Methods:
- Benefits and costs were quantified for typical large, medium, and small broadleaf trees and a conifer.
- The analysis assumed that trees were planted in a residential yard, public park, or street side with a 55-percent survival rate over 40 years.
- Tree care costs were based on results from a survey of municipal and commercial arborists.
- Benefits were calculated by using tree growth curves and numerical models that consider regional climate, building characteristics, air-pollutant concentrations, and prices.

Benefits analyzed:
- Energy savings (electricity and natural gas)
- Air pollution reduction (carbon dioxide, nitrogen dioxide, sulfur dioxide, ozone, airborne particles, and volatile organic compounds)
- Runoff reduction (rainfall interception)
- Property values

Costs analyzed:
- Tree purchase and planting
- Pruning
- Irrigation
- Pest and disease prevention and control
- Removal and disposal
- Sidewalk repair
- Leaf litter cleanup
- Liability, legal aspects, and administration

Project partners included Charlotte City Engineering, Landscape Management; Davey Resource Group; USDA Forest Service Southern Center for Urban Forestry Research and Information; USDA Forest Service State and Private Forestry, Urban and Community Forestry.

Resources:
Healthy trees mean:

**Healthy people**
- Each year, 100 large, mature street trees
  - Remove 17 tons of carbon dioxide (CO₂)
  - Remove 137 pounds of other air pollutants
  - Catch about 477,800 gallons of rainwater

**Healthy communities**
- Tree-filled neighborhoods
  - Report lower levels of domestic violence
  - Are safer and more sociable
  - Reduce stress of body and mind
  - Decrease need for medication, and speed recovery times

**Homeowner savings**
- One well-placed large tree
  - Provides average savings of $16 in home air conditioning costs each year

**Better business**
- In tree-lined commercial districts, shoppers report
  - More frequent shopping
  - Longer shopping trips
  - Willingness to pay more for parking
  - Willingness to spend 12 percent more for goods

**Higher property values**
- Trees increase the resale value of houses
  - Each large front yard tree adds 1 percent to the sales price of a house
  - Large specimen trees can add 10 percent to property value

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A large tree in the South will provide $4,240 in environmental and other benefits over its lifetime. That’s a 400-percent return on investment!

It pays to care for trees

Landscape trees provide benefits that far exceed the costs of planting and care over their lifetime.

Environmental and aesthetic benefits, such as energy savings, stormwater runoff reduction, cleaner air, and higher property values, are consistently many times greater than tree care costs.

The greatest benefits are stormwater treatment cost savings and higher property values.

One large public tree, 40 years after planting, averaged:

<table>
<thead>
<tr>
<th></th>
<th>$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual benefits</td>
<td>$106</td>
</tr>
<tr>
<td>Annual costs</td>
<td>$27</td>
</tr>
<tr>
<td>Annual net benefit</td>
<td>$79</td>
</tr>
</tbody>
</table>

Over 40 years, 100 large public trees total:

<table>
<thead>
<tr>
<th></th>
<th>$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefits</td>
<td>$423,680</td>
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<tr>
<td>Costs</td>
<td>$107,560</td>
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<tr>
<td>40-year net benefit</td>
<td>$316,120</td>
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</tbody>
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