CREATING AN URBAN FOREST STRATEGIC PLAN

Boulder’s community urban forest includes approximately 50,725 inventoried public street and park trees, managed by the City of Boulder, primarily by the City Forestry Division. These trees are a subset of the overall urban forest that also includes hundreds of thousands of trees on public and private property. As the urban forest has grown, challenges and opportunities have emerged that require a proactive management approach and a long-term planning strategy to preserve the health, sustainability, and benefits of trees and canopy cover. In 2016, the City of Boulder contracted with the Davey Resource Group (DRG) to develop an Urban Forest Strategic Plan (UFSP) to specifically address the unique challenges and opportunities Boulder’s urban forest will face over the next 20 years.
In response to recent and potential impacts to Boulder’s urban tree canopy, Boulder’s Parks and Recreation Department will complete a broader scope Urban Forest Strategic Plan. The plan will capitalize on the recently completed public tree inventory and make recommendations for urban tree management for city parks and street rights-of-way. The Urban Forest Strategic Plan (UFSP) will also allow for a more comprehensive community-wide discussion of the following topics:

- Establishment of a baseline figure for urban tree canopy and long term canopy goals;
- Tree diversification goals;
- Urban heat island mitigation;
- Prioritization of tree planting activities;
- Pesticide use guidelines for public trees;
- Appropriate pesticide use guidelines for private property owners treating public street trees;
- Placement and selection of tree species that are compatible with optimizing rooftop solar capture capacity;
- Public outreach and education regarding the benefits of the urban canopy

The Boulder Forestry Division has contracted Davey Resource Group (technical) and Two Forks Collective (community outreach) to assist in the completion of the Urban Forest Strategic Plan.

**Next Steps**

Phase 2:
Evaluate and prioritize goals. Establish a working group of community members to submit feedback and recommendations

Phase 3:
Based on outcomes of Phase 2, create action items and initiatives along with a timeline to execute Strategic Plan

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WHAT IS AN URBAN FOREST?

The Urban Forest refers to the population of all public and private trees and shrubs that grow within an urban area. And within this context of the greater Boulder Urban Forest, we are referring to the subset of Boulder’s Tree population that is carefully tended and managed by The Boulder Forestry Division.

“Urban forests are an integral part of community ecosystems, whose numerous elements – such as people, animals, buildings, infrastructure, water, and air – interact to significantly affect the quality of urban life.”

-Nowak- Sustaining America’s Urban Forest
50,725 public trees

237 unique tree species
The top 5 species are: Green ash, Siberian elm, Honeylocust, Silver maple and Cottonwood

BY THE NUMBERS

91% of the trees are in fair or better condition.

651 acres of public canopy cover
That’s about 4% of the overall land area in Boulder

Annually, Boulder’s public trees provide cumulative services to the public at an average value of $102 per tree, for a total value of nearly $5.2 million per year. These annual services include:

- $442K Combined annual value of electric and gas consumption reduction
- 2,254 Tons of atmospheric carbon that public trees capture
- 30.6M Gallons of storm water that public trees intercept

Reducing electricity and natural gas use through shading and climate effects.

Improving air quality, including removal and avoidance of pollutants.

Increasing property values, human health, community aesthetics, and socioeconomics.

GOOD RETURN. When the annual investment of nearly $1.17 million for the management of the public urban forest is considered, the annual net benefit (services minus investment) for the community is over $4 million, an average of $39 per tree. In other words, for every $1 invested in public trees, the community receives $4.46 in services.
THREATS TO OUR FOREST

INVASIVE INSECTS AND DISEASES

Dutch Elm Disease (DED | Ophiostoma fungus) Spread by the elm bark beetle, DED is responsible for the demise of over 1,300 large American elms in the city (over 30,000 statewide).

Emerald Ash Borer (EAB) This invasive insect will impact about 6,000 public and 70,000 private ash trees in Boulder.

Thousand Cankers Disease (TCD | Geosmithia fungus) Spread by the walnut twig beetle, TCD is responsible for the mortality of nearly 1,000 black walnuts in the city.

Drippy Blight (Kermes Scale and Lonsdalea Enterobacteria) A bacterial associate of this common insect pest increases red and pin oak tree dieback and mortality. Research is currently underway to determine if effective control options are available.

Thousand Canker Disease (TCD | Geosmithia fungus) Spread by the walnut twig beetle, TCD is responsible for the mortality of nearly 1,000 black walnuts in the city.

SEVERE WEATHER

Drought As water drives internal processes from photosynthesis to root growth to nutrient uptake, prolonged drought makes trees more susceptible to pests or leads to mortality.

Snow and Ice Excess weight on branches can cause breaks or internal cracks. Cold snaps after trees have broken bud can cause tissue damage and defoliation. De-icing chemicals can cause salt burn on foliage, create undesirable soil conditions and compromise overall plant health.

Extreme Temperatures Unseasonably warm or cold temperatures can cause tissue damage or dehydration. Extreme temperature fluctuations may lead to dead branches or mortality.

Wind Trees can bend and/or fall during wind events.

Climate Change Changing temperatures and precipitation patterns are expected to alter the palette of trees and the respective pests that can survive or flourish in Boulder.

DEVELOPMENT

Increased development and population growth along the Front Range could divert available water from landscapes. Land development can impact established tree canopy, however, landscaping and irrigation accompanying new structures can contribute to a healthy, sustainable tree canopy.

#TREEOPP

In 2016, a Knight Cities Foundation grant allowed the City of Boulder to partner with Bridge House, a local nonprofit that assists individuals experiencing homelessness, and BLDG 61 Makerspace to develop the TreeOpp program which employs local artisans to train apprentices with Bridge House’s Ready to Work program to use ash wood debris to craft wood products, such as furniture and crafts that can be purchased by the community.
The City Forestry Division is committed to maintaining healthy and safe city trees as well as preserving an extensive and diverse tree cover for future generations. The City’s existing well-trained Forestry staff include Certified Arborists and Qualified Tree Risk Assessors. These programs set Boulder ahead of other communities and illustrate the City’s commitment to maintaining a diverse, healthy tree population for all to enjoy.

The following are some of City Forestry’s programs and duties:

- Rotational pruning for tree health and safety of both trees in city parks and in the public street rights-of-way
- Tree planting
- Removal of dead, diseased/infested or potentially dangerous trees
- Tree safety inspections
- Integrated pest management
- Commercial tree program
- Providing development design review and enforcement of tree protection codes for public trees
- Arborist licensing
- Emergency response after major storm events
- Tree watering and mulching
- Tree inventory database maintenance
OUR CANOPY*

Percentage of Canopy Cover 15.89%

Number of Canopy Acres 2,773 acres

Planted: Average Past 20 years** 260 annual / 5,200 total

Removed: Average Past 20 years** 300 annual / 6,000 total

Environmental Benefit $876,155

*Data based on 2013 canopy assessment
**Does not reflect private property or other city projects

CITY FORESTRY BUDGET AND FUNDING

The City Forestry budget includes funds from the general fund and Parks and Recreation Sales Tax, as well as limited-term Capital Improvement Program (CIP). Currently, CIP funds are being used to address emerald ash borer management, and past uses have included tree planting campaigns and tree inventory database updates. The following characterizes typical actual City Forestry expenses over the past 3 years (2014 - 2016):

TYPICAL ANNUAL OPERATING BUDGET

- Salaries & benefits
- Pesticide Treatments
- Ash Removals
- Fleet
- Puzzling
- Commercial Tree Program
- Removals
- Seasonal Salary
- Administrative
- IPM

$956,000

ANNUAL CAPITAL IMPROVEMENTS BUDGET***

- Tank Watering
- Wood Debris
- Pesticide Treatments
- Puzzling
- Planting

$220,000

Stormwater Benefit 1,500,357 gallons at $177,016 value
Carbon Benefit 18,709 tons at $676,508 value
Air Quality Benefit 278,780 pounds at $22,631 value

*Administrative may include landscape supplies, other tree care activities, training, cell phones, technology, etc.
**IPM refers to non-emerald ash borer pesticide applications
***Percent of budget allocated for ash removals will increase annually as EAB progresses over the next five years

Stormwater Benefit
Carbon Benefit
Air Quality Benefit

1,500,357 gallons at $177,016 value
18,709 tons at $676,508 value
278,780 pounds at $22,631 value

Environmental Benefit $876,155

Tree Speak Open House | March 9, 2017 | Boulder Urban Forest Strategic Plan | Project lead: Kathleen Alexander, 303-441-4406
It is estimated that by the year 2037, 160,000 public and private trees will be removed. Our planning now will define how we will maintain a vibrant and vital canopy. As you will see in the following scenarios there is a lot of work to be done over the next twenty years to maintain our current level of canopy coverage.

While we can’t predict the future, we can anticipate tree and canopy change over the next 20 years. These canopy scenarios were developed based on mapping existing canopy, then applying change factors such as tree planting, normal tree mortality, and insects and diseases that currently exist in Boulder.

Also note, the tree canopy takes time to develop, and newly planted trees provide little impact on overall canopy area. Therefore, in order to achieve the canopy growth projected for 2037, trees would need to be planted in the first 5-10 years of the scenario.

Total Acres of Boulder Tree Canopy: 2,773*

*Based on 2013 assessment
1. **CANOPY LOSS 2037**

- **28% Canopy loss**
  - **1,997** Canopy Acres
    - **-776** Acre loss
  - **$634,439** Annual Average Environmental Benefit

2. **NET NEUTRAL 2037**

- **0% Canopy Growth**
  - **2,773** Canopy Acres
    - **0** Acre loss
  - **$876,155** Annual Average Environmental Benefit

3. **CANOPY GROWTH 2037**

- **6% Canopy Gain**
  - **2,939** Canopy Acres
    - **166** Acre gain
  - **$931,296** Annual Average Environmental Benefit

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*Percentage of canopy change based on 2,773 acres. All figures are estimates based on current data and future projections. Figures based off of $375/tree.*
For more information, visit

BranchingOutBoulder.org