

Assessing Street Tree Populations

🌳 i-Tree Streets assesses:

- Structure
- Function
 - ✓ Energy
 - ✓ Air pollution
 - ✓ Stormwater *
 - ✓ Carbon
 - ✓ Aesthetic Value *
- Value
- Management needs *
- IPED Pest Detection *



A STRATUM Analysis Tool

Background

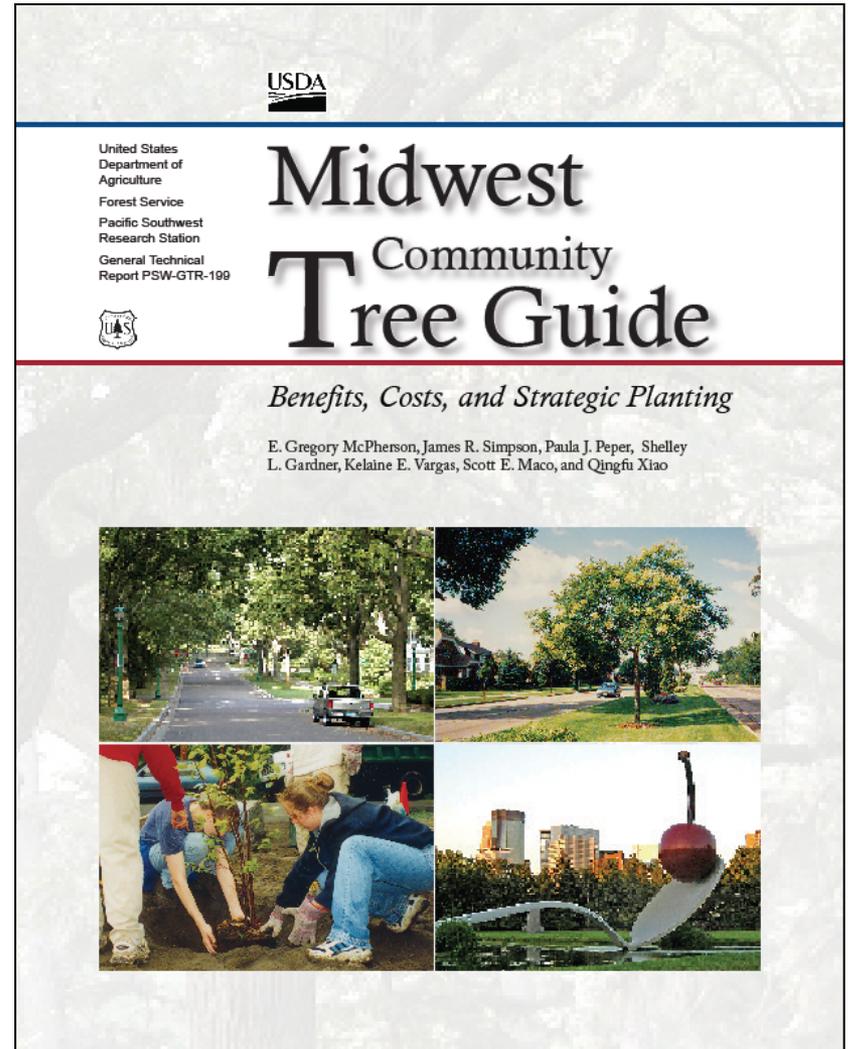
Center for Urban Forest Research
USDA Forest Service
PSW Research Station

 *To demonstrate
new ways that
trees add value -
quality of life - to
communities.*



Streets Foundation: Reference City Research

 Regional ***Tree Guide*** studies to develop growth models of representative street trees and their dimensions as a basis for Benefit-Cost Analysis.



www.fs.fed.us/psw/programs/uesd/uep/tree_guides.php

Research Process—Structural Analysis

- 🌳 Data collection 25 field measurements for each tree
- 🌳 900 trees, 20 predominant regional species
- 🌳 Calculate leaf area and foliar biomass
- 🌳 Regression models predict growth.



Research Process—Functional Analysis

🌳 Models use structural data – (size at various ages).

🌳 To determine magnitude of annual benefits:

- Energy saved
- Atmospheric CO₂ reduction
- Air pollutants removed
- Rainfall intercepted
- Aesthetics & other



Regional model with local adjustments

Define Species

Species Code	Common Name	Scientific Name	Assigned Sp. Value	Non-Tree?
ACSA1	Silver maple	<i>Acer saccharinum</i>	ACSA1	<input type="checkbox"/>
ACSA2	Sugar maple	<i>Acer saccharum</i>	ACSA2	<input type="checkbox"/>
A EGL	Ohio buckeye	<i>Aesculus glabra</i>	ACPL	<input type="checkbox"/>
A EHI	Horsechestnut	<i>Aesculus hippocastan...</i>	BDL OTHER	<input type="checkbox"/>
A IAL	Tree of Heaven	<i>Ailanthus altissima</i>	BDL OTHER	<input type="checkbox"/>
AL	Alder	<i>Alnus species</i>	MA2	<input type="checkbox"/>
ALJU	Mimosa	<i>Albizia julibrissin</i>	BDS OTHER	<input type="checkbox"/>
BDL OTHER	Broadleaf Decid...	Broadleaf Deciduous ...	FRPE	<input type="checkbox"/>
BDM OTHER	Broadleaf Decid...	Broadleaf Deciduous ...	ACPL	<input type="checkbox"/>
BDS OTHER	Broadleaf Decid...	Broadleaf Deciduous ...	MA2	<input type="checkbox"/>

Delete
New
Stocking

Assigned Species Value: _____

Common Name:

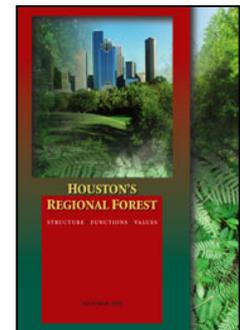
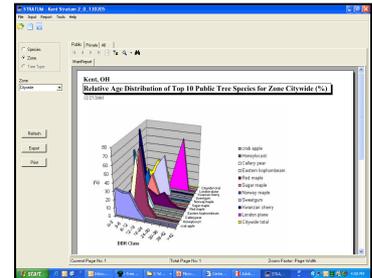
Scientific Name:

Tree Type:

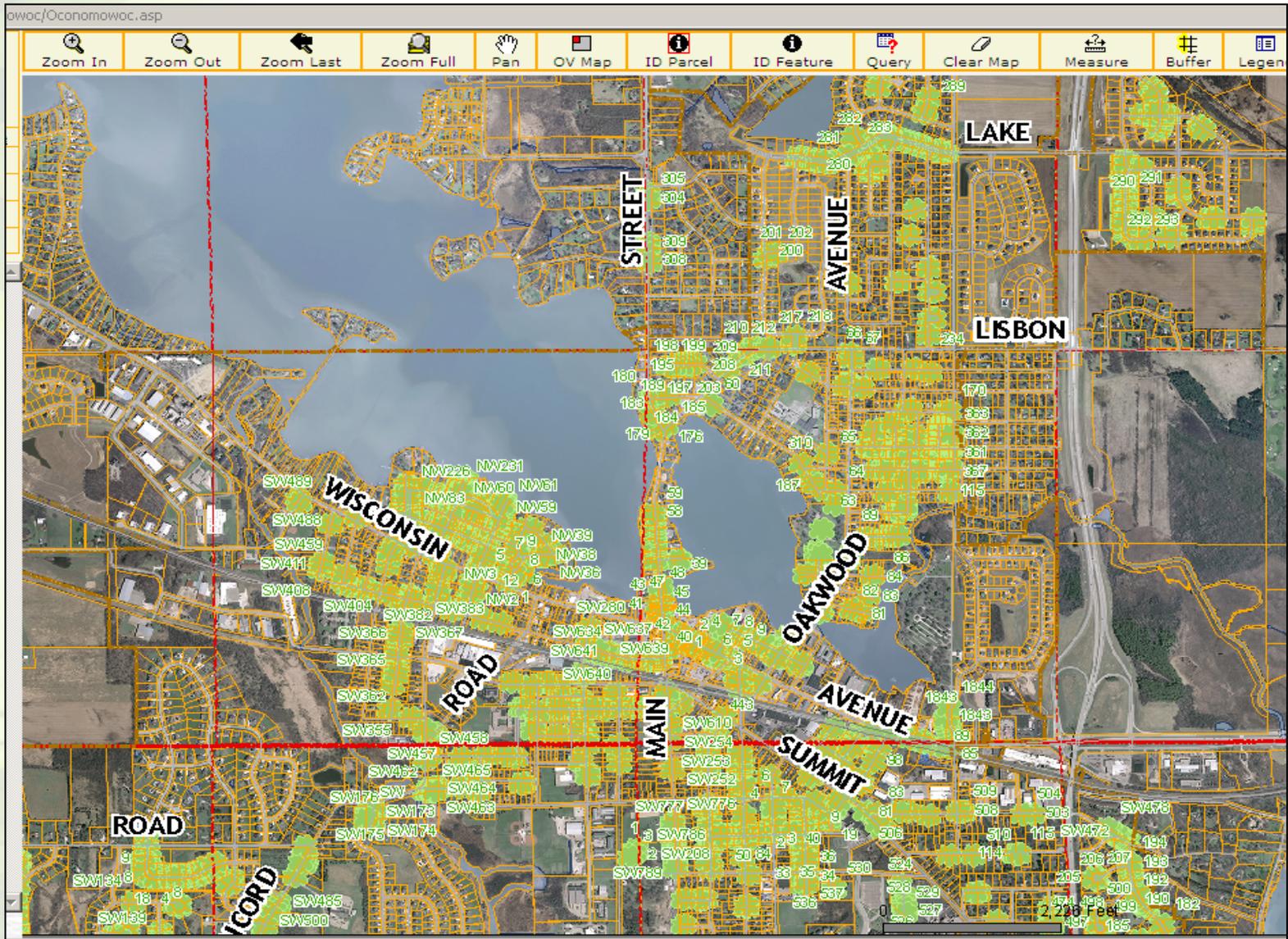
OK
Cancel

Phase I: Getting Started

- Existing inventory?
- Conduct inventory:
 - Study area
 - Inventory type
 - ✓ Sample or complete
 - Other inputs: city data, benefit prices,
 - Data collection method
 - ✓ PDA, paper or other



Working with Existing Inventories



Provided courtesy of City of Oconomowoc, WI

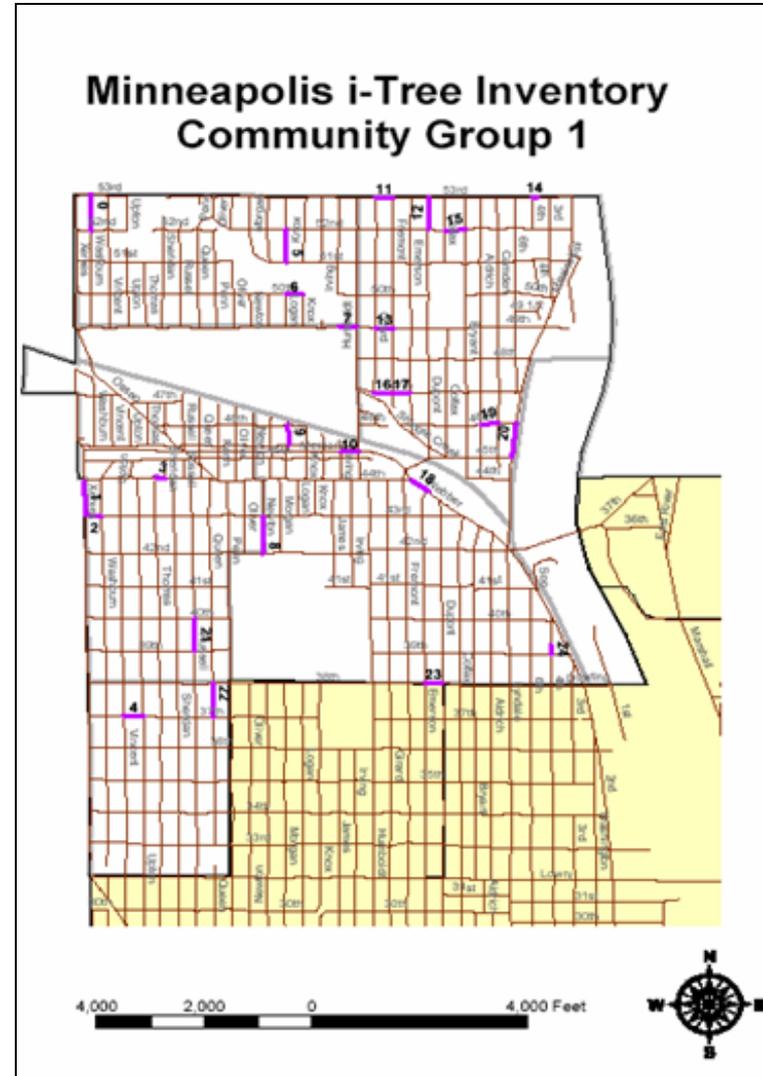
Reformatting Existing Inventories

	H	I	J	K	L	M	N	O	P
1	Common Name	SpCode	Year Plant	Growth Space	SiteType	Diameter	DBH	Deadwood	Height (
2	Maple Spp	AC	2008	Open	1	2	2	0	0'-15'
3	Maple Spp	AC	2008	Open	1	2	2	0	0'-15'
4	Maple Spp	AC	2008	Open	1	2	2	0	0'-15'
5	Maple Spp	AC	2006	7'	7	1.5	1.5	0	0'-15'
6	Maple Spp	AC	2008	8'	8	2	2	0	0'-15'
7	Maple Spp	AC	2006	7'	7	1.5	1.5	0	0'-15'
8	Maple Spp	AC		7'	7	1.6	1.6	0	0'-15'
9	Maple Spp	AC		8'	8	15.2	15.2	0	45'-60'
10	Maple Spp	AC		Open	1	25.5	25.5	0	45'-60'
11	Maple Spp	AC		6'	6	2.6	2.6	0	15'-30'
12	Maple Spp	AC	2007	7'	7	1.25	1.25	0	0'-15'
13	Maple Spp	AC	2007	7'	7	1.25	1.25	0	0'-15'
14	Maple Spp	AC	2007	7'	7	1.25	1.25	0	0'-15'
15	Maple Spp	AC	2007	7'	7	1.25	1.25	0	0'-15'
16	Maple Spp	AC	2007	7'	7	1.25	1.25	0	0'-15'
17	Maple Spp	AC	2007	7'	7	1.25	1.25	0	0'-15'

www.itreetools.org Resources – Archives tab

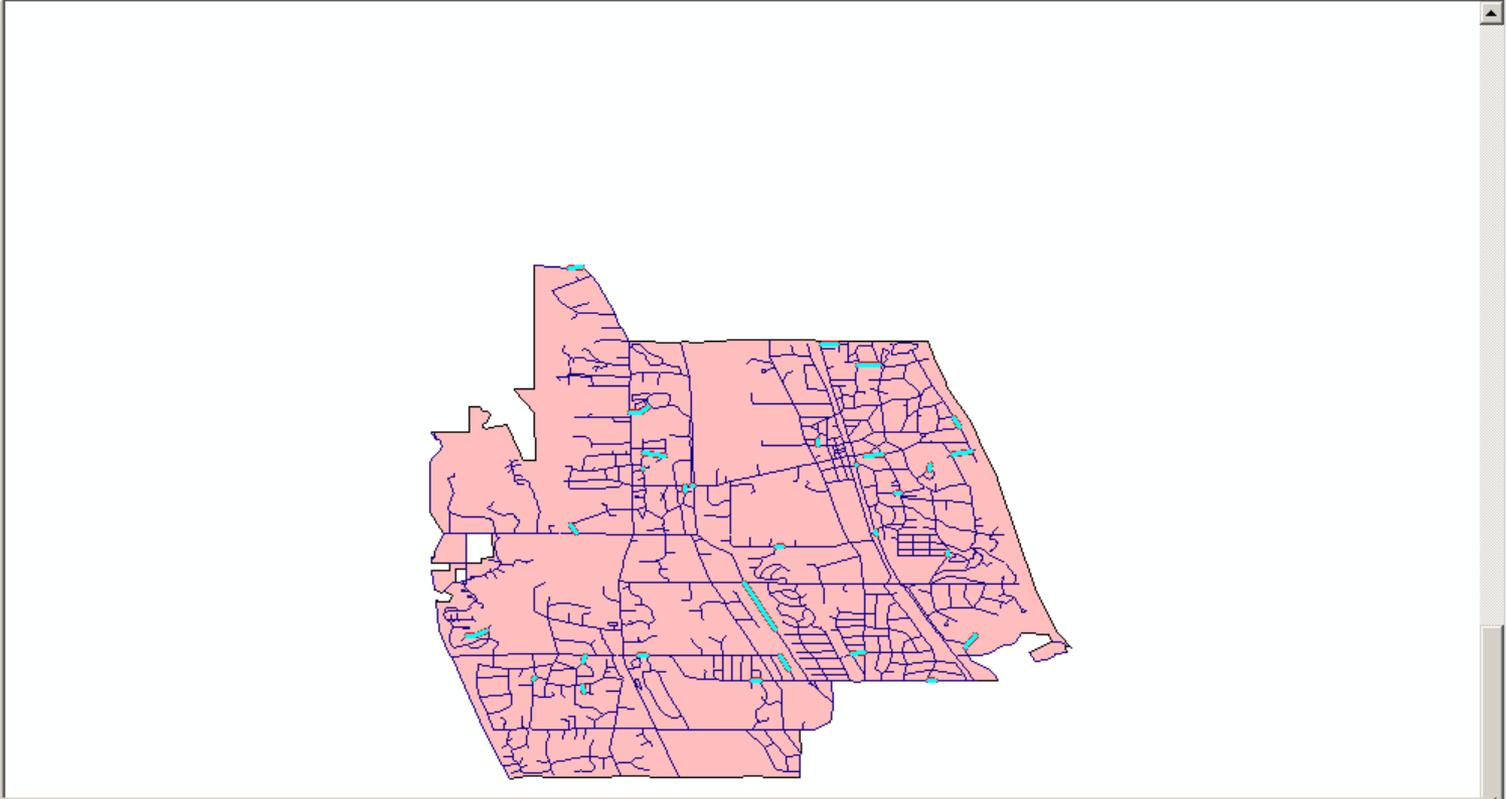
See - **Streets Existing Inventory Import Resources**

Sample Based Assessment



Layers

- Lake_Forest_Segments
- LF_road_set
- Roads
- LF_Boundary
- Places



Attributes of Lake_Forest_Segments

FID	Shape *	TLID	FNODE	TNODE	LENGTH	FEDIRP	FENAME	FETYPE	FEDIRS	CFCC	FRADDL	TOADDL	FRADDR	TOADDR	ZIPL	ZIPR	CENSUS1	CENSUS2	CFCC1	CFCC2
13	Polyline	119647302	30345	30269	0.11334		Lake	Rd		A41	904	998	911	979	60045	60045	0	0	A	A4
2	Polyline	119644004	25121	24751	0.17598		Larchmont	Ln		A41	801	999	800	998	60045	60045	0	0	A	A4
18	Polyline	119647578	28502	28738	0.10321		Linden	Ave		A41	310	398	311	399	60045	60045	0	0	A	A4
16	Polyline	119647436	26502	26706	0.07193	W	Old Elm	Rd		A41	298	258	299	259	60045	60045	0	0	A	A4
20	Polyline	119647872	29984	29846	0.05668		Old Elm	Rd		A41	700	742	846	814	60035	60045	0	0	A	A4
15	Polyline	119647393	26977	27099	0.05624	W	Onwentsia	Rd		A41	150	110	141	101	60045	60045	0	0	A	A4
7	Polyline	119646944	27831	28202	0.13287		Park	Ave		A41	100	198	101	199	60045	60045	0	0	A	A4
0	Polyline	119643779	23676	23416	0.11262		Rockland	Rd		A31	929	999	0	0	60044		0	0	A	A3
26	Polyline	119702166	29278	29377	0.05051		Rosemary	Rd		A41	552	610	565	629	60045	60045	0	0	A	A4
19	Polyline	119647805	30175	30201	0.04861	S	Sheridan	Rd		A41	198	122	199	123	60045	60045	0	0	A	A4
29	Polyline	119710436	22272	21992	0.17644	W	Southmeadow	Ln		A41	1847	2031	2030	1846	60045	60045	0	0	A	A4
14	Polyline	119647355	30245	30493	0.149		Spring	Ln		A41	900	998	903	999	60045	60045	0	0	A	A4
0	Polyline	119647145	28814	29047	0.17376		Spring	Ave		A41	348	498	371	499	60045	60045	0	0	A	A4

Record: 1 Show: All Selected Records (30 out of 30 Selected) Options

Street Segment Field Map



Phase II: Project Establishment

🌳 Configure project inputs:

- City Info
- Annual Costs
- Benefit prices
- Data fields
- Species

🌳 Set-up PDA



ates option is part of a beta module.

Cost & Price Information

The image shows a software dialog box titled "Define Cost" with a sub-dialog box titled "Benefit Prices". The "Benefit Prices" dialog contains a list of environmental and economic factors with corresponding numerical values in input fields. The values are: Electricity (\$/Kwh) at 0.0636, Natural Gas (\$/Therm) at 0.9066, CO2 (\$/lb) at 0.0075, PM10 (\$/lb) at 0.49, NO2 (\$/lb) at 2.77, SO2 (\$/lb) at 0.98, VOC (\$/lb) at 2.61, Stormwater Interception (\$/gallon) at 0.0108, and Average Home Resales Value (\$) at 251,731. At the bottom of the dialog are three buttons: "OK", "Cancel", and "Help".

Benefit Category	Value
Electricity (\$/Kwh)	0.0636
Natural Gas (\$/Therm)	0.9066
CO2 (\$/lb)	0.0075
PM10 (\$/lb)	0.49
NO2 (\$/lb)	2.77
SO2 (\$/lb)	0.98
VOC (\$/lb)	2.61
Stormwater Interception (\$/gallon)	0.0108
Average Home Resales Value (\$)	251,731

Inventory Data Field Decisions

The screenshot shows a software dialog box titled "User Defined Fields" with a close button (X) in the top right corner. The dialog is organized into several sections:

- Field Selection Tabs:** A row of tabs at the top includes "Land Use", "Maintenance", "Conflicts", "Other 1", "Other 2", and "Other 3". Below this, another row of tabs includes "Record", "DBH", "Zone/Sample", "Condition", "Streets", "Site Type", and "Loc. Site".
- Reportable Data:** A section containing a grid of checkboxes for data fields:
 - Public/Private Trees (checked)
 - Maintenance Info (checked)
 - Pest Signs & Symptoms* (unchecked)
 - Other One (checked)
 - Street Segment (unchecked)
 - Land Use (checked)
 - Sidewalk Damage (checked)
 - Other Two (checked)
 - Condition (checked)
 - Site Type (checked)
 - Wire Conflicts (checked)
 - Other Three (unchecked)
- Inventory Details:** A section containing a grid of checkboxes for inventory-related fields:
 - Street Address (checked)
 - GPS Lat/Long (unchecked)
 - Surveyor (checked)
 - Survey Date (checked)
 - Location Site (checked)
 - Location Number (checked)
- Buttons:** A "Defaults" button is located in the lower right area of the dialog. At the bottom of the dialog are "OK" and "Cancel" buttons.
- Footnote:** A note at the bottom left states: "* Indicates option is part of a beta module."

Phase III: Out in the Field

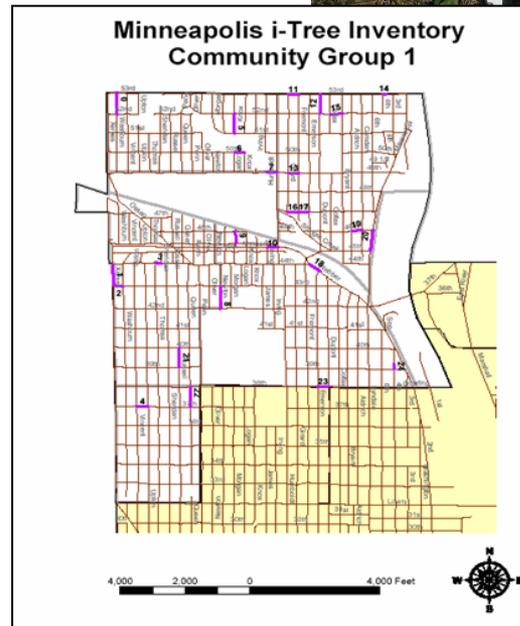
🌳 Locate trees or sample segments

🌳 Data collection

➤ PDA or Paper forms

🌳 Data definitions

🌳 QA/QC



Phase IV: Running i-Tree Streets

- 🌳 Upload or manual data entry
- 🌳 Error checking
- 🌳 Rechecking data in the field
- 🌳 Reporting results
- 🌳 Exporting results

