

TRENDS IN CANOPY COVER ASSESSMENT, TECHNOLOGY AND PRACTICE

CUFC11 – OCTOBER 2014

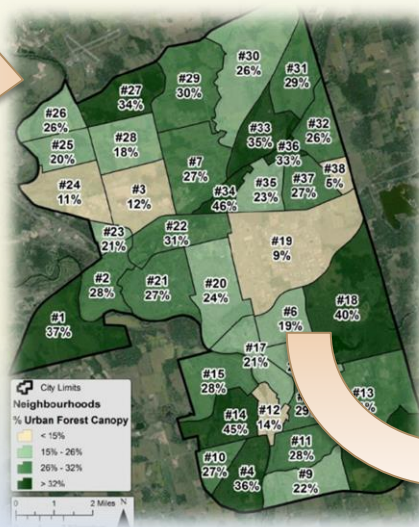
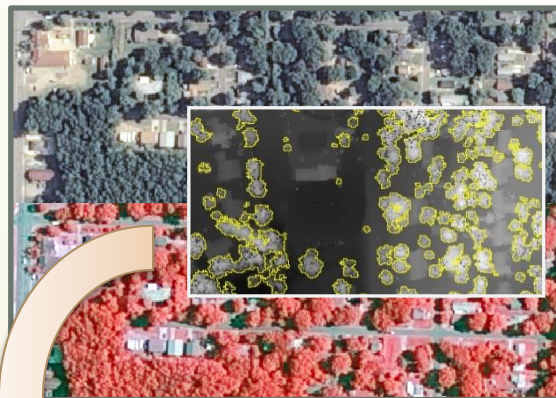
Presented by:

Ian Hanou of ...









Philip van Wassenauer of ...

URBAN FOREST INNOVATIONS INC
Urban Forestry and Arboricultural Consulting



AGENDA

-  **Why:** this topic?
-  **What:** 101 basics, uses, benefits, products
-  **Where:** comparing canopy assessment projects
-  **How:** putting canopy into management plans
-  **Canopy Online:** web mapping applications
-  **Recap:** resources, discussion

ASSESSING CANOPY: WHY *THIS* TOPIC, WHY *TODAY*?



Gaining Momentum: becoming ubiquitous as a method at gauging urban forest extent every 5-10 years



UFMPs: tying canopy to and informing the management planning process



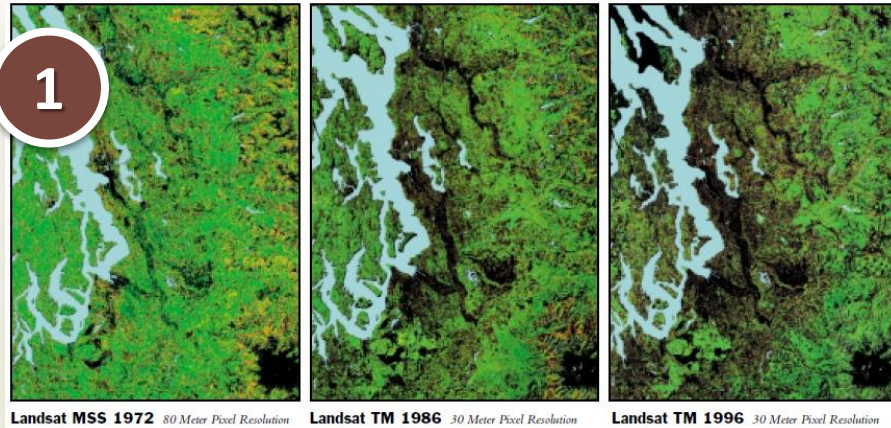
Lessons Learned: from Canadian municipalities we've worked with



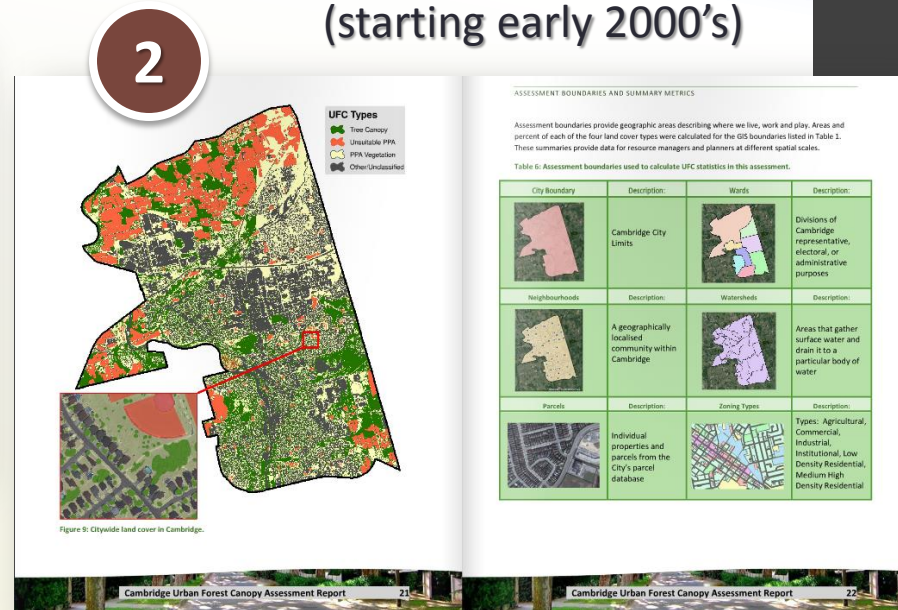
Vision: help municipalities design their project for success

ASSESSING CANOPY: METHODS / TOOLS

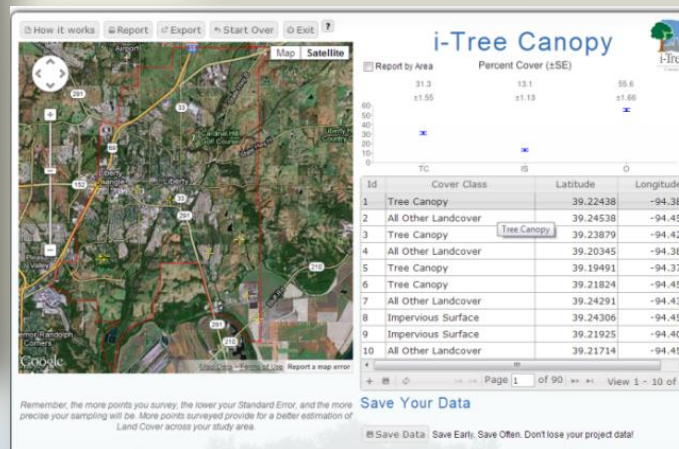
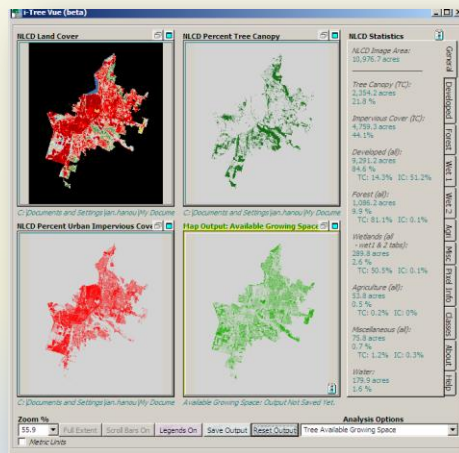
30-meter (coarse) resolution studies (1990's)



UTC/UFC Assessments (starting early 2000's)



i-Tree Vue and i-Tree Canopy (~2010)



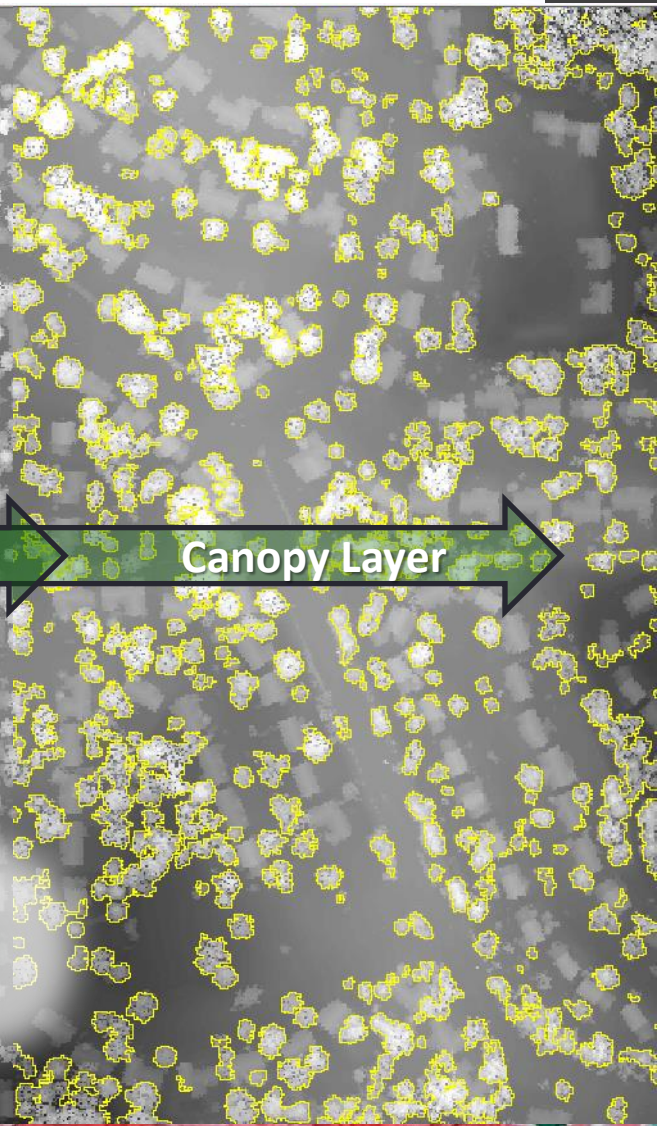
CANOPY ANALYSIS: INPUTS-OUTPUTS



Multispectral Imagery








LiDAR Surface Model







Canopy Layer

*White Pixels = higher elevation
Dark Pixels = low elevation*








CANOPY ASSESSMENT: USES

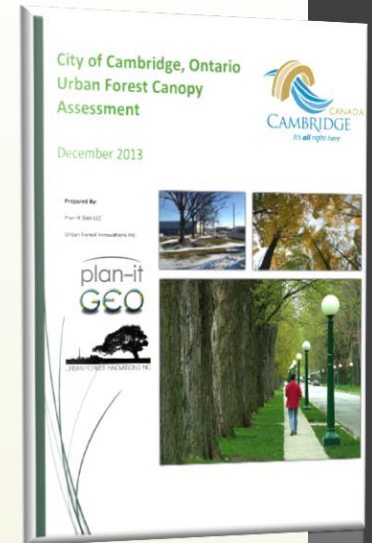
-  **Benchmark:** baseline conditions
-  **Prioritize:** strategic planting locations and areas with the greatest needs
-  **Inform:** an UFMP and policies / ordinances
-  **Monitor:** trends in canopy gains / losses
-  **Calculate:** ecosystem services for regulatory compliance

CANOPY ASSESSMENT: BENEFITS

-  **Time & Money:** Cost-effective and rapid assessment
-  **An Opportunity:** to inform elected officials and citizens
-  **“Big-Picture”:** green vs. gray infrastructure on public and private properties, useful to planners, stormwater, etc.
-  **Competition?:** can create a healthy competition among cities or neighborhoods

CANOPY STUDIES: TYPICAL PRODUCTS

-  **GIS Data:** imagery, land cover, and assessment boundaries
-  **Metrics:** assessment spreadsheet
-  **Maps:** existing canopy or priority planting areas
-  **Web Applications:** online interactive maps
-  **Ecosystem Services:** analyze current or future scenarios
-  **Documents:** Report, Fact Sheet, Implementation Plan
-  **Outreach:** workshop/training or Council presentation



CANOPY: ASSESSMENT SCALES & THEMES

Political:

- ✓ Wards/councils, voting districts

Environmental:

- ✓ Riparian buffer, watersheds/drainage basins

Social:

- ✓ Neighbourhood, census, SGU

Management:

- ✓ ROW, land use, zoning, parcels



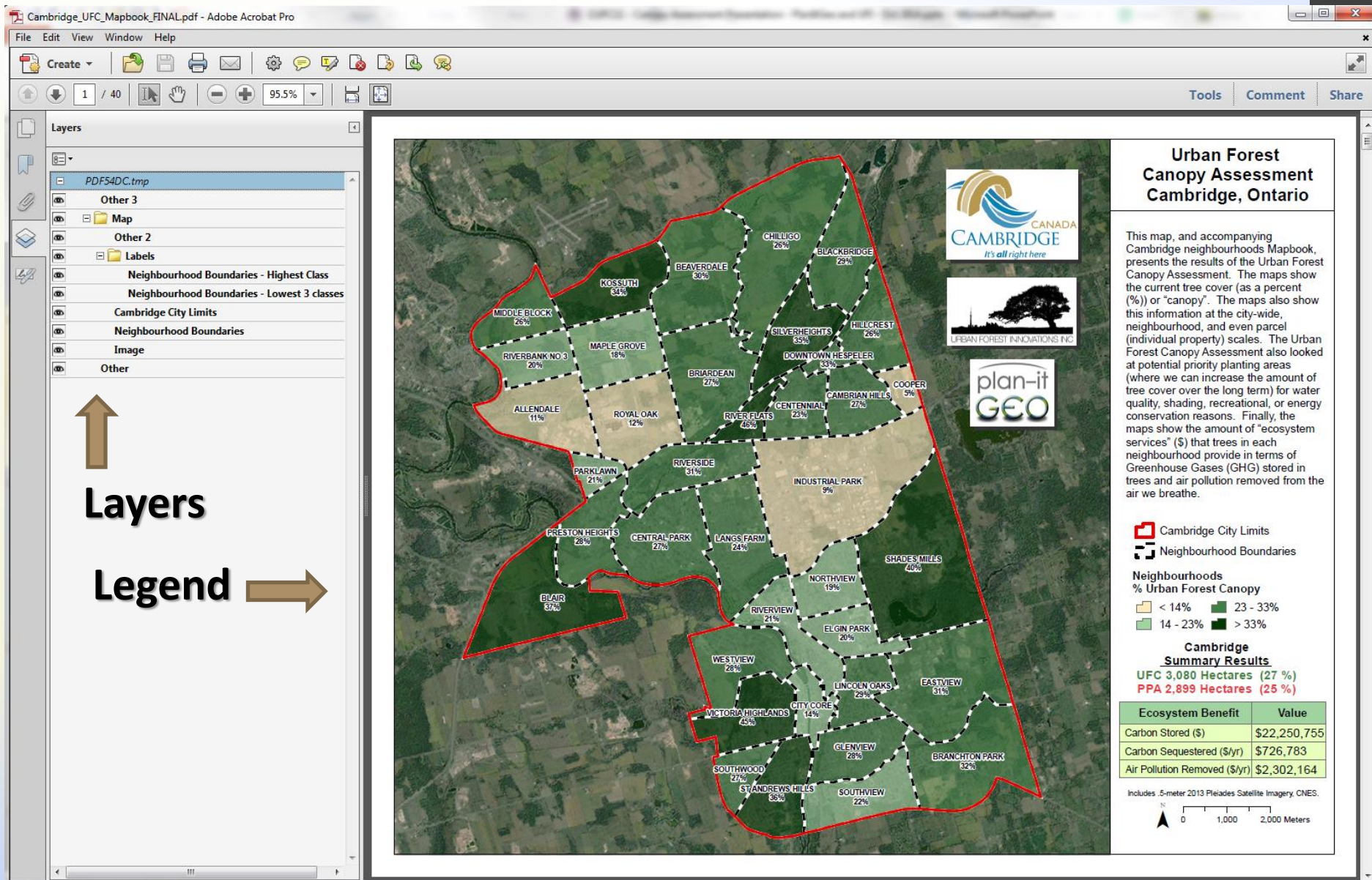
CANOPY STUDIES: COMPARING PROJECTS

CITY	UTC / UFC *	Imagery / Year / Resolution	# of Land Cover Classes	Part of UFMP?	Eco. Services (i-Tree)	Other
Brampton	11	Satellite, 2007, 60cm	7	No	N/A	Part of Peel Region analysis
Calgary	9	City's Aerial Imagery	9	No	i-Eco	Phase 1 i-Eco / Phase 2 Canopy
Cambridge	27	Satellite, 2013, 50cm	4	Yes	i-Vue	Phase 1 Canopy, Phase 2 UFMP
Mississauga	15**	Satellite, 2007, 60cm	7	No	i-Eco	Part of Peel Region analysis
Oakville	27	Hyperspectral, 2010, 1m	7	No	i-Eco	Part of EAB/ash mapping project

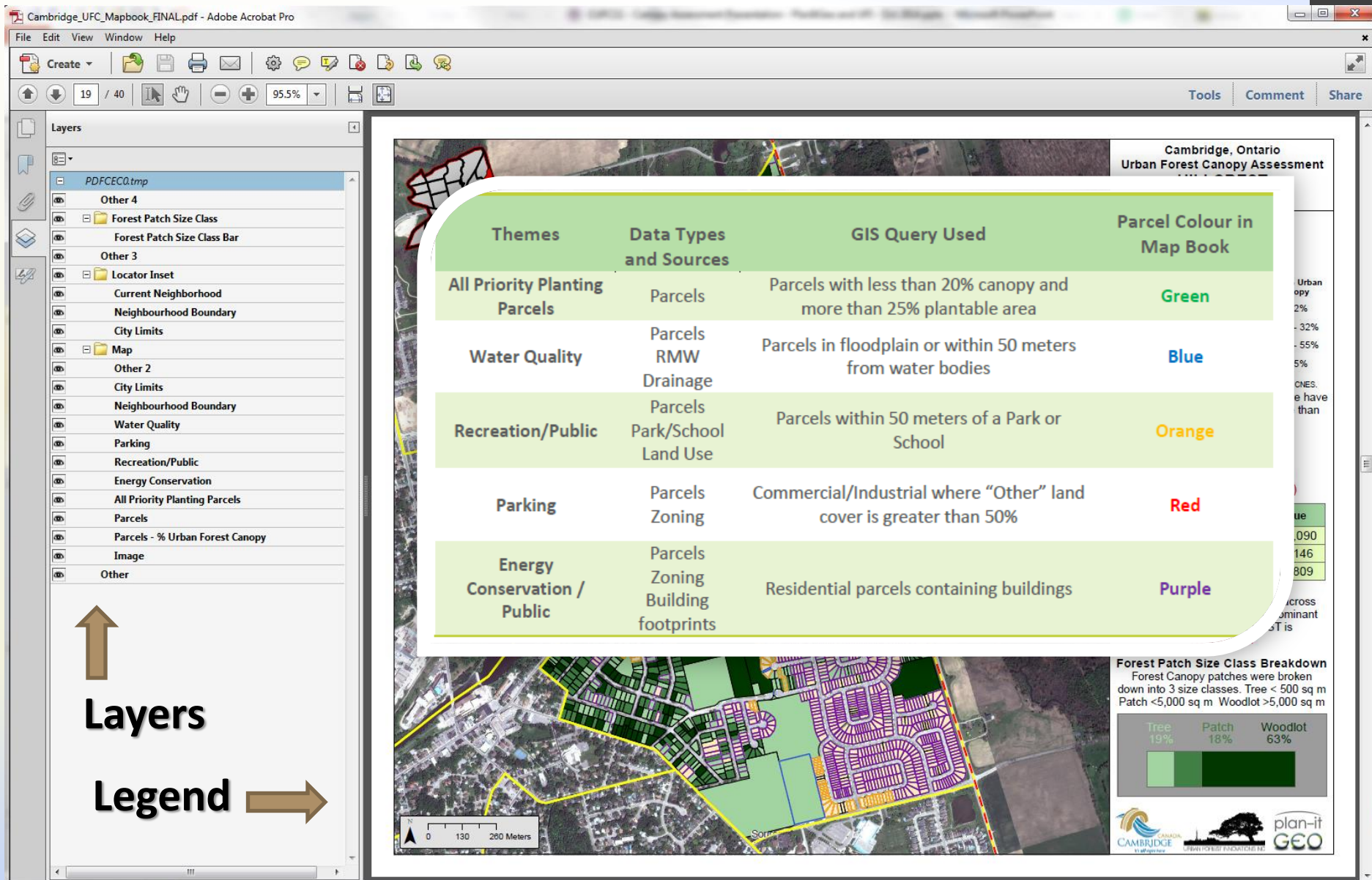
* Urban Tree Canopy (UTC) excludes shrubs, Urban Forest Canopy (UFC) includes shrubs

** Currently being updated using 2014, 50cm satellite imagery




INTERACTIVE COMMUNITY TREE MAPS



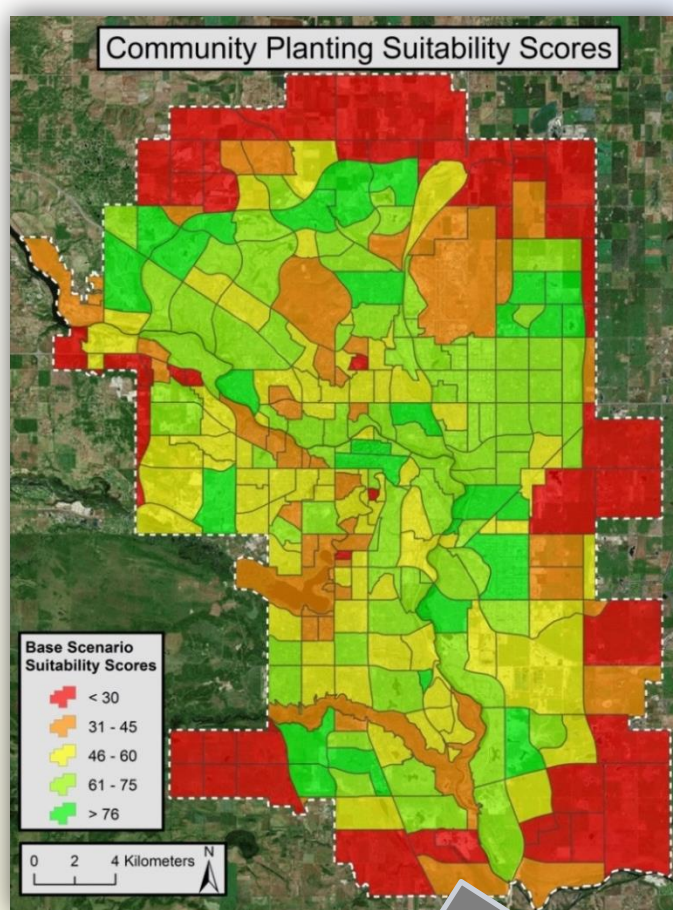
INTERACTIVE COMMUNITY TREE MAPS



Experiences tying canopy data into planning:

-  **Calgary** - existing, potential and plantable spaces
-  **Mississauga** – adaptive management, threats
-  **Cambridge** – comprehensive approach

CALGARY PRIORITY PLANTING MAPS



Base Scenario (Equal Weights)

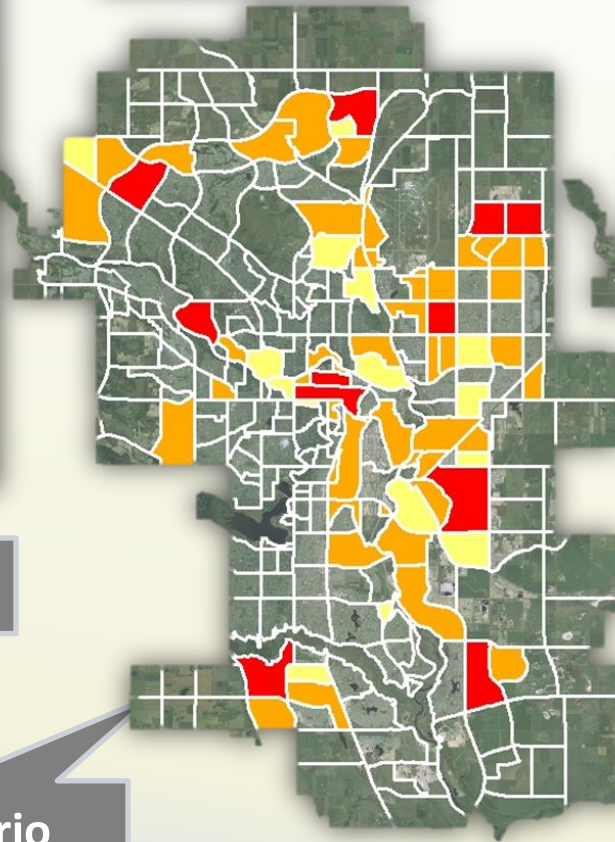
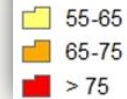
Top 25% Communities
for Urban Heat Island Mitigation

Suitability Score

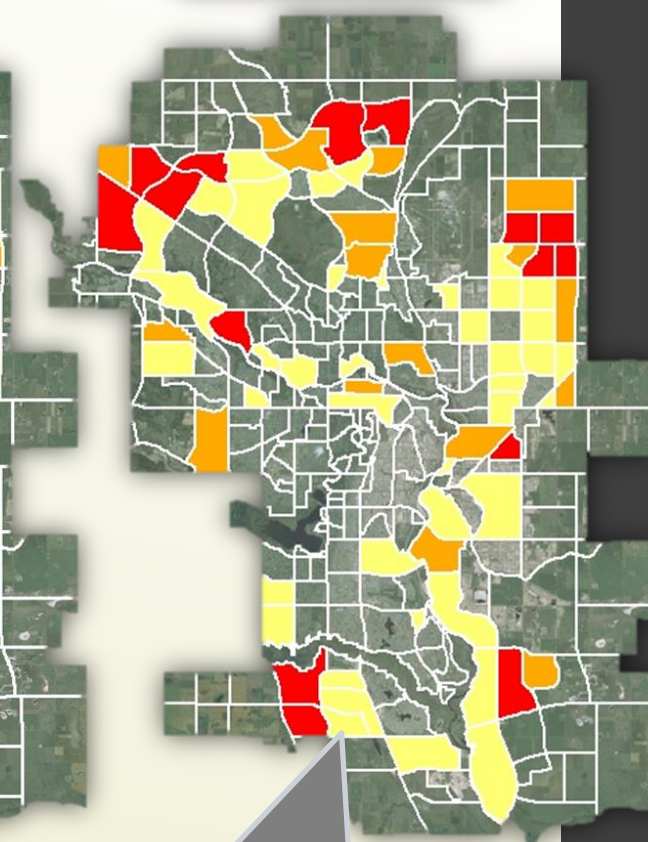


Top 25% Communities
for Energy Conservation

PPA Energy Suitability Score

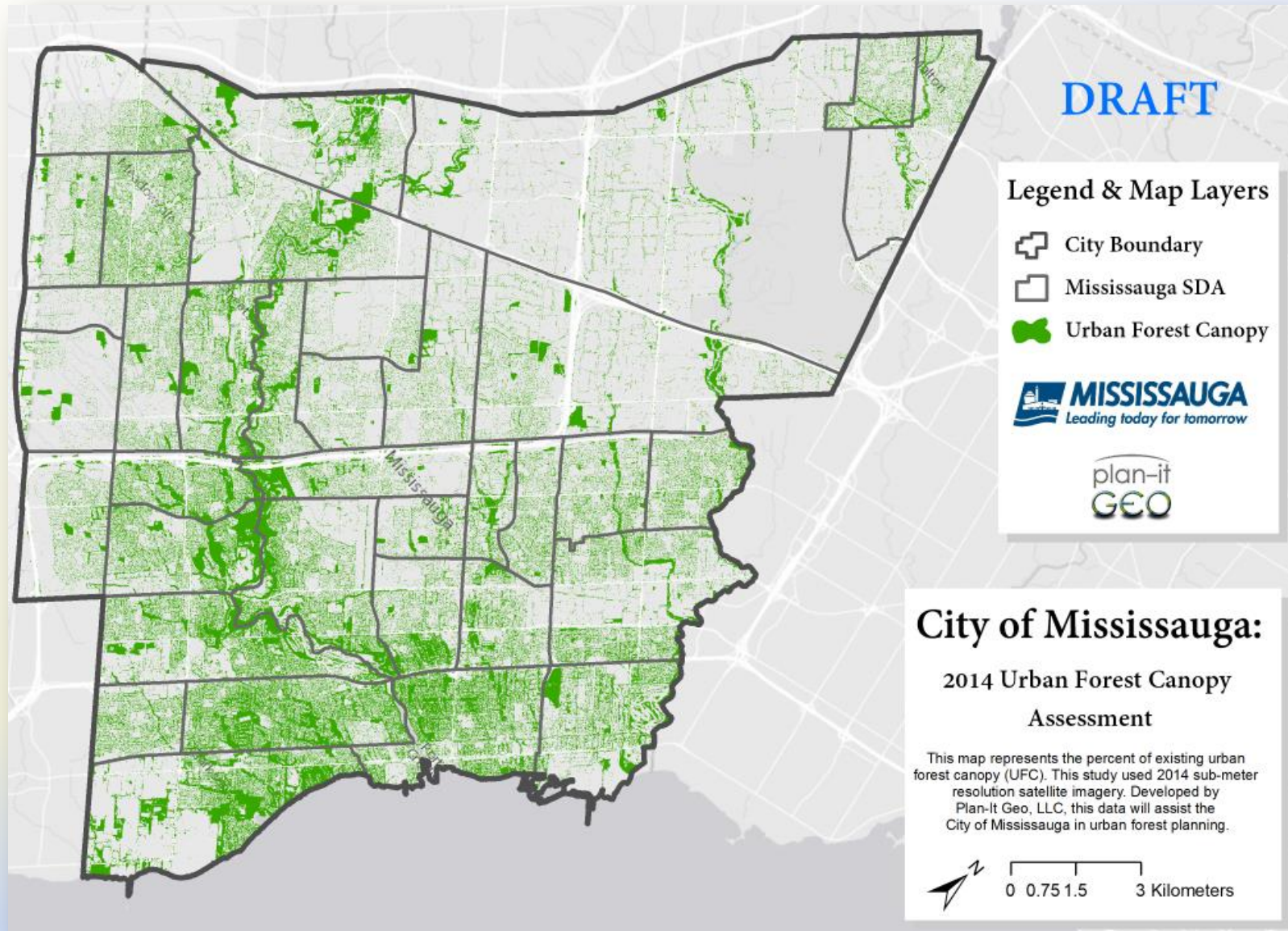


UHI Scenario

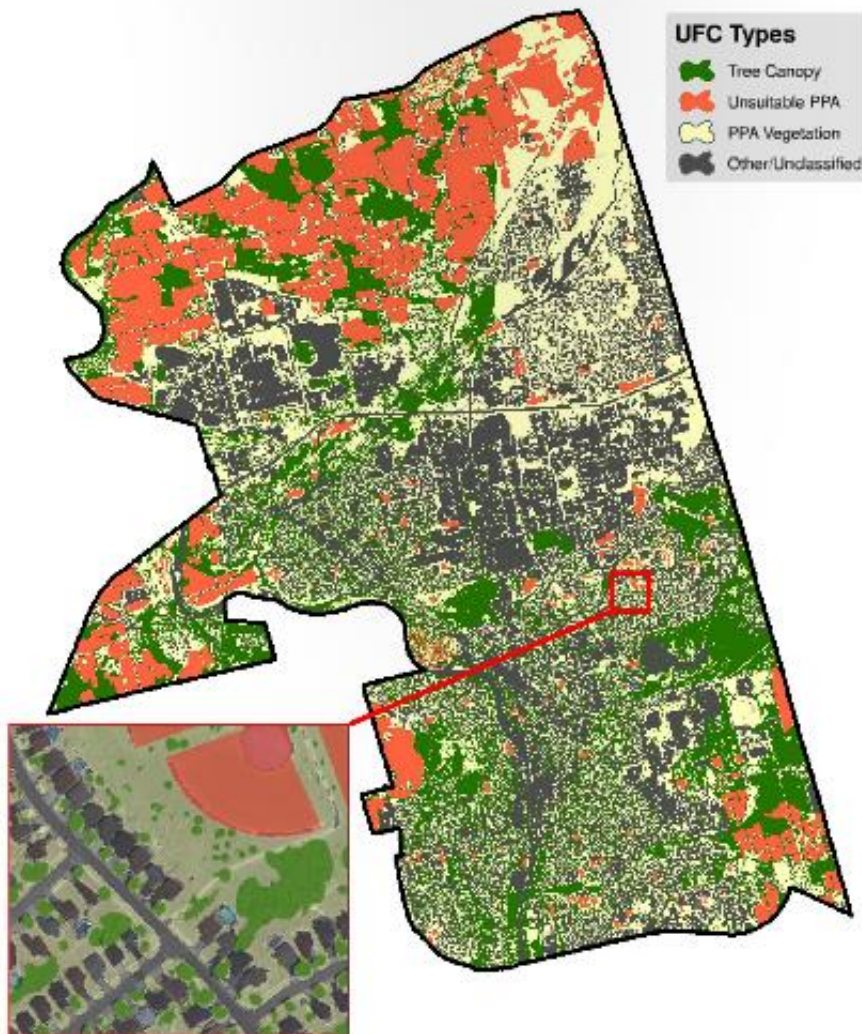


Energy Scenario

MISSISSAUGA → CANOPY RE-ASSESSMENT









CAMBRIDGE → MANAGING ACROSS SCALES



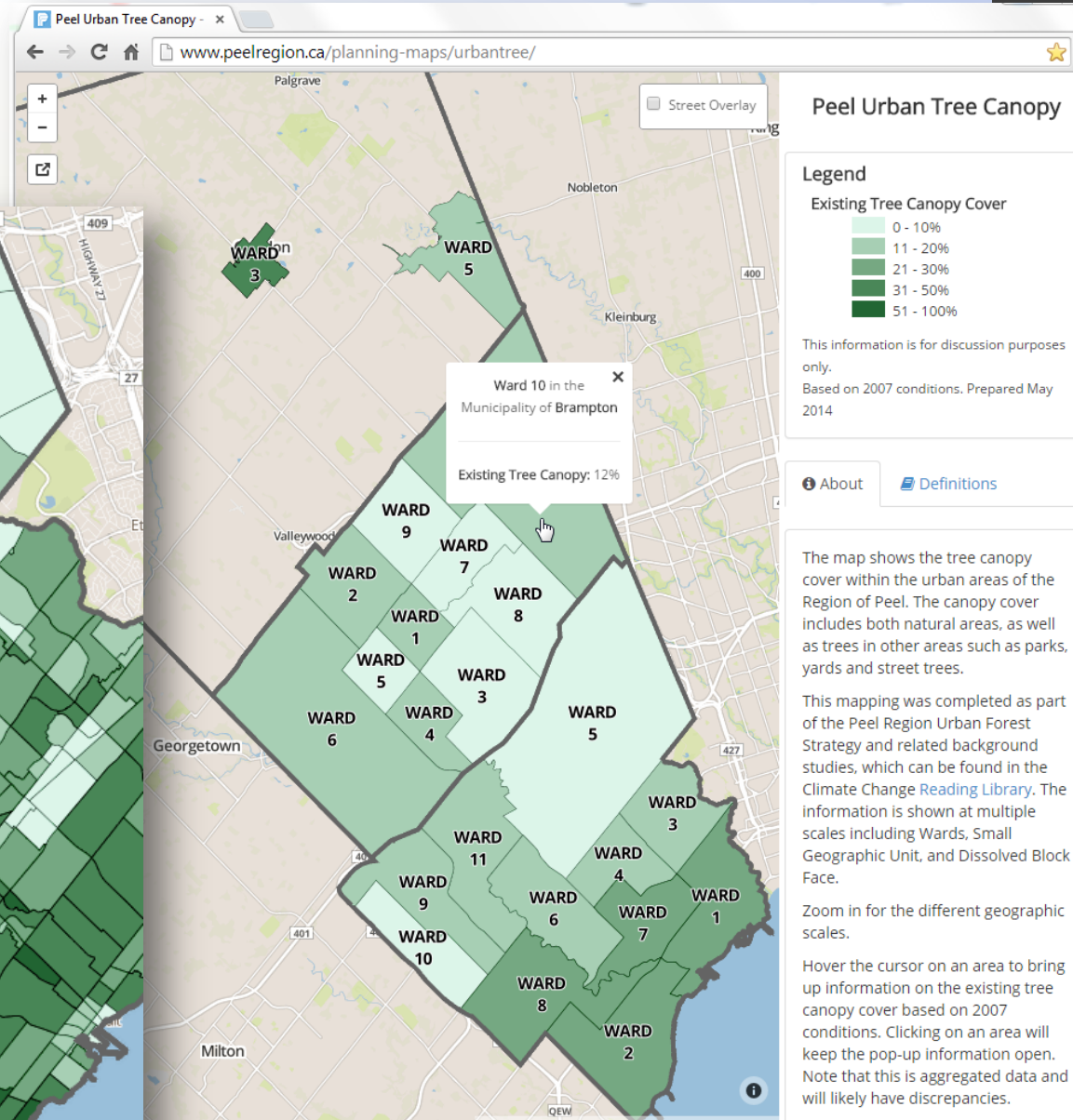
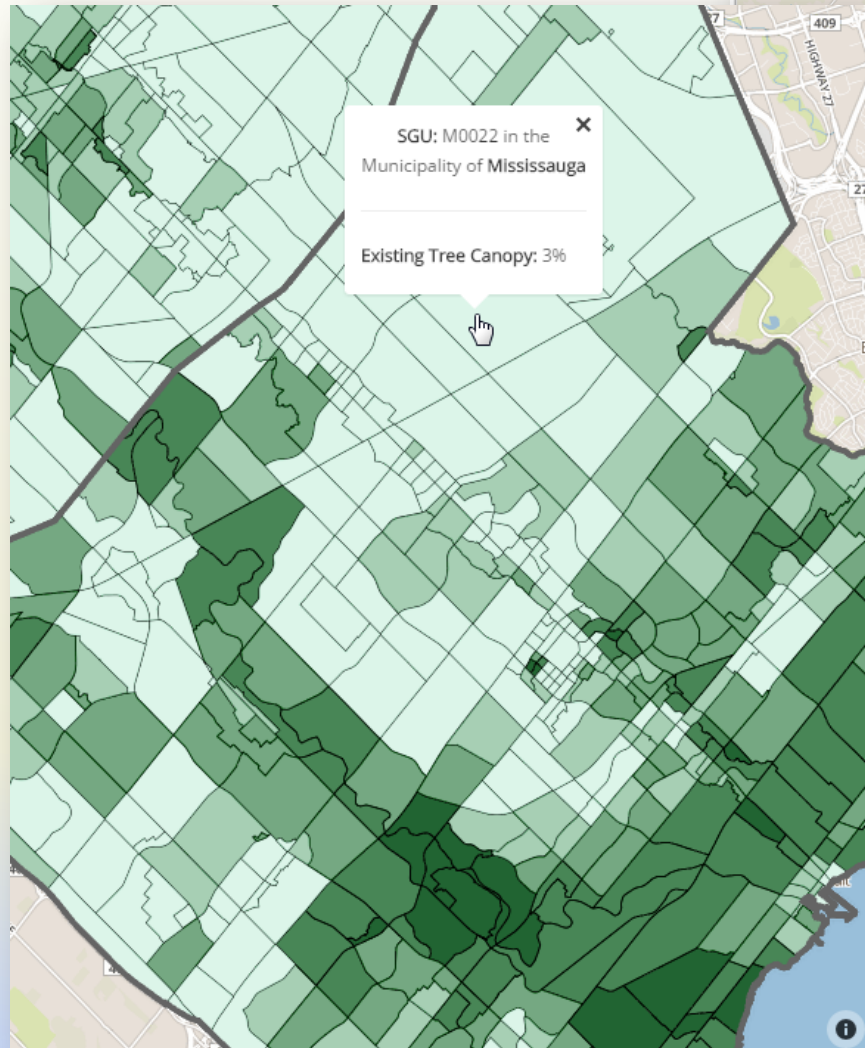
ASSESSMENT BOUNDARIES AND SUMMARY METRICS

Assessment boundaries provide geographic areas describing where we live, work and play. Areas and percent of each of the four land cover types were calculated for the GIS boundaries listed in Table 1. These summaries provide data for resource managers and planners at different spatial scales.

Table 6: Assessment boundaries used to calculate UFC statistics in this assessment.

City Boundary	Description:	Wards	Description:
	Cambridge City Limits		Divisions of Cambridge representative, electoral, or administrative purposes
Neighbourhoods	Description:	Watersheds	Description:
	A geographically localised community within Cambridge		Areas that gather surface water and drain it to a particular body of water
Parcels	Description:	Zoning Types	Description:
	Individual properties and parcels from the City's parcel database		Types: Agricultural, Commercial, Industrial, Institutional, Low Density Residential, Medium High Density Residential

CANOPY ONLINE: WEB-MAPPING APPLICATIONS



CANOPY PLANNER®: VIEWER & ANALYTICAL TOOL

Log in.

Use a local account to log in.

User name

Password

☐ Remember me?

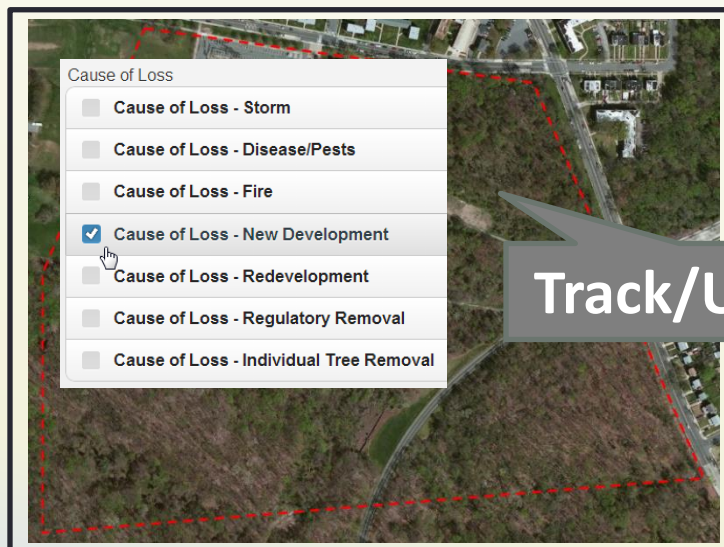
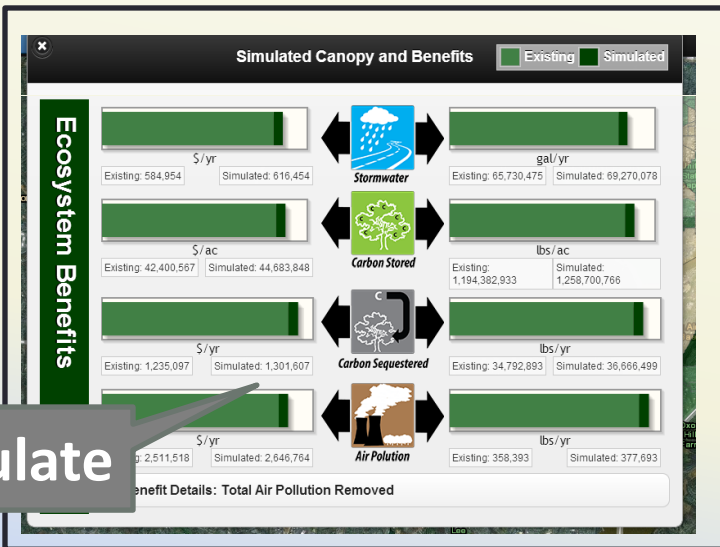
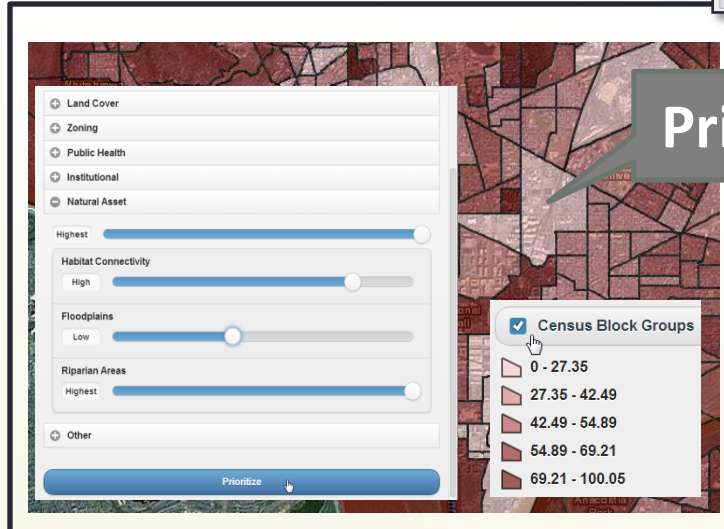
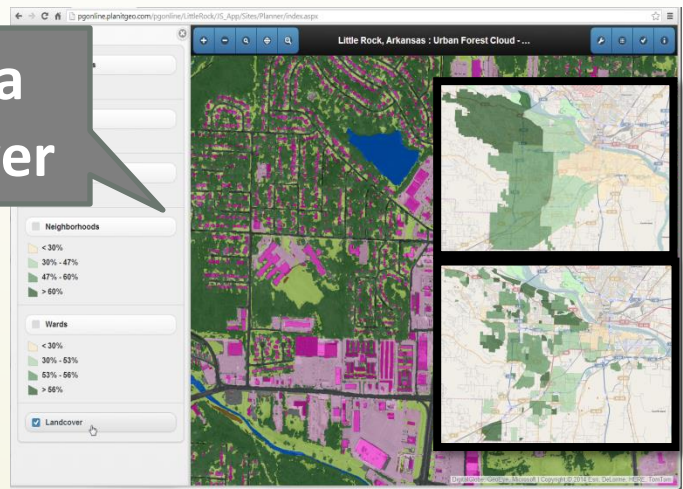
Log in

Data
Viewer

Prioritize

Track/Update

Simulate

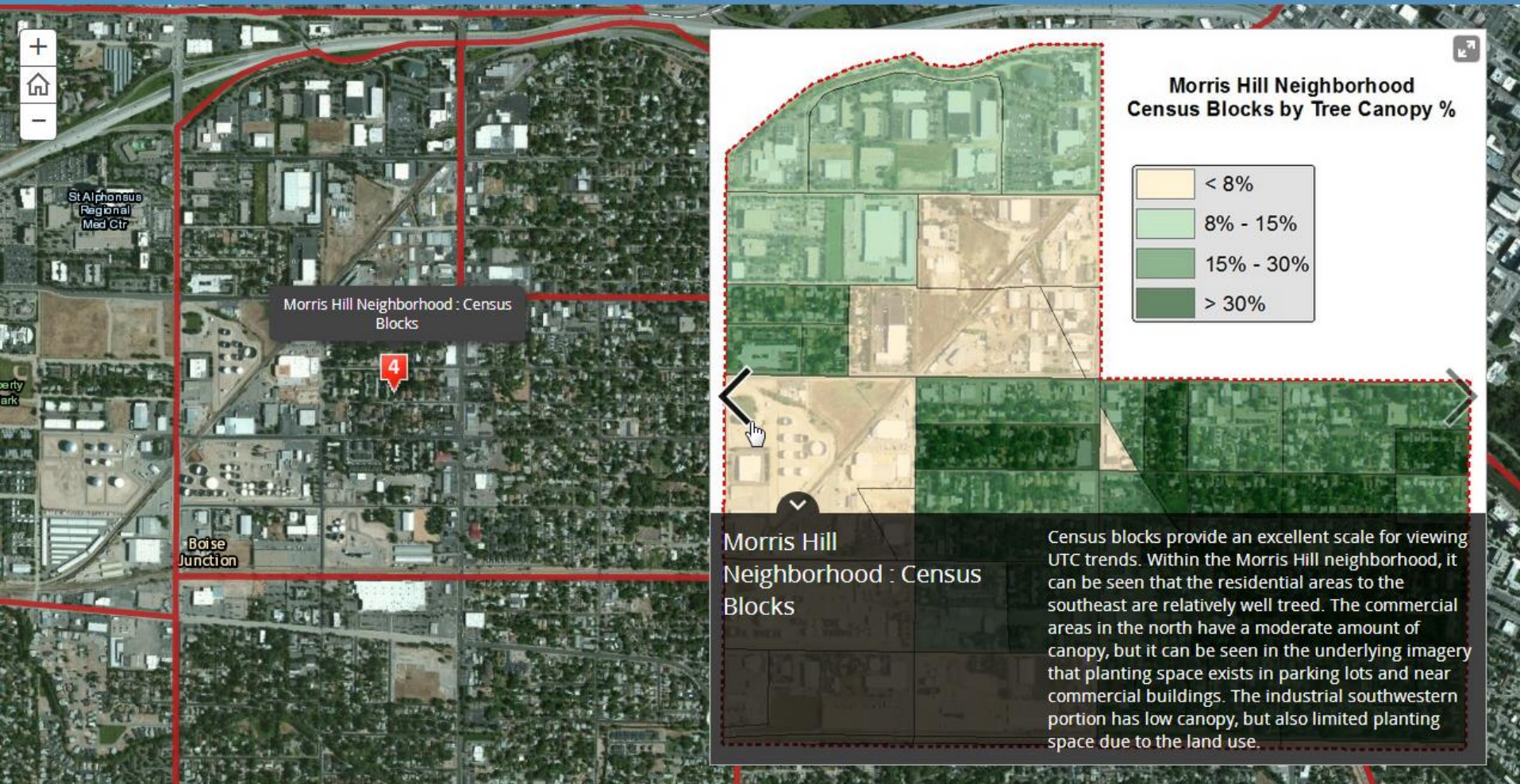


CANOPY ASSESSMENT "STORY MAP"

A story map by Plan-it Geo



Boise, Idaho Urban Tree Canopy (UTC)



1
North End Neighborhood :
Aerial Imagery



2
North End Neighborhood :
Land Cover Mapping



3
West Downtown : Land Cover
Stats



4
Morris Hill Neighborhood :
Census Blocks



5
Borah Neighborhood :
Parcels



6
Southwest Neighborhood :
Potential Planting Sites




7
Southeast Neighborhood :
Right-of-Way

TREE CANOPY: RESOURCES

 **U. S. Forest Service:** UTC websites and i-Tree Tools

 www.nrs.fs.fed.us/urban/utc/

 www.itreetools.org

 **Contact Us:** sample reports/plans, a scope of work or proposal, and canopy web applications

 **Questions & Answers:** discussion

THANK YOU!



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*A geospatial technology,
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