The urban forest is comprised of all of the trees in an urban setting, regardless of who owns or manages them. It is made up of street trees, forested natural areas and even the trees in resident’s back yards. These trees are all included in the urban forest, because they all provide benefits that municipalities depend on. They improve air and water quality, reduce flooding and the urban heat island effect, and reduce energy use by shading buildings. Trees provide habitat for wildlife and improve residents' quality of life by reducing crime rates, increasing property value and boosting social cohesion in neighborhoods.

The magnitude of benefits that trees provide correlates with the size, structure and location of their canopy. Understanding the extent of tree canopy is critical for urban planning. Canopy maps can be used to quantify the benefits that their trees provide, identify where new plantings would have the greatest impact and to develop priorities and strategies for expanding the canopy.

The Chicago Region Trees Initiative, USDA Forest Service, American Forests, and the University of Vermont mapped land cover across the seven-county Chicago Region. This project not only identifies tree canopy, but also other green infrastructure including vegetation under 10 feet tall, bare soil and water; and gray infrastructure including buildings, roads and rail and other paved surfaces like sidewalks and parking lots (Fig. 1). Here after, these seven layers will be referred to as land cover types.

Fig. 1: Comparison of satellite image and land cover map. Seven types of gray and green infrastructure are in the land cover map.
Overall, 17% of Lake County is covered by tree canopy (Fig. 2). There is a lot of room for growth across the county. We can identify spaces where trees could potentially be planted by adding together the vegetation, bare soil and other paved surface land cover types, as these land cover types could be converted to canopy with minimal effort. In all, these land cover types make up 63% of the county's area, meaning that canopy cover could potentially be raised to 86% if all of these surface were converted to trees. It is important to note, that while these surfaces could theoretically be covered with canopy, it is not necessarily preferable. Agricultural fields and baseball diamonds are included as “plantable space,” but few would agree that these are ideal sites to expand the forest canopy.

These land cover data can also describe canopy at the municipal scale. St. John currently has 15% canopy cover, and could potentially increase their canopy to 85% (Fig. 2).
Canopy cover is not distributed evenly across the region, nor within municipalities. To better understand how land cover patterns vary, we can compare them across land use types, like residential, commercial or industrial properties. In St. John, the highest percentage of canopy is found in residential properties (Fig. 3). Agriculture and potential development have the lowest canopy cover. See Table 1 at the end of this report for more details.

Fig 3: Variations in land cover across land use types.
By combining vegetation, bare soil and other paved surface categories we can identify which land use types have the most room for growth. In St. John, the highest proportions of plantable space are found in agriculture and open spaces (Fig. 4).

Fig 4: Current canopy and possible planting space across land use types.
While agriculture and open space have a high percentage of plantable space, they make up a relatively small area in St. John. The majority of land is low density residential (Fig. 5).

Fig 5: The majority of land is low density residential land use.
Low density residential and potential development land use types have the most area that could possibly be converted to canopy (Fig. 6). Targeting these areas could have the greatest impact in expanding the canopy. However, each of these land use types will require different strategies to increase canopy. Residential property owners could be encouraged to plant more trees through tree giveaways, ordinances that encourage tree preservation, or stormwater tax breaks for properties that have more tree canopy. Ordinances can mandate that trees be planted to offset the impacts of development of new properties.

Fig 6: Low density residential has the greatest potential for increasing the canopy, followed by potential development.

<table>
<thead>
<tr>
<th>Land use</th>
<th>Tree canopy Acres</th>
<th>Tree canopy Percent</th>
<th>Vegetation Acres</th>
<th>Vegetation Percent</th>
<th>Bare soil Acres</th>
<th>Bare soil Percent</th>
<th>Water Acres</th>
<th>Water Percent</th>
<th>Buildings Acres</th>
<th>Buildings Percent</th>
<th>Roads and rail Acres</th>
<th>Roads and rail Percent</th>
<th>Other paved Acres</th>
<th>Other paved Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>4.1</td>
<td>0.9%</td>
<td>419.8</td>
<td>95.7%</td>
<td>1.4</td>
<td>0.3%</td>
<td>1.1</td>
<td>0.3%</td>
<td>1.8</td>
<td>0.4%</td>
<td>8.1</td>
<td>1.8%</td>
<td>2.3</td>
<td>0.5%</td>
</tr>
<tr>
<td>Commercial</td>
<td>52.7</td>
<td>11.8%</td>
<td>194.8</td>
<td>43.5%</td>
<td>24.0</td>
<td>5.3%</td>
<td>13.3</td>
<td>3.0%</td>
<td>32.9</td>
<td>7.4%</td>
<td>35.4</td>
<td>7.9%</td>
<td>94.9</td>
<td>21.2%</td>
</tr>
<tr>
<td>Institutional</td>
<td>17.2</td>
<td>13.6%</td>
<td>43.9</td>
<td>34.5%</td>
<td>12.8</td>
<td>10.0%</td>
<td>0.1</td>
<td>0.1%</td>
<td>19.1</td>
<td>15.1%</td>
<td>5.3</td>
<td>4.2%</td>
<td>28.7</td>
<td>22.6%</td>
</tr>
<tr>
<td>Light Industrial</td>
<td>23.3</td>
<td>12.3%</td>
<td>126.0</td>
<td>66.7%</td>
<td>1.9</td>
<td>1.0%</td>
<td>3.2</td>
<td>1.7%</td>
<td>6.7</td>
<td>3.6%</td>
<td>8.8</td>
<td>4.7%</td>
<td>19.0</td>
<td>10.1%</td>
</tr>
<tr>
<td>Low Density Res</td>
<td>865.4</td>
<td>21.3%</td>
<td>2312.3</td>
<td>56.9%</td>
<td>11.9</td>
<td>0.3%</td>
<td>108.5</td>
<td>2.7%</td>
<td>276.7</td>
<td>6.8%</td>
<td>293.5</td>
<td>7.2%</td>
<td>198.3</td>
<td>4.9%</td>
</tr>
<tr>
<td>Medium Density Res</td>
<td>19.8</td>
<td>22.8%</td>
<td>46.8</td>
<td>53.9%</td>
<td>0.0</td>
<td>0.0%</td>
<td>0.3</td>
<td>0.4%</td>
<td>7.6</td>
<td>8.8%</td>
<td>6.5</td>
<td>7.4%</td>
<td>5.8</td>
<td>6.7%</td>
</tr>
<tr>
<td>Park/Open Space/Recreation</td>
<td>82.6</td>
<td>9.2%</td>
<td>710.7</td>
<td>79.4%</td>
<td>6.6</td>
<td>0.7%</td>
<td>34.3</td>
<td>3.8%</td>
<td>8.7</td>
<td>1.0%</td>
<td>17.3</td>
<td>1.9%</td>
<td>35.0</td>
<td>3.9%</td>
</tr>
<tr>
<td>Potential Development</td>
<td>79.9</td>
<td>5.6%</td>
<td>947.9</td>
<td>66.3%</td>
<td>54.4</td>
<td>3.8%</td>
<td>75.0</td>
<td>5.2%</td>
<td>88.2</td>
<td>6.2%</td>
<td>121.5</td>
<td>8.5%</td>
<td>61.7</td>
<td>4.3%</td>
</tr>
<tr>
<td>Total abundance</td>
<td>1145.0</td>
<td>14.9%</td>
<td>4802.3</td>
<td>62.5%</td>
<td>113.0</td>
<td>1.5%</td>
<td>235.7</td>
<td>3.1%</td>
<td>441.9</td>
<td>5.8%</td>
<td>496.2</td>
<td>6.5%</td>
<td>445.7</td>
<td>5.8%</td>
</tr>
</tbody>
</table>