Priority Planting Areas
Automating the Selection of Planting Sites

Partners in Community Forestry
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SDOT
Seattle Department of Transportation

Our mission, vision, and core values

Mission: deliver a high-quality transportation system for Seattle

Vision: connected people, places, and products

Committed to 5 core values to create a city that is:
- Safe
- Interconnected
- Affordable
- Vibrant
- Innovative

For **all**

Project Goals

- Rank areas of the city according to potential social, environmental and economic value of trees in locations that best support canopy cover, social equity and transportation safety.

- Display most current information on current stocking levels

- Identify areas where low stocking levels, available planting sites and high potential benefits intersect.

Tree Benefits Map

- Areas within environmentally critical areas
- Areas along proposed neighborhood greenways
- Areas that can accommodate large trees
- Areas within Urban Villages
- Areas with low canopy cover
- Areas near high-need or underserved populations

Processing the Map

- Create a GIS grid feature class of 150x150 foot squares. Any square that does not intersect right of way is eliminated

- Develop a weighted scoring system

- Assign scores to a grid square when it intersects an attribute layer

- Calculate a total score for each square

Tree Benefits Map
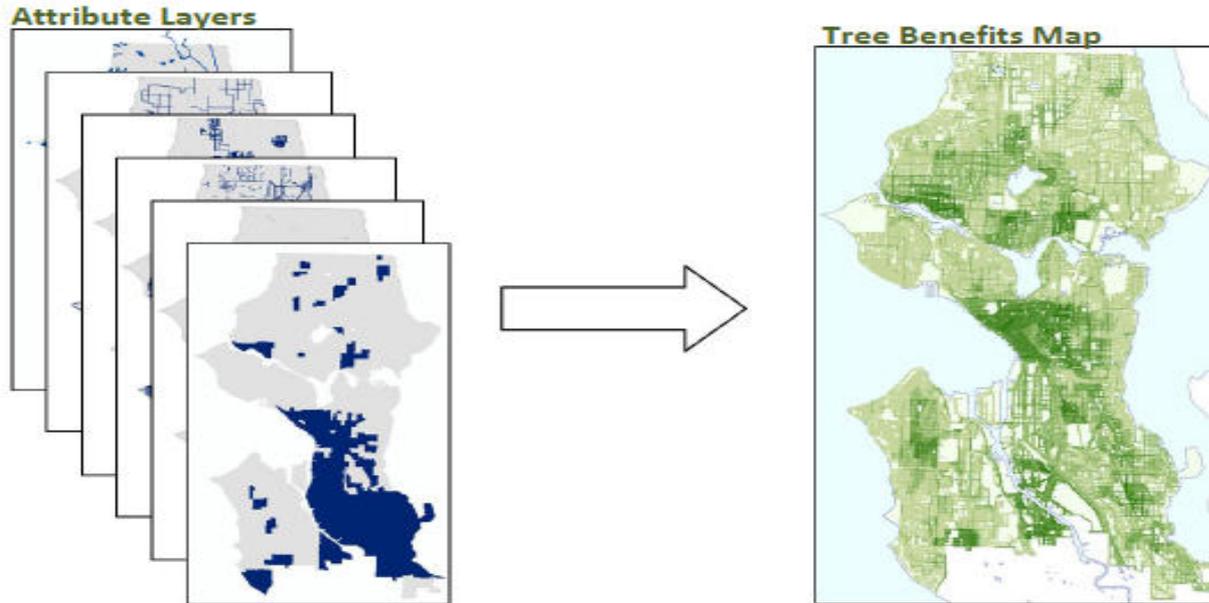
Figure 1 The Tree Benefits Map (in green) is a visualization tool that helps SDOT determine where to plant new street trees. Attribute maps are combined by determining weights, and summing them in a matrix of 150x150 foot "grid squares."

Attribute Distribution

Table 2 – In this attribute distribution matrix for the 2013 Tree Benefits Map, attribute combinations with the highest coverage appear in red, while combinations with less coverage appear in yellow (medium) and green (low). The numbers represent the percentage of the city covered by the combination of attributes on each axis.

	Wetlands	Riparian	Wildlife	Urban Village	Greenways	Low Canopy	Tree Size	Need – high	Need – highest	Intersect Probability
Wetlands	**0.034**	0.016	0.012	0.003	0.003	0.002	0.005	0.005	0.002	*0.171*
Riparian		**0.034**	0.011	0.003	0.003	0.001	0.008	0.003	0.001	*0.170*
Wildlife			**0.062**	0.011	0.005	0.003	0.011	0.009	0.005	*0.134*
Urban Village				**0.301**	0.032	0.124	0.162	0.132	0.055	*0.216*
Greenway					**0.115**	0.031	0.084	0.023	0.008	*0.208*
Low Canopy						**0.219**	0.157	0.072	0.033	*0.152*
Tree Size							**0.532**	0.119	0.042	*0.078*
Need –highest								**0.222**	X	*0.234*
Need – high								X	**0.095**	*0.222*

Street Tree Spacing Map

- Visual representation of stocking levels
- Outputs streets by color code to display…
- Fully planted (average tree spacing <30 feet)
- Planted (average tree spacind of 31 – 60 feet)
- Underplanted (average tree spacing of 61 – 180 feet)
- Very few or no trees (average tree spacing >180 feet)

Street Tree Spacing

Average spacings were calculated based on Seattle's street tree inventory on August 14th, 2013.

Values are calculated by multiplying the length of each street segment by two, and dividing by the total number of trees withing a 40 foot search distance of the segment.

Legend
Average tree spacing (ft)
- 2 - 30
- 31 - 60
- 61 - 120
- 121 - 180
- 181 - 9999
- No right of way present
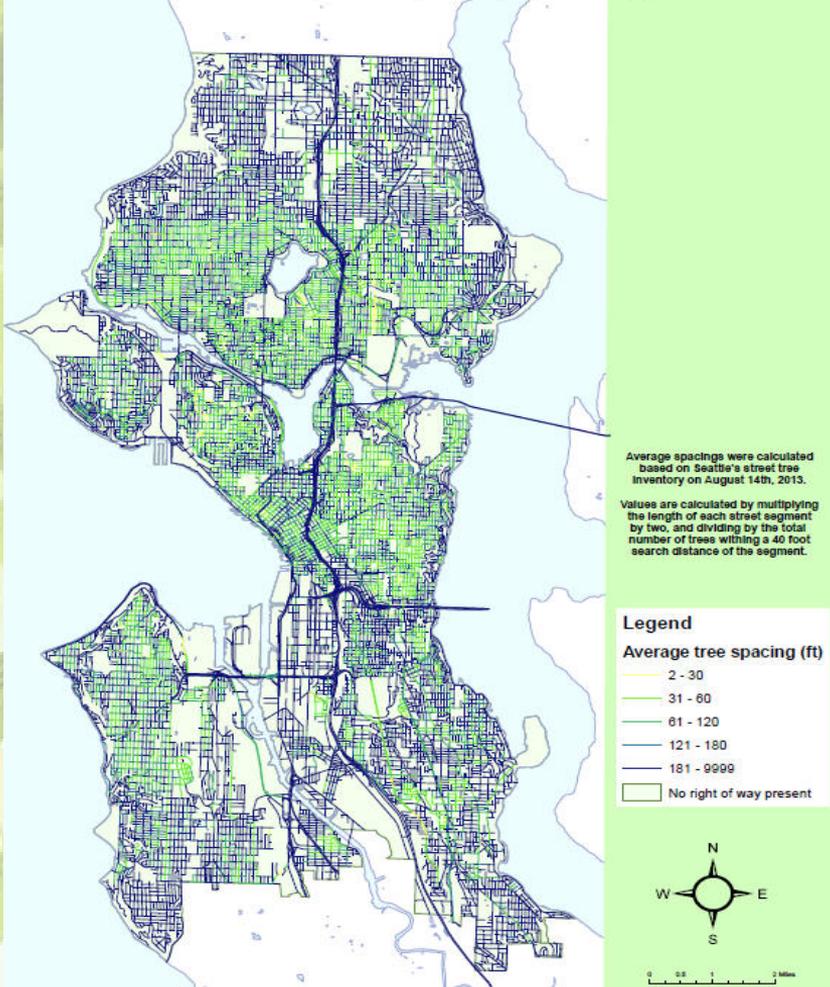
Darker colors indicate areas of greater tree spacing.

Priority Streets Mapping

- Tree Benefits map and Tree Spacing map combine to produce a Priority Streets map.
- Areas with high scores are selected from the benefits map – a layer is created with this data.
- Combined with areas from the spacing map which have low stocking levels – a layer is created with this data
- Use the "select by location" tool, select the features that intersect in the new layers.

Street Tree Restoration- Priority Streets
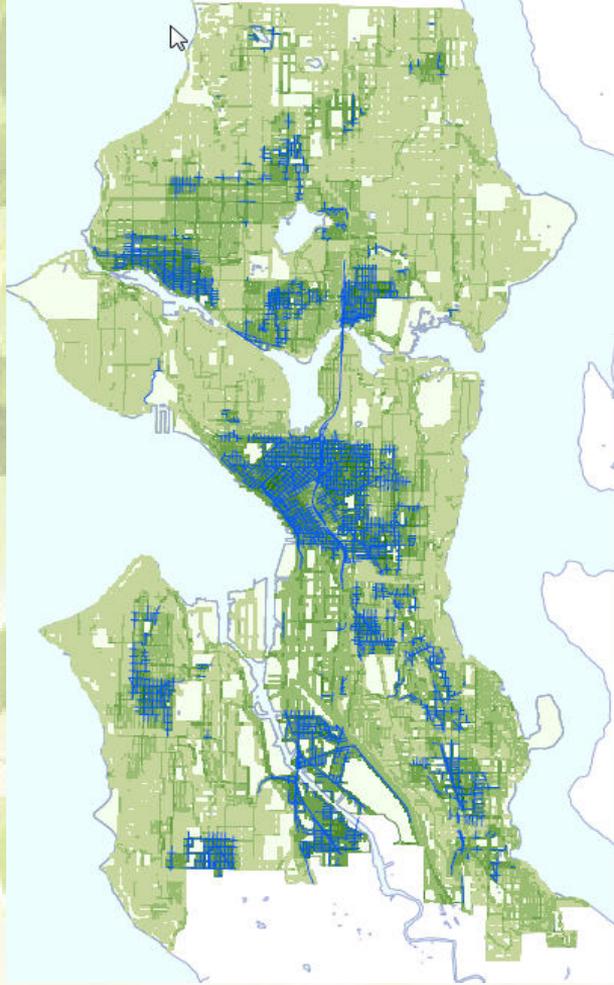
This map is designed to identify areas within Seattle that would benefit most from street tree restoration projects.

Priority Streets are generated from the intersection of the Aug 28, 2013 Street Tree Spacing Map and the 2013-2014 Tree Benefits Map.

Priority Streets are defined as streets with average tree spacings greater than 60 feet that intersect areas of the Tree Benefits Map with PP_Score values of 35 or greater.

Legend
— Priority Streets
PP_Score
  0 - 10
  11 - 20
  21 - 30
  31 - 40
  41 - 50
  No right of way present
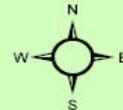
Priority Streets Mapping

- Areas identified that would most benefit from street tree restoration projects
- Tree spacing greater than 60 feet and a high benefit score

Analysis of past projects
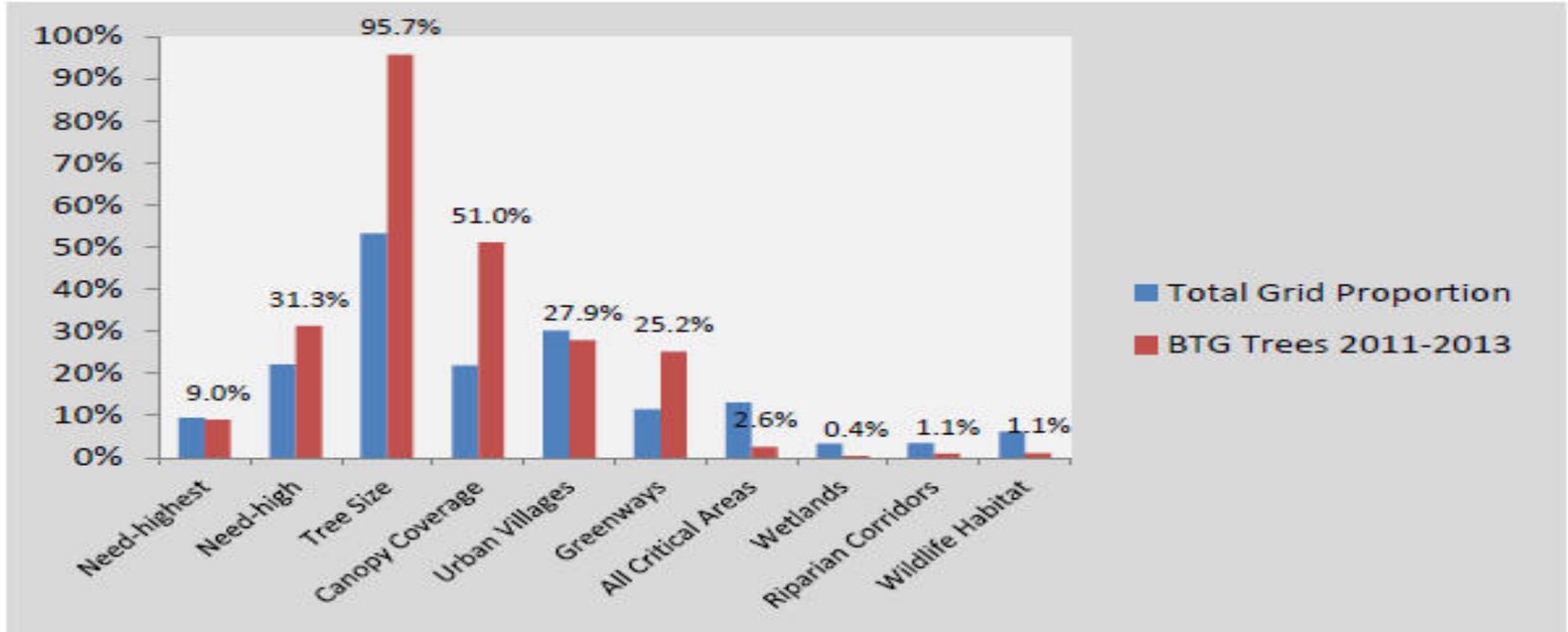
Figure 4 – The attributes represented by BTG trees planted from 2011 to 2013 (red) are compared to the percentage of the Tree Benefits Map covered by each attribute (blue).

Other Challenges

- Narrow planting strips
- Views
- Community Support
- Utility and Infrastructure Density
- Tree Maintenance responsibility (public or private)

Street Tree Map

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www.seattle.gov/transportation/arborist.htm

Questions?

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