Issue: Sustainability planning in any area, urban or rural, requires a detailed understanding of what is in place currently, and what could be. Urban policy makers and planners often have access to this information for the built environment, but not for the natural environment. The US Forest Service and partners pioneered Urban Tree Canopy (UTC) Suite, a high-resolution mapping methodology that integrates green and gray land cover data with critical social, economic, and environmental information to inform sustainability and resilience policy, planning, and management (http://www.nrs.fs.fed.us/urban/utc/).

Summary
An Urban Tree Canopy (UTC) assessment provides a measure of a community’s tree canopy cover and is important for understanding land use and the extent of a community’s forest or tree resource. The Forest Service’s UTC Suite of tools helps communities establish tree canopy goals and prioritize tree planting based on social, economic, and environmental needs; engage local residents; and evaluate program success. UTC has applications beyond the urban landscape – the suite allows for fully integrating ecosystem services and other science-based benefits of natural systems into sustainability planning across the urban to rural gradient.

<table>
<thead>
<tr>
<th>UTC SUITE</th>
<th>TYPES OF QUESTIONS ADDRESSED</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Assessment</td>
<td>A. <em>How much do I have and how much could I have?</em> These questions are answered in terms of owner, location, neighborhood, zoning, watersheds, and land uses.</td>
</tr>
</tbody>
</table>
| 2. Prioritization | A. *Where do I need trees to achieve my goals?* Priorities are social, economic, or environmental and link to sustainability and resilience goals. Locations include public, private, and community lands.  
   B. *Who shares my goals?*  
   C. *Who wants to work in the same location(s)?* |
| 3. Marketing | A. *Who is being reached, where, and in relation to priorities?*  
   B. *Who is being missed, where, and in relation to priorities?*  
   C. *What messages and messengers might I need to be more effective?* |
| 4. Change | A. *Where has UTC increased, decreased, or stayed the same?* Change is described in relation to people, place, priorities, and spatial characteristics.  
   B. *Which social, economic, and environmental factors are associated with changes in UTC?* |

Key Points

Why is UTC information important?
- 138 million acres of the U.S. are classified as urban and community land, where 80% of the population lives. Urban and community trees provide critical social, economic, and environmental benefits to these people and are crucial to advancing urban sustainability and resilience.
- UTC assessments show that in many cities, most of the greening opportunity lies with private residential land owners. In Philadelphia, for example, 42% of the land is residential, contributing 35% of the existing tree canopy cover and holding the majority of available space for new trees. UTC Marketing helps local leaders identify the most effective way of reaching their diverse residential populations.
• Previous remote sensing assets such as the National Landcover Dataset (NLCD) severely underestimate the extent of urban tree canopy, particularly on urban residential lands. To illustrate, there is a twofold difference in canopy cover between NLCD (10%) and UTC (20%) in the City of Philadelphia.

**The UTC Suite helps jurisdictions achieve the following desired outcomes:**

• The use of trees and stewardship on urban and community lands to promote public health and safety, economic development and security, vibrant communities, and vital ecosystems.
• Participation of diverse publics and landowners in urban tree care and planting - particularly private, residential landowners where most existing and potential canopy cover can be found.
• Improved policies, plans, and management of urban and community lands through better data. This requires:
  o 100% census of an area that is scalable, from individual parcels to municipal boundaries, states, and regions such as the Chesapeake Bay.
  o Integration into municipal GIS systems and combined with other social, economic, and environmental data using parcels as geographic and administrative “hooks.”
  o Highly accurate and precise data to measure trees at fine scales and in building shadows, permitting the characterization of highly urbanized areas and changes over time.

**The UTC Suite is open data and depends on FS partnerships:**

• All UTC data and software are published with metadata and are available via the Internet or harddrive transfer (http://www.nrs.fs.fed.us/urban/utc/).
• UTC data, tools, techniques, visualizations, and reports are documented and disseminated through peer-reviewed publications, websites, blog-posts, webinars, and consultations.
• UTC data are interoperable with other FS tools, including iTree, StewMap, and partners’ systems such as NYC’s OASIS, Baltimore Neighborhood Indicators and its Green Registry.
• UTC development is a partnership of USFS, University of Vermont Spatial Analysis Lab, SavATree Consulting Group, and Clarke University Graduate School of Geography.

Map illustrating the City of Baltimore’s UTC Prioritization based on social, economic, and ecological criteria – environmental equity is a key criterion, in addition to asthma, physical activity, crime, flooding, summer heat, noise pollution, and social cohesion.

**Contact:** Morgan Grove, USFS Baltimore Field Station, morgangrove@fs.fed.us