



Urban Tree Canopy Assessments

Supporting long-term green Infrastructure development, management, sustainability, and resilience.



Urban and community trees and forests are part of the green infrastructure that complements a community's grey infrastructure (i.e. the built structures that support a community) and should be managed with equal importance. Urban Tree Canopy (UTC) assessments help communities determine how much of their land area is covered by trees, and the location/extent of those trees relative to the built structures, impervious hardscapes, and other green infrastructure components (e.g. parks, wetlands, riparian buffers, trail systems). UTC assessments look at both public and private tree canopy. These assessments should be developed to integrate with a community's geographic information system (GIS) so that tree canopy can be analyzed comprehensively in relationship to environmental, economic, and social issues at a range of scales (i.e. neighborhood, district, municipality, watershed).

Urban tree canopy assessments can be used to support a wide range of programs within the overall green infrastructure concept; programs that support policy, ordinances, monitoring, stewardship, sustainability, and goal setting to reach optimal levels of canopy and public benefit. UTC assessments should be developed and used to provide an easily understood measure of the community's progress in reaching community goals.

Properly implemented, UTC assessment is a critical urban forest and green infrastructure management tool. When combined and analyzed with other readily available geographic information, the UTC assessment becomes a powerful tool for building coalitions to strengthen community resilience – encompassing technical, organizational, social, environmental, and economic elements. UTC assessment and analysis can be used to...

- Establish a baseline measurement to monitor health and change
 - to set policy and goals (e.g. minimum canopy)
 - support comprehensive plans and landuse planning
 - to develop ordinances
 - to evaluate programs
- Create tree planting prioritization guidelines to support a wide range of objectives
 - environmental justice issues
 - urban heat island and energy conservation
 - EPA voluntary air quality plans (SIP)
 - EPA stormwater mitigation
 - physical and psychological health related programs centered on walkable communities
- Develop disaster preparedness, response, and mitigation plans
 - that includes urban tree risk management
 - floodplain conservation to address catastrophic and recurring flooding
 - debris planning and management
 - to build and strengthen overall community resilience
- Support green asset accounting (GASB 34)
 - as an indicator of environmental service productivity
 - to monitor long-term condition
 - and support payment for environmental services (PES)
- Provide a basis for urban forest sustainability
 - long-term management of insect, disease, and herbaceous invasives
 - anthropogenic impacts
 - urban wood utilization
- Enhance green infrastructure development
 - through the nodes and linkage concept (community scale)
 - stormwater management (site level scale)
 - interaction of natural and human systems (range of human activity from passive to active)
- Support watershed planning with neighboring partners
 - Identify and enhance forested riparian zones
 - stormwater management (flooding, infiltration)
 - forest to faucet concepts
 - regional greenspace and recreation planning
- Support an Urban Forest Sustainability and Management Audit
 - As an inventory and monitoring component
 - supports Tree City and Tree Campus designations and growth awards



Urban Tree Canopy Assessments and Disaster Planning

Supporting long-term green Infrastructure development, management, sustainability, and resilience.



Using your community's urban tree canopy (UTC) assessment to support disaster planning...

The National Mitigation Framework (FEMA 2013) identifies the assessment and management of risk as the key mitigation strategy to build and strengthen your community's resilience to natural disasters.

A relatively simple measurement component for viewing your potential for storm related risk is **Urban Tree Canopy (UTC)**. **UTC** can be combined with urban tree risk management concepts and protocols to help Identify and reduce tree risk prior to storms and estimate your exposure to tree related risk.

The Urban Tree Risk Index (UTRI) was developed as a GIS component of the Vegetative Risk Management Planning (VRMP) process that uses tree canopy and other readily available data to prioritize ANSI A300 Level 1 tree risk assessments and mitigation. UTRI can be used as a standalone model if desired, but is most effective when used within a local, collaborative, and comprehensive strategy for disaster mitigation. GIS models like UTRI work with layers, and use readily available data from local, regional, state and national sources to develop a risk index that supports additional assessment and subsequent prioritized mitigation. The UTRI model does not use a tree risk rating system like that needed for a comprehensive risk management program. However, the GIS layers function as surrogates for rating street segments as "potential" areas of concern, inspection, and subsequent mitigation.

UTC provides the locations of possible risk trees and one layer for the UTRI model. **UTC** can also support other disaster planning concerns beyond rights-of-way risk mitigation:

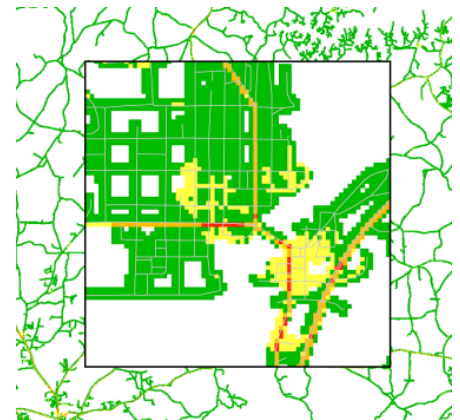
- Urban tree risk management (long-term risk Mitigation)
- Debris estimation and management (Response)
- Priority planting areas (long-term Recovery)

The UTRI (Urban Tree Risk Index) Tool includes:

- **Field verification worksheet:** Provides a form for verification, assessment and mitigation listed by priority
- **Identifies tree management needs:** To reduce risk; such as routine pruning in high tree density areas vulnerable to damage
- **Mitigation:** Identify areas prior to events where mitigation and corrective actions should be implemented on an expedited basis – i.e. specific street segments
- **Inspection frequencies:** Identify zones for setting tree and vegetation inspection frequencies and schedules

How the UTRI GIS model is implemented:

1. The model assessment (via GIS layers) locates areas of "concern"
2. Specific site level inspections identify threats – field verification
3. Principal management actions are tree pruning and removal
4. Mitigation is prioritized based on UTRI rating
5. The street segments with UTRI rating also establish the inspection frequency and scheduling



UTRI Map: Wetumpka, AL – Red are street segments of concern.

References:

- National Mitigation Framework, May 2013, FEMA, US Department of Homeland Security, Washington, DC. <http://1.usa.gov/1xW7EuS>
- ANSI A300 (Part 9)-2011 Tree Risk Assessment; a. Tree Structure Assessment, Tree Care Industry Association, Inc., Londonderry, NH <http://bit.ly/U904tl>
- Best Management Practices: Tree Risk Assessment (2011), Smiley, E.T., and N. Matheny, S. Lilly, International Society of Arboriculture, Champaign, IL <http://bit.ly/PMCiml>
- Tree Risk Assessment - Manual (2013), Dunster, J. and E.T. Smiley, N. Matheny, and S. Lilly, International Society of Arboriculture, Champaign, IL (i.e. TRAQ)
- Primer on Risk Analysis: Decision Making Under Uncertainty (Chapter 1) – CRC Press - Charles Yoe - 2012
- Urban Tree Risk Management: A Community Guide to Program. Design and Implementation, NA-TP-03-03, J.D. Pokorny (Coordinating Author), 2003, St. Paul, MN <http://1.usa.gov/OHL8QV>
- Vegetation Risk Management Plan (VRMP) Template – (GIS/UTRI approach) <http://bit.ly/1vCFXW>

