# RECONSTRUCTION OF SUMNER AVENUE AT DICKINSON STREET AND BELMONT AVENUE (THE “X")

## ASSESSING URBAN TREE BENEFITS USING I-TREE ANALYSIS TOOLS

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a summary report parepard by the US Forst Service in partnership with ReGreen Springfield

ReGreenSpringfield

# Reconstruction of Sumner Avenue at Dickinson Street and Belmont Avenue (The “X")

## ASSESSING URBAN TREE BENEFITS USING I-TREE ANALYSIS TOOLS

The reconstruction of urban infrastructure often presents opportunities to enhance the sustainability and livability of communities through the integration of green infrastructure. One such tool that aids in assessing the benefits of trees in urban settings is the i-Tree Planting software. This brief outlines how i-Tree Planting software was employed to calculate the benefits of existing, proposed, and trees that are being removed as part of the reconstruction of Sumner Avenue at Dickinson Street and Belmont Avenue (referred to as "The X”) in Springfield, MA.

**i-Tree Planting Software Overview:**

i-Tree Planting is a powerful software tool developed by the USDA Forest Service that quantifies the ecological and economic benefits of urban trees. It provides a comprehensive analysis of the urban forest's impact on air quality, stormwater management, energy conservation, and carbon sequestration. The software utilizes tree species-specific data and urban characteristics to estimate the monetary value of these benefits.

**Case Study: Sumner Avenue Reconstruction (The "X"):**

The reconstruction of Sumner Avenue offers a unique opportunity to assess the impact of trees on the urban environment. By utilizing the i-Tree Planting software, the project aimed to evaluate the benefits of existing trees, forecast the advantages of proposed tree plantings, and understand the consequences of tree removals.

**Existing Trees Assessment:**


The i-Tree Planting software analyzed the existing tree canopy cover along Sumner Avenue, evaluating their contributions to air quality improvement, stormwater runoff reduction, energy savings, and carbon sequestration. The results highlighted the significant role that the existing trees played in mitigating the urban heat island effect and enhancing local air quality.

**Proposed Tree Plantings:**

Incorporating urban forestry into the reconstruction project involved strategically planting trees along Sumner Avenue. The i-Tree Planting software allowed planners to assess the potential benefits of proposed tree plantings, including their future impact on stormwater management, energy consumption, and overall urban ecosystem health.

**Tree Removal Impact:**

Recognizing that certain trees may need to be removed due to construction requirements, the i-Tree Planting software facilitated an analysis of the loss of benefits associated with these trees. This evaluation informed decision-makers about the trade-offs and prompted discussions about mitigation measures to preserve tree canopy cover.

**Conclusion:**

The utilization of the i-Tree Planting software in the Sumner Avenue Reconstruction project (The "X") underscores the importance of considering the ecological and economic benefits of urban trees in infrastructure projects. By quantifying the advantages of existing, proposed, and removed trees, decision-makers can make informed choices that balance development needs with environmental sustainability. This case study serves as a model for integrating green infrastructure assessments into urban planning, contributing to resilient and vibrant communities.

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**About i-Tree**

The i-Tree software tools developed by the US Forest Service are a suite of tools designed to assess and analyze the benefits and value of urban trees and forests. These tools help communities, researchers, and professionals understand the ecological, economic, and social contributions that trees make to urban environments.

These i-Tree software tools collectively provide a comprehensive approach to understanding the role of trees in urban environments, facilitating informed decision-making, and promoting sustainable urban forestry practices.

For information on i-Tree please visit www.itreetools.org

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# SUMMARY OF TREE REMOVAL AND NEW PLANTING OPERATIONS 10-YEAR PROJECTIONS

**Existing Trees: Sustaining Ecological Equilibrium**

As the roadway project commences, the existing trees silently embraced their roles as ecological sentinels, their cumulative benefits set to unfold over the next decades. With steadfast dedication, they are projected to sequester an impressive 259,388.3 pounds of carbon dioxide (CO2), rendering the atmosphere a cleaner canvas for future generations. Their benefits extend beyond CO2, as they effectively remove 938.68 pounds of ozone, curbing its adverse effects on air quality. Additionally, the existing trees stand as purifiers, eliminating 36.44 pounds of sulfur dioxide and 33.14 pounds of particulate matter 2.5, thereby enhancing the health and vibrancy of the Forest Park Neighborhood.

Yet, their contributions reach beyond the realm of the air. These natural features are expected to intercept a remarkable 1,879,745.0 gallons of rainfall, a feat that not only reduces urban flooding and lessens soil erosion but nourishes the earth beneath. A further benefit lies in the avoidance of 339,406.7 gallons of runoff, allowing the land to absorb water and recharge its resources, ultimately promoting a healthy and sustainable hydrological cycle.

**Losses Due to Tree Removal: An Ecosystem Impacted**

However, the prospect of tree removal casts a shadow on these beneficial endeavors. The loss of these green canopy components would equate to a diminished ability to sequester carbon dioxide, with 28,941 pounds of CO2 left unabsorbed. The atmosphere's purification would wane, as 98.28 pounds of ozone, 3.94 pounds of sulfur dioxide, and 2.36 pounds of particulate matter 2.5 would no longer be filtered out. The intricate interaction between trees and water would also be disrupted, with 279,218.3 gallons of rainfall left unintercepted and 50,415.6 gallons of runoff untamed.

**New Trees: A Hopeful Restoration**

Yet, there is a silver lining in the form of new trees planned for the project's completion. These new trees, though not immediate counterparts to their predecessors, hold promise. Over the span of a decade, they are projected to collectively sequester 69,106.2 pounds of CO2, continue the legacy of ozone removal by eliminating 232.43 pounds, and extract 9.0 pounds of sulfur dioxide and 8.01 pounds of particulate matter 2.5 from the air.

Furthermore, these new trees possess the potential to intercept a substantial 470,331.7 gallons of rainfall, alleviating the burden on the soil, preventing erosion and lessening urban flooding. Their contributions extend to the avoidance of 84,923.1 gallons of runoff, as they participate in preserving the delicate balance of the local ecosystem.

In the end, these three scenarios underscore the indispensable role that trees play in maintaining environmental equilibrium, showcasing the cascading effects of their presence, absence, and revival.

# Reconstruction of Sumner Avenue at Dickinson Street and Belmont Avenue (The "X")

## TREE BENEFITS ANALYSIS SUMMARY

### TREE BENEFITS OF EXISTING TREES AT PROJECT START*

CO2 Sequestration - 259,388.3 pounds

Ozone Removed - 938.68 pounds

Sulfur Dioxide Removed - 36.44 pounds

Particulate Matter 2.5 Removed - 33.14 pounds

Rainfall Interception - 1,879,745.0 gallons

Runoff Avoided - 339,406.7 gallons

### TREE BENEFITS LOST BY REMOVAL OF TREES DURING PROJECT*

CO2 Sequestration - 28,941 pounds

Ozone Removed - 98.28 pounds

Sulfur Dioxide Removed - 3.94 pounds

Particulate Matter 2.5 Removed - 2.36 pounds

Rainfall Interception - 279,218.3 gallons

Runoff Avoided - 50,415.6 gallons

### TREE BENEFITS OF NEW TREES AT PROJECT COMPLETION*

CO2 Sequestration - 69,106.2pounds

Ozone Removed - 232.43 pounds

Sulfur Dioxide Removed - 9.0 pounds

Particulate Matter 2.5 Removed - 8.01 pounds

Rainfall Interception - 470,331.7 gallons

Runoff Avoided - 84,923.1 gallons

* All values calculated over a 10-year time period

# Project Report - i-Tree Planting Calculator

Location: Springfield, Massachusetts 01109
Electricity Emissions Factor: 1,113.80 pounds CO2 equivalent/MWh
Fuel Emissions Factor: 151.48 pounds CO2 equivalent/MMBtu
Lifetime: 10 years
Project Lifetime Tree Mortality: 1%

All amounts in the tables are for the full lifetime of the project.

| Location | | $CO_2$ (Carbon Dioxide) Benefits | | | |
|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | $CO_2$ (Carbon Dioxide) Avoided (pounds) | $CO_2$ Avoided ($) | $CO_2$ Sequestered (pounds) | $CO_2$ Sequestered ($) |
| 1 | • (25.0) Norway maple(Acer platanoides) at 16.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 72,215.4 | $1,679.51 | 63,443.0 | $1,475.49 |
| 7 | • (7.0) Red maple(Acer rubrum) at 11.000000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 928.9 | $21.60 | 12,328.4 | $286.72 |
| 8 | • (1.0) Sugar maple(Acer saccharum) at 22.000000000000004 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 3,662.9 | $85.19 | 2,147.5 | $49.94 |
| 9 | • (1.0) Tree of heaven(Ailanthus altissima) at 1.0 inch DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | -776.8 | $-18.07 | 256.3 | $5.96 |
| 10 | • (1.0) Serviceberry spp(Amelanchier) at 4.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 667.7 | $15.53 | 455.3 | $10.59 |

| Location | | $CO_2$ (Carbon Dioxide) Benefits | | | |
|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | $CO_2$ (Carbon Dioxide) Avoided (pounds) | $CO_2$ Avoided ($) | $CO_2$ Sequestered (pounds) | $CO_2$ Sequestered ($) |
| 11 | • (13.0) White ash(Fraxinus americana) at 6.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | -13,648.6 | $-317.42 | 7,866.7 | $182.96 |
| 12 | • (1.0) Green ash(Fraxinus pennsylvanica) at 14.000000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 3,662.9 | $85.19 | 1,187.5 | $27.62 |
| 13 | • (13.0) Thornless honeylocust(Gleditsia triacanthos v. inermis) at 17.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | -18,637.7 | $-433.46 | 25,202.0 | $586.12 |
| 14 | • (5.0) Prairie crabapple(Malus ioensis) at 7.000000000000001 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 3,310.7 | $77.00 | 3,894.9 | $90.58 |
| 15 | • (1.0) Eastern white pine(Pinus strobus) at 21.000000000000004 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | -138.0 | $-3.21 | 1,703.3 | $39.61 |

| Location | | $CO_2$ (Carbon Dioxide) Benefits | | | |
|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | $CO_2$ (Carbon Dioxide) Avoided (pounds) | $CO_2$ Avoided ($) | $CO_2$ Sequestered (pounds) | $CO_2$ Sequestered ($) |
| 16 | • (25.0) London planetree(Platanus x hybrida) at 18.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 91,573.7 | $2,129.72 | 35,180.5 | $818.19 |
| 17 | • (1.0) Douglas fir(Pseudotsuga menziesii) at 14.000000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | -138.0 | $-3.21 | 714.3 | $16.61 |
| 18 | • (19.0) Callery pear(Pyrus calleryana) at 10.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 12,739.3 | $296.28 | 22,430.3 | $521.66 |
| 19 | • (4.0) Pin oak(Quercus palustris) at 22.000000000000004 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 530.8 | $12.34 | 10,659.5 | $247.91 |
| 20 | • (15.0) Northern red oak(Quercus rubra) at 25.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 54,944.2 | $1,277.83 | 51,972.2 | $1,208.71 |

| Location | | $CO_2$ (Carbon Dioxide) Benefits | | | |
|---|---|---|---|---|---|
| **Group Identifier** | **Tree Group Characteristics** | **$CO_2$ (Carbon Dioxide) Avoided (pounds)** | **$CO_2$ Avoided ($)** | **$CO_2$ Sequestered (pounds)** | **$CO_2$ Sequestered ($)** |
| 22 | • (1.0) Lilac spp(Syringa) at 6.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 660.2 | $15.36 | 809.2 | $18.82 |
| 23 | • (15.0) Littleleaf linden(Tilia cordata) at 13.000000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | -19,946.8 | $-463.90 | 16,689.9 | $388.16 |
| 24 | • (3.0) American elm(Ulmus americana) at 5.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 4,528.3 | $105.31 | 1,588.3 | $36.94 |
| 25 | • (7.0) Elm spp(Ulmus) at 1.0 inch DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | -4,336.4 | $-100.85 | 859.4 | $19.99 |
| **Total** | | **191,802.7** | **$4,460.74** | **259,388.3** | **$6,032.57** |

| Location | | Energy Benefits | | | |
|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | Electricity Saved (kWh) (Kilowatt-Hours) | Electricity Saved ($) | Fuel Saved (MMBtu) (Millions of British Thermal Units) | Fuel Saved ($) |
| 1 | • (25.0) Norway maple(Acer platanoides) at 16.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 9,458.7 | $2,198.19 | 403.2 | $5,563.77 |
| 7 | • (7.0) Red maple(Acer rubrum) at 11.000000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 7,003.9 | $1,627.71 | -48.3 | $-666.92 |
| 8 | • (1.0) Sugar maple(Acer saccharum) at 22.000000000000004 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 465.4 | $108.16 | 20.6 | $283.75 |
| 9 | • (1.0) Tree of heaven(Ailanthus altissima) at 1.0 inch DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 66.3 | $15.41 | -5.6 | $-77.88 |
| 10 | • (1.0) Serviceberry spp(Amelanchier) at 4.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 83.3 | $19.36 | 3.8 | $51.89 |

| Location | | Energy Benefits | | | |
|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | Electricity Saved (kWh) (Kilowatt-Hours) | Electricity Saved ($) | Fuel Saved (MMBtu) (Millions of British Thermal Units) | Fuel Saved ($) |
| 11 | • (13.0) White ash(Fraxinus americana) at 6.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 10,456.4 | $2,430.07 | -171.4 | $-2,365.36 |
| 12 | • (1.0) Green ash(Fraxinus pennsylvanica) at 14.000000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 465.4 | $108.16 | 20.6 | $283.75 |
| 13 | • (13.0) Thornless honeylocust(Gleditsia triacanthos v. inermis) at 17.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 10,185.9 | $2,367.19 | -202.2 | $-2,790.83 |
| 14 | • (5.0) Prairie crabapple(Malus ioensis) at 7.000000000000001 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 391.2 | $90.92 | 18.8 | $259.62 |
| 15 | • (1.0) Eastern white pine(Pinus strobus) at 21.000000000000004 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 1,070.1 | $248.69 | -9.2 | $-127.39 |

| Location | | Energy Benefits | | | |
|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | Electricity Saved (kWh) (Kilowatt-Hours) | Electricity Saved ($) | Fuel Saved (MMBtu) (Millions of British Thermal Units) | Fuel Saved ($) |
| 16 | • (25.0) London planetree(Platanus x hybrida) at 18.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 11,634.9 | $2,703.94 | 514.1 | $7,093.77 |
| 17 | • (1.0) Douglas fir(Pseudotsuga menziesii) at 14.000000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 1,070.1 | $248.69 | -9.2 | $-127.39 |
| 18 | • (19.0) Callery pear(Pyrus calleryana) at 10.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 1,635.2 | $380.03 | 71.4 | $985.06 |
| 19 | • (4.0) Pin oak(Quercus palustris) at 22.000000000000004 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 4,002.2 | $930.12 | -27.6 | $-381.10 |
| 20 | • (15.0) Northern red oak(Quercus rubra) at 25.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 6,980.9 | $1,622.36 | 308.4 | $4,256.26 |

| Location | | Energy Benefits | | | |
|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | Electricity Saved (kWh) (Kilowatt-Hours) | Electricity Saved ($) | Fuel Saved (MMBtu) (Millions of British Thermal Units) | Fuel Saved ($) |
| 22 | • (1.0) Lilac spp(Syringa) at 6.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 76.6 | $17.81 | 3.8 | $51.92 |
| 23 | • (15.0) Littleleaf linden(Tilia cordata) at 13.000000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 5,355.6 | $1,244.64 | -173.3 | $-2,391.79 |
| 24 | • (3.0) American elm(Ulmus americana) at 5.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 562.2 | $130.65 | 25.5 | $352.19 |
| 25 | • (7.0) Elm spp(Ulmus) at 1.0 inch DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 454.6 | $105.65 | -32.2 | $-443.82 |
| **Total** | | **71,418.9** | **$16,597.76** | **710.9** | **$9,809.51** |

| Location | | Ecological Benefits | | | |
|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | Tree Biomass (short ton) | Rainfall Interception (gallons) | Runoff Avoided (gallons) | Runoff Avoided ($) |
| 1 | • (25.0) Norway maple(Acer platanoides) at 16.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 39.7 | 171,432.0 | 30,953.8 | $276.60 |
| 7 | • (7.0) Red maple(Acer rubrum) at 11.000000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 5.8 | 42,778.4 | 7,724.1 | $69.02 |
| 8 | • (1.0) Sugar maple(Acer saccharum) at 22.000000000000004 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 2.8 | 10,764.6 | 1,943.7 | $17.37 |
| 9 | • (1.0) Tree of heaven(Ailanthus altissima) at 1.0 inch DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 0.1 | 1,543.5 | 278.7 | $2.49 |
| 10 | • (1.0) Serviceberry spp(Amelanchier) at 4.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 0.1 | 3,283.0 | 592.8 | $5.30 |

| Location | | Ecological Benefits | | | |
|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | Tree Biomass (short ton) | Rainfall Interception (gallons) | Runoff Avoided (gallons) | Runoff Avoided ($) |
| 11 | • (13.0) White ash(Fraxinus americana) at 6.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 3.1 | 64,205.7 | 11,593.0 | $103.59 |
| 12 | • (1.0) Green ash(Fraxinus pennsylvanica) at 14.000000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 0.7 | 13,099.7 | 2,365.3 | $21.14 |
| 13 | • (13.0) Thornless honeylocust(Gleditsia triacanthos v. inermis) at 17.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 18.8 | 207,953.1 | 37,548.0 | $335.53 |
| 14 | • (5.0) Prairie crabapple(Malus ioensis) at 7.000000000000001 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 1.6 | 23,805.0 | 4,298.2 | $38.41 |
| 15 | • (1.0) Eastern white pine(Pinus strobus) at 21.000000000000004 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 1.3 | 17,205.6 | 3,106.6 | $27.76 |

| Location | | Ecological Benefits | | | |
|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | Tree Biomass (short ton) | Rainfall Interception (gallons) | Runoff Avoided (gallons) | Runoff Avoided ($) |
| 16 | • (25.0) London planetree(Platanus x hybrida) at 18.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 27.4 | 464,437.7 | 83,858.8 | $749.36 |
| 17 | • (1.0) Douglas fir(Pseudotsuga menziesii) at 14.000000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 0.5 | 10,056.4 | 1,815.8 | $16.23 |
| 18 | • (19.0) Callery pear(Pyrus calleryana) at 10.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 11.5 | 140,299.8 | 25,332.5 | $226.37 |
| 19 | • (4.0) Pin oak(Quercus palustris) at 22.000000000000004 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 9.5 | 98,113.9 | 17,715.4 | $158.31 |
| 20 | • (15.0) Northern red oak(Quercus rubra) at 25.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 53.6 | 428,243.8 | 77,323.7 | $690.96 |

| Location | | Ecological Benefits | | | |
|---|---|---|---|---|---|
| **Group Identifier** | **Tree Group Characteristics** | **Tree Biomass (short ton)** | **Rainfall Interception (gallons)** | **Runoff Avoided (gallons)** | **Runoff Avoided ($)** |
| 22 | • (1.0) Lilac spp(Syringa) at 6.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 0.3 | 3,978.1 | 718.3 | $6.42 |
| 23 | • (15.0) Littleleaf linden(Tilia cordata) at 13.000000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 10.6 | 154,129.4 | 27,829.6 | $248.69 |
| 24 | • (3.0) American elm(Ulmus americana) at 5.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 0.5 | 13,991.0 | 2,526.2 | $22.57 |
| 25 | • (7.0) Elm spp(Ulmus) at 1.0 inch DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 0.2 | 10,424.4 | 1,882.2 | $16.82 |
| **Total** | | **188.0** | **1,879,745.0** | **339,406.7** | **$3,032.94** |

| Location | | Air Benefits | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | $O_3$ (Ozone) Removed (pounds) | $NO_2$ (Nitrogen Dioxide) Avoided (pounds) | $NO_2$ (Nitrogen Dioxide) Removed (pounds) | $SO_2$ (Sulfur Dioxide) Avoided (pounds) | $SO_2$ (Sulfur Dioxide) Removed (pounds) | VOC (Volatile Organic Compound) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Removed (pounds) | Avoided Value (Values for avoided pollutants) ($) | Removal Value (Values for removed pollutants) ($) |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | • (25.0) Norway maple(Acer platanoides) at 16.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 113.45 | 10.41 | 13.84 | 133.58 | 4.27 | 2.46 | 2.85 | 5.31 | $45.20 | $407.77 |
| 7 | • (7.0) Red maple(Acer rubrum) at 11.000000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 25.93 | 0.13 | 3.11 | 1.72 | 0.98 | -0.05 | 1.68 | 1.10 | $13.81 | $88.38 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | • (1.0) Sugar maple(Acer saccharum) at 22.000000000000004 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 7.16 | 0.53 | 0.87 | 6.78 | 0.27 | 0.13 | 0.14 | 0.34 | $2.26 | $25.81 |
| 9 | • (1.0) Tree of heaven(Ailanthus altissima) at 1.0 inch DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 0.50 | -0.11 | 0.05 | -1.44 | 0.02 | -0.03 | 0.01 | 0.01 | $-0.16 | $1.23 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | • (1.0) Serviceberry spp(Amelanchier) at 4.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 1.04 | 0.10 | 0.11 | 1.24 | 0.04 | 0.02 | 0.03 | 0.02 | $0.41 | $2.58 |
| 11 | • (13.0) White ash(Fraxinus americana) at 6.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 31.41 | -1.97 | 3.61 | -25.25 | 1.22 | -0.61 | 2.39 | 1.05 | $15.00 | $94.86 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | • (1.0) Green ash(Fraxinus pennsylvanica) at 14.000000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 6.97 | 0.53 | 0.81 | 6.78 | 0.27 | 0.13 | 0.14 | 0.26 | $2.26 | $22.02 |
| 13 | • (13.0) Thornless honeylocust(Gleditsia triacanthos v. inermis) at 17.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 93.42 | -2.69 | 10.56 | -34.48 | 3.65 | -0.78 | 2.29 | 2.85 | $12.61 | $269.59 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | • (5.0) Prairie crabapple(Malus ioensis) at 7.000000000000001 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 8.82 | 0.48 | 0.96 | 6.12 | 0.35 | 0.11 | 0.12 | 0.22 | $1.99 | $23.22 |
| 15 | • (1.0) Eastern white pine(Pinus strobus) at 21.000000000000004 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 15.79 | -0.02 | 2.82 | -0.26 | 0.68 | -0.02 | 0.25 | 0.98 | $2.01 | $159.84 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | • (25.0) London planetree(Platanus x hybrida) at 18.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 222.53 | 13.20 | 25.48 | 169.39 | 8.65 | 3.13 | 3.52 | 7.29 | $56.62 | $663.99 |
| 17 | • (1.0) Douglas fir(Pseudotsuga menziesii) at 14.000000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 8.13 | -0.02 | 1.44 | -0.26 | 0.35 | -0.02 | 0.25 | 0.46 | $2.01 | $74.23 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 18 | • (19.0) Callery pear(Pyrus calleryana) at 10.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 66.52 | 1.84 | 7.60 | 23.56 | 2.59 | 0.44 | 0.49 | 2.15 | $7.91 | $197.43 |
| 19 | • (4.0) Pin oak(Quercus palustris) at 22.000000000000004 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 55.14 | 0.08 | 6.51 | 0.98 | 2.11 | -0.03 | 0.96 | 2.15 | $7.89 | $179.63 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | • (15.0) Northern red oak(Quercus rubra) at 25.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 190.46 | 7.92 | 21.49 | 101.63 | 7.46 | 1.88 | 2.11 | 5.74 | $33.97 | $546.87 |
| 22 | • (1.0) Lilac spp(Syringa) at 6.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 1.48 | 0.10 | 0.16 | 1.22 | 0.06 | 0.02 | 0.02 | 0.04 | $0.39 | $3.90 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 23 | • (15.0) Littleleaf linden(Tilia cordata) at 13.000000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 81.02 | -2.88 | 9.45 | -36.90 | 3.12 | -0.77 | 1.12 | 2.94 | $2.84 | $254.18 |
| 24 | • (3.0) American elm(Ulmus americana) at 5.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 5.77 | 0.65 | 0.64 | 8.38 | 0.23 | 0.15 | 0.17 | 0.16 | $2.77 | $15.98 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | • (7.0) Elm spp(Ulmus) at 1.0 inch DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 3.14 | -0.63 | 0.33 | -8.02 | 0.13 | -0.16 | 0.07 | 0.06 | $-0.75 | $7.62 |
| **Total** | | **938.68** | **27.66** | **109.86** | **354.77** | **36.44** | **6.00** | **18.64** | **33.14** | **$209.05** | **$3,039.13** |

*Sequestration and biomass are gross values that exclude losses to mortality.*

*Application v2.6.0, powered by engine v0.13.0 (APIv2) and database v12.0.49.*

www.fs.fed.us
www.davey.com
www.arborday.org
www.urban-forestry.com
www.isa-arbor.com
www.caseytrees.org
www.esf.edu
www.northeasternforests.org


Version 2.6.0

# Project Report - i-Tree Planting Calculator

## REMOVED TREES

Location: Springfield, Massachusetts 01109
Electricity Emissions Factor: 505.21 pounds CO2 equivalent/MWh
Fuel Emissions Factor: 68.71 pounds CO2 equivalent/MMBtu
Lifetime: 10 years
Project Lifetime Tree Mortality: 1%

All amounts in the tables are for the full lifetime of the project.

| Location | | $CO_2$ (Carbon Dioxide) Benefits | | | |
|---|---|---|---|---|---|
| **Group Identifier** | **Tree Group Characteristics** | **$CO_2$ (Carbon Dioxide) Avoided (pounds)** | **$CO_2$ Avoided ($)** | **$CO_2$ Sequestered (pounds)** | **$CO_2$ Sequestered ($)** |
| 1 | • (6.0) Norway maple(Acer platanoides) at 12.8 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | -5,012.8 | $-116.58 | 11,864.4 | $275.93 |
| 2 | • (1.0) Red maple(Acer rubrum) at 15.000000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 1,661.5 | $38.64 | 2,569.0 | $59.75 |
| 3 | • (1.0) Tree of heaven(Ailanthus altissima) at 1.0 inch DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | -352.4 | $-8.19 | 256.3 | $5.96 |
| 4 | • (6.0) White ash(Fraxinus americana) at 5.66 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 6,279.7 | $146.05 | 3,410.8 | $79.33 |
| 5 | • (1.0) Green ash(Fraxinus pennsylvanica) at 14.000000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 60.2 | $1.40 | 1,187.5 | $27.62 |
| 6 | • (5.0) Thornless honeylocust(Gleditsia triacanthos v. inermis) at 18.200000000000003 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 6,551.1 | $152.36 | 10,641.2 | $247.48 |

| Location | | $CO_2$ (Carbon Dioxide) Benefits | | | |
|---|---|---|---|---|---|
| **Group Identifier** | **Tree Group Characteristics** | **$CO_2$ (Carbon Dioxide) Avoided (pounds)** | **$CO_2$ Avoided ($)** | **$CO_2$ Sequestered (pounds)** | **$CO_2$ Sequestered ($)** |
| 7 | • (1.0) Prairie crabapple(Malus ioensis) at 5.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | -259.2 | $-6.03 | 532.3 | $12.38 |
| 9 | • (3.0) London planetree(Platanus x hybrida) at 11.000000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 2,348.6 | $54.62 | 2,203.8 | $51.25 |
| 10 | • (18.0) Callery pear(Pyrus calleryana) at 9.800000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and west (270°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | -321.4 | $-7.47 | 20,721.7 | $481.92 |
| 11 | • (1.0) Pin oak(Quercus palustris) at 28.000000000000004 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and west (270°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 1,207.1 | $28.07 | 3,328.2 | $77.40 |
| 12 | • (2.0) Northern red oak(Quercus rubra) at 20.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and west (270°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 2,414.2 | $56.15 | 5,147.7 | $119.72 |
| 13 | • (1.0) Peking lilac(Syringa reticulata ssp. pekinensis) at 2.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 298.7 | $6.95 | 321.7 | $7.48 |

| Location | | $CO_2$ (Carbon Dioxide) Benefits | | | |
|---|---|---|---|---|---|
| **Group Identifier** | **Tree Group Characteristics** | **$CO_2$ (Carbon Dioxide) Avoided (pounds)** | **$CO_2$ Avoided ($)** | **$CO_2$ Sequestered (pounds)** | **$CO_2$ Sequestered ($)** |
| 14 | • (7.0) Littleleaf linden(Tilia cordata) at 10.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and west (270°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | -260.4 | $-6.06 | 5,704.3 | $132.67 |
| 15 | • (1.0) Chinese elm(Ulmus parvifolia) at 7.000000000000001 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | -758.6 | $-17.64 | 1,217.3 | $28.31 |
| **Total** | | **13,856.4** | **$322.26** | **69,106.2** | **$1,607.20** |

| Location | | Energy Benefits | | | |
|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | Electricity Saved (kWh) (Kilowatt-Hours) | Electricity Saved ($) | Fuel Saved (MMBtu) (Millions of British Thermal Units) | Fuel Saved ($) |
| 1 | • (6.0) Norway maple(Acer platanoides) at 12.8 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 4,125.2 | $958.70 | -105.0 | $-1,449.41 |
| 2 | • (1.0) Red maple(Acer rubrum) at 15.000000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 465.4 | $108.16 | 20.6 | $283.75 |
| 3 | • (1.0) Tree of heaven(Ailanthus altissima) at 1.0 inch DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 66.3 | $15.41 | -5.6 | $-77.88 |
| 4 | • (6.0) White ash(Fraxinus americana) at 5.66 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 1,809.4 | $420.51 | 77.3 | $1,067.04 |
| 5 | • (1.0) Green ash(Fraxinus pennsylvanica) at 14.000000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 1,000.6 | $232.53 | -6.9 | $-95.27 |
| 6 | • (5.0) Thornless honeylocust(Gleditsia triacanthos v. inermis) at 18.200000000000003 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 1,889.9 | $439.20 | 80.6 | $1,112.92 |

| Location | | Energy Benefits | | | |
|---|---|---|---|---|---|
| **Group Identifier** | **Tree Group Characteristics** | **Electricity Saved (kWh) (Kilowatt-Hours)** | **Electricity Saved ($)** | **Fuel Saved (MMBtu) (Millions of British Thermal Units)** | **Fuel Saved ($)** |
| 7 | • (1.0) Prairie crabapple(Malus ioensis) at 5.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 65.2 | $15.15 | -4.3 | $-59.05 |
| 9 | • (3.0) London planetree(Platanus x hybrida) at 11.000000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 660.5 | $153.51 | 29.0 | $400.81 |
| 10 | • (18.0) Callery pear(Pyrus calleryana) at 9.800000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and west (270°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 11,606.6 | $2,697.38 | -94.9 | $-1,309.96 |
| 11 | • (1.0) Pin oak(Quercus palustris) at 28.000000000000004 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and west (270°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 1,596.4 | $371.00 | 5.2 | $71.14 |
| 12 | • (2.0) Northern red oak(Quercus rubra) at 20.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and west (270°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 3,192.8 | $742.00 | 10.3 | $142.28 |
| 13 | • (1.0) Peking lilac(Syringa reticulata ssp. pekinensis) at 2.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 75.2 | $17.47 | 3.8 | $51.92 |

| Location | | Energy Benefits | | | |
|---|---|---|---|---|---|
| **Group Identifier** | **Tree Group Characteristics** | **Electricity Saved (kWh) (Kilowatt-Hours)** | **Electricity Saved ($)** | **Fuel Saved (MMBtu) (Millions of British Thermal Units)** | **Fuel Saved ($)** |
| 14 | • (7.0) Littleleaf linden(Tilia cordata) at 10.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and west (270°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 5,000.1 | $1,162.03 | -42.7 | $-588.82 |
| 15 | • (1.0) Chinese elm(Ulmus parvifolia) at 7.000000000000001 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 549.4 | $127.69 | -15.3 | $-211.31 |
| **Total** | | **32,102.9** | **$7,460.73** | **-48.0** | **$-661.83** |

| Location | | Ecological Benefits | | | |
|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | Tree Biomass (short ton) | Rainfall Interception (gallons) | Runoff Avoided (gallons) | Runoff Avoided ($) |
| 1 | • (6.0) Norway maple(Acer platanoides) at 12.8 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 6.4 | 32,886.8 | 5,938.0 | $53.06 |
| 2 | • (1.0) Red maple(Acer rubrum) at 15.000000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 1.5 | 8,303.6 | 1,499.3 | $13.40 |
| 3 | • (1.0) Tree of heaven(Ailanthus altissima) at 1.0 inch DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 0.1 | 1,543.5 | 278.7 | $2.49 |
| 4 | • (6.0) White ash(Fraxinus americana) at 5.66 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 1.3 | 27,763.3 | 5,012.9 | $44.80 |
| 5 | • (1.0) Green ash(Fraxinus pennsylvanica) at 14.000000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 0.7 | 13,099.7 | 2,365.3 | $21.14 |
| 6 | • (5.0) Thornless honeylocust(Gleditsia triacanthos v. inermis) at 18.200000000000003 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 8.4 | 86,343.3 | 15,590.1 | $139.31 |
| 7 | • (1.0) Prairie crabapple(Malus ioensis) at 5.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 0.2 | 3,510.2 | 633.8 | $5.66 |

| Location | | Ecological Benefits | | | |
|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | Tree Biomass (short ton) | Rainfall Interception (gallons) | Runoff Avoided (gallons) | Runoff Avoided ($) |
| 9 | • (3.0) London planetree(Platanus x hybrida) at 11.000000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 1.2 | 28,942.9 | 5,225.9 | $46.70 |
| 10 | • (18.0) Callery pear(Pyrus calleryana) at 9.800000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and west (270°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 10.5 | 129,841.2 | 23,444.1 | $209.50 |
| 11 | • (1.0) Pin oak(Quercus palustris) at 28.000000000000004 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and west (270°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 3.6 | 32,316.1 | 5,835.0 | $52.14 |
| 12 | • (2.0) Northern red oak(Quercus rubra) at 20.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and west (270°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 4.4 | 42,883.5 | 7,743.0 | $69.19 |
| 13 | • (1.0) Peking lilac(Syringa reticulata ssp. pekinensis) at 2.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 0.1 | 2,012.7 | 363.4 | $3.25 |
| 14 | • (7.0) Littleleaf linden(Tilia cordata) at 10.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and west (270°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 3.0 | 53,823.5 | 9,718.4 | $86.84 |

| Location | | Ecological Benefits | | | |
|---|---|---|---|---|---|
| **Group Identifier** | **Tree Group Characteristics** | **Tree Biomass (short ton)** | **Rainfall Interception (gallons)** | **Runoff Avoided (gallons)** | **Runoff Avoided ($)** |
| 15 | • (1.0) Chinese elm(Ulmus parvifolia) at 7.000000000000001 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 0.4 | 7,061.4 | 1,275.0 | $11.39 |
| **Total** | | **41.7** | **470,331.7** | **84,923.1** | **$758.87** |

| Location | | Air Benefits | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | $O_3$ (Ozone) Removed (pounds) | $NO_2$ (Nitrogen Dioxide) Avoided (pounds) | $NO_2$ (Nitrogen Dioxide) Removed (pounds) | $SO_2$ (Sulfur Dioxide) Avoided (pounds) | $SO_2$ (Sulfur Dioxide) Removed (pounds) | VOC (Volatile Organic Compound) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Removed (pounds) | Avoided Value (Values for avoided pollutants) ($) | Removal Value (Values for removed pollutants) ($) |
| 1 | • (6.0) Norway maple(Acer platanoides) at 12.8 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 20.68 | -1.59 | 2.50 | -20.44 | 0.78 | -0.44 | 0.90 | 0.92 | $3.80 | $72.06 |
| 2 | • (1.0) Red maple(Acer rubrum) at 15.000000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 5.35 | 0.53 | 0.65 | 6.78 | 0.20 | 0.13 | 0.14 | 0.24 | $2.26 | $18.92 |

| Location | | Air Benefits | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | $O_3$ (Ozone) Removed (pounds) | $NO_2$ (Nitrogen Dioxide) Avoided (pounds) | $NO_2$ (Nitrogen Dioxide) Removed (pounds) | $SO_2$ (Sulfur Dioxide) Avoided (pounds) | $SO_2$ (Sulfur Dioxide) Removed (pounds) | VOC (Volatile Organic Compound) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Removed (pounds) | Avoided Value (Values for avoided pollutants) ($) | Removal Value (Values for removed pollutants) ($) |
| 3 | • (1.0) Tree of heaven(Ailanthus altissima) at 1.0 inch DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 0.50 | -0.11 | 0.05 | -1.44 | 0.02 | -0.03 | 0.01 | 0.01 | $-0.16 | $1.23 |
| 4 | • (6.0) White ash(Fraxinus americana) at 5.66 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 13.37 | 2.00 | 1.53 | 25.61 | 0.52 | 0.47 | 0.54 | 0.44 | $8.66 | $40.04 |

| Location | | Air Benefits | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | $O_3$ (Ozone) Removed (pounds) | $NO_2$ (Nitrogen Dioxide) Avoided (pounds) | $NO_2$ (Nitrogen Dioxide) Removed (pounds) | $SO_2$ (Sulfur Dioxide) Avoided (pounds) | $SO_2$ (Sulfur Dioxide) Removed (pounds) | VOC (Volatile Organic Compound) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Removed (pounds) | Avoided Value (Values for avoided pollutants) ($) | Removal Value (Values for removed pollutants) ($) |
| 5 | • (1.0) Green ash(Fraxinus pennsylvanica) at 14.000000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 6.97 | 0.02 | 0.81 | 0.25 | 0.27 | -0.01 | 0.24 | 0.26 | $1.97 | $22.02 |
| 6 | • (5.0) Thornless honeylocust(Gleditsia triacanthos v. inermis) at 18.200000000000003 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 38.11 | 2.08 | 4.29 | 26.72 | 1.49 | 0.49 | 0.57 | 1.14 | $9.04 | $109.03 |

| Location | | Air Benefits | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | $O_3$ (Ozone) Removed (pounds) | $NO_2$ (Nitrogen Dioxide) Avoided (pounds) | $NO_2$ (Nitrogen Dioxide) Removed (pounds) | $SO_2$ (Sulfur Dioxide) Avoided (pounds) | $SO_2$ (Sulfur Dioxide) Removed (pounds) | VOC (Volatile Organic Compound) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Removed (pounds) | Avoided Value (Values for avoided pollutants) ($) | Removal Value (Values for removed pollutants) ($) |
| 7 | • (1.0) Prairie crabapple(Malus ioensis) at 5.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 1.22 | -0.08 | 0.13 | -1.06 | 0.05 | -0.02 | 0.01 | 0.03 | $-0.09 | $3.13 |
| 9 | • (3.0) London planetree(Platanus x hybrida) at 11.000000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 14.95 | 0.75 | 1.74 | 9.58 | 0.58 | 0.18 | 0.20 | 0.53 | $3.21 | $46.45 |

| Location | | Air Benefits | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | $O_3$ (Ozone) Removed (pounds) | $NO_2$ (Nitrogen Dioxide) Avoided (pounds) | $NO_2$ (Nitrogen Dioxide) Removed (pounds) | $SO_2$ (Sulfur Dioxide) Avoided (pounds) | $SO_2$ (Sulfur Dioxide) Removed (pounds) | VOC (Volatile Organic Compound) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Removed (pounds) | Avoided Value (Values for avoided pollutants) ($) | Removal Value (Values for removed pollutants) ($) |
| 10 | • (18.0) Callery pear(Pyrus calleryana) at 9.800000000000002 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and west (270°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 61.26 | -0.10 | 6.99 | -1.31 | 2.38 | -0.16 | 2.77 | 1.97 | $22.05 | $181.36 |
| 11 | • (1.0) Pin oak(Quercus palustris) at 28.000000000000004 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and west (270°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 18.97 | 0.38 | 2.26 | 4.92 | 0.72 | 0.08 | 0.40 | 0.78 | $4.06 | $63.38 |

| Location | | Air Benefits | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | $O_3$ (Ozone) Removed (pounds) | $NO_2$ (Nitrogen Dioxide) Avoided (pounds) | $NO_2$ (Nitrogen Dioxide) Removed (pounds) | $SO_2$ (Sulfur Dioxide) Avoided (pounds) | $SO_2$ (Sulfur Dioxide) Removed (pounds) | VOC (Volatile Organic Compound) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Removed (pounds) | Avoided Value (Values for avoided pollutants) ($) | Removal Value (Values for removed pollutants) ($) |
| 12 | • (2.0) Northern red oak(Quercus rubra) at 20.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and west (270°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 20.48 | 0.77 | 2.34 | 9.84 | 0.80 | 0.15 | 0.81 | 0.67 | $8.13 | $61.01 |
| 13 | • (1.0) Peking lilac(Syringa reticulata ssp. pekinensis) at 2.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 0.61 | 0.09 | 0.06 | 1.22 | 0.02 | 0.02 | 0.02 | 0.01 | $0.39 | $1.47 |

| Location | | Air Benefits | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | $O_3$ (Ozone) Removed (pounds) | $NO_2$ (Nitrogen Dioxide) Avoided (pounds) | $NO_2$ (Nitrogen Dioxide) Removed (pounds) | $SO_2$ (Sulfur Dioxide) Avoided (pounds) | $SO_2$ (Sulfur Dioxide) Removed (pounds) | VOC (Volatile Organic Compound) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Removed (pounds) | Avoided Value (Values for avoided pollutants) ($) | Removal Value (Values for removed pollutants) ($) |
| 14 | • (7.0) Littleleaf linden(Tilia cordata) at 10.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and west (270°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 26.87 | -0.08 | 3.10 | -1.06 | 1.04 | -0.08 | 1.19 | 0.92 | $9.40 | $81.98 |
| 15 | • (1.0) Chinese elm(Ulmus parvifolia) at 7.000000000000001 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 3.09 | -0.24 | 0.35 | -3.09 | 0.12 | -0.07 | 0.12 | 0.09 | $0.43 | $8.79 |
| **Total** | | **232.43** | **4.41** | **26.82** | **56.50** | **9.00** | **0.71** | **7.93** | **8.01** | **$73.15** | **$710.87** |

*Sequestration and biomass are gross values that exclude losses to mortality.*

*Application v2.6.0, powered by engine v0.13.0 (APIv2) and database v12.0.49.*








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*https://help.itreetools.org/eula/*
Version 2.6.0

# Project Report - i-Tree Planting Calculator

NEW TREES

Location: Springfield, Massachusetts 01109
Electricity Emissions Factor: 1,113.80 pounds CO2 equivalent/MWh
Fuel Emissions Factor: 151.48 pounds CO2 equivalent/MMBtu
Lifetime: 10 years
Project Lifetime Tree Mortality: 2%

All amounts in the tables are for the full lifetime of the project.

| Location | | $CO_2$ (Carbon Dioxide) Benefits | | | |
|---|---|---|---|---|---|
| **Group Identifier** | **Tree Group Characteristics** | **$CO_2$ (Carbon Dioxide) Avoided (pounds)** | **$CO_2$ Avoided ($)** | **$CO_2$ Sequestered (pounds)** | **$CO_2$ Sequestered ($)** |
| 1 | • (1.0) White fir(Abies concolor) at 4.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 1,457.0 | $33.89 | 183.6 | $4.27 |
| 2 | • (6.0) Red maple(Acer rubrum) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | -9,594.0 | $-223.13 | 2,838.3 | $66.01 |
| 3 | • (20.0) Apple serviceberry(Amelanchier x grandiflora) at 2.5 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 13,181.4 | $306.56 | 3,353.7 | $78.00 |
| 4 | • (4.0) American hornbeam(Carpinus caroliniana) at 2.5 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | -5,029.4 | $-116.97 | 674.8 | $15.69 |
| 5 | • (15.0) Ginkgo(Ginkgo biloba) at 2.5 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 9,926.1 | $230.85 | 758.3 | $17.64 |
| 6 | • (1.0) Honeylocust(Gleditsia triacanthos) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | -1,132.7 | $-26.34 | 391.4 | $9.10 |
| 7 | • (7.0) Tulip tree(Liriodendron tulipifera) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 18,737.5 | $435.78 | 2,440.8 | $56.77 |

| Location | | $CO_2$ (Carbon Dioxide) Benefits | | | |
|---|---|---|---|---|---|
| **Group Identifier** | **Tree Group Characteristics** | **$CO_2$ (Carbon Dioxide) Avoided (pounds)** | **$CO_2$ Avoided ($)** | **$CO_2$ Sequestered (pounds)** | **$CO_2$ Sequestered ($)** |
| 8 | • (8.0) Black tupelo(Nyssa sylvatica) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | -12,181.8 | $-283.31 | 2,086.5 | $48.53 |
| 9 | • (6.0) London planetree(Platanus x hybrida) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 3,964.9 | $92.21 | 1,018.8 | $23.69 |
| 10 | • (20.0) Accolade flowering cherry(Prunus subhirtella x sargentii 'Accolade') at 2.5 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | -25,568.7 | $-594.65 | 7,028.6 | $163.46 |
| 11 | • (8.0) Littleleaf linden(Tilia cordata) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 5,250.1 | $122.10 | 1,867.0 | $43.42 |
| 12 | • (8.0) American elm(Ulmus americana) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | -12,320.5 | $-286.54 | 2,673.1 | $62.17 |
| 13 | • (7.0) American elm(Ulmus americana) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 6,833.7 | $158.93 | 2,339.0 | $54.40 |

| Location | | $CO_2$ (Carbon Dioxide) Benefits | | | |
|---|---|---|---|---|---|
| **Group Identifier** | **Tree Group Characteristics** | **$CO_2$ (Carbon Dioxide) Avoided (pounds)** | **$CO_2$ Avoided ($)** | **$CO_2$ Sequestered (pounds)** | **$CO_2$ Sequestered ($)** |
| 14 | • (2.0) The David Elm(Ulmus davidiana) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | -3,264.7 | $-75.93 | 453.2 | $10.54 |
| 15 | • (5.0) Japanese zelkova(Zelkova serrata) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and east (90°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 233.5 | $5.43 | 834.6 | $19.41 |
| **Total** | | **-9,507.5** | **$-221.11** | **28,941.7** | **$673.09** |

| Location | | Energy Benefits | | | |
|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | Electricity Saved (kWh) (Kilowatt-Hours) | Electricity Saved ($) | Fuel Saved (MMBtu) (Millions of British Thermal Units) | Fuel Saved ($) |
| 1 | • (1.0) White fir(Abies concolor) at 4.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 134.8 | $31.34 | 8.6 | $118.26 |
| 2 | • (6.0) Red maple(Acer rubrum) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 1,896.9 | $440.84 | -78.1 | $-1,077.54 |
| 3 | • (20.0) Apple serviceberry(Amelanchier x grandiflora) at 2.5 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 1,556.9 | $361.82 | 74.9 | $1,033.74 |
| 4 | • (4.0) American hornbeam(Carpinus caroliniana) at 2.5 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 246.6 | $57.31 | -35.1 | $-484.63 |
| 5 | • (15.0) Ginkgo(Ginkgo biloba) at 2.5 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 1,201.9 | $279.32 | 56.2 | $775.29 |
| 6 | • (1.0) Honeylocust(Gleditsia triacanthos) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 63.3 | $14.72 | -8.0 | $-109.98 |
| 7 | • (7.0) Tulip tree(Liriodendron tulipifera) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 2,390.9 | $555.64 | 105.1 | $1,450.41 |

| Location | | Energy Benefits | | | |
|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | Electricity Saved (kWh) (Kilowatt-Hours) | Electricity Saved ($) | Fuel Saved (MMBtu) (Millions of British Thermal Units) | Fuel Saved ($) |
| 8 | • (8.0) Black tupelo(Nyssa sylvatica) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 2,048.8 | $476.14 | -96.3 | $-1,329.58 |
| 9 | • (6.0) London planetree(Platanus x hybrida) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 476.0 | $110.62 | 22.5 | $310.12 |
| 10 | • (20.0) Accolade flowering cherry(Prunus subhirtella x sargentii 'Accolade') at 2.5 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 1,476.4 | $343.12 | -180.3 | $-2,487.69 |
| 11 | • (8.0) Littleleaf linden(Tilia cordata) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 603.7 | $140.30 | 30.0 | $413.50 |
| 12 | • (8.0) American elm(Ulmus americana) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 1,449.3 | $336.82 | -92.6 | $-1,277.89 |
| 13 | • (7.0) American elm(Ulmus americana) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 844.9 | $196.36 | 38.5 | $531.88 |

| Location | | Energy Benefits | | | |
|---|---|---|---|---|---|
| **Group Identifier** | **Tree Group Characteristics** | **Electricity Saved (kWh) (Kilowatt-Hours)** | **Electricity Saved ($)** | **Fuel Saved (MMBtu) (Millions of British Thermal Units)** | **Fuel Saved ($)** |
| 14 | • (2.0) The David Elm(Ulmus davidiana) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 199.4 | $46.33 | -23.1 | $-318.80 |
| 15 | • (5.0) Japanese zelkova(Zelkova serrata) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and east (90°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 1,297.7 | $301.60 | -8.5 | $-117.98 |
| **Total** | | **15,887.5** | **$3,692.27** | **-186.3** | **$-2,570.88** |

| Location | | Ecological Benefits | | | |
|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | Tree Biomass (short ton) | Rainfall Interception (gallons) | Runoff Avoided (gallons) | Runoff Avoided ($) |
| 1 | • (1.0) White fir(Abies concolor) at 4.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 0.1 | 1,977.6 | 357.1 | $3.19 |
| 2 | • (6.0) Red maple(Acer rubrum) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 0.8 | 9,932.0 | 1,793.3 | $16.03 |
| 3 | • (20.0) Apple serviceberry(Amelanchier x grandiflora) at 2.5 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 1.0 | 41,334.3 | 7,463.3 | $66.69 |
| 4 | • (4.0) American hornbeam(Carpinus caroliniana) at 2.5 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 0.2 | 9,095.3 | 1,642.2 | $14.68 |
| 5 | • (15.0) Ginkgo(Ginkgo biloba) at 2.5 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 0.2 | 29,185.1 | 5,269.7 | $47.09 |
| 6 | • (1.0) Honeylocust(Gleditsia triacanthos) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 0.1 | 3,032.1 | 547.5 | $4.89 |
| 7 | • (7.0) Tulip tree(Liriodendron tulipifera) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 0.6 | 19,293.1 | 3,483.6 | $31.13 |

| Location | | Ecological Benefits | | | |
|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | Tree Biomass (short ton) | Rainfall Interception (gallons) | Runoff Avoided (gallons) | Runoff Avoided ($) |
| 8 | • (8.0) Black tupelo(Nyssa sylvatica) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 0.6 | 21,041.7 | 3,799.3 | $33.95 |
| 9 | • (6.0) London planetree(Platanus x hybrida) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 0.3 | 14,600.6 | 2,636.3 | $23.56 |
| 10 | • (20.0) Accolade flowering cherry(Prunus subhirtella x sargentii 'Accolade') at 2.5 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 1.9 | 46,633.6 | 8,420.2 | $75.24 |
| 11 | • (8.0) Littleleaf linden(Tilia cordata) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 0.5 | 16,644.8 | 3,005.4 | $26.86 |
| 12 | • (8.0) American elm(Ulmus americana) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 0.7 | 23,969.6 | 4,327.9 | $38.67 |
| 13 | • (7.0) American elm(Ulmus americana) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 0.6 | 20,973.4 | 3,787.0 | $33.84 |
| 14 | • (2.0) The David Elm(Ulmus davidiana) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 0.1 | 6,158.3 | 1,111.9 | $9.94 |

| Location | | Ecological Benefits | | | |
|---|---|---|---|---|---|
| **Group Identifier** | **Tree Group Characteristics** | **Tree Biomass (short ton)** | **Rainfall Interception (gallons)** | **Runoff Avoided (gallons)** | **Runoff Avoided ($)** |
| 15 | • (5.0) Japanese zelkova(Zelkova serrata) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and east (90°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 0.3 | 15,346.7 | 2,771.0 | $24.76 |
| **Total** | | **8.1** | **279,218.3** | **50,415.6** | **$450.51** |

| Location | | Air Benefits | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | $O_3$ (Ozone) Removed (pounds) | $NO_2$ (Nitrogen Dioxide) Avoided (pounds) | $NO_2$ (Nitrogen Dioxide) Removed (pounds) | $SO_2$ (Sulfur Dioxide) Avoided (pounds) | $SO_2$ (Sulfur Dioxide) Removed (pounds) | VOC (Volatile Organic Compound) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Removed (pounds) | Avoided Value (Values for avoided pollutants) ($) | Removal Value (Values for removed pollutants) ($) |
| 1 | • (1.0) White fir(Abies concolor) at 4.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 1.17 | 0.21 | 0.20 | 2.70 | 0.05 | 0.05 | 0.04 | 0.05 | $0.80 | $8.37 |
| 2 | • (6.0) Red maple(Acer rubrum) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 4.24 | -1.38 | 0.48 | -17.75 | 0.17 | -0.36 | 0.38 | 0.12 | $0.06 | $11.99 |

| Location | | Air Benefits | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | $O_3$ (Ozone) Removed (pounds) | $NO_2$ (Nitrogen Dioxide) Avoided (pounds) | $NO_2$ (Nitrogen Dioxide) Removed (pounds) | $SO_2$ (Sulfur Dioxide) Avoided (pounds) | $SO_2$ (Sulfur Dioxide) Removed (pounds) | VOC (Volatile Organic Compound) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Removed (pounds) | Avoided Value (Values for avoided pollutants) ($) | Removal Value (Values for removed pollutants) ($) |
| 3 | • (20.0) Apple serviceberry(Amelanchier x grandiflora) at 2.5 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 11.46 | 1.90 | 1.18 | 24.38 | 0.47 | 0.45 | 0.48 | 0.21 | $7.92 | $26.89 |
| 4 | • (4.0) American hornbeam(Carpinus caroliniana) at 2.5 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 3.68 | -0.73 | 0.41 | -9.30 | 0.15 | -0.18 | 0.02 | 0.10 | $-1.41 | $10.09 |

| Location | | Air Benefits | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | $O_3$ (Ozone) Removed (pounds) | $NO_2$ (Nitrogen Dioxide) Avoided (pounds) | $NO_2$ (Nitrogen Dioxide) Removed (pounds) | $SO_2$ (Sulfur Dioxide) Avoided (pounds) | $SO_2$ (Sulfur Dioxide) Removed (pounds) | VOC (Volatile Organic Compound) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Removed (pounds) | Avoided Value (Values for avoided pollutants) ($) | Removal Value (Values for removed pollutants) ($) |
| 5 | • (15.0) Ginkgo(Ginkgo biloba) at 2.5 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 9.46 | 1.43 | 1.00 | 18.36 | 0.38 | 0.34 | 0.37 | 0.20 | $6.02 | $23.55 |
| 6 | • (1.0) Honeylocust(Gleditsia triacanthos) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 1.07 | -0.16 | 0.12 | -2.10 | 0.04 | -0.04 | 0.01 | 0.03 | $-0.30 | $2.77 |

| Location | | Air Benefits | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | $O_3$ (Ozone) Removed (pounds) | $NO_2$ (Nitrogen Dioxide) Avoided (pounds) | $NO_2$ (Nitrogen Dioxide) Removed (pounds) | $SO_2$ (Sulfur Dioxide) Avoided (pounds) | $SO_2$ (Sulfur Dioxide) Removed (pounds) | VOC (Volatile Organic Compound) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Removed (pounds) | Avoided Value (Values for avoided pollutants) ($) | Removal Value (Values for removed pollutants) ($) |
| 7 | • (7.0) Tulip tree(Liriodendron tulipifera) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 8.64 | 2.70 | 0.98 | 34.66 | 0.34 | 0.64 | 0.72 | 0.26 | $11.61 | $25.01 |
| 8 | • (8.0) Black tupelo(Nyssa sylvatica) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 7.37 | -1.76 | 0.79 | -22.53 | 0.30 | -0.46 | 0.39 | 0.17 | $-0.62 | $19.01 |

| Location | | Air Benefits | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | $O_3$ (Ozone) Removed (pounds) | $NO_2$ (Nitrogen Dioxide) Avoided (pounds) | $NO_2$ (Nitrogen Dioxide) Removed (pounds) | $SO_2$ (Sulfur Dioxide) Avoided (pounds) | $SO_2$ (Sulfur Dioxide) Removed (pounds) | VOC (Volatile Organic Compound) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Removed (pounds) | Avoided Value (Values for avoided pollutants) ($) | Removal Value (Values for removed pollutants) ($) |
| 9 | • (6.0) London planetree(Platanus x hybrida) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 5.46 | 0.57 | 0.60 | 7.33 | 0.22 | 0.14 | 0.15 | 0.14 | $2.40 | $14.46 |
| 10 | • (20.0) Accolade flowering cherry(Prunus subhirtella x sargentii 'Accolade') at 2.5 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 15.10 | -3.69 | 1.60 | -47.30 | 0.61 | -0.93 | 0.15 | 0.32 | $-6.73 | $37.63 |

| Location | | Air Benefits | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | $O_3$ (Ozone) Removed (pounds) | $NO_2$ (Nitrogen Dioxide) Avoided (pounds) | $NO_2$ (Nitrogen Dioxide) Removed (pounds) | $SO_2$ (Sulfur Dioxide) Avoided (pounds) | $SO_2$ (Sulfur Dioxide) Removed (pounds) | VOC (Volatile Organic Compound) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Removed (pounds) | Avoided Value (Values for avoided pollutants) ($) | Removal Value (Values for removed pollutants) ($) |
| 11 | • (8.0) Littleleaf linden(Tilia cordata) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 6.12 | 0.76 | 0.67 | 9.71 | 0.24 | 0.18 | 0.19 | 0.15 | $3.12 | $16.09 |
| 12 | • (8.0) American elm(Ulmus americana) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 8.83 | -1.78 | 0.96 | -22.79 | 0.35 | -0.46 | 0.25 | 0.22 | $-1.82 | $23.28 |

| Location | | Air Benefits | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | $O_3$ (Ozone) Removed (pounds) | $NO_2$ (Nitrogen Dioxide) Avoided (pounds) | $NO_2$ (Nitrogen Dioxide) Removed (pounds) | $SO_2$ (Sulfur Dioxide) Avoided (pounds) | $SO_2$ (Sulfur Dioxide) Removed (pounds) | VOC (Volatile Organic Compound) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Removed (pounds) | Avoided Value (Values for avoided pollutants) ($) | Removal Value (Values for removed pollutants) ($) |
| 13 | • (7.0) American elm(Ulmus americana) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and north (0°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 7.73 | 0.99 | 0.84 | 12.64 | 0.31 | 0.23 | 0.26 | 0.19 | $4.18 | $20.37 |
| 14 | • (2.0) The David Elm(Ulmus davidiana) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and south (180°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 2.18 | -0.47 | 0.24 | -6.04 | 0.09 | -0.12 | 0.02 | 0.05 | $-0.84 | $5.64 |

| Location | | Air Benefits | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Group Identifier | Tree Group Characteristics | $O_3$ (Ozone) Removed (pounds) | $NO_2$ (Nitrogen Dioxide) Avoided (pounds) | $NO_2$ (Nitrogen Dioxide) Removed (pounds) | $SO_2$ (Sulfur Dioxide) Avoided (pounds) | $SO_2$ (Sulfur Dioxide) Removed (pounds) | VOC (Volatile Organic Compound) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Avoided (pounds) | $PM_{2.5}$ (Particulate matter smaller than 2.5 micrometers in diameter) Removed (pounds) | Avoided Value (Values for avoided pollutants) ($) | Removal Value (Values for removed pollutants) ($) |
| 15 | • (5.0) Japanese zelkova(Zelkova serrata) at 3.0 inches DBH (Diameter at Breast Height).<br>• Planted 0-19 feet and east (90°) of buildings that were built pre-1950 with heating and cooling.<br>• Trees are in excellent condition and planted in full sun. | 5.77 | 0.03 | 0.63 | 0.43 | 0.23 | -0.01 | 0.31 | 0.15 | $2.58 | $15.33 |
| **Total** | | **98.28** | **-1.37** | **10.69** | **-17.59** | **3.94** | **-0.52** | **3.73** | **2.36** | **$26.99** | **$260.47** |

*Sequestration and biomass are gross values that exclude losses to mortality.*

*Application v2.6.0, powered by engine v0.13.0 (APIv2) and database v12.0.49.*

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