TREES FOR LAFAYETTE

The Master Tree Plan
Lafayette, California

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Lafayette, California

By Russell A. Beatty

NCC/ASLA Publications Group

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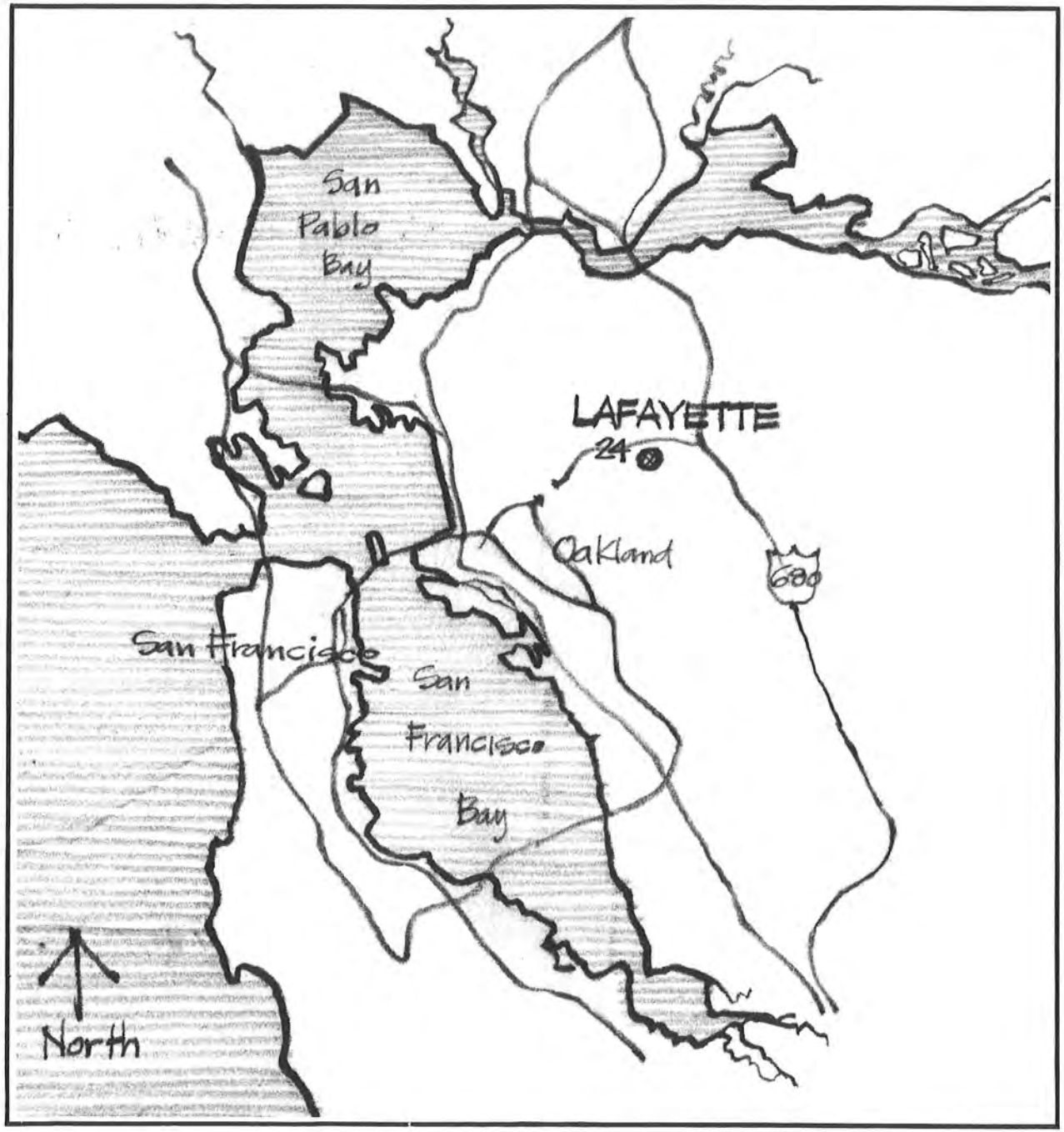
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INTRODUCTION

Trees have always been a common part of our daily lives, so much so that we have sometimes taken them for granted. We are becoming increasingly conscious of the importance of trees, yet they are baffling to most of us. How many of us can name the trees in our gardens or on our street? How often are we puzzled over the selection of a new tree to plant? How often are questions left unresolved about pruning or feeding our young trees? How often do we draw a blank when an old tree appears to be dying?

This dilemma exists at the community level as well. Questions about tree selection, maintenance and preservation are raised continually in the governing of a city. We are riding on a wave of rising concern about our environment and trees are an important element of this concern. Tree plantings are becoming a requirement in the development of both public and private land. Communities are assuming greater responsibility in the maintenance of street trees, parks and open spaces. Tree preservation is a paramount issue in new construction.

The City of Lafayette is blessed with an abundance of trees. The lush creeks and wooded hillsides are the framework and backdrop of the Lafayette environment. They are the City's heritage and define much of its rural character. The choice of trees to be planted is an important one. New trees planted today affect the quality of the environmental heritage for years to come. The maintenance and preservation of fine old trees links the past with the present, binding this heritage to the future.

The City of Lafayette is keenly conscious of its trees. The adoption of Ordinance 38 which established the City's Tree Commission and its Grand Tree Program is evidence of this concern for an environmental heritage. This Master Tree Plan is dedicated to these ends—that today's decisions and actions about trees are a part of tomorrow's environmental heritage. This Plan is intended to answer some of the questions asked about trees both individually and collectively as a community and to offer design and technical information to assist decision making.

A discussion of Lafayette's natural vegetation and historic development is presented to highlight the community's important treescape. The relationship between climate and the natural vegetation types is explained and the distribution of plant associations is mapped. Guidelines for tree plantings complimentary to the natural landscape are developed.

The many different types of streetscapes of the community are discussed with examples of fine street and neighborhood plantings located on a map. Design guidelines for future tree planting are presented along with lists of trees for specific situations.

Unique or prominent tree groves are located on the Lafayette Tree Guide. The criteria for selecting these important features of the community are discussed. In addition, individual trees worthy of special community recognition are mapped. An expansion of the City's Grand Tree Program is offered to designate these unique specimens.

Tree planting, maintenance and preservation techniques are explained and illustrated with diagrams. The techniques outlined apply to existing as well as new trees.

As an individual self-study reference, the Lafayette Tree Guide is included. This is a map locating fine specimens of trees which have been discussed or recommended in the Plan.

In the text, tree names are given using the common name with the botanical name in parentheses. Because common names vary and are undependable (there are at least two versions of a Tulip Tree), plants on the lists are given in alphabetical order by botanical name. Botanical names are also used on the maps.

The characteristics of each recommended tree are not discussed here. Several excellent publications have complete descriptions of all the trees. These books are listed in the References and are readily available at local libraries or book stores.

In any discipline, a vocabulary of specific and perhaps unfamiliar words is used. The plant-related professions (landscape architecture, horticulture and botany) are no exceptions. The meanings of these words or terms are included in a Glossary at the end.

Becoming more familiar with the trees of our community adds a new dimension of understanding and enjoyment of the surroundings. This Plan is designed for all the citizens of Lafayette, old-timers and newcomers alike. It is intended to become a useful reference for residents, public staff and officials and developers of Lafayette, both now and in the years to come.

TREE SELECTION CRITERIA

Selecting the right tree for the right place is a design problem to be solved. The subjective approach of choosing favorite plants is usually unsatisfactory. Instead, by using a more objective, rational process, the selection of trees and other plants can be made easily with more effective results. In a design problem we identify the purposes the tree or trees are to serve. To do that, the criteria to be fulfilled by the tree must be known. This is how we select a car, a house or make many other major decisions.

More specifically, trees can be considered as having three major categories of selection criteria—*visual* (aesthetic), *functional* (utilitarian) and *cultural* (horticultural or ecological). All of these factors are interrelated for any planting situation. One or more may be dominant in a particular instance, but all must be considered. By defining more clearly what these three factors imply, we can determine how they may be applied to any one planting design problem.

Visual Criteria

Trees are design elements just as any other materials (wood, stone, brick). Each tree has its own inherent visual characteristics. These include form, color, texture as well as seasonal changes such as fall color and spring flowers. In combination these give a tree its own character, much the same as a person's character is the composite of individual traits.

For example, Lombardy Poplar has an emphatically erect form with sparkling, bright green foliage. A Valley Oak has a broad, sheltering canopy of dark, dusty green supported by a massive, sculptural trunk and branching structure. Some trees are bright and lively; others are dark and somber. Each has a visual impact in the landscape. Individual interpretations may vary (we all perceive things differently), but the visual characteristics of a tree can be fairly objectively described.

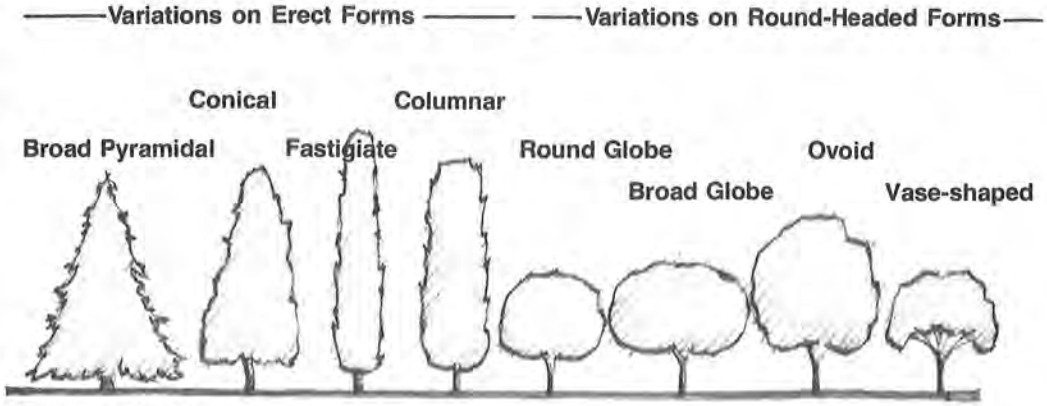
Stately Lombardy Poplars–a prominent landmark at the Diablo Forge.

The factor of time must be considered when evaluating the visual quality of trees, particularly tree form. The shapes of some trees change as they mature. Young trees may look quite different from older ones of the same species. Also, the ultimate size of mature trees must be considered in relation to the spaces they occupy. Major surgery when trees outgrow their spaces is a poor substitute for appropriate tree selection.

Functional Criteria

Trees can and do serve many functions in the landscape. Traditionally we have focused on the aesthetic qualities of plants. Recently, however, the many functional roles served by trees have become recognized in landscape architecture and environmental planning. Many of these uses are directly related to plant form.

Trees can be classified as architectural elements to define spaces similar to building spaces. They can be used to provide a canopy (ceiling) over a space or define its edge (walls or screens). A broad-spreading, round-headed tree casts a large shadow and can serve as a canopy tree. A narrow, upright tree that branches close to the ground can serve as a visual barrier or screen. The degree of screening depends upon the density of the trees and their spacing in the ground.



Tree form variations.

Environmental control functions of trees have created great interest recently. These include climate control (air conditioning), acoustical control (noise buffering) and atmospheric purification. Of these, climate control is one of the most effective uses of trees. In Lafayette, the use of trees for summer cooling is an important consideration in any planting. In this regard, size and form are important selection criteria.

Narrow, upright Eucalyptus trees form an excellent screen and shade this apartment house.

Broad, round-headed trees provide a shade canopy for an intimate space.

Although research has concluded that plants can be used to reduce noise, a few trees do little more than block the noise source (out of sight, out of mind!) and are not effective unless used in great quantities. All plants help purify the air through filtration of dust, absorption of carbon dioxide and other pollutants and generation of oxygen. This alone is sufficient reason to plant masses of trees in urban areas.

Cultural Criteria

The ultimate test of the success of any tree planting depends upon the survival of the plants. Each tree has its own set of tolerances and preferences which determines its horticultural suitability. Ecologically, plants adapt to more or less specific habitats based primarily upon climate and soil types. By matching these habitats as closely as possible in a new environment, greater success is assured.

We can modify a plant's environment horticulturally to better suit its needs. Water is the most common modification. Irrigation broadens the range of plants we grow in California. Nevertheless, this device must be used sensibly—*we cannot afford to irrigate the entire State*. As a general principle, drought tolerant species should be used in public plantings such as streets, highways and open spaces and in peripheral portions of private properties. Trees with higher water requirements should be confined to smaller public areas and private patios.

Maintenance is another aspect of cultural criteria. If the degree or quality of maintenance can be determined ahead of time, trees can be selected to suit. This is an essential criteria to be carefully considered in the design of public landscape plantings. In essence, the trees used should be selected to match the growing conditions and degree of maintenance to be anticipated.

This brief introduction to the selection of trees will be expanded in later sections of this Plan. These three basic elements of plant selection will be related to specific tree selection for various situations in Lafayette.

HISTORICAL PERSPECTIVE

At this historic point in time with the celebration of this country's Bicentennial, it is significant to note that the only present-day inhabitants of Lafayette which existed 200 years ago are the trees. A few of those individuals have persisted and are epitomized by The Grand Tree of Lafayette, a Valley Oak at the Lafayette-Orinda Presbyterian Church. These remaining old trees are a living heritage of the early landscape of Lafayette.

The landscape of Lafayette has changed remarkably over the years. It would be difficult to reconstruct the landscape of 200 years ago when this nation was founded, but we do know from early photographs that 100 years ago there were fewer trees than today. The Oak Woodlands on the hillsides were rather sparse, probably due to cattle grazing and summer grass fires. However, the thickly wooded streams and water courses have changed little, if any. Meandering ribbons of Oaks, Cottonwoods and other Riparian trees are still predominant in today's landscape.

In that early landscape, the Indians lived in close harmony with the land and its trees. Their symbiotic relationship with nature lasted centuries. Their interdependence on the native vegetation for food, fuel, shelter and materials is well documented. However, a significant aspect of the Indian tenure on the land was the stability of the tree cover. In the Lafayette area as well as elsewhere in California, grass fires were common. Many were deliberately set by the Indians. One member of the Vancouver Expedition in 1792 observed: "All night great fires burned on the land at the back of the harbor (San Francisco); the natives were accustomed to burn the grass to further its growth." And Dr. Alfred Louis Kroeber confirms such observations: "The usual California practice was followed of burning the country over in order to clear out the underbrush for facilitating acorn gathering and to foster the growth of seed bearing annuals." Other records show that the Indians would hunt deer by driving them with grass fires to narrow spaces where they could be easily shot with arrows.

"Locust Farm"– residence of Nathaniel Jones on Rancho Acalanes.

The result on the landscape was a more open woodland and a predominance of grassland. Brush, such as Poison Oak, Coyote Brush, and young tree seedlings was controlled by the burning—an effective method no longer used. Thus the large Oaks we see today were carefully preserved and, in fact, encouraged in the Indian days as a principal source of food.

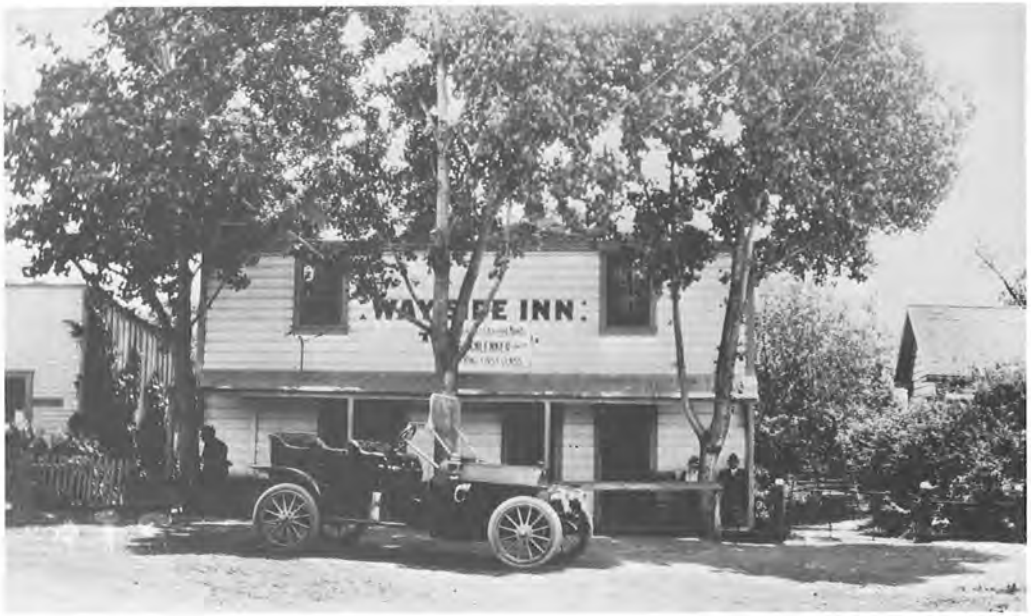
Under the Mexican control of California, the landscape changes were slight. In an effort to reinforce boundaries, a planting requirement was imposed upon Mexican landowners. As a provision of ownership, rancho boundary limits were to be marked with "some fruit trees or wild trees of some utility." Such a requirement was made by the Mexican Governor, Candelario Valencia, when he received Rancho Acalanes in 1834. There is little, if any, evidence that this requirement was adhered to in the Lafayette area. The mere size of those early ranchos, let alone the difficulty of establishing trees during the searing hot summers, made this provision almost impossible to fulfill.

Thirty years later as the ranchos were being settled, a tree protection provision was imposed by Horace W. Carpentier on nearly all of the parcels of land he sold within Rancho Laguna de los Palos Colorados. In the deeds to the new landowners he stated that "the Walnut trees shall not be cut down, wasted or destroyed." One of the parcels covered the present Glenside area. This deed restriction might be considered Lafayette's first Tree Ordinance.

When the emigrants from the East arrived, tree planting began in earnest. One of the first trees planted here and in many other early California settlements was the Black Locust. This rugged, spiny native of the East and Midwest was conveniently carried to California as seed. As a valuable source of fence posts on eastern farms it was naturally one of the favorites of the west-bound farmers.

Nathaniel Jones introduced the Locust to Lafayette. Coming West in covered wagons with Elam Brown, the two men eventually settled on Rancho Acalanes which Brown purchased in November, 1847. At some time thereafter, Jones selected 372 acres in what is now Happy Valley and he reportedly planted a great number of Black Locust trees on his farm, naming it "Locust Farm." Jones or those claiming the area around the early settlement near present-day First and Second Street, also planted a number of Locust seeds, on the banks of Lafayette Creek. Apparently these trees became a significant grove for which the Locust Grove Ice Cream Store was later named. A third planting was made around Elam Brown's home near the creek on what is now Hough Avenue.

First trees planted in The Plaza around 1900 by Robert McNeil.



Cottonwoods planted as street trees in front of the Wayside Inn.

The Plaza became the site of other early plantings. There is little record of tree planting there until after 1900. Robert McNeil, proprietor of the Pioneer Store (in the building now "The Handlebar"), planted a number of small trees, probably fruit trees. He also planted the two Deodar Cedars that still grace the Methodist Church on Moraga Road. About the same time, the first street trees were planted in front of businesses for shade. Photographs of the Wayside Inn and the Lafayette Hotel, both fronting the Plaza, show these early plantings.

Only a few remnants of the early trees exist today. Several of those Black Locusts and their numerous progeny can still be seen in Happy Valley and along Lafayette Creek between First and Second Streets. These old patriarchs serve as a living link with the early settlement of Lafayette.

Orchards provide a patchwork mosaic in Lafayette around 1936.

Orchards were the next and most prominent tree plantings in the Lafayette area. The pioneers all had orchards for family use. Commercial orchards later dominated the valley bottoms. Fruit trees are generally short-lived and disappear after a few decades unless replanted. Walnut trees last longer, but unless carefully maintained, decline after about 40 years. Today those orchards have all but disappeared with the residential expansion of the City.

Lafayette from Brown Avenue in 1940 and 1958 showing increased tree cover as well as development.

Lafayette from Brown Avenue in 1975

Suburban development, the last phase of transformation, has been the most rapid and most dramatic, covering a period of only 35 years. Unprecedented tree planting has occurred. With the lack of cattle grazing and increased fire control, the native trees have also increased in numbers. Today the City is a mosaic of many kinds of trees, both native and introduced. Remnants of orchards interspersed within residential housing and occasional livestock ranches studded with Oaks remind us of our agrarian heritage.

Perhaps it is this agricultural heritage which influences the desire of the community to maintain a rural character. The predominance of the natural landscape, woodlands and streams, certainly enhances this ruralism.

The trees, their types and patterns of occurance, define landscape character. However, with the increasing development of the hills and valley lands, the character is changing.

The growth of the nursery industry and the discovery of new plants from other lands has had a dramatic influence on the landscape of urbanized areas of California. The combination of a mild climate and modern irrigation has extended the range of plant materials. Trees from all parts of the world can be grown in Lafayette. Among the numerous trees from Northern Europe, we have the London Plane Tree and the White Birch. Olive, Oleander, Stone Pine and Lombardy Poplar are a few of the many trees from the Mediterranean—an area with a climate similar to ours. From Asia come the Crape Myrtle and Chinese Pistache. Japanese imports include more than cars and radios! The Japanese Maple, Flowering Cherries, Evergreen Pear, Ginkgo, several deciduous Magnolias and the Zelkova comprise a few of the many trees from the rich flora of Japan. The Eucalyptus and Acacias from Australia are familiar to the California landscape. The California Pepper, dating back to the Mission Period, is actually from Chile, as is the Mayten Tree.

Emigrants, as well as horticulturists, have introduced a host of North American natives to California. Added to the Black Locust are the Silk Tree, the Southern Magnolia, Sweetgum or Liquidambar and Tulip Tree. Redwoods and Monterey Pines are native to limited areas of California, but have been introduced widely throughout the State. Combining all these species with the increasing selection of cultivated varieties, we have a bewildering array of trees from which to choose for our gardens, streets, parks and other open spaces.

Collectively the planting of trees on both private and public land can change the character of the landscape, whether it is a neighborhood or street or a whole community. The abundance of native trees, primarily the Oak Woodlands and the streamside woods comprise a large part of the rural charm of Lafayette. Most people cherish the many qualities of this landscape. Yet the character of the native landscape can be altered quickly with the large-scale introduction of contrasting trees. The change is ususally unintentional—individual plantings of favorite trees which collectively dominate the native trees, especially the slower growing ones. Before long the rural charm that attracted so many people can be transformed into a potpourri of exotic (introduced) trees. Trees planted today affect the quality and character of the community for years to come. The planting must be done sensitively so that the fine qualities of the natural landscape are preserved and enhanced, not obliterated.

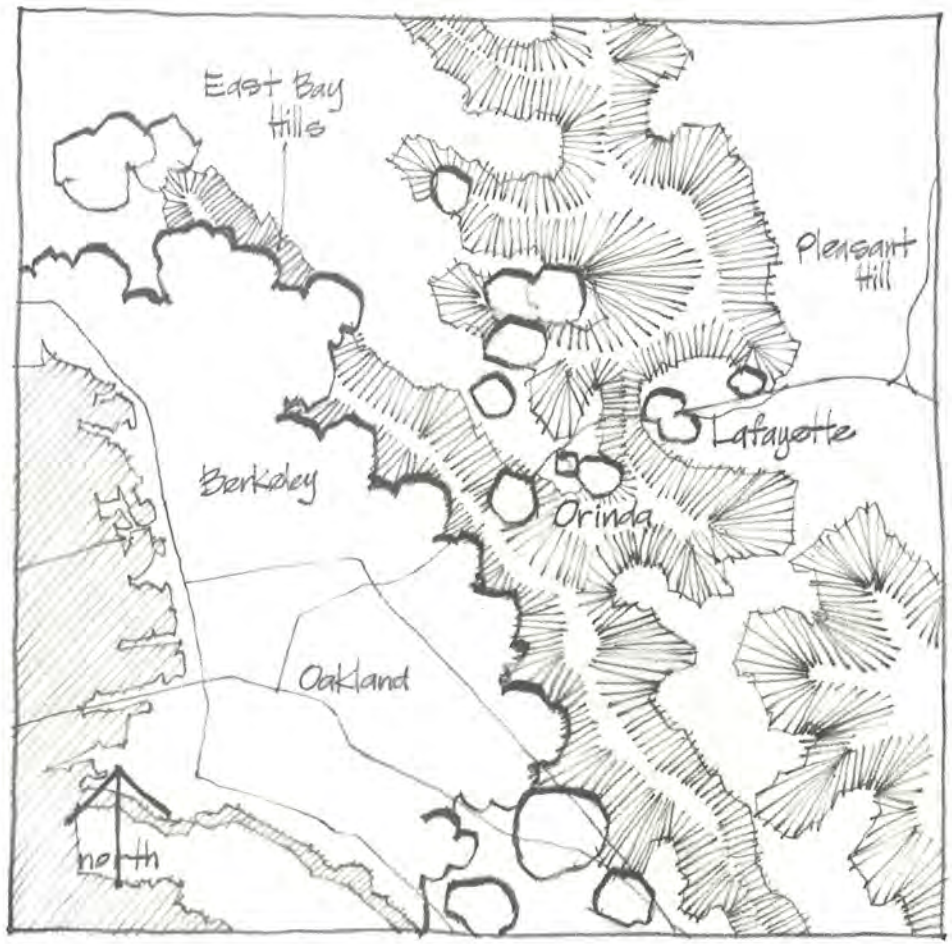
CLIMATE

Climate more than any other environmental factor determines what plants will grow where. In the natural landscape, the distribution of trees is determined primarily by the amount of precipitation and the temperature range. Wind and wind patterns play a lesser role. The interrelationship of these factors is complex, but a few figures can help to interpret the climate of Lafayette.

The *Sunset Western Garden Book* places most of Lafayette in a zone of cold winter valley floors and land troughs—Zone 14. The warmer hill areas above the valley floors are placed in the milder Zone 15. Typically this area is hot in the summer and cold in the winter. The summer high may reach 112° F (46°C). Frequent, short duration winter frosts can cause temperatures to drop to 17° F (−12°C). Annual rainfall is generally limited to the winter months (November through March) and ranges from 25 to 30 inches (63.5 to 76.2 centimeters).

The East Bay Hills which form a barrier to the ocean's influence are the key to Lafayette's climate. The City is situated in a transition zone between the maritime coastal climate and the continental climate of the Central Valley. Summer fog which prevails on the coast only partially penetrates into the valleys just east of the ridge.

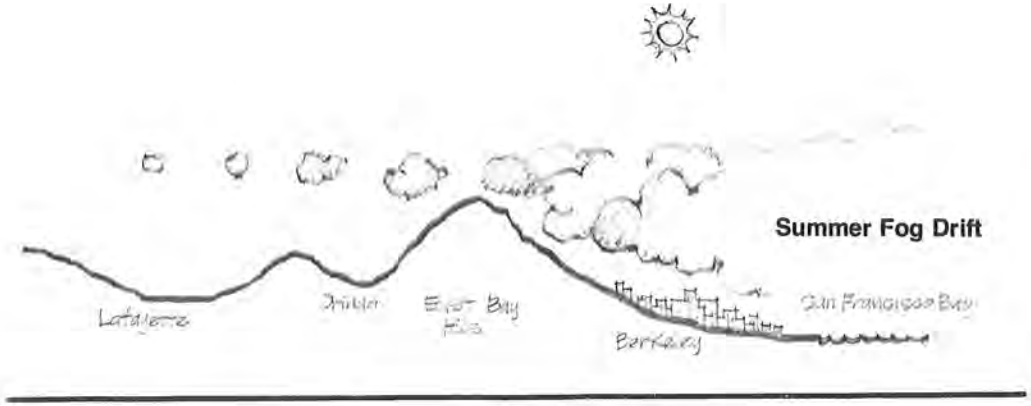
The most important aspects of these rather general data are the extremes. These are limiting factors in relation to plant growth. The lowest temperature on record establishes the cold hardiness limit. The summer extremes indicate the amount of heat stress to be expected. Compared to San Francisco, these extremes are remarkable. A new resident in Lafayette probably has a difficult time understanding the dramatic temperature and fog differences that occur when passing through the Caldecott Tunnel. In a distance of less than 10 miles, there are two very different microclimates.



East Bay summer fog patterns showing cooling effect from fog drift.

When selecting plants for Lafayette, temperature differences are extremely important. The handsome Victorian Box *(Pittosporum undulatum)* lining the streets of San Francisco and Berkeley will most certainly freeze out on this side of the East Bay Hills. Thus the more tender, subtropical broadleaf evergreen trees are not well-suited to Lafayette. A list of tender, subtropical trees to avoid in Lafayette is given on page 62. Conversely, heat tolerant trees such as Chinese Pistache *(Pistacia chinensis)* and Silk Tree *(Albizia julibrissin)*, both of which are deciduous, grow better in Lafayette than in Berkeley.

Summer fog cools the coast and increases the amount of precipitation in the form of condensed air moisture. The Crape Myrtle *(Lagerstroemia indica)* which prefers hot summers is a good indicator of cooling fog. In Walnut Creek it performs very well. In Orinda and parts of Lafayette it tends to mildew (a leaf fungus favored by moist air) and in Berkeley it cannot be successfully grown at all.



Fog patterns over East Bay Hills.

The natural vegetation is a far more reliable indicator of climate patterns than introduced trees. The native trees have survived centuries of weather patterns and have adapted to this locale with the ability to tolerate the cyclical patterns of precipitation and temperature change. Introduced trees may be quite young (less than 50 years old) and may not have been exposed to any real extremes, especially low temperatures. The Big Freeze of 1972 proved this point. Eucalyptus which have been growing for 70–100 years and thought to be "hardy" were severely damaged or killed. Other less dramatic plant kills also occurred in 1972. Many 20 year old Citrus and Acacias were lost.

Clearly the climate of Lafayette is more suitable for deciduous trees than broadleaf evergreens. Of the thirteen trees native to *the area,* only three are broadleaf evergreens. These are: Madrone *(Arbutus menziesii),* Coast Live Oak *(Quercus agrifolia)* and California Bay *(Umbellularia californica).*

The Madrone is rarely found in Lafayette due to high summer heat and drier air and soils. It is a coastal tree thriving in the cooler, foggy Redwood belt. The Coast Live Oak reaches its eastern limit near Lafayette on the western edge of the Central Valley. In Lafayette the Live Oak occurs near streams, and on east or north facing slopes while the Madrone is limited to occasional distribution on the cooler east or north facing hillsides where fog may linger a little longer. By comparison Orinda's hills are thickly covered with Madrone and Live Oak.

The valley bottoms and especially the water courses are the coldest winter areas due to cold air drainage. Here deciduous trees predominate; they include the Buckeye *(Aesculus californica),* Cottonwood *(Populus fremontii),* Willows *(Salix species)* Alder *(Alnus rhombifolia),* Boxelder *(Acer negundo),* Valley oak *(Quercus lobata)* and Black Walnut *(Juglans hindsii).* The ridges and hillsides, especially south and west facing slopes, are warmer and drier. On these slopes, tree cover is sparse and grassland predominates with patches of chaparral.

Thus the climate of Lafayette is a composite of many microclimates with subtle variations based upon elevation, slope exposure and fog patterns. Tree selection should coincide with these differences, using the natural tree cover as an indicator. The temperature extremes are the critical factors in determining what trees will thrive here. Because of irrigation, rainfall is a less important factor.

All trees recommended for use in Lafayette in this Plan are capable of tolerating these climatic conditions. This common denominator of climate, along with a sensitivity to the character and composition of the natural landscape, are the underlying themes for tree selection in this Master Tree Plan.

THE NATURAL LANDSCAPE

The natural vegetation of Lafayette contributes immeasurably to its rural quality. The two predominant plant communities which lend this charm are the Oak Woodlands and the Riparian (streamside) Woodlands. Grassland is a third plant community which sets off the woodlands with a sharply contrasting color and texture. Together they form handsome patterns of greens and browns. Chaparral, the fourth plant community, exists in relatively few areas and is composed of primarily shrubby plants. The accompanying sketch shows the general distribution of these plant communities in Lafayette.

If the rural qualities of Lafayette are to remain, the woodlands must also remain. Much of the Oak Woodland is developed and nearly all the creeks located in flat valley bottoms are bordered by residential property. With development of the land, new trees are planted and through time these trees mature and have an effect on the character and quality of their settings. Unfortunately, few of the plantings we see today are sensitively related to the natural woodlands. Cedars, Pines, Birches and other exotic trees are being planted beneath towering Oaks or are mixed in the woodlands. Ultimately they grow up into the overhead trees or against the woodland edge, destroying the charm of the woodland character. Lawns or heavily irrigated plantings are installed under the trees and not only disrupt the visual quality, but may cause disease and eventual death of the Oaks.

Similarly along creeks, especially where flood control work has caused the removal of the native trees, new plants are installed with total disregard for either the visual or ecological order. Ornamentals such as Oleander, Twisted Juniper, Podocarpus and Bamboo sharply contrast the lush Riparian Woodland and disrupt its continuity. In time these woodlands can lose their charm and one of the most important qualities of Lafayette will be gone.

To help understand how to plant in these natural areas, let us first describe the ecological elements that contribute to their existence and examine their visual components.

The four plant communities of Lafayette represented on the hills north of Happy Valley.

Oak Woodland

Situated in a series of interior valleys between the East Bay Hills and the Diablo range, Lafayette is in a transitional vegetation zone as discussed in the section on Climate. The combination of ample rainfall, some maritime cooling and warm summers favor the lush growth of Oaks and other trees. In the Coast Range, the hills and valleys typically run north and south. The cooler, moister east facing slopes are heavily wooded and the warmer, drier west facing slopes more barren, frequently covered by only grasses. In Lafayette this pattern is somewhat modified by the occurance of northeast—southwest running hills such as Lafayette Ridge to the north of the City and Lafayette Heights south of the town center. These ridges, especially Lafayette Heights, create expanses of cooler north facing slopes which are thickly wooded. The resulting landscape displays the predominance of the Oak Woodlands. Drier than similar slopes nearer the coast (Orinda or parts of Marin County), these hillsides are dominated by the Valley Oak *(Quercus lobata)* with occasional occurances of Live Oak *(Quercus agrifolia)* and Black Oak *(Quercus kelloggii)*. The Black Oak is found only in the coolest canyons and is rarely seen in the eastern part of the City. Canyon Live Oak *(Quercus chrysolepis)* is sometimes found in the drier canyons and Blue Oak *(Quercus douglasii)* occurs on a few of the driest ridges. The Valley Oaks extend into the valley bottoms where they attain great size because of deeper soils and an ample underground water supply. Both California Bay *(Umbellularia californica)* and Buckeye *(Aesculus californica)* accompany the Oaks adding complimentary contrasts near ravines.

Oak Woodland.

These native Oaks regenerate easily. Anyone who has cultivated the soil near an Oak can attest to this. A multitude of seedlings sprout effortlessly and in a surprisingly short time become small trees. Oaks are often scorned as slow growers and frequently are not planted as a result. Both the Valley Oak and the Live Oak grow relatively fast—1 to 2 feet a year—if properly managed.

Proper management is the key to survival and encouragement of the Oak Woodlands. The following horticultural pointers are outlined here as a part of the design guidelines for tree plantings in or near natural Oak Woodlands:

Competition—The great Oaks we see today grew to that size because competition from other plants was controlled by either fire or grazing. When Oak seedlings are thinned out, those remaining grow more quickly and robustly.

Pruning—For vigorous growth, the tops of Oaks should be thinned and the lower branches gradually removed. The very top branches of an Oak should never be headed back.

Watering — Irrigation around the base of an individual Oak or Oak grove should be minimal. Use drought tolerant shrubs and groundcover as an understory and keep lawns away from the tree trunks. Water runoff from lawns located upslope from an Oak usually kill the tree. The soil around the trunks must be kept dry during the summer to prevent root and crown rotting diseases. Occasional deep watering can benefit young Oaks and help increase their growth rate.

Shade Tolerant Understory—Oaks cast a dense shade under their canopy. Sun loving shrubs and groundcover do not perform well if planted as an understory. Sun seeking trees planted beneath Oaks tend to grow tall, blocking out the sculptural elegance of trunks and branches. Choose low growing, shade tolerant plants for planting beneath Oaks.

COMPATIBLE TREES FOR OAK WOODLANDS

Plant Name	Deciduous/ Broadleaf Evergreen	Shade Tolerance	Drought Tolerance
*Acer circinatum— **Vine Maple**	deciduous	good	fair
*Aesculus californica— **California Buckeye**	deciduous	good	good
A. carnea— **Red-flowering Horsechestnut**	deciduous	poor	fair
Arbutus unedo— **Strawberry Tree**	broadleaf	fair	good
*Ceanothus arboreus— **Feltleaf Ceanothus**	broadleaf	fair	good
C.a. 'Ray Hartman'— **Ceanothus Variety**	broadleaf	fair	good
Ceratonia siliqua— **Carob**	broadleaf	fair	good
*Cercis occidentalis— **Western Redbud**	deciduous	poor	good
Crataegus 'Autumn Glory' **Hawthorn Variety**	deciduous	poor	good
*Heteromeles arbutifolia— **Toyon**	broadleaf	good	good
Photinia serrulata **Chinese Photinia**	broadleaf	good	good
Pistacia chinensis— **Chinese Pistache**	deciduous	poor	good
*Prunus ilicifolia— **Hollyleaf Cherry**	broadleaf	good	good
*P. lyonii— **Catalina Cherry**	broadleaf	good	good
Pyrus kawakami— **Evergreen Pear**	deciduous	good	fair
*Quercus agrifolia— **Coast Live Oak**	broadleaf	fair	good
Q. coccinea— **Scarlet Oak**	deciduous	fair	fair
Q. ilex— **Holly Oak**	broadleaf	fair	good
*Q. kelloggii— **Black Oak**	deciduous	fair	good
*Q. lobata— **Valley Oak**	deciduous	fair	good
Q. rubra— **Red Oak**	deciduous	fair	fair
Quercus suber— **Cork Oak**	broadleaf	fair	good
Robinia pseudoacacia— **Black Locust**	deciduous	good	good

Visual as well as horticultural guidelines apply to the perpetuation of Oak Woodlands. An Oak Woodland has qualities which can be described in words—rounded forms, dark green color, fine texture, sculptural trunks, spreading shade. The "look" of an Oak Woodland can be achieved by using trees and plants other than Oaks. The important element of visual continuity lies in the selection of compatible plants having similar visual qualities.

Form — Select trees or understory shrubs which repeat the rounded forms. Avoid conical tree forms that disrupt the inherent harmony of the rounded woodland.

Color — Select plants with medium to dark green foilage. Bright light green foilage sharply contrasts the dark green values of Oaks.

Grass, Poison Oak and Snowberry together with Buckeye, California Bay and occasionally Toyon comprise the main understory plants found in an Oak Woodland. A number of other California natives also satisfy the horticultural and visual design guidelines for understory planting. Exclusive use of natives might be ecologically desirable, but highly limiting. Many natives are difficult to grow commercially and are touchy to transplant. The list of compatible trees for Oak Woodlands includes both natives and other suitable plants from similar climate zones. Conifers have been omitted from the list because of both visual and ecological incompatibility.

The asterisk (*) indicates a California Native.

Chaparral and Grassland

Although the Chaparral and Grassland plant communities have few, if any trees, they are of particular interest to this Plan. Because they afford a contrasting backdrop for the Oaks, they are essential to the landscape character of Lafayette. By maintaining the Chaparral and Grassland areas, a greater ecological and visual diversity is sustained.

Chaparral (Spanish for "place of the Mediterranean Live-Oak scrub") is composed of various species of dense, twiggy, evergreen shrubs and shrubby trees with only a few larger trees on its edges or in ravines. There are two types of Chaparral which are differentialed by the softness and density of the plants. Hard Chaparral is a very dense, one-layered vegetation type—plants such as Toyon, Manzanita and Scrub Oak are its primary species. Soft Chaparral contains softer, more easily penetrated species such as Coyote Brush. Several small patches of hard Chaparral exist within Lafayette on the southern slopes of Lafayette Ridge and larger areas occur higher on the ridge just outside the City limits. These slopes are steeper and rockier than the surrounding Grassland and the Chaparral seems to be permanent. This means that the Chaparral plants will always regenerate themselves, even after fire.

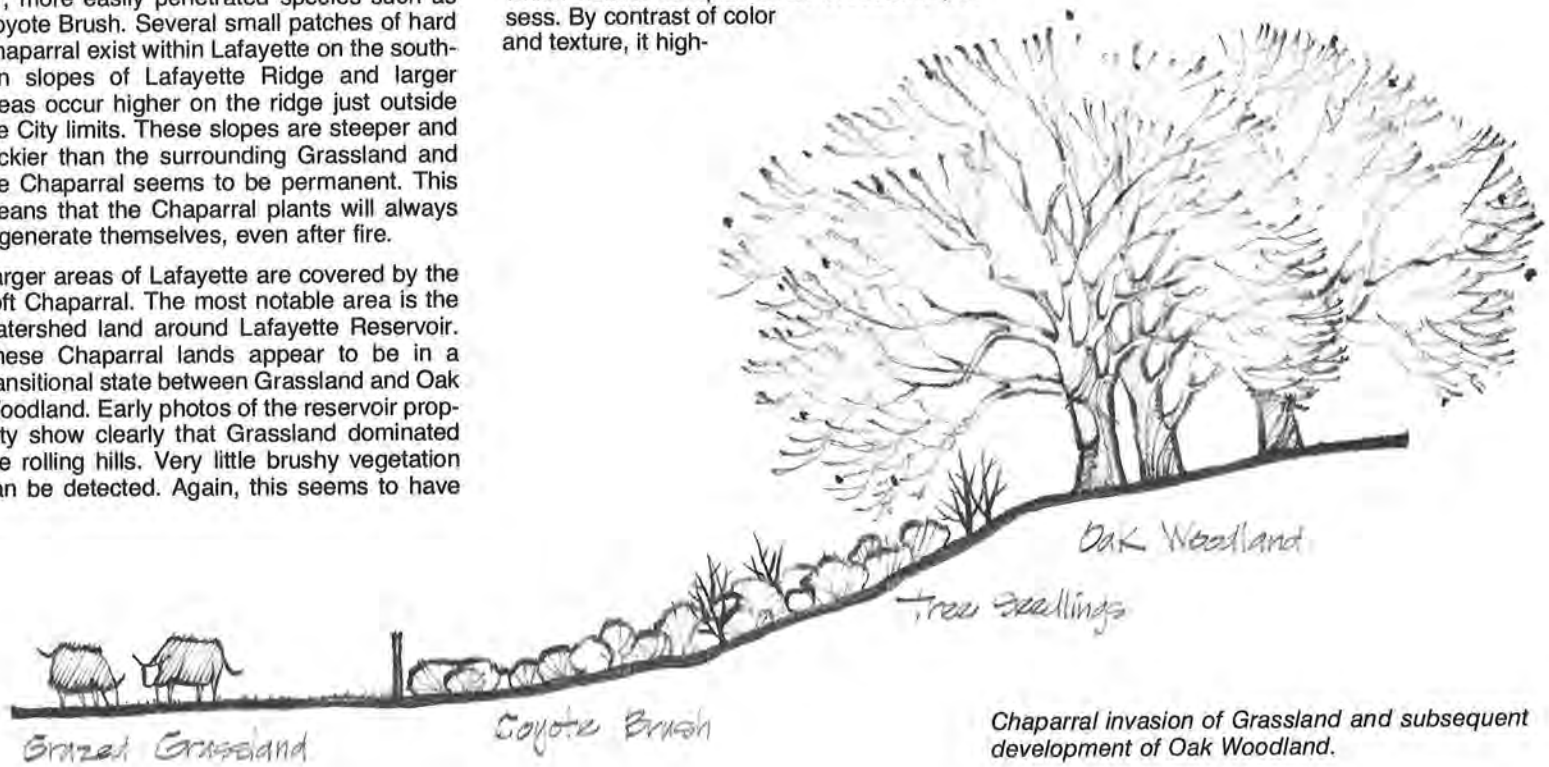
Larger areas of Lafayette are covered by the soft Chaparral. The most notable area is the watershed land around Lafayette Reservoir. These Chaparral lands appear to be in a transitional state between Grassland and Oak Woodland. Early photos of the reservoir property show clearly that Grassland dominated the rolling hills. Very little brushy vegetation can be detected. Again, this seems to have been the result of control by grass fires and grazing. Once these two controls are removed, the Coyote Brush moves into the Grassland and quickly covers the land. Seedlings of Oaks, Bay and Buckeye then become established in the the shade of the Chaparral. Eventually the trees increase in size and number, crowding and shading out the Coyote Brush. In time, the woodland returns unless fire burns off the woody plants.

This plant succession sequence continues on many of the Grasslands of Lafayette where grazing is discontinued. The Oak Woodlands will eventually dominate except on the steeper, drier slopes. The transition will be subtle, but in time, a marked change in the landscape composition will be noticed.

Grassland has unique open space qualities which neither Chaparral nor Woodland possess. By contrast of color and texture, it highlights surrounding wooded areas. Grasslands offer a different recreational experience for hiking and horseback riding as well as kite flying, birdwatching and sunning in an open field.

Because of the unique open space qualities of grassland, certain areas within the City, such as the Reservoir watershed, should be managed for the perpetuation of this vegetation type.

Grasslands offer a diversity in the landscape composition. Existing Woodlands should not be removed to recreate a Grassland mosaic, but maintaining golden hills preserves the distinctive California landscape.



Chaparral invasion of Grassland and subsequent development of Oak Woodland.

Grassland dominates slopes of Lafayette Reservoir in this early photograph.

Chaparral and Woodlands invade Grassland at Lafayette Reservoir.

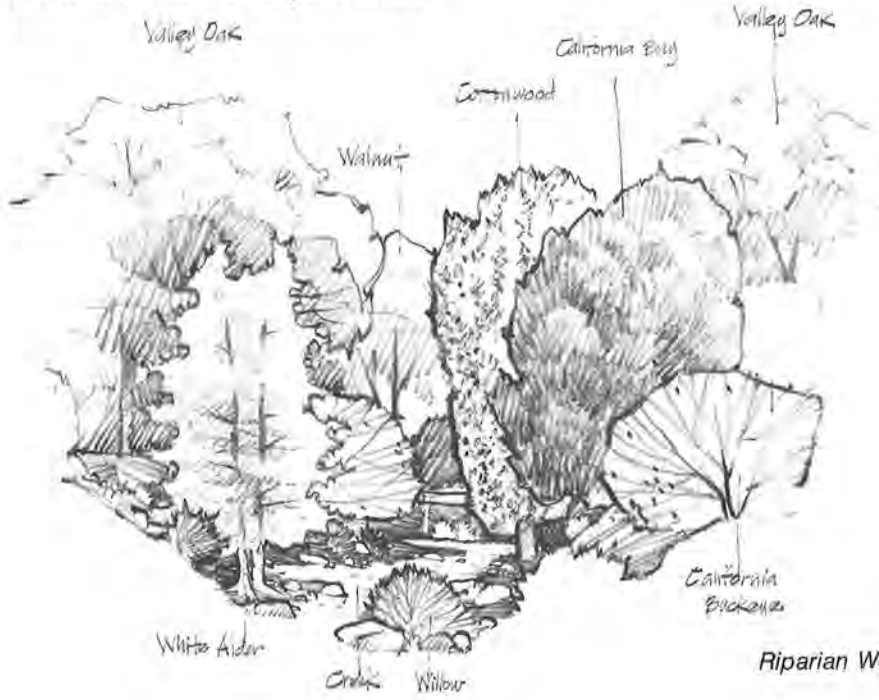
Riparian Woodland

Unlike the Oak Woodlands which have changed since Indian times, the woodlands along the many streams remain largely the same. In Lafayette the narrow valleys are laced with streams banded with lush trees which form protective habitats for wildlife. These Riparian Woodlands vary in width and form a tall, dense backdrop to all the lowland areas of the City. They are an integral part of the landscape because of their visual prominence. Towering Valley Oaks and Walnuts, along with Bay, Live Oak and Buckeye are interspersed with the brighter, lighter Boxelder and Cottonwood. Several species of low Willows line the deep channels and occasionally White Alder and Bigleaf Maple arch over the streams.

A Riparian Woodland is a collage of varying colors and textures. The predominant theme of streamside vegetation is the association of the trees and shrubs with water. All riparian trees are waterseeking, some requiring more than others. Each tree finds its place in relation to the water course. The higher drier banks favor the Oaks, Bay and Buckeye with the Alder, Boxelder, Willow and Cottonwood at or near the water's edge.

This association with water is the key for selecting plants in a Riparian Woodland. The main water courses in Lafayette—Las Trampas and Lafayette Creeks—flow year 'round. Other channels are intermittant, flowing only when rainfall and runoff are heavy. Both types of situations foster the conditions of soil moisture necessary for native riparian trees.

When selecting trees to plant in watercourses, choose first from a selection of trees which would naturally grow in or near the creek or creek bed. Using several species provides the variety which is characteristic of a Riparian Woodland.



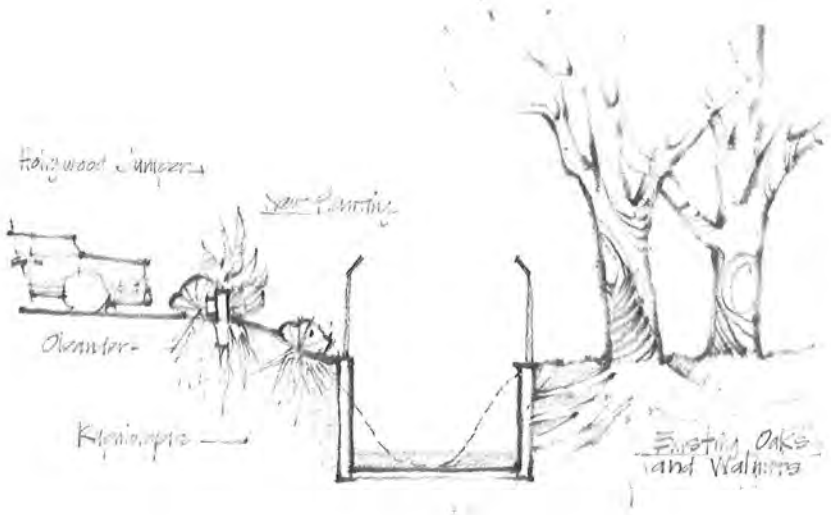
Riparian Woodland

The list of trees for creekside planting includes only native trees commonly found along streams. These trees will perpetuate the quality of this natural plant community. The relative growth rates of the various trees are included in the list. Many of the native riparian trees are fast growing. Thus tree cover can be established or re-established relatively quickly.

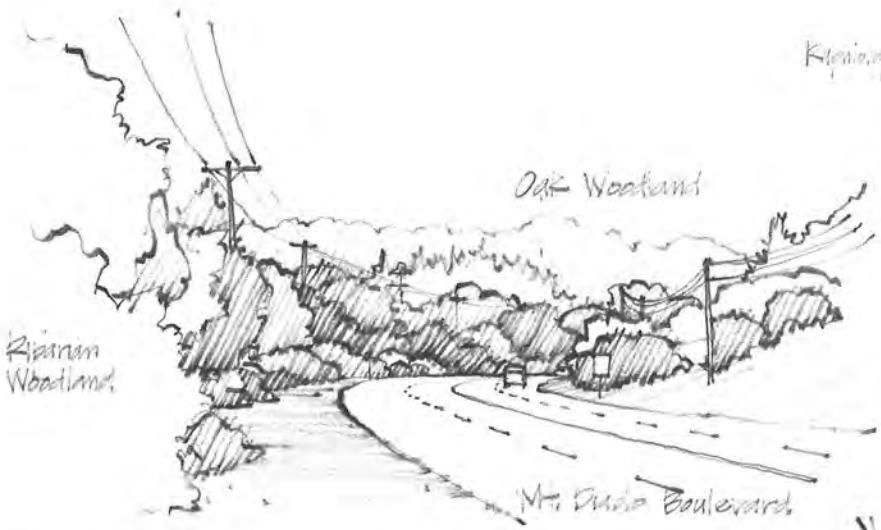
The use of irrigation systems to water young plants is not always necessary, especially along streams. Research at the University of California—Davis has developed techniques for the direct seeding of woody plants. Procedures for this process are detailed in a free Agricultural Extension Service publication entitled, *Direct Seeding of Woody Plants* (AXT-n27) by R. Harris, A. Leiser and F. Chan. Direct seeding done in the fall prior to the winter rains can produce well established trees before the next summer. The native riparian trees which can be successfully grown by direct seeding methods are: Bigleaf Maple, Black Walnut, Boxelder, Buckeye, Live Oak and Valley Oak.

In addition to the native trees there are a number of other trees which can be used along streams in certain situations. These trees are especially suitable for private gardens bordering on streams where a more varied plant selection is desired. The supplemental list includes trees that are compatible with the natives and ecologically suitable for the riparian environment. They are *not* recommended for a primary or dominant planting—only as secondary trees to be planted in limited numbers. Many exhibit good fall foliage color. This seasonal enrichment to the landscape has been indicated on the list.

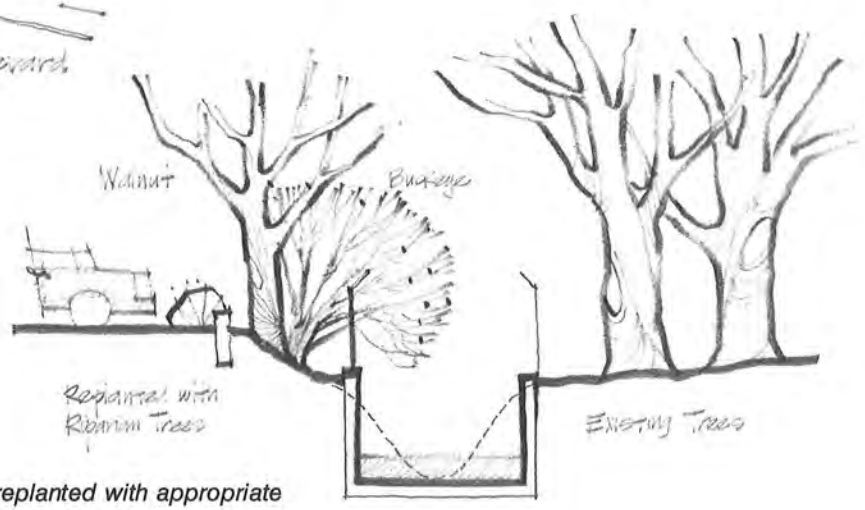
Consistency of plant cover along water courses occurs because streams are linear systems. Seeds from trees upstream are carried along the channel in the flowing water. These seeds become lodged in rocks or debris along the bank and establish new plants perhaps miles away from the parent trees.



Channelized creek replanted with unrelated exotic plants.



Rural character of west entry to Lafayette.



Channelized creek replanted with appropriate streamside trees.

There is an inherent danger of introducing the wrong trees along a stream and spreading them along its length. Several exotic trees occasionally used in this area reseed prolifically and are extremely aggressive growers. These trees should be especially avoided if our streams are to be maintained in their natural state.

Many of the trees on this "to be avoided" list are also visually incompatible with natural riparian woodlands. This is especially true of the grey-leaved Acacias and Eucalyptus, Pines and the Purpleleaf Plum.

Drainage swales are similar to streams in that they transport water for at least a part of the year. These intermittant water courses may be very narrow drainage ditches or broad swales constructed to transport runoff. Frequently they carry a small amount of irrigation runoff in the summer. They generally lie in the more level valley floors and usually lack tree cover.

These earth-formed swales should be treated as streams when planted. If there is no visual connection to the natural woodlands, the trees on the supplemental list may be effectively used. Alders, Poplars, Willows, Red Maple and Liquidambar are all capable of growing well in moist swales and ditches.

It is difficult to imagine Lafayette without its creeks, but we can look at neighboring Walnut Creek for comparison. Increased flood plain development combined with single-purpose flood control techniques can erase the natural creeks forever. A small piece of Lafayette Creek between Moraga Road and Second Street is already channelized. This is visible proof that the natural creek beds can disappear.

In the business district, the Riparian Woodlands form a unique edge to the commercial center. These tall trees are a superb buffer between the downtown and the nearby residential areas. Few communities have such a fine backdrop. Similarly, nearly all the major arterial roads entering Lafayette follow stream courses. St. Mary's Road, Moraga Road and the western end of Mt. Diablo Boulevard are notable examples. The adjacent Riparian Woodlands define these corridors providing the unique rural charm that distinguishes Lafayette.

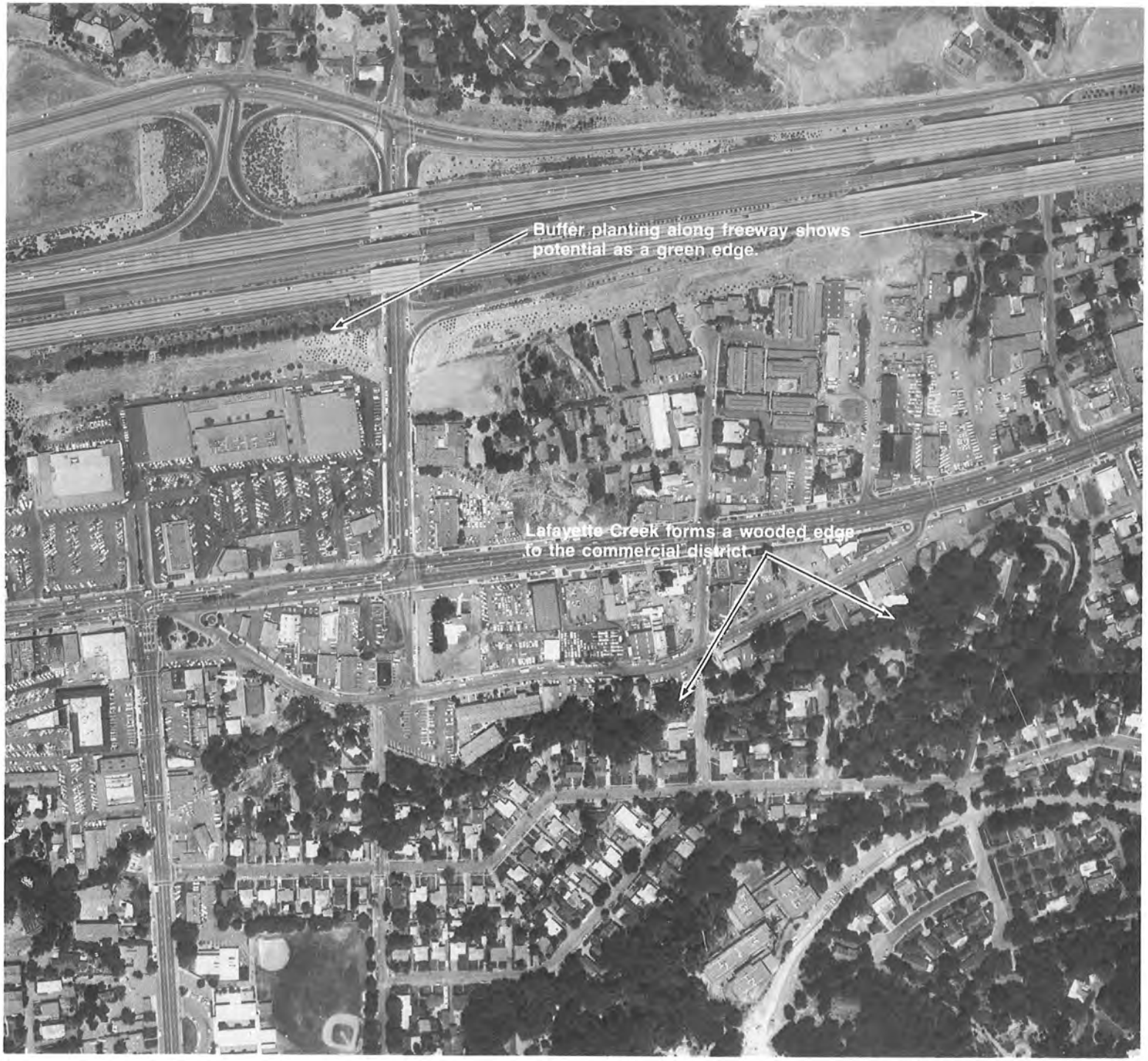
Concrete channelization and other structural flood control solutions are debatable issues which cannot be discussed in detail in this report. Nevertheless, it is obvious that the loss of Lafayette's creeks, especially those near the business district, would have a devastating effect on the quality of the environment. Few cities are still fortunate enough to have a flowing stream with magnificent trees so close to a commercial center as well as wooded streams pervading nearly every residential neighborhood.

These streams and their woodlands are irreplaceable and are therefore of infinite value. All the streams in Lafayette should be officially recognized and protected as essential environmental resources.

There are a number of circumstances which may require either major or minor alteration to stream courses. Flood control is one example; bridge or road bank construction are others. Existing trees tagged to be "saved" in an improvement project along streams are often killed during construction or as a result of it. Grades are raised around the base of trunks, roots are severed, and frequently the natural water source is sealed off. Creekside trees grow there because of the water. Once this water is diverted, tree survival is highly improbable. Tree preservation guidelines are outlined in detail in a separate section. These guidelines should be followed whenever construction around existing Riparian trees is proposed.

In situations where tree cover is removed along streams, plans for replanting should be considered an integral part of the project. The objective of such planting should be to restore, insofar as possible, the original habitat and to re-establish the continuity of the Riparian Woodland. Surprisingly, this simple logic is frequently not followed. Instead, we can see many examples throughout the Bay Area of "gardenesque" creek replanting schemes. Oleanders, Purpleleaf Plums and other exotics are introduced into what was once a lush woodland. Such plants are appropriate for a private garden, but conflict with the character of streamside vegetation, even for those streams which have been modified.

The City should include plans for preserving existing trees as well as replanting tree cover which is removed as a part of the initial review of any stream construction project. Such plans should be reviewed by the Tree Commission and/or a qualified consultant for appropriateness to the setting and its ecosystem, using the design guidelines of this Plan as a basis for approval.



Aerial View of Commercial District

NATIVE RIPARIAN TREES FOR CREEKSIDE PLANTING

Plant Name	Deciduous/ Evergreen	Growth Rate
Acer macrophyllum— **Bigleaf Maple**	deciduous	moderate
A. negundo— **Boxelder**	deciduous	fast
Aesculus californica— **California Buckeye**	deciduous	moderate
Alnus rhombifolia— **White Alder**	deciduous	fast
Juglans hindsii— **Black Walnut**	deciduous	fast
Populus fremontii— **Cottonwood**	deciduous	fast
Salix laevigata— **Red Willow**	deciduous	fast
S. lasiolepis— **Arroyo Willow**	deciduous	fast
Quercus agrifolia— **Coast Live Oak**	broadleaf	slow—moderate
Q. lobata— **Valley Oak**	deciduous	slow—moderate
Umbellularia californica— **California Bay**	broadleaf	slow—moderate

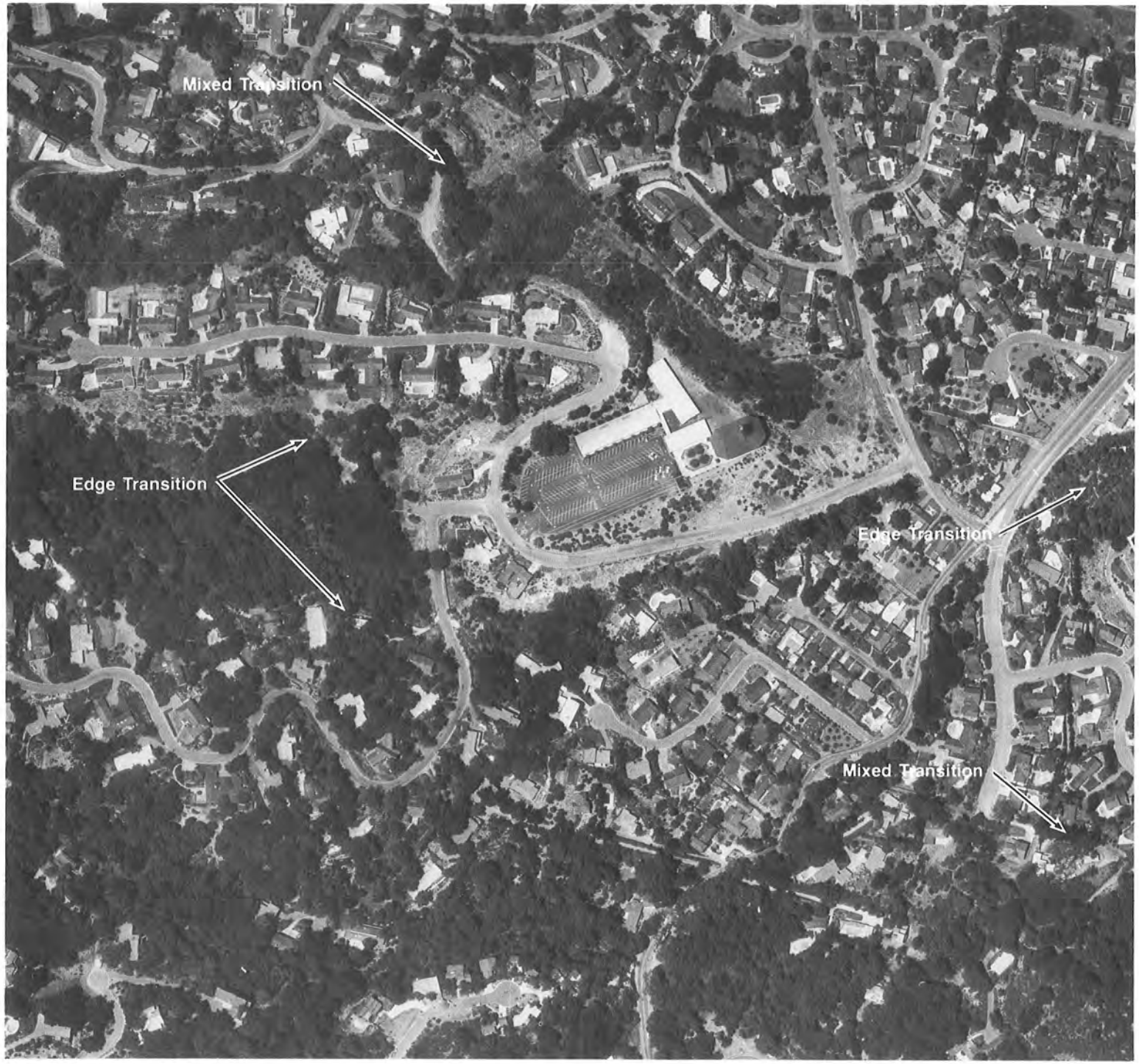
TREES TO BE AVOIDED ALONG STREAMS OR DRAINAGE CHANNELS

Plant Name
Acacia armata - **Kangaroo Thorn**
A. baileyana - **Bailey Acacia**
A. decurrens - **Green Wattle**
A. d. dealbata - **Silver Wattle**
A. longifolia - **Golden Wattle**
A. melanoxylon - **Black Acacia**
Ailanthus altissima - **Tree of Heaven**
Eucalyptus species - **Eucalyptus, Gums**
Pinus species - **Pines**
Populus species - **White Poplar**
Prunus species - **Plums** (particularly P. cerasifera 'Atropurpurea' 'Atropurpurea)—**Plums**

TREES TO SUPPLEMENT STREAM PLANTING

Plant Name	Deciduous/ Broadleaf Evergreen/ Conifer	Good Fall Foliage Color
*Acer circinatum— **Vine Maple**	deciduous	yes
A. rubrum— **Red Maple**	deciduous	yes
Alnus cordata— **Italian Alder**	deciduous	no
Liquidambar styraciflua— **Sweetgum**	deciduous	yes
Maytenus boaria— **Mayten Tree**	broadleaf	no
Nyssa sylvatica— **Black Gum**	deciduous	yes
Platanus occidentalis— **American Sycamore**	deciduous	no
*P. racemosa— **California Sycamore**	deciduous	no
Populus nigra 'Italica' **Lombardy Poplar**	deciduous	yes
Salix babylonica— **Weeping Willow**	deciduous	yes
S. discolor— **Pussywillow**	deciduous	no
S. matsudana 'Tortuosa'— **Corkscrew Willow**	deciduous	no
*Sequoia sempervirens— **Coast Redwood**	conifer	no

The Asterisk (*) indicates a California native.



The Two Types of Transitional Landscapes.

THE TRANSITIONAL LANDSCAPES

In this Plan the tree planting guidelines are associated with the various types of landscapes of Lafayette. The landscape in which trees are planted becomes the basic visual context. The Oak Woodlands and the Riparian Woodlands have easily recognizable landscape characteristics. The completely urbanized landscape is also distinctive for its lack of influence from the natural plant communities. In Lafayette, many residential areas are in what can be called transitional landscapes.

Two types of transitional landscapes can be observed. One occurs in that zone between a clearly natural woodland or grassland and a developed or planted property. This zone or edge is transitional because of location. An example would be the edge of a residential neighborhood or school abuting an adjacent wooded hillside.

The other transitional landscape occurs in areas where native trees intermingle with introduced trees. Neither tree type dominates the landscape character. Much of the Acalanes area exhibits this pattern of tree cover.

Typical transitional planting situations include:

- property lines;
- roads between residential tracts and woodlands;
- school or church boundaries;
- utility easements (power and water);
- parks, trails and other open space areas.

Recent plantings in these transitional landscapes are almost exclusively composed of exotics which bear little visual or ecological relationship to the natural landscape. The widespread planting of Monterey Pine *(Pinus radiata)* stands out as an example of a fine tree frequently used in the wrong place.

This Pine is used to line roads, surround playing fields, border private gardens and cover grassy slopes. It has become the most commonly planted tree in Lafayette.

Monterey Pine has many virtues, but also many flaws when it is used in this areas. Its fast growth rate (up to 4 feet a year) and its relative drought tolerance are attractive qualities for achieving quick growth on barren land. However, the Monterey Pine is native only to the cool, foggy coastal Monterey Peninsula of California where temperatures rarely exceed 85° F (30°C) nor fall below freezing. Summer fog condenses on the Pine's needles and creates measurable precipitation.

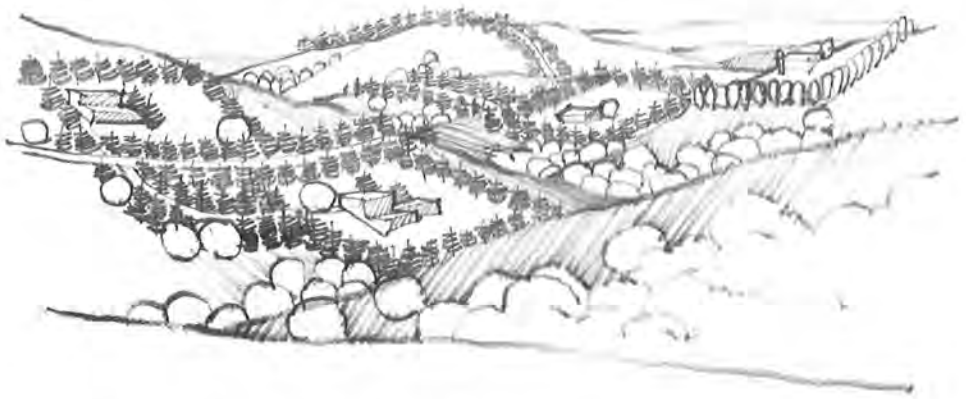
In Lafayette, Monterey Pine is growing outside its native climatic environment. The trees are stressed during the hot, dry summers. As a result of this stress, a number of pests have attacked the Pine, especially older ones. The Pine Engraver Beetle *(Ips paraconfusus)* attacks these older trees, carving out channels in the cambium layer under the bark which causes quick death to the trees. Monterey Pine is also particularly sensitive to smog and damage to trees, particularly those close to the freeway, has been documented. Even under ideal growing conditions this tree is short-lived and declines after 30 or 40 years.

Fads in the use of plant materials exist just as they do in the choice of clothes or other consumer commodities. In the East and Midwest, millions of American Elms are dying of Dutch Elm disease. The over-use of that tree a century ago is now being replaced by a craze for planting Honeylocusts. Nature does not tolerate monocultures long, especially when plants are growing at the edge of their environmental limits. The Eucalyptus disaster during the 1972 Freeze is evidence of this. The more subtle death of many Monterey Pines in Contra Costa County is another.

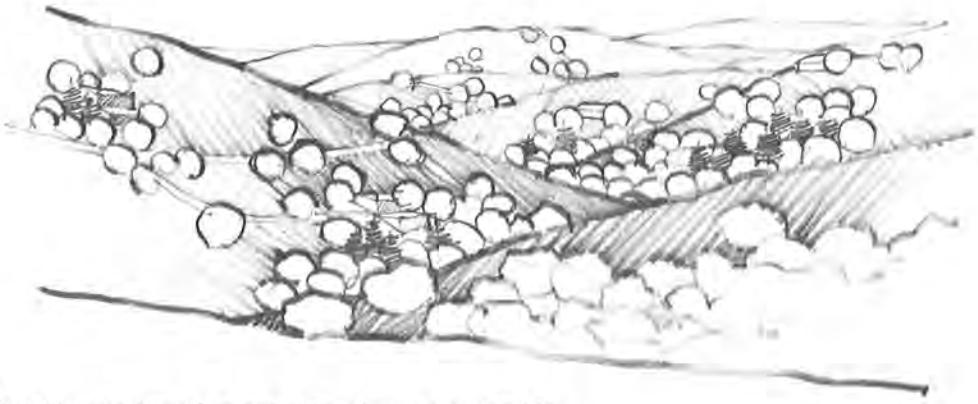
Several other conifers are well adapted for planting in Lafayette. Among them are the Italian Stone Pine *(Pinus pinea),* a round-topped species from the Mediterranean region. The Coulter Pine *(Pinus coulteri)* is another drought tolerant native found in scattered locations of the South Coast Range of California. The Knobcone Pine *(Pinus attenuata)* found on rocky soils of the inner Coast Range, is still another excellent drought tolerant native. It reseeds easily making it useful for erosion control.

Monterey Pines are frequently planted along property lines for a visual screen. Pines, like other conifers shed their lower needles and branches as the upper foliage shades the lower. In a few years, the desired screen no longer exists. A smaller, more shrub-like tree would serve the purpose more effectively.

This Plan is not proposing a ban on the planting of Monterey Pine. Rather, it encourages a thoughtful selection of trees to satisfy a particular function, always considering the overall effect on the character of the landscape. The Pine Grove at the entrance to the Reservoir creates a splendid landscape composition as well as a fine entry experience—an excellent example of the use of the tree. Monterey Pine should be used with more restraint. As a result of their wholesale planting, the character of the landscape is changing. Rounded hills with complementary rounded tree forms are being covered with dark, sharp-topped conical forms which march in regular lines across the slopes. Sharply delineated boundaries unrelated to topography or natural vegetation are becoming more visible.



Boundary and road edge tree planting conflicts with topography and native vegetation.



Random planting of rounded tree forms arranged in groupings sympathetic to both topography and native tree masses.

Establishing clear planting guidelines for the two types of transitional landscapes is difficult. They are neither completely natural nor entirely exotic. A transitional landscape borrows qualities of both. But again, planting clues should be taken from established surroundings.

As a principle to follow when planting in the transitional types of landscape, first determine the relationship of the proposed tree planting to the nearby natural landscape. Tree forms and types which compliment the natural vegetation should be used. Then the trees should be fitted into natural patterns, enhancing the natural topography rather than opposing it.

Where the natural landscape is not a strong element, consideration of tree type is less important. Fitting the trees to the topography still remains an important design factor. Effective screening or spatial definition can be achieved by planting trees in irregular groupings rather than in single rows. These clumps and groupings of trees can blend more harmoniously to the form of the topography than rigid lines of trees.

Specific recommendations for planting in the transitional landscapes are difficult because of the many variables of landscape character and tree use. In the next section, The Developed Landscape, a number of lists suggest appropriate trees for various functions. These trees can be used in the transitional landscapes. Similarly, the trees recommended for use in the natural landscape can be used where appropriate—the edge of a woodland or to develop a woodland character.

In the more densely developed landscape where residential and commercial development predominate, the visual connection to the natural landscape is either non-existent or only remotely visible in the distance. Here natural vegetation is absent or represented by an occasional large tree. The dominant treescape comprises ornamentals such as Modesto Ash, London Plane and Oleander. Introduced plants establish the landscape character.

In Lafayette, the developed landscape is generally found in two types of situations. The first and largest of these areas are the valley bottoms. Orchards once covered this land with a neat patchwork. Residential subdivisions and the commercial center have now replaced all but a few small remnants of the agrarian times. However, the scale of the landscape is largely unchanged. Small to medium sized trees similar in size and character to the orchard trees cover the valley floors. In some places the orchard influence is still quite strong, as along portions of Happy Valley and Springhill Roads. Views are foreshortened in these convex land forms. Views outward are usually up toward the ridges and trees stand out against the skyline.

The other type of developed landscape occurs on the hillside, especially south and west facing slopes, and ridge tops. Here the natural cover was formerly grass or the shrubby soft chaparral. In some places grading for streets and building sites has removed the few trees that dotted the land.

From these convex land forms views are long—across to distant hills or down into the valleys. Trees stand out against both land forms and the sky.

The compositional elements of the developed landscape are buildings, pavement and introduced plants. In the most densely developed areas such as the commercial center, trees stand out in sharp contrast to structures and pavement. Because of this contrast as well as their relative scarcity, trees take on important roles as design elements. They serve as landmarks, pinpointing or emphasizing locations. The great Eucalyptus in front of Petar's or the Lombardy Poplars at Diablo Forge are examples of such landmarks. Street trees unify and bring harmony to a street of varied uses and architectural forms as do the Plane Trees along the east end of Moraga Boulevard. Trees can also reinforce the importance of streets relative to their size and scale. Other trees humanize the scale of plazas and shopping centers such as at Plaza Park. Climate control, especially shading, is another important function of trees in this hot summer area.

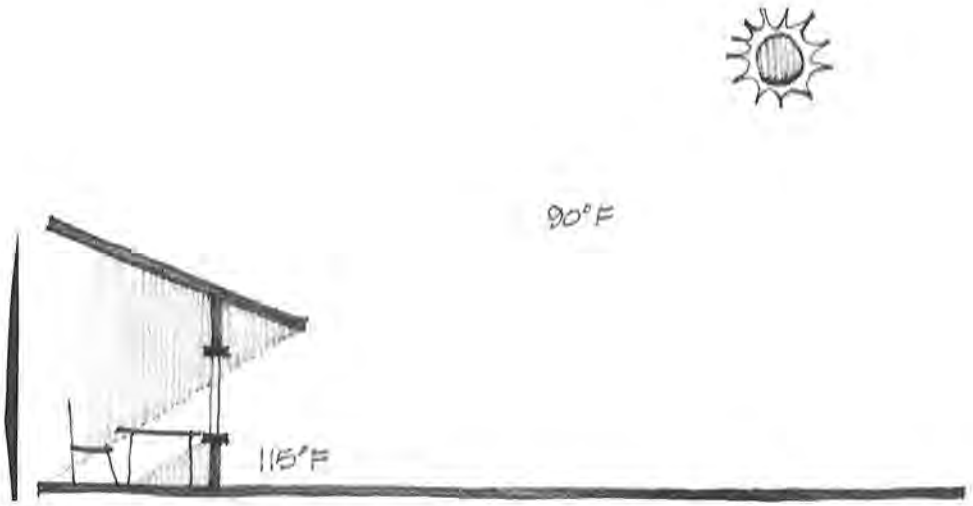
The question of what trees to plant in this developed landscape becomes an issue of design. Because the relationship to natural woodlands is diminished, the selection of trees must be related to the visual and functional roles to be served.

The following design guidelines are divided into three types of developed landscape: the commercial zone, residential areas and institutional property with an emphasis on schools and churches. Guidelines with lists of appropriate trees are given for each. The lists are not intended to suggest that *all* the trees should be used. They offer appropriate selections to satisfy specific planting functions. Detailed planting schemes for any proposed improvement would have to be developed and reviewed for appropriateness and conformance to the guidelines.

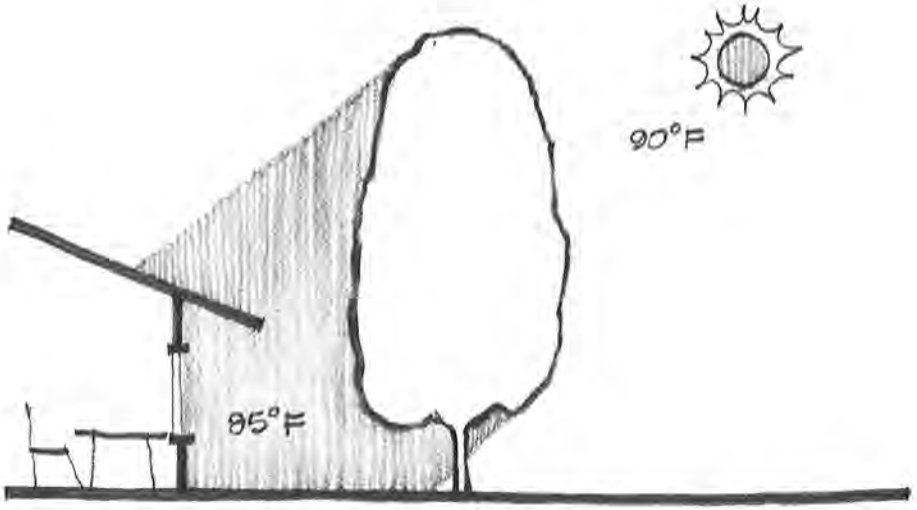
Throughout the text, reference is made to the usefulness of trees for microclimate control. This function deserves special emphasis in this day of decreasing energy reserves. The guidelines included here apply to all three types of developed landscape.

Because of the high summer heat and colder winters in Lafayette, air conditioners and furnaces are used to control the indoor climate. The trend toward technological solutions to climatic control negates time-tested building design and siting techniques. As a result, energy consumption has spiraled in recent years, especially with regard to the use of air conditioning.

Trees are extremely efficient air conditioners. Their foliage canopy blocks the intense direct sunlight, maintaining a consistently cool zone of air beneath. Used in conjunction with building design and orientation, trees can reduce the heavy reliance upon air conditioners for summer cooling. The choice of deciduous trees allows the warming sun to partially heat interiors in the winter, thereby reducing winter fuel demand. A few basic principles are presented here as guidelines for using trees to reduce energy demands.

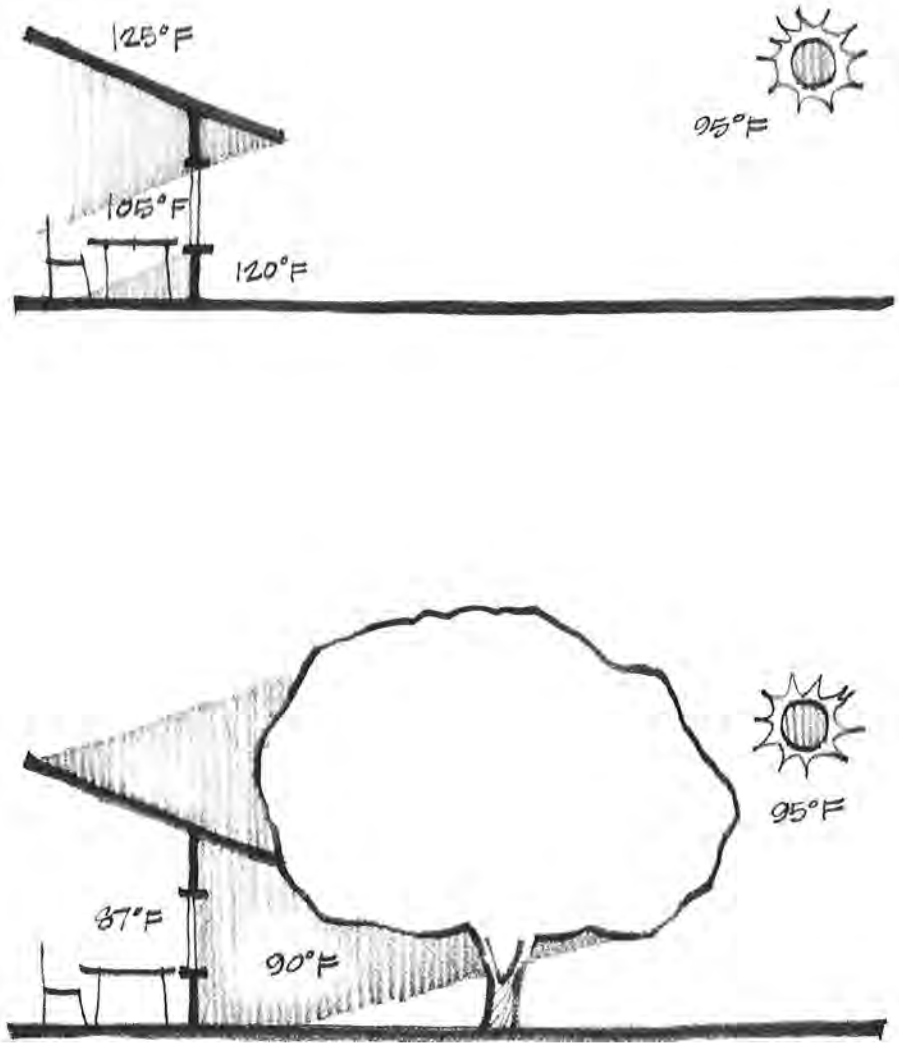


High angle of south sun is easily shielded using small, vertical trees.



Shade on building walls during the summer is a function of building orientation and sun angle. The easiest side of a building to shade is the south facing wall. Here the sun angle is the highest in summer and only a narrow extension of the roof line is required to shade the wall. Extended eaves with a vine arbor may be sufficient. Several vertical deciduous trees can also be effective. By preventing the sun from entering the windows or striking the wall, very efficient cooling is possible. Conversely, in the winter allowing the sun to warm the south wall maximizes the use of sun to heat the building. The use of deciduous trees makes this possible.

The east and west facing walls are the most difficult to protect in summer. The sun angle is lower and strikes windows and walls more directly. Broad spreading, low branching canopy trees are needed to extend the roof line and block the sun's rays. The west side is most critical. The sun is hottest in late afternoon since the air has been heated all day long. The accompanying sketches help illustrate how trees can be used to cool these south and west exposures and thereby conserve energy.



Low angle of west sun requires a broad-spreading tree for protection.

The City of Lafayette should encourage the use of trees as a long-term means of energy conservation in its review of site plans for all new development and proposed improvements.

The utilitarian use of trees for food is another important function of trees that deserves discussion. The large commercial orchards are gone. However, the land and climate that favored those orchards still exists. In a time of economic stress and high food costs, the planting of orchards is a most appropriate form of tree planting and should be encouraged.

Rather than lining properties with Pines or Dwarf Eucalyptus, we might consider reinstating Candelario Valencia's requirement to mark the boundary limits with fruit or nut trees! The planting of small private orchards or even cooperative neighborhood orchards can be an effective means of providing fruit and nuts as well as maintaining the rural quality of Lafayette.

Lot sizes in many residential areas are quite large—one-half acre or more. The planting of these large properties poses a real problem for many residents. The tendency is to attempt to "garden" the entire piece of property using exotic trees and shrubs and maintaining expensive lawns. The planting of a small orchard can help solve this dilemma and create a pleasing and productive landscape. Even in new housing developments, the planting of fruit trees is a realistic and aesthetically satisfying alternative to the large expanses of irrigated lawns. Apples, pears, plums, almonds and walnuts all thrive in Lafayette. Their display of spring flowers gives an added dimension of enjoyment. Persimmons provide a brilliant splash of fall foilage and fruit color.

Fruit trees do require careful maintenance. However, in terms of the benefits of product and seasonal enrichment, the traditional effort seems worthwhile.

The City of Lafayette should encourage the retention of old orchards and the planting of new ones in its review of site plans for future development.

Commercial Zone

Lafayette's commercial area is a linear zone of retail and office buildings running almost the entire length of Mt. Diablo Boulevard. The central node occurs at Moraga Road around Plaza Park. The major arterials in addition to Mt. Diablo Boulevard are Oak Hill Road, Happy Valley Road and First Street from the north and Moraga Road from the south.

The linear form of the commercial area is reinforced at its north and south edges. Lafayette Creek, walled with trees, forms a distinct, green edge on the south. The freeway embankment forms the northern edge. Here a few large trees remain from the original highway. The young trees planted on this embankment have not yet grown sufficiently to provide a continuous green buffer. The aerial photograph included on page 18 of the Natural Landscape section shows these two edges clearly.

Additional planting on the EBMUD easement adjacent to the freeway would widen and strengthen this buffer between the downtown and the transportation corridor.

The downtown core is in a state of transition and expansion. The so-called BART Block may be redeveloped in future years. Other expansion for both retail and office space is likely in the next decade. New development affords an excellent opportunity for the comprehensive redesign of large portions of the commercial zone. Carefully developed tree planting schemes should become an integral part of any such plans.

Tree planting situations in the commercial zone of Lafayette fall into five broad categories:

- Street trees for the major boulevard and primary access roads.
- Street trees for secondary commercial streets.
- Trees for parks, plazas, pedestrian malls and walkways.
- Trees for parking areas.
- Trees for the buffer zone (EBMUD corridor).

Each situation has its own design determinants from which criteria for tree selection can be developed. The list of trees for each situation satisfies the established criteria.

Tree canopy over First Street forms a strong buffer between the commercial zone and the residential area.

Street Trees for the Major Boulevard & Primary Access Roads

Mt. Diablo Boulevard, the "main street" of Lafayette, is essentially a seven lane boulevard (4 lanes of traffic, 1 lane median or turn-out, 2 lanes of parking). The principal design requirements for trees relate to scale, reinforcement of street unity, shade, and heat tolerance.

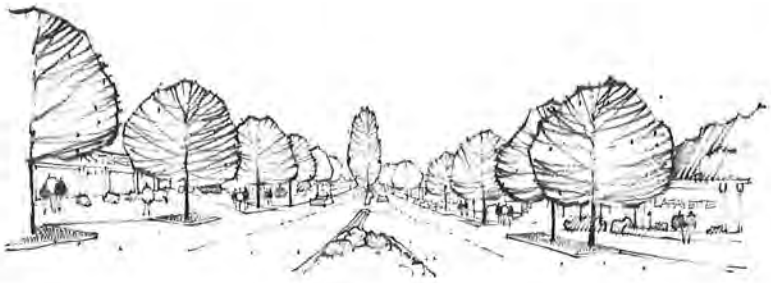
Because Mt. Diablo Boulevard is very wide and long, trees used should be large in scale. This means generally coarse textured trees that will attain a large size and occupy a large volume. Small scaled trees would not make a sufficient visual impact on such a large street. Trees placed closely together (25 to 35 feet) also unify the streetscape giving it both reinforced form and character. Broad-spreading trees provide a canopy over pavement which shades and cools sidewalks, traffic lanes and building interiors. This shading is particularly important on the north side of a street which is exposed to the sun for a long period during a summer day. Because of the intense heat reradiated from the hard-surfaced surroundings, the trees must withstand high summer temperatures.

The major access streets to the commercial zone—Oak Hill Road, Happy Valley Road, First Street and Moraga Road—are similar in size to Mt. Diablo Boulevard. These streets deserve special treatment to reflect their importance as entries into the business district. Each street might be treated a little differently, but schemes adopted should echo the character of Mt. Diablo Boulevard. The design criteria for tree selection are nearly identical to those described for Mt. Diablo Boulevard. The wider streets should incorporate a planted median to reduce their widths and clearly delineate traffic lanes.

When street trees are to be planted the argument over uniform versus varied tree species inevitably arises. Many people favor alternating or varying tree selections along the street to avoid monotony. A section of Mt. Diablo Boulevard is an example of this concept—Liquidambars and Southern Magnolias have been interspersed. Another section of the Boulevard reflects the other point of view—uniformity of species, Tulip Trees in this case. Both arguments have validity making the issue difficult to resolve.

Mt. Diablo Boulevard looking west–1975.

Oak Hill Road looking north from Mt. Diablo Blvd.–1975.



Mt. Diablo Boulevard concept planting scheme.

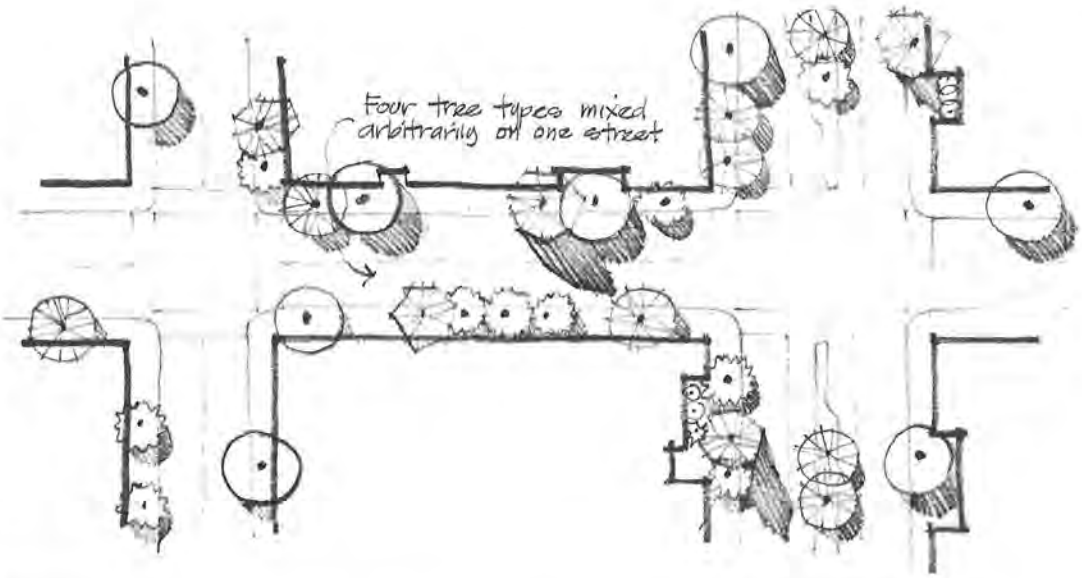
Oak Hill Road concept planting scheme.

Rather than attempting to arbitrarily favor one concept or the other, let us look at the issue as a design problem with the city-wide effects in mind. A commercial street (and to a certain extent a residential street) is a linear composite of many architectural forms and styles. The resulting visual diversity can border on chaos. There is no single unifying element or theme to give harmony to the whole. Tree planting is able to counterbalance this diversity and provide a pleasingly harmonious character to the street.

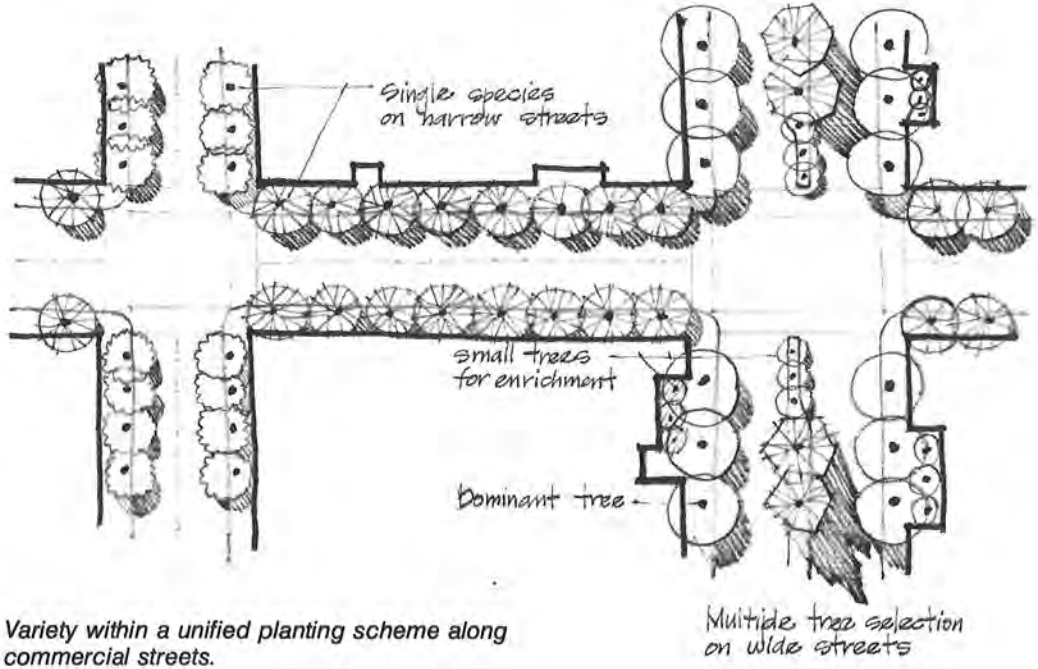
Because each species of tree has its own visual characteristics (form, color, texture, etc.), a mixture of different species of trees tends to dilute the strength of unity possible with one dominant tree. A planting scheme which accomplishes maximum harmony but allows some diversity is possible. A dominant tree can be selected for the entire street and planted uniformly throughout. Supplemental trees such as those on the accompanying list then can be used at various points along the street — buildings, plazas, bus stops, ends of median islands or other elements.

Diversity is achieved within a unified whole. The dominant tree, selected for its scale, form, size and color carries the theme while the supplemental trees add enrichment without disrupting the unity by visual competition. This type of planting is obviously most appropriate on wide streets where maximum planting space is available.

The planting of a single, appropriate species along other major streets can reflect the importance of such streets. Major collector streets can be made obvious by the planting of one dominant species along the sides. Those streets will "read" as important thoroughfares in the city as a whole. Diversity is achieved by the variation of trees among the different streets. Diversity becomes a city-wide factor rather than an issue of a single street. For example, some streets might be planted with appropriately selected trees that give a splendid display of fall color. Other streets could be planted with spring flowering trees. Each would give a brilliant display, undiluted with variations. These effects are not suggested to supplant the other criteria for tree selection—form, size, etc. They are suggested as a means of developing strength and richness through city-wide tree selection.



Excessive, unplanned variety along commercial streets.



Variety within a unified planting scheme along commercial streets.

DOMINANT TREES RECOMMENDED FOR THE MAJOR BOULEVARD & PRIMARY ACCESS ROADS

Plant Name	Form	Deciduous/ Broadleaf Evergreen	Needs 8' Min. Root Space
Celtis australis— **European Hackberry**	round globe	deciduous	
Cinnamomun camphora— **Camphor**	round globe	broadleaf	•
Fraxinus holotricha 'Moraine'— **Moraine Ash**	round globe	deciduous	
F. uhdei— **Shamel Ash**	erect, ovoid	deciduous	•
Ginkgo biloba 'Autumn Gold'— **Maidenhair Tree**	ovoid	deciduous	
Gleditsia triacanthos inermis 'Moraine'— **Moraine Honeylocust**	broad globe	deciduous	
Liriodendron tulipifera— **Tulip Tree**	erect, ovoid	deciduous	•
Pistacia chinensis— **Chinese Pistache**	broad globe	deciduous	
Platanus acerifolia— **London Plane Tree**	ovoid	deciduous	•
Quercus coccinea— **Scarlet Oak**	round globe	deciduous	
Q. ilex **Holly Oak**	round globe	broadleaf	
Tilia cordata **Little-leaf Linden**	dense, pyramidal	deciduous	•
Zelkova serrata **Japanese Zelkova**	broad globe	deciduous	

TREES RECOMMENDED TO SUPPLEMENT PLANTING OF THE MAJOR BOULEVARD & PRIMARY ACCESS ROADS

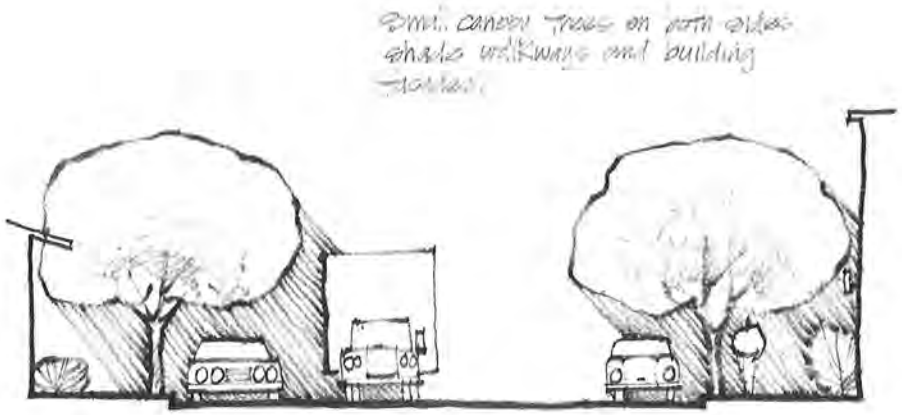
Plant Name	Form	Deciduous/ Broadleaf Evergreen
Crataegus 'Autumn Glory'— **Hawthorn Variety**	round globe	deciduous
Fraxinus oxycarpa 'Raywoodii'— **Raywood Ash**	round globe	deciduous
Lagerstroemia indica— **Crape Myrtle**	vase-shaped	deciduous
Liquidambar styraciflua— **American Sweetgum**	conical	deciduous
Ligustrum lucidum— **Glossy Privet**	round globe	broadleaf
Magnolia grandiflora 'Samuel Sommer'— **Southern Magnolia Variety**	round globe	broadleaf
Malus floribunda— **Japanese Flowering Crabapple**	round globe	deciduous
Photinia fraseri— **Photinia**	round	broadleaf
Prunus cerasifera 'Atropurpurea'— **Purpleleaf Plum**	round globe	deciduous
Pyrus calleryana 'Bradford'— **Bradford Pear**	ovoid pyramidal	deciduous
Pyrus kawakami— **Evergreen Pear**	irregular round globe	semi-deciduous

Street Trees for Secondary Commercial Streets

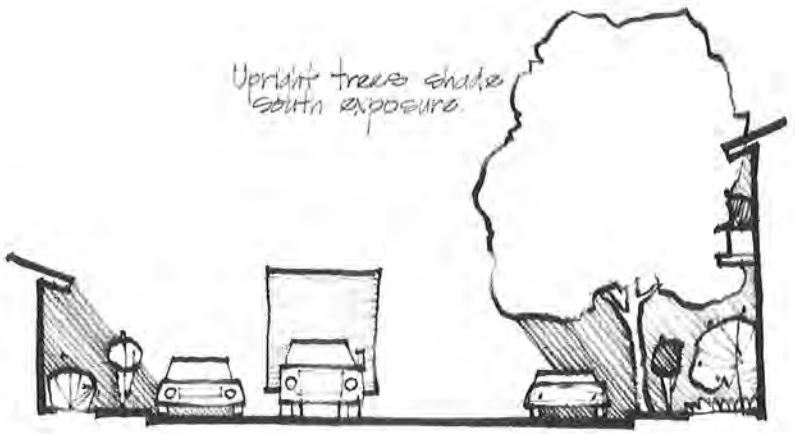
Secondary commercial streets include Oakland Avenue, First and Second Streets south of Mt. Diablo Boulevard and Golden Gate Way. These streets are narrower and less important as access streets to the business district. They have a greater pedestrian orientation. Some already have sidewalks and the beginnings of street tree plantings.

The design criteria for these streets include small scale, narrow planting spaces, short street length, shade over pedestrian walks and, in some cases, presence of natural creek vegetation. Each street might be planted with a single species of a small to medium sized canopy tree with a fine to medium texture.

When space permits, both sides of the street may be planted. Erect, oval-shaped trees are suitable for the narrowest spaces. Uniform planting on both sides of these streets is of less importance because street width is already scaled down. North facing buildings need little extra shade protection. For effective street shading, planting should be concentrated on south and west facing building facades and walks. Seasonal interest such as spring flower or fall foliage color may be desirable because of the village-like scale of these streets—a sharp contrast to the wider access streets. New streets in future redevelopment areas are likely to be of this type and scale.



Typical planting of a wide commercial street.



Typical planting of a narrow commercial street.

TREES RECOMMENDED FOR SECONDARY COMMERCIAL STREETS

Plant Name	Form	Deciduous/ Broadleaf Evergreen
Crataegus 'Autumn Glory'— **Hawthorn Variety**	round globe	deciduous
Fraxinus oxycarpa 'Raywoodii'— **Raywood Ash**	round globe	deciduous
Ginkgo biloba 'Fairmount'— **Maidenhair Tree**	conical	deciduous
Gleditsia triacanthos inermis 'Shademaster'— **Shademaster Honeylocust**	erect, ovoid	deciduous
Lagerstoemia indica— **Crape Myrtle**	vase-shaped	deciduous
Ligustrum lucidum— **Glossy Privet**	round globe	broadleaf
Liquidambar styraciflua— **American Sweetgum**	conical	deciduous
Prunus cerasifera 'Atropurpurea'— **Purpleleaf Plum**	round globe	deciduous
P. lyonii— **Catalina Cherry**	round globe	broadleaf
Pyrus calleryana 'Bradford'— **Bradford Pear**	ovoid, pyramidal	deciduous
Quercus ilex— **Holly Oak**	round globe	broadleaf
Robinia pseudoacacia 'Decaisneana'— **Pink Locust**	ovoid	deciduous
Tilia cordata **Little-leaf Linden**	conical	deciduous

TREES RECOMMENDED FOR PLAZAS, MALLS & PEDESTRIAN WALKWAYS

Plant Name	Form	Deciduous/ Broadleaf Evergreen
Acer buergerianum **Trident Maple**	round globe	deciduous
A. campestre **Hedge Maple**	round globe	deciduous
A. palmatum **Japanese Maple**	round globe	deciduous
Crataegus 'Autumn Glory'— **Hawthorn cultivar**	round globe	deciduous
C. lavallei— **Carriere Hawthorn**	dense round globe	deciduous
Crinodendron patagua— **Lily-of-the-Valley Tree**	dense round globe	broadleaf
Eucalyptus polyanthemos— **Silver Dollar Gum**	ovoid	broadleaf
Ginkgo biloba 'Fairmount'— **Maidenhair Tree**	pyramidal	deciduous
Gleditsia triacanthos inermis 'Shademaster'— **Shademaster Honeylocust**	ovoid	deciduous
Lagerstroemia indica— **Crape Myrtle**	vase-shaped	deciduous
Laurus nobilis— **Grecian Laurel**	dense round globe	broadleaf
Ligustrum lucidum— **Glossy Privet**	dense round globe	broadleaf
Liquidambar styraciflua— **American Sweetgum**	pyramidal	deciduous
Olea europaea 'Swan Hill' — **Swan Hill Olive**	round globe	broadleaf
Prunus cerasifera 'Krauter Vesuvius'— **Flowering Plum cultivar**	round globe	deciduous
Pyrus calleryana 'Bradford'— **Bradford Pear**	ovoid	deciduous
Quercus ilex— **Holly Oak**	round globe	broadleaf
Q. suber— **Cork Oak**	round globe	broadleaf
Robinia pseudoacacia 'Decaisneana'— **Pink Locust**	ovoid	deciduous

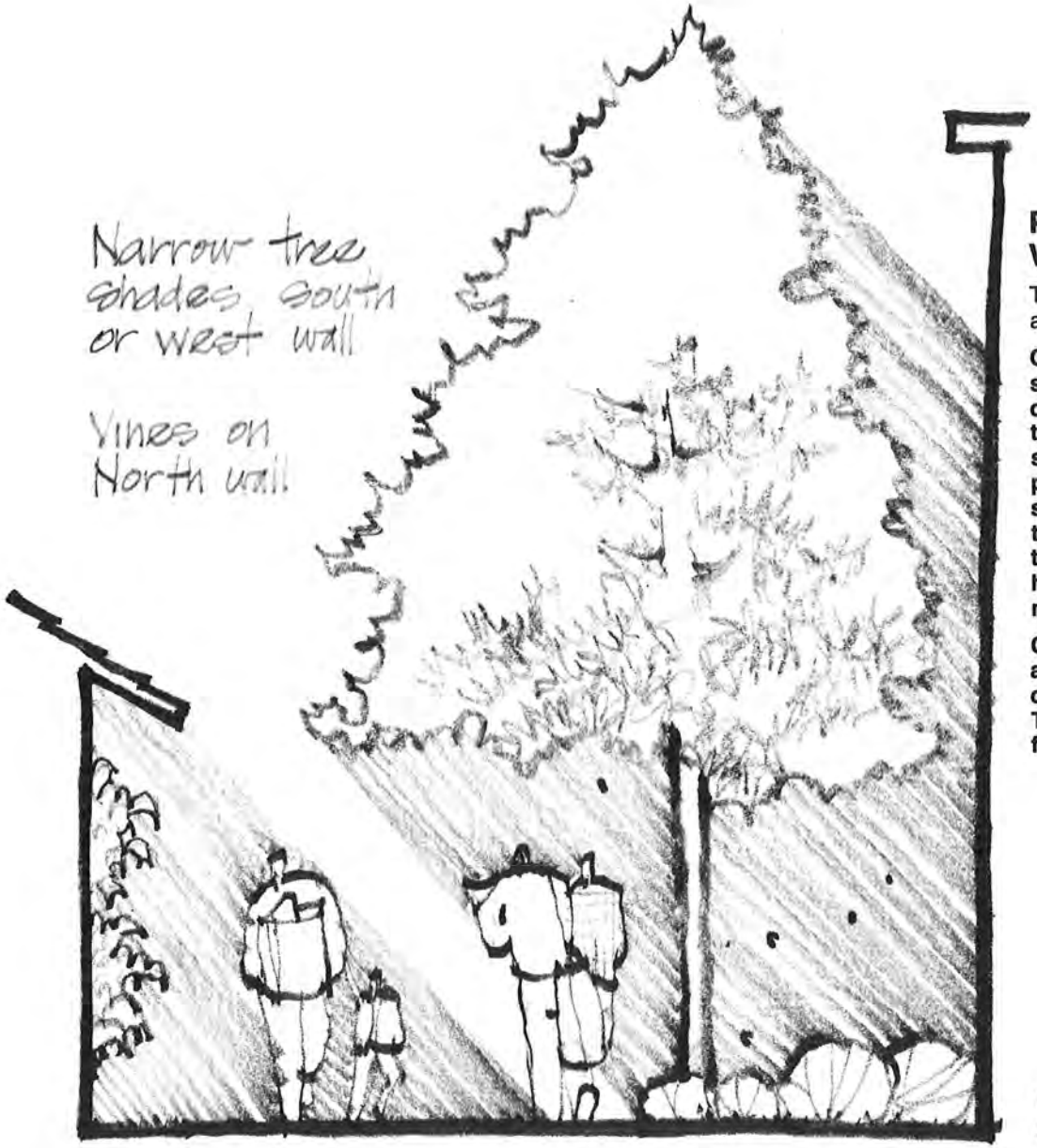
When selecting trees for streets or paved areas several general considerations are important. The form and size of the tree should allow freedom of movement for both cars and pedestrians. The lowest permanent branches eventually must be able to clear 8 feet over sidewalks and 13 feet or more over streets, depending upon proximity of truck traffic. Multi-trunked or small low branching trees should never be used. Conifers are inappropriate street trees because of their branching habit.

Low-branching or conical trees crowd sidewalks.

Trees which have deep root systems should be used when this can be determined. Known shallow-rooted trees such as those on the accompanying list should be avoided. Similarly trees which create excessive litter should be avoided. This does not mean selecting only broadleaf evergreen trees. Many deciduous trees are "cleaner" in that they shed their leaves only once during the year. Many broadleaf evergreens shed their older leaves continuously, creating constant litter.

TREES INAPPROPRIATE FOR SIDEWALKS OR PAVED AREAS

Plant Name	Problem
Ailanthus altissima— **Tree of Heaven**	litter, aggressive roots
Acer saccharinum— **Silver Maple**	litter, aggressive roots
Albizia julibrissin— **Silk Tree**	litter, aggressive roots
Betula verrucosa— **White Birch**	low branching
Catalpa speciosa— **Western Catalpa**	litter
Cedrus deodara— **Deodar Cedar**	low branching
Cinnamomum camphora— **Camphor Tree**	aggressive roots
Fraxinus uhdei— **Shamel Ash**	aggressive roots
Maytenus boaria— **Chilean Mayten Tree**	litter, low branching
Populus alba— **White Poplar**	low branching, aggressive roots
P. nigra 'Italica'— **Lombardy Poplar**	low branching, aggressive roots
Pinus species— **Pines**	litter, low branching
Prunus blireiana— **Purpleleaf Plum**	low branching
Salix babylonica— **Weeping Willow**	litter, low branching, aggressive roots
Schinus molle— **California Pepper**	litter, low branching aggressive roots
Sequoia sempervirens— **Coast Redwood**	low branching, litter
Ulmus pumila— **Siberian Elm**	litter, aggressive roots



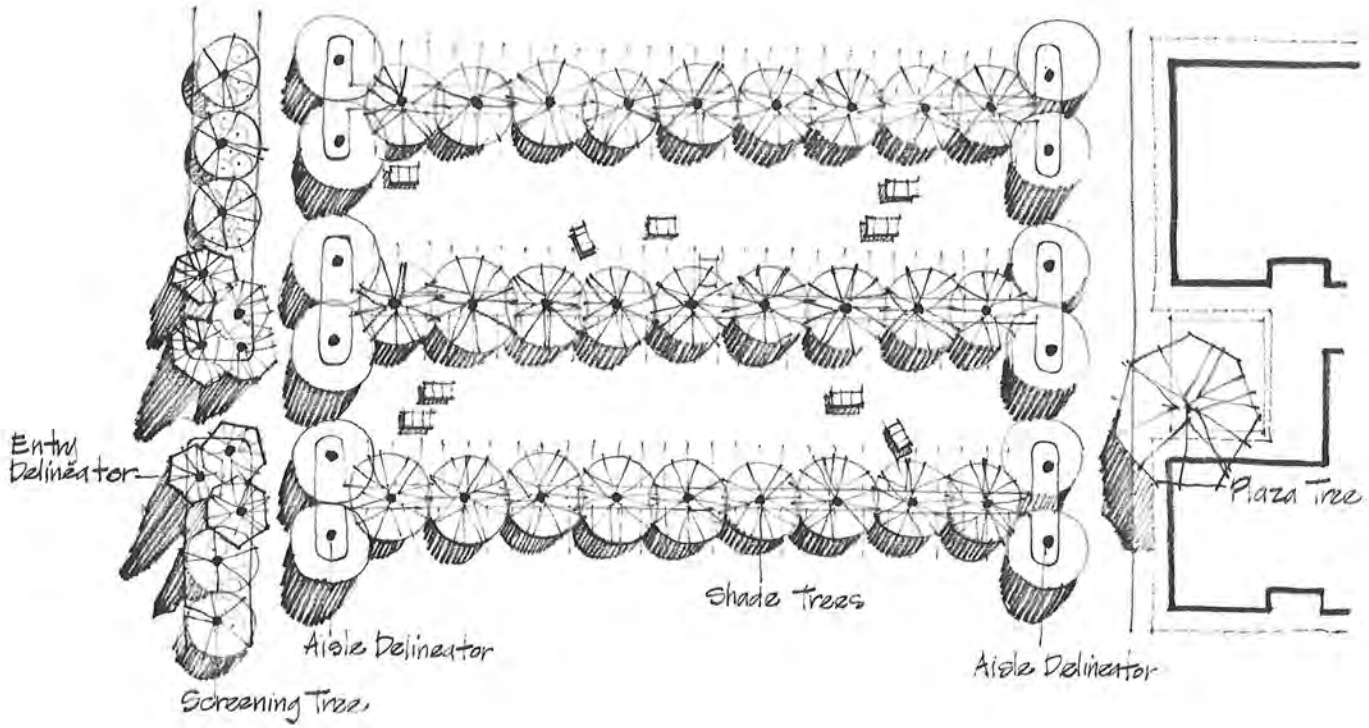
Plazas, Malls and Pedestrian Walkways

These spaces are small in scale and size and are related to the slow pace of walking.

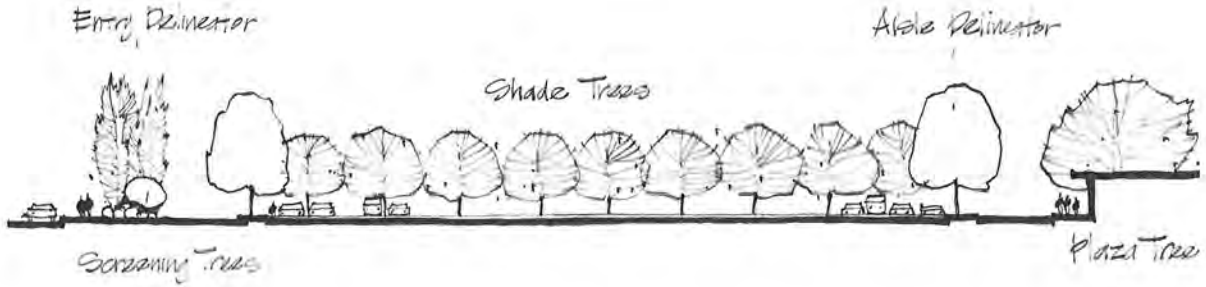
Close observation of detail is important in small spaces. Interesting shadow patterns on pavement, seasonal color and sculptural form are desirable elements in tree selection. Trees should generally be planted closely together. The apparent size of a small space can be manipulated through varied tree spacing. Trees for these spaces need not branch at the height required for automobiles and multi-trunked specimens can be used.

Clearly defined pedestrian ways and linkages should become integrated into the central portion of the business district. They are especially important to include in future development.

Typical planting of an alley converted to a pedestrian walkway.



Parking area concept sketch.



Typical Section

Parking Areas

Trees for parking areas fall into three basic types: shade trees, emphatic or delineator trees and screening or edge defining trees.

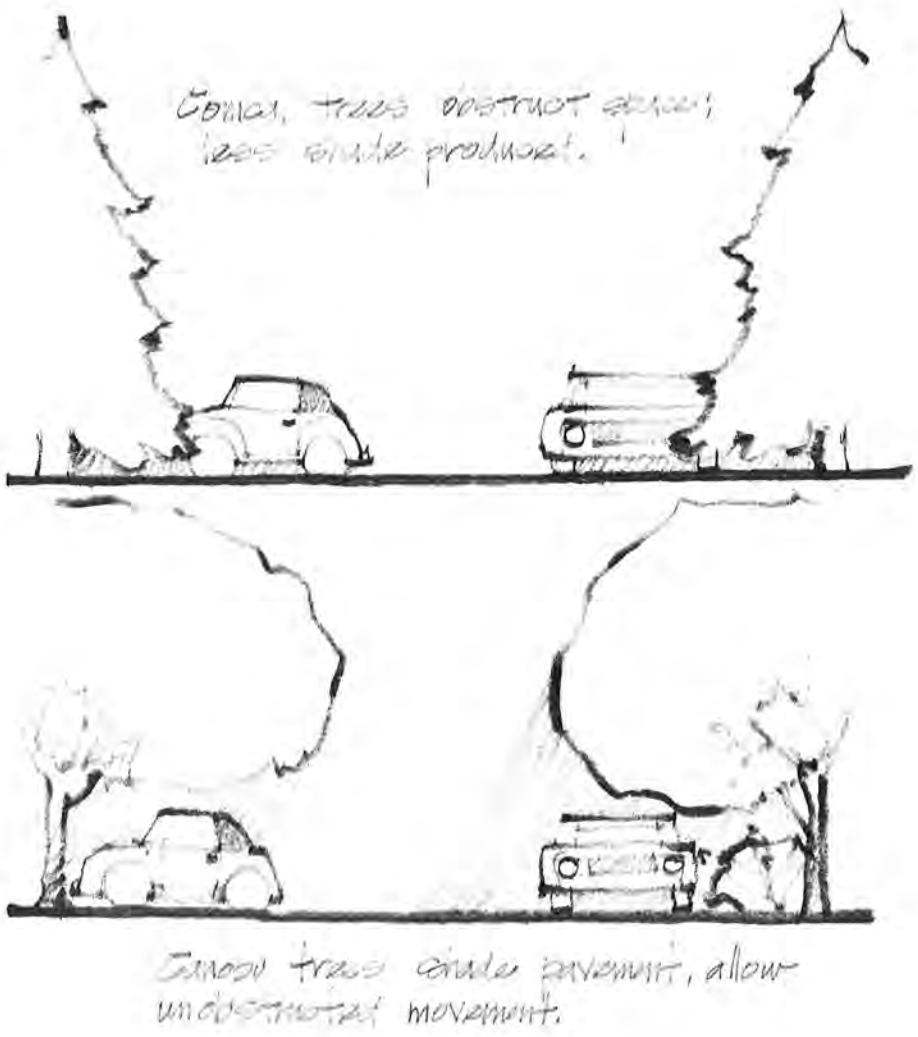
The shade trees should have a rounded, high branched form and grow relatively quickly to cast a broad shadow. Deciduous trees allow winter sun to dry the asphalt beneath which helps to prevent cracking.

Delineator trees are used to guide traffic, highlight entrances, terminate vistas and indicate ends of parking bays. They should be taller and more erect (pyramidal or ovoid forms) than the shade trees used; contrasting foliage color is also desirable. Broadleaf evergreen trees are suitable for year 'round visibility, but this is not essential.

Screening trees may be smaller in size than shade or delineator trees. Both round and erect forms are appropriate. Low branching is important if sufficient planting space is available. Evergreen trees afford year 'round screening. Higher branching trees can be effectively used if they are combined with low shrubs. The canopy shadow tends to block the glare from cars thereby giving the illusion of screening.

All trees used in parking areas should be fairly drought tolerant and be able to withstand intense, reflected heat.

In addition low branching, conical trees, particularly conifers, should be avoided in parking areas.



Parking area tree selection.

TREES FOR PARKING AREAS

Plant Name	Deciduous/ Broadleaf Evergreen/ Conifer	Needs 8' Min. Root Space
Shade Trees		
Albizia julibrissin— **Silk Tree**	deciduous	•
Celtis australis— **European Hackberry**	deciduous	
Fraxinus oxycarpa 'Raywoodii'— **Raywood Ash**	deciduous	
F. uhdei— **Shamel Ash**	deciduous	•
F. velutina 'Modesto'— **Modesto Ash**	deciduous	
Gleditsia triacanthos inermis—		
'Moraine'—	deciduous	
'Sunburst'—	deciduous	
Honeylocust Varieties		
Morus alba 'Fruitless'— **Fruitless Mulberry**	deciduous	•
Pistacia chinensis— **Chinese Pistache**	deciduous	
Platanus acerifolia— **London Plane Tree**	deciduous	•
Robinia pseudocacia 'Decaisneana'— **Pink Locust**	deciduous	
Zelkova serrata— **Japanese Zelkova**	deciduous	
Delineator Trees		
Eucalyptus leucoxylon— **White Ironbark**	broadleaf	
E. pauciflora— **Ghost Gum**	broadleaf	
E. polyanthemos— **Silver Dollar Gum**	broadleaf	
E. rudis— **Desert Gum**	broadleaf	
E. sideroxylon 'Rosea'— **Pink Ironbark**	broadleaf	
Liquidambar styraciflua— **American Sweetgum**	deciduous	
Liriodendron tulipifera— **Tulip Tree**	deciduous	•
Populus nigra 'Italica'— **Lombardy Poplar**	deciduous	•

Plant Name	Deciduous/ Broadleaf Evergreen/ Conifer	Needs 8' Min. Root Space
Screen/Edging Trees		
Ceratonia siliqua— **Carob Tree**	broadleaf	•
Cinnamomum camphora— **Camphor**	broadleaf	•
Crataegus 'Autumn Glory'— **Hawthorn cultivar**	deciduous	
C. lavallei— **Carrier Hawthorn**	deciduous	
C. phaenopyrum— **Washington Thorn**	deciduous	
Eucalyptus leucoxylon macrocarpa 'Rosea'— **Large Fruited Redflowering Gum**	broadleaf	
Laurus nobilis— **Grecian Laurel**	broadleaf	
Ligustrum lucidum— **Glossy Privet**	broadleaf	
Liquidambar styraciflua— **American Sweetgum**	deciduous	
Nerium oleander— **Oleander**	broadleaf	
Olea europaea— **Olive**	broadleaf	
Photinia serrulata— **Chinese Photinia**	broadleaf	
Pinus pinea— **Italian Stone Pine**	conifer	•
Prunus lyonii— **Catalina Cherry**	broadleaf	
Pyrus kawakami— **Evergreen Pear**	semi.-deciduous	
Quercus ilex— **Holly Oak**	broadleaf	
Rhamnus alaternus— **Italian Buckthorn**	broadleaf	

The Buffer Zone

The strip of land north of the business district on the EBMUD corridor affords a special opportunity to combine tree planting with recreational development. The trees selected for this narrow band should be tall, upright trees which will provide a visual buffer between the business district and the freeway. Also they should be selected and arranged for the linear continuity of future trails as well as the freeway. Where freeway planting exists, the buffer zone trees should blend or repeat the trees already existing. Informal combinations using both deciduous and broadleaf evergreen trees should be used.

Because of the special problems associated with planting along the underground water conduit, no attempt is made here to develop a list of trees. The corridor is a special design problem and must be discussed with officials of EBMUD. The intent here is merely to recommend conceptual criteria.

Residential Areas

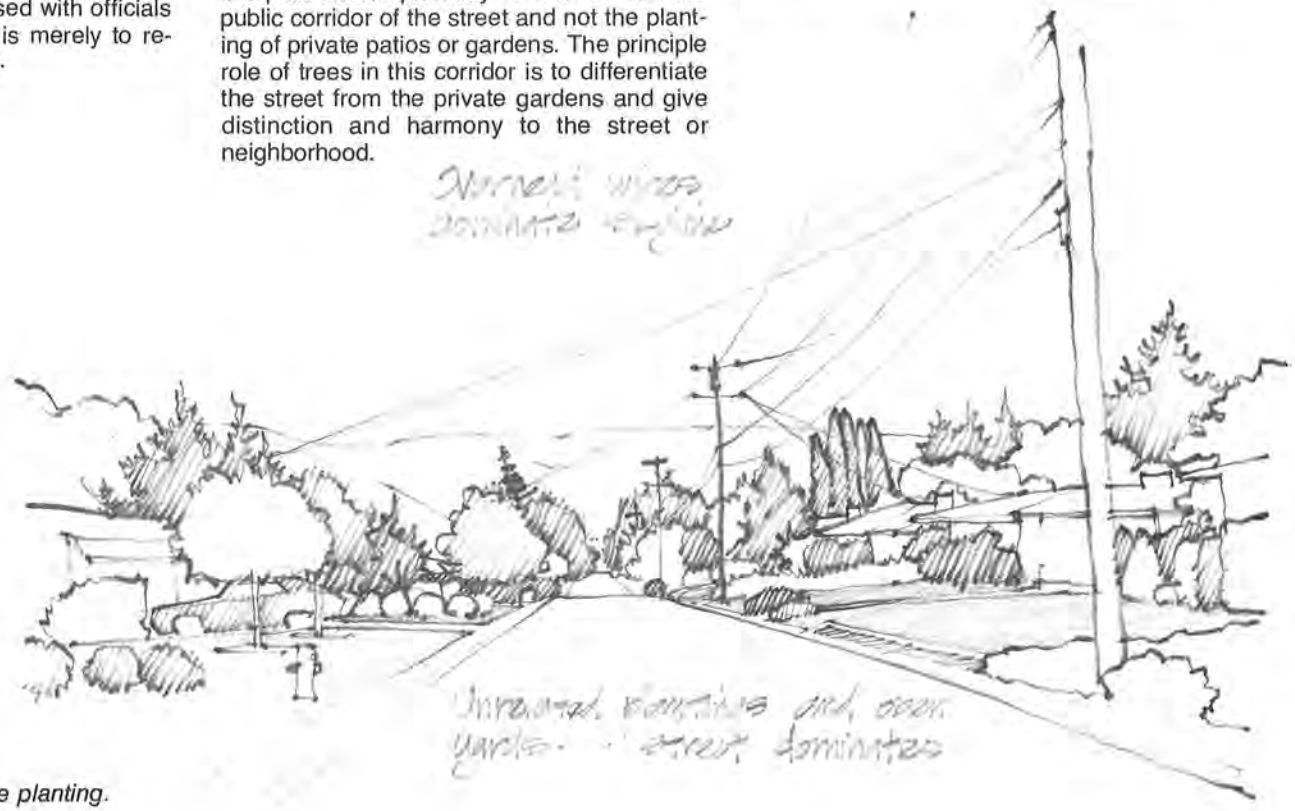
By comparison, the residential areas of Lafayette have many more trees than the commercial area. Large native Oaks in the wooded areas, older street and orchard trees, and the many trees in private gardens combine to provide verdant residential neighborhoods. Trees are commonplace here; they stand out boldly in the business district.

The question might then be raised as to what more can be said about trees in residential areas. How can this Plan be useful to areas that seem to be already well planted? Aren't private gardens with their own trees sufficient? Isn't tree selection an individual decision?

To answer these questions, let us examine the role trees can play in residential areas. In this plan we are primarily concerned with the public corridor of the street and not the planting of private patios or gardens. The principle role of trees in this corridor is to differentiate the street from the private gardens and give distinction and harmony to the street or neighborhood.

Residential gardens reflect a high degree of individuality and rightfully so. On the other hand, a street is a public or semi-public space. The street or neighborhood should be considered a design problem just as a garden planting is considered a design problem. However, a street is *not* a garden, but a larger-scaled landscape relating to the more or less linear corridor and the higher speed travel experience.

Here the functional uses of trees are less important considerations than in the commercial area. The harmonious character or theme that tree plantings can achieve becomes their dominant role. The repetition of tree species or types of trees helps unify a street of varying architectural styles and garden plantings. A street with too many small, dissimilar, unrelated tree forms tends to appear disorderly.



Residential street without tree planting.

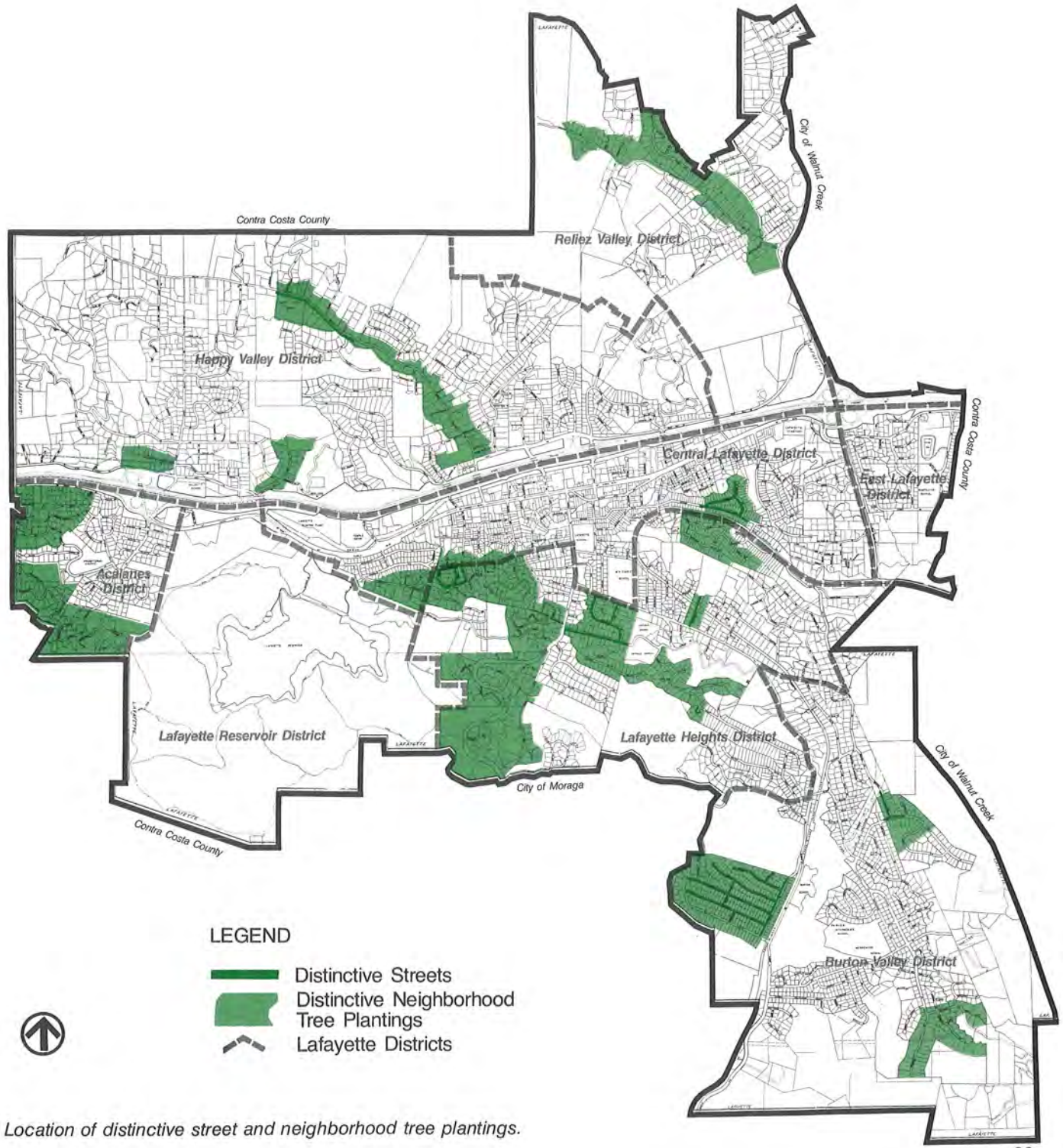
Residential street unified with consistent planting of mature Modesto Ash.

The most pleasing streets and neighborhoods in Lafayette are those with a strength of unity due to a consistent use of trees. This can be achieved without infringing upon the individuality of plantings in private gardens. A number of streets in Lafayette exemplify this principle. Streets such as Hamlin Drive and Broadmore Court are planted to achieve a fine strength of character. These streets are identified on the accompanying map. Similarly, many neighborhoods have a fine visual harmony, not necessarily because of regular street plantings, but because of the repetition of similar trees in a consistent fashion. These residential areas are also indicated on the map.

The decision of what trees to plant and how to plant them along residential streets is based upon qualitative questions relating to the desired street character.

- Should it be open and sunny or closed and canopied?
- Should the tree canopy give dense shadows or dappled light?
- Is formality and regularity or informal consistency important?
- Is seasonal color desirable or is a uniform green necessary?

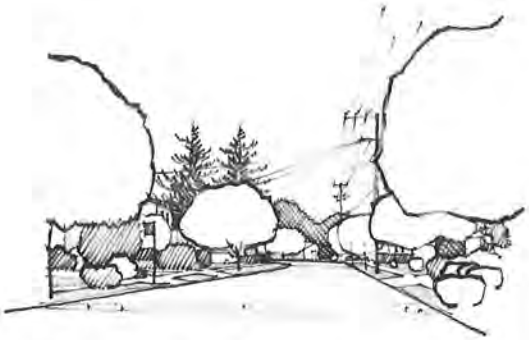
Planting trees in regular lines is perhaps the first treatment which comes to mind when street trees are discussed. This is the most common approach, but is only one alternative. Others are possible and relate to the street width, the presence or absence of existing trees and the topography. Taking clues from nature, we can observe that a fine Oak Woodland is visually pleasing because of repetition of forms, colors and textures—a simplicity achieved through a variety of similar tree species.



Location of distinctive street and neighborhood tree plantings.

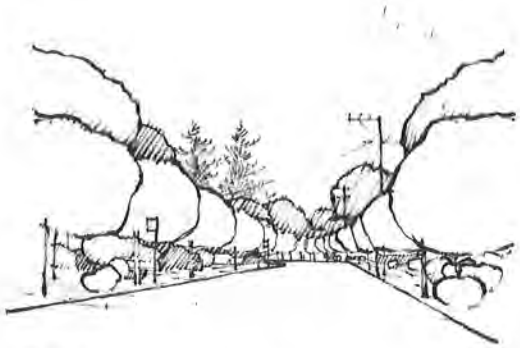
In a residential landscape lacking natural tree cover, the harmony we see in the natural landscape can be achieved by the deliberate planting of visually similar trees. A combination of Modesto Ash, London Plane and Tulip Trees planted randomly, but repeatedly, throughout a neighborhood or along a street can achieve this effect. The predominance of overhead wires on the skyline can be masked or softened by using large canopy trees.

Random planting of similar trees unifies a narrow residential street.



Random planting of same tree species lends informal unity to a wide residential street.

In a residential landscape with various existing trees, a more cohesive appearance can be achieved with a random planting of a single species such as Zelkova or Chinese Pistache. In such a planting, the trees are spaced at various distances from each other along the street. Their locations are determined by analyzing the existing conditions and carefully placing the trees in the most effective spaces. This can be done to screen views of utility lines and poles, shade driveways and south or west facing building walls and separate open front yards from the street.



Regular planting of same tree species gives reinforcement to a wide residential street.

Valley areas tend to have flatter, more undifferentiated terrain. If the street is quite wide such as Silverado Drive, heat and glare can be uncomfortable in summer. Here the decision might be made to use large-canopy shade trees to enclose the street and humanize the scale of the broad, flat landscape. Trees such as White Alder or the Tulip Tree planted 30 to 40 feet apart and 6 feet from the pavement will achieve this effect.

Random planting of small trees unifies a street, yet allows openness.

A narrower street in an older neighborhood may have many large trees in the private gardens. Here a smaller tree such as Washington Thorn or Japanese Crabapple might be used to give the street harmony without destroying its openness.

There are a number of other possibilities. The theme of Walnut orchards can be repeated by using the Fruitless Mulberry or Chinese Pistache in regular rows to replace the declining Walnuts. Where space permits, simply encouraging or replanting the Black Walnut can be an effective street treatment.

On hillside streets, trees should be selected that will not obstruct the views from adjacent residences. Low, rounded trees such as Holly Oak or Glossy Privet are more appropriate than conical or erect trees.

Utility poles and overhead wires are visually distracting elements in most Lafayette neighborhoods. Of course, the best solution for eliminating this distraction is underground wiring—a very costly undertaking. However, trees planted along a street can significantly mask the prominence of power lines. Either rows or randomly spaced trees planted forward on lots offset the regularity of utility pole spacing. The canopy of small to medium sized trees planted beneath wires can block the direct view of overhead lines. Large trees, if properly pruned when young, can be trained to completely screen the view of lines. The wires are strung unencumbered through the center of the canopies.

Many neighborhoods or streets in Lafayette can benefit from developing street planting programs. The results can be a more satisfactory streetscape and quite possibly a greater sense of neighborhood unity. The actual tree planting can be a shared event that will bring together neighbors, young and old alike, in a concerted effort at neighborhood improvement. The recommendation of specific trees for residential neighborhoods is more difficult than for commercial areas which tend to have more definitive design criteria. Factors such as topography, soil, existing trees, proximity to natural woodlands all added to the more personal nature of residential areas form a complexity of design determinants. In some areas, trees will be planted in irrigated lawns. On certain streets, trees will be planted in partially irrigated beds or groundcover or shrubs. In still others, the unirrigated orchard or field edge forms the planting space.

The accompanying lists are divided into two types—one for medium to large trees (30 to 70 feet or more) and one for small trees (15 to 30 feet). Each one lists whether the trees are suitable for planting in lawns or not, whether the trees are broadleaf evergreen or deciduous and whether the relative growth rates are fast, moderate or slow (F,M,S).

TREES FOR RESIDENTIAL STREETS

Large Trees, generally rounded forms suitable for development of tree canopy

Plant Name	Planting in Lawns	Semi-irrigated	Growth Rate (F,M,S)	Deciduous or Broadleaf Evergreen
Acer rubrum **Red Maple**	•		M	deciduous
Aesculus carnea **Redflowering Horsechestnut**	•		S	deciduous
Albizia julibrissin **Silk Tree**		•	F	deciduous
Alnus rhombifolia **White Alder**	•		F	deciduous
A. cordata **Italian Alder**	•		F	deciduous
Celtis australis **European Hackberry**	•	•	M	deciduous
Ceratonia siliqua **Carob**		•	M	broadleaf
Cinnamonum camphora **Camphor**		•	S	broadleaf
Fraxinus holotricha 'Moraine' **Moraine Ash**	•		F	deciduous
F. uhdei **Shamel Ash**	•		F	deciduous
F. velutina 'Modesto' **Modesto Ash**	•	•	F	deciduous
Gleditsia triacanthos inermis				
'Moraine'	•	•	F	deciduous
'Shademaster'	•	•	F	deciduous
'Sunburst' **Honeylocust Varieties**	•	•	F	deciduous
Ginkgo biloba 'Autumn Gold' **Maidenhair Tree**	•		F	deciduous
Juglans hindsii **Black Walnut**		•	F	deciduous
Liriodendron tulipifera **Tulip Tree**	•		M-F	deciduous
Magnolia grandiflora 'Samuel Sommer' **Southern Magnolia Variety**	•		S	broadleaf

TREES FOR RESIDENTIAL STREETS

Large Trees, generally rounded forms suitable for development of tree canopy

Plant Name	Planting in Lawns	Semi-irrigated	Growth Rate (F,M,S)	Deciduous or Broadleaf Evergreen
Morus alba 'Fruitless'— **Fruitless Mulberry**	•	•	F	deciduous
Pistacia chinensis **Chinese Pistache**	•	•	M	deciduous
Platanus acerifolia **London Plane Tree**	•	•	F	deciduous
Quercus agrifolia **Coast Live Oak**		•	S-M	broadleaf
Q. coccinea **Scarlet Oak**	•		M	deciduous
Q. ilex **Holly Oak**	•	•	M	broadleaf
Q. lobata **Valley Oak**		•	M	deciduous
Q. suber **Cork Oak**	•	•	M	broadleaf
Robinia pseudoacacia 'Decaisneana' **Pink Locust**	•	•	F	deciduous
Sophora japonica **Japanese Pagoda Tree**	•		M	deciduous
Tilia cordata **Little-leaf Linden**	•		M	deciduous
Ulmus parvifolia **Evergreen Elm**	•		F	deciduous
Zelkova serrata **Japanese Zelkova**	•	•	M-F	deciduous

TREES FOR RESIDENTIAL STREETS

Small Trees

Plant Name	Planting in Lawns	Semi-irrigated	Growth Rate (F,M,S)	Deciduous or Broadleaf Evergreen
Acer buergerianum **Trident Maple**	•		S	deciduous
A. campestre **Hedge Maple**	•		S	deciduous
Crataegus 'Autumn Glory' **Hawthorn cultivar**		•	F	deciduous
C. phaenopyrum **Washington Thorn**		•	M	deciduous
Fraxinus oxycarpa 'Raywoodii' **Raywood Ash**	•		F	deciduous
Lagerstroemia indica **Crape Myrtle**	•		S	deciduous
Ligustrum lucidum **Glossy Privet**	•		M	broadleaf
Liquidambar styraciflua **American Sweetgum**	•		S	deciduous
Malus floribunda **Japanese Flowering Crabapple**	•		M	deciduous
Prunus cerasifera 'Atropurpurea' **Purpleleaf Plum**	•		M	deciduous
Pyrus calleryana 'Bradfordi' **Bradford Pear**	•		M	deciduous
P. kawakami **Evergreen Pear**	•		M-F	semi-deciduous

Schools and Churches

Public schools present a splendid opportunity for extensive tree plantings. Environmental education is becoming an important feature in school curricula development. By using the school grounds as outdoor classrooms and laboratories, the plantings can be more meaningful as well as improve the aesthetic qualities of the school environment.

The grounds of the public schools of Lafayette were evaluated using criteria similar to those developed for residential streets and neighborhoods. Two schools stand out as fine examples of excellence in planting design—Happy Valley School and Springhill School. The plantings are consistent throughout, not merely streetside facades. The total environment of the schools was planted sensitively—playgrounds and athletic fields as well as interior and parking areas. The maintenance has been superb.

Happy Valley School–an excellent example of tree planting throughout the grounds.

Other schools vary in the quality of plantings. All should be encouraged to develop planting programs that combine visual quality and environmental education. For example, Burton School has a splendid opportunity to take advantage of Las Trampas Creek as a study resource. Tree plantings harmonious to the riparian vegetation could be made by the children as a part of their education. The rich creek environment affords opportunities for countless studies—trees, fish, wildlife and birds. Such plantings should be planned carefully using consultants such as a landscape architect and a plant ecologist or biologist. The objective should be to develop integrated, harmonious plantings following a carefully developed theme, rather than to collect numerous, unrelated plants.

Similarly, churches should be encouraged to develop tree plantings harmonious to their surroundings. Like schools, churches have large parcels of lands. Their visual influence is great on the surrounding neighborhood as well as the entire community. The tendency to plant Pines just to provide green on the barren landscape is all too obvious. Sensitively conceived planting plans should consider the churches' relationship to the setting, their needs for outdoor classrooms as well as the various functional requirements of shade for cars, screening, and planting for low maintenance. Churches are not residential complexes and should not be planted in a residential manner. They are significant institutions which are permanent features in the landscape of the community. Their plantings should reinforce the dignity of this role.

The various plant lists presented in this Plan are appropriate to develop planting plans for both schools and churches. The lists for parking area trees, deer resistant trees, and street trees, as well as those related to the Oak and Riparian Woodlands can be used.

DISTINCTIVE TREES & TREE GROVES

Throughout Lafayette many fine mature individual trees exist. Many are located in prominent view from public streets and roads giving them special significance. Similarly, a number of excellent tree groves add considerable beauty to the landscape and skyline of the City.

The City has taken a significant step towards the recognition and protection of such trees and groves. City Ordinance 38 establishes the Tree Commission and clearly states the City's commitment to designate and protect fine individual trees and groves. The Tree Commission has developed a set of criteria for selecting Grand Trees and has begun selecting "Grand Trees."

A Grand Tree shall meet one or more of the following criteria:

- have historical significance
- possess unusual beauty
- be of significant size or outstanding aesthetic impact.

In addition, candidate trees are judged on all of the following:

- be nominated by, or with the permission of the owner of the property on which the tree stands
- be visually accessible
- indicate a high chance of survival, be healthy and well maintained
- possess horticultural or structural interest
- be located on a permanent site, indicating little possibility of future clearing of the land for development
- be located within Lafayette City Limits.

The Grand Tree of Lafayette–a Valley Oak selected in 1971 to initiate the Grand Tree Program.

To date, (8/75) five Grand Trees have been so designated, in addition to "The Grand Tree of Lafayette" at the Lafayette-Orinda Presbyterian Church on Knox Drive. Each tree is marked with a bronze plaque. On the Lafayette Tree Guide accompanying this Plan the locations of these designated Grand Trees are marked.

During the field surveys which were done in preparation of this Plan, many unique specimen trees were discovered and inventoried. Most of these trees are native and all are worthy of special designation and protection. However, not all of the trees fit the criteria for Grand Tree.

To assist in objectively evaluating such trees, a rating form was developed. The basic criteria established for evaluating Grand Trees was expanded and quantified. The trees were judged on three basic sets of criteria and rated on a scale from 1 to 5:

The Tree Specimen

- form (symmetrical, typical for species)
- size
- uniqueness (rare species, unique to area)
- prominence (visibility from public rights-of-way)
- proximity to public property (adjacent to roads, parks, schools, churches)

The Setting

- stability of the site (susceptibility to landslides, future development, change of maintenance)
- compatibility with surroundings (visual fitness, aesthetic setting, composition)

Horticulture

- present health
- present level of maintenance

NOTE:

Key Symbols refer to tree grove locations shown on the Lafayette Tree Guide Map *which has been distributed with copies of this Plan. Similar listings with street addresses are also included for Specie Specimens and Official Tree Groves.*

DISTINCTIVE TREE GROVE CANDIDATES

Key Symbol	Description of Grove
1	Planted grove of Coast Redwoods *(Sequoia sempervirens)* already designated as the City's first Official Tree Grove.
2	Small grove of Black Oak *(Quercus kelloggii)*, an Oak species found only in limited numbers in Lafayette.
3	Small stand of Madrone *(Arbutus menziesii)*. This grove is part of a dense Oak Woodland.
4	Hilltop grove of Monterey Pine *(Pinus radiata.)*.
5	Striking row of Lombardy Poplars *(Populus nigra 'Italica')* lining a drainage swale.
6	Mature grove of Monterey Pine *(Pinus radiata)* planted as a street tree along Pine Lane.
7	Mature stand of Monterey Pine *(Pinus radiata)* planted when the Lafayette Reservoir was completed in the early 1930's.
8	Cluster of large Valley Oaks *(Quercus lobata)*.
9	Fine example of an Oak Woodland. Valley Oak *(Quercus lobata)* is the dominant species.
10	Cluster of large Valley Oaks *(Quercus lobata)*.
11	Cluster of large Valley Oaks *(Quercus lobata)*.
12	Group of four large Valley Oaks *(Quercus lobata)*.
13	Stand of Monterey Pine *(Pinus radiata)*.
14	Double row of Olives *(Olea europaea)* lining an entrance drive.
15	Prominent grove of California Bay *(Umbellularia californica)* which is part of a Riparian Woodland.
16	Fine example of an Oak Woodland which includes both Valley Oak *(Quercus lobata)* and Coast Live Oak *(Quercus agrifolia)*.
17	Prominent grove of Blue Gums *(Eucalyptus globulus)*.

Specimen Trees

The earliest introduction of exotic trees to Lafayette dates back to Nathanial Jones' Black Locusts planted in the late 1840's. Since that time scores of other trees have been planted in the private gardens of the City. During the field survey 77 specimens representing 38 different species were inventoried and mapped. These trees are mapped on the Lafayette Tree Guide.

Although these specimen trees are not being recommended for official status, they are significant enough to be included in this Plan as superb examples of some of the trees recommended in the various lists of this Plan. The purpose of their inclusion is to afford citizens and other interested people the opportunity of observing mature specimens of the various trees. The Guide can become a "tree tour" of Lafayette. Bicyclists and hikers can use the Guide to locate the trees and increase their tree vocabulary or simply see what a mature tree of any particular species looks like.

All the trees were selected for their proximity to public viewing, health and form characteristic of the species. Duplicate specimens were selected throughout the City so that the residents of each district might observe specimens closest to their homes. A few species were found in only one location, however. It is hoped that the Guide of these trees will become a useful tool for the study of trees in Lafayette.

Recommendation for Official Tree Groves

Several superb tree groves have also been identified in the field work for this Plan. Using criteria similar to those used for evaluating official trees, these groves have been selected for their visibility, landscape significance, health, and size or extent. The groves include stands of both native and introduced trees and are mapped on the Lafayette Tree Guide. These groves are recommended for further evaluation by the Tree Commission for designation as official Lafayette Tree Groves under the provisions of Ordinance 38.

Two types of groves have been recommended. One includes introduced trees; the other includes prominent, natural woodlands. Groves of introduced trees should be of only one species such as Coast Redwood. Mixtures of various trees that do not give a grove effect are inappropriate. On the other hand, an Oak Woodland grove may include a few other trees typical of that plant community such as California Bay and Buckeye. In this type of grove, the Oaks are dominant and the natural occurance of different species does not detract from the grove effect.

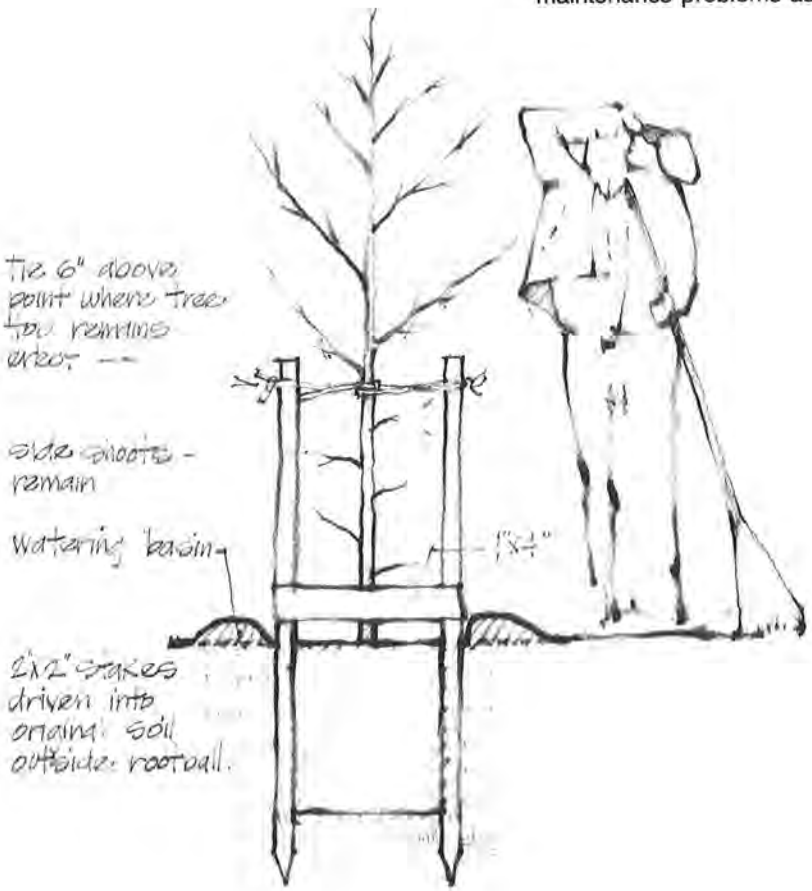
As emphasized in the section on the Riparian Woodlands, the creekside trees are of infinite value to the environment of Lafayette. These linear woodlands cannot be classified as Tree Groves. Nevertheless, these valuable riparian trees should all be designated and protected by the City as irreplaceable resources.

Monterey Pine grove at Lafayette Reservoir–one of the groves recommended for official designation. This grove is visually prominent, yet blends well with the natural land forms.

TREE PLANTING AND MANAGEMENT TECHNIQUES

Bringing up young trees can often be as challenging as bringing up young children. We need all the help we can get! And sometimes we are besieged with too much help—from advice freely shared by the "local expert" to the myriad books at the local nursery or bookstore. Much of the information is indeed helpful. Nevertheless, there is considerable misinformation. Many publications about gardening and tree planting are written by Eastern or Midwestern specialists. Text and examples from these books may not apply to Western conditions.

This section of the Plan is intended to cover a few of the basic principles involved in the planting and early care of trees in the Bay Area. At the planting stage, a number of steps can be taken to prevent or minimize future maintenance problems as the trees mature.



Plant Quality

Selecting the best quality planting stock is good insurance for preventing future failures. This is simple logic. Yet the components of high quality trees have puzzled even horticultural experts. Recent research in the Department of Environmental Horticulture at the University of California-Davis has removed some of the mystery. Studies have concentrated on discovering how to detect root defects as well as what constitutes good top growth.

The top of the tree should show good vigor through relatively rapid growth, large-sized leaves and color typical of the species. Trees with stunted growth and yellowish foliage should be avoided. The tree should have small branches all along its trunk to the soil line. This distribution of foliage helps strengthen the tree by developing a more tapered trunk. A well-tapered trunk, like a fishing rod, has great flexibility. It will be able to return to an upright position when deflected in the wind. This means that minimum staking is required and the tree will grow stronger in a relatively short time. Untapered trees with all the lower foliage removed requires staking longer—as much as two or three years. Their tops should be thinned out to relieve their top-heaviness.

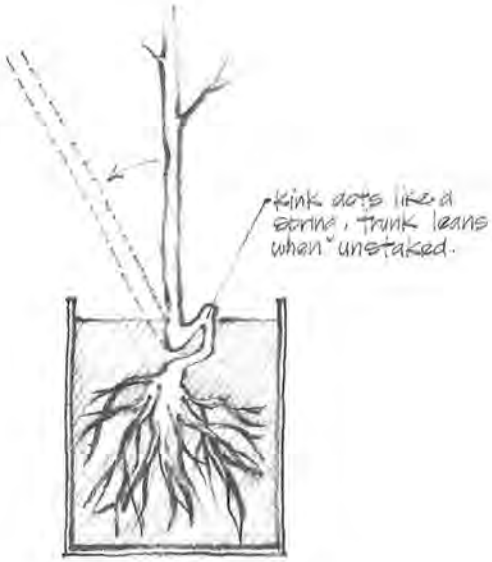
Young trees need little pruning. Other than removing dead or broken shoots, the main goal of pruning at this stage should be to thin out a dense foliage crown to decrease the wind load. The central leader should never be headed back. The permanent lateral branches are usually not formed yet on either deciduous or broadleafed evergreen trees. Removal of the leader tends to slow the growth and development of the permanent scaffold branches. Crowded side shoots in the foliage head which criss-cross or closely parallel another branch should be removed. Heavy heading back at the young stage tends to dwarf and deform the tree. Trees that have been severly clipped into a tight foliage head should be avoided. Fruit trees are possible exceptions.

The quality of the root system of container-grown trees is more difficult to assess than the top parts. Nevertheless, serious future problems can be avoided if root defects are detected before planting the tree. The three most serious root defects are:

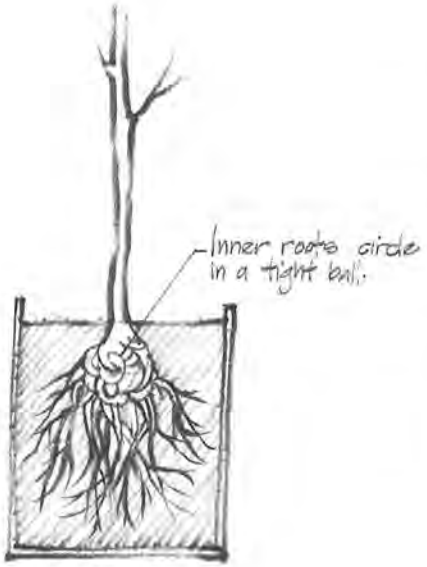
- girdling roots,
- kinked roots,
- circling roots.

Girdling root.

A girdling root is usually visible at the base of the trunk (crown) or just beneath the soil surface. A quick check with the fingers can reveal such a problem. If undetected, the trunk will become girdled as both it and the main root increase in size. Ultimately the tree can fall over because of this weakened, restricted spot in the trunk.



Kinked root.



Circling roots.

A kinked root is revealed in two ways. If the young tree leans over as though the base were hinged. a kinked root can be suspected. Acting like a spring, the kinked root causes a very unstable top of the tree. No amount of staking can correct this situation. A simple test can be made to determine if a kinked root exists on a container tree. If the tree is slowly lifted vertically by the trunk and the top moves an inch or more before the container rises, a kinked root can be suspected.

Circling roots are the most difficult to detect. They occur inside the root ball below the soil line. They result from improper transplanting at an intermediate growth stage such as when the tree is transplanted from a one-gallon can to a five-gallon container. Only by removing the soil from the root ball can this root defect be discovered. When buying a large quantity of trees, destruction of a 2% sampling is recommended to check for circling roots.

Any one of these three root defects is cause for rejecting the tree or trees. They will only cause very serious future problems possibly complete failure. They are a result of incorrect transplanting techniques in the production of trees. These defects are avoidable and should not be passed on to the consumer.

Matted roots circling just inside the container are not indication of a serious problem. Most container trees will have these matted roots. These roots should be scored with a knife or shears and pulled out lightly from the root ball to encourage rooting in the soil when planted.

Tree Planting

Planting the tree is not difficult if a few basic principles are observed.

The planting hole should be twice the diameter of the root ball. In uncompacted soil, the depth should be no greater than the root ball. Holes dug too deeply cause settling — the tree crown sinks below the normal soil level. Soil deposited around the trunk will cause crown rot and death of most trees. If the hole must be dug deeper to provide a good growing medium, the tree should be planted with the top of the root ball 2 inches higher than the surrounding grade. Planting high is better than planting too deeply.

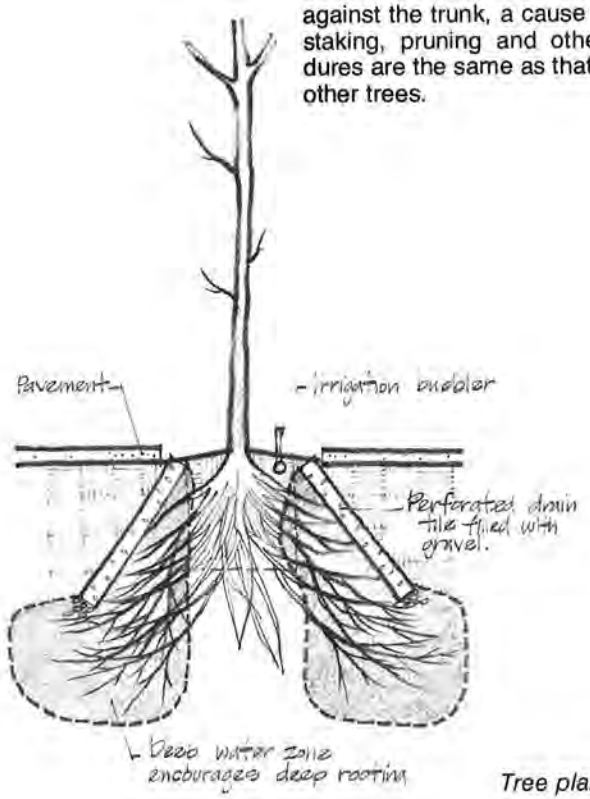
No fertilizer is needed in the planting hole. Vigorous trees will begin root establishment immediately with water and friable soil as the only requirements. After planting, a surface application of a slow-release, balanced fertilizer may be used. This will avoid burning the developing roots and provide a slow, steady supply of nutrients.

The addition of 30 to 50% organic matter to the backfill soil (original soil) helps provide a more porous, friable soil conducive to rapid root establishment. It also aids in water and nutrient retention. Nitrified (nitrogen added) redwood or fir sawdust works well. Peat moss is expensive, difficult to wet and holds too much water when used with clay soil.

Under no circumstances should rock or gravel be placed in the bottom of the planting hole. There is a popular myth still perpetrated in current publications that gravel in the planting hole improves drainage. Research has shown the reverse to be true. The gravel causes an interface where the soil above the gravel remains saturated with water. The plant literally drowns. This is also true for planting in containers.

A watering basin built around the tree helps in the initial watering of a young tree. The berm is formed from loose soil and should be approximately 6 inches high. It should be placed at the outside edge of the root ball so that water can be concentrated in the root zone. The sandy soil mix used in nursery containers can dry out quickly. This sandy soil ball must be kept moist until the roots have become established in the heavier surrounding soil. This usually takes only one growing season. The watering basin should be removed prior to the first winter rains to prevent drowning the plant.

Tree planting in paved areas poses a special problem. Tree wells or cutouts are often small and the surrounding pavement seals off air and water to the soil beneath. The planting hole should be dug deeply enough to break through any compacted layers and into the original soil. The insertion of two 3 or 4 inch diameter drain pipes filled with coarse gravel angled down and away from the root ball permits deep watering. This will help prevent shallow root development and buckling of the pavement. Irrigation should be provided for each tree by means of a bubbler placed in each tree well. Tree wells may be covered with bricks set in sand, metal grates, or precast concrete tree well covers. Any covering should be removable to allow for expansion of the trunk. Sand or soil should not be piled against the trunk, a cause of crown rot. Tree staking, pruning and other planting procedures are the same as that recommended for other trees.



Tree planting in pavement.

Tree Staking

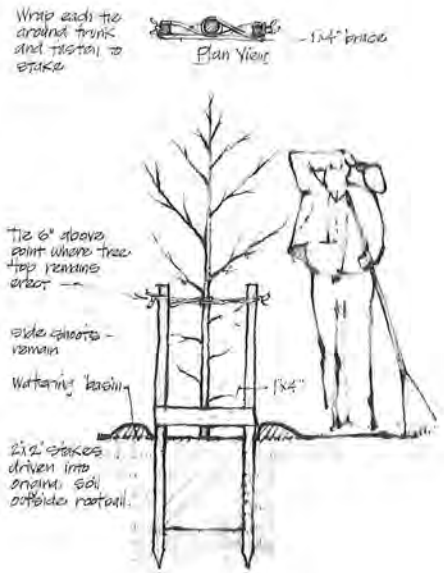
Tree staking has more variations than any other aspect of tree planting. Recent research has proven that, given good quality trees, minimum staking produces a stronger tree more quickly. Trunk movement acts to strengthen the wood fiber much in the same way that exercise strengthens our own limbs. Improper staking causes serious damage to the young tree. The two most frequently found types of damage are:

- girdling of the trunk from tight tree ties;
- rubbing or debarking of trunk from tree stakes.

The nursery stake, a 1 × 1 stake tied tightly to the trunk, should always be removed. Depending upon whether or not the tree can remain upright or nearly so when unstaked, the staking should be done for one of the following reasons:

- support staking—holding a weak-trunked tree upright;
- anchor staking—holding the root ball stable until roots become established;
- protective staking—protecting strong trunked trees from physical damage (mowers, children, etc.).

Support staking is for trees unable to stand upright. The point where the tree is to be tied is determined by holding the trunk vertical at various points along the trunk starting from the base. Tie the tree 6 inches above the point where the top remains upright when deflected. Use two or three stakes driven into the soil *outside* the root ball. Attach the tree to the stakes with flexible ties (elastic web belting, wide rubber bands such as cut from innertubes, wide plastic ties). Stakes should be required only through the first season. Thinning the top improves the tree's ability to stand alone.



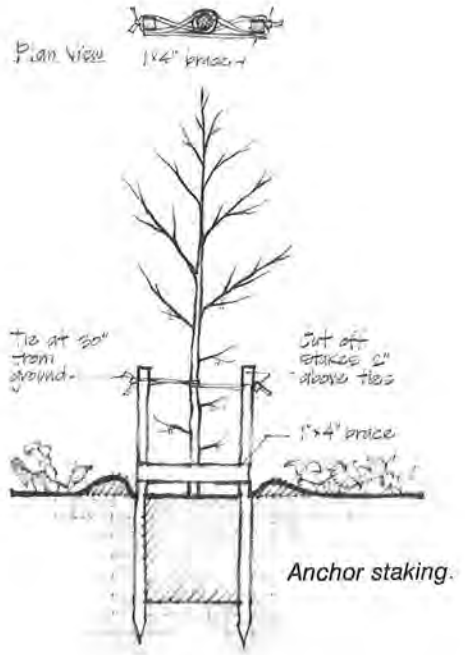
Support staking and typical planting method.

Anchor staking holds the root ball in place, allowing the young roots to become established in the soil. Movement of the root ball from excessive top movement can break the young roots. Staking is kept quite low (about 30 inches above the ground) using two or three short stakes and flexible ties attached several inches from the end of the stakes. These ties should also be removed at the end of the first growing season.

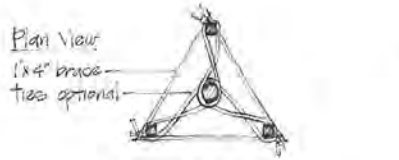
Protective staking is done for trees able to stand upright that need protection. They prevent damage from mowing equipment or other inadvertant abuse. Three stakes are better than two for this purpose. The stakes should be tall enough to be seen and placed at the edge of the root ball.

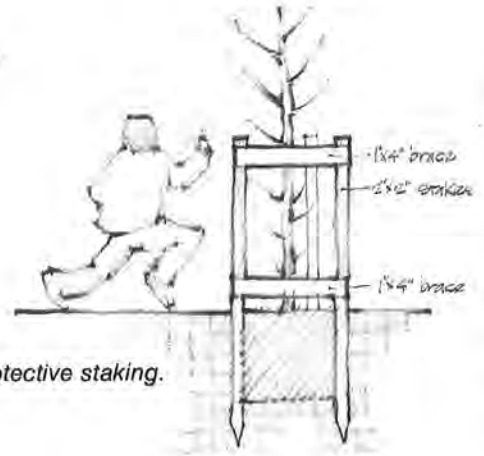
Bare-root trees and most young conifers need no staking unless they are too large. The tops of these trees should be able to stand upright. Thus, if staking is required, root anchorage is all that is needed.

These are the essential steps to be followed in planting young trees. More detailed instructions can be found by consulting the various publications listed in the References.



Anchor staking.





Protective staking.

TREE MAINTENANCE

The maintenance of mature trees begins the day the decision to plant is made. A tree species selected to suit a particular site and a good quality young tree properly planted will solve most of the future maintenance problems. Another way of putting it is that the vast majority of maintenance problems result from planting the wrong tree. Thus the best way to prevent maintenance problems as a tree or trees mature is to:

- select the appropriate species for the site and function served;
- select high quality stock free from root and top defects;
- plant the young tree correctly using proper pruning and staking techniques.

Beyond these important preventative measures, there are a few basic maintenance procedures to consider. These include fertilization, watering, staking and pruning.

Fertilization

Nutrient requirements for trees are not as critical as for herbaceous plants. A tree's root system can literally "mine" a large soil volume for nutrients and water. The period when fertilization can benefit tree growth is during the first few years, before the root system is fully developed.

California soils tend to lack nitrogen, the nutrient essential for foliage and shoot growth. Initially, surface applications of a moderately high nitrogen fertilizer in a slow-release form is sufficient. Two applications, once in spring and another in mid-summer, of a 10-5-5 fertilizer should be sufficient for the first two or three years (fertilizer formulas are written in figures representing the per cent by weight of the nutrients nitrogen, potassium, phosphorous: N-P-K). As the tree matures and the root system expands, deeper applications should be made. Using a water powered root feeding needle, fertilizer can be injected 2 to 3 feet into the soil at or near the dripline. One feeding a year for the next few years should help push the tree along and establish a reasonably good sized tree within six years after planting. The best indicators of whether a tree requires fertilizer or not are the vigor of the shoots and color of the foliage. If the growth is abnormally slow or the older leaves are pale green or yellow-green, nitrogen fertilization may be needed. If only the young leaves show yellowing between the veins and shoot growth is good, the tree is probably suffering from iron deficiency. In this situation the addition of either granular or liquid iron sulfate is recommended.

An important principle to remember is that nutrients are made available to the tree by water. Fertilizer should never be applied when the soil is bone dry. Irrigate first and fertilize a day or two later. Always irrigate deeply after applying fertilizer.

Watering

Like fertilization, watering trees is most critical during the first few years after planting. If a watering basin was constructed around the tree at planting time, it should be broken and the soil graded level prior to the first winter rains. Basins left during the winter form "bathtubs" around trees growing in heavy clay (adobe) soils. Most trees will not tolerate standing water at their base and young trees can be killed easily if this situation occurs.

Trees growing in lawns tend to develop shallow roots. This results from the frequent, shallow waterings lawns receive. Tree roots develop where the water supply is most ample—the top foot of soil. The occasional use of a root watering needle can help create a deeper root system if this technique is done consistently. Also aeration of the lawn annually using a turf hole-punching machine can help increase water penetration.

Trees planted in paved areas such as sidewalk street trees or trees in paved plazas need special watering considerations. Each tree should be provided with its own irrigation bubbler or drip emitter and a drainage pipe to carry the water into the root zone. Care must be taken to avoid planting the tree too deeply—the "bathtub" mentioned previously results. The drain pipes should be checked frequently to insure proper draining of irrigation water.

Staking

A number of future maintenance problems can be averted if the maturing young tree is checked periodically during its period of establishment. Other than forgetting about the soil berm watering basins, the most frequently neglected early maintenance chore is the removal of the tree stakes. In every city, maturing trees can be seen with the support stakes still in the ground long after the tree is able to stand alone. Set it and forget it seems to be the policy! Tree ties girdle the trunk as it grows and expands; stakes rub gashes in the bark. **Support stakes should be removed no later than two years after planting.**

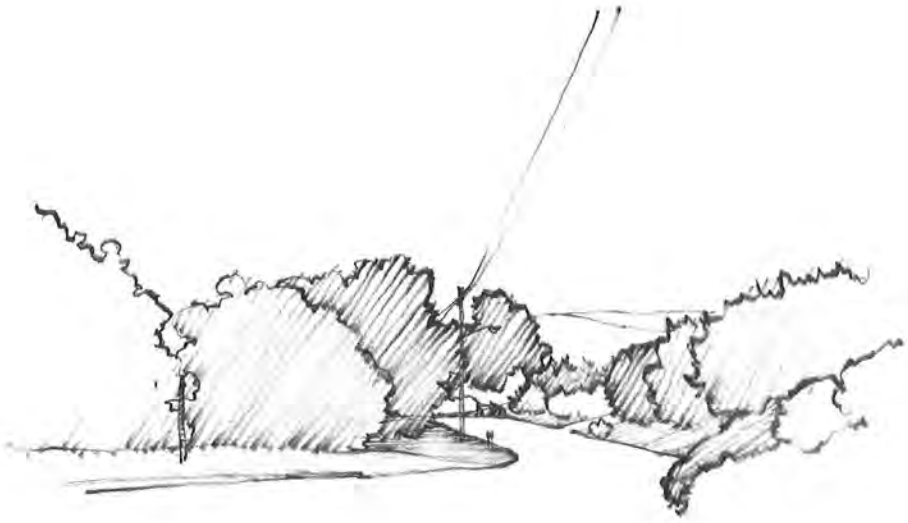
Pruning

Pruning of mature trees is by far the least understood aspect of tree management. In many cases more damage is done to trees *by pruning* than by not pruning. Even so-called tree pruning experts butcher young and old trees alike. Trees can be ruined forever if improperly pruned.

The most common error committed is hacking back large branches to barren stubs. The result is a "shaving-brush" type of growth which sprouts from dormant buds just behind the cut. This growth in the form of long, vigorous shoots grows attached to the outside of the main wood of the limb and never forms a strong point of connection. If allowed to grow into large branches, they are in danger of breaking off at the main limb. Once this "stubbing back" type of pruning has been done, it is usually repeated during subsequent years.

Incorrect power line clearance–trees are ruined and quality of street is degraded.

Incorrect pruning method–severe heading back to stubs ruins form of tree; brushy shoots result.



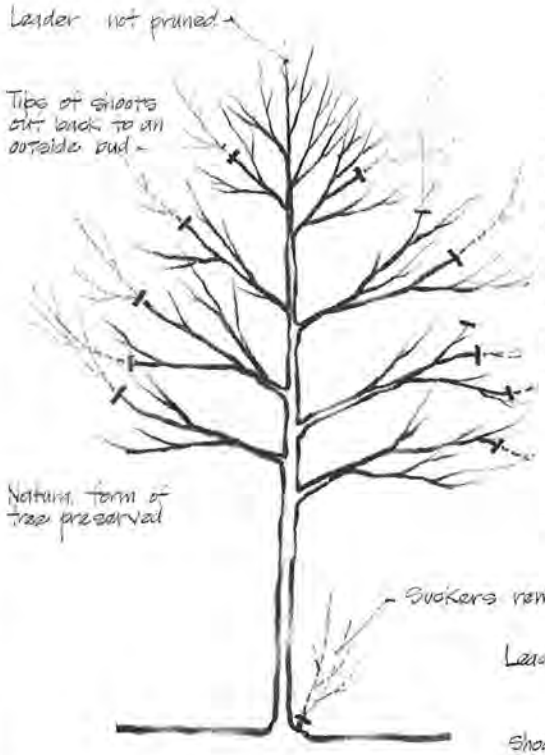
Incorrect line clearance and power line siting–hole cut through mature Live Oak deforms tree.

Several tree species stand out as the ones most commonly butchered. Fruitless Mulberry *(Morus alba 'Fruitless')* heads the list. It grows exceedingly fast—up to 6 feet a year. Frustrated with this rapid growth, the tree pruner gives it a good hair cut. The next year it sends out sprouts 10–12 feet long and again gets the same treatment. Other trees which are often incorrectly pruned include: London Plane *(Platanus acerifolia)*, Silver Maple *(Acer saccharainum)*, Modesto Ash *(Fraxinus velutina 'Modesto')* and Weeping Willow *(Salix babylonica)*.

A few of these broad spreading, fast growing species are appropriately used as street trees throughout Lafayette. If improperly pruned they can downgrade the visual quality of an entire neighborhood.

Utility line clearance is a frequent excuse for stubbing back mature trees. *The conflict can be anticipated in advance and the trees sensitively pruned before the crisis actually exists.* In new residential areas, utility lines can be placed underground to prevent this conflict as well as the visual disruption of the skyline. In established areas where undergrounding is not possible, trees which are easy to control can be selected. This does not necessarily mean the use of small trees. Medium to large trees can be trained to grow around the wires. Gradual heading back with moderate thinning out over a period of several years can accomplish the necessary line clearence without distorting the tree form. Chemical growth control has been used successfully in a number of Bay Area communities and is a very satisfactory solution for rapid growing trees. Street trees are assets which should be managed as neighborhood and community resources.

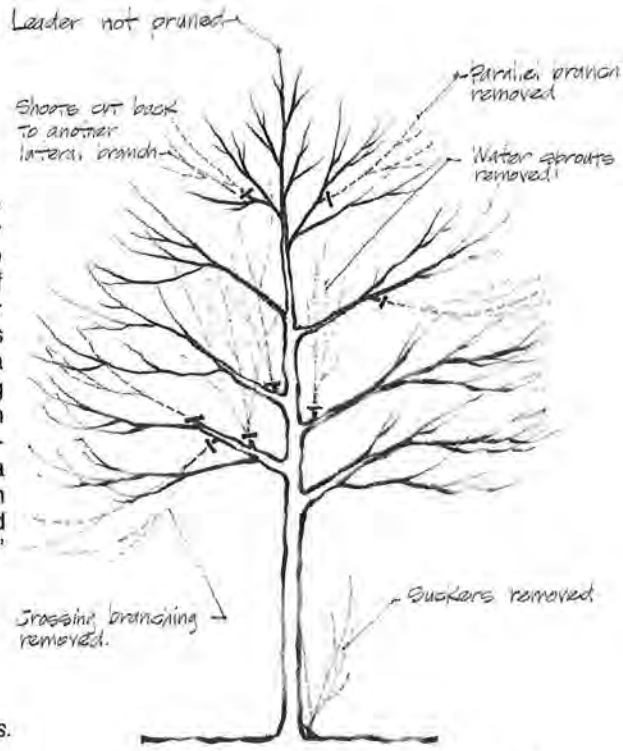
To stress a point mentioned before, maintenance begins the day a tree is planted. If a small tree is needed, a tree which matures to a small size should be planted. Fast growing, large trees will always need severe pruning if they are planted in a small space. Good design decisions should not have to be corrected by pruning.



Pruning cuts must be made carefully to prevent possible damage to the tree. When heading back, prune at a slight angle about ¼ inch from a bud. Select a bud pointing in the direction where growth is wanted, usually one going away from the center of the tree (outside bud). Inside buds promote criss-cross branching. Similarly, thinning out cuts should be made to an outside pointing branch or shoot.

Correct method of heading back trees.

The proper method of controlling tree size (within reason) is to head back the major branches moderately each year—about 1/4 to 1/3 of their total yearly growth. Thinning out of approximately 20% of the brushy inner growth, especially watersprouts, also helps control the next year's growth. This will have a dwarfing influence on the tree without causing excessive growth the subsequent year. Each year less and less pruning is required. Eventually the tree's growth is distributed over a larger branching pattern and is slower than in the youthful stage. Pines are easily controlled by pinching out the new shoots or "candles" in the spring when they reach 2 inches.



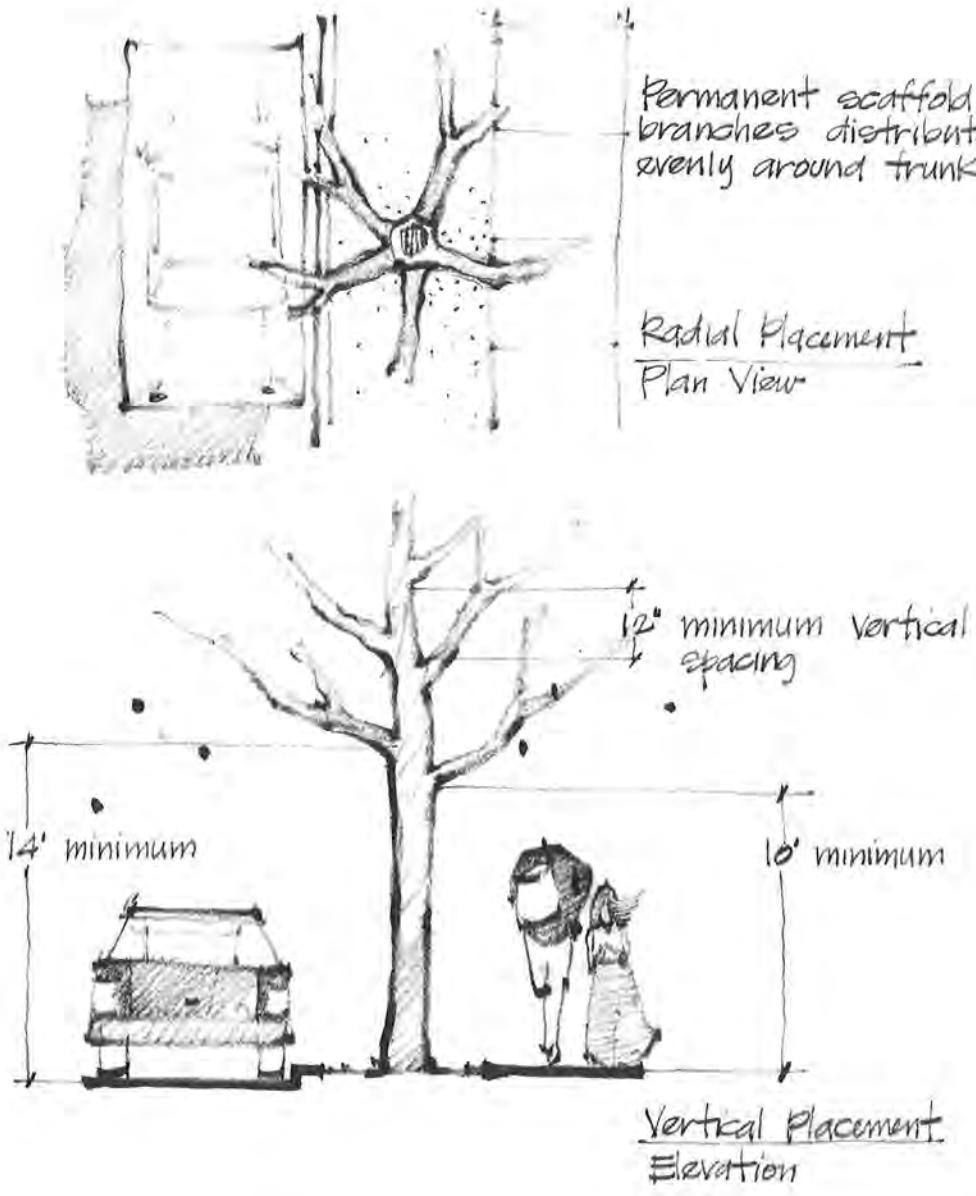
Correct method of thinning out trees.

Branching clearance and the shape of the tree canopy can be controlled by pruning. It is important to identify scaffold branches, those permanent branches which form the basic structure of the tree, before pruning cuts are made. Tree branches grow radially from a trunk in a more or less symmetrical pattern. Limbs lopped from only one side destroy the form of the canopy.

Large limbs should be cut in two stages using three cuts as shown in the diagram. This prevents the bark or wood from being ripped down the trunk causing a huge wound. Branches should be cut off cleanly at the connection where a series of ridges or shoulder rings is usually visible. The wound will then heal quickly. A "coathanger stub" never heals.

Considerable controversy surrounds the use of wound dressing. Traditionally the use of such a material (usually a black asphaltic emulsion) has been similar to the use of iodine on a cut finger—to prevent infection. What can happen is this: the thick tarry substance hardens, cracks and provides a moist environment in which disease organisms can enter and grow rapidly. Therefore, its purpose is contradicted. Small sized wounds (1 to 3 inches) on properly made cuts heal very rapidly. Even larger cuts, if made at the proper place and angled to drain water, will remain dry and heal in a few years. The main principle is to keep the wound dry.

This is also true for large cavities caused by interior rotting at a wound or at the base of a tree. The practice of filling the cavity with cement simply seals the heartwood in a moist chamber which hastens rotting. Keeping the cavity dry and open is essential. Occasionally a small pipe (1/2 to 3/4 inches diameter) must be inserted in a hole drilled at an angle up to the bottom of the cavity. This will insure drainage of the wound. Use plastic irrigation pipe, *not copper pipe* which is toxic to plants.



Placement of permanent scaffold branches.

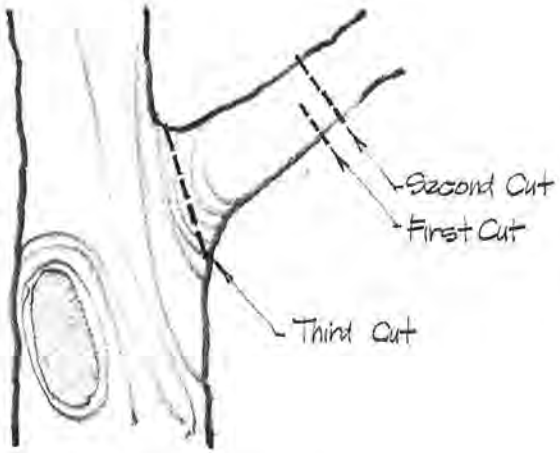
To summarize and simplify pruning practices let us look at the principal goals to be achieved:

- removal of dead, diseased or broken branches;
- directing growth to improve tree form;
- controlling size (within limits).

Pruning for the sake of habit or ritual should be avoided. If the tree or trees do not require any of the above training, pruning is not required.

A conservative rule of thumb is stressed - **when in doubt, don't prune!**
At least don't overprune.

There are a number of other problems for which maintenance procedures are required. Some of these are covered in the section on Tree Preservation. Others, such as Mistletoe control or maintaining old Walnut trees are special problems. Information on these is available free in pamphlets from the Agricultural Extension Service of the University of California. A few are listed under the References at the end of this Plan.



Removal of a large limb.

Correct method of branch removal.

TREE PRESERVATION

Cultural attitudes can be observed by how people treat their environment. People destroy, preserve, revere and neglect trees. All these actions can be read in the landscape and indicate the varied attitudes that exist. A city can also have a cultural attitude toward its environment and specifically toward its trees. If the care and preservation of its trees is placed low on the list of priorities, future generations will inherit a legacy of neglected, abused and dead trees. Cultural ambivalance or apathy can have the same results. Only an aggressive, consistent, pro-tree policy can be effective for both today and the future. The excuse—lack of funds—means lack of commitment. It is a question of attitude, not resources. Oakland has all but lost its Oaks; Walnut Creek, its Walnuts (certainly the creek). Lafayette is not *named* for its trees, but is *known* for them.

With a positive commitment, the City of Lafayette adopted in Ordinance Number 38 the basic attitude that the City's trees warrant protection. The Ordinance gives the legal guidelines to this end. The design guidelines in this Plan are intended to help implement the City Code. Merely allowing trees to stand does not insure their preservation. There are a number of declining, old trees in the City which have been left, *but not preserved.* Technically, the code was fulfilled—the trees were not cut down. Nevertheless, their slow death is sufficient evidence to warrant special regulations for their preservation.

Like all living things, trees too are born, live, reproduce and die. Some species of trees, such as Oaks, live much longer than others, but people, through mistakes, can cause the premature death of any tree.

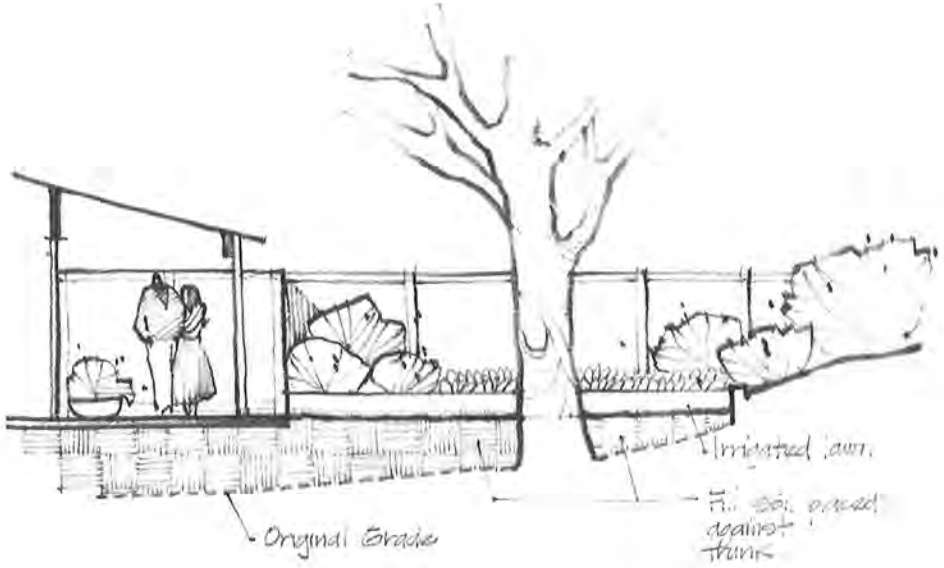
The following recommendations are developed to protect existing trees, particularly native Oaks, against the most commonly encountered errors. Trees live in a delicate balance, but can survive minor stress and damage. Major changes to their environment or structure will almost certainly cause their demise.

Each of the following situations causes a drastic change in a tree's environment. Frequently several of these situations are combined to speed the process of decline or death:

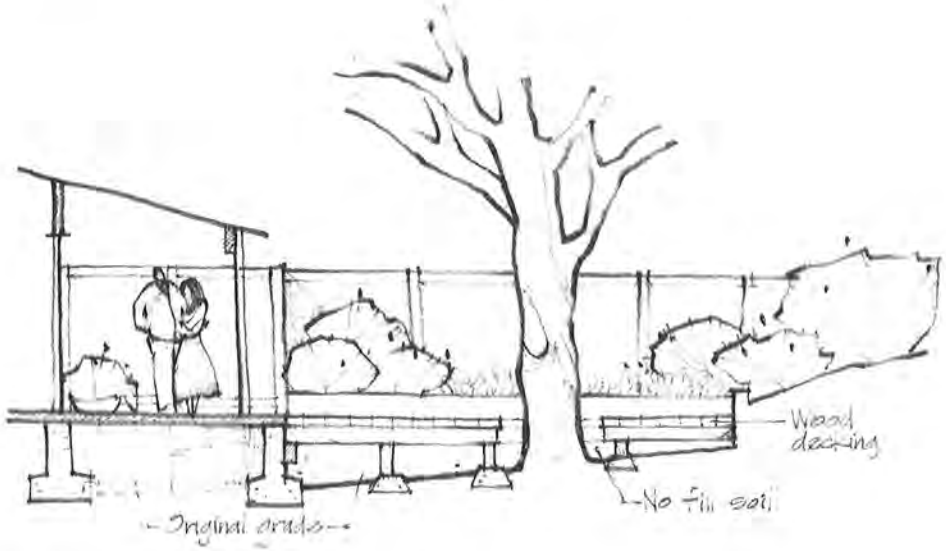
- Fill soil placed around the trunk;
- Water drainage directed toward the trunk;
- Excessive pavement over roots;
- Extensive root removal;
- Trunk and limb damage;
- Excessive pruning (heading back);
- Change of moisture level with irrigation.

Let us look at how each affects most trees.

Fill soil placed around the trunk provides a moist environment around the normally dry bark which encourages the growth of rot inducing organisms; the bark and cambium layer are killed. If the tree is girdled completely (bark killed all around the trunk), the entire tree will die. **There should be no fill soil placed against the trunk.**

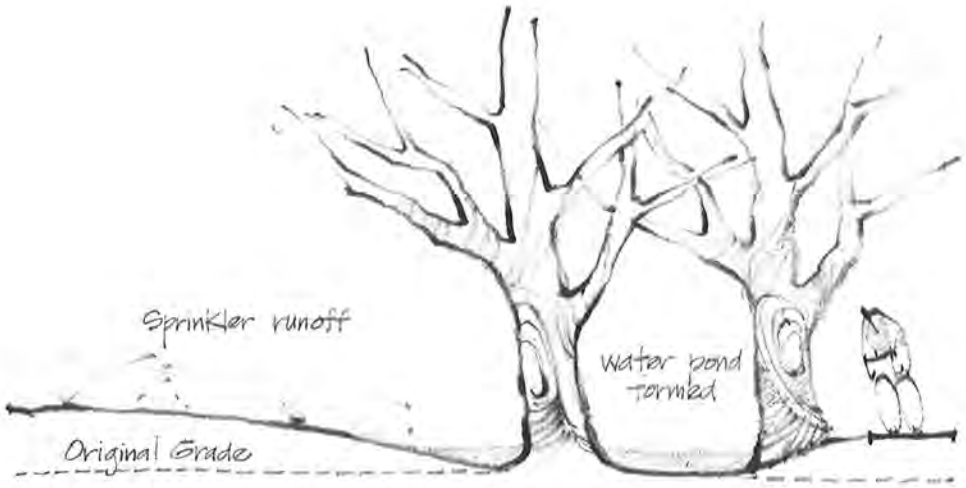


Fill soil placed around trunk of mature tree; tree eventually dies.



Original grade maintained by using decking around tree.

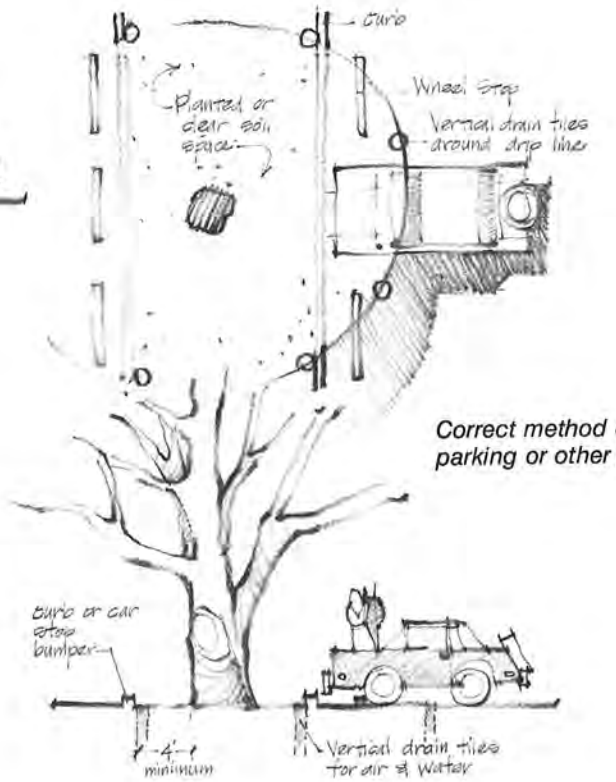
Water drainage directed toward the trunk as a result of grading causes constantly moist soil at the normally dry base (root crown) of the tree and innundation for extended periods in winter. Crown rot organisms are favored and attack at the soil line, weakening and eventually killing the entire tree as above. **The grade of the soil should always be sloped away from the base of the tree. Catch basins and drain lines tend to clog and are not good, permanent solutions.**



Incorrect grading directs water toward trunk; crown rot develops in constantly wet soil.

Pavement over entire root system cuts off air and water from roots and encourages parking too close to trunk.

Pavement over the entire root system up to the trunk creates an impermeable seal preventing air and water from entering the soil. The result is suffocation and possible dehydration during summer months causing weakening and gradual decline of the tree. Tree roots need air as well as water, both of which are carried to the roots in the open pore spaces of the soil. Compacted fill over the root zone can create the same problem. **Pavement should be held at least 5 feet back from the trunk and sections of perforated drain pipe should be inserted in the pavement around the dripline of the tree.**



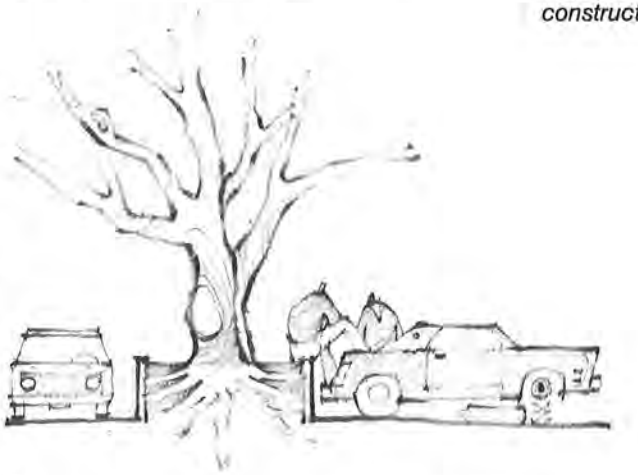
Correct method of paving around mature trees in parking or other paved areas.

Alternative sidewalk paving to preserve mature tree.

In Lafayette sidewalks are being installed along many older streets which were not initially planned for walks. Mature trees, both native and introduced, frequently occur close to the street pavement. Fortunately these trees are not being cut down arbitrarily to accommodate the walk. Nevertheless, the question of how close to pave to the tree inevitably arises. **As a rule sidewalk pavement should be held back a minimum of 3 feet from the trunk. This allows for both trunk and root expansion. Where this is impossible or where trees lie in the path of the sidewalk, the walk should be "paved" around the tree for a distance of 6 feet or more with porous material such as compacted quarry waste (a type of fine gravel). This will allow for root and trunk expansion without destruction of the sidewalk.**

Excessive pruning (heading back) of large tree limbs creates an imbalance with the root system and permanently disfigures the tree. The result is the development of brushy growth along the upper trunk and remaining limb stubs. These shoots are weakly attached and if allowed to develop to a large size are subject to breaking and falling in the wind. **Normally the only top pruning necessary is to remove dead or damaged branches and light thinning to balance any root pruning.**

Extensive root removal caused by cutting too close to a tree during grading deprives the tree of water, food and air. Most roots are normally found in the top four feet of soil spreading radially out from the trunk. Removal of one or more large diameter (2 inches or more) roots removes a larger network of root tips causing an imbalance with the top foliage of the tree. Extensive dieback and sometimes death will occur in severly root pruned trees. **As a general rule, no extensive cutting (lower than one foot) should occur within the dripline of the tree. Any root pruning should be balanced with an equal proportion of top thinning.**



Incorrect grading–excessive root removal close to trunk.

Trunk and limb damage from equipment causes open wounds which are susceptible for entry of disease organisms or insects. Limbs can be torn with extensive strips of bark ripped down the entire trunk. Gashes in the trunk take years to heal and may set back the tree. Complete girdling will kill the tree. **All trees must be protected during construction by a barrier.**

Tree protection barriers for use during site construction work.

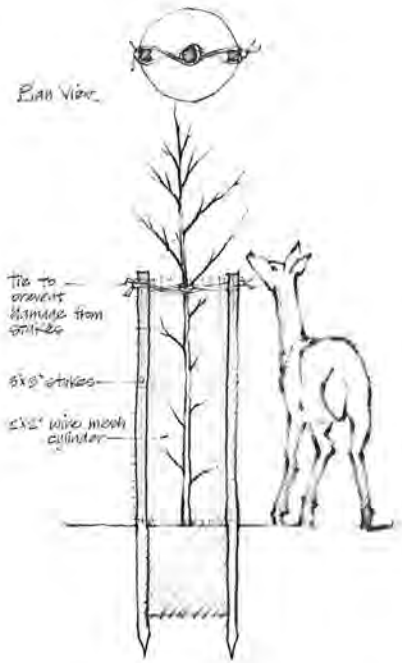
Changing the moisture level through the installation of an irrigation system establishes a moist soil environment conducive to the growth of plant pathogens. The most destructive are Oak Root Fungus *(Armillaria mellea)* and various types of Crown Rot organisms. Oak Root Fungus and Crown Rot organisms are always present in California soils. Trees subjected to excessive soil moisture at the base can be weakened by Crown Rot organisms which are directly favored by the moisture. Oak Root Fungus can then invade the weakened tree and combine with the Crown Rot organisms to speed its decline. Anything that weakens a tree increases its susceptibility to disease. This is true for physical damage to the root system as well as excessive soil moisture.

There is no effective means of chemical control of Oak Root Fungus. The only real preventative is to keep the soil around the tree dry during summer. Certain Crown Rot organisms can be controlled chemically, but the only permanent control is to keep the base of the trunk and at least three feet of adjacent soil dry.

There are other possible types of damage that can be caused either during construction or in the ensuing maintenance of old trees. Nevertheless, the above situations are the most common. Preventing the errors that lead to these types of damage will not insure the preservation of a mature tree. What is certain is that any one or a combination of these conditions can cause severe damage or death to the tree.

TREES FOR SPECIAL SITUATIONS

The trees listed in the foregoing sections of this Plan cover the primary trees recommended for use in Lafayette. There are a number of special situations or problems that are frequently encountered which deserve mention and recommendations. The question of what to plant in heavily populated deer areas is of primary importance to many residents. Fall color is another interest for those of us who have been transplanted from the East. These and other lists of trees are provided in this section as supplements to those already given. *The Sunset Western Garden Book* and various Agricultural Extension Service publications mentioned in the References give additional lists.



Tree protection from deer browse.

Deer Resistant Trees

With protection from fire, low shrubs and brush which are a natural deer browse vegetation grow taller and coarser. Deer accustomed to feeding on this chaparral can no longer forage there and seek more available and more succulent growth. Obviously, lush gardens provide the delectable feasts. In addition, deer populations have exploded because natural predators (primarily mountain lions) have all but disappeared and hunting is prohibited around urban areas. Thus we have a serious conflict when attempting to grow trees and especially lower growing shrubs.

Deer can damage trees in three ways:

- Eating the tender, young foliage;
- Stripping and eating the young bark;
- Rubbing the bark of young trees to remove velvet from their antlers.

The last two types of damage can girdle the trunk and kill the entire top of the tree. If this happens, the tree should be cut back to below the damaged area or to about 6 inches above the ground. Many trees will resprout and with the protection of a wire cylinder can quickly regain their original size. Selective removal of the weaker shoots can encourage one or more stronger sprouts.

Trees eventually grow beyond the browse level of deer, roughly up to 8 feet from the ground. Nevertheless, they must be protected from damage for the first few years. This can be accomplished by constructing a protective wire cylinder around the young plants.

There are some trees which are considered to be "deer-resistant." Actually, if a deer is hungry enough, he will eat almost anything. The following list is extracted from "Deer Resistant Plants for Ornamental Use" by Cummings, Kimbal and Longhurst University of California Extension Service Leaflet #167. It is not foolproof (the deer have not read it), but it can be used as a guide for tree selection in heavily browsed areas of Lafayette.

DEER RESISTANT TREES FOR LAFAYETTE

The asterisk (*) indicates a California native.

Plant Name

Albizia julibrissin—**Silk Tree**
Arbutus unedo—**Strawberry Tree**
Catalpa bignonioides—**Common Catalpa**
Cedrus species—**Cedars**
Celtis australis—**European Hackberry**
Ceratonia siliqua—**Carob**
*Cercis occidentalis—**Western Redbud**
Cornus capitata—**Himalayan Dogwood**
Cotinus coggygria—**Smoke Tree**
Crataegus species—**Hawthorns**
Diospyros virginiana—**Persimmon**
Eucalyptus species—**Eucalypts, Gums**
Ficus carica—**Edible Fig**
Fraxinus velutina—**Arizona Ash**
Ginkgo biloba—**Maidenhair Tree**
Ilex aquifolium—**English Holly**
*Lyonothamnus floribundus—**Catalina Ironwood**
Maclura pomifera—**Osage Orange**
Magnolia species—**Magnolias**
Maytenus boaria—**Mayten Tree**
Melia azedarach—**China-berry Tree**
*Myrica californica—**Wax Myrtle**
Nerium oleander—**Oleander**
Olea europaea—**Olive**
Paulownia tomentosa—**Empress Tree**
*Pinus species—**Pines (some species are not California natives)**
Platanus racemosa—**Western Sycamore**
Robinia pseudoacacia—**Black Locust**
Schinus molle—**California Pepper Tree**

In addition, all palm trees are resistant to deer browse, but are excluded as being visually incompatible with the natural woodland character of Lafayette.

TREES TO ATTRACT BIRDS

The asterisk (*) indicates a California native.

Plant Name	Features
Acer campestre **Hedge Maple**	shelter, nesting
*Aesculus californica **California Buckeye**	flowers
A. carnea **Red-flowering Horsechestnut**	flowers
Alnus cordata **Italian Alder**	catkins
*A. rhombifolia **White Alder**	catkins
Albizia julibrissin **Silk Tree**	flowers
*Arbutus menziesii **Madrone**	berries
Celtis australis **European Hackberry**	berries
Crataegus species **Hawthorns**	fruit, nesting, insects
Eucalyptus species **Eucalyptus**	flowers
*Juglans hindsii **Black Walnut**	fruit, insects
Liquidambar styraciflua **American Sweetgum**	seeds
Magnolia grandiflora **Southern Magnolia**	seeds
Malus species **Crabapples**	fruit
Photinia serrulata **Chinese Photinia**	fruit
Pinus species **Pines**	seeds, insects, nesting
Platanus species **Plane Tree, Sycamore**	seed clusters, nesting
Quercus species **Oaks**	acorns
Salix species **Willows**	nesting, insects
Ulmus species **Elms**	seeds

Trees to Attract Birds

Most of us are aware of the close relationship that occurs between birds and plants. We see Robins and Cedar Waxwings feeding on Pyracantha shrubs in the winter, sassy Scrub Jays robbing acorns, Hummingbirds flitting among flowering plants and Red-tailed Hawks soaring over the open hillsides. Many people are interested in attracting birds to their gardens and seek plant lists as a guide of what to plant. Plant lists concentrate on plants that attract birds either for food or nectar. Plants and planting can do far more.

In a recent graduate study of the relationship between birds and suburban development in Moraga Valley, Malcolm Sproul of the Department of Landscape Architecture at the University of California-Berkeley has discovered a number of interesting bird-plant relationships in addition to the obvious berry flower producing attractants. The habitats that various birds seek can be an influential part of any planting scheme or maintenance program. Cavity-nesters such as the Western Bluebird seek holes in dead trees to nest. Obviously elimination of all dead wood or trees will discourage such birds. Towhees seek the shelter of loose shrubs, but avoid the commonly planted Junipers. The Sparrow Hawk, Red-tailed Hawk and Meadowlark require open grassland. As these grasslands disappear or are allowed to develop into chaparral or woodlands, these birds will likewise disappear. The greater the diversity of vegetation, the greater diversity of birds. Some birds nest high in tall trees, others in small trees or shrubs.

Therefore planting of berried trees and shrubs or flowering plants is only a small part of enriching our environment with bird life. Preserving natural habitats, foraging grounds and hunting areas is equally important. Space here does not permit a detailed investigation of this subject. The important point is to encourage a community-wide consciousness of the importance of preserving diverse habitats. This means protecting the natural woodland—both riparian and hillside—as well as open grassland. Where replanting is done the use of as many trees and shrubs native to Lafayette should be encouraged. Channelized creeks will eliminate large populations of birds. Replanting with riparian plants along modified streams will encourage the return of birds that enjoy that habitat.

Three trees stand out as supporting the most diverse bird populations year 'round—California Black Walnut, Valley Oak and Coast Live Oak. Woodpeckers seek insects in the bark. Scrub Jays feed on the walnuts and acorns in summer; the numerous insect feeders inhabit the high foliage canopy.

The accompanying list suggests a few additional trees to consider and the type of attraction they afford. Lists of shrubs can be obtained from other references such as the Sunset book, *Attracting Birds to your Garden.*

Trees for Fall Color

Because of the special semi-continental nature of the climate of Lafayette, many deciduous trees can be grown that display outstanding foliage color in the fall. The following list comprises the trees most suitable for public and private plantings. Some of these trees are not mentioned on other lists, but are suitable for private gardens.

Frost Tender Trees

Winters vary in Lafayette. During some mild winters, temperatures rarely go below about 22° F (14° C). However, in December 1972, lows were recorded between 17° F (11° C) and 19° F (12° C) intermittently for a week and many mature trees were killed.

A number of subtropical evergreen trees commonly grown west of the East Bay Hills are unsuitable for Lafayette because of tenderness to cold temperatures (32° F or 0° C or below). Many of these trees are hardy to only 25° F (16° C) for short intervals. These will almost certainly be killed in Lafayette during one winter or another and should be avoided. Another group of trees are damaged about 20° F (12.5° C). These are considered marginal here and should not be depended upon for permanent plantings. The accompanying list is included to help prevent costly mistakes in tree selection.

TREES FOR FALL COLOR

The asterisk (*) indicates a California native.

Plant Name

Gold-Yellow Foliage

*Acer macrophyllum—**Bigleaf Maple**
*Acer negundo—**Boxelder**
Fraxinus velutina 'Modesto'—**Modesto Ash**
Ginkgo biloba—**Maidenhair Tree**
Gleditsia triacanthos inermis 'Shademaster'—**Shademaster Honeylocust**
Koelreuteria paniculata—**Goldenrain Tree**
Liquidambar styraciflua (selected cultivars)—**American Sweetgum**
Liriodendron tulipifera—**Tulip Tree**
Morus alba 'Fruitless'—**Fruitless Mulberry**
*Populus fremontii—**Fremont Cottonwood**
P. nigra 'Italica'—**Lombardy Poplar**
Salix babylonica—**Weeping Willow**

Orange to Orange-Red Foilage

*Acer circinatum—**Vine Maple**
Acer palmatum—**Japanese Maple**
Crataegus phaenopyrum—**Washington Thorn**
Diospyros species—**Persimmons**
Lagerstroemia indica—**Crape Myrtle**
Liquidambar Styraciflua (selected forms)—**American Sweetgum**
Oxydendrum arboreum—**Sourwood**
Pistacia chinensis—**Chinese Pistache**

Red-Scarlet-Burgundy Foilage

Acer rubrum—**Red Maple**
Cercidiphyllum japonicum—**Katsura Tree**
Crataegus lavallei—**Carriere Hawthorn**
C. phaenopyrum—**Washington Thorn**
Fraxinus oxycarpa 'Raywoodii'—**Raywood Ash**
Liquidambar styraciflua (selected forms)—**American Sweetgum**
Nyssa sylvatica—**Sour Gum**
Prunus cerasifera 'Atropurpurea'—**Purpleleaf Plum**
Quercus coccinea—**Scarlet Oak**
Q. rubra—**Red Oak**

FROST TENDER TREES TO AVOID

Plant Name	Marginal in Lafayette	Avoid Altogether
Acacia longifolia— Sydney Golden Wattle	•	
Casuarina stricta— Beefwood		•
Citrus species— Lemons, Oranges, Grapefruit	•	
Dodonea viscosa— Hopseed Bush	•	
Eucalyptus citriodora— Lemon-scented Gum		•
E. ficifolia— Scarlet-flowering Gum		•
E. lehmannii— Bushy Yate		•
E. globulus— Blue Gum	•	
Grevillea robusta— Silk Oak	•	
Jacaranda species— Jacarandas		•
Leptospermum laevigatum— Australian Tea Tree		•
Leucadendron argenteum— Silver Tree		•
Melaleuca styphelioides— Prickly Melaleuca		•
M. quinquinervia— Cajeput Tree		•
Metrosideros excelsa— New Zealand Christman Tree		•
Myoporum laetum—		•
Persea americana— American Avocado		•
P. indica— Indian Avocado		•
Pinus canariensis— Canary Island Pine	•	
Pittosporum undulatum— Victorian Box		•
Podocarpus gracilior— Fern Pine	•	
Schinus molle California Pepper	•	
S. terebinthifolius— Brazilian Pepper		•
Syzygium paniculatum— Australian Brush Cherry		•
Tristania conferta— Brisbane Box		•

GLOSSARY OF TERMS

The various specific terms used throughout the text are arranged in similar groupings relating to their use.

Tree Types

Broadleaf Evergreen—evergreen tree having more or less broad leaves similar to those of deciduous trees; leaves remain on branches for two or more years.

Coniferous Evergreen or Conifer—what most people call "evergreens"; any tree with narrow needle-like leaves that bear cones or conelike structures (Cedar, Pine, Fir). Not all conifers are evergreens (Dawn Redwood, Bald Cypress).

Deciduous—a tree that sheds all of its leaves annually.

Semi-deciduous or Semi-evergreen—a tree that retains some of its leaves during a mild winter (Evergreen Pear); it may lose all of its leaves during cold winters.

Vegetation Types

Chaparral—a general name for the dense, shrubby, evergreen vegetation; from the Spanish meaning "place of the Scrub Oak."

Riparian—a general term for the vegetation found growing along streams and creeks.

Horticultural Terms

Balled and Burlapped (B & B)—a type of nursery plant stock in which the plant has been field dug and the rootball wrapped with burlap and tied with string. Plants are available in this form for a very brief period during the winter, usually conifers in this area.

Bare Root—another type of field dug tree (always deciduous); soil is absent from roots, therefore root defects are easily detected. Also available for short time in winter months.

Container Tree—trees grown and sold in a container according to container size—5 and 15 gallon cans, various sized boxes from 16 inches up to 4 feet.

Dripline—a line you might draw on the ground around a tree directly beneath its outermost branches where rain water tends to drip. The term is used in regard to grading around trees.

Hardiness—refers to the cold tolerance of a tree, not its ability to withstand abuse or difficult growing conditions. A "hardy" tree is one that tolerates temperatures below freezing or to about 15° F in Lafayette.

Mildew—a fungus disease usually made visible by a powdery or chalky substance on the leaves (the fruiting and growth structures of fungus).

Organic Matter—organic soil additive or conditioner such as peat moss, sawdust, manure or compost; used to make humus which results in more friable, porous soil.

Pruning Terms

Heading Back—one of two types of pruning cuts in which a branch is cut back to a bud to increase bushiness or limbs cut back to reduce the size or height of a tree. For the other type of cut see **Thinning Out.**

Lateral Branch—a branch arising from a bud on the side of the main trunk or leader; grows in a horizontal or upward angled fashion.

Leader—the vertical, central, upright branch which ultimately forms the trunk.

Scaffold Branches—the permanent branches of a tree that form its structure. Branches do not increase in height as a tree grows and always remain in the same position on the tree.

Standard Tree—a shrub that has been pruned up into a tree (Oleander); a normally multi-trunked tree that has been pruned into a single trunk (Olive).

Sucker—very vigorous shoot arising from the base of a tree; should be removed to prevent a brushy tree form. See also **Watersprout.**

Thinning Out—the second type of pruning cut in which entire branches—large or small—are removed back to a lateral branch or the main trunk. The objective is to develop a more open tree canopy or lighten a top-heavy young tree.

Watersprout — long, vigorous shoot arising from a main limb or just behind a pruning stub; should be removed to prevent crowded branching.

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The first five references are generally available in local bookstores except for the Chevron Chemical Company booklet which can be obtained from:

Chevron Chemical Company,
200 Bush Street,
San Francisco, California 94120.

Agricultural Extension publications may be obtained from the Agricultural Extension Service by writing to:

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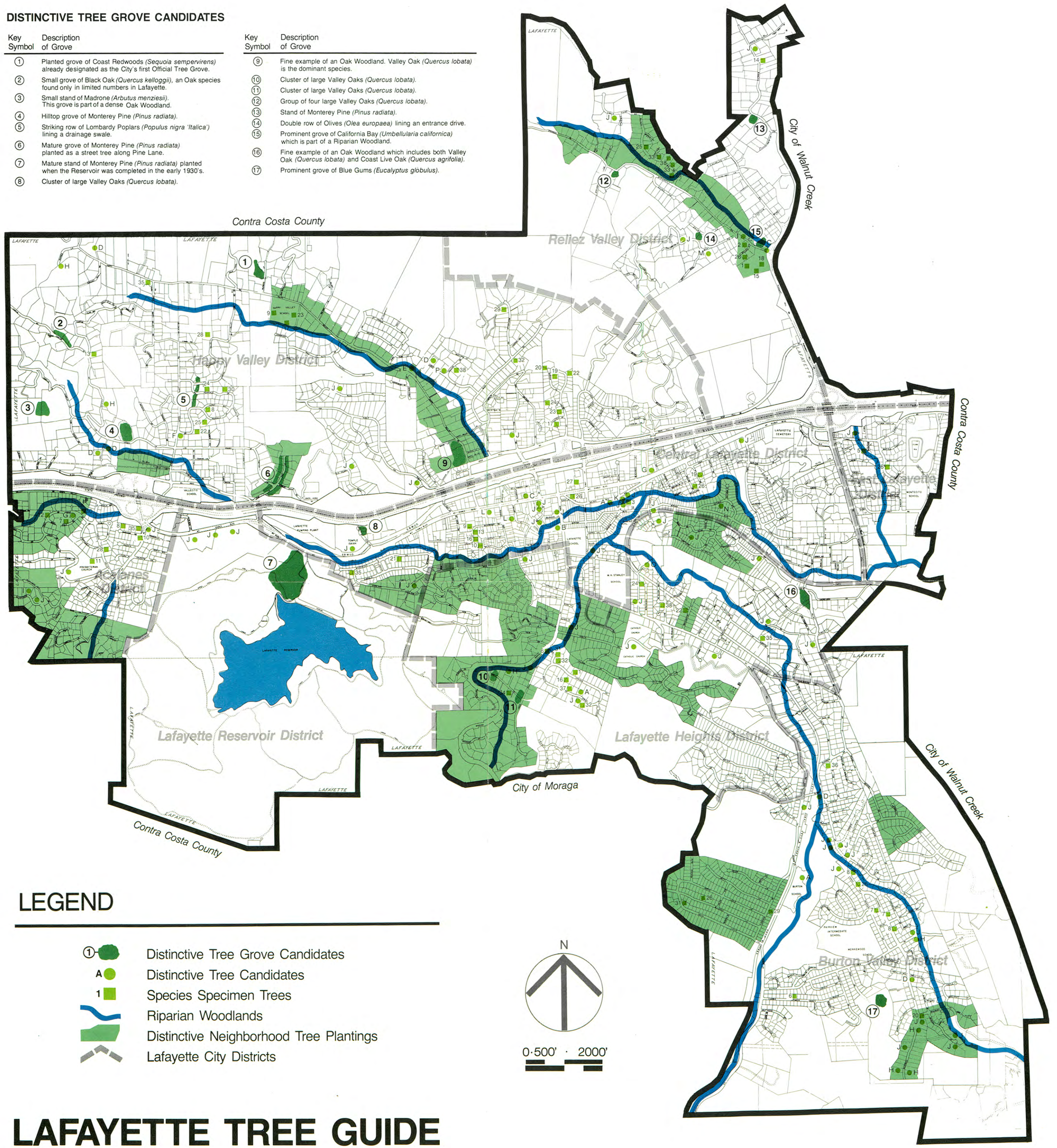
DISTINCTIVE TREE GROVE CANDIDATES

Key Symbol	Description of Grove
①	Planted grove of Coast Redwoods *(Sequoia sempervirens)* already designated as the City's first Official Tree Grove.
②	Small grove of Black Oak *(Quercus kelloggii)*, an Oak species found only in limited numbers in Lafayette.
③	Small stand of Madrone *(Arbutus menziesii)*. This grove is part of a dense Oak Woodland.
④	Hilltop grove of Monterey Pine *(Pinus radiata)*.
⑤	Striking row of Lombardy Poplars *(Populus nigra 'Italica')* lining a drainage swale.
⑥	Mature grove of Monterey Pine *(Pinus radiata)* planted as a street tree along Pine Lane.
⑦	Mature stand of Monterey Pine *(Pinus radiata)* planted when the Reservoir was completed in the early 1930's.
⑧	Cluster of large Valley Oaks *(Quercus lobata)*.
⑨	Fine example of an Oak Woodland. Valley Oak *(Quercus lobata)* is the dominant species.
⑩	Cluster of large Valley Oaks *(Quercus lobata)*.
⑪	Cluster of large Valley Oaks *(Quercus lobata)*.
⑫	Group of four large Valley Oaks *(Quercus lobata)*.
⑬	Stand of Monterey Pine *(Pinus radiata)*.
⑭	Double row of Olives *(Olea europaea)* lining an entrance drive.
⑮	Prominent grove of California Bay *(Umbellularia californica)* which is part of a Riparian Woodland.
⑯	Fine example of an Oak Woodland which includes both Valley Oak *(Quercus lobata)* and Coast Live Oak *(Quercus agrifolia)*.
⑰	Prominent grove of Blue Gums *(Eucalyptus globulus)*.



LEGEND

- ① — Distinctive Tree Grove Candidates
- A — Distinctive Tree Candidates
- 1 — Species Specimen Trees
- Riparian Woodlands
- Distinctive Neighborhood Tree Plantings
- Lafayette City Districts

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LAFAYETTE TREE GUIDE