part of urban design and development and as a critical component of fostering a healthy and livable environment for residents. Trees serve many useful functions in an urban environment by providing health, environmental, and economic benefits, while reducing the County’s liability and increasing the quality of life for residents.

Hudson County has seen a significant loss of open space while incurring a large increase of impervious coverage. Commercial and residential development is making Hudson County even more urbanized with an increase of nearly 2000 acres of ‘urban land’ since 1986 with 639 acres of that total occurring since 2007. Conversely, Hudson County has lost nearly 2000 acres of forested lands, wetlands, and barren land. Table 11 provides a more detailed breakdown of the changes in land use observed in Hudson County based on data provided by the NJ-DEP Bureau of Geographic Information Systems.
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<td>2313</td>
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Table 2 - Hudson County Land Use/Land Cover

Photo: Development has eliminated swaths of wetlands in the Hackensack River watershed.

The number of acres of parks and open space in Hudson County has significantly increased since the creation of the Green Acres program in 1962. Hudson County has a total of 4,008 acres of open space. Out of the 4,008 acres of Open Space, there are a total of 550 acres of County Parks, and 597 acres of Municipal Parks. The County, along with one municipality, has approved
an “Open Space Trust Fund” for the expansion of parks and open space, rehabilitation of existing parks and playgrounds and the preservation of historic sites.

The County is generally lacking in open space acres when compared to acreage recommendations based on the total population of the county\textsuperscript{19}, and neither the county nor its constituent municipalities meet state or national guidelines for parks and open space. According to the New Jersey Open Space and Outdoor Recreation Plan, 3\% of developable land in each municipality should be set aside for municipal open space, and 7\% of developable land in a county should be set aside for County Parkland.

The following chart illustrates the change in acres of open space and parks over time:

\textbf{Chart 2 - Hudson County Open Space (1964-2013)}


\textsuperscript{19} Hudson County Open Space and Recreation Plan 2005
<table>
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<tr>
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<tr>
<td>State</td>
<td>12</td>
<td>287</td>
<td>1076</td>
<td>1600</td>
<td>1688</td>
<td>1732</td>
<td>1746</td>
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<tr>
<td>County</td>
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<td>616</td>
<td>612</td>
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<td>45</td>
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<tr>
<td>Other</td>
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<td>284</td>
<td>15</td>
<td>138</td>
<td></td>
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<tr>
<td>TOTAL</td>
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<td>1380</td>
<td>2341</td>
<td>2755</td>
<td>2869</td>
<td>3056</td>
<td>3348</td>
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</table>

Table 3 - Hudson County Open Space in Acres (1964-2013)

There are initiatives in Hudson County that are aiming to increase open space. For example, the County recently provided grant money to both Weehawken and Union City to aid the purchase and development of the previously unused Hackensack Reservoir No. 2 to provide new passive recreational opportunities to the area. Other acquisitions partially funded by the Hudson County Open Space Trust Fund include the locations in Jersey City, Hoboken, Secaucus, and Weehawken. One of the most notable OSTF acquisitions is the future site of Hoboken’s Southwest Park which will provide much needed open space to a section of the city that is lacking in recreational access as well as to provide novel stormwater retention systems to help alleviate the city’s flooding issues.

Photo: The 13 acre former Reservoir No. 3 in Jersey City’s Heights neighborhood has been preserved for future park space.
HEALTH BENEFITS

It is a commonly held understanding that city life is stressful, and having access to green spaces has been shown to help to counteract stress and improve the health and psychological well-being of local residents. A study of relationships between green space and human health found that people living in a greener environment show more signs of healthy living\textsuperscript{20}. Recently a connection was made between the escalating obesity epidemic in the U.S. (especially child obesity) and the declining interest in outdoor recreation and the lack of access to open space\textsuperscript{21}. In 2007, Richard Louv testified before the U.S. House Interior Appropriations Subcommittee that public land managers and Congress must recognize the direct link between the two and address this problem as a public health issue\textsuperscript{22}. It has been proven that a “sedentary lifestyle increases the risk of overall early mortality (two-to three-fold), cardiovascular disease (three-to five-fold), and some types of cancer, including and breast cancer (Dannenberg 2005\textsuperscript{23}). In addition, obesity related health care costs exceed $100 billion per year, which is more than smoking related costs.”\textsuperscript{24} The number of acres of parks and open space in Hudson County has significantly increased since the creation of the Green Acres Program in 1962; however neither the County nor its constituent municipalities meet state or national guidelines for parks and open space. Therefore, it is imperative that the County protect and enhance existing open space, while also looking for opportunities to expand the open space inventory appropriately.

In addition, sun exposure is a contributor to skin cancer, and Melanoma (a serious form of skin cancer) is the sixth most common cancer in American men and the seventh most common in American women\textsuperscript{25}. The American Cancer Society notes that melanoma accounts for only about 4% of all skin cancer cases, but it causes 79% of all skin cancer related deaths.\textsuperscript{26} Trees provide


\textsuperscript{25} http://www.melanomacenter.org/basics/statistics.html

\textsuperscript{26} http://www.melanomacenter.org/basics/index.html
shade and protection from the sun’s harmful ultraviolet (UV) rays, and studies have shown that
trees can reduce exposure to UV rays by about half, making it take twice as long to burn in the
shade as in the sun. Shade trees are vital along County roads and throughout County owned
properties and parks to provide protection from the sun’s harmful UV rays.

Air pollution causes many health impairments which can lead to increased social costs in the
form of a greater burden on social services and medical care, increased work and school
absenteeism and a reduced lifespan. Urban trees lessen the impact of urban development by
reducing air pollution which helps to lower the occurrence of pollution related diseases and
impairments. Trees act like air filters and improve local air quality by helping to mitigate
pollutants like dust, pollen and smoke that are hazardous to human health. Trees filter these
pollutants by absorbing them through the pores in the leaf surface and filtering them through
leaves, stems and twigs, washing them to the ground by rainfall.

The American Lung Association issues an annual “State of the Air” report card that grades air
quality for communities across the country. The American Lung Association’s 2015 State of the
Air report gave Hudson County a grade of “D” for High Ozone Days and a “B” for 24-Hour
Particle Pollution levels. Although it is beneficial in the upper atmosphere because it protects
people from UV radiation, ozone is an extremely reactive gas molecule which is the primary
ingredient of smog air pollution and attacks lung tissue, making it very harmful to breath.
However, in comparison to the same study completed in 2009, the County’s air quality has seen
a steady improvement with the ozone rating increasing and 24-hour particle pollution improving
from a grade of “F”.

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Proceedings of the SPIE 4482, January 17.

28 NJDEP Division of Parks and Forestry.
http://www.njparksandforests.com/forest/community/Benefits_economic.html

Studies have confirmed that even short-term exposure to ozone can shorten lives, increase mortality rates and produce immediate reactions such as shortness of breath, chest pain, wheezing and coughing, asthma attacks and increased susceptibility to multiple infections and conditions. Long term exposure to ozone has been shown to affect the lungs’ ability to function properly and also have a negative effect on the functioning of the heart. Particle pollution is also harmful for residents because particle pollution is a mix of very small solid and liquid particles that are in the air and either become trapped in the lungs or pass through the lungs and enter the blood stream. Breathing particle pollution may trigger illness, hospitalization and premature death, increase the occurrence of heart attack, increase the severity of asthma attacks and cause inflammation of the lungs in young, healthy adults. Table 8 details the results of the American Lung Associations’ 2015 “State of the Air Report” for Hudson County.

Hudson County’s population was estimated at approximately 660,282 in 2015 which indicates that about 55% of the population is considered at risk to the various health issues associated with air pollution. This is a serious concern for the County as the health of its residents is a priority and planting more trees to help filter the air is an important step to help mitigate the harmful pollutants in the air.

### ENVIRONMENTAL BENEFITS

From an environmental standpoint, increasing the shade tree inventory and open space acreage in the County is beneficial on multiple levels. Trees and green space help to reduce the “urban heat island effect”, help mitigate both water and air pollution and reduce the impact of carbon emissions.

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Because Hudson County is highly urbanized, the concentration of buildings and paved surfaces retain more heat than more suburban and rural areas. The asphalt, brick and concrete in the County lead to higher nighttime temperatures than that of surrounding suburban areas through a phenomenon known as a "heat island effect". Heat islands can affect communities by increasing summertime peak energy demand, air conditioning costs, air pollution and greenhouse gas emissions, heat-related illness and mortality, and water quality. During the summer, dark colored rooftops, pavements, and surfaces absorb and radiate heat from the sun. In addition, there is a lower amount of water present in urban areas because streams and tributaries are mostly covered with pavement and buildings. This means that there is less evaporation occurring, which is key to the naturally occurring cooling process. The two aforementioned occurrences in densely populated urban areas contribute to the heat island effect. The following graph illustrates how the temperatures can vary depending on the density and build-up of an area.

Because projections indicate that the average temperatures for Hudson County are going to increase, it is important for communities to take actions now that will help to off-set the effects of the increase in temperature and higher impact of heat islands. Trees and other green spaces have been shown to lower air temperature by as much as 10 degrees Fahrenheit, which decreases the demand for resources needed to heat and cool buildings. In addition,

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34 The Office of the New Jersey State Climatologist. http://climate.rutgers.edu/stateclim/?section=uscp&target=NJCoverview
temperatures have been recorded at 5-15 degrees lower when walking under a tree canopied street\textsuperscript{38}.

Based on the NJDEP’s GIS analysis of 2012 land use/land cover for Watershed Management Areas 4, 5, & 7\textsuperscript{39}, the total impervious surface in Hudson County accounted for approximately 56.5\% of the total land area, which represents an increase of about .7\% over a 7 year period and an increase of 5\% since 2000/01. It is important to note that most recently, development in Hudson County was mostly redevelopment, as Hudson County has been built-out for quite some time. A major exception is the Meadowlands, now under the jurisdiction of the NJSEA and Liberty State Park. Both of these areas are, for the most part, protected from major development however it is expected that the development regulations currently governing the Meadowlands District will change. Several municipalities within the district have also decided to assume land use and zoning jurisdiction from the NJSEA. Since the County maintains several roads within the District, it is important that the County continues to enforce shade tree requirements and expand as new development proposals are presented for approval.

The most recent National Water Quality Inventory reports that stormwater runoff from urbanized areas is the leading source of water quality impairments to surveyed estuaries and the third largest source of impairments to surveyed lakes\textsuperscript{40}. When storm events occur, stormwater runs over impervious surfaces like roads and parking lots and collects pollutants from these surfaces which can include oils, antifreeze, grease, pesticides, chemicals, bacteria, road salts, heavy metals, pet waste and many other toxic pollutants. The rainwater flows through the sewer system and is deposited into streams, rivers and bays which kills native vegetation, harms the local wildlife and fish populations and makes recreational areas unsafe and unpleasant\textsuperscript{41}.

By comparison, if trees didn’t exist in the Delaware Valley, local governments would have to spend $105 million to build the necessary stormwater infrastructure to do the job that trees do in controlling almost 53 million cubic feet of runoff\textsuperscript{42}. Trees help to clean water systems by filtering surficial runoff through their roots before they are introduced to the water supply. Studies have shown that urban trees reduce stormwater runoff by 2 to 7 percent, with the

\textsuperscript{39} Watershed Management Areas (WMA) 4, 5 and 7 were analyzed to get this figure. WMA’s for Hudson County include portions of Bergen County, and where this was the case the polygons where greater than 50\% was in Bergen County was removed. This number excludes undevelopable land such as wetlands and open water (Hudson, Hackensack, Passaic Rivers).
crown of a mature tree able to store 50 to 100 gallons of water during storms which reduces runoff volume during peak flows\(^{43}\). Trees are especially helpful in reducing non-point water pollution and stormwater runoff which is of particular importance to Hudson County because of the abundance of impermeable ground cover. It is estimated that 100 mature trees can intercept 100,000 gallons of rainfall per year\(^{44}\), which would significantly benefit Hudson County's aging infrastructure and reduce the number of Combined Sewer Overflow (CSO) events.

**GREEN HOUSE GAS MITIGATION**

Planting additional trees throughout Hudson County is a significant step towards mitigating air pollution as well as reducing the County's carbon footprint. As previously discussed, air pollution can create hazardous conditions for residents, and a dense urban area like Hudson County is especially vulnerable to deteriorating air quality. A parked car emits hydrocarbons which account for about 20% of the total inventory of emissions in urban smog. A shaded parking area reduces these emissions by lowering air temperatures 1-3 degrees Fahrenheit, gasoline temperatures four to eight degrees and temperatures inside the car by as much as 40 degrees\(^{45}\). Annually, one acre of trees absorbs enough CO\(_2\) to offset a car driven 26,000 miles and produces enough oxygen for 18 people\(^{46}\). A recent study showed that Los Angeles's "Million Tree" program will reduce atmospheric carbon dioxide by about one million tons over 35 years, which is the equivalent of taking 7,000 cars off the road each year\(^{47}\).

In Hudson County, the Green House Gas (GHG) mitigation potential of the County Executive's goal of planting 10,000 trees by 2020 is significant. According to the Center for Urban Forest Research (CUFR) Tree Carbon Calculator, the total amount of carbon dioxide sequestered through 2020 as a result of the tree plantings is 1,010 metric tons of carbon dioxide. This translates into the equivalent of NOT combusting almost 100,000 gallons of gas in a car\(^ {48}\).

**ECONOMIC BENEFITS**

Urban trees are continuously impacting their surrounding environment, and although the monetary value of each tree is relatively small, the annual benefits of mature trees are usually


\(^{44}\) NJDEP Division of Parks and Forestry. [http://www.njparksandforests.com/forest/community/Benefits_economic.html](http://www.njparksandforests.com/forest/community/Benefits_economic.html)


\(^{46}\) NJDEP Division of Parks and Forestry [http://www.njparksandforests.com/forest/community/Benefits_Environment.html](http://www.njparksandforests.com/forest/community/Benefits_Environment.html)


\(^{48}\) Data provided from North Jersey Transportation Planning Authority research conducted by Jeffrey Perlman. October 2010.
two to four times greater than their costs. For a planting cost of $250-600 (includes first 3 years of maintenance) a single street tree returns over $90,000 of direct benefits (not including aesthetic, social and natural) during the lifetime of the tree. In New York, it is estimated that trees save the city $10 million a year in air pollution services, in Chicago the figure is about $9 million a year and in Atlanta existing tree cover saves the metro area $133 million annually in pollution and stormwater services. Urban forests add value to local communities by increasing the local land value which increases local tax base, lowering annual heating and cooling costs, increasing public safety and quality of life.

Economically, there has been a significant contrast between properties with trees and those without. For example, “a property for sale with five large trees in the front yard yields a 4% higher price than a property with small trees or no trees, while apartments and offices with a green view rent quickly and yield a higher rent.” Furthermore, a recent U.S. Tax Court case determined a value of 9% ($15,000) for the loss of a large black oak on a property valued at $164,500, and studies indicate that that people react more favorably to tree lined parking lots and consumers will pay 12% more in this atmosphere and linger longer.

It has also been proven that trees can lower annual heating and cooling costs in buildings. Trees act as windbreaks and reduce wind speed and air infiltration by up to 50%, which can reduce heat loss for potential annual heating savings of 10-12%. In addition, a recent study concluded that shade and lower air temperatures from three 25-foot-tall trees could reduce cooling costs by 34%, and that a strategically planted tree can save 100 kilowatt hours annually in electricity use. Overall, projections indicate that the population will continue to grow in Hudson County, and shade trees can be a significant contribution towards more energy efficient practices to mitigate the increasing demands of this growth.

Trees also provide many safety benefits for motorists, pedestrians and bicyclists. Trees create safer walking and bicycling environments by forming and framing the edges of roads, bike lanes and pedestrian areas, while also providing a buffer zone between the motorist and pedestrian/bicycle areas. A recent street safety comparison shows a reduction of run-off-the-road crashes and overall crash severity when street tree sections are compared to equivalent

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treeless streets. In addition, studies have shown that motorists drive 3 mph to 15 mph slower when driving down a tree lined street as opposed to those without. Because Hudson County is poised to see an increase in population that will be looking for alternative methods of transportation, it is important to begin planning to meet the demands of a non “car-centric” population that will benefit from the safety enhancements of trees along county roads.

The impact that a healthy urban forest has on resident’s quality of life is especially significant when taking into consideration recent evidence that shows a significant shift in population housing patterns. A report by a private real estate consulting firm, the Otteau Valuation Group, indicates that the retiring Baby Boomer population is more likely to relocate to communities with access to mass transit and entertainment. In addition, figures also indicate that “Generation Y”, some 75 million people in the US between the ages of 15 and 32, are more likely to be childless and looking for transit and denser urban centers than previous generations. Hudson County is poised to benefit from this shift, as it offers dense housing options, access to transportation and proximity to major employment markets. In order to make living in Hudson County more attractive to this shifting housing market, it is important to foster a “green” approach to future development and revitalization of existing County infrastructure and properties.

Aesthetically, tree lined boulevards and canopied pockets of green space add to the character and desirability of a neighborhood, fostering a sense of place for residents and increasing overall well-being. Trees help to soften and screen necessary street features such as utility poles, light poles and other essential infrastructure. In addition, people are impacted by unsightly or ugly environments where they spend their time, and the presence of trees has been noted to help reduce blood pressure and improve overall emotional and psychological health.


58 Otteau Valuation Group, Inc. 2009, Downtown New Jersey Conference presentation.

SECTION 4 - PROGRAM ADMINISTRATION

Staff at the Hudson County Division of Planning will draft the plan and provide overall project management, primarily through the Shade Tree Coordinator, along with the following county agencies: Division of Parks, Division of Engineering, the Division of Buildings and Grounds and the Division of Roads and Bridges. The organization of the County departments involved is as follows:

![Figure 4 – Hudson County Organization Chart](image)

1) **Board of Chosen Freeholders**
   
   a) The Board serves as the Legislative Branch of County Government, offering advice and consent to the actions of the County Executive and administrative staff.
   
   b) The Board approves all contracts signed by the County Administrator, sets policy under the Administrative Code, and votes on the county budget.

2) **County Administrator**
   
   a) Serves as the chief administrative official of the County.
b) Responsible for managing the daily operation of the County government and implementing the policies and directions of the Board of Chosen Freeholders.

3) **Hudson County Planning Board**

   a) The County Planning Board reviews site plans and subdivisions for projects that are located along county roads or affect county drainage.
   b) Responsible for administering and implementing elements of the County Master Plan and Land Development Regulations as they relate to development in the county.

4) **Hudson County Open Space Advisory Board**

   a) Review, prioritize and recommend projects for open space, recreation and historic preservation funding that meet the goals and objectives outlined in the Hudson County Open Space & Recreation Plan.

5) **Department of Roads & Public Properties**

   a) **Division of Roads and Bridges**

   i) Responsible for the maintenance, repair, construction, and reconstruction of approximately 65 miles of county roads and is charged with keeping these roadways free from obstructions and hazards, and snow and ice. The unit also services over 28 trucks.
   ii) Report tree hazards to appropriate department supervisor and/or the County Shade Tree Coordinator.
   iii) Supervises and inspects private contractors on County rights-of-ways.

6) **Office of the County Engineer**

   a) The Office of the County Engineer is responsible for providing technical reviews and services affecting 65 miles of County roads, 178 signalized intersections, 690 acres of County Parks, 25 bridges and viaducts, and all County owned buildings and grounds.
   b) Issues road opening permits which are required for the planting, removal, and maintenance of trees along County roads.

7) **Department of Parks & Community Services**

   a) **Division of Community Development**

   i) Responsible for administering Hudson County’s annual appropriation of Community Development Block Grant (CDBG), HOME Investment Partnerships Act (HOME) and Emergency Shelter Grant funds (ESG) from the United States Department of Housing and Urban Development (HUD).
b) Division of Parks

i) Operates and maintains 701.78 acres of county parkland.

ii) Develops and acquires public parks, playgrounds and recreation places within Hudson County.

iii) Constructs, maintains and improves sidewalks, roadways, bike paths, footpaths, bridle paths, and nature walks.

iv) Constructs, reconstructs, and maintains park buildings, structures, and grounds.

v) Cares for and cultivates plantings, trees, shrubs, and flowers.

vi) Contains a Forestry Division that is responsible for trees in all County parks and also operates a greenhouse.

vii) Responsible for tree removal, tree maintenance and pruning in County rights-of-way and other County facilities.

c) Division of Planning

i) Oversees the planting of street trees along County roads in accordance with the Hudson County Land Development Regulations.

ii) Reviews requests for tree plantings, removal or maintenance and makes the necessary inspections.

iii) Houses the Hudson County Shade Tree Coordinator whose responsibilities include:

   (1) Supervision of Forestry Division / tree crews.

   (2) Attends trainings on forestry management.

   (3) Coordinates training for forestry unit staff.

   (4) Coordinates tree removal/maintenance requests.

   (5) Performs hazard tree assessments.

   (6) Coordinates new shade tree plantings and reviews site plans that are to be approved by the Hudson County Planning Board to ensure that all shade tree requirements or payments in-lieu-of are met.

   (7) Prepares and sends quarterly updates / press releases.

   (8) Prepares annual report.

   (9) Responsible for implementing the Community Forestry Management Plan.

In addition, the project team will seek the advice and support from the representatives from each municipality, NJ Meadowlands Commission, NJ Division of Parks and Forestry, public utilities, neighborhood association groups, and other interested parties. It is the goal of the county to seek comments from all of the stakeholders including members of the general public. Public participation will be a vital component to the plan; therefore, the project team will hold open public forums for which stakeholders can provide additional feedback.
TREE SERVICE REQUEST PROCESS

Requests for pruning, removal or inspection of trees owned and maintained by Hudson County can be made by any department, municipality or individual residing in Hudson County. For more detail and guidance on processing tree service requests, please refer to Page 58.
SECTION 5 – COMMUNITY MAP

Hudson County Community Maps can be found in Section 3, *Hudson County Overview*, on pages seven (7) and eight (8).
SECTION 6 - TRAINING PLAN

GOALS:
1. Provide sufficient training to all individuals within the Community Forestry Program.
2. Send two members to CORE and Continuing Education Unit Training to satisfy the Act’s annual continuing education requirements.
3. Ensure that tree maintenance and inspections follow accepted, current standard procedures.
4. Provide continued technical training for hazard tree identification, pruning, tree care disaster planting, tree selection and equipment safety.

TRAINING PROVISIONS:
1. Training and professional development in urban forestry is available to all employees serving Hudson County’s Community Forestry Program.
2. The cost of training is funded by the operating budget of the attendee’s respective department.

CURRENT EXPERTISE:
1. Hazardous Tree Identification
2. Roadside Vegetation Management
3. Division of Parks – Forestry Unit employees have been trained in the following:
   a. Tree maintenance equipment operation
   b. Chainsaw safety
   c. Tree Pruning
   d. CPR & first-aid
   e. EHAP – Electrical Hazards Awareness Program
   f. DOT Flagger and Work Zone Safety Training
   g. Fire extinguisher training
   h. Power and hand-tool safety
TRAINING NEEDS:

1. Advanced level tree hazard identification.
2. Intermediate level tree hazard identification.
4. CORE Training for an interested member of the public or county employee.
5. Tree planting and installation
6. Forklift operation
7. Pruning techniques
8. Heavy Equipment / Proximity training
9. Aerial tree climbing
10. Cabling and Bracing
SECTION 7 - PUBLIC EDUCATION, AWARENESS, & OUTREACH

GOAL:
Hudson County aims to promote environmental stewardship and tree preservation amongst its highly urbanized landscape. Public outreach is critical for the success of the overall initiative. Therefore, various strategies have been outlined to engage the community. Through media, County events, and coordinated local efforts, Hudson County aims to educate its residents on the value of the County’s urban tree resources, proper tree care, and promote civic involvement to enhance the outcome of the Initial Community Forestry Management Plan.

OBJECTIVES:

Publications (On-going)
- Submit articles on shade tree care to Hudson County Improvement Authority (HCIA) quarterly newsletter;
- Include an article about the County’s effort on urban forestry and tree preservation in the Hudson County Division of Planning annual newsletter;
- Inform local newspapers of any major County events or activities, such as for Arbor Day, through the Hudson County Communications and Policy.

Budget: FREE

Offer Resident Tree Plantings (2017-2021)
The County plans to offer free tree plantings to residents who own homes along county roads in exchange for a commitment to tree care and preservation.
- Coordinate effort of necessary agencies throughout the County;
- Implement plantings.
  - Confirm commitment with residents by contracts;
  - Tree planting;
  - Provide informational materials;
    - Description of the tree species, specific tree care instructions, and County contact information
- Facilitate a continued outreach effort;
  - The Shade Tree Website (as explained in the following section) will include a link to a request form for a tree planting.
- Provide past tree recipients with annually updated tree care information.

Budget: $10,000 from Open Space Trust Fund
$87,500 from annual operations budget ($17,500/year for purchasing trees)
This total does not include salaries.
Shade Tree Website (2017-2018)
The Hudson County Division of Planning plans to create and set-up a Shade Tree Website from their own division launch site. The website will include:
- Maps of tree locations on County roads;
- Images and explanations of tree species within the County;
- Detailed instructions on tree maintenance;
- Form to request a tree planting, maintenance, or removal on a County road;
- Form to report issues with trees on a County road;
- County contact information.
Budget: FREE

Arbor Day / Earth Day (Annually)
Facilitate tree plantings throughout Hudson County’s municipalities. Participate in the Hudson County Improvement Authority’s annual Earth Day event held in Liberty State Park.
- 2016: One tree in each of the 12 municipalities;
- 2017-2021: Increase the number of tree plantings in each municipality;
- Promote environmental awareness and sustainability practices;
- Educate the public on the importance of trees in urban environments;
- Educate the public on proper tree care and maintenance practices;
- Distribute trees to County residents for private plantings;
- Increase the exposure of the County’s urban forestry efforts.

Coordinate a Local Effort (On-going)
Promote the involvement of various local groups throughout the County, including:
- Appropriate agencies from Hudson County’s municipalities
- Community groups
- Local environmental organizations
  Recruit volunteers from:
  - High school clubs (specifically those dedicated to environmental causes) and Youth Groups (i.e. Boys & Girls Club; Boy Scouts & Girl Scouts

Tree Recycling
The Hudson County Division of Parks reuses wood chips and mulch as needed throughout. In addition, they make firewood and mulch available for free to the public. Also, Hudson County coordinates a Christmas tree recycling program each season.
SECTION 8 - BUDGET & RESOURCES

OVERVIEW:

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit Cost</th>
<th>Units</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>County Forester / Shade Tree Coordinator Salary</td>
<td>$15,000.00</td>
<td>1</td>
<td>$15,000.00</td>
</tr>
<tr>
<td>Tree crews</td>
<td>Variable</td>
<td>9</td>
<td>$348,064.48</td>
</tr>
<tr>
<td>Equipment (boom truck, crane, chipper with accessory vehicle to catch debris, 2 chainsaws)</td>
<td>$320,000.00</td>
<td>1</td>
<td>$320,000.00</td>
</tr>
<tr>
<td>Maintenance and supplies</td>
<td>$2,000.00</td>
<td>1</td>
<td>$2,000.00</td>
</tr>
<tr>
<td>Training, conferences</td>
<td>$265.00</td>
<td>3</td>
<td>$795.00</td>
</tr>
<tr>
<td>Advertisement for public meetings</td>
<td>Variable</td>
<td>Unknown</td>
<td>-</td>
</tr>
<tr>
<td>Cost per tree (wholesale)</td>
<td>$175.00</td>
<td>100</td>
<td>$17,500.00</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>$703,359.48</td>
</tr>
</tbody>
</table>

Table 5 - Hudson County Forestry Budget

EMPLOYEE SALARIES

These are the official proposed County budget numbers for 2016 and 2017. Since the Division of Planning will be listed as the lead agency, the estimated salary portion was 100% for the Shade Tree Coordinator and 2.5% for all other Planning staff based on the number of staff and on their corresponding hours dedicated to the Urban Forestry Initiative. The Division of Parks will also contribute staff and hours to the Urban Forestry Plan and the estimated salary portion was 5%.

<table>
<thead>
<tr>
<th>Employee Salaries and Wages</th>
<th>2016</th>
<th>2017</th>
<th>Percentage</th>
<th>2016 Tree Salary Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Division of Parks</td>
<td>$348,064.48</td>
<td>$420,714.09</td>
<td>100%</td>
<td>$348,064.48</td>
</tr>
<tr>
<td>Division of Planning</td>
<td>$140,000.00</td>
<td>$145,000.00</td>
<td>100%/2.5%</td>
<td>$13,625.00</td>
</tr>
<tr>
<td>Total Tree Salary Estimate</td>
<td></td>
<td></td>
<td></td>
<td>$361,689.48</td>
</tr>
</tbody>
</table>

Table 6 - Hudson County Forestry Program Employee Wages
COUNTY OPERATIONS & EQUIPMENT
The following is a summary of the official and proposed County budget numbers for 2016 and 2017. Within each Division budget, the funds are itemized into budget categories. The categories selected are associated with this plan. An appropriate portion of these funds will be available to the implementation of the Initial Community Forestry Management Plan. The total estimate is **NOT** the complete amount of funds allocated to the program. It is the potential budget pool of funds that the program can use.

<table>
<thead>
<tr>
<th>Item</th>
<th>Item Budget</th>
<th>Cost Code</th>
<th>Percentage of 2016 Division Budget</th>
<th>2016 Operational Budget</th>
<th>2017 Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seminars and Meeting Expense</td>
<td>$8,010</td>
<td>73</td>
<td>12.8%</td>
<td>$62,200</td>
<td>$63,000</td>
</tr>
<tr>
<td>Auto Parts and Repairs</td>
<td>$186,000</td>
<td>55</td>
<td>10.2%</td>
<td>$1,819,363</td>
<td>$1,910,331</td>
</tr>
<tr>
<td>Equipment Repairs and Services</td>
<td>$36,325</td>
<td>56</td>
<td>2%</td>
<td>$1,819,363</td>
<td>$1,910,331</td>
</tr>
<tr>
<td>Maintenance Supplies</td>
<td>$384,000</td>
<td>64</td>
<td>21.1%</td>
<td>$1,819,363</td>
<td>$1,910,331</td>
</tr>
<tr>
<td>Outside Services</td>
<td>$363,984</td>
<td>67</td>
<td>20%</td>
<td>$1,819,363</td>
<td>$1,910,331</td>
</tr>
<tr>
<td>Rentals</td>
<td>$18,000</td>
<td>72</td>
<td>0.9%</td>
<td>$1,819,363</td>
<td>$1,910,331</td>
</tr>
<tr>
<td><strong>Total Operations &amp; Equipment Potential Funds Estimate</strong></td>
<td><strong>$1,819,363</strong></td>
<td></td>
<td></td>
<td><strong>$1,973,331</strong></td>
<td></td>
</tr>
</tbody>
</table>

Table 7 - Hudson County Forestry Operational Budget

TREE PLANTING ESTIMATE
The appropriate County staff provided this estimate for one tree planting based on recent plantings performed by the County. The estimate is based on planting a 2.5-3” caliper, native, deciduous, urban tolerant shade tree with a 4’x 4’ tree pit and associated materials, equipment, and labor.

*One (1) Tree Planting estimated amount:* **$1,900**

VOLUNTEER SERVICES
The Hudson County Division of Planning and the Division of Parks are in the process of reaching out to specific volunteer groups throughout the County. Refer to section “Public Education, Awareness & Outreach”, for further detail.
HUDSON COUNTY OPEN SPACE TRUST FUND GRANT

The Hudson County Division of Planning was awarded a grant in 2008 by the Hudson County Open Space Advisory Board and approved by the Board of the Hudson County Freeholders. This grant was specifically designated to help with carrying out the “County Executive’s Urban Forestry Initiative” to plant 10,000 new shade trees.

*Open Space Grant amount: $10,000*

CURRENT PERSONNEL RESOURCES

Currently, the County of Hudson has staff from the Hudson County Division of Parks dedicated to its urban forestry program along with support personnel from the Division of Planning. Two additional positions are expected to be added by the Department of Parks in late 2016/early 2017.

Staffing levels include:

- **Division of Parks Forestry Unit**
  - Ten (10) trained employees dedicated to tree maintenance, removal, and plantings
  - The Division of Parks will be hiring two additional employees to bolster the Forestry Unit at the end of 2016/beginning of 2017.

- **Hudson County Division of Planning**
  - Shade Tree Coordinator
  - Assistant Planner
  - GIS Specialist

CORE TRAINED

The Urban Forestry Program also has three core trained individuals.

- Massiel Ferrara, Hudson County Division of Planning, Division Chief
- Mario Tridente, Hudson County Division of Planning, Site Inspector / Shade Tree Coordinator
- Marilyn DePice – Community Volunteer
SECTION 9 - STATEMENT OF PLAN
IMPLEMENTATION

The Hudson County Division of Planning along with its County partners has prioritized the implementation of the recommendations set forth in this Initial Community Forestry Management Plan. The County and its elected leaders recognize the importance of promoting and incentivizing the ‘greening’ of the County and to ensuring that new development includes environmentally friendly and sustainable design such as the planting of street trees by mandate. Additionally, the County aims to conduct the necessary work and establish more comprehensive street tree and tree infrastructure inventories so as to better analyze and plan future street tree plantings, inspect and maintain the County’s assets more efficiently, and minimize future liability to the County while ensuring public safety. The Division of Planning and the Division of Parks, through the recommendations of the Shade Tree Coordinator and consulting staff, have recommended the following implementation schedule:

<table>
<thead>
<tr>
<th>PLAN IMPLEMENTATION SCHEDULE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
</tr>
<tr>
<td>• Develop a regular shade tree inspection and maintenance program that focuses on removing hazardous trees based on tree and tree infrastructure inventories under-development</td>
</tr>
<tr>
<td>• Develop working partnerships with local municipalities and utility companies to improve efficiency and effectiveness of urban forestry resource</td>
</tr>
<tr>
<td>• Complete the Urban Forestry Initiative: Initial Community Forestry Management Plan for 2017–2021 and submit to the NJDEP Community Forestry department for approval</td>
</tr>
<tr>
<td>• Collect tree inventory data along County roads</td>
</tr>
<tr>
<td>• Begin Hudson County Parks tree inventory and hazardous tree assessment PILOT</td>
</tr>
<tr>
<td>o Columbus Park, Hoboken</td>
</tr>
<tr>
<td>o Mercer Park, Bayonne</td>
</tr>
<tr>
<td>o Washington Park, Jersey City/Union City</td>
</tr>
<tr>
<td>• Post Initial Community Forestry Management Plan on County website</td>
</tr>
<tr>
<td>• Public survey to designate a county tree</td>
</tr>
<tr>
<td>• Provide training to relevant County personnel on all aspects of plan implementation</td>
</tr>
<tr>
<td>• Adhere to the “Sunshine Law” by providing public notice of upcoming Shade Tree Commission meetings, which include a quarterly report on trees removed, planted and maintained; budget status, and information from quarterly newspaper/HCIA reports (QUARTERLY)</td>
</tr>
<tr>
<td>• Conduct regular tree inspections and hazardous tree assessments</td>
</tr>
</tbody>
</table>
• Plant 100 new trees throughout County (ANNUAL)
• Conduct internal meetings in order to review the feasibility and potential means of creating a Hudson County Shade Tree Commission
• Continue annual participation in HCIA’s Earth Day/Arbor Day event held in Liberty State Park

2018
• Create program for “Adopt-A-Tree” program- to focus on beautifying barren stretches of roads with shade trees
• Create program for Memorial Tree Planting program through County website
• Develop working partnerships with local municipalities and utility companies to improve efficiency and effectiveness of urban forestry resource
• Create link on Hudson County website to include information on
  o Hotline number for tree removal
  o News on how to participate in tree planting events
  o Quarterly updates
  o Storm damaged-trees
• Coordinate maintenance schedules with parking authority and street sweeping
• Apply for acceptance into the Tree City USA Program
• Begin to submit quarterly horticulture column in the local paper (The Jersey Journal & Hudson Reporter)-include information on pollen counts, invasive species alerts, tree removal hotline (QUARTERLY)
• Set up a horticulture/tree awareness booth at the HCIA Earth Day event (ANNUAL)
• Include a shade tree informational column in the HCIA “Seasons” newsletters--discuss information on pollen counts, invasive species alerts, tree removal hotline (QUARTERLY)
• Prepare the Community Stewardship Incentive Program (CSIP) grant application
• Prepare annual report to include trees removed, planted and maintained; budget status, and information from quarterly newspaper/HCIA reports (ANNUAL)
• Subscribe to the Journal of Arboriculture & Tree Care and pass on relevant articles to key tree maintenance personnel (ONGOING)
• Create a tree waste recycling program (i.e. mulch and firewood made available to residents)
• Continue annual, quarterly and ongoing activities
• Continue annual participation in HCIA’s Earth Day/Arbor Day event held in Liberty State Park

2019
• Continue maintenance and inspection program of trees
• Apply for acceptance into the Clean Communities Program
- Create a “Municipal Planting Partnerships Program” to donate 8-10 trees annually to each municipality to be planted by the County contractor
- Create a tree care disaster plan that outlines policies and procedures to follow and reduce risks
- Continue annual, quarterly and ongoing activities

2020
- Evaluate tree maintenance equipment and upgrade as budget allows
- Provide workshops and training for planting crews to teach them the importance of proper tree maintenance practices (annual)
- Have inaugural Arbor Day Observance celebration (ANNUAL)
- Continue annual, quarterly and ongoing activities

2021
- Continue annual, quarterly and ongoing activities
- Complete updated inventory of shade trees along County owned streets, parks and properties for next five year Community Forestry Management Plan
- Draft the Hudson County Urban Forestry Initiative: Community Forestry Management Plan 2021-2026
- Continue quarterly and annual program requirements and activities
COMPONENTS OF PLAN IMPLEMENTATION

TREE INVENTORY AND ASSESSMENT

In 2007 and 2008 The Hudson County Division of Planning hired interns to conduct a physical tree inventory of all forest resources located on county roads, county parks, and other county-owned property. Members of the project team estimated the total amount of tree coverage through the use of field surveys and aerial photograph interpretation. Through the use of the Hudson County geographic information system (GIS), recent oblique aerial photography provided the project team with visual tools to assess tree canopy coverage along county roads and in county parks. In addition, the project team utilized mobile global position systems (GPS) to electronically collect field data and location information for trees. These field surveys identified the most common tree species, hazardous trees, and old-growth forest resources. Other observations such as the amount of understory growth, topography, soils, and site growing conditions were recorded.

In 2013, the Division of Planning followed up the Forestry Initiatives beginnings by partnering with New Jersey City University’s (NJCU) Geography Department to start a spatial inventory of the County’s street trees. The partnership with NJCU represents a mutually beneficial relationship in which the County is able to develop a comprehensive spatial database of the County’s street tree assets, including tree pits and planting strips, and participating students are able to garner important field experience and develop an understanding of working partnerships with government agencies.

The project, now moving into its third field season, has expanded to include students from surrounding community colleges with varying backgrounds, which has allowed additional data to be captured such as tree heights and diameters as well as tree species. The introduction of this data compliments the wide array of information already being collected such as whether or not there is sidewalk uplift, utilities present, or if there are powerlines overhead.

**Goal:** To minimize the liability of the County and maximize the benefits of existing community forest resources by recognizing shade trees and green space as essential components of the County’s infrastructure that need to be proactively managed.

**Objectives**

- Develop a Community Forestry Management Plan that is future oriented with specific milestones and measurements of success designed to adapt to changing conditions efficiently within existing budgetary constraints.
- Create a complete and current tree inventory.
• Create an efficient maintenance schedule that is linked to the inventory data to improve the efficiency of tree management activities.
• Develop better methods and analytical models that will quantify the health and economic benefits generated by the urban forest.
• To maximize public safety in relation to trees on County roads & properties by conducting bi-annual visual inspections to identify the highest hazards and remediating.

### RESULTS OF 2007/08 HUDSON COUNTY TREE INVENTORY

Since the urban forest is an important component of the urban infrastructure, an effective management plan needs to be developed to insure this resource is preserved and properly managed. One of the most important steps in the development of an urban forestry management plan is conducting a street tree inventory that sets a baseline for future progress and maintenance to be based on. An efficient tree inventory monitors elements of the urban forest such as age, diversity and of the existing tree resource. Hudson County acknowledges the importance of a comprehensive tree inventory for county roads, parks and properties. The following municipalities were inventoried during this process:

- The City of Bayonne
- The Borough of East Newark
- The Town of Guttenberg
- The Town of Harrison
- The City of Hoboken
- The City of Jersey City
- The Town of Kearny
- The Township of North Bergen
- The Town of Secaucus
- The City of Union City
- The Township of Weehawken
- The Town of West New York

A total of 1,852 trees were inventoried along the following County Roads:

- JFK Boulevard
- JFK Boulevard East
- Frank E. Rodgers Boulevard
- Passaic Avenue
- Bergen Turnpike
- Garden Street
- Park Avenue
- Hudson Street
- Observer Highway
- 14th Street
- 1st Street

Trees inventoried were located along County owned streets, parks and properties. The inventory was conducted by interns hired during the spring and fall of 2007. The data was collected in a walking survey using the USDA Forest Service’s “Northeast Center for Urban and Community Forestry” guidelines and aerial photography. Data collected included the following:

1. Tree Location
2. Species
3. DBH: Trunk diameter at breast height (approximately 4.5 feet above the ground) was measured to the nearest inch.
4. Condition of overall tree health
5. Maintenance Recommendation: pruning recommendations
6. Sidewalk damage: presence or absence

The inventory identified a total of 37 different species among the 1,852 inventoried trees with total canopy coverage of approximately 56,373.18 square feet. This was estimated by approximating the leaf spread of trees inventoried. The most prevalent trees species is London Plane (46%), with the other most prevalent species being Callery Pear (18%), Norway Maple (7%), Red Maple (6%) and Honey Locust (6%). The “other” category constitutes 10% of the trees inventoried and each species observed in this category represented 2% or less of the total trees inventoried. The five most predominant trees account for 83% of the total inventory. The following table and chart details the species distribution of the trees inventoried.

Chart 3 - Hudson County Tree Species Distribution
<table>
<thead>
<tr>
<th>TREE SPECIES</th>
<th>NUMBER</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>London Plane</td>
<td>766</td>
<td>41%</td>
</tr>
<tr>
<td>Callery Pear</td>
<td>312</td>
<td>17%</td>
</tr>
<tr>
<td>Norway Maple</td>
<td>121</td>
<td>7%</td>
</tr>
<tr>
<td>Red Maple</td>
<td>99</td>
<td>5%</td>
</tr>
<tr>
<td>Honey Locust</td>
<td>96</td>
<td>5%</td>
</tr>
<tr>
<td>Pin Oak</td>
<td>67</td>
<td>4%</td>
</tr>
<tr>
<td>Cherry</td>
<td>51</td>
<td>3%</td>
</tr>
<tr>
<td>Little Leaf Linden</td>
<td>45</td>
<td>2%</td>
</tr>
<tr>
<td>American Linden</td>
<td>40</td>
<td>2%</td>
</tr>
<tr>
<td>Autumn Blaze Maple</td>
<td>33</td>
<td>2%</td>
</tr>
<tr>
<td>Ash</td>
<td>31</td>
<td>2%</td>
</tr>
<tr>
<td>Northern Red Oak</td>
<td>29</td>
<td>2%</td>
</tr>
<tr>
<td>Silver Maple</td>
<td>25</td>
<td>1%</td>
</tr>
<tr>
<td>Cherry cultivar</td>
<td>22</td>
<td>1%</td>
</tr>
<tr>
<td>Ginkgo</td>
<td>21</td>
<td>1%</td>
</tr>
<tr>
<td>Amur Maackia</td>
<td>18</td>
<td>1%</td>
</tr>
<tr>
<td>American Elm</td>
<td>12</td>
<td>1%</td>
</tr>
<tr>
<td>Horse Chestnut</td>
<td>12</td>
<td>1%</td>
</tr>
<tr>
<td>Blackgum</td>
<td>10</td>
<td>1%</td>
</tr>
<tr>
<td>Silver Linden</td>
<td>9</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Unknown</td>
<td>5</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Amur Maple</td>
<td>4</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Black Locust</td>
<td>4</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Sweet Gum</td>
<td>4</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Green Ash</td>
<td>3</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Dogwood</td>
<td>2</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Amur corktree</td>
<td>1</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Black Cherry</td>
<td>1</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Chinese Elm</td>
<td>1</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Elm</td>
<td>1</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Hedge Maple</td>
<td>1</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Japanese Tree Lilac</td>
<td>1</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Rose of Sharon</td>
<td>1</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Striped Maple</td>
<td>1</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Sugar Maple</td>
<td>1</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Thornless Hawthorne</td>
<td>1</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>White Ash</td>
<td>1</td>
<td>&lt;1%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1852</strong></td>
<td></td>
</tr>
</tbody>
</table>

Table 8 - Tree Species Inventory
The largest size class is represented by London Plane, which was heavily planted in the first half of the 20th century, and most specimens in Hudson County are nearing the end of their natural lifespan. The Norway Maple is the third largest size class represented and the biggest challenge facing this species comes in the form of a potential long haired beetle infestation. However, the long-haired beetle has been largely eradicated and no longer represents the risk it once did in the State of New Jersey.

The following is a profile of the six most commonly occurring tree species in the areas inventoried:

**London Planetree (Platanus x acerifolia):** This tree is classified as a Shade Tree and grows to be 75’-100’ in height, with a full spread of about 80’ at full maturity. This species is noted to thrive in sooty air and is able to withstand air pollution, drought and other adversities which make it an ideal candidate for an urban environment.60

**Red Maple (Acer rubrum):** This tree is classified as a Shade Tree and grows to be 40’-60’ in height, with a full spread of about 40’ at full maturity. This species is fast growing and tolerant of many soils, with a preference for wet soil conditions and has a slight drought tolerance.61

**Honeylocust (Gleditsia triacanthos inermis):** This tree is classified as a Shade Tree and grows to be 30’-70’ in height, with a full spread of about 30’-70’ at full maturity. This tree is fast growing and can be expected to grow at a rate of about 2 feet or more for the first 10 seasons. This tree has moderate flooding and drought tolerance, is able to withstand a wide range of soil conditions and is especially tolerant to the stress of urban conditions.62

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60 Arbor Day Foundation Tree Guide [http://www.arborday.org/trees/treeguide/TreeDetail.cfm?id=33](http://www.arborday.org/trees/treeguide/TreeDetail.cfm?id=33)

61 Arbor Day Foundation Tree Guide [http://www.arborday.org/trees/treeguide/TreeDetail.cfm?id=28](http://www.arborday.org/trees/treeguide/TreeDetail.cfm?id=28)

62 Arbor Day Foundation Tree Guide [http://www.arborday.org/trees/treeguide/TreeDetail.cfm?id=24](http://www.arborday.org/trees/treeguide/TreeDetail.cfm?id=24)
**Pin Oak (Quercus palustris):** This tree is classified as a shade tree and grows to be 60’-70’ in height, with a full spread of about 25’-40’ at full maturity. This tree is fast growing and tolerates wet conditions including moderate flooding conditions. This tree is distinctive for its unusual branching patterns in that the upper branches are upright, middle ones are horizontal and the lower limbs slant downward towards the ground. This species is a popular choice for streetscaping and landscaping.63

![Pin Oak](image)

---

**Callery Pear (Pyrus calleryana):** This tree is classified as a street tree and grows to be 25’-35’ in height, with a full spread of about 16’-25’ at full maturity. This tree is shallow rooted and can tolerate a wide range of soils. This tree is a particularly good street tree because it produces almost no litter, tolerates pollution and salt very well, and has a good resistance to diseases and storm damage. This species is a popular choice for streetscaping and landscaping.64

![Callery Pear](image)

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**Norway Maple (Acer platanoides):** This tree is classified as a shade tree. It is a deciduous, broadleaf maple tree, and grows to be 40’-50’ in height, with a full spread of about 40’-50’ at full maturity. This tree is distinguished by its larger leaves with pointed lobes and by the presence of one or more teeth on all of the lobes. This tree is favored as a shade tree because it is tolerant to the stresses of urban conditions.65 However, it is also considered to be an invasive species with numerous issues associated with its planting including a shallow root system, verticillium wilt and dieback, as well as anthracnose. Due to these issues, Norway Maples are no longer used as shade trees with nearly the same frequency as they once were.

![Norway Maple](image)

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63 Arbor Day Foundation Tree Guide [http://www.arborday.org/trees/treeguide/TreeDetail.cfm?id=19](http://www.arborday.org/trees/treeguide/TreeDetail.cfm?id=19)

64 Arbor Day Foundation Tree Guide [http://www.arborday.org/trees/treeguide/TreeDetail.cfm?id=155](http://www.arborday.org/trees/treeguide/TreeDetail.cfm?id=155)

The trunk diameter at breast height (DBH) is a useful calculation for estimating various calculations such as growth, volume and yield. The DBH is measured with a tape measure or caliper along the outside bark diameter at breast height which is defined as 4.5 feet above the ground. The optimal DBH distribution should have a high proportion of young trees to replace the tree stock as the percentage of older trees declines with age.

<table>
<thead>
<tr>
<th>DBH Ranges (in inches)</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 5.99</td>
<td>379</td>
<td>22%</td>
</tr>
<tr>
<td>6 - 11.99</td>
<td>432</td>
<td>25%</td>
</tr>
<tr>
<td>12 - 17.99</td>
<td>285</td>
<td>16%</td>
</tr>
<tr>
<td>18 - 23.99</td>
<td>283</td>
<td>16%</td>
</tr>
<tr>
<td>24 - 29.99</td>
<td>241</td>
<td>14%</td>
</tr>
<tr>
<td>30 - 35.99</td>
<td>119</td>
<td>7%</td>
</tr>
<tr>
<td>&gt;= 36</td>
<td>8</td>
<td>0.50%</td>
</tr>
</tbody>
</table>

Table 9 - Tree Width Frequencies (2007/08)

Although there are a number of factors that are used to estimate the age of a tree which varies by species, more than half of the trees inventoried (57%) fall in the smallest caliper ranges (0-5.99 and 6-11.99), which suggests that the majority of the trees inventoried may fall in the category of being considered a young tree. This is a benefit because as the older tree stock begins to die there will likely be more than enough younger trees to replace and even surpass existing tree inventory levels.

The condition of trees inventoried indicates that the majority (88%) are in good condition, while only 5% fall into the “dead” or “poor” category. This indicates that the existing tree stock along county roads are generally in good condition and require only regular care and maintenance. About 20 trees were classified as dead, even though for most of them the stumps remain rooted in the tree pits. About 74 trees were noted to be in poor condition and will require more than the regular care and maintenance. Of the total trees inventoried, the tree that will need more care than the regular maintenance is minimal and a more intense management plan for this small percentage of trees could be easily instituted to upgrade the condition of these trees.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dead</td>
<td>20</td>
<td>1%</td>
</tr>
<tr>
<td>Poor</td>
<td>74</td>
<td>4%</td>
</tr>
<tr>
<td>Fair</td>
<td>132</td>
<td>7%</td>
</tr>
<tr>
<td>Good</td>
<td>1647</td>
<td>88%</td>
</tr>
</tbody>
</table>

Table 10 - Observed Tree Condition (2007/08)

Chart 5 - Condition of Hudson County Trees (2007/08)
The canopy coverage in the municipalities inventoried was estimated by calculating the approximate tree leaf spread during the visual inspection. As the following table and chart illustrate, there is a significant variation in the amount of canopy coverage throughout the various municipalities inventoried.

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Canopy (square feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bayonne</td>
<td>8939</td>
</tr>
<tr>
<td>East Newark</td>
<td>465</td>
</tr>
<tr>
<td>Guttenberg</td>
<td>719.5</td>
</tr>
<tr>
<td>Harrison</td>
<td>965</td>
</tr>
<tr>
<td>Hoboken</td>
<td>14552.68</td>
</tr>
<tr>
<td>Jersey City</td>
<td>12179</td>
</tr>
<tr>
<td>Kearny</td>
<td></td>
</tr>
<tr>
<td>North Bergen</td>
<td>11559.5</td>
</tr>
<tr>
<td>Secaucus</td>
<td></td>
</tr>
<tr>
<td>Union City</td>
<td>1679</td>
</tr>
<tr>
<td>Weehawken</td>
<td>2770</td>
</tr>
<tr>
<td>West New York</td>
<td>2544.5</td>
</tr>
</tbody>
</table>

Table 11 - Canopy Coverage (2007/08)

Chart 6 - Canopy Coverage by Municipality (2007/08)
Although there are many factors which can be attributed to the canopy coverage in each municipality inventoried, it appears that with the exception of Hoboken and Union City, there is more canopy coverage where the population is higher, which is a positive correlation for quality of life purposes.
HAZARD TREE IDENTIFICATION & MANAGEMENT

Through analysis of the tree inventory and assessment, the project team will provide recommendations and draft an action plan to address hazardous trees and their liabilities. Hazard trees pose potentially unsafe situations if not cared for properly; and the management plan will seek to mitigate against those conditions. Areas of concern include utility damage, spread of disease and pest infestations, and overall public safety. The project team will also identify areas where trees have the potential to damage infrastructure including curbs, sidewalks, and underground and overhead utilities. Lastly, the County will establish a tree hazard assessment scale to be used when conducting routine inspections as a means of prioritizing trees for action. Please refer to Appendix X for the assessment scale.

Goal: Identify hazard trees through a regular inspection schedule and become more proactive towards remediation.

Objectives:

1. Minimize the risk of trees to public safety and infrastructure;
2. Develop a tree hazard survey program that will identify hazardous trees on all County roads, properties and parks;
3. Establish an efficient procedure for tree maintenance requests;
4. Coordinate with Hudson County Parks Forestry Division to perform visual / windshield inspections on Hudson County forestry assets after major storms;
5. Establish Tree Hazard Assessment Scale.

BEST MANAGEMENT PRACTICES: HAZARD TREES

Identification of potential hazard trees is vital to minimizing the risk to the public as well as limiting the County’s liability for any damages the tree may cause along County owned roads and properties. According to the NJ Department of Environmental Protection’s Division of Parks and Forest Community Forestry Tree Care Guidelines, trees should be evaluated by inspecting the tree roots, trunk flare, main stem, branches and branch unions on all sides yearly and after severe storms to inspect for defects. Defects in trees can include:67

- Dead branches
- Cracks
- Weak branch unions
- Decay

67 The NJDEP Division of Parks & Forest “Community Forestry Tree Care Guidelines”
http://www.state.nj.us/dep/parksandforests/forest/community/tree_defects.htm
• Cankers
• Root problems
• Poor tree architecture

PESTS AND DISEASES

The following pests and diseases are identified by the NJDEP Division of Parks & Forestry as potential risks to trees in New Jersey.

THE ASIAN LONG HORNED BEETLE (ALB): The ALB is native to Asia, immigrated to North America in wood packing material from China, and was first discovered in Brooklyn, NY in 1996. The first occurrence of the ALB in NJ was in 2002 in Jersey City. The ALB is most likely to affect maple trees, but it will also attack willows, poplars, ash, horse chestnuts and buckeye trees.

Detection: ALB infestation can be detected by the observation of perfectly round exit holes in the bark about the width of a pencil, and by the “frass”, a mixture of sawdust and waste that the beetle leaves behind. The branches of an infested tree may also exhibit yellowing leaves and dying limbs.

Management: The best practice to deal with an ALB infestation is to remove and fully chip the infested trees, grinding the stumps of infested trees below the soil level and removing all potential host trees within one-eighth to one-quarter mile radius of infested trees to prevent future spreading of ALB. The long-haired beetle has been considered eradicated in the State of New Jersey since the Spring of 2013.

THE EMERALD ASH BORER (EAB): The EAB was first discovered in Michigan in 2002. In May of 2012, it was discovered in Somerset County, NJ, but as of October 2015, it has not yet been found in Hudson County. Foresters are actively making sure that the EAB does not become a

68 The NJDEP Division of Parks & Forest “Pests & Disease Guide”
http://www.state.nj.us/dep/parksandforests/forest/community/alb.html
69 Photo Credit: NY State Department of Agriculture & Markets http://www.agmkt.state.ny.us/PI/ALB.html
70 NJ Department of Agriculture
http://www.nj.gov/agriculture/divisions/pi/prog/emeraldashborer.html
problem in the future as this insect can inhabit an area for several years before it is detected. EAB can be spread by transporting ash trees from nurseries and from moving infested wood.

**Detection:** When a tree becomes infested, there are initially little or no visible physical symptoms. The larvae feed on the inner bark of Ash trees, disrupting the tree’s ability to transport water and nutrients\(^\text{71}\). When physical symptoms do manifest, initial signs will be jagged holes in the bark where woodpeckers are feeding on the EAB larvae, vertically split bark over larval feeding galleries, D-shaped exit holes left by vacating adult beetles, and after many years of infestation the tree’s crown will turn brown.

**Management:** There are multiple insecticide options that can address an EAB infestation. The EAB only attacks Ash trees, which means that approximately 3% of the trees inventoried in Hudson County are vulnerable to this infestation.\(^\text{72}\)

![D-shaped Exit Holes](image1.png)

**THE GYPSY MOTH:** The Gypsy Moth was originally introduced into the US in 1869 by a botanist trying to develop the silkworm industry. The insects escaped from his laboratory, colonized and spread throughout the country. The Gypsy Moth is active in 19 states and without intervention they spread at a rate of about 13 miles per year. If a healthy tree is infested and defoliated, the tree may re-leaf during the summer, but with smaller leafs, and this stress will make the tree more susceptible to borers, fungus and drought. In 1981, New Jersey suffered the largest loss from the gypsy moth in the defoliation of 800,000 acres. Review of recent aerial photographs by foresters indicates that the moth population is on the rise again. From 42,000 acres defoliated in 2005, the infestation has risen to over 127,000 acres in 2006 and 324,000 in 2007.

**Detection:** The gypsy moth can be visually identified on the host tree.

**Management:** There is no way to prevent a gypsy moth infestation, however monitoring gypsy moth populations, maintaining the health and vigor of trees, discouraging gypsy moth

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\(^{71}\) [http://www.emeraldashborer.info/](http://www.emeraldashborer.info/)

\(^{72}\) The NJDEP Division of Parks & Forest “Pests & Disease Guide” [http://www.state.nj.us/dep/parksandforests/forest/community/Emerald_Ash_Borer.htm](http://www.state.nj.us/dep/parksandforests/forest/community/Emerald_Ash_Borer.htm)

\(^{73}\) Photo Credit: US Department of Agriculture Forest Service. David Cappaert, [www.forestryimages.org](http://www.forestryimages.org) [http://www.fs.fed.us/fstoday/2008/080822/03.0About%20Us/pests.html](http://www.fs.fed.us/fstoday/2008/080822/03.0About%20Us/pests.html)
survival, and treating with insecticides to kill larvae and protect tree foliage are effective measures. In addition, natural predators of the gypsy moth including deer mice, tachinid flies and braconid wasps can help decrease gypsy moth populations. Otherwise, Manual removal of gypsy moths may be effective for reducing damage on small, open-grown trees and shrubs.  

The moths feed on many different species of trees, but prefer the oak as a host tree. Approximately 6% of the Hudson County trees inventoried are likely to be susceptible to a gypsy moth infestation.

**The Southern Pine Beetle:** The Southern Pine Beetle attacks most species of pines, whose natural range is from Pennsylvania to Florida. Without intervention the southern pine beetle can spread rapidly, affecting thousands of trees.

**Detection:** When a pine tree has become infested with the beetle, the tree’s needles turn yellow, red and then brown. NJ foresters monitor and track the occurrence of infestations and attempt to predict the severity of upcoming infestations.

**Management:** To control the beetle populations, foresters cut a 40’-70’ buffer strip around the affected area and then chip the trees or spray them with insecticide. Of the trees

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75 The NJDEP Division of Parks & Forest “Pests & Disease Guide” [http://www.state.nj.us/dep/parksandforests/forest/community/Gypsy_Moth.htm](http://www.state.nj.us/dep/parksandforests/forest/community/Gypsy_Moth.htm)
76 Photo Credit: University of Illinois/James Appleby [http://insects.about.com/od/photography/ig/Tussock-Moth-Caterpillars/gypsymoth.htm](http://insects.about.com/od/photography/ig/Tussock-Moth-Caterpillars/gypsymoth.htm)
inventoried, there were no pine trees identified, indicating that there is a very low risk of a Southern Pine beetle infestation along county roads in Hudson County.

THE HEMLOCK WOOLY ADELGID (HWA): The HWA is a tiny insect from Japan that was first discovered in the Pacific Northwest in the 1920’s, and has since made its way up the eastern coastline all the way up to Rhode Island. The HWA lacks natural enemies in North America, so it has spread throughout the eastern United States and damages the host tree. The HWA sucks fluid from the base of hemlock needles and may also inject toxins into the tree as it feeds.

Detection: Hemlocks that have been affected by the HWA often have grayish-green needles with cotton-like wool tufts under the needles, instead of the normal shiny, dark green color. The tree will eventually drop its needles and die if left uncontrolled.

Management: Treatment for an infestation includes removing the eggs and adults by spraying the twigs with water or by pruning the most heavily infested branches from the tree. The HWA prefers the hemlock and spruce trees. Of the trees inventoried, there were no hemlock or spruce trees identified, indicating that there is a very low risk of a HWA infestation along county roads in Hudson County.

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79 The NJDEP Division of Parks & Forest “Pests & Disease Guide”
http://www.state.nj.us/dep/parksandforests/forest/community/Southern_Pine_Beetle.htm

80 Photo Credit: Florida Nature website http://www.floridiannature.com/FloridaBeetles.htm

81 Photo Credit: USDA/USFS http://www.njarboristsisa.com/alerts_pinebeetle.php

82 Pennsylvania Department of Conservation and Natural Resources
http://www.dcnr.state.pa.us/forestry/woollyadelgid/index.aspx

83 The NJDEP Division of Parks & Forest “Pests & Disease Guide”
http://www.state.nj.us/dep/parksandforests/forest/community/Hemlock_Woolly_Adelgid.htm
BACTERIAL LEAF SCORCH (BLS): BLS is caused by the bacterium *Xylella fastidiosa*, and it clogs the xylem, the cells that transport water between the roots and leaves, which causes the leaves to scorch and cause branch dieback, eventually killing the tree. Reported hosts include sycamore, mulberry, red maple, sugar maple, sweetgum, American elm, and a number of oaks such as bur, pin, scarlet, red, laurel, water, turkey, bluejack, and shingle oak. Infection is spread by “leaf hopping” insects that are xylem-sap feeders and spread the disease from tree to tree.

Detection: Trees infected will exhibit leaf browning, bordered by a pale halo band separating the dead or scorched tissue from the green tissue.

Management: There is no preventative treatment or cure for BLS, and the best way to remediate the problem is by tree replacement. Trunk injections with antibiotics have been shown to suppress symptoms, but not completely cure the disease. Careful monitoring and conscientious pruning can help to remove branches that appear to be infected, and in some circumstances the tree will exhibit a natural resistance to the disease once the infected branches are removed. Approximately 13% of the Hudson County trees inventoried could be impacted by a BLS infection.

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85 Photo Credit: The National Park Service [http://www.nps.gov/neri/naturescience/hwa.htm](http://www.nps.gov/neri/naturescience/hwa.htm)
An Elm tree affected by leaf scorch\textsuperscript{87}  An Oak tree affected by leaf scorch\textsuperscript{88}

\textbf{GOUTY OAK GALL:} A Gouty Oak Gall is an irregular plant growth that forms on twigs and stems of trees. The growths are caused by small wasps whose females lay eggs as part of their lifecycle to which the trees react and from the galls around the eggs. The galls do not directly affect the health of the tree, however, if the tree becomes heavily infested with the galls, the weight may cause the branches to droop and eventually die. In addition, a heavily infested tree is more susceptible to storm damage.

\textbf{Detection:} Irregular growths, “galls”, will be visible on the twigs and stems of trees.

\textbf{Management:} There is no effective way to prevent the growth of galls because the wasps are located within the gall chambers and insecticides are ineffective. However, a gall infestation will probably not kill the tree and most often natural controls will reduce the population in succeeding years. The trees affected by Gouty Oak Gall include Scarlet, Red, Pin and Black Oak. \textsuperscript{89} This indicates that approximately 6\% of the Hudson County trees inventoried are susceptible to a Gouty Oak Gall infestation.

\textsuperscript{87} Photo Credit: The United States National Arboretum \url{http://www.usna.usda.gov/Research/BacterialLeafScorch.html}
\textsuperscript{88} Photo Credit: The United States National Arboretum \url{http://www.usna.usda.gov/Research/BacterialLeafScorch.html}
\textsuperscript{89} The NJDEP Division of Parks & Forest “Pests & Disease Guide” \url{http://www.state.nj.us/dep/parksandforests/forest/community/Gouty_Oak_Gall.htm}
\textsuperscript{90} Photo Credit: The NJDEP Division of Parks & Forest “Pests & Disease Guide” \url{http://www.state.nj.us/dep/parksandforests/forest/community/Gouty_Oak_Gall.htm}
\textsuperscript{91} Photo Credit: Missouri Botanical Garden \url{http://www.mobot.org/GARDENINGHELP/PLANTFINDER/IPM.asp?code=280&group=40&level=s}
**VERTICILLIUM WILT:** Verticillium Wilt is a fungus that lives in soil and can be spread through flowing water, wind or by tools or transplanted plants that have come in contact with the fungus. When the fungus enters the plant’s root system, it blocks the water from circulating throughout the tree. This fungus can infect more than 300 plant species including 80 species of trees.

Detection: Indications that a tree has been infected include a yellowing around the edges of the leaves, wilting and a cut branch will show discoloration in streaks, bands or flecks.

Management: Although there is no cure, treatment includes pruning the affected limbs, watering and fertilizing the tree, until it eventually dies. The fungus will remain in the roots and soil beneath the infected tree for several years after the tree has died. The most commonly infected trees include maple and redbud. This indicates that 16% of the Hudson County trees inventoried are susceptible to Verticillium Wilt.

**DUTCH ELM DISEASE:** Dutch Elm Disease (DED) is a wilt fungus that grows in the sapwood of elms. When the fungus enters the plant’s root system, it blocks the water from circulating throughout the tree. Because the American DED are especially devastating to tree populations, DED is one of the most destructive shade tree diseases in North America, and has killed millions of elms since it was initially identified in North America in the 1950’s. The fungus grows in the xylem of the tree, and when the tree attempts to fight the infection it produces gums and cell

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92 The NJDEP Division of Parks & Forest “Pests & Disease Guide”
[http://www.state.nj.us/dep/parksandforests/forest/community/Verticillium_Wilt.htm](http://www.state.nj.us/dep/parksandforests/forest/community/Verticillium_Wilt.htm)
93 Photo Credit: The NJDEP Division of Parks & Forest “Pests & Disease Guide”
[http://www.state.nj.us/dep/parksandforests/forest/community/Verticillium_Wilt.htm](http://www.state.nj.us/dep/parksandforests/forest/community/Verticillium_Wilt.htm)
94 Photo Credit: The University of Minnesota Center for Urban Ecology & Sustainability
[http://www.entomology.umn.edu/cues/dx/CB/v_wilt.htm](http://www.entomology.umn.edu/cues/dx/CB/v_wilt.htm)
95 Photo Credit: The University of Minnesota Center for Urban Ecology & Sustainability
[http://www.entomology.umn.edu/cues/dx/CB/v_wilt.htm](http://www.entomology.umn.edu/cues/dx/CB/v_wilt.htm)
96 Biggerstaff, Cassandra; Gleason, Mark L.; Iles, Jeffrey K. “Sustainable Urban Landscapes: Dutch Elm Disease and Disease Resistant Elms”. Iowa State University- University Extension. SUL-4, January 1999.
[http://www.extension.iastate.edu/Publications/SUL4.pdf](http://www.extension.iastate.edu/Publications/SUL4.pdf)
outgrowths that block its own xylem vessels. This blocks the distribution of the trees water supply and causes the characteristic wilting visible on infected elms.

Detection: The first indications that a tree has been infected include wilting on the leaves of one or a few of the branches in the upper canopy of the tree which will subsequently turn yellow, then brown and fall from the tree prematurely. After a branch has lost its leaves, it usually dies quickly. “Depending on when and how the tree was infected, its branches may die progressively, or the entire tree may die within a few weeks of infection.”

The disease is spread either through root grafts formed between neighboring trees or by elm bark beetles.

Management: Although there is no cure, there are various control strategies that can be employed to help minimize the spread of the disease. It has been estimated that more than 90 percent of urban elms that have died from DED were infected through roots grafts. Therefore, one of the most important methods of controlling a DED outbreak is by removing all infected trees and branches pruned from infected trees. In addition, it is also important to destroy sources of the fungus and any potential breeding grounds for the elm bark beetle. Any infected wood that is to be reused as firewood should have the bark removed as it can serve as a potential breeding ground for the beetle. Another technique for minimizing the spread of DED is to disrupt the root grafts by digging a trench between any susceptible trees within 50 feet of the infected tree. The most successful preventative measure has been using a fungicide injection in trees before they have been infected, however, this can be costly. The most viable option for proactive prevention of DED would be to plant species of elms that are more resistant to DED infection. There are new American elm trees that have been proven to have a higher level of tolerance to the DED fungus, and some have even recovered from an infection after symptom expression. The only trees affected by DED are elms. This indicates that approximately 2% of the Hudson County trees inventoried are susceptible to DED.

97 Biggerstaff, Cassandra; Gleason, Mark L.; Iles, Jeffrey K. “Sustainable Urban Landscapes: Dutch Elm Disease and Disease Resistant Elms”. Iowa State University- University Extension. SUL-4, January 1999.
P.http://www.extension.iastate.edu/Publications/SUL4.pdf
98 Biggerstaff, Cassandra; Gleason, Mark L.; Iles, Jeffrey K. “Sustainable Urban Landscapes: Dutch Elm Disease and Disease Resistant Elms”. Iowa State University- University Extension. SUL-4, January 1999.
P.http://www.extension.iastate.edu/Publications/SUL4.pdf
99 Biggerstaff, Cassandra; Gleason, Mark L.; Iles, Jeffrey K. “Sustainable Urban Landscapes: Dutch Elm Disease and Disease Resistant Elms”. Iowa State University- University Extension. SUL-4, January 1999.
P.http://www.extension.iastate.edu/Publications/SUL4.pdf
TREE SELECTION

Given the especially harsh conditions of an urban environment, careful and well-thought out tree selection is vital to the long term survival of the tree. There are many different factors which must be considered in tree selection including environmental conditions, susceptibility to pests and disease, the ability to be easily transplanted, local availability and maintenance requirements.

Goal: To increase species diversity as a natural means of protecting against pest infestation and diseases as well as to ensure that tree selection takes into account salt/urban tolerant species.

Objectives:

1. Create a list of County recommended tree species;
2. Evaluate the existing tree inventory to encourage species diversity in accordance “Best Management Practices” to minimize potential for population devastation from insect infestation or disease.

BEST MANAGEMENT PRACTICES: TREE SELECTION

1. It is important to determine if the plant will be able to fit into the proposed space. Considerations include any potential barriers to growth both above and below ground, including utilities and compacted soil. In addition, it is imperative that the mature tree will not interfere with clear sightlines for vehicular and pedestrian safety.

2. The tree needs to be able to adapt to extremes of heat and cold as the temperature in Hudson County vary greatly between the winter and summer. This can be evaluated by knowing the USDA heat and cold hardiness of the area and determining microclimatic factors such as reradiated heat, wind, rain shadows caused by buildings and frost pockets. It is also important to note that the choice of planters has an impact on the temperature of the soils as a raised planter can often cause a small amount of soil to change temperatures as drastically as the ambient air temperature. The following considerations must be evaluated prior to purchasing a tree in order to ensure that the proper species has been selected for each site.101

Other mitigating factors include:

101 These criteria are adapted from “Trees in the Urban Landscape, Site Assessment, Design and Installation” by Peter J. Trowbridge and Nina L. Bassuk. Published by John Wiley & Sons, Inc. Hoboken, NJ, 2004.
SUN/SHADE
Most trees require four to six hours of full sun to grow to their mature size and form, although some trees are tolerant of partial or heavy shade. It is important to account for the surrounding infrastructure and how much sun exposure the planting site has.

SOIL MOISTURE
Soil texture, depth, volume, density, drainage, and the presence of irrigation determine the availability of water and air in the soil. It is important to choose tree species that can tolerate the wide range of soil moisture conditions that are common in urban environments.

SOIL PH
Most plants grow best in slightly acidic soils, while some also grow well in pH’s as high as 8.2. Fewer trees will grow well in extremely acidic soils of pH 3.5-4.5. It is important to determine the pH of the planting site and plant a tree that is able to thrive in the existing soil conditions.

SALTS
In an urban environment, trees must be selected that are tolerant of de-icing salts. If a planting site has good drainage, most of the salts will run through the root zone after a rain event, however, poor drainage will worsen salt contamination.

PESTS & DISEASE
Most trees will have pest problems, however, some attract less and have a stronger resistance to common diseases. In addition, certain trees that are especially susceptible to a recent disease outbreak or pest infestation should be avoided in areas that have recently been affected. For example, Jersey City recently experienced an Asian Long Horned Beetle infestation and planting trees that are especially susceptible to this pest is not recommended. If a tree is planted in a site where it is well adapted and has prime growing conditions, it will suffer fewer pest problems and be able to recover from an attack or disease more quickly.

TRANSPLANTING
Certain trees have been noted as especially difficult to transplant, and therefore it is important to not choose too many of these for a planting event. The following is a list of trees and shrubs that are difficult to transplant:
<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acer buergeranum</td>
<td>Trident Maple</td>
</tr>
<tr>
<td>Amelanchier spp.</td>
<td>Serviceberry</td>
</tr>
<tr>
<td>Asimina trifoliata</td>
<td>Pawpaw</td>
</tr>
<tr>
<td>Betula spp.</td>
<td>Birch</td>
</tr>
<tr>
<td>Carpinus betulus</td>
<td>European Hornbeam</td>
</tr>
<tr>
<td>Carpinus caroliniana</td>
<td>Musclewood</td>
</tr>
<tr>
<td>Corylus spp.</td>
<td>Hickory</td>
</tr>
<tr>
<td>Corylus colurna</td>
<td>Turkish Filbert</td>
</tr>
<tr>
<td>Crataegus spp.</td>
<td>Hawthorn</td>
</tr>
<tr>
<td>Diospyros virginiana</td>
<td>Persimmon</td>
</tr>
<tr>
<td>Fagus spp.</td>
<td>Beech</td>
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<td>Juglans spp.</td>
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<tr>
<td>Taxodium distichum</td>
<td>Bald Cypress</td>
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<tr>
<td>Tilia tomentosa</td>
<td>Silver Linden</td>
</tr>
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</table>

Table 12 - List of Trees/Shrubs Difficult to Transplant

**COST AND AVAILABILITY**

It is important to consider the availability of the tree and determine if the species and size specification can be easily located and is cost efficient.

**MAINTENANCE ISSUES**

Some trees produce an excessive amount of leaf litter, produce messy fruit, develop thorns or may require excessive pruning to maintain their appropriate appearance. It may be more appropriate to select small-fruited or fruitless trees to decrease the demand for more intensive maintenance. In addition, trees that grow faster frequently
are termed as being “weak wooded”, which means that they are more prone to break up or drop limbs in high winds or during snow and ice storms. These trees should be planted away from areas that people frequent or any property that could be damaged.

**NATIVE VS. NON-NATIVE TREES**

Most urban sites have been altered significantly so as to make a plant’s native site condition, prior to centuries of development, irrelevant. Non-native introductions represent a very small proportion of weedy plants that become a nuisance; however, it is important to choose trees that are not prone to becoming invasive. In general, certain trees are known to be problematic to certain areas, particularly street trees in urban areas. Please refer to **Appendix X** as a reference for which trees are tolerant in environments predominant in Hudson County.

**DIVERSITY**

There is often a conflict between the desire for visual conformity and the need for species diversity. Monoculture plantings can make an area especially prone to decimation should a disease or pest outbreak occur. Overplanting some species can lead to serious maintenance problems. Species that have characteristics such as weak wood, a tendency to develop chlorosis, girdling roots, and messy fruits can be difficult to manage if they are planted in abundance. Some examples of these types of trees include Norway Maple (girdling roots) and Silver Maple (weak wood). In addition, overplanting one species can put an area’s tree population at risk. The inherent diversity in urban conditions makes it impossible for all tree species to thrive uniformly throughout an area. Variables such as light, temperature, drainage, soil compaction, root space, soil pH, availability of water, exposure to salt and restrictions to crown development can vary significantly from one planting area to the next. In order to satisfy both the aesthetic desire for uniformity and the functional importance of species diversity, the goal is to create communities of trees that are genetically diverse, yet visually consistent.

**TREE SELECTION REGULATORY GUIDANCE**

Trees should be selected based on the following characteristics:

1. General Characteristics;
   a. Native to New Jersey & the immediate area;
   b. Drought tolerant;
   c. Tolerant to urban environments;
   d. Suitable to thrive in the soil conditions on the site;
e. Tolerant of road salts;  
f. Have root growth and crown shape that will not be physically intrusive to surrounding utilities or County roads and structures;  
g. Adequate canopies at maturity to provide shade and rain absorption;  
h. Require low maintenance.  

2. Tree species shall be selected in accordance with their growth habit and environmental function;  
   a. Commercial streets should have trees that complement the building façade and provides shade;  
   b. Residential streets should provide for an appropriate canopy that provides shade and serves as a visual buffer between the street and home.  

3. Trees shall be planted in groupings of similar varieties, although monoculture plantings are discouraged. Use trees of similar form, height and character along a roadway to promote uniformity;  

4. The minimum caliper of trees shall be 2.5 to 3.5 inches (based on the American Association of Nurseryman standards). The caliper shall be measured at a point four and a half (4.5) feet above the ground (measured from the highest ground point when a tree is located on a slope);  

5. The mature height and spread shall be considered to ensure that interference with existing or proposed structures or overhead utilities is minimized;  

6. Trees will be selected so as to minimize interference with walls, walks, drives, and other paved surfaces, or affect water and sewer lines or underground drainage systems;  

7. Trees will be selected and located so as to minimize interference with sight triangles near intersections;  
   a. If a tree is planted within a sight triangle, tree selection shall ensure the planted tree has a canopy no less than 7 feet above ground level;  
   b. All plantings and selected trees will have their impact evaluated by the County Engineer and the Shade Tree Coordinator on a case-by-case basis.  

8. No tree planting approval will be issued without a two (2) year guarantee period;  

9. All trees shall be supplied by reputable nurserymen and planted in accordance with these regulations.  

Refer to Appendix 1 for a list of acceptable trees and for additional detail regarding tree selection and siting.
BEST MANAGEMENT PRACTICES: TREE PLANTING

Currently, there is no comprehensive plan for replacing trees as they age or planting trees in new locations for Hudson County. This step in the urban forestry plan will seek to create a countywide policy for replacing trees and increasing the tree canopy cover by setting goals throughout each year of the five-year management plan. The need to increase the number of trees is evident due to several factors. As the urban forest of Hudson County ages, a successful replacement program will ensure the continued success for the Urban Forestry Plan. Clear guidance for planting, maintaining and removing trees from streets, parks and other public places will be highlighted in detail including a list of recommended tree species appropriate for varying planting sites.

Goal: Plant 1,000 trees along county roads, in county parks and facilities during the next five years with a total goal of 10,000 total trees over ten years. The County seeks to reach this goal utilizing widely accepted best management practices in accordance with the regulations set forth in this document and, more specifically, in Appendix 1A.

Objectives:

1) Make sure trees are planted to minimize conflicts with overhead and underground utilities, structures, street-scaping and traffic;
2) Increase the County tree population;
3) Optimize tree species diversity to include a wide range of multi-aged and diverse species that are site appropriate;
4) Improve species selection to increase aesthetic appeal and reduce risk of disease and insect infestations;
5) Improve growing conditions, planting techniques, tree protection, and maintenance procedures in order to minimize future needs and costs;
6) To engage local school and civic groups in planting events;
7) Ensure development and applicable projects under the jurisdiction of the Hudson County Planning Board includes the minimum number of tree plantings required as defined by this document, more specifically in Appendix 1A;
8) Trees removed or damaged in the process of completing any construction, home improvements, street resurfacing, etc.; must be replaced by the responsible party.

BEST MANAGEMENT PRACTICES: TREE PLANTING

The planting of new trees must be a priority in order to maintain a healthy forestry resource that is continuously expanding. A tree that is planted properly is two times as likely to survive,
compared to one that is carelessly planted.\textsuperscript{102} Best practices for planting shade trees in the urban landscape should take into account what the function of the tree will be, as well as evaluating the various elements of design, site analysis, tree species selection and an efficient planting and maintenance program. The best plan of action for the planting process should specify the exact planting requirements which have been developed with the assistance of a knowledgeable professional. These specifications should include the species to be planted, the size, the spacing, the size of the root ball, and the hole that it is to be planted in, as well as any other unique factors\textsuperscript{103}. A valuable source for information on the best procedures for planting is the American Association of Nurserymen, which publishes the “American Standard for Nursery Stock” which is a key resource for developing planting specifications. This document can be accessed online at \url{http://agri.nv.gov/Brochures/ANLASTandard2004.pdf}.

Pursuant to the conditions set forth in this document, more specifically Appendix 1A, the following guidelines are applicable to all tree plantings:

**A. Planting location**

1. Trees shall be planted so as to minimize future interference with nearby utility wires or other infrastructure;
2. When possible the tree leader shall be offset so as to prevent interference with overhead powerlines;
3. All trees shall adhere to the following minimum planting distances for all utility or site infrastructure clearances (measured from the center of the trunk of the applicable tree):
   - I. 10 feet from all buildings;
   - II. 5 feet from a fire hydrant (minimum of 2 feet for tree pits);
   - III. 10 feet from all drain inlets, catch basins, and trench drains;
   - IV. At least 1.5 feet from the curb line or driveway with necessary consideration given to sight triangles:
     - a. Review by the County Engineer and Shade Tree Coordinator required;
   - V. At least 7 feet from a curb cut or driveway with necessary consideration given to site triangles;

\textsuperscript{102} “A Guide: Developing a Street and Park Tree Management Plan”. The USDA Forest Service, Northeastern Area. The Northeast Center for Urban & Community Forestry Holdsworth Natural Resource Center. The University of Massachusetts, Amherst, MA. V.1.0

\textsuperscript{103} “A Guide: Developing a Street and Park Tree Management Plan”. The USDA Forest Service, Northeastern Area. The Northeast Center for Urban & Community Forestry Holdsworth Natural Resource Center. The University of Massachusetts, Amherst, MA. V.1.0
VI. 15 feet from a stop sign with necessary consideration given to sight triangles;
   a. Review by the Municipal Engineer and/or County Engineer and Shade Tree Coordinator is required;
VII. At least 10 feet from all traffic signs (excluding stop signs);
VIII. 25 feet from a street intersection with necessary consideration given to sight triangles:
   a. Review by the Municipal Engineer and/or County Engineer and Shade Tree Coordinator required.

4. Trees shall not be planted in front of building entrances to minimize interference with emergency responders;
5. Trees shall not be planted in bus stops;
6. Minimum distances between planted trees shall be 15 feet depending upon site conditions;
7. Within sight triangles, a single tree may be permitted only with site-specific approval of the Municipal Engineer and/or County Engineer, and Shade Tree Coordinator. Such trees, including those at driveways, shall be of such size as will enable them to be immediately pruned up to seven feet height upon planting.
8. Where on-street parking is provided, trees, shrubs and raised planters should be located as not to conflict with opening car doors or pedestrian access to and from on-street parking.

B. Planting Specifications
1. Trees shall be planted in tree pits or within a planting strip, in accordance with these requirements. Construction specifications for tree planting are provided in Figure’s 3 and 4 below;
2. Tree planting pits should be as large as possible to allow for ample growing space for tree roots and crown. The overall width of a sidewalk can limit the size of a tree pit. The minimum width of a tree pit in the sidewalk area is 3 feet;
3. Consider using continuous planting strips as opposed to individual tree pits, wherever possible;
4. Trees shall be properly planted in accordance with accepted horticultural standards; the standards and construction details used shall be submitted with the application and plans;
5. A protective root barrier shall be installed to a depth of eighteen (18) inches within the planting bed, between the sidewalk and the curb;
6. Depending on the size of the tree, stalking of trees is not recommended unless required by the County Engineer or Inspector;
7. A prepared planting medium shall be used that is capable of permitting the percolation of water and air;

8. The surface of the planting area shall be mulched with wood-chips, or other suitable material to conserve soil moisture. Mulch shall be applied to a uniform depth of three (3) inches and shall be so distributed as to create a smooth, level cover over the exposed soil. A gap of approximately 2” should be left between the mulch and the trunk of the tree to avoid mounding above the trunk flare and to avoid the “mulch volcano”;

9. On site irrigation methods shall be specified. Water hose locations shall be convenient and underground irrigation shall be provided if deemed appropriate and suitable;

10. The use of tree grates in areas with considerable commercial and pedestrian activity shall be used and considered as a temporary structure with a 5-10 year life span. Only ADA compliant tree grates shall be permitted, as well as those that allow for radial expansion as the tree grows. The Shade Tree Coordinator shall review all planting locations and assess the level of pedestrian activity to determine the appropriate tree grate (if any) to be used;

11. During construction, protective barriers shall be installed around each pit and/or group of plants that are to be retained within the county right-of-way. Barriers shall be self-supporting and shall not be attached to the vegetation being protected. Barriers shall be a minimum of four (4) feet high and constructed of highly visible orange plastic mesh that is durable and that will last until construction is completed, i.e. snow fences;

12. Gator bags or a similar product shall be put in place for a period of one (1) year if on-site irrigation is not possible or provided. Best Management Practices regarding the use of Gator Bags must be followed.

13. Required materials to be used for all tree plantings include:
   a. Peat Moss;
   b. Bio-Tone or similar plant food for use with trees;
   c. Tree oxygenators;
   d. Mulch;
   e. Watering Bags;
   f. Tree stakes/guiding poles;
   g. Tree grate where applicable;
   h. Tree

Refer to Appendix 1 of this document for the Hudson County Tree Planting Requirements.
Figure 5 - Tree Planting Detail
Figure 6 - Tree Pit Detail
TREE MAINTENANCE & CARE

It is important to institute a regular maintenance plan to ensure the continued success of the urban forestry resource.

Goal: To create an environment where shade trees can successfully grow and to create a proactive tree maintenance program.

Objectives:

1. Develop a working database of all trees and planting spaces along county owned roads, properties and parks;
2. To analyze data collected to help prioritize the determination of work projects and future planting opportunities;
3. Improve program administration and clarify staff roles;
4. To create an inventory of equipment for tree maintenance and a “wish list” of what the county will need to effectively carry out the proposed maintenance and pruning schedule;
5. Identify potentially hazardous trees through regular inspections;
6. Develop and utilize a Hazard Tree Assessment Scale.

IDENTIFICATION OF HAZARDOUS TREES

Trees located on County roads, parks and properties should be visually inspected annually in order to determine if additional pruning or maintenance is required other than the standard scheduled maintenance described above. This will help to reduce the risk of a hazard tree falling and injuring a person or damaging private property. In addition, special attention should be paid to trees that are located underneath utility lines because not only do they pose a risk to people and private property, but if a branch hits a power lines there can be power outages, surges, fires and other damage. The following is a checklist provided by the International Society of Arboriculture that can help the County employees responsible for tree maintenance determine if a tree is in need of additional attention.
TREE HAZARD CHECKLIST

Consider these questions:

1. Are there large dead branches in the tree?
2. Are there detached branches hanging in the tree?
3. Does the tree have cavities or rotten wood along the trunk or in major branches?
4. Are mushrooms present at the base of the tree?
5. Are there cracks or splits in the trunk or where branches are attached?
6. Have any branches fallen from the tree?
7. Have adjacent trees fallen over or died?
8. Has the trunk developed a strong lean?
9. Do many of the major branches arise from one point on the trunk?
10. Have the roots been broken off, injured, or damaged by lowering the soil level, installing pavement, repairing sidewalks, or digging trenches?
11. Has the site recently been changed by construction, raising the soil level, or installing lawns?
12. Have the leaves prematurely developed an unusual color or size?
13. Have trees in adjacent wooded areas been removed?
14. Has the tree been topped or otherwise heavily pruned?

The following are defects or signs of possible defects in urban trees:

1. Re-growth from topping, line clearance, or other pruning;
2. Electrical line adjacent to tree;
3. Broken or partially attached branch;
4. Open cavity in trunk or branch;
5. Dead or dying branches;
6. Branches arising from a single point on the trunk;
7. Decay and rot present in old wounds;
8. Recent change in grade or soil level, or other construction.

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Figure 7 - Defects / Signs of Defects in Urban Trees

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In addition, a Tree Hazard Assessment Scale has been developed which is intended to provide a guide to the Hudson County Shade Tree Program’s response to health and safety issues regarding the County’s urban forestry resources. Hazards are ranked from 1-5 with 1 representing low hazard priority and 5 representing the highest priority, requiring immediate attention and remediation. The scale can be viewed in Appendix 2.

**TREE SERVICE REQUEST PROCESS**

Requests for pruning, removal or inspection of trees owned and maintained by Hudson County can be made by any department, municipality or individual residing in Hudson County. All requests must follow this procedure:

1. All requests must be mailed or called in to the Division of Parks or the Hudson County Shade Tree Coordinator (Division of Planning).
2. All information will be sent to the Hudson County Shade Tree Coordinator (Division of Planning) for review and referred to the appropriate department.
3. Emergency situations will be dealt with in an expedited manner and sent directly to the appropriate department supervisor.
4. Work requests will be completed in the order they are received.
5. All property owners adjacent to the requested work will be notified of any action to be taken.
6. Records of inspections and tree removal are maintained by the Inspector of the Division of Planning.
7. Records of pruning and general maintenance are maintained by the Roads Department.
8. Removal of trees over 60’ will be contracted out to a private tree care firm.

**MANAGING TREE HAZARDS**

After a hazard tree has been identified, it is important to take quick action to prevent the tree from further deterioration. It is important to note that without an impending threat to the public or the provision of utility services, County permission is required to remove any tree located on a county road or property. After the situation has been evaluated, the International Society of Arboriculture recommends the following actions:

- **Remove the target.** While a home or a nearby power line cannot be moved, it is possible to move picnic tables, cars, landscape features, or other possible targets to prevent them from being hit by a falling tree. This is a temporary solution pending a more permanent mitigation action;
- **Prune the tree.** Remove the defective branches of the tree. Because inappropriate pruning may weaken a tree, pruning work is best done by an ISA Certified Arborist;
• **Cable and brace the tree.** Provide physical support for weak branches and stems to increase their strength and stability.

• **Provide routine care.** Mature trees need routine care in the form of water, fertilizer (in some cases), mulch, and pruning as dictated by the season and their structure.

• **Remove the tree.** Some hazardous trees are best removed. If possible, plant a new tree in an appropriate place as a replacement.\(^{105}\)

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### TREE PRUNING

As described by the USDA Forest Service, the main reasons for pruning shade trees include safety, health and aesthetics. Pruning for safety involves removing branches that could fall and cause injury or property damage, trimming branches that interfere with lines of sight on streets or driveways and removing branches that grow into utility lines. Pruning for health involves removing diseased or insect-infested wood, thinning the crown to increase airflow and reduce some pest problems, and removing crossing and rubbing branches. Pruning for aesthetics involves enhancing the natural form and character of trees or stimulating flower production.\(^{106}\) The USDA Forest Service has a useful manual with detailed instructions on proper pruning techniques entitled “How to Prune Trees.”\(^{107}\) This document can be found on the USDA’s Forest Service Website for the Northeastern Area at [http://na.fs.fed.us](http://na.fs.fed.us) and will be made available on the Division of Planning’s website.

Some general guidelines provided by the National Arbor Day Foundation include\(^{108}\):

- Never remove more than 1/3 (33%) of a tree's crown (total number of leaves in the canopy) in a season. Typically it is best to remove less than ¼ (25%) of the leaves.
- Where possible, try to encourage side branches that form angles that are 1/3 off vertical (10:00 or 2:00 positions) from the parent stem.
- For most species, the tree should have a single trunk, a central growing stem, taller than the other lateral branches that grow off of the trunk.
- Ideally, the size of main side branches should not exceed 2/3 the diameter of the parent stem.

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\(^{106}\) Bedker, Peter J., O’Brien, Joseph G., Mielke, Manfred M. “How to Prune Trees” The USDA Forest Service, Northeastern Area State and Private Forestry. NA-FR-01-95


\(^{108}\) The Redwood City, Ca, Public Services website, as adapted from the adapted from the National Arbor Day Foundation’s “9 Things You Should Know About Trees” [http://www.redwoodcity.org/publicworks/trees/management.htm](http://www.redwoodcity.org/publicworks/trees/management.htm)
• If removal of a main branch is necessary, cut it back to where it is attached to another large branch or the trunk (see make proper pruning cuts below).
• Do not truncate a branch or leave a stub or small sprout.
• If the branch is removed at a lateral branch rather than the trunk - the lateral branch, which will become the new terminal shoot, should be at least ½ the diameter of the parent branch.
• For most deciduous (broadleaf) trees, don't prune up from the bottom any more than 1/3 of the tree’s total height.

MAKE PROPER PRUNING CUTS

Large Limbs

A. Make a partial undercut from beneath.
B. Make a second cut from above several inches out and allow the limb to fall.
C. Complete the job with a final cut just outside the branch collar.

Small Branches

• Make a sharp clean cut, just beyond a lateral bud or other branch.

Figure 8 - Three Cut Pruning for Large Limbs

Figure 9 - Pruning Small Branches
TREES AND UTILITIES
Because Hudson County is a densely populated urban area, it is especially important to implement preventative measures as well as consistent monitoring and maintenance to minimize interference between shade trees and utilities infrastructure. The maximum tree height must be within the available space of overhead growing space in relation to any overhead utility wires so as to minimize future interference and maintenance. It is also important to make sure there is not a conflict underground between sub-surface utilities and the anticipated root area of the tree, which is often a larger area than the branch spread above ground. Prior to planting it is important to have a utility “mark-out” performed to make sure there will be no conflicts between the tree and utilities.

Pursuant to the conditions set forth in this document, specifically Appendix 1, the following guidelines are applicable to tree maintenance and removal:

A. Tree Removal
   i. No person shall remove any tree along a County Right-of-Way without first obtaining a permit and/or gaining the approval of the Hudson County Shade Tree Coordinator;
   ii. Every reasonable measure shall be taken to avoid the removal of healthy deciduous trees with a caliper in excess of 24 inches or healthy coniferous trees with a height in excess of fifteen (15) feet.

B. Tree Replacement
   i. Any tree along County property or along the County Right-of-Way that is removed as a result of a site plan application subject to County approval shall be replaced with an acceptable shade tree as set forth by this document. If a replacement tree cannot be replaced due to site conditions, payment-in-lieu-of planting can be made as set forth in the Hudson County Land Development Regulations and Appendix 1A of this document. A combination of replacement plantings and payments-in-lieu-of plantings may be arranged with the Hudson County Shade Tree Coordinator as a condition of approval;
   ii. Developers are required to preserve as many of the existing trees as practical. Trees that are being preserved on a work site must be protected, as per the planting specifications, with snow fences or a similar method;
   iii. Any planted tree that is dead or, in the of the Shade Tree Coordinator, is in an unhealthy or unsightly condition, and/or has lost its natural shape due to dead branches, excessive pruning, inadequate or improper maintenance, or other causes including vandalism, prior to final acceptance, shall be replaced in the next planting season. There shall be a two (2) year
guarantee on trees commencing after the final inspection of the permitted planting. The topsoil in the tree pit shall be changed when any replacement tree is planted. All new plantings must adhere to the planting specifications outlined under Tree Planting, Section B-13.

iv. Where dead trees have been identified, whether due to natural causes or vandalism, the dead material shall be removed by the property owner, including stakes, and Arbor Tie within three (3) weeks of notification. When necessary, topsoil, grass seed or appropriate paving material shall be added to the pit by the property owner to eliminate potential tripping hazards at the time of removal.

v. Where vandalism or related causes are agreed as the cause for tree replacement, the applicant or property owner shall be responsible for one replacement during the two (2) year guarantee period after final inspection of the permitted planting.

C. Maintenance

i. Maintenance of new trees shall be the responsibility of the adjoining property owner unless provided by the municipality.

ii. Maintenance shall include weeding, cultivating, edging, pruning, adjustment and repair of stakes, and Arbor Tie™, repair of minor washouts, soil replacement and other horticultural operations necessary for the proper growth of all trees, and for keeping the entire planting area neat in appearance.

D. Time of Guarantee

All trees shall be guaranteed for a period of two (2) years from the date that all improvements are accepted as complete. Both the planting of and the two (2)-year guarantee for trees shall be covered under the developer’s performance security for the road and/or drainage improvements.

SIDEWALK MAINTENANCE PROGRAM

Sidewalks along both municipal and county roads fall under the jurisdiction of the host municipality. In most cases, homeowners are responsible for sidewalk maintenance in front of their property. However, the Hudson County Division of Roads does perform routine maintenance along all county roads. Issues of sidewalk uplift due to trees maintained by the County will be reported to the Hudson County Shade Tree Coordinator.
STORMWATER MANAGEMENT

Hudson County has a stormwater management plan County roads. Stormwater management for streets throughout the municipalities also falls under the jurisdiction of the individual municipalities. Municipalities manage all street sweeping along County roads through a Shared Services agreement. In addition, the Division of Planning has applied “No Dumping” medallions and inventoried catch basins and outfalls located on or along County Roads.

Please refer to the Hudson County Stormwater Management Plan and the County’s Land Development Regulations for more information.
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<td>□ Continue all existing public education, awareness and outreach</td>
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<td>programs</td>
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<td>□ Continue HCIA quarterly newsletter submission</td>
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<td>□ Inform local newspapers on any major County events</td>
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<td>□ Set up a horticulture/tree awareness booth at the HCIA Earth Day</td>
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<td>2  Resident Tree Planting</td>
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<td>□ Prepare mailing/survey to all residents along a County road to</td>
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<td>gauge interest</td>
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<td>□ Create a contract with interested residents to confirm commitment</td>
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<td>□ Establish Hazardous Tree Hotline for Hudson County residents</td>
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<td>□ Provide information materials including type of tree species, tree</td>
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<td>care instructions and hazard tree identification</td>
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<td>□ Continue outreach effort</td>
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<td>3  Shade Tree Website</td>
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<td>□ Create the Hudson County Tree website</td>
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<td>□ Maintain and update educational website identifying and mapping</td>
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<td>the location of trees on county roads</td>
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<td>□ Update tree maintenance guidelines</td>
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<td>□ Create a form for residents to request a tree planting on a</td>
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<td>□ Create program for “Adopt-A-Tree” program through the county</td>
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<td>PUBLIC EDUCATION, AWARENESS &amp; OUTREACH</td>
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<td>Arbor Day</td>
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<td>□</td>
<td>Select a tree as the &quot;County tree&quot;</td>
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<td>□</td>
<td>Plant 1 tree in each of the 12 municipalities</td>
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<td>□</td>
<td>Increase the number of trees planted in each municipality</td>
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| 5 | Coordinate Local Effort |
| □ | Promote the involvement of volunteers, community groups, and local environmental organizations |
| □ | Recruit volunteers from high school clubs and youth groups |

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<th>TREE INVENTORY/ASSESSMENT</th>
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<th>HAZARD TREE IDENTIFICATION AND MANAGEMENT</th>
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<tr>
<td>TREE MAINTENANCE AND CARE</td>
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<tr>
<td>□ Determine each department’s responsibility in terms of tree maintenance</td>
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<td>□ Create an inventory of equipment for tree maintenance and what is needed in the future</td>
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<tr>
<td>□ Create a tree waste recycling program (i.e. mulch and firewood available to residents)</td>
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<tr>
<td>□ Create a tree care disaster plan that outlines policies and procedures to follow to reduce risks</td>
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<tr>
<th>PLAN PREPARATION &amp; EVALUATION</th>
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<td>□ Prepare and Submit Annual Accomplishment Report to NJFS</td>
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<td>□ Prepare Five Year Evaluation</td>
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<td>□ Evaluate goals and objectives</td>
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<td>□ Evaluate progress and begin formulating new objectives</td>
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SECTION 10 - COMMUNITY STEWARDSHIP INCENTIVE PROGRAM (CSIP)

Program Components:

1. **Training (p. 17):** Two members of the Community Forestry Program will attend CORE training and CEU training.

2. **Community Forestry Ordinance Establishment:** Hudson County will encourage municipalities to create and enforce shade tree ordinances. An ordinance may be established by the Board of Chosen Freeholders when a Shade Tree Commission or Department is established.

3. **Public Education & Awareness (p. 19):** It is anticipated that all outreach and public awareness programs will expand over the course of the next five years. In addition, the County plans to plant 100 new shade trees every year for the next five years, and continue to expand public demonstrations and education.

4. **Arbor Day (p.20):** Hudson County will establish an Arbor Day event.

5. **Tree Inventory (p. 2, 27):** An inventory will be completed for all County roads and properties that have not yet been done.

6. **Hazard Tree Assessment (p. 2, 27, 38):** Through the process recommended in Hazard Tree Identification and Maintenance Implementation Plan, the County tree inventory will be assessed and hazard trees will be identified.

7. **Storm Damage Assessment (p. 2, 25, 38, 50):** Storm damaged trees are handled by the Hudson County Parks Departments Forestry Division.

8. **Tree Maintenance and Removals (p.2, 15, 60):** The Parks Department currently has 1 stump grinder, 2 bucket trucks, and 1 crane. Additional purchases may be necessary to meet the needs of the County’s tree resource over the next five years.

9. **Insect and Disease Management (p. 39):** Further education and training for County officials with the Division of Parks and the Division of Roads would be beneficial throughout the implementation of this program.
10. **Wildfire Protection:** Hudson County does not have a designated agency or trained staff in the field of wildfire protection. However, since the landscape of Hudson County is not highly susceptible to wildfires, resources would be better used to address another CSIP.

11. **Tree Planting (p. 2, 3, 48, 53):** As tree planting is a major objective of this plan, the implementation methods for this CSIP are more explicitly outlined throughout various applicable sections, such as the tree selection and tree planting sections. The County will continue to explore more options and opportunities for tree plantings.

12. **Tree Recycling (p. 20):** The Hudson County Division of Parks reuses wood chips and mulch as needed throughout. In addition, they make firewood and mulch available for free to the public. Also, Hudson County coordinates a Christmas tree recycling program each season.

13. **Sidewalk Maintenance Program (p. 64):** Sidewalk maintenance on all municipal roads throughout the County falls under the jurisdiction of the individual municipalities. However, the Hudson County Division of Roads does perform all the routine maintenance along County roads. Issues of sidewalk uplift due to tree maintained by the County will be reported to the Hudson County Shade Tree Coordinator.

14. **Stormwater Management (p. 64):** Hudson County has a storm water management plan that is annually updated for all County roads and featured inlets and outfalls. Stormwater management for streets throughout the municipalities also falls under the jurisdiction of the individual municipalities. Municipalities also manage all street sweeping along County roads through a Shared Services agreement. In addition, the Division of Planning recently applied “No Dumping” medallions and inventoried catch basins located on County Roads.

15. **Other:** None at this time.