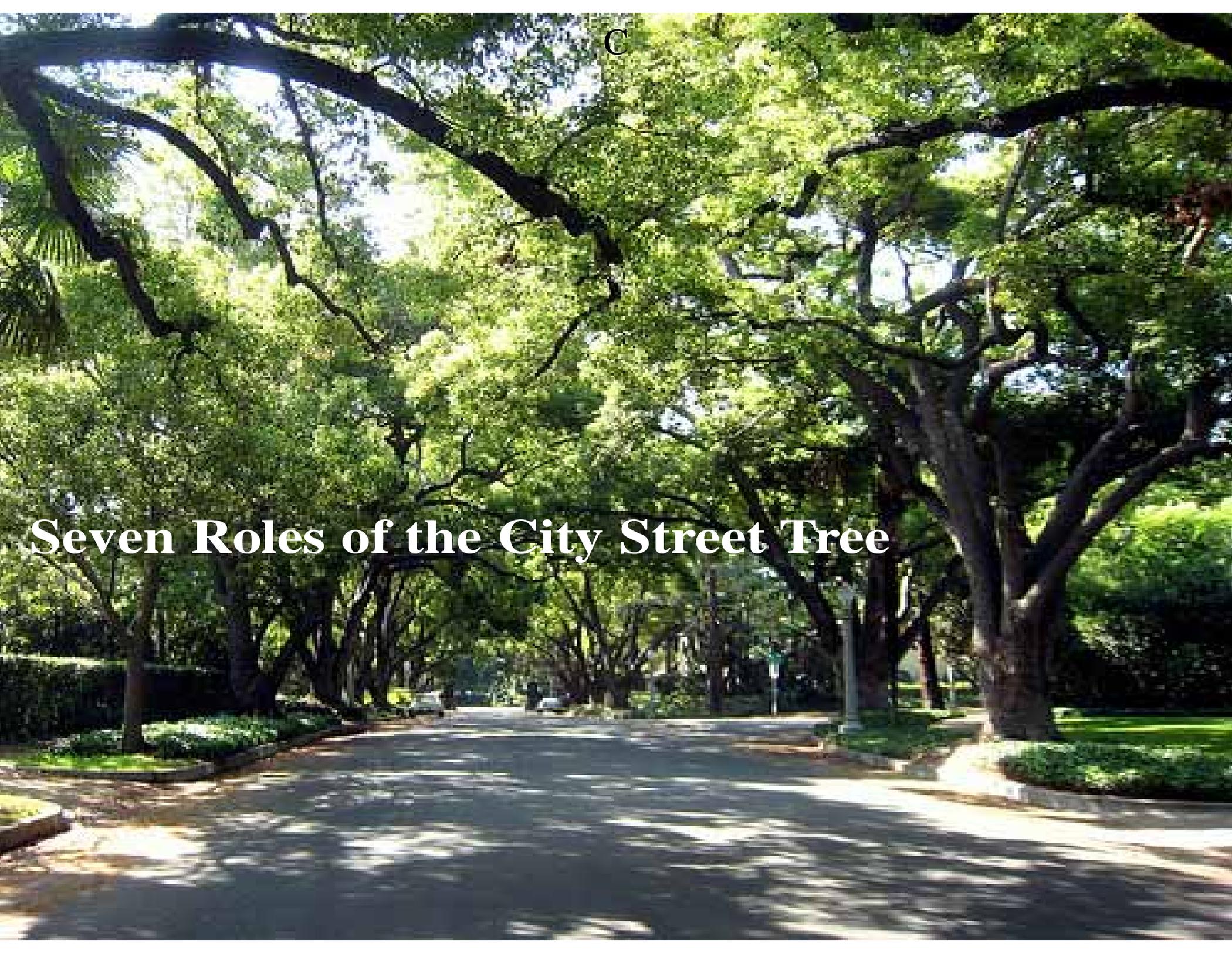


©

Seven Roles of the City Street Tree





Define the Space of the Street

The space of the street particularly applies to:

Streets that are too wide for the height of the buildings

Streets with holes in the street wall

Suburban streets where buildings are too far apart to contain the space of the street.







**Define
pedestrian space**

**Aided by parked cars
street trees are
providing distinct
edges to sidewalks**

**Streets trees improve
the walkability, pride,
care of place, and
various social
activities**

**Businesses on
properly designed
tree-scaped streets
show higher income
streams**





A photograph of a residential street lined with large, mature trees. The street is paved and has several cars parked on both sides. On the left, a white house is partially visible behind the trees. The scene is bright and sunny, with shadows cast by the trees onto the road. In the top right corner, there are small navigation icons: a left-pointing arrow, a right-pointing arrow, and a square icon.

**Calm Traffic
Protect
Pedestrians**





N Van Ness Blvd



**Filter the Sunlight
Remove CO₂**



Through photosynthesis, trees lower city temperatures in the summer and change carbon dioxide into oxygen.

Temperature reductions of 5-15 degrees are felt when walking under tree canopied streets.

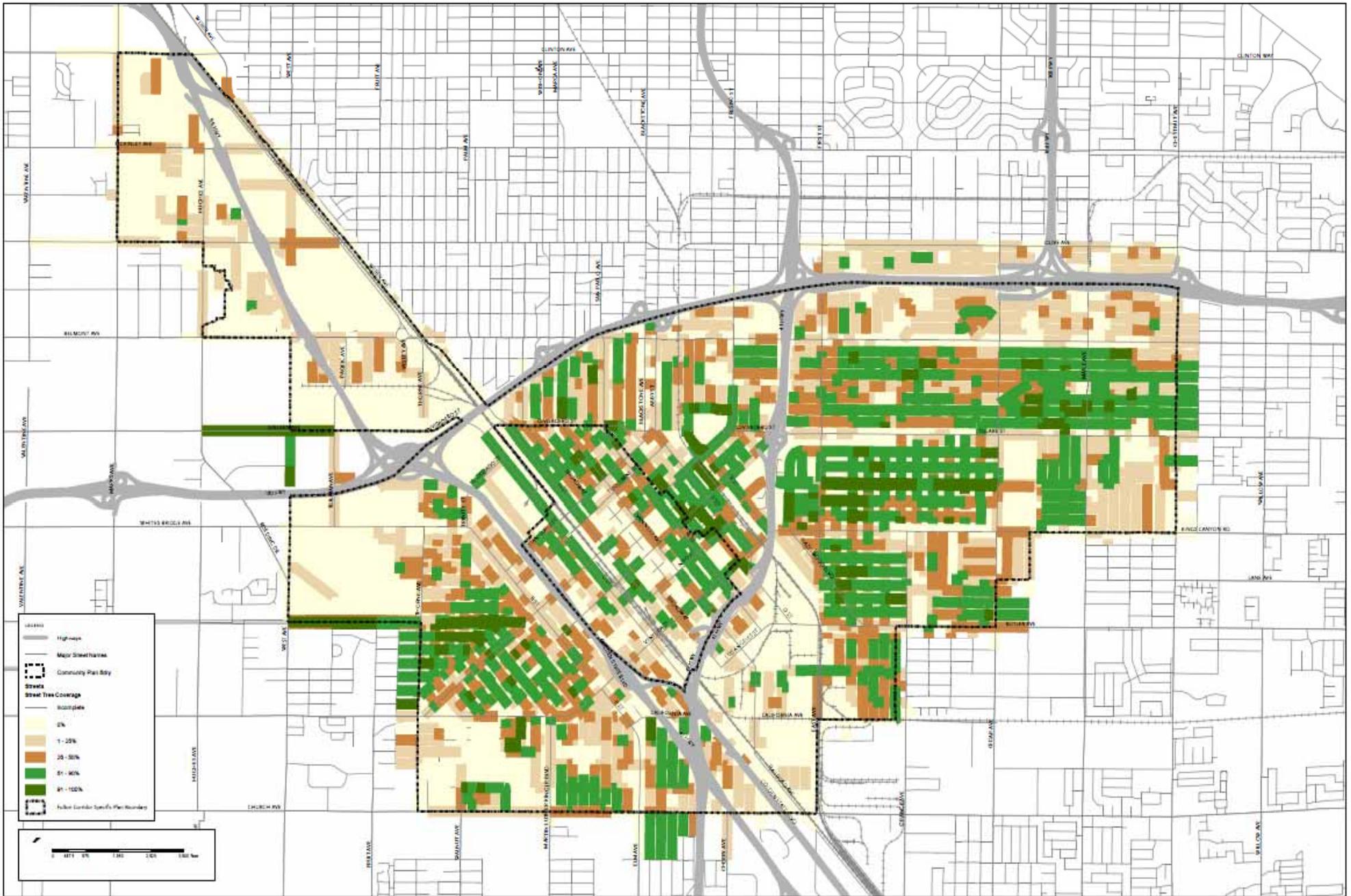
Volatile organic compounds (VOC) in the air react with oxides of nitrogen and sunlight to form ground ozone. Breathing air with ground ozone concentrations above air quality standards aggravates symptoms of people with pulmonary diseases and seems to increase rates of asthma attacks. Impacts are reduced significantly by tree canopies since ozone and VOC's are temperature dependent.

Trees in street proximity absorb 9 times more pollutants than more distant trees.

50% of a tree is composed of carbon. The Kyoto Protocol recognizes this for sequestration purposes.

Studies conducted in a variety of California environments show that the shade of urban street trees can add from 40-60% more life to costly asphalt. This factor is based on reduced daily heating and cooling (expansion/contraction) of asphalt.

Although care and maintenance of trees in urban places is a costly task, the value in returned benefits is so great that a sustainable community cannot be imagined without these important green features



STREET TREE COVERAGE

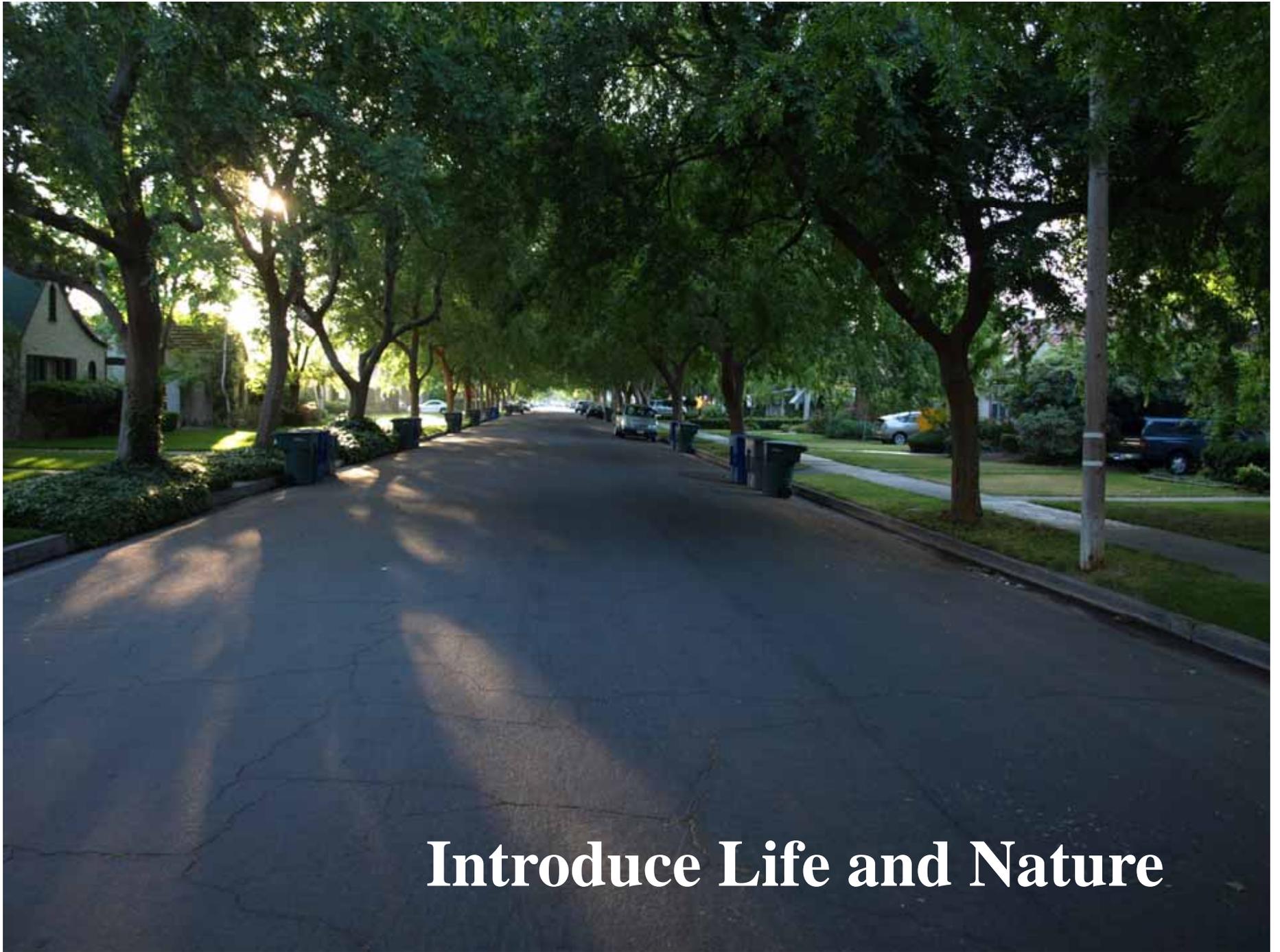


Order the Street





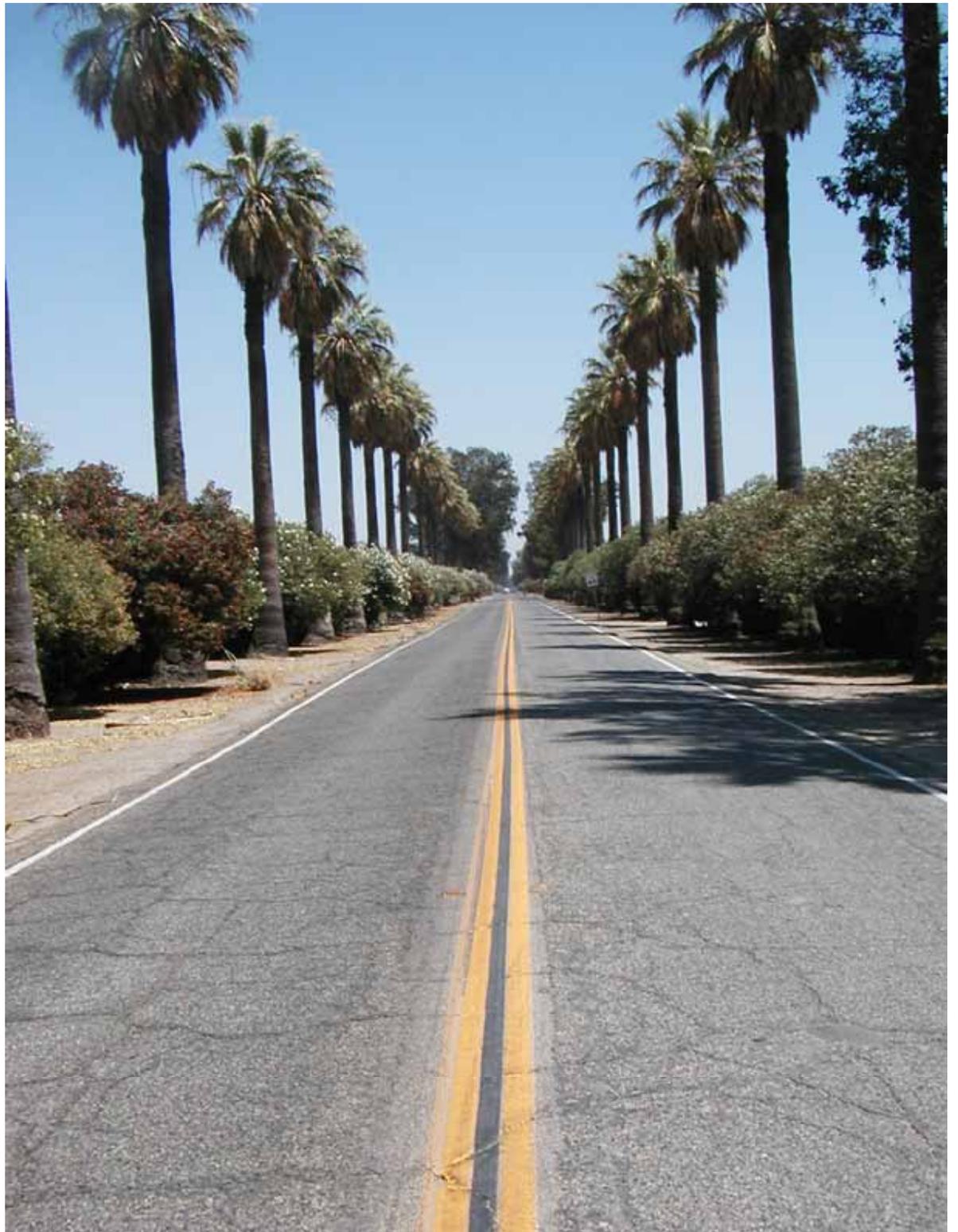
E Brown Ave

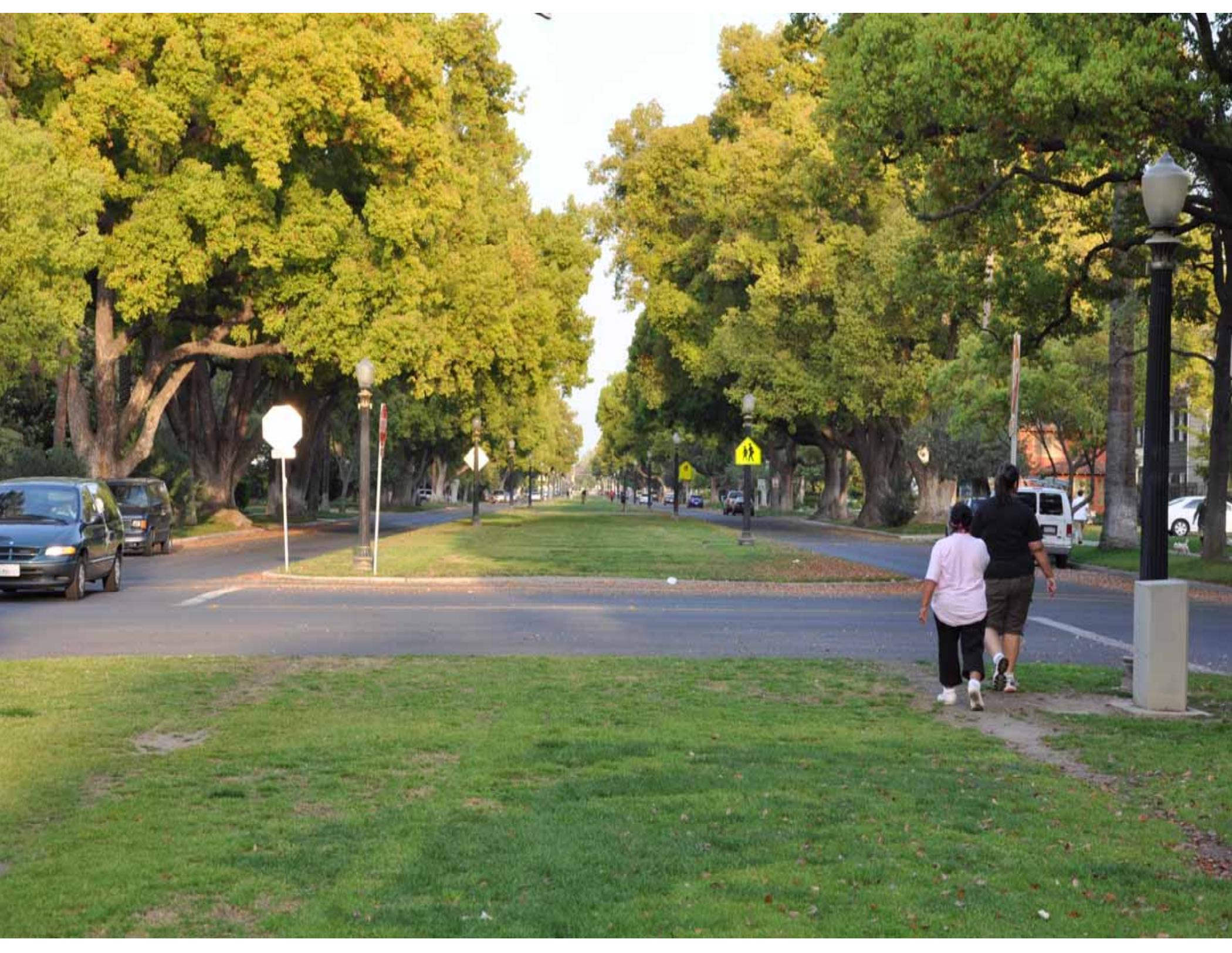


Introduce Life and Nature



Develop Community Character









Large vs Small, the City of Modesto is trying to introduce more large trees into the community. There was a trend for a while to plant smaller stature trees like crape myrtle. Those trees don't have some of the problems of larger trees, but they don't provide the benefits of the large trees either. Because of the new awareness of the value of trees, the city has gone back to the 1940s way of thinking and is taking any opportunity to plant large trees.

...“The millions of dollars invested in the community forest are coming back to residents in the form of increased property values, enhanced scenic beauty, air pollutant uptake, cooling and heating savings, lower summertime temperatures, and reduced stormwater retention.”

...In other words, while the city spent \$2.6 million per year on their urban forestry program, the total annual benefits to the community were \$4.8 million. This translated into a net annual benefit back to the city of \$2.2 million.

(Center for Urban Forest Research • Pacific Southwest Research Station • USDA Forest Service Spring 2003)



The average life expectancy of newly planted urban trees has been reported to be 10 to 15 years, and only 7 to 10 years for urban street trees

(Urban, 1996; Appleton, McPherson and others, 2002)



Trees and other greenspace may lower air temperatures 5-10° F. Because of the San Joaquin Valley's hot, dry summer weather, potential cooling savings from trees are among the highest in the nation. Computer simulations for an energy-efficient home in Fresno indicate that shade from two 25-foot tall trees on the west side and one on the east side are estimated to save \$75-\$103 each year. Evapotranspirational cooling from these three trees is estimated to increase savings by another \$28. The right tree in the right spot saves energy. In midsummer, the sun shines on the northeast and east sides of buildings in the morning, passes over the roof near midday, then shines on the west and northwest sides in the afternoon. Air conditioners work hardest during the afternoon when temperatures are highest and incoming sunshine is greatest. Therefore, a home's west and northwest sides are the most important sides to shade. In San Joaquin Valley communities, the east side is the second most important side to shade.

(Excerpt from: Tree Guidelines for San Joaquin Valley Communities, authors: E. Gregory McPherson, James R. Simpson, Paula J. Peper, Qingfu Xiao for Western Center for Urban Forest Research and Education, USDA Forest Service, Pacific Southwest Research Station March 1999)



By shading asphalt surfaces and parked vehicles trees reduce emission of hydrocarbons that come from leaky fuel tanks and worn hoses as gasoline evaporates. These evaporative emissions are a principal component of smog and parked vehicles are a primary source

(Excerpt from: Tree Guidelines for San Joaquin Valley Communities, authors: E. Gregory McPherson, James R. Simpson, Paula J. Peper, Qingfu Xiao for Western Center for Urban Forest Research and Education, USDA Forest Service, Pacific Southwest Research Station March 1999)



Research shows that residents who have participated in tree planting events are more satisfied with trees and their neighborhood than are residents where trees have been planted by the city, a developer, or volunteer groups without resident involvement.

Through the City of Long Beach's Neighborhood Improvement Tree Project, city staff worked with neighborhood groups, the Conservation Corps of Long Beach, and local businesses to plant trees in physically distressed neighborhoods during the spring of 1998. Five hundred volunteers helped to plant over 800 trees. City staff report that the event provided local residents with a sense of empowerment and helped to strengthen community



Sustainability

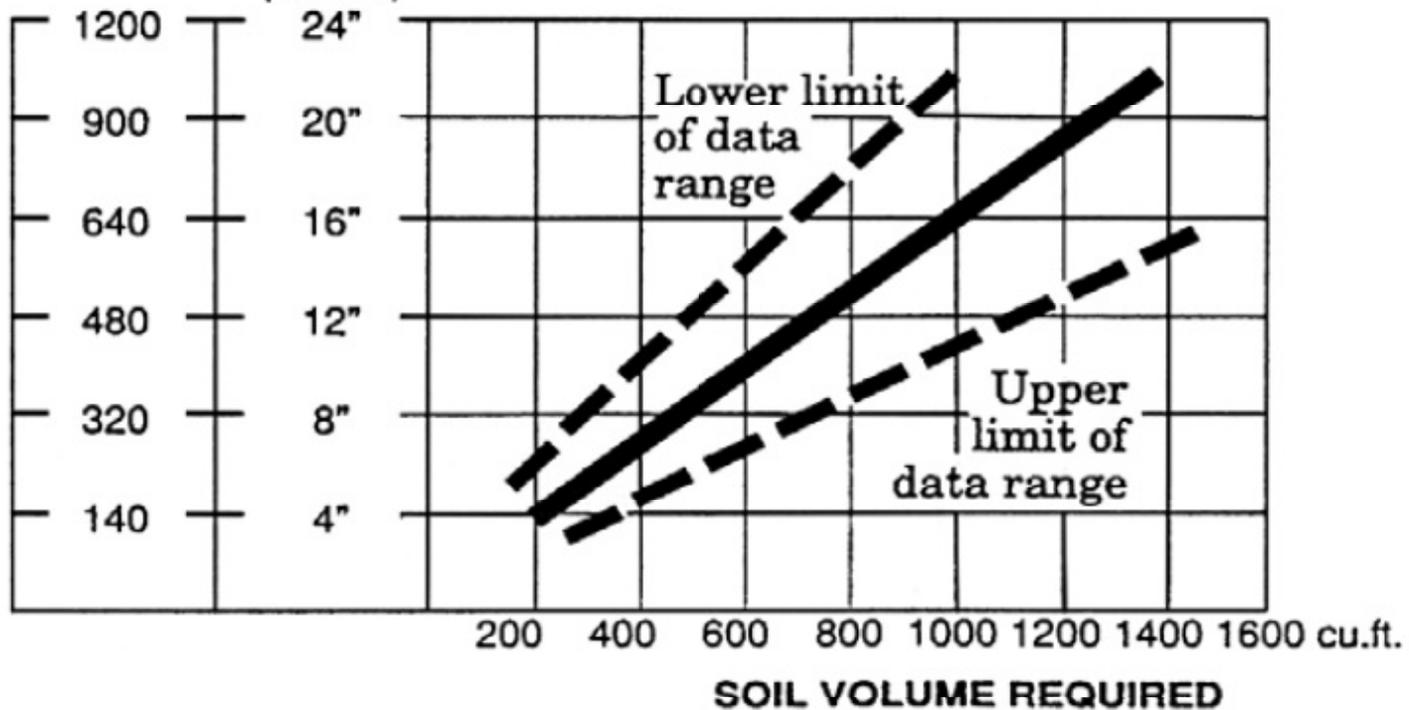


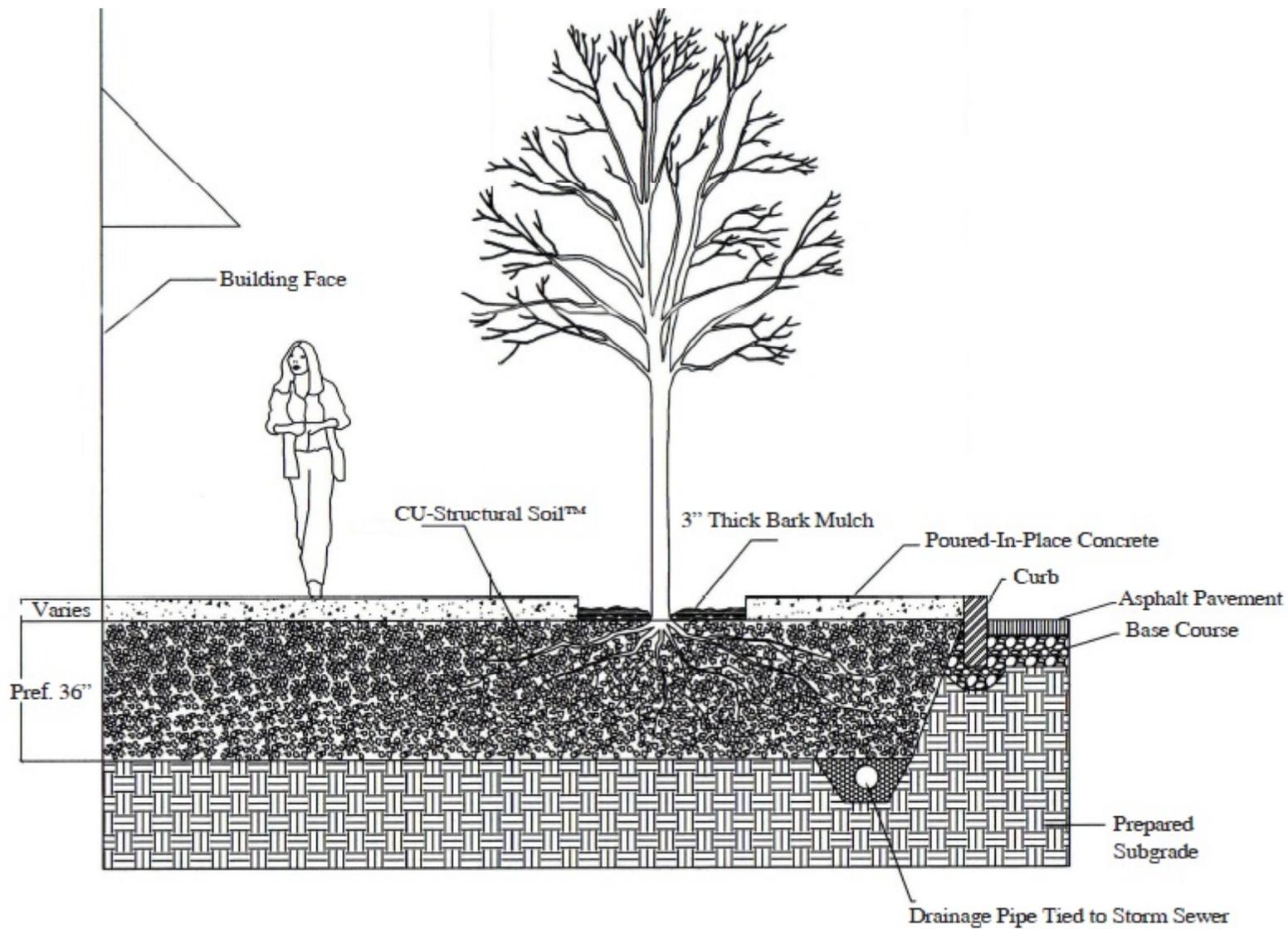
Ultimate Tree Size

Crown
Projection
(sq. ft.)

Diameter
Breast
Height
(inches)

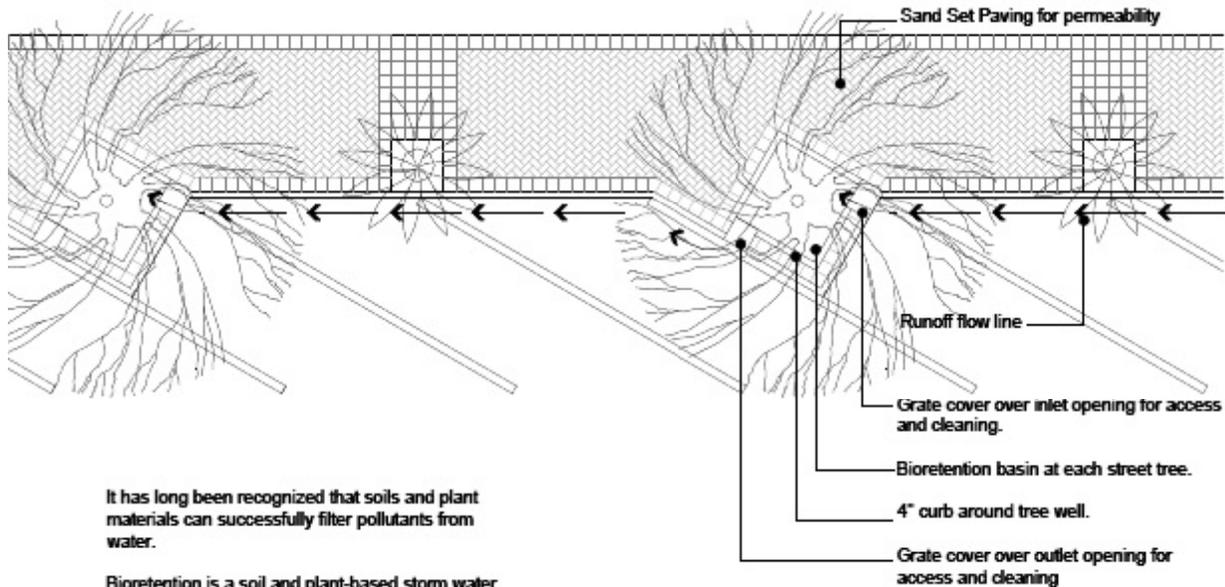
Adequate soil volume needed for roots can be approximated from the size the tree will be at maturity.





Recommended Minimum Setbacks for Overhead Wires

| Recommended Setback | Description | Source |
|---------------------|---|---|
| 10-15 feet* | Height setback between top of mature tree and overhead wires | Gilman, 1997; Head and others, 2001 |
| 10 feet | Distance setback for small trees (< 30 ft) | GFC, 2002; Gilman, 1997 |
| 15 -20 feet | Distance setback for medium trees (30-50 ft) | PSU, 1997; Head and others 2001 |
| 20 to 40 feet | Distance setback for large trees (> 50 ft) | Nebraska Forest Service, 2004; Head and others 2001 |
| 20 feet | Distance setback from transmission right-of-way for all trees taller than 15 feet | Kochanoff, 2002 |



It has long been recognized that soils and plant materials can successfully filter pollutants from water.

Bioretention is a soil and plant-based storm water best management practice (BMP) employed to filter runoff from developed communities.

Various grasses, shrubs, and trees are established to promote evapotranspiration, maintain soil porosity, encourage biological activity, and promote uptake of some pollutants. Runoff from an impervious area is directed into the bioretention facility. The water infiltrates through the plant/mulch/soil environment, providing the treatment.

Green space is made functional to keep storm water onsite, to minimize runoff by maximizing infiltration, and to employ natural processes for water quality improvement. This is accomplished by running the the storm water collected from the sidewalks and streets in the gutter through the street tree planters. The soil level in the planters is six inches lower than the street gutter. Runoff is directed into the planter through a slot into the treewell. The pollutants are caught by the landscape filter and some water is percolated into the soil.

