



“If you look at a tree, and think of it as a design assignment, it would be like asking you to make something that makes oxygen, sequesters carbon, fixes nitrogen, distills water, provides habitat for hundreds of species, accrues solar energy’s fuel, makes complex sugars and food, changes colors with the seasons, creates microclimates, and self-replicates.”

— William McDonough,
American Architect

Roadside trees are a low cost investment that improve ecological health, economic prosperity and community quality of life.

Native and site appropriate trees provide value by:

Mitigating for Greenhouse Gas Emissions

Through photosynthesis, trees and plants store carbon in their biomass, preventing it from being released into the atmosphere. “Carbon sequestration” (the long-term storage of carbon) is a cost-effective mitigation strategy for slowing atmospheric accumulation of carbon dioxide (CO₂). CO₂ is the most significant greenhouse gas that is released through deforestation and the burning of fossil fuels.

“U.S. forests currently serve as a carbon ‘sink’, offsetting ...from 10 to 20% of U.S. emissions each year.” -US Forest Service, Climate Change Resource Center

“Given the growing expanse of urban areas, trees within these areas have the potential to store and annually sequester substantial amounts of carbon.” U.S. Department of Agriculture (USDA)- Forest Service (USFS)

Cleaning the Air

Through the leaf structures that facilitate photosynthesis and gas exchange, trees remove gaseous pollutants from the air such as ozone, sulfur dioxide, nitrogen dioxide and carbon monoxide. Trees also intercept particulate matter, preventing it from remaining airborne.

“In 1994, trees in New York City removed an estimated 1,821 metric tons of air pollution at an estimated value to society of \$9.5 million.” -USFS

Cooling the Air

By providing shade to adjacent buildings and pavement, and through natural

processes of plant respiration, water absorption, and water loss, vegetation cools the air.

“The net cooling effect of a young, healthy tree is equivalent to ten room-size air conditioners operating 20 hours a day.” -USDA

Treating Stormwater

Trees, vegetation and their associated soils are often referred to as “green infrastructure” due to their ability to treat stormwater runoff and facilitate infiltration of precipitation on-site.

“The planting of trees means improved water quality, resulting in less runoff and erosion. This allows more recharging of the ground water supply.” -USFS

Supporting Pollinators & Wildlife

Trees and plants provide essential food and shelter for pollinators and wildlife. “Plantings of diverse vegetation support pollinators, beneficial insects, birds and other wildlife. Plantings can provide corridors, cover, nesting sites, and food sources.” - USDA Agroforestry Center

Conserving Energy

Trees that provide wind-blocks in winter, and shade for buildings and streets in summer can significantly reduce energy consumption. In hot weather, unshaded roofs and pavements can be heated to temperatures far above that of the surrounding area, creating what are called “heat islands.” Heat islands increase summertime peak energy demands through increased use of air conditioning.

“To exist as a nation, to prosper as a state, and to live as a people,
we must have trees.”

—Theodore Roosevelt

“Trees properly placed around buildings can reduce air conditioning needs by 30 percent and can save 20–50 percent in energy used for heating.” -USFS

Improving Human Health

Trees and plants provide public health benefits related to improved air and water quality. Trees can contribute to improved cardiovascular health and reduce stress by encouraging people to walk outside. Research also shows that views of trees and vegetation can significantly boost immune system functioning.

“People who live in areas with higher street tree density report better health perception and fewer cardiometabolic conditions compared with their peers living in areas with lower street tree density.” -Scientific Reports, July 2015

A study centered on a suburban Pennsylvania hospital found that “patients with bedside window looking out on leafy trees healed, on average, a day faster, needed significantly less pain medication and had fewer postsurgical complications than patients who instead saw a brick wall.” -D. Franklin, Scientific American

Providing Fiscal Benefits

The environmental services provided by trees and vegetation provide monetary benefits to communities, and the state.

The monetary value of the environmental benefits provided by public trees “...including energy savings, stormwater-runoff reduction, improved air quality, and reduced atmospheric carbon dioxide, are up to three times greater than tree care costs.” - Piedmont Community Tree Guide

“There are about 60– to 200-million spaces along our city streets where trees could be planted. This translates to the potential to absorb 33 million more tons of CO₂ every year, and saving \$4 billion in energy costs.” -National Wildlife Federation

Increasing Land Values

Trees and landscaping add to the aesthetic appeal of communities which contributes to higher occupancy rates and property values.

“Landscaping, especially with trees, can increase property values as much as 20 percent.” - International City/County Management Association

Providing Natural Beauty & “Sense of Place”

Trees and vegetation add to the aesthetic appeal of highways, streets, and communities. As the photos on these pages illustrate, trees and plants contribute to a unique “sense of place,” –providing a connection to nature, the seasons, and community identity.

“Association with beauty can enlarge man’s imagination and revive his spirit... What a citizen sees every day is his America. If it is attractive it adds to the quality of his life. If it is ugly it can degrade his existence.” -President L. B. Johnson

Caltrans Landscape Architecture

<https://dot.ca.gov/programs/design/lap-intro-to-landscape-architecture>