

David S. Bienemann
Municipal Arborist
City of Bowling Green

Using – iTree to Preserve Your urban Forestry Program

Objectives

- What's in for the Community?
- Arborist – What's in it for You!
- New Tools of I-Tree
- What i-Tree is not created to do?
- Challenges and Opportunities of I-Tree
- Implementing an i-Tree Project.
- Using i-Tree to Advance Bowling Green's Urban Forestry Program.
- The Next I-Tree Project in Bowling Green.

What's in it for the community?

UTILITY COMPATIBLE TREES



PROVIDING ANSWERS

- We promote the professional practice of urban forestry, foster public awareness of benefits of trees, and increase the extent and condition of our urban and community forest.
- Provide information to decision makers such as mayors, town council, and other city leaders on how much to invest in the management and care of trees.
- How much is known about the environmental services and benefits trees provide on an annual basis?
- How much is known about possible threats to the community forest?

Arborist – What's in it for you?

NEW TOOL IN THE TOOL BOX

- i-Tree provides summary reports on the structure of urban forestry, species diversity, tree health, infrastructure conflicts, storm damage assessment and pest management.
- i-Tree gives an overall view of the urban forestry and the benefits in dollars. Decision makers need to know what the value of the urban of forest and long-term return on investing in tree care and maintenance for the community.
- The Arborist can use the data from street tree inventory to better manage and budget for urban and community forestry program.

NEW STUMP CUTTER 2012



New Tools of i-Tree

I-TREE USERS IN THE US



ANALYSIS TOOLS

- i-Tree Eco
- i-Tree Streets
- i-Tree Species
- i-Tree Storm
- i-Tree Vue
- i-Tree Design (Beta)
- i-Tree Storm Debris (In Progress)

What i-Tree is not?

- Real Time Information
- GPS/GIS Street Tree Inventory Database.
- Work History and Cost Analysis System.
- Tracks Customer Calls
- Run customized queries to capture tree related data.

Bowling Green, OH: Query Site Listing by Area - Work History
For Qty: 0162, Routine_LG Maintenance

Location	In	Area	I.C.	Item	Inventory Date	In	Site.ID
Area ADA AVE							
121 ADA AVE	S	318	2	MARLE NORWAY-OR	524205	MR	11080
126 ADA AVE	S	318	3	ARBOR/ITAE	524205	MR	11084
138 ADA AVE	S	318	1	MARLE NORWAY-	524205	MR	11086
202 ADA AVE	S	318	1	MARLE NORWAY	524205	MR	11087
210 ADA AVE	S	318	1	MARLE NORWAY	524205	MR	11089
Area ADAMS ST							
125 ADAMS ST	S	026	1	HAWTHORN OTHER	922024	JK	315
315 ADAMS ST	S	026	1	ARBOR/ITAE	922024	JK	412
	S	026	2	ARBOR/ITAE	922024	JK	413
Work Date: 7/22/2005							
Work Type: PRUNE							
Work Cost: R							
Crew ID: EL1							
Man.Hrs: 0.5							
Cost: 38.21							
Area ALEXANDRIA BLVD							
ALEXANDRIA BLVD	S	092	1	CRABAPPLE	917204	JK	2050
	S	092	3	CRABAPPLE	917204	JK	2052
Area ARLINGTON CT							
15 ARLINGTON CT	S	034	3	MARLE SUGAR	922024	JK	456
14 ARLINGTON CT	S	034	1	MARLE NORWAY	922024	JK	504
15 ARLINGTON CT	S	034	1	MARLE NORWAY	922024	JK	505
	S	034	2	MARLE NORWAY	922024	JK	506

What i-Tree is not?

MANAGER OF THE PROGRAM

- Uses a small sample of tree population - 3 percent.
- Does not include unmanaged trees in public property.
- Software generates reports based on sample.
- Does not run the urban forestry but provide ideas and opportunities to enhance the urban forestry program.
- Does not stop tree topping!

TOPPED TREE ON PRIVATE PROPERTY IN BOWLING GREEN

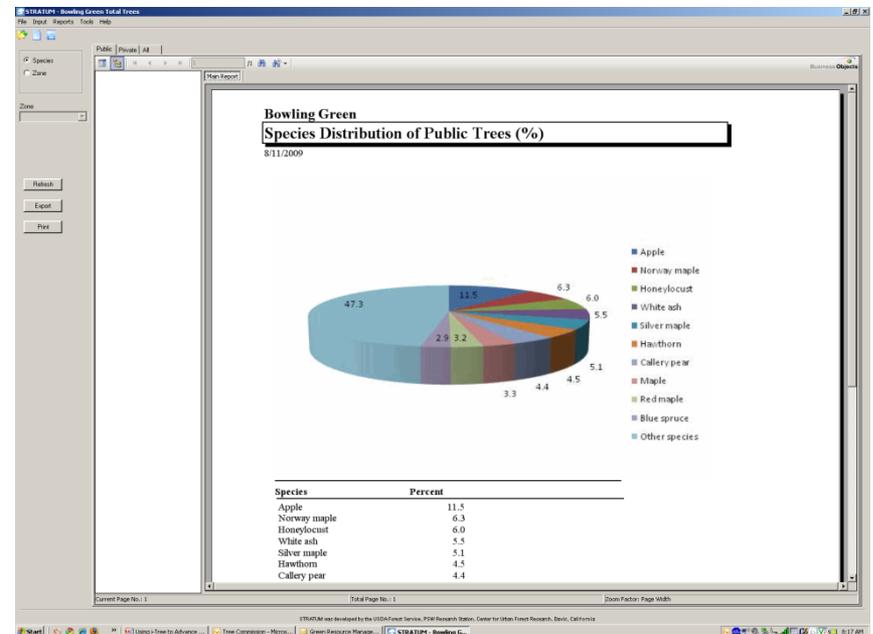


Implementing i-Tree Project

CONTACTS

- Dr. Greg McPherson, USFS Pacific Southwest Research Station in Davis, California.
- Eric Kuehler, Technology Transfer Specialist, USFS Southern Research Station, Athens, Georgia.
- Scott Maco, Research and Development Analyst, Davey Tree Expert Company.
- Jerri J. LaHaie, Executive Director, Society of Municipal Arborists.
- Gene Hyde, City Forester, City of Chattanooga, Tennessee.
- Jake Hildreth, Systems Specialist, City of Bowling Green, Ohio.

I-TREE STREETS



Implementing i-Tree Project

CITY OFFICIALS

- Mayor
- Administrator
- Assistant Administrator
- Public Works Director
- Utility Director
- Planning & Zoning Director
- Parks & Rec. Director
- Finance Director
- IT Department
- Tree Commission

DANGEROUS WATERS



Implementing i-Tree Project

NEW STREET PLANTING IN BG



WHAT ARE THE BENEFITS TO BOWLING GREEN?

- Value of the Green infrastructure.
- Energy Conservation
- Storm Water Control – EPA Reports
- Growth Award Project for Tree City USA.
- National Recognition of Bowling Green's Urban Forestry Program.

Challenges of i-Tree

- Microsoft Access is hard to work with and has its own bugs.
- Conversion of Microsoft Excel into Microsoft Access sometimes leave blank data sets.
- You must manually go through each line of data.
- BG had 8300 lines of data with 17 columns.
- Species codes in i-Tree required conversion of the species codes in ACRT's Green Resource Manager (GRM).
- Database errors required multiple uploads and Stratum Project runs.

Challenges of i-Tree

MAKING I-TREE WORK

- **Transferring** City of Bowling Green's street tree inventory and GIS data into a formatted Excel spreadsheet.
- **Mapping** the City's GIS data categories to the STRATUM/i-Tree Streets Excel database categories.
- **Matching** the STRATUM/i-Tree Streets definitions to the City's GIS Software categories.
- **Upload** the STRATUM/i-Tree Streets formatted Excel Spreadsheet into Access for STRATUM V.3.4 to run a project.
- **Bugs** - The STRATUM V. 3.4 had software bugs that could not be fixed by the user. The i-Tree software team had to run reports with a patch on the software.
- **Bugs Fixed** - The new i-Tree Streets released in May 2009 fixed the bugs.

STRATUM/I-TREE STREETS DATA SHEET

The screenshot shows an Excel spreadsheet with the following columns: A: TreeID, B: Zone, C: StreetSeq, D: CityManaged, E: SpCode, F: LandUse, G: LocSite, H: DBH, I: MicroRec, J: Priority, K: Task, L: SuClamp, M: WireConflict, N: CondWood, O: CondS, P: OtherOne, Q: OtherTwo, R: OtherTree, S: T, U: W, V: X, Y: Z.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1	TreeID	Zone	StreetSeq	CityManaged	SpCode	LandUse	LocSite	DBH	MicroRec	Priority	Task	SuClamp	WireConflict	CondWood	CondS	OtherOne	OtherTwo	OtherTree							
2	6	1	0	2	PVCA	0	0	0	2	2	1	1	4	0	1	0	0								
3	7	1	0	2	PVCA	0	0	0	2	2	1	1	4	0	1	0	0								
4	8	1	0	2	PVCA	0	0	0	2	2	1	1	4	0	1	0	0								
5	9	1	0	2	PVCA	0	0	0	2	2	1	1	4	0	1	0	0								
6	10	1	0	2	PVCA	0	0	0	2	2	1	1	4	0	1	0	0								
7	11	1	0	2	PVCA	0	0	0	2	2	1	1	4	0	1	0	0								
8	12	1	0	2	PVCA	0	0	0	2	2	1	1	4	0	1	0	0								
9	13	1	0	2	PVCA	0	0	0	2	2	1	1	4	0	1	0	0								
10	14	1	0	2	PVCA	0	0	0	2	2	1	1	4	0	1	0	0								
11	15	1	0	2	PVCA	0	0	0	2	2	1	1	4	0	1	0	0								
12	16	1	0	2	PVCA	0	0	0	2	2	1	1	4	0	1	0	0								
13	17	1	0	2	PVCA	0	0	0	2	2	1	1	4	0	1	0	0								
14	18	1	0	2	PVCA	0	0	0	2	2	1	1	4	0	1	0	0								
15	19	1	0	2	PVCA	0	0	0	2	2	1	1	4	0	1	0	0								
16	20	1	0	2	PVCA	0	0	0	2	2	1	1	4	0	1	0	0								
17	21	1	0	2	PVCA	0	0	0	2	2	1	1	3	0	1	0	0								
18	22	1	0	2	PVCA	0	0	0	2	2	1	1	2	0	1	0	0								
19	23	1	0	2	PVCA	0	0	0	2	2	1	1	3	0	1	0	0								
20	24	1	0	2	PVCA	0	0	0	2	2	1	1	4	0	1	0	0								
21	25	1	0	2	PVCA	0	0	0	2	2	1	1	4	0	1	0	0								
22	26	1	0	2	PVCA	0	0	0	2	2	1	1	2	0	1	0	0								
23	27	1	0	2	PVCA	0	0	0	2	2	1	1	2	0	1	0	0								
24	28	1	0	2	PVCA	0	0	0	2	2	1	1	2	0	1	0	0								
25	29	1	0	2	PVCA	0	0	0	2	2	1	1	2	0	1	0	0								
26	30	1	0	2	PVCA	0	0	0	2	2	1	1	2	0	1	0	0								
27	31	1	0	2	PVCA	0	0	0	2	2	1	1	2	0	1	0	0								
28	32	1	0	2	PVCA	0	0	0	2	2	1	1	1	0	1	0	0								
29	33	1	0	2	PVCA	0	0	0	2	2	1	1	3	0	1	0	0								
30	34	1	0	2	PVCA	0	0	0	2	2	1	1	2	0	1	0	0								
31	35	1	0	2	PVCA	0	0	0	2	2	1	1	3	0	1	0	0								
32	36	1	0	2	PVCA	0	0	0	2	2	1	1	3	0	1	0	0								
33	37	1	0	2	PVCA	0	0	0	2	2	1	1	4	0	1	0	0								
34	38	1	0	2	PVCA	0	0	0	2	2	1	1	4	0	1	0	0								
35	39	1	0	2	PVCA	0	0	0	2	2	1	1	4	0	1	0	0								
36	40	1	0	2	PVCA	0	0	0	2	2	1	1	2	0	1	0	0								
37	41	1	0	2	PVCA	0	0	0	2	2	1	1	3	0	1	0	0								
38	42	1	0	2	PVCA	0	0	0	2	2	1	1	3	0	1	0	0								
39	43	1	0	2	PVCA	0	0	0	2	2	1	1	3	0	1	0	0								
40	44	1	0	2	PVCA	0	0	0	2	2	1	1	3	0	1	0	0								
41	45	1	0	2	PVCA	0	0	0	2	2	1	1	4	0	1	0	0								
42	46	1	0	2	PVCA	0	0	0	2	2	1	1	4	0	1	0	0								
43	47	1	0	2	PVCA	0	0	0	6	6	1	1	1	0	1	0	0								
44	48	1	0	2	PVCA	0	0	0	2	2	1	1	3	0	1	0	0								
45	49	1	0	2	PVCA	0	0	0	2	2	1	1	4	0	1	0	0								
46	50	1	0	2	PVCA	0	0	0	2	2	1	1	3	0	1	0	0								
47	51	1	0	2	PVCA	0	0	0	2	2	1	1	4	0	1	0	0								
48	52	1	0	2	PVCA	0	0	0	2	2	1	1	4	0	1	0	0								
49	53	1	0	2	PVCA	0	0	0	2	2	1	1	4	0	1	0	0								
50	54	1	0	2	PVCA	0	0	0	6	6	1	1	5	0	1	0	0								
51	55	1	0	2	PVCA	0	0	0	2	2	1	1	4	0	1	0	0								
52	56	1	0	2	PVCA	0	0	0	2	2	1	1	4	0	1	0	0								
53	57	1	0	2	PVCA	0	0	0	2	2	1	1	3	0	1	0	0								
54	58	1	0	2	PVCA	0	0	0	2	2	1	1	4	0	1	0	0								
55	59	1	0	2	PVCA	0	0	0	2	2	1	1	3	0	1	0	0								
56	60	1	0	2	PVCA	0	0	0	6	6	1	1	5	0	1	0	0								

Challenges of i-Tree

- Mapping the ACRT's Green Resource Manager (GRM) data required the City IT Network Technician and i-Tree Designers on a conference call to move forward.
- Matching the definitions of columns in i-Tree to ACRT's GRM required calls to the i-Tree Software Designers.
- Upload process is very specific and you must follow directions exactly or the upload will not move forward.



Challenges of I-Tree

DATA CONVERSION

- In October 2011, the City of Bowling Green contracted with Davey Tree Resource Group to perform the i-Tree Streets data conversion.
- We completed conversion in March 2012.
- We have the new data with 98% of the public ash tree removed.
- The data conversion was much easier than 2008.

2012 ARBOR DAY – KENWOOD ELEMENTARY SCHOOL



Opportunities of i-Tree

THE GOOD OF I-TREE

- Municipal Forest Resource Analysis.
- Determines the value of green infrastructure to a community.
- Species Diversity.
- Age Structure of the urban forest.
- Condition of the urban forest.

I-TREE MANUAL



Opportunities of i-Tree

DOWNTOWN BOWLING GREEN



THE GOOD OF I-TREE

- Street Tree Canopy Cover.
- Energy Savings.
- Carbon Dioxide Reduction
- Air Quality
- Avoided Pollutants
- Storm Water Control
- Aesthetic, Property Values, Social, and Community Benefits.

Opportunities of i-Tree

THE GOOD OF I-TREE

- **Management** Recommendations for urban forestry program.
- **Benefit- Cost Ratio** – 258% Return in Bowling Green’s Urban Forestry Program (After ash tree removed – 226%)
- **Tree Removal** – Reduction of priority tree has significantly reduced property damage, power outages, and overtime costs.
- **Cyclical Pruning** – City has an increase in the tree population by 11.3% from 2003 to 2012. The cost to maintain the pruning will increase as the tree grow larger.

DR. DAN HERMS, OSU EAB RESEARCH IN BOWLING GREEN



Opportunities of i-Tree

ROTARY NATURE CENTER



THE GOOD OF I-TREE

- New Tree Establishment
- City's total investment per new tree planted is \$300.
- 10-20-30 Rule of Planting Diversity.
- Tree-Related Maintenance Activities such sidewalks, visibility, street signs, business signs and narrow tree lawns.
- Overhead utility line conflicts.
- 10% of the manage trees under power lines.

Opportunities of i-Tree

THE GOOD OF I-TREE

- 8200 Managed Street Trees
- Green Infrastructure Asset Valued at \$6,620,821 (After Ash Removal - \$6,183,876)
- Canopy cover is the driving force of the urban forest's ability to produce benefits for the community.
- City of Bowling Green has invested \$2,500,000 in the program from 2004-2012.

ARBOR DAY PROGRAM - ST. ALOYSIUS SCHOOL



STRATUM & Our Tree Inventory

ECONOMIC IMPACTS TO THE CITY OF BOWLING GREEN

- Loss of tax revenue to Bowling Green in 2008-2009.
- In 2008, Sky bank closed and was purchased by Huntington Bank.
- In 2008, Rexam Plastics closed in December. Palm Plastics has leased plant.
- In 2009, Henry Filter closed.
- In 2009, Auto Suppliers plants have temporarily reduced workforce due to car industry shutdowns in 2009.
- City tax revenue down 5% in 2009.

MONEY DOWN THE DRAIN



STRATUM & Our Tree Inventory

ECONOMIC IMPACTS TO BG URBAN FORESTRY

- Used i-Tree reports and data to justify tree care and maintenance programs for 2009 -2012 budgets.
- Used i-Tree reports and data to minimize the amount of money reduced from 2009 2012 budgets.
- City Administration, City Council, Board of Public Utilities, and City Department Directors' received copies of the i-Tree Municipal Forest Resource Analysis on August annually.
- PDF copies of the i-Tree Municipal Forest Resource Analysis to be posted on the City website by October.

SLIPPERY ELM BIKE TRAIL



STRATUM & Our Tree Inventory

EXPOSE BOWLING GREEN'S URBAN FORESTRY PROGRAM TO US.

- Bring in Urban Forestry Research Projects to BG.
- Two EAB Research Projects and One Species Diversity Research Project.
- BG Municipal Arborist asked to speak across the Midwest on EAB Management Plans and Urban Forestry.
- Network Urban Forestry Professionals in Ohio and across the US.

OSU EAB RESEARCHERS AT WATER POLLUTION CONTROL PLANT.



Using i-Tree to Preserve Your Urban Forestry Program

MEETINGS & TRAINING

- Offer 3 free public educational seminars on urban forestry.
- Hosted 2011 NW Ohio Tree City USA Awards Ceremony in April 2011.
- Hosting Bucket Truck, Chipper and Chainsaw Certification training for NW Ohio Communities in Fall 2012.
- Hosting 2012 UAA EAB Summit at the OARDC OSU Campus.

HOSTING EDUCATIONAL SEMINARS IN BOWLING GREEN



Using i-Tree to Preserve Your Urban Forestry Program

I-TREE REPORT DATA

- 139 Tree Species identified in BG.
- Five Predominate Species:
 - Crab Apple (9.4%)
 - Norway Maple (7.4%)
 - Honey Locust (6.1%)
 - Pear (5.2%)
 - Silver Maple (4.5%)
 - White and Green Ash (0.7%) - 2012
- This is of concern because of the Emerald Ash Borer's impact and silver maple are large, weak-wooded trees. A large portion of the tree canopy will be lost with removal of white ash and silver maple.

SILVER MAPLE REMOVAL



Using i-Tree to Preserve Your Urban Forestry Program

EMERALD ASH BORER ON WHITE ASH LOG IN RESEARCH PLOT.



I-TREE REPORT DATA

- **Age Structure of Urban Forest in BG: Ideal 2012**
- 47.7% Young Trees (< 6 inches in dbh)
- 23% Established Trees (6-12 in. dbh)
- 21.8% maturing Tree (12<24 in dbh)
- 7.5% Mature Trees (>24 in dbh)
- **Condition of Trees:**
- 72.9% are Good.
- 22.2 % are Fair.
- 4.7% are Poor.
- 0.2% are Dead. (Priority Removals)
- **Tree Canopy:** 88 acres or 1.06% of the total land area in BG (80 acres).

Using i-Tree to Preserve Your Urban Forestry Program

I-TREE REPORT DATA

- **\$4,157,808** is the Value of Street Trees (**\$3,740,863**) .
- **\$2,443,013** is the Value of the Park Trees and Oak Grove Cemetery (**-\$20,000**).
- **Benefit-Cost Ratio is 258% Return (226%)**.
- **Energy Savings is \$220,170 per year for electric and gas (\$170,394)**.

FALL COLOR IN BG



Using i-Tree to Preserve Your Urban Forestry Program

BG TREE COMMISSION – 2012 ARBOR DAY POSTER CONTEST



I-TREE REPORT DATA

- Carbon Dioxide Reduction: Tree reduces 1668 tons (After Ash removal 1477).
- Air Pollution Control: Trees reduce 1 ton of particulate matter.
- Avoided Pollutants" Tree reduced plant emissions by 4.6 tons (After ash removal 4.3 tons).
- Storm Water Reduction: Trees intercept 7,447,550 gallons of stormwater annually (after ash removal 6,640,653).
- Trees add to the Aesthetic, Social, Economic, and Property Values in Bowling Green.

Using i-Tree to Preserve Your Urban Forestry Program

I-TREE REPORT DATA

- **Tree Removals** – Critical part of Urban Forestry Program. BG crews remove 205 trees per year.
- Significantly reduce property damage, power outages, and overtime costs to the city.
- EAB, Gypsy Moth, ALB and other invasive pests/diseases can impact a tree removal program.
- Cyclical Pruning – ideal is 5-10 year frequency of pruning street trees.
- BG crews prune 1350 trees per year.

FLOWERING CHERRY TREE



Using i-Tree to Preserve Your Urban Forestry Program

CITY ADMINISTRATION BUILDING TREE PLANTING



I-TREE REPORT DATA

- **New Tree Establishment –** City has planted an average 300-350 trees per year from 2003-2012 using 10-20-30 rule of diversity.
- **Resulted in 11% increase in the tree stocking levels.**
- **As trees continue to grow the cost to maintain the trees increase.**
- **Average invest in a city planted tree is \$300.**

Using i-Tree to Preserve Your Urban Forestry Program

I-TREE REPORT DATA

- Sidewalk Conflicts -255 sites or 3.2% of total public trees.
- 49 required immediate attention and remaining 206 required grinding.
- Overhead utility power lines – 10% of the city-managed tree canopy is within 10 feet of an overhead utility.

WHITE ASH REMOVAL BY BG MUNICIPAL POWER LINES



Using i-Tree to Preserve Your Urban Forestry Program

- i-Tree has helped improve the long-term benefits of managing of an urban forest to the city leadership and citizens.
- i-Tree is tool in the tool box an urban forestry manger can use to compliment the urban forestry program.
- i-Tree can help small and large communities to move the urban forestry program forward.
- New Urban Forestry Arboretum Planned in BG to start 2011.



The Next i-Tree Project in Bowling Green

- i-Tree ECO
- In 2010 -2012
- Determine the scope of the i-Tree Eco Project.
- Implement in Spring 2010 and finish in 2012.
- Involve Volunteers.



Specials Thanks to:

- Dr. Greg McPherson, USFS
- Eric Kuehler, USFS
- Scott Maco, Davey Tree Expert Company
- Jerrie LaHaie, Executive Director SMA.
- Gene Hyde, City Forester, Chattanooga, TN
- Jake Hildreth, IT Network Technician, City of Bowling Green, Ohio.
- Lori Tretter, Assistant City Administrator, City of Bowling Green, Ohio.
- Bowling Green Tree Commission.

QUESTIONS??????

BALLOON FIESTA IN NM



BALLOON FIESTA IN NM

