

High-Tech, Sustainable Landscape Management & Design

Web interface makes tree inventories and plans dynamic tools

By Christine Esposito

Imagine. Being able to go to your computer and, with a click of a mouse, seeing what your client's landscape management priorities are. Does that specimen tree in the high-traffic area need to be pruned this year? Is it time for the American elm to be treated? Having an easily accessible and updatable management plan can empower you and your clients to know what needs to be done when, and help budget for that care.

A new, digital way of inventorying trees and shrubs – and systematically tracking and planning for their maintenance needs – makes it all possible. But its value extends beyond landscape management planning. It's also a tool for sustainable land design, helping landscape architects and designers gain points toward Sustainable Sites Initiative™ (SITES™) targets for new developments.

It's the Bartlett Inventory Solutions, or BIS, developed by the Bartlett

Tree Research Laboratories in Charlotte, NC, which conduct the research upon which Bartlett Tree Experts' practices and treat-

ments are based. "The primary intent of these inventories is to create a living, working plan for managing the resource," says Scott Jamieson, vice president of Bartlett. "And that's driven by client needs. We customize each inventory and plan to meet specific client goals and priorities."

GPS and lasers

The foundation for this multifaceted inventory is the data collection. According to Mike Sherwood, geographic information systems and technologies manager for Bartlett, the company uses mapping-grade GPS data collectors to precisely record the location of each tree and shrub to an accuracy of less than three feet. The handheld collector gathers information from a minimum of four satellites to pinpoint the location. The arborists also record as many as two dozen observations and recommendations in the collector, from pruning needs, defects and any cabling needs, to height,

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A 360-degree panoramic camera used to document trees in Chicago's Millennium Park as part of the BIS inventory and management plan. The images can also be used to provide a virtual tour of the world-famous park.

Green Technology

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maturity and proximity to sidewalks.

When a tree or shrub is so close to a building or other structure that adequate satellite input is impossible, a laser helps determine the plant's location. The arborist bounces a laser beam off of a tree while using the GPS device to collect the available satellite information. The collector automatically combines the distance information from the laser with the satellite data to precisely identify the tree's location. In addition to recording location and condition, the arborists photograph the trees and shrubs that they inventory. Once the inventory is complete, they prepare a management plan based on the care needs they have observed and recorded.

An interactive plan

And here is how the tool becomes interactive. Using Geographic Information System (GIS) software, the data and photos are overlaid on Google Maps images of the site to provide a digital inventory and management plan. A web interface developed by Bartlett enables the client to sit at his or her computer and see a color-coded aerial map of all the trees needing the most urgent attention, for instance. Or with the click of a mouse, see where all the ashes are. Or where all the trees of a certain dbh are located. When conditions change, such as through planting and maintenance activities, the client can update the database with the new information.

"Up until recently, the tree inventory we had, which was done around five years ago, sat in a three-ring binder," says Paul Hack, grounds and maintenance superintendent for Elmhurst College, which obtained a BIS inventory and management plan for its 38-acre campus arboretum last fall. "It just listed the species and gave a grid-map location for each tree. It didn't even give the size of the tree. Plus, many things have changed since the last inventory.

"It's great now because I can get to it all by computer. It's nice to have it all at your fingertips with the press of a key.

"We recently did some winter pruning. I was able to look at aerial views of the campus to see where all the Priority 1 trees are. I could pull up the list of trees and the pictures of them. If the inventory noted that a tree had a weak structure, I could also pull up a picture of that part of the tree. I went around the campus with my Bartlett arborist and a list of the Priority 1 trees that I felt needed attention. Knowing what was in my budget, we could decide which trees to prune.

"It's great, too, for plant health care because I have an online record of what day a tree was treated and what it was treated for. Before, we'd have to go back and pull out the file from 2008, for instance, go through and find the tree and treatment. Now I just pull up that tree and all the treatments for each year are right there."

Donor tree programs

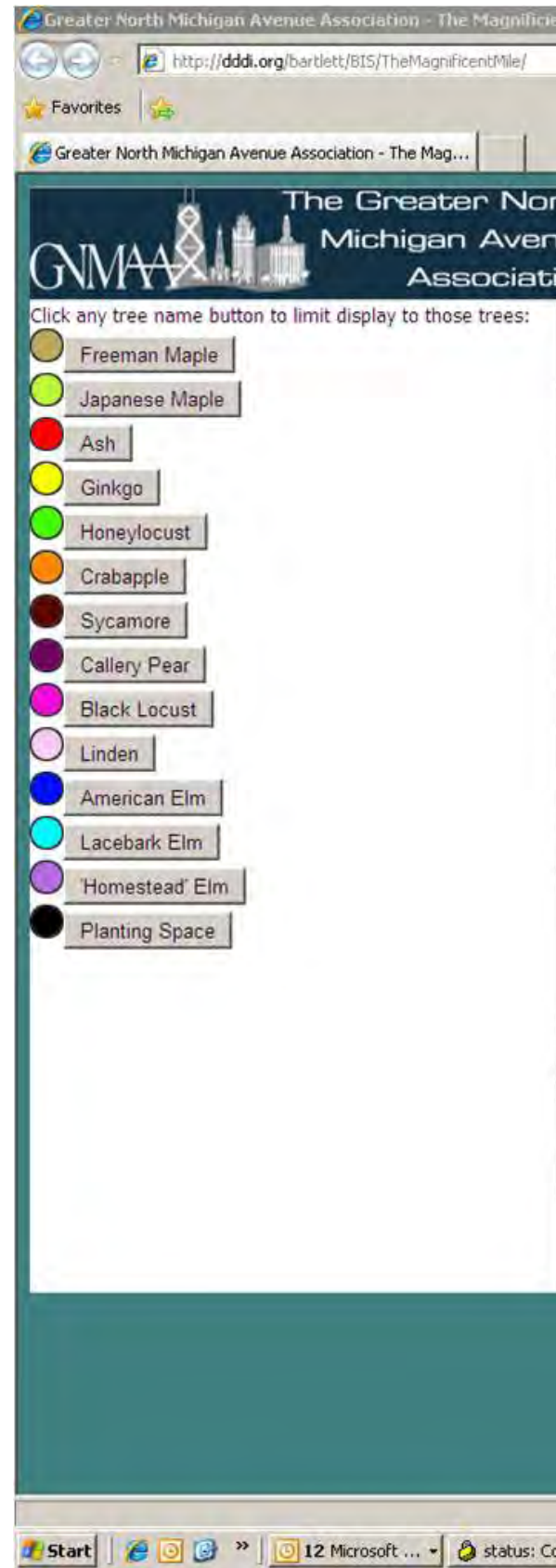
Richard Bumstead, RLA, ASLA, associate director for campus environment at the University of Chicago, is particularly interested in having photos accompany the university's forthcoming BIS inventory of its more than 2,200 trees. The images will depict the plant material in-leaf and without leaves. In this case, they'll be taken by a university intern and uploaded into the inventory database (which is one of the benefits of the GIS mapping approach – data from several sources can be incorporated).

"One of the features I was really interested in was being able to use the photos of the trees in-leaf with donors," he said. We have donor trees here, a way for people to honor a parent, spouse, faculty member. Once we have the inventory, I can tell donors who inquire about their tree that they can check online to see how it's doing. They'll be able to see the trees remotely."

A practical application

For John Chikow, president and CEO of the Greater North Michigan Avenue Association (GNMAA), the BIS online inventory and management plan are an education tool. They're valuable for

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Magnificent Mile - Bartlett Inventory Solution - Windows Internet Explorer

entMile/

Google

Page Safety Tools

er North
Avenue
Association

The Magnificent Mile

Select trees by Northern Cross Street:
Chestnut
Chicago
Delaware

Select trees by condition:
Good
Fair
Poor

Tree ID: 259
American Elm
Ulmus americana
Condition: Good

Greater North Michigan Avenue Associ...
http://ddd.org/bartlett/BIS/TheMagnificentMile/tree/259

Viewing Tree: 259 Ulmus americana DBH: 22

Tree attributes

Tree Attributes
Tag Number: 259
Common Name: American Elm
Species: Ulmus americana
Diameter: 22
Height: 49
Age Class: Mature
Canopy Radius:
Stems:
Condition: Good

DBH:
en" only: AND

Height:
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k Priority:

BARTLETT TREE EXPERTS

status: Connec... idocuments - W... Greater North... Greater North... Microsoft Powe... 11:31 AM

The BIS web interface enables clients to view and update information about specific trees or groups of trees from their computers.

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helping property managers along the Magnificent Mile plan for the maintenance of the streetscape trees adjacent to their properties.

“What’s significant about the GNMAA area is that the property owners and managers are responsible for the care of the trees next to their buildings,” he says. “This helps them make informed decisions.” Also, he points out, “Our trees greatly enhance our marketing.” He cites research finding that retail environments with tree canopy can perform more than 30 percent better than those without it. “The extent of our tree canopy differentiates the Magnificent Mile shopping district from others around the country.”

Then there’s the environmental-services component of GNMAA’s inventory. Applying the US Forest Service’s i-Tree software to the inventory, Bartlett has used the data to quantify the environmental benefits of the Magnificent Mile trees, such as the amount of rainfall they intercept and how much carbon they store. This also helps build support for maintaining the trees, and in some cases, can help organizations raise funds for their care. The information can also be used to develop documentation for obtaining government grants.

Chikow says he plans to make the GNMAA inventory and management plan publicly accessible to further build widespread appreciation and buy-in for the trees and their care.

Millennium Park

Jennifer Davit, director and head horticulturist at the Lurie Garden in Chicago’s Millennium Park, says the BIS inventory and three-year management plan it acquired will be useful in budgeting for tree care throughout the Lurie Garden. “Most people don’t realize the crucial role the trees play here,” she says, “but they provide the shade needed by certain perennials. Their health is crucial to the success of the Lurie Garden.” With remote access to the online inventory and plan, managers will be able to save time by not having to meet on site

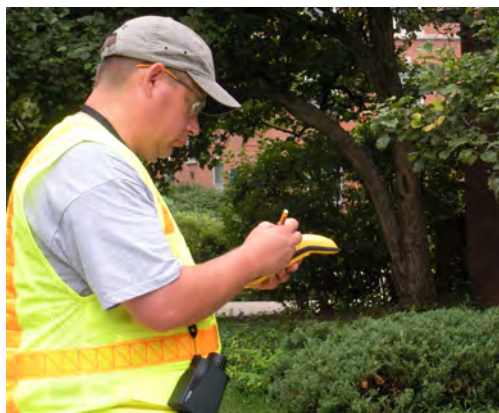


A laser device measures tree height.

to confer and make informed landscape decisions.

BIS and the SITES™ Initiative

While BIS is valuable for assessing and planning for existing landscapes, it is also a tool for meeting the national guidelines and performance benchmarks for sustainable land development and maintenance laid out in the national Sustainable Sites Initiative™.



Arborists can record as many as two dozen characteristics describing a tree’s condition and surroundings in the GPS data collector.

In its examples of sustainable practices involving vegetation, SITES™ calls for preserving important trees and removing invasive species, along with encouraging “a tight disturbance zone to limit construction damage.”

An accurate inventory that can easily be updated not only provides the necessary information, but also lays the groundwork for maintaining the vegetation on an ongoing basis once the site is developed.

The same holds true for the SITES™ soils recommendations, which aim to preserve and protect healthy soils. “Before site design, map out areas where soil is healthy ... and where it has been disturbed by previous land uses,” state the guidelines. BIS data collection and aerial mapping can accommodate such soils information in the GIS overlays.

The same holds true for unique cultural and historical places, which the SITES design guidelines seek to protect and maintain for points toward human health and well-being.

“These dynamic plans are a more systematic, economical and sustainable way to manage your tree canopy and site,” says Bartlett’s Jamieson. “We’re just beginning to scratch the surface of what’s possible with them.” 🌿

Christine Esposito is founder and president of Terracom Public Relations, a firm that, for 21 years, has helped green organizations grow in size and impact through strategic PR and marketing communications. Bartlett Tree Experts is a Terracom client.