

Concord Public Works Tree Inventory & Management Plan Project

Presenters:

Richard Reine, CPW Director

Daniel Rowley, CPW Highway & Grounds Superintendent

Andrew Hillman, Senior Urban Forester and Davey Resource Group Business Developer

Elizabeth McKinley, Urban Forester and Davey Resource Group Site Manager



**Concord Public Works
Highway and Grounds Division**





Tree Inventories and Their Usage

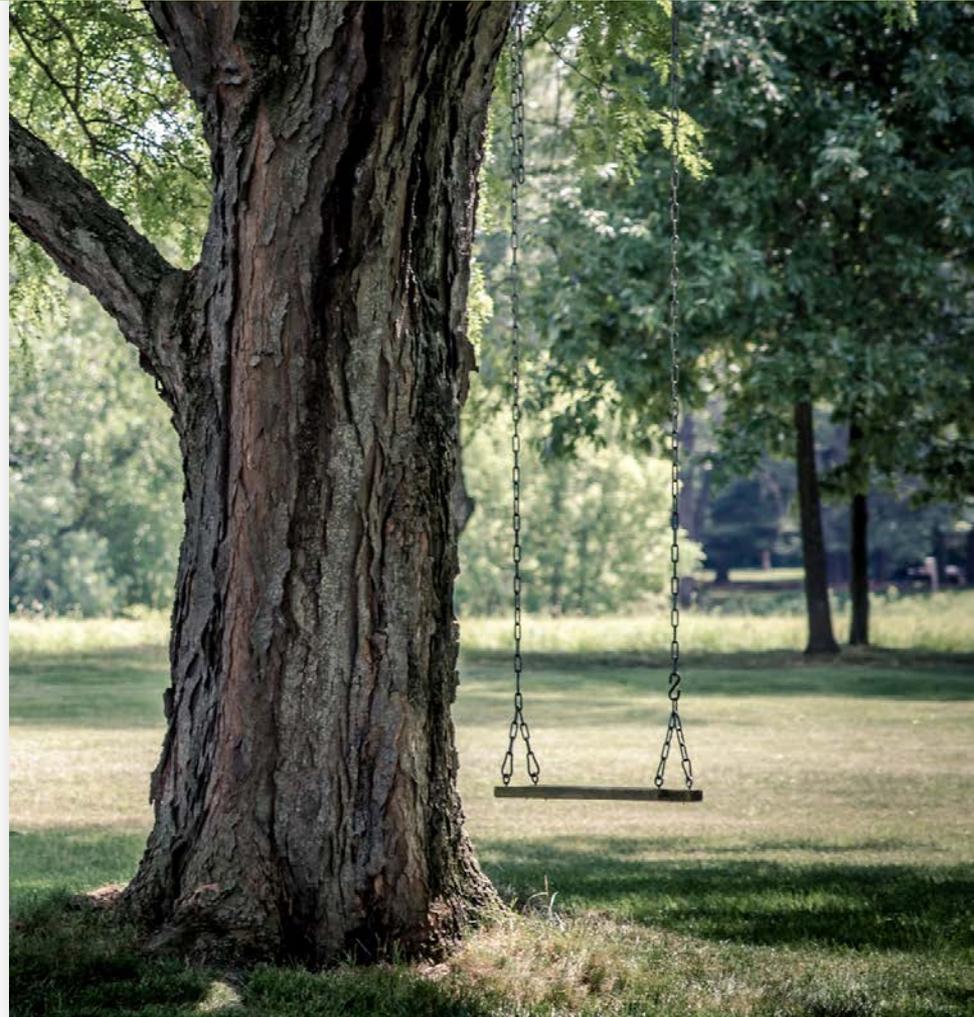
- What is involved in a tree inventory?
- Why do a tree inventory?



A Tree Inventory is ...

A tree inventory provides information about individual trees. Collectively, the data can provide information about a tree population.

- A database
- A maintenance tool
- A management tool



A Tree Inventory Can...

- Identify tree locations
- Identify planting sites
- Streamline operations
- Reduce risk
- Improve urban forest composition
- Estimate future needs



Tree Inventory Benefits

- Increase public safety
- Increase efficiency
- Facilitate short and long-term planning
- Help mitigate major pest and disease outbreaks
- Document actions
- Calculate tree benefits
- Aid in determining budget needs



Davey's Data Collection Method



Panasonic Toughpad

GIS-based data collection

- Three-tiered system
- Increased production rates
- High level of location accuracy
- Faster project completion

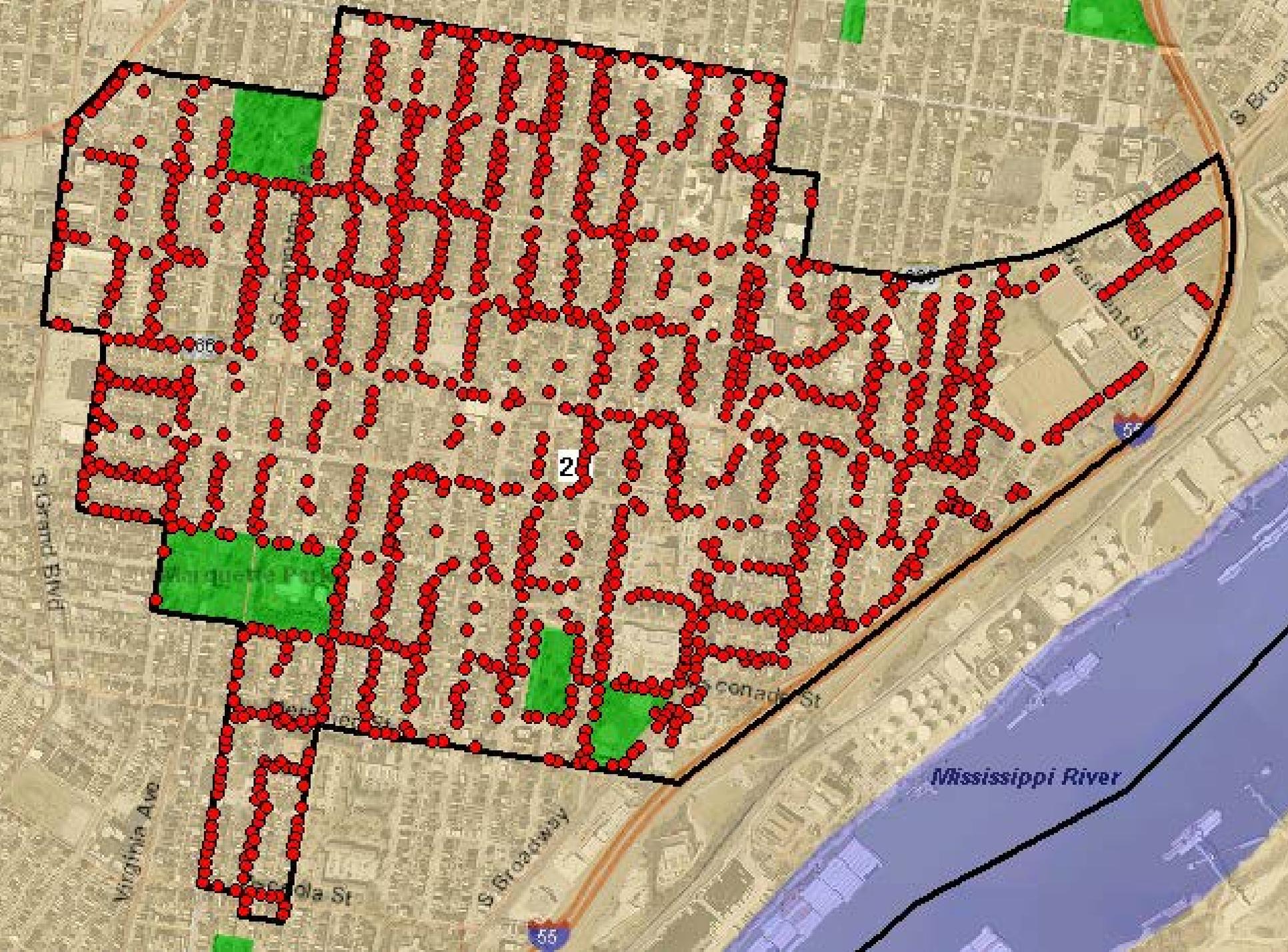


Trimble Pro HX GPS

Pen-based computer technology

- Specifically configured inventory project
- GIS information (ROW, streets, parcels)
- Community aerial photographs
- Simple input forms to decrease errors





2

S Grand Blvd

Virginia Ave

W 10th St

S Broadway

Conrad St

President St

S Broadway

Mississippi River

886

55

55

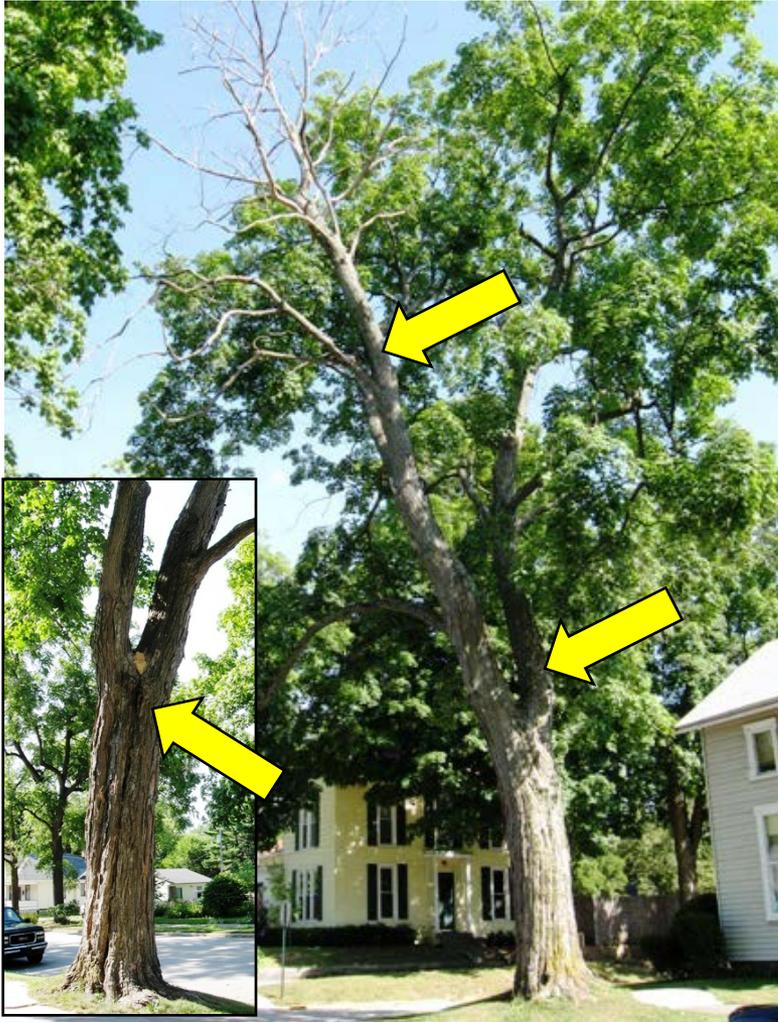
Tree Inventory Data Fields



- Address/Location
- Species Identification
- Tree Size
- Condition
- Primary Maintenance Needs
- Secondary Maintenance Needs
- Risk Assessment/Rating
- Further Inspection
- Overhead Utility Conflicts
- Other Observations
- Photo of the Tree



An Example of an Assessment



- Area is Ben Franklin
- Address is 107 Weston St., Side To
- Sugar maple (*Acer saccharum*)
- Diameter is 38 inches
- Condition is critical
- Maintenance recommendation is removal
- No overhead utilities
- Observation is serious decline
- Yellow arrows point to a dead scaffold branch and severely decayed union
- All removals should be performed as soon as possible



Risk Assessment

- Likelihood of failure
- Likelihood of impacting a target

Likelihood of Failure	Likelihood of Impacting Target			
	Very Low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very Likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely



Risk Assessment

- Likelihood of failure
- Consequences of failure

Likelihood of Failure	Consequences			
	Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low



Planting Sites

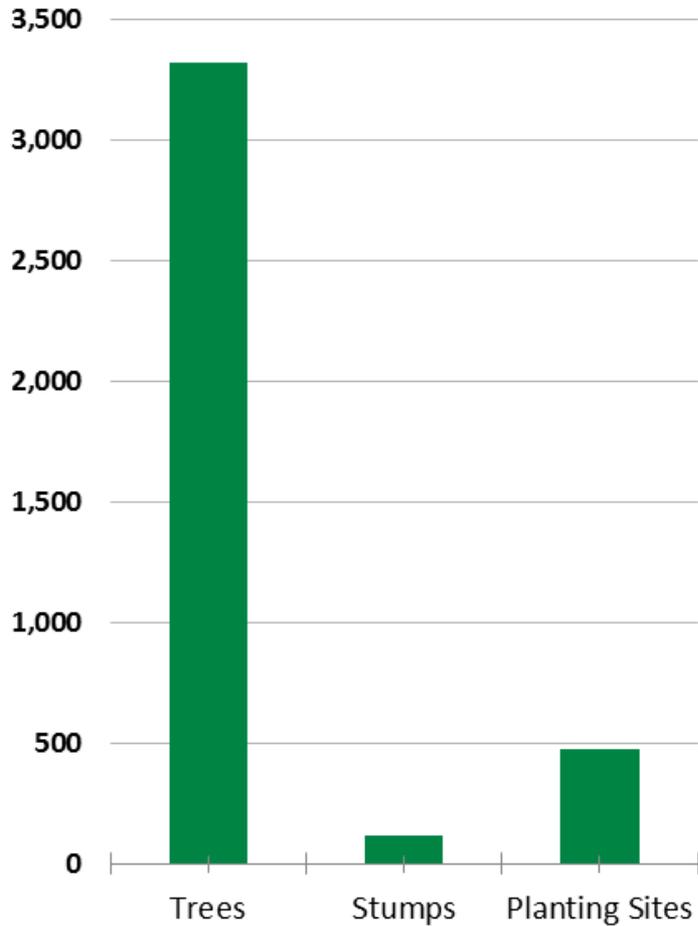
New planting sites will be inventoried and mapped and will include this information:

- Location
- Address
- Space Type
- Space Size
- Presence of overhead utilities
- Appropriate species selection



Site Type Breakdown

Sample Data

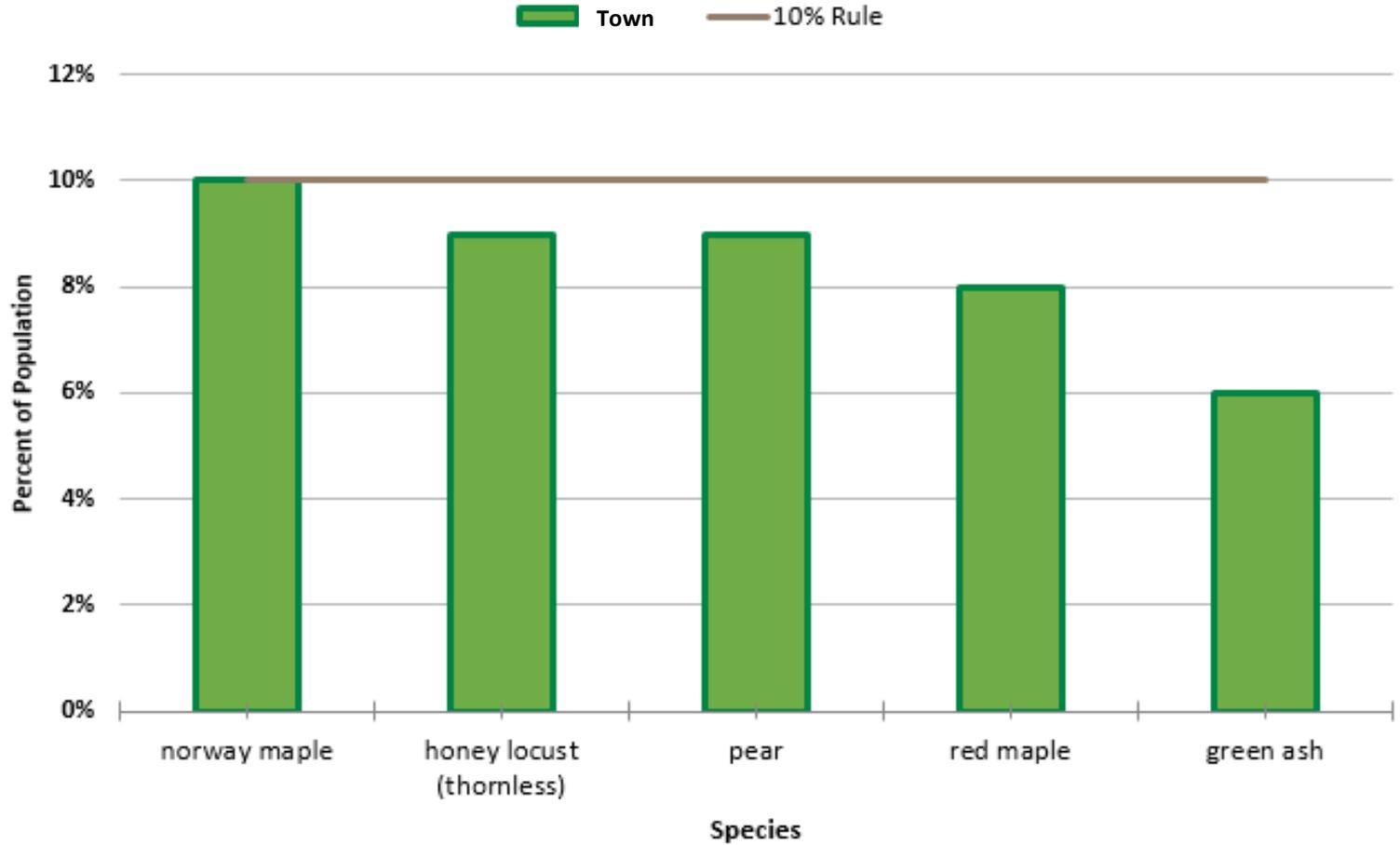


Site Type	# Collected
Trees	3,322
Stumps	119
Planting Sites	476
Total	3,917



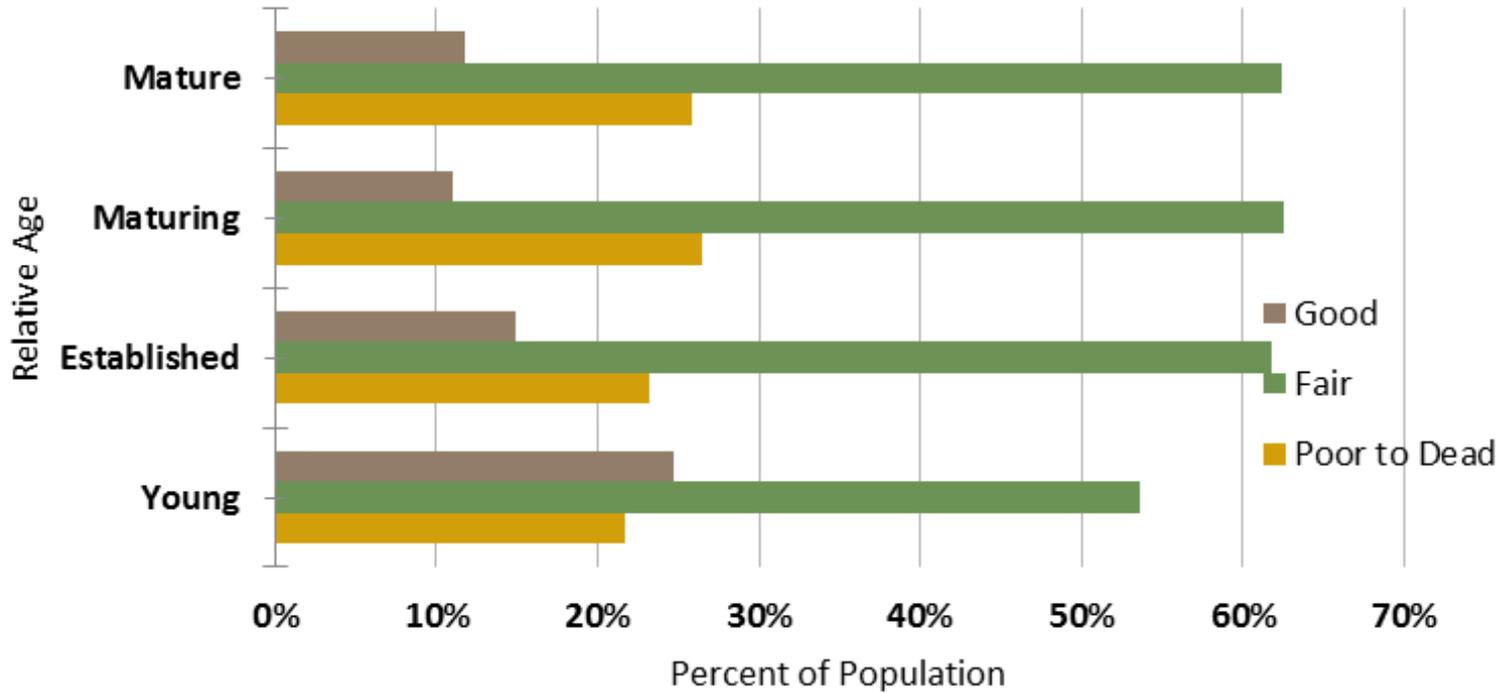
Species Distribution

Sample Data



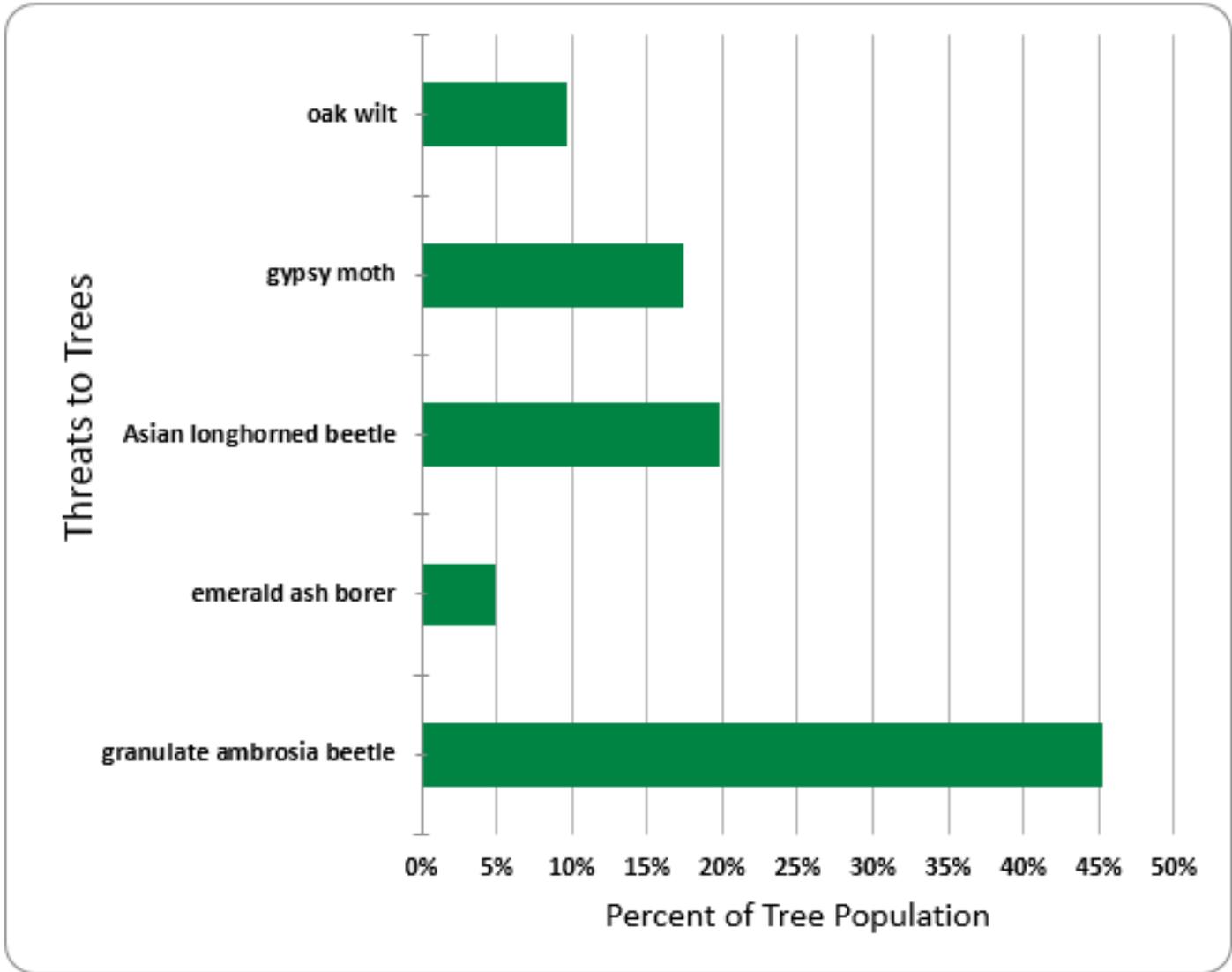
Condition of Trees by Age

Sample Data



Pest Threats

Sample Data



Five Year Budget Plan

Sample Data

Year	Estimated Total Cost
1	\$118,827
2	\$102,499
3	\$70,024
4	\$60,100
5	\$59,500

The five year budget plan includes pruning, removals, and planting. Depending on the current condition of the urban forest, it is expected additional tree related work will be needed when the management plan is implemented and is reflected in this budget plan.



Public Shade Tree Management System

Inventory Management Software

- Manage a tree inventory
- Manage calls received by community residents
- Manage work records generated internally and by calls received
- Track the costs associated with work
- Report on all available data



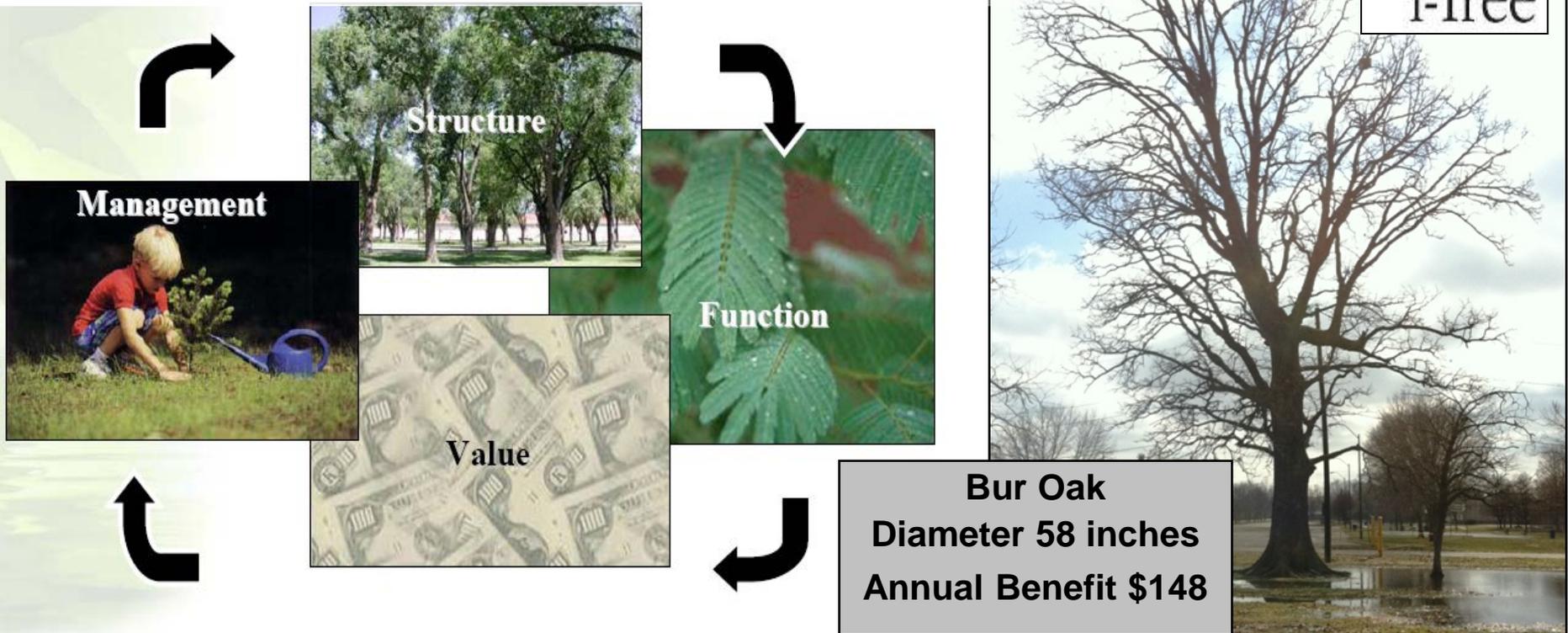
TreeKeeper[®] 7

The screenshot displays the TreeKeeper 7 web application interface. On the left is a sidebar menu with icons and text for: Sites, Calls, Work, Reports, Tools, Help, Sampler, Log Off, Toggle Map-Off, GIS Help, and Refresh. The main content area is divided into two sections. The top section contains site metadata: Address: 2343, Suffix: (blank), Street: BRIGHTON DR, Side: Front, Site: 1, X: 855433.2833, Y: 526005.2421. It also includes 'Blockside' information: OnStreet: BRIGHTON DR, FromStreet: AMBERSON DR, ToStreet: N THOMPSON RD. The bottom section shows inventory details: Inventory Date: July 21, 2007, Site ID: 3102, Species: Fraxinus americana (ash white), and Diameter: 9. On the right side, there is a 'DOCUMENTS' panel with a message: 'No documents are currently associated with this site.' Below this are buttons for 'Browse...' and 'Upload Files', and a note: 'Total uploaded file size 3.069 MB out of 20 MB. I need help with this feature.' The bottom half of the interface features a map of a residential street labeled 'BRIGHTON DR'. The map shows several houses with orange outlines and green dots indicating tree locations. A red circle highlights a specific tree location. The map includes a toolbar with various navigation and tool icons. The Davey Resource Group logo is visible in the bottom left corner of the interface.



Putting i-Tree Streets to Work

- Calculate a tree population's annual benefit
- Leverage yearly maintenance budgets



i-Tree Street Analysis

Benefit	Annual Dollars per Tree	Total Annual Benefit
Energy Savings	\$7.49	\$4,376
Avoided and Sequestered Carbon Dioxide	\$1.34	\$783
Air Quality	\$2.68	\$1,568
Stormwater Runoff Reduction	\$23.73	\$13,859
Aesthetic, Property Value, Social, Economic, and Other Benefits	\$33.23	\$19,409
TOTAL	\$68.48	\$39,995



Conclusion

In summary, the benefits of a tree inventory and management plan include:

- Providing the tree manager with a comprehensive overview of the urban forest which will aid in prioritizing and managing tree maintenance efforts
- Providing data needed to determine specific levels of funding for tree maintenance and tree planting projected over a multi-year period
- Tasks and associated costs can be tracked and are supported by detailed lists
- A good inventory provides a solid basis for proper management of the urban forest

