Urban Forest Resource Analysis

Salt Lake City, Utah

2019

Davey Resource Group

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Executive Summary

Public trees play a vital role in Salt Lake City. They provide numerous tangible and intangible benefits to residents, visitors, and neighboring communities. Salt Lake City recognizes that public trees are a valued resource, a critical component of the urban infrastructure, and part of the City's identity. As of 2018, the public tree inventory includes 86,199 trees. The inventory data is maintained by the City using TreeKeeper®8, a software management system that allows inventory specifics to remain accurate and current with regard to tree characteristics, health, and maintenance performed.

In 2018, Salt Lake City contracted with Davey Resource Group (DRG) to complete an urban forest resource analysis to assess the structure of the urban forest along with the benefits that the resource is providing. DRG used current inventory data in conjunction with i-Tree *Streets* benefit-cost modeling software to develop a detailed and quantified analysis of the current structure, function, and value of the community urban forest. This report details the results of that analysis.

Structure

A structural analysis is the first step towards understanding the benefits provided by the public trees, as well as their management needs. As of 2018, Salt Lake City's public tree inventory includes 86,199 trees and 24,239 available planting sites on streets[1] [2]. Considering species composition, diversity, age distribution, condition, canopy coverage, and replacement value, DRG determined that the following information characterizes Salt Lake City's public tree inventory:

- 290 unique tree species were identified in the inventory.
- The predominant species are *Acer platanoides* (Norway maple) (12.6%), *Tilia cordata* (little-leaf linden) (6.2%), and *Pyrus calleryana* (flowering pear) (5.6%).[3]
- 56.3% of trees are less than 12 inches in diameter (DBH)[4], indicating a young resource that will provide greater benefits over time as individual trees mature. 12.0% of trees are larger than 24 inches in diameter.
- 62.0% of trees are in good condition.
- 31.2% of trees are in fair condition, indicating that a high percentage of public trees may require significant maintenance.
- 90.9% of trees are deciduous broadleaf, evergreen conifers are the second most prevalent at 9.1%.
- Public trees provide an estimated 1,455 acres of canopy cover, approximately 2.0% of the total land area.
- The current stocking level for the public tree inventory is based on a total 24,329 suitable planting sites (vacant sites and stumps), including 86,199 trees.

[1] Available planting sites includes vacant sites and stumps.
[2] Vacant sites were not inventoried in City golf courses, parks, or in the northwest quadrant of the city.
[3] Industry standards recommend that no species represent more than 10% of the overall inventory. As of 2018, Norway maple is overrepresented in the inventory.
[4] DBH: Diameter at Breast Height. DBH represents the diameter of the tree when measured at 1.4 meters (4.5 feet) above ground (U.S.A. standard).

- There are an estimated 12,000 potential planting sites in golf courses, parks, and the northwest quadrant of the City that were not included in the inventory.
- Replacement of the 86,199 public trees with trees of equivalent size, species, and condition, would cost nearly $280 million.

Benefits

Annually, Salt Lake City's public trees provide cumulative benefits to the community at an average value of $86.83 per tree, for a total value of nearly $7.5 million. These benefits include:

- Reducing electricity (8,330 MWh) and natural gas (278,811 therms) use through shading and climate effects for a benefit of nearly $1.1 million, an average of $12.85 per tree.
- Intercepting more than 66.4 million gallons of stormwater, valued at $332,093, an average of $3.85 per tree.
- Reducing atmospheric carbon dioxide by 13,964 tons, valued at $92,168, an average of $1.07 per tree.
- Improving air quality by removing 161,311 pounds of pollutants, valued at $143,908, an average of $1.67 per tree.
- Increasing property values for aesthetic and socioeconomic benefits worth nearly $5.8 million, an average of $67.39 per tree.

When the annual investment of $2.2 million for the management of public trees is considered, the annual net benefit (benefit minus investment) to the community is more than $5.3 million. In other words, **for every $1 invested in public trees, the community receives $3.40 in benefits.**

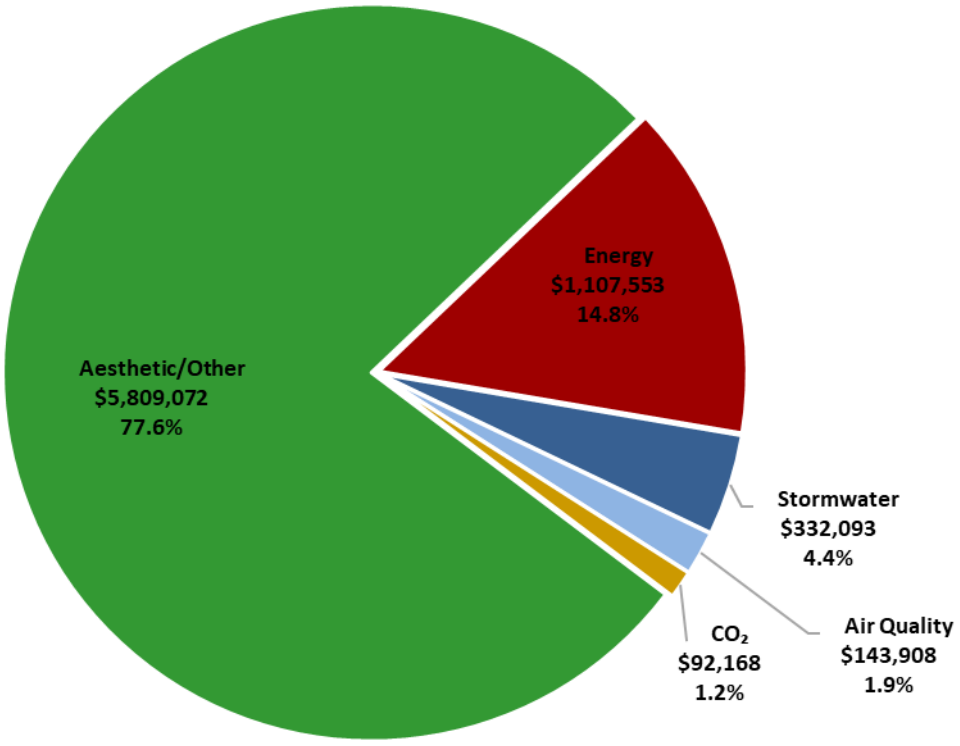

Figure 1: Benefits from the Public Tree Inventory in Salt Lake City

Management

Salt Lake City's public tree inventory is a dynamic resource that requires continued investment to maintain and realize its full benefit potential. Trees are one of the few community assets that have the potential to increase in value with time and proper management.

Appropriate and timely tree care can substantially increase lifespan. When trees live longer, they provide greater benefits. As individual trees mature, and aging trees are replaced, the overall value of the community forest and the amount of benefits provided grow as well. However, this vital living resource is vulnerable to a host of stressors and requires ecologically sound and sustainable best management practices to ensure a continued flow of benefits for future generations.

Overall, the public tree inventory in Salt Lake City is a resource in fair to good condition with a nearly ideal age distribution. With proactive management, planning, and new and replacement tree planting, the benefits from this resource will continue to increase as young trees mature.

Based on this resource analysis, DRG recommends the following:

- Provide structural pruning for young trees and establish a regular pruning cycle of less than 10 years for all trees.
- Protect high value public trees and planting sites during public and private property construction activities, and when possible improve tree growing conditions so that new trees can achieve greater size and longevity.
- Preserve and protect existing trees as long as practical to extend life-span and maximize benefits.
- Manage risk with regular inspection to identify and mitigate structural and age-related defects and reduce the likelihood of tree and branch failure.
- Increase genus and species diversity in new and replacement tree plantings to reduce reliance on the most prevalent species.
- Continue to maintain and update the inventory database, including tracking tree growth and condition during regular pruning cycles.
- Use available planting sites to improve diversity and increase benefits. Plant large-stature species for greater benefits wherever space allows.
- Work to integrate plantings of large groups of trees on golf course properties, and under-utilized park spaces.
- Promote approaches to preserve or increase soil volume and canopy space in order to grow larger trees in downtown areas, business districts, and major thoroughfares.

With adequate protection and planning, the value of the public tree inventory in Salt Lake City will continue to increase over time. Proactive management and a tree replacement plan are critical to ensuring that residents continue to receive a high return on their investment. Along with new tree installations and replacement plantings, funding for tree maintenance and inspection is vital to preserving benefits, prolonging tree life, and managing risk. Existing mature trees should be maintained and protected whenever possible since the greatest benefits accrue from the continued growth and longevity of the existing canopy. Managers can take pride in knowing that public trees support the quality of life for residents and neighboring communities.