



# AN ASSESSMENT OF MUNICIPAL TREE UTILIZATION AND THE URBAN FORESTRY PROGRAMS OF RICHMOND, VIRGINIA AND RALEIGH, NORTH CAROLINA

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# **An Assessment of Municipal Tree Utilization and the Urban Forestry Programs of Richmond, Virginia and Raleigh, North Carolina**

## **Executive Summary**

This project examined urban tree utilization and the urban forestry programs in the communities of Richmond, Virginia and Raleigh, North Carolina. Individual reports for each community were prepared which include summaries of existing urban tree utilization, urban forestry programs, case studies of specific partnerships and opportunities, and results of stakeholder consultations.<sup>1</sup>

Urban forests provide diverse and essential benefits and services to communities. When trees are removed, the wood is most often mulched, composted, or sent to a landfill site. But, in the U.S., urban forests offer the potential for enhanced utilization with estimates of annual availability ranging from 16 to 38 million green tons.

Barriers to urban tree utilization include technical and logistical constraints, availability of processing facilities, and markets. Perhaps the most significant barrier to urban trees entering the wood processing stream may be the prevalent idea that urban trees are suitable only for low-value products. Many urban forestry program managers, as well as urban residents, are not fully aware of the opportunities for use of urban trees following removals and associated potential benefits.

Across the U.S., urban forestry programs are typically located in either a Department/Division of Public Works or a Department/Division of Parks. In Richmond, the Public Works Department has responsibility for the management of the urban forest, whereas in Raleigh, this responsibility resides with the Parks Division. The assessment of these two urban forestry programs included review of their urban tree planning and implementation processes. The review covered program materials, site visits, staff interviews, city tours, observations of on-the-ground program activities and outcomes, and surveys of stakeholders to identify program strengths and weaknesses.

The two assessments led to recommendations and identification of potential actions for each city. The project findings were presented to each community and have resulted in actions being taken in Richmond and Raleigh to further enhance utilization of urban trees through strong and robust urban forestry programs.

## **Background**

From a national perspective, the number of trees and volume of wood removed annually from urban and community forests is significant. Removal is often triggered by land conversion, pest damage, storm events, or trees deemed hazardous. Removal estimates range from 16 to 38 million green tons per year nationally. Even the lower value of these estimates is comparable to total annual harvests from America's National (U.S. Forest Service-managed) Forests (Bratkovich et al. 2008). This project included an assessment of urban tree utilization capacity and the urban forestry programs for the cities of Richmond, Virginia and Raleigh, North

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<sup>1</sup> The individual reports are available at the Dovetail website, <http://www.dovetailinc.org/reports>

Carolina. The assessments included interviews and site visits focused on local urban tree utilization capacity plus reviews of each city's processes for urban tree program planning and implementation. Both assessments provide recommendations to support continued enhancements. Although both assessments were targeted to specific cities, the recommendations may apply to many communities in North America.

### *Richmond, Virginia*

The City of Richmond is about 100 miles south of Washington, DC (Figure 1). Richmond is the capital of the Commonwealth of Virginia, and during the Civil War served as the capitol of the Confederate States of America. Richmond has a population of over 217,000 with a metro-area population greater than 1.2 million (Figure 2).<sup>2</sup> As State Capitol, Richmond is home to dozens of state offices including the Science Museum, Supreme Court, and Department of Education. Richmond is also home to the Virginia Secretary of Natural Resources, the Virginia Secretary of Agriculture and Forestry, and the Library of Virginia.<sup>3</sup>

**Figure 1. Map of Virginia**



**Figure 2. Richmond, VA Area Map**



Sources:

<http://www.goplayoutdoors.com/Member/RichmondVA/index.htm>;

[http://www.homefinders.com/map\\_facts.php](http://www.homefinders.com/map_facts.php)

Richmond is headquarters to two Fortune 500 companies – Dominion Resources and MeadWestvaco – with other ‘500’ companies in the metropolitan area. The city is home to both the U.S. Court of Appeals for the Fourth Circuit and the Federal Reserve Bank of Richmond.<sup>4</sup> The city is also home to the University of Richmond and Virginia Commonwealth University (VCU), with VCU including a medical center. The Richmond region offers undergraduate, graduate and professional degree programs at more than 10 colleges and universities.<sup>5</sup>

<sup>2</sup> [http://en.wikipedia.org/wiki/Richmond,\\_Virginia](http://en.wikipedia.org/wiki/Richmond,_Virginia).

<sup>3</sup> <http://www.agencydirectory.virginia.gov/>.

<sup>4</sup> [http://en.wikipedia.org/wiki/Richmond,\\_Virginia](http://en.wikipedia.org/wiki/Richmond,_Virginia).

<sup>5</sup> <http://www.visitrichmondva.com/about-richmond-region/universities-colleges/>.

## Raleigh, North Carolina

The City of Raleigh is located in Wake County, in central North Carolina. The population of Wake County is over 975,000.<sup>6</sup> The median household income, and per capita income, for the county, is above both the state and national averages.<sup>7</sup>

Raleigh's population (over 431,000) is growing rapidly. The city is at the heart of the burgeoning Raleigh-Durham Research Triangle sprawl (Figure 3). A North Carolina State University study noted that of 83 U.S. metro areas, Raleigh-Durham had the third worst sprawl index in 2009 (Lawler 2011). Raleigh, a city with an extensive tree inventory, generates a large supply of wood fiber in the form of urban trees, pallets, clean wood from construction and demolition (C&D), etc. According to Lawler (2011), Raleigh typifies the wood waste and energy issues faced by other communities in North Carolina and the Southeast U.S.

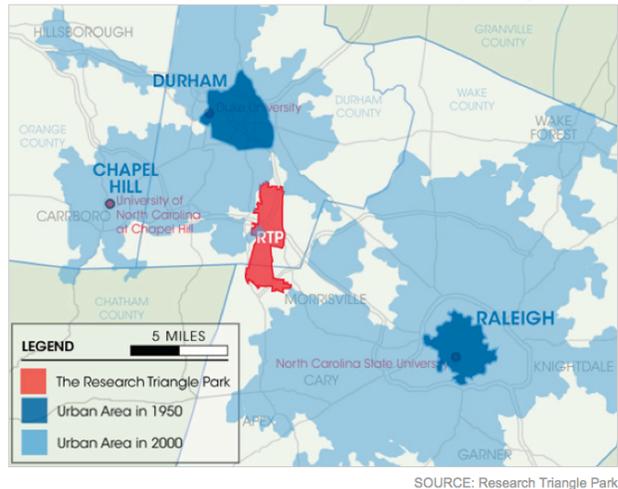


Figure 3. Map of Raleigh and Research Triangle

Raleigh is the state capitol of North Carolina and is the headquarters of the North Carolina Forest Service and roughly 200<sup>8</sup> other state agencies and offices. The city is home to seven colleges and universities including North Carolina State University (NCSU)<sup>9</sup> and the NCSU Department of Forestry and Environmental Resources and NCSU Department of Forest Biomaterials.

### Current Situation

A review of current urban tree utilization activities in both Richmond and Raleigh led to the following observations about existing capacity and service providers.

- *Innovative and entrepreneurial tree service firms exist* – Log sawing, furniture-making, and custom millwork are a few of the products and services offered by select tree service firms in Richmond. In Raleigh, some firms realize that since trees must be removed and trucked for disposal and/or utilization, tree utilization is a “cost-avoidance” strategy.
- *Niche businesses related to urban tree utilization are present* – There are numerous businesses that traditionally “fly under the radar” of the larger corporations and the public-at-large including sawmillers and tree material aggregators.
- *A leader that fosters enhanced coordination among private and public entities is needed* – This includes identifying the key players and providing a forum for them to explain their points-of-view, services and product offerings, identification of markets, etc.

<sup>6</sup> Raleigh's population is 439,896 (2014 estimates, <http://www.census.gov/quickfacts/table/PST045215/3755000>) and metro area 1.3 million (2010 census, <http://www.citypopulation.de/php/usa-metro-raleighnc.php>)

<sup>7</sup> See Wake County Economic Development at <http://www.ncgov.com/government/agencies/index.aspx>.

<sup>8</sup> See NC Government Agencies at <http://www.ncgov.com/government/agencies/index.aspx>.

<sup>9</sup> NCSU is home to approximately 34,000 students and 2,000 faculty.

- *Markets are diverse; tree resources are available* – The populations of Richmond and Raleigh are growing (customers!) and both cities are geographically situated in areas that procure and produce a host of traditional forest products.
- *Mulch is a big industry* – Both communities have growing populations that need/want mulch and compost for gardens and many other uses. Understanding the mulch industry and its markets are important to understanding urban tree/wood flow.
- *Uniqueness exists in both communities* – In Richmond, historic preservation is “big” due to the close proximity to Williamsburg and other factors. In Raleigh, the city is located in/around the traditional timber industry (loggers, sawmills, wood yards, etc.).
- *Strong advocacy exists* – Both communities have non-profits and governmental agencies that are at the forefront of pushing for enhanced urban tree utilization.
- *Woodyards are important* – Mulch sites often serve as distribution yards in Richmond. Traditional woodyards (log yards) exist in/near Raleigh and its metropolitan area.
- *Both communities are engaged in innovative tree utilization programs* – One of Richmond’s programs is Project WARM (firewood for low income households); Raleigh proudly points to its NeighborWoods program (marketing sawlogs and other urban tree removals to support tree planting efforts).
- *A critical mass of urban wood enthusiasts exists* – This includes producers as well as users and a host of intermediaries involved in the process. Private and public entities as well as not-for-profit groups play key roles.

## Methods

### *Urban Wood Utilization Assessment – Industry Cluster Model*

The concept of an “industry cluster” was applied in assessments of urban wood utilization in the two communities. By definition, industry clusters are groups of firms and/or organizations located within a defined geographic region, which have developed cooperative links with one another through value and supply chains, labor, and use of similar inputs, technology, and complementary products (Sidebar 1). Another way of thinking about this concept is that a cluster is any instance of closely located (i.e., geographic proximity) and closely aligned operations (i.e., high frequency or number of transactions, or closely related product lines). For a cluster to flourish, it is necessary that the parties involved receive mutual benefits.

#### Sidebar 1: Types of Clusters

There are four descriptive categories:

- *Marshallian clusters* are typically local small- and medium-sized companies that trade their products and services with other cluster members.
- *Hub and spoke clusters* include one or several large companies serving as anchor companies interacting with numerous small suppliers.
- *Satellite platform clusters* consist of large companies with multiple branch locations that act independently.
- *State anchored clusters* are based on an anchoring institution such as a university, government agency or military installation.

Clusters can be formally organized through trade associations, buyers groups, or cooperatives, or developed through an informal manner (e.g., via friends, families, or neighbors). Some clusters are developed intentionally through government assistance or actions by a development agency, while others evolve as a result of local entrepreneurs that discover and seize new market opportunities.

Oftentimes clusters provide the benefits of efficiency, enhanced productivity, economies of scale and greater resilience to members due to the synergies and relationships they support. On the downside, clusters have been known to create conditions of co-dependence, which can limit any individual participant's ability to innovate. Interdependence can also contribute to the quick demise of enterprises due to significant changes in economic, social, or environmental conditions.

Examples of well-known clusters throughout the U.S. include the high technology-oriented (computer) industry in Silicon Valley, California; the automotive industry in and around southern Michigan;<sup>10</sup> the movie production industry in and around Hollywood; and the Research Triangle Park cluster in North Carolina. On a smaller scale, wood-based clusters include the Amish furniture industry in Holmes County, Ohio; the Forest Industry Park in Ladysmith, Wisconsin; and the wooden boat cluster in Port Townsend, Washington.

#### Ingredients for a Successful Cluster:

In 2008, the U.S. Endowment for Forestry and Communities commissioned a study to examine the status of, and opportunities for, business clustering within the U.S. forest products sector and other closely aligned sectors.<sup>11</sup> One of the outcomes of this study was a summary and description of *ingredients* for a successful industry cluster. The ingredients for success<sup>12</sup> include:

- ✓ Feasibility analysis
- ✓ Education, technical and research support
- ✓ Supportive government actions including financial grants
- ✓ Supporting and complementary industries
- ✓ Entrepreneurship and innovation
- ✓ Access to raw materials, markets and transportation networks
- ✓ Leadership, commitment and collaboration
- ✓ Business climate

In any given cluster, certain ingredients will be more important or critical for success than others. For example, *entrepreneurship and innovation* might be the critical ingredient for a business person developing a new product in an untapped market that can lead to a wave of similar industries in a geographic region. Likewise, *leadership, commitment and collaboration* spearheaded by a champion (individual or group) are often vital to jump-start a cluster such as in the case of an industrial park development. Regardless of the critical key to success, most successful industry clusters will exhibit most, if not all, of the above *ingredients* during their development and initial expansion.

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<sup>10</sup> The auto industry has been one of the most recognized industry clusters in the U.S. For decades, hundreds of firms clustered around this core industry to provide supporting services and products. Today, some of the shortcomings of clusters can be illustrated within this industry sector.

<sup>11</sup> The complete report is available at the U.S. Endowment website: <http://www.usendowment.org/>. An additional summary report is available from Dovetail Partners at: [http://www.dovetailinc.org/reports/Forest-Based+Economic+Clusters\\_n300?prefix=%2Freports](http://www.dovetailinc.org/reports/Forest-Based+Economic+Clusters_n300?prefix=%2Freports).

<sup>12</sup> Because clusters can initially form and grow in different ways (via entrepreneurship, government intervention, cooperatives, etc.) the elements or *ingredients for success* can vary from the above list and include other ingredients such as private financing (private investment), labor resources, and overall infrastructure including availability of utilities, buildings, building sites, work force, etc.

*Urban Forestry Program Assessment*

In addition to applying the industry cluster concept to Richmond and Raleigh, the project methods included an assessment of the overall urban forestry program capacity and operations to identify and evaluate core strengths and opportunities. This assessment included a review of the sustainability of each city's processes for urban tree program planning and implementation. Specifically, the assessment was informed by reviews of program materials; site visits including staff interviews, city tours, observations of on-the-ground program activities and outcomes; and surveys of stakeholders to identify program strengths and weaknesses.

The assessment design utilized the facilitation and planning process used by Dovetail Partners, including application of the Mobius Model.<sup>13</sup> The assessment design also incorporated experience with third-party forest certification systems. To date, third-party forest certification systems (including the programs of the Sustainable Forestry Initiative (SFI), Forest Stewardship Council (FSC), and American Tree Farm System (ATFS)) have generally been applied to rural forestry systems, including commercial forest management. However, a review of some of the standards for these programs (Table 1) illustrates that they may have broad applicability to the practice of forestry more generally.<sup>14</sup>

**Table 1. Principles for the FSC and SFI Certification Programs**

FSC Principles	SFI Principles
<ol style="list-style-type: none"> <li>1. Compliance with Laws and FSC Principles</li> <li>2. Tenure and Use Rights and Responsibilities</li> <li>3. Indigenous Peoples' Rights</li> <li>4. Community Relations and Workers' Rights</li> <li>5. Benefits from the Forest</li> <li>6. Environmental Impact</li> <li>7. Management Plan</li> <li>8. Monitoring and Assessment</li> <li>9. Maintenance of High Conservation Value Forests</li> <li>10. Plantation Management</li> </ol>	<ol style="list-style-type: none"> <li>1. Sustainable Forestry</li> <li>2. Forest Productivity and Health</li> <li>3. Protection of Water Resources</li> <li>4. Protection of Biological Diversity</li> <li>5. Aesthetics and Recreation</li> <li>6. Protection of Special Sites</li> <li>7. Responsible Fiber Sourcing Practices in North America</li> <li>8. Legal Compliance</li> <li>9. Research</li> <li>10. Training and Education</li> <li>11. Community Involvement and Social Responsibility</li> <li>12. Transparency</li> <li>13. Continual Improvement</li> <li>14. Avoidance of Controversial Sources including Illegal Logging and Offshore Fiber Sourcing</li> </ol>

<sup>13</sup> For a description of this process, see the Dovetail Report *Creating Collaboration out of Chaos*, available at: [http://www.dovetailinc.org/report\\_pdfs/2008/dovetailcollab0208ks.pdf](http://www.dovetailinc.org/report_pdfs/2008/dovetailcollab0208ks.pdf)

<sup>14</sup> In addition to the various forest certification programs, there are other certification and recognition programs that are directly applicable to urban forests and urban forest products. These include: *Tree City USA* (<http://www.arborday.org/>); *Urban Forest Sustainability & Management Review, USDA Forest Service Centers for Urban and Interface Forestry* (<http://www.urbanforestrysouth.org/whats-new/recent-updates-urban-forest-sustainability-management-review>); and *SCS Salvaged Wood & Fiber Standard, SCS Global Services* (<http://www.scsglobalservices.com/>)

## Results

### *Richmond, Virginia*

The following Recommendations for Advancing Urban Tree Utilization Clustering in the Richmond Area are offered in no particular order. The recommendations are based on numerous personal interviews, site-visits, observations, past experiences in working with urban tree utilization clusters, and review of public documents.

- *Conduct a feasibility study* - This is the starting point for advancing the idea of business clustering as it relates to urban tree utilization. A feasibility study should include a comprehensive inventory of tree removals, including leaves, limbs and branches (tree pruning residue), and a categorization of these removals (sawlog, pulpwood, firewood, boiler fuel, etc.). The protocol used in southeast Michigan is a model worth adopting and/or adjusting for the Richmond area (MacFarlane 2007).



Figure 4. Richmond, VA

- *Evaluate the overall business climate in terms of economic conditions, existing infrastructure, labor resources, cost of equipment and disposal, and other factors* - This effort can be included in the feasibility study if time and resources permit; if not, a separate analysis should be conducted. Strategies that “make it pay” to better utilize urban trees should be carefully examined. Sometimes a “make it pay” or “make a buck” message is quickly dismissed when a producer contemplates the additional expenses that his/her firm might incur to better utilize trees. Another method of describing this issue is to talk in terms of “cost-avoidance.” All firms, big or small, can relate to the message of cost-avoidance.

A public education campaign (tied into recycling awareness and the *green* movement) and coupled with better markets for urban tree products is needed in the Richmond area. For example, recycling messages should include urban trees in a list of recyclable items such as aluminum cans, mixed paper, and newspapers. The same is true for the “buy local” movement – lumber and lumber products in addition to mulch, compost, and firewood – should be touted as products that can be produced in the Richmond area. Tying urban tree utilization into the existing reclaimed lumber movement is a strategy that should be investigated.

Although significant, tree disposal costs are NOT necessarily the largest cost for organizations that remove urban trees. However, “lack of space” and “transportation costs” were commonly referenced in interviews as factors that undermine innovative urban tree utilization. One idea is to locate tree drop-off points (yards with free or reduced tipping fees) around the Richmond area. These public/private yards could become utilization centers (hubs) for log sorting and sales, log sawing, etc. (a person with experience in operating a log yard should oversee this effort). Existing disposal locations, such as mulch sites, should be contacted first to discuss the pros and cons of such a strategy.

- *Collaborate with stakeholders from industry, government and supporting individuals and organizations* - The key is to get buy-in from various stakeholders and develop a vision for utilization of urban trees including next-steps and action items. It is important that stakeholders share key information with one another (without divulging company or organizational secrets). Storage space and transportation costs (as noted above), equipment, tipping fees, etc. are some of the issues that need to be “on the table” for meaningful collaboration to take place. Different stakeholders often have different “issues” so better communication is needed between the groups (for the betterment of everyone).
- *Select a leader to coordinate activities, facilitate development and gain policy support* - The leader or champion does not necessarily have to possess a wood utilization background but should strongly support the utilization effort and should have the ability (and time!) to use his or her position to “rally the troops.” A local and respected urban forestry leader could fill this role.
- *Secure funding* - Financial resources, both private and public, are important to support feasibility studies, technology development, workforce training, capital investment, applied research and other project components. Funding can include national, state, or local sources. Programs directed at wood utilization and urban forestry efforts are obvious avenues for obtaining funding but broad-based recycling grants, small business loans, and bio-based energy programs (as examples) can also provide direct financial support for urban tree utilization.
- *Focus on education and engagement of entrepreneurial thinking and innovation* - Support the creation of a position with the assigned duties of ‘urban wood utilization’ either for Richmond or in a statewide capacity (perhaps based in Charlottesville). A person in this capacity can efficiently focus on education and training opportunities for arborists, assist and encourage start-up urban wood businesses, conduct utilization-based feasibility studies, and become a focal point for technical/hands-on utilization activities.
- *Nurture supporting and complementary industries* - An important task of the leader/champion, urban wood specialist, or key stakeholder(s) is to facilitate partnerships and relationships (formal or informal) between the numerous industries (and organizations) that are in the cluster (or beginning stages of a cluster). This effort should show cluster members how their businesses are inter-connected and dependent on one

another from procurement of raw materials to production, marketing and distribution of end products.

- *Recognize the differences in types of clusters and act accordingly* - A strategy for cluster development is to select or nurture one of four models as a starting point, or build upon what already exists. This can help focus efforts and provide a framework for collaborative work. Richmond (especially the private sector) appears to be in the early stages of a Marshallian cluster (Sidebar 1) – one that is typically comprised of small- and medium-sized companies that trade their products and services with other cluster members.
- *Develop a Richmond-specific regional list of small sawmills, loggers, timber buyers, and forest product manufacturers* – A directory (hard copy and/or on-line) is needed for “small” timber users in the area. The mills, loggers, and others on a potential “small producer” list are often not included in a statewide directory of primary and secondary producers. The list should be specific to the Richmond area.
- *Work closely with the existing mulch industry* – Since mulch is a large and seemingly growing market in the Richmond area, innovators and entrepreneurs should explore additional products that could be manufactured from urban trees that fit with the strengths of the mulch industry.

In addition to urban tree utilization and the cluster model, the assessment of the overall urban forestry program capacity and operations provided the following results for Richmond.

#### Strengths:

- Well-trained, credentialed, professional staff and volunteer partners
- Detailed inventory information being developed to provide assessment of urban forest
- Innovation and urban forestry activity within partnerships and private sector
- Well-structured city program – reporting, record keeping, tracking, and inventory

#### Opportunities for improvement include:

- Fill vacant arborist position(s)<sup>15</sup>
- Increase funding and financial resources for the program
- Strengthen volunteer programs and collaborations with diverse partners
- Complete inventory development and leverage results to inform resource allocations and program planning
- Complete Master Plan/Comprehensive Management Plan

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<sup>15</sup> Since this assessment was undertaken it is important to note that the City of Richmond has taken actions to fill vacant positions.

There are four “next steps” recommended for the City of Richmond:

1. Develop a strategic plan for the urban forestry program. The recommendations and opportunities from the Richmond report ([http://www.dovetailinc.org/report\\_pdfs/2016/dovetailrichmondfinalreport2015august27.pdf](http://www.dovetailinc.org/report_pdfs/2016/dovetailrichmondfinalreport2015august27.pdf)) can be used as a basis for the plan.
2. Establish a structure for measuring progress for the urban forestry program. This includes clearly defining the roles and responsibilities of staff members as well as a schedule of review milestones.
3. Develop a directory of small mills, dry kilns, loggers, furniture makers, etc., that operate in the Richmond metropolitan area. Individuals and businesses in this directory should have a desire to work with urban trees. The City of Richmond could “appoint” someone to do this task, or look for a volunteer. The city should take the lead on this directory, even if the actual work is accomplished by a third-party (intern or work-study student from a local college, tree-related volunteer, governmental employee from the DOF or other state agency, etc.). The important step is for the city to “get the ball rolling.”
4. Hold regular meetings of stakeholders involved with urban tree utilization (or assign/ask someone to hold these meetings since city staff time is limited). These meetings should include area arborists, urban foresters, small sawmill and dryer operators, loggers, mulch yard owners, state regulators, municipal managers, small wood-based business owners, and so forth. Ideally, the meetings would be held at a “neutral” location to encourage maximum participation.

### *Raleigh, North Carolina*

The following recommendations support the further development of urban tree utilization “clustering” in the Raleigh metropolitan area:

- *Conduct a feasibility study* – This study should include a comprehensive inventory of tree removals, including leaves, limbs and branches and a categorization of these removals (sawlogs, pulpwood, firewood, etc.) by the entity conducting the removal (city, tree service firms, utility companies, homeowners, etc.). The protocol conducted in southeast Michigan (MacFarlane 2007), is a model to consider for the Raleigh metropolitan area.
- *Evaluate economic conditions, existing infrastructure, labor resources and other factors that impact the overall business climate* – This effort can be included in the feasibility study if time and resources permit; if not, a separate analysis should be conducted. For example, potential “loopholes” in the current system should be investigated including the role of Land Clearing and Inert Debris landfills (LCID landfills can legally accept yard waste including trees; however, Municipal Solid Waste (MSW) and Construction & Debris (C&D) landfills cannot legally accept yard waste).

- *Collaborate with stakeholders from industry, government, and supporting individuals and organizations* – The key is to get buy-in from various stakeholders and develop a vision for utilization of urban trees including next-steps and action items. There is a wealth of resources available in the Triangle region including technical, educational, and research information; these resources need to be capitalized on, and collaboration is an important first step.
- *Assist stakeholder groups in sharing key information* – At least four groups view urban tree utilization from a distinct perspective. State regulators, city managers (including municipal foresters), LCID owners/operators, and producers/users (tree care companies for example) all have different “missions” and all “control” key information. Better communication is needed between the groups.
- *Engage the leadership of a key organization to coordinate activities, facilitate development, and gain policy support* – The leader or champion does not necessarily have to possess a wood utilization background but should strongly support the utilization effort and should have the ability and time to use his or her position to “rally the troops.”
- *Secure funding* – Financial resources, both private and public, are important to support feasibility studies, technology development, workforce training, capital investment, applied research and other project components. Funding can include national, state, or local sources.
- *Focus on education and engagement of entrepreneurial thinking and innovation* – Support the creation of a position with the assigned duties of “urban wood utilization.” A person in this capacity can efficiently focus on education and training opportunities for arborists (log manufacturing, grading, transport, etc.), assist and encourage start-up urban wood businesses, conduct utilization-based feasibility studies, and become a focal point for technical/hands-on utilization activities. Fortunately, a critical mass of urban wood enthusiasts currently resides in the Raleigh metropolitan area.
- *Nurture supporting and complementary industries* – An important task of the utilization champion, urban wood specialist, or key stakeholder(s) is to facilitate partnerships and relationships (formal or informal) between the numerous industries (and organizations) that are in the cluster.

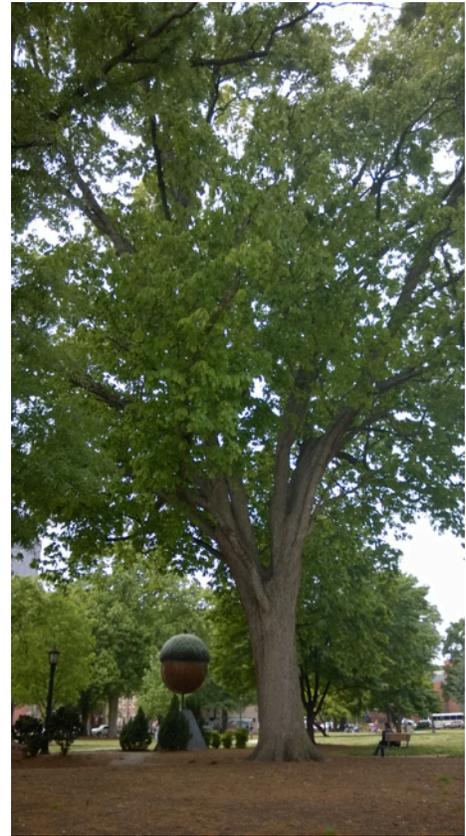


Figure 5. Raleigh, the "City of Oaks"

- *Recognize the differences in types of clusters and act accordingly* – One strategy for cluster development is to select or nurture one of four models (Sidebar 1) as a starting point, or build upon what already exists. This can help focus efforts and provide a framework for collaborative work. Raleigh appears to be in the early stages of a Marshallian cluster – one that is typically comprised of small- and medium-sized companies that trade their products and services with other cluster members.
- *The City of Raleigh has the potential to lead the way on urban tree utilization* – Since the sale of wood products (mulch, compost, firewood, sawlogs) finances (in part) the NeighborWoods tree planting program, it behooves the city to seek additional markets and/or higher prices for their wood-based sales. Also, Raleigh should investigate the possibility of cooperating with adjacent cities on log storage sites, wood products, marketing initiatives, etc. An “answer” to a “problem” might be found in an adjoining county or municipality.
- *Develop a city (county) list of small sawmills, loggers, timber buyers, and forest product manufacturers* – A directory is needed for “small” timber users in the area. The list should be specific to Raleigh and/or Wake County (or the Triangle area). Minnesota (Twin Cities), Michigan (Detroit) and Illinois (Chicago) have produced lists for their specific metropolitan areas.
- *Building code issues should be addressed* – Using wood produced from local and/or city-based trees for structural purposes can be problematic. The state of Wisconsin has addressed this issue by “certifying” mills to produce structural lumber on a small or part-time basis. Adopting the Wisconsin model is one solution to the building code issue (on small lumber batches) in North Carolina.

From the urban forestry management program assessment the following summary of programmatic strengths and opportunities is provided.

#### Strengths:

- Attracting talent, passion, skills in workforce and service providers
- Appropriately staffed, well-trained, experienced and professional individuals – emphasis on good science-based practices
- Leveraging legacy as the City of Oaks
- Innovative, comprehensive programs – from tree planting, inspection, removal, disposal/utilization
- Diverse lands and appropriate management approaches to fit them – right-of-ways, greenways, nature preserves, and parks
- Awareness of importance of communications between departments

#### Opportunities:

- Updating and receiving approval of the City Tree Manual<sup>16</sup>, including the addition of technology improvements via CityWorks

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<sup>16</sup> Since this assessment was undertaken, it is important to note that the City has accomplished the updating of the City Tree Manual and the tree ordinance (as of March 2015).

- Establishing funding stability and long-term strategies and objectives for NeighborWoods program
- Exploring new market opportunities for urban wood, including potential for biomass markets and bioenergy

There are four “next steps” recommended for the City of Raleigh:

1. Develop a strategic plan for the urban forestry program. The recommendations and opportunities from the Raleigh report ([http://www.dovetailinc.org/report\\_pdfs/2016/dovetailraleighfinalreport2015july.pdf](http://www.dovetailinc.org/report_pdfs/2016/dovetailraleighfinalreport2015july.pdf)) can be used as a basis for the plan.
2. Establish a structure for measuring progress for the urban forestry program. This includes clearly defining the roles and responsibilities of staff members as well as a schedule of review milestones.
3. Develop a strategic plan specific to the NeighborWoods program. This plan should include the economic sustainability of the program as well as the role that urban tree utilization plays in the program.
4. Hold regular meetings of stakeholders involved with urban tree utilization. These meetings should include Triangle area arborists, urban foresters, small sawmill and dry kiln operators, loggers, wood yard owners, land clearing and inert debris (LCID) operators, state regulators, municipal managers, small wood-based business owners, and so forth. Ideally, the meetings would be held at a “neutral” location to encourage maximum participation.

## Conclusions

The **City of Richmond** has a strong history and well established urban forestry program. The private tree care industry in Richmond also provides capacity to support a healthy urban forest. The full potential of the city’s urban forestry program is currently limited by capacity concerns. To improve the program, it will be necessary to increase the number of arborists to a level that is sufficient to maintain and care for the extensive urban forest, especially where private tree care services are not a reasonable or reliable alternative.

The Richmond metropolitan area is home to over 1.2 million people, and growing. East central Virginia (which includes the capital city of Richmond) supports a strong forestry and forest products industry. Historic preservation and renovation are important businesses in the Richmond area, due in part to the proximity of Williamsburg.

Richmond, and the surrounding area, is home to “under the radar” firms currently utilizing urban trees beyond the traditional products of mulch and firewood. Evidence of an emerging urban tree business cluster can be found in the private sector, but a leader is needed to create forward momentum. An urban tree utilization leader can mobilize both private and public sectors to collaborate on issues that impact both groups. A leader could also provide the spark for a much-needed feasibility analysis in Richmond that estimates tree removals and potential products.

The **City of Raleigh** currently has an exceptional urban forestry program. It is thoughtful, comprehensive, and effective. Although there are always opportunities for improvement, perhaps the strongest recommendation for the City of Raleigh is to continue doing what it is already doing well and to maintain its commitment to its urban forest resource.

The City of Raleigh is situated in the midst of a strong forestry and forest products industry. Raleigh's population is expanding rapidly as well as the entire Research Triangle Area. Raleigh, and the surrounding area, is home to many firms currently utilizing urban trees beyond the traditional products of firewood and mulch/compost. However, there is still a considerable amount of tree waste entering LCID landfills. Capturing these wastes "before the gate" for the highest value could help to meet growing needs for fiber and wood products for a growing population.

Raleigh has many of the key ingredients of an urban tree utilization cluster already in place. A feasibility analysis (including a wood waste plan), and better collaboration with municipalities and key groups (such as urban foresters, private arborists, sawmillers, lumber dryers, wood artisans, furniture builders and such) are two of the actions needed to move Raleigh to a higher level of urban tree utilization. Raleigh could also consider participating in the newly emerging urban forestry programs, including the Urban Forest Sustainability & Management Review program<sup>17</sup> or the development of the SCS Salvaged Wood & Fiber Standard<sup>18</sup>.

Both Richmond and Raleigh also have the opportunity to explore some of the newest ideas that are emerging in the practice of urban forestry. These ideas include establishment of "food forests" in urban areas, utilizing fruit and nut trees as appropriate and in collaboration with community partners; engaging with woodworkers and other artists to utilize urban wood resources in special events or as part of an extended effort; incorporating additional wildlife considerations into the urban forest (e.g., nest boxes, food plots, etc.); providing training opportunities about how to maximize the economic value of removed trees (e.g., log bucking lengths, grading systems, etc.); and utilizing diverse vegetation management techniques to get desired outcomes (e.g., use of prescribed fire, Integrated Vegetation Management<sup>19</sup> in rights-of-way, etc.).

### **Bottom Line**

Urban forests provide diverse and essential benefits and services to communities. When trees are removed, the wood is most often mulched, composted, or sent to a landfill site. But, urban forests offer the potential for enhanced utilization with national estimates of annual availability ranging from over 16 to 38 million green tons.

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<sup>17</sup> This program has been developed by the U.S. Forest Service and has been piloted in campus evaluations. More information is available at: <http://www.urbanforestrysouth.org/whats-new/recent-updates-urban-forest-sustainability-management-review> It is important to note that since this assessment was completed the City of Raleigh has decided to pilot the application of the Urban Forest Sustainability & Management Assessment program in their community.

<sup>18</sup> SCS Global Services is an accredited environmental auditing firm based in California. Their drafted Salvaged Wood & Fiber Standard is available at:

[https://www.scsglobalservices.com/files/standards/draft\\_fm\\_std\\_salvagedwood\\_v1-0\\_031915.pdf](https://www.scsglobalservices.com/files/standards/draft_fm_std_salvagedwood_v1-0_031915.pdf)

<sup>19</sup> For more information about IVM, please see: [http://www.rowstewardship.org/integrated\\_vegetation\\_management](http://www.rowstewardship.org/integrated_vegetation_management)

Barriers to urban tree utilization include technical and logistical constraints, availability of processing facilities, and market considerations. Perhaps the most significant barrier to urban trees entering the wood processing stream may be the prevalent idea that urban trees are suitable only for low-value products. Many urban forestry programs, as well as urban residents, are not fully aware of the opportunities and benefits.

The assessments in Richmond, Virginia and Raleigh, North Carolina provide leading examples of current best practices in urban wood utilization and urban forestry program operation. The approaches and opportunities for improvement identified in these communities can help inform assessments and actions in other cities and their effective development of urban forestry and urban wood utilization.

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### **For Additional Information**

*The individual complete reports for each community are available at the Dovetail Partners' website. Additional prior work done within the Twin Cities region is also available online:*

#### **Richmond, Virginia: An Assessment of Municipal Tree Utilization and the Urban Forestry Program**

Project completed with support from the Virginia Department of Forestry. 2015

[http://www.dovetailinc.org/report\\_pdfs/2016/dovetailrichmondfinalreport2015august27.pdf](http://www.dovetailinc.org/report_pdfs/2016/dovetailrichmondfinalreport2015august27.pdf)

#### **Raleigh, North Carolina: An Assessment of Municipal Tree Utilization and the Urban Forestry Program**

Project completed with support from North Carolina Urban and Community Forestry Grant Program. 2015

[http://www.dovetailinc.org/report\\_pdfs/2016/dovetailraleighfinalreport2015july.pdf](http://www.dovetailinc.org/report_pdfs/2016/dovetailraleighfinalreport2015july.pdf)

#### **Urban Wood Utilization and Industrial Clusters: A Twin Cities Case Study**

[http://www.dovetailinc.org/report\\_pdfs/2010/werc63010finalreportsm.pdf](http://www.dovetailinc.org/report_pdfs/2010/werc63010finalreportsm.pdf)

2010

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