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 50-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 the Fort Collins Parks and Forestry Divisions; Cheyenne Urban Forestry Division; Wyoming State Forestry Division; Colorado State Forest Service; Oregon State Department of Forestry; Utah Division of State Lands and Forestry; Utah State University, Department of Forest Resources; Colorado Department of Public Health and Environment; and USDA Forest Service State and Private Forestry, Urban and Community Forestry Program, Rocky Mountain, Northern and Intermountain, Pacific Northwest, and Pacific Southwest Regions.

Resources:

It pays to care for trees

Fort Collins, Colorado, is the reference city for the i-Tree Streets program’s Northern Mountain and Prairie climate region. Base data were collected there during the summer of 2002. To learn how to use this information to calculate costs and benefits for any community in this region (shown in brown on the map), refer to the Northern Mountain and Prairie Community Tree Guide at http://www.fs.fed.us/psw/programs/uesd/uep/tree_guides.php. To learn more about i-Tree Streets, visit http://www.itreetools.org.
The Value of a Tree in the Northern Mountains and Prairies

A large tree in the Northern Mountain and Prairie Region will provide $1,680 in environmental and other benefits over its lifetime. That’s a 200-percent return on investment!

Trees produce benefits for us when we plant and nurture them in our urban environments. The Urban Ecosystems and Social Dynamics Program at the USDA Forest Service Pacific Southwest Research Station is assessing the ways that trees pay us back and their value to us.

Healthy trees mean:

Healthy people
Each year, 100 large, mature street trees
- Remove 8 tons of carbon dioxide (CO₂)
- Remove 146 pounds of other air pollutants
- Catch about 120,900 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 $8 on 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

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 runoff reduction and higher property values.

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

<table>
<thead>
<tr>
<th>Benefit Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual benefits</td>
<td>$42</td>
</tr>
<tr>
<td>Annual costs</td>
<td>$21</td>
</tr>
<tr>
<td>Annual net benefit</td>
<td>$21</td>
</tr>
</tbody>
</table>

Over 40 years, 100 large public trees total:

<table>
<thead>
<tr>
<th>Benefit Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefits</td>
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<tr>
<td>Costs</td>
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<tr>
<td>40-year net benefit</td>
<td>$84,480</td>
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