



THE TREE PROJECT

ENERGY • WATER • AIR

THE IES TREES FOR HEALTHY COMMUNITY AND ECONOMY PROJECT

CITY AND COUNTY OF BROOMFIELD
COLORADO

The goal of The Tree Project - Integrated Urban Environmental Improvement Through Tree Selection and Management - is to identify how trees can be used to optimize energy and water conservation, mitigate climate change and improve air quality.

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Public Works-Environmental Services Division

One DesCombes Drive, Broomfield, CO 80020

Phone (303) 438-6360, FAX (303) 438-6234

August 25, 2011

Dear Broomfield Business:

Trees for a Healthy Community and Economy

The City and County of Broomfield is pleased to announce “Trees for a Healthy Community and Economy,” a unique urban forestry project to improve environmental quality and economic development opportunities within Broomfield’s expanding city center. Broomfield is honored to have been chosen by the Institute for Environmental Solutions (IES) as the pilot community for this collaborative effort.

Trees benefit environmental and community health by reducing air pollution, moderating air temperature, and cost-effectively improving stormwater management. Trees benefit the local economy by improving consumer attitudes.

“Trees for a Healthy Community and Economy” will include scientific analysis to develop a tree-planting plan for the pilot program in Broomfield’s city center. The results from this pilot study will be used to optimize environmental and economic benefits throughout the community. Working with Broomfield staff members, local businesses, and community representatives, we will plant the first phase of new trees early next spring.

Broomfield and IES are committed to involving local businesses, business leaders, community members, teachers and students to make this project successful. A strong volunteer response is needed for the project to succeed. IES will be contacting you directly to tell you more about the Trees for Healthy Community and Economy project. Please welcome them. We encourage your involvement in this project. Your participation and help would be most appreciated! Please contact Kathy Schnoor of my staff at 303-438-6363 or kschnoor@Broomfield.org if you have questions.

Sincerely,

Kevin Standbridge
Deputy City Manager
City and County of Broomfield

Cc: Kathy Schnoor, Environmental Services Superintendent
Tom Wells, City Forester
Carol Lyons, Executive Director, Institute for Environmental Solutions
Amory Ledyard, Project Manager, Institute for Environmental Solutions

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THE IES TREES FOR HEALTHY COMMUNITY AND ECONOMY

PROJECT OVERVIEW

The IES Trees for Healthy Community and Economy project will utilize strategic tree selection, siting, and planting to improve environmental quality and provide economic development opportunities along the City and County of Broomfield's emerging city center. IES will use its expertise and network of professionals to develop a strategic tree-planting plan with economic and environmental improvement targets that will attract more people to the downtown area and improve the local economy and environment. The planting plan will focus on sustainable landscape design practices and incorporate guidelines from the Sustainable Sites Initiative (www.sustainablesites.org).

...with economic and environmental targets that will attract more people to the downtown area and improve the local economy and environment.

IES will evaluate the project using objective measurements, including assessment of the economic and environmental health achieved, costs, and surveys of participants and partners. Trees for Healthy Community and Economy will serve as a replicable model for the cooperative implementation of community-based economic development programs targeting integrated environmental improvement.

COLLABORATIONS AND PARTNERSHIPS

PARTNERS

- *Members of ASLA*
- *Colorado State Forest Service*
- *Colorado Tree Coalition*
- *Broomfield Business Community*
- *Community Volunteers*

With generous funding provided by Xcel Energy, IES is partnering with the City and County of Broomfield (e.g. Public Works and Environmental Services Department), Broomfield Chamber of Commerce, and local businesses including Rocky Mountain Tire & Auto to establish a collaborative funding model based on the shared values of an expanded tree canopy. This collaboration will help to create a civic center for Broomfield that provides a special identity that will attract residents and visitors. IES will document successful tactics and tools for communicating the value of trees to enable other communities to initiate similar strategic urban forestry programs in partnership with local businesses.



THE IES TREES FOR HEALTHY COMMUNITY AND ECONOMY

...to create a civic center for Broomfield that provides a special identity that will attract residents and visitors.

In addition to partnerships established as part of the collaborative funding model, IES will engage volunteers from the American Society of Landscape Architects to help develop a sustainable planting plan. IES will work with the Colorado State Forest Service and the Colorado Tree Coalition to gather the best available expertise to plan and implement the tree planting. We will engage other volunteers through our partners in the Broomfield business community. IES encourages local business and community members to participate in this unique project.

PARTNERSHIP OPPORTUNITIES

Trees increase in value and services over time, it is therefore an investment in the future. IES is currently looking to form partnerships with businesses in the Broomfield community that wish to take part in this developing project. This opportunity to participate in the Healthy Community and Economy Project will provide many benefits to the Broomfield area including environmental, social, and economic benefits as well.

The economic benefits will improve real property values, increase municipal revenues and develop a stronger business district overall. In general, public opinion recognizes corporate environmental stewardship and sustainability practices as reason for patronage. Opportunities for involvement can include being a member of the Project Advisory Committee, collaborating on economic assessment and "Willingness to Pay" survey, or funding trees, research, planting event, volunteer commemorative items, and food/refreshments. In-kind services are also a way to become a project partner.

FUNDING LEVELS

IES DONATION LEVELS:

- *Glacier Guardian* \$10,000
- *Prairie Protector* \$5,000
- *Forest Defender* \$2,500
- *River Warrior* \$1,000



THE ECONOMIC BENEFITS OF TREES

TREES MAKE CENTS

Our vision of a city generally includes buildings, concrete and cars. How often does it include trees? City trees improve economic, social and environmental quality. With respect to business, trees improve public opinion, consumer behavior and product pricing, energy savings, and land value.

POSITIVE BUSINESS IMPACTS

- *Improved Public Perception*
- *Increased Consumer Patronage*
- *Consumers Spend ~12% More*
- *Higher Commercial Property Values*
- *Higher Occupancy & Rental/Lease Rates*
- *Reduction in Energy Costs*

Public opinion: Planting trees helps you market your business as eco-friendly and community-oriented. Just as music and lighting, trees located near businesses improve shoppers' judgments of the image of a place. In a comparison of business districts with and without tree-lined sidewalks, consumers preferred districts with tree-lined sidewalks in terms of appeal and comfort, product quality and value, and merchant responsiveness.

Consumer behavior and product

pricing: Consumers travel farther and more frequently to business districts with trees. They

are willing to shop longer, and pay more (12%) for all categories of goods, as well as for shaded parking.

Property value: Landscaping increases the value and enhances the sales appeal of commercial real estate. Landscape features have the highest correlation with commercial occupancy rates, higher even than direct access to major roads. Commercial areas with trees have higher occupancy and rental/lease rates than identical properties lacking such natural amenities.

[Consumers] are willing to travel farther and more frequently to these areas, shop longer, and pay more...

Energy savings: Depending on species and location, trees can reduce building energy use and associated costs by acting as both natural air conditioners and insulators. During the summer months, trees can lower peak air temperatures 2-9°F by releasing water through their leaves and shading surfaces. A single large tree can cool an area as effectively as ten room-size air conditioners operating all day. During the winter, trees can lower heating costs by providing a natural windbreak.

THE ECONOMIC BENEFITS OF TREES

...trees are valuable and growing assets worth
up to 3x the investment.

The benefits of urban trees are as numerous and far-reaching as their roots, and these benefits grow over time. Strategically planted and properly maintained, trees can generate returns worth up to three times their planting and maintenance costs. Trees contribute to commercial growth, stronger communities, and a healthy environment. To invest in the urban forest is to invest in your future and that of your community and local economy. Not only do trees mean business, they make sense.

For more information about the benefits of trees and how you can get involved in community urban forestry projects, contact the Institute for Environmental Solutions at www.i4es.org.



When we use the tree respectfully and economically,
we have one of the greatest resources of the Earth.

- Frank Lloyd Wright

THE SOCIAL BENEFITS OF TREES

DIRECT SOCIAL BENEFITS

Trees are valuable in the benefits they provide culturally, aesthetically and even psychologically. The value comes from a person's direct experience of the environment, which can create the opportunity to interact with one's neighbors. A treed area can also provide a restorative environment where a person can recover from the daily stress of work and life. After being exposed to a healthy, green environment, the benefits will continue to impact people and those they are in contact with.

OBSERVED BENEFITS

- *Develop Community Relationships*
- *Reduce Mental Fatigue*
- *Perceived Feeling of Safety*
- *Improve Mood & Productivity*

Trees help to improve the local community by:

Increasing social ties:

Trees are an important component in residential outdoor spaces. By drawing people out of their homes, trees create an opportunity for neighbors to interact and develop community relationships. People in buildings with trees know and socialize more with neighbors from their building therefore generating a stronger sense of community.¹

Improving mental health by providing stress reduction:

Urban environments can contribute to mental fatigue, and natural environments can help alleviate that fatigue. The environment of the inner city with its crowding, noise, violence, and other factors contributes to a person's mental fatigue. Natural settings including trees create a restorative environment that helps people to recover.²

Increasing perceptions of safety:

In studies conducted by Sullivan and Kuo in 2001, people living in inner-city neighborhoods gave the highest safety ratings to areas that were densely planted. In addition, people living near trees reported feeling safer than those living in more stark surroundings. Research suggests that people feel safer as a result of increased activity in green outdoor spaces which deters crime.³

People in buildings with trees knew and socialized more with neighbors from their buildings, had a stronger sense of community, and felt safer than people in buildings without trees.

¹ Kuo, F. (2003). The role of arboriculture in a healthy social ecology. *Journal of Arboriculture*, 29 (3), 148-155.

² Kuo 2003.

³ Kuo, Frances E. and Sullivan, William C. (2001) Environment and crime in the inner city: does vegetation reduce crime? *Environment and Behavior* 33: 343-367

THE SOCIAL BENEFITS OF TREES

Improving worker productivity:

Studies conducted by Kaplan in 1995 suggest that time spent in natural environments may reduce mental fatigue and improve a person's mood and their capacity to function. Once a person returns to work, a person is able to concentrate better on the task at hand. A person feels more alert and optimistic.⁴

Creative play and access to adults are important to cognitive and social development of children.

⁴ Schroeder, Herbert W. 2011. Environmental values and their relationship to ecological services. In: Mittleman, D.; Middleton, D.A., eds. Make no little plans. Proceedings of the 42nd annual conference of Environmental Design Research Association. Chicago, IL. McLean, VA: The Environmental Design Research Association (EDRA): 212-217.

THE ENVIRONMENTAL BENEFITS OF TREES

ENVIRONMENTAL BENEFITS

Trees temper the effects of weather conditions:⁵

Trees absorb solar radiation, providing cooler cover for living organisms. Tree species with dense foliage, such as certain evergreens, are particularly useful at easing strong winds when planted strategically. Additionally, trees collect storm water, which reduces the effects of runoff and the chance of flooding from severe rainstorms.

Trees moderate the local climate:

The outdoor temperature is cooler near trees, which release water vapor into the air and provide shade. Trees mitigate the urban phenomenon known as the heat-island effect – a term used to describe elevated temperatures in cities resulting from the abundance of heat-retaining surfaces, such as concrete and asphalt, and a lack of vegetation. The process of releasing water vapor has been found to reduce peak summer temperatures from 2° to 9°F.⁶

Trees improve air quality:

The bark and leaves of trees absorb several air pollutants, including ozone (O₃), carbon dioxide (CO₂), carbon monoxide (CO) and sulfur dioxide (SO₂). In addition to absorbing pollutants, leaves filter dust and other particulate matter from the air. The capture of CO₂ is of particular importance, because it is a significant driver of global climate change. In one year, an acre of mature trees can absorb the equivalent amount of CO₂ emitted from driving 26,000 miles.⁷ The gross amount of carbon captured by trees in Golden, Colorado is about 637 metric tons annually, with an associated value of \$14,500.⁸ While filtering pollutants from the air, trees also emit oxygen that sustains life. However, trees are also responsible for emitting volatile organic compounds (VOCs) that contribute, albeit minimally, to street-level ozone (smog). The emission of VOCs varies depending on the species of the tree planted. Although trees minimally contribute to ozone formation, an increase in tree cover generally results in an overall decrease in smog.⁹

ACTIVE BENEFITS

- *Temper the effects of sun, wind, & rain*
- *Moderate the local climate*
- *Improve air quality*
- *Reduce soil erosion*
- *Improve water quality*
- *Conserves energy*
- *Provides wildlife habitat*
- *Provides food*

⁵ "Trees Are Good - Tree Care Information." Trees Are Good. International Society of Arboriculture. Web. 25 Oct. 2011. <http://www.treesaregood.com/treecare/tree_benefits.aspx>.

⁶ "Environmental Effects of Urban Trees and Vegetation." Encyclopedia of Earth. Web. 25 Oct. 2011. <http://www.eoearth.org/article/Environmental_effects_of_urban_trees_and_vegetation>.

⁷ "Top 22 Benefits of Trees." TreePeople. Web. 25 Oct. 2011. <<http://www.treepeople.org/top-22-benefits-trees>>.

⁸ Institute for Environmental Solutions. The Tree Project: Integrated Urban Environmental Improvement Through Tree Selection and Maintenance – Phase II Report. Print. 35.

⁹ Ibid. 29-31.



THE ENVIRONMENTAL BENEFITS OF TREES

Trees reduce noise pollution: Unwanted noise can lead to stress and worker productivity loss. Strategically planted trees can act as noise buffers, reducing noise by five to ten decibels (approximately 50% to the human ear).¹⁰

Trees improve water quality and reduce soil erosion.¹¹ Trees recharge the supply of groundwater and improve water quality by flushing and filtering chemicals and pollutants collected on the surface of their leaves. Root systems beneath trees hold soil in place and slow the effects of storm flash events. Trees break the impact of rainfall, allowing the ground below to absorb precipitation more gradually, while preventing severe soil erosion caused by runoff.

Trees help conserve energy: Strategically placed trees can reduce the energy needed to heat and cool buildings, thus reducing greenhouse gas emissions and financial costs. Estimates of potential energy savings range from 7% to 40%, depending on the site placement, trees' shape and density, and the species of the tree planted.¹² Reducing energy demand also reduces the pollutants generated by the utility plants producing electricity.

Trees provide an essential habitat for wildlife: Trees house an abundance of life, and they are critical to the reproduction cycles of many species. Trees supply wildlife with protective cover from the elements and provide nesting materials for various species.

Trees can provide forage: Fruit and nuts that can nourish humans and animals. Apples, chestnuts, oranges and peaches are just a few favorites that have become staples in the diets of many.

¹⁰ “Leaf’ the Noise Out.” Inside Agroforestry (Spring 1998). USDA National Agroforestry Center.

¹¹ http://www.eoearth.org/article/Environmental_effects_of_urban_trees_and_vegetation. Web. 25 Oct. 2011.

¹² Institute for Environmental Solutions. 56.



TREES FOR A HEALTHY COMMUNITY AND ECONOMY CITY AND COUNTY OF BROOMFIELD, CO

This spring, IES and our City and County of Broomfield partners will strategically plant trees in the city center, thereby improving the local environment to make Broomfield a more desirable place to live and work. IES is currently looking to form partnerships with businesses that wish to take part in the “Trees for a Healthy Community and Economy” project in Broomfield. This project will directly benefit your organization and its employees.

The IES “Trees for a Healthy Community and Economy” project in Broomfield will:

Enhance the local environment by creating shade, improving air quality, and managing stormwater.
Encourage communal unity, improve community health, and increase worker productivity.
Create more opportunities for existing businesses, attract new businesses, raise real property values and occupy rates, and increase municipal revenues.

Monetary donations to the “Trees for a Healthy Community and Economy” project will help IES and our partners plant more trees, advance our research on the economic benefits of urban forestry, and host a community volunteer tree planting event in Spring 2012.

Let your business’s commitment to improving the local environment speak for itself. Don’t miss this wonderful opportunity to show others you are a leading environmental steward in Broomfield!

To make a donation, contact:

Carol Lyons
IES Executive Director
761 Newport Street
Denver, Colorado 80220-5554 USA
303-388-5211
Carol@I4ES.org

IES Donation Levels:

Glacier Guardian	\$10,000
Prairie Protector	\$5,000
Forest Defender	\$2,500
River Warrior	\$1,000

Your contribution is fully tax deductible and will help IES make the “Trees for a Healthy Community and Economy” project a success.



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Scientific solutions for a better environment