

Street Tree Planting Plan

ACKNOWLEDGEMENT:

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Existing Conditions

The City of Watsonville has a great deal to build on in terms of urban form and character. Its scale, street pattern, development density and the influences of the natural and agricultural landscape all combine to create a charming and livable city. Watsonville's citizens show pride in their city, and their neighborhoods are well cared for. Watsonville's climate is ideal for a wide range of plants and street trees and many of the city's streets and landscapes exhibit a unique and rich planting character. Some of the city's historic neighborhoods and its newest developments have a rich urban forest that illustrates Watsonville's potential to be a tree-filled city.

Based on a sample tree inventory performed for this report, some characteristics of Watsonville's urban forest are:

- The sample inventory found a total of 36 distinct tree species.
- The relative age structure of Watsonville's public tree population is intermediate, with less than 1% of trees measuring greater than 24 inches DBH. This means that the age distribution of trees will progress toward a healthy balance as new trees are planted, with few trees currently at the end of their lifespan.
- Watsonville's tree resource is in relatively good condition overall, with 36.5% of trees rated good or better and 60% rated fair.
- Watsonville's public tree population has sequestered 631.1 tons of carbon (CO₂) to date, valued at \$9,467.

Overall, however, the city has a dearth of street trees. The City's tree canopy coverage, including not only street trees but also trees on private property, is approximately 7.8%. A city with Watsonville's climate can reasonably set a goal of 40% canopy cover. For Watsonville, this would mean planting an additional 1,350 acres of tree canopy, approximately 46,600 additional trees. At an approximate cost of \$300 per tree, this would require an investment of \$14 million.

Most of any city's trees are on private property or large public open spaces and nature preserves. However, street trees can contribute significantly to the overall canopy coverage. For example, the City of Burbank, CA, which is similar to Watsonville in size and density, has over 20% canopy coverage in its municipal public spaces, including streets. Moreover, street trees contribute most to the quality of the public environment, since streets comprise approximately 90% of the total public open space of a typical city. With approximately 1,500 existing street trees, it is clear that Watsonville's public streetscape realm has a huge potential to incorporate more street trees.



A typical treeless street in Watsonville.



Comparison of typical streets in Burbank, CA (left) and Watsonville (right).



Map showing the existing street trees in the public realm.

The Value of Trees

A healthy urban forest provides a number of benefits to the community. Some of these benefits are:

- **Increased home value:** Landscaping, particularly with trees, adds monetary and aesthetic value to a home. Studies have shown that street trees can increase a home's value by 7 – 20%.
- **Decreased crime:** According to a 2001 University of Illinois study, trees and greenery can cut crime significantly: "Compared with buildings that had little or no vegetation, buildings with high levels of greenery had 48 percent fewer property crimes and 56 percent fewer violent crimes. Greenery lowers crime through several mechanisms. First, greenery helps people to relax and renew, reducing aggression. Second, green spaces bring people together outdoors, increasing surveillance and discouraging criminals. Relatedly, the green and groomed appearance of an apartment building is a cue to criminals that owners and residents care about a property and watch over it and each other." (<http://lhl.illinois.edu/crime.htm>)
- **Calmed traffic:** Trees planted along streets create an environment that makes drivers more aware of their surroundings, which includes pedestrians, and drivers will reduce their speed. Studies indicate that street trees can result in automobile speed reductions of 4 – 7 miles per hour, even without any other changes to the roadway.
- **Reduced energy use:** Trees provide natural shade for buildings during hot summer months, and deciduous trees allow in winter sunlight and solar gain.
- **Reduced global warming:** Trees naturally absorb and store atmospheric carbon dioxide, thereby slowing climate change. According to the tree inventory done for this study, the public trees in Watsonville are estimated to currently sequester 54.5 tons of atmospheric CO2 per year. An additional 42.4 tons is avoided through decreased energy use.
- **Improved air quality:** Trees remove carbon dioxide from the atmosphere, while releasing oxygen into it. These two processes are among the most important for human and environmental health. The trees' foliage also traps particulates, essentially filtering the air to a higher level of quality.
- **Absorb storm water:** The network of a tree's roots extends far into soil, stabilizing it, and absorbing more water than soil alone can hold. Stable, permeable soils allow more water to be absorbed and causing less surface runoff into streets and water bodies.
- **Create urban habitat:** Trees, along with understory plants, provide refuge and homes for animals such as songbirds, and other small animals escaping predators. A diversity of urban wildlife is ensured when trees and landscaped areas are present.
- **Psychological benefits:** Living and playing in areas that are green with trees and plants improves general emotional wellbeing for children and adults. Neighborhoods that have trees growing in them have stronger community ties, with residents more likely to feel safe and to socialize.
- **Improved public health:** A city with urban trees is a city that addresses the civic and environmental topics listed above. Healthier, more economically viable cities value the importance of urban trees as an integral part of their society.
- **Encourage economic development:** Street tree planting can be a catalyst for economic development on sites adjacent to improved public streets.
- **Trees are beautiful:** Some qualities of trees can't be easily measured, such as their green leaves, their flowers or fruit, a leaf's color change in autumn, or the winter appearance of branches against the sky. Additionally, trees can be landmarks or reminders, and can define the character of a neighborhood.



This downtown section of Main Street has a well-established street tree canopy.

Understanding Watsonville

This Street Tree Planting Plan endeavors to describe the opportunity for street trees to reinforce and enhance the unique character of Watsonville on a city-wide and neighborhood scale. From the perspective of increasing tree canopy coverage and achieving the ecological and economic value of street trees described above, it may be sufficient to identify trees that are suited to Watsonville's climate, identify the potential locations for street tree planting, prioritize areas for initial implementation, and begin planting trees. A well-thought-out citywide street tree planting plan can add more to the quality of the city by enhancing the city's form and character. This approach combines urban greening with "place-making" to achieve ecological, economic and cultural goals.

Watsonville's form and character has three main influences: The cultural influence, which includes its historic development, architectural character, pattern of land use, and circulation networks; the agricultural influence, which is apparent around the city's perimeter and its overall setting in this rich and productive agricultural region; and the natural influence, which is primarily expressed in the sloughs and the Pajaro River corridor. Each of these influences is described below.

CULTURAL INFLUENCE – NEIGHBORHOOD CHARACTER

Watsonville consists of 30 neighborhoods, some of which are quite small. These neighborhoods are mapped in Figure 2. These neighborhoods are a result of historic growth patterns, which are simplified here into six general categories:

- Residential Ranch Style
- Residential Two-Story
- Residential Bungalow
- Residential New Development
- Commercial Mixed-Use
- Industrial

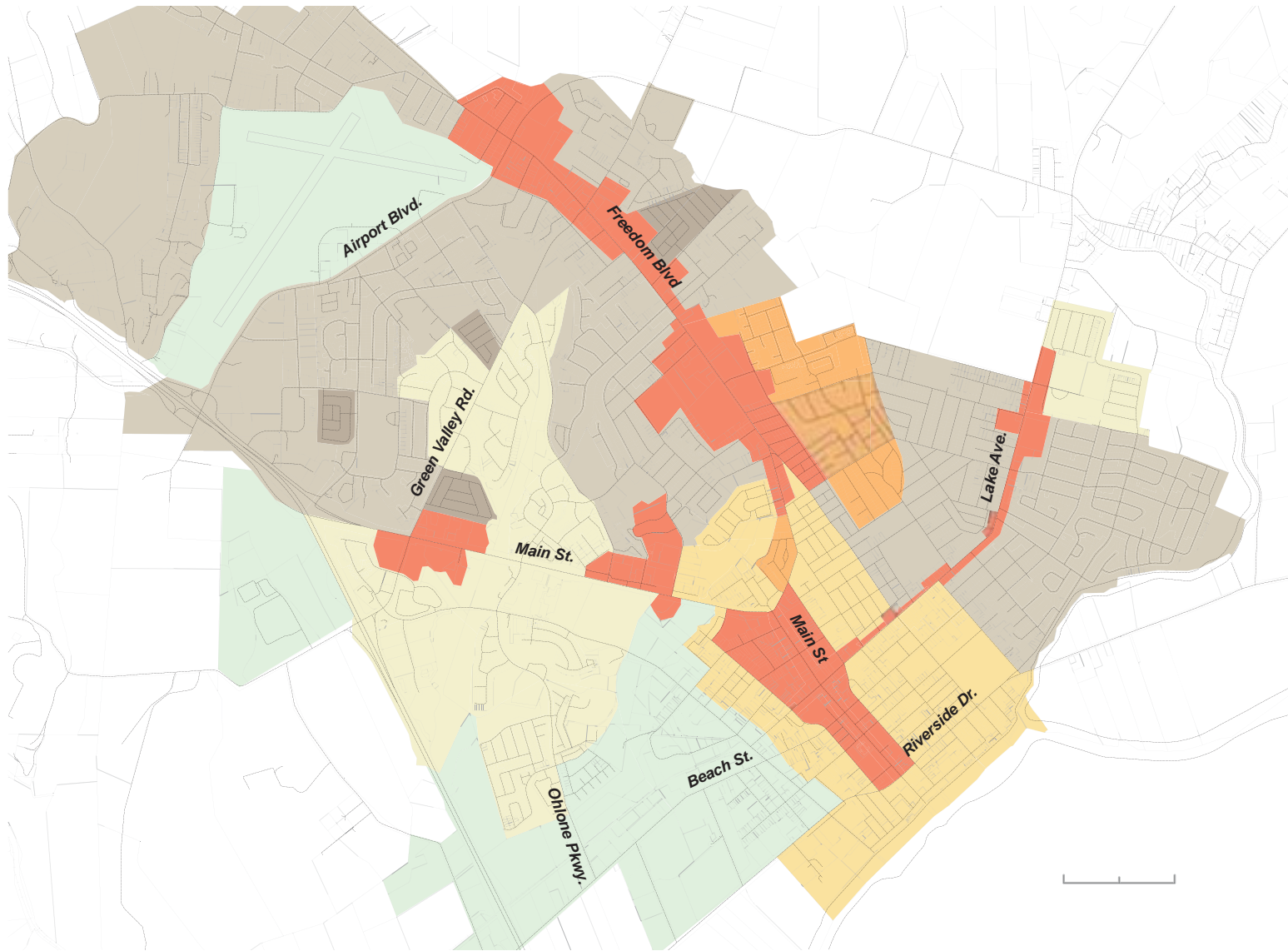
The downtown commercial mixed-use area and bungalow-style residential neighborhoods are the earliest historical areas of Watsonville. The next areas to develop historically were the ranch-style and two-story neighborhoods, which were mostly built in the '80s. The most recent residential development areas tend to be located near the sloughs. The main industrial zone of the city is associated with the food processors toward the south. In addition to the downtown



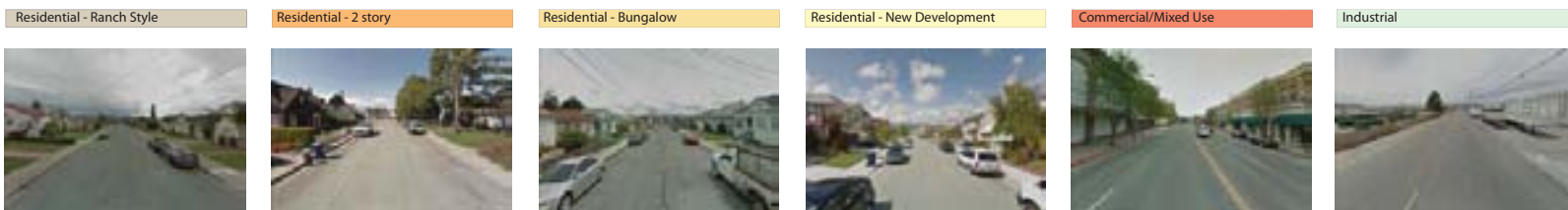
A new development in Watsonville with planted tree strips.



Sections of Tuttle Avenue have large established trees in front yards.



Neighborhood Character



Neighborhood Character Map

mixed-use commercial zone, there are three main commercial corridors: upper Main Street, East Lake Ave., and Freedom Blvd.

Watsonville's neighborhoods are generally well cared for. People take care of their front yards; there is little blight or litter. Many gardens throughout the city display a sense of pride and creativity.

An eclectic mix of plant species is part of what makes Watsonville unique. The streets that do have street trees show that Watsonville has great potential to be a beautifully tree-filled city. Because of Watsonville's climate, the city can support a wide range of species. Watsonville is at the intersection of the southern California and northern California influences and its climate is very hospitable to trees. The trees that are in Watsonville are generally very healthy. The existing mix of succulents, palm trees, perennials, and evergreen and deciduous trees indicates that a huge range of trees can do well in Watsonville's climate.

While most of the streets in Watsonville do not have street trees, the newest neighborhoods show what is possible with abundant trees, shrubs and perennials planted in tree strips between the curb and sidewalk. Some streets in the newest neighborhoods have implemented innovative ways to maximize planting in the public right of way while balancing the need for on-street parking (see photo on opposite page).



A well planted front yard in Watsonville.



Established yard trees in an older section of Watsonville.



La Hacienda Street has an innovative solution to accommodate street trees and on-street parking.

NATURAL INFLUENCE

Watsonville lies at the upper reaches of two natural sloughs, which are part of a system of six freshwater wetlands that flow to the Monterey Bay. These sloughs extend into the urban fabric of the city, and are one of the city's most striking landscape features (Figure 4). Recently, areas around the sloughs have been developed as amenities with trails and parks that take advantage of this natural resource. The sloughs are a strong visual amenity seen from various vantage points, especially crossings points and where streets dead-end at the sloughs.

The Pajaro River and the Salsipuedes Creek (which is a tributary to the Pajaro) form the eastern boundary of the city. These rivers are largely separated from the city by levees, however the trail on top of the levees are a well-used amenity. The influence of the riparian zone can be felt at certain places along the river and at the river crossings.

The vegetation in the sloughs is characterized by:

Trees:

- Coast Live Oak (*Quercus agrifolia*)
- Cottonwood (*Populus fremontii*)
- Western Sycamore (*Platanus racemosa*)
- Willow (*Salix sp.*)
- California Boxelder (*Acer negundo var. californicum*)

Shrubs:

- Coffeeberry (*Rhamnus californicus*)
- Coyote brush (*Baccharis sp.*)
- Toyon (*Heteromeles arbutifolia*)
- California Dogwood (*Cornus californica*)



Aerial view showing adjacency of the sloughs to the urban fabric.



A view of the sloughs from one of the Watsonville's wetland trails.



Map showing the sloughs and rivers of Watsonville.

AGRICULTURAL INFLUENCE

Equally important as the natural influence is the agricultural influence on the city form. The city is bounded to the north and south by agricultural lands (see map on opposite page). To the south, there is an industrial transition zone between the agricultural lands and the residential and commercial areas of the city. To the north, the sense that the residential neighborhoods abut agricultural lands is felt more strongly, as there is no transitional zone; rather, the line between the two land uses is clear and distinct.



Aerial view of Watsonville farmland



Street at the edge of Watsonville bordering on farmland (Wagner Ave.)



Map showing agricultural lands adjacent to Watsonville streets

STREETS AND GATEWAYS

One of Watsonville's unique characteristics is its non-orthogonal network of streets.

Watsonville is a patchwork of street grids with various orientations. The various patches of street grids are linked and bordered by larger neighborhood connectors, commercial corridors and arterials. For the purposes of the Street Tree Planting Plan, six street types are identified: retail boulevards, such as upper Main St.; commercial corridors, such as Freedom Blvd. and East Lake St.; green arterials, such as Airport Blvd.; downtown passages, such as lower Main St.; neighborhood connectors, such as Martinelli St.; agricultural gateways, such as Riverside Blvd.; and local residential neighborhood streets. A map of street types (opposite page) distills the city's form into a clear hierarchy of street networks.



Street Character

Agricultural Gateway



Commercial Corridor



Downtown Passage



Retail Boulevard



Green Arterial



Neighborhood Connector



URBAN FORM ANALYSIS MAP

The composite Urban Form Analysis Map (opposite page) combines the above components—neighborhood character, natural influence, agricultural influence, and street and gateways network. Here, clear patterns and adjacencies can be seen that give strong cues for street planting strategies that can reinforce the city's unique character as described in the next section.

Street Character

Agricultural Gateway



Commercial Corridor



Downtown Passage



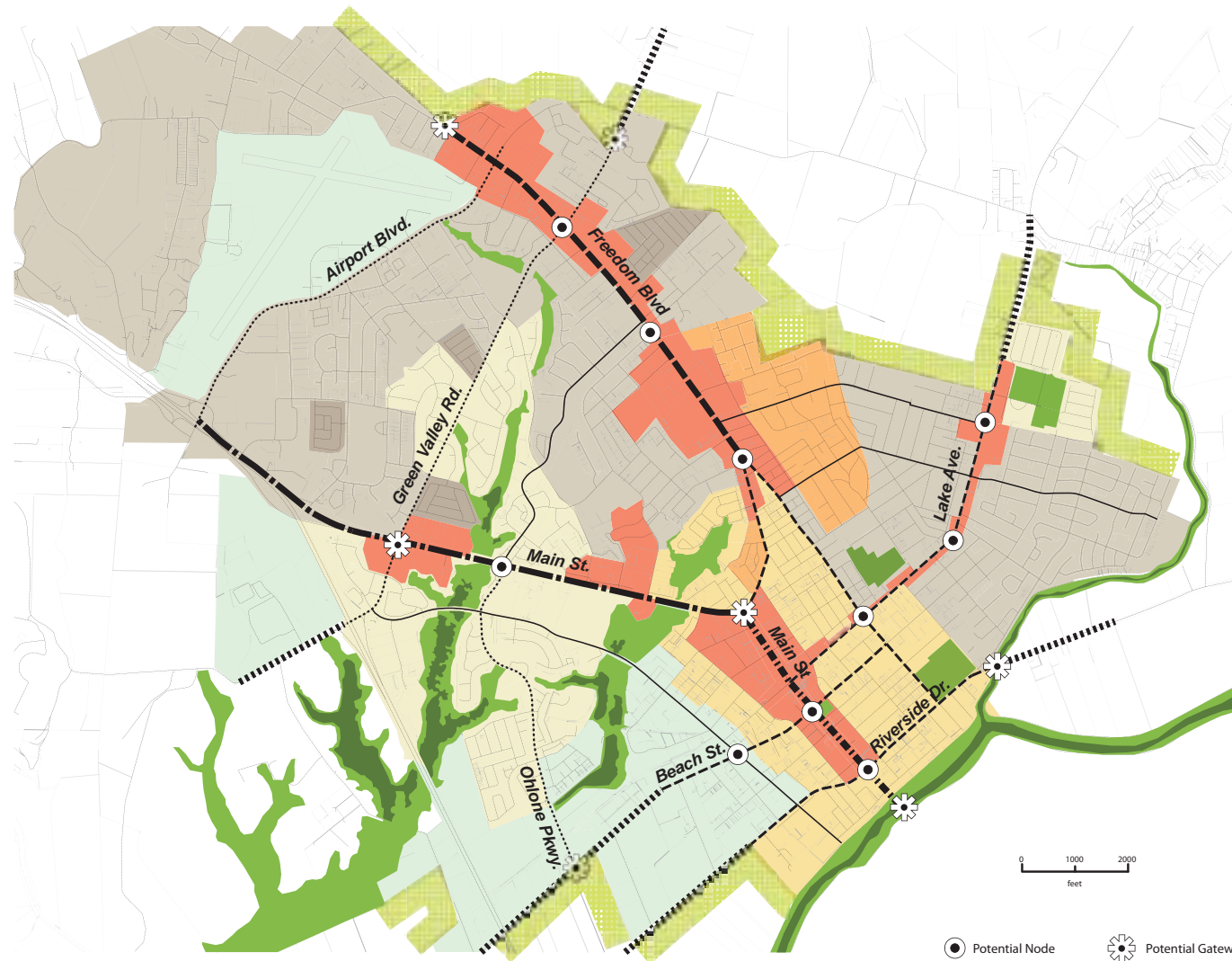
Retail Boulevard



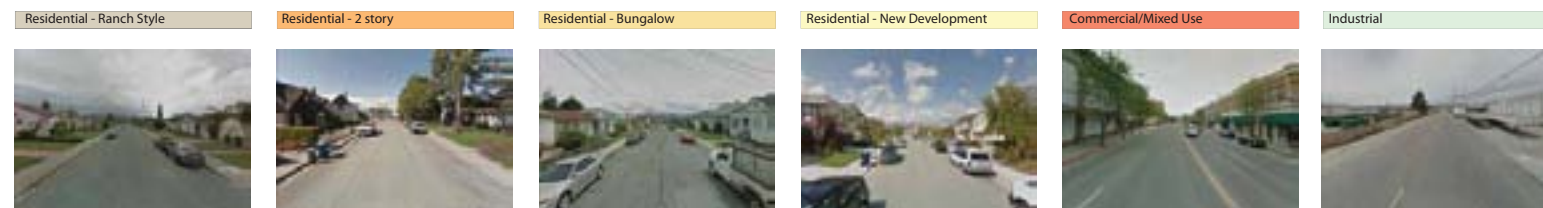
Green Arterial



Neighborhood Connector



Neighborhood Character



Composite Urban Form Analysis map

Street Tree Program Framework

The Street Tree Program Framework diagram (opposite page) builds on the Urban Form Analysis Map to define a series of zones that a street tree planting program would respond to. Each zone would be expressed by the types of street trees planted there. These zones are as follows:

HISTORIC DOWNTOWN CORE

This zone consists of the mixed-use commercial downtown core and the adjacent bungalow-style residential neighborhoods. These areas are characterized by historic tree plantings, typically of non-native ornamental species and shade trees. The residential neighborhoods in this zone are planted with an eclectic mix of ornamental plants, including flowering perennials, succulents, palm trees, shade trees, needle-leafed evergreens including redwoods, and even monkey-puzzle trees. The downtown commercial core, meanwhile, is planted with consistent street trees on each street, giving a formal character to the commercial streets. This historic downtown core could influence the neighborhood to its north.

AGRICULTURAL INFLUENCE ZONE

The neighborhoods to the northeast of the city are within what could be considered an agricultural influence zone that might reflect its adjacency to the agricultural fields to the north through the types of trees used. These could include fruit trees that reflect the historic orchards or “windrow” trees reflecting agricultural windrows commonly used in the region. Martinelli Street, named for the apple producer, passes through this zone.

SLOUGH CHARACTER ZONE

The neighborhoods that are adjacent to the sloughs might be enhanced by street tree plantings that relate to the slough and riparian ecologies. Slough and riparian species such as Black Walnut, Buckeye and Sycamore would give these neighborhoods a defining character and potentially increase the habitat value of the natural corridors that thread through the city. Notable views of the sloughs from adjacent streets and crossings may be marked by a change in the tree species and tree spacing.

RESIDENTIAL NEIGHBORHOODS

The residential neighborhoods that are outside of the natural and agricultural influence zones are places where Watsonville’s eclectic planting character is expressed and would be enhanced

with a diverse tree planting program.

AGRICULTURAL GATEWAYS

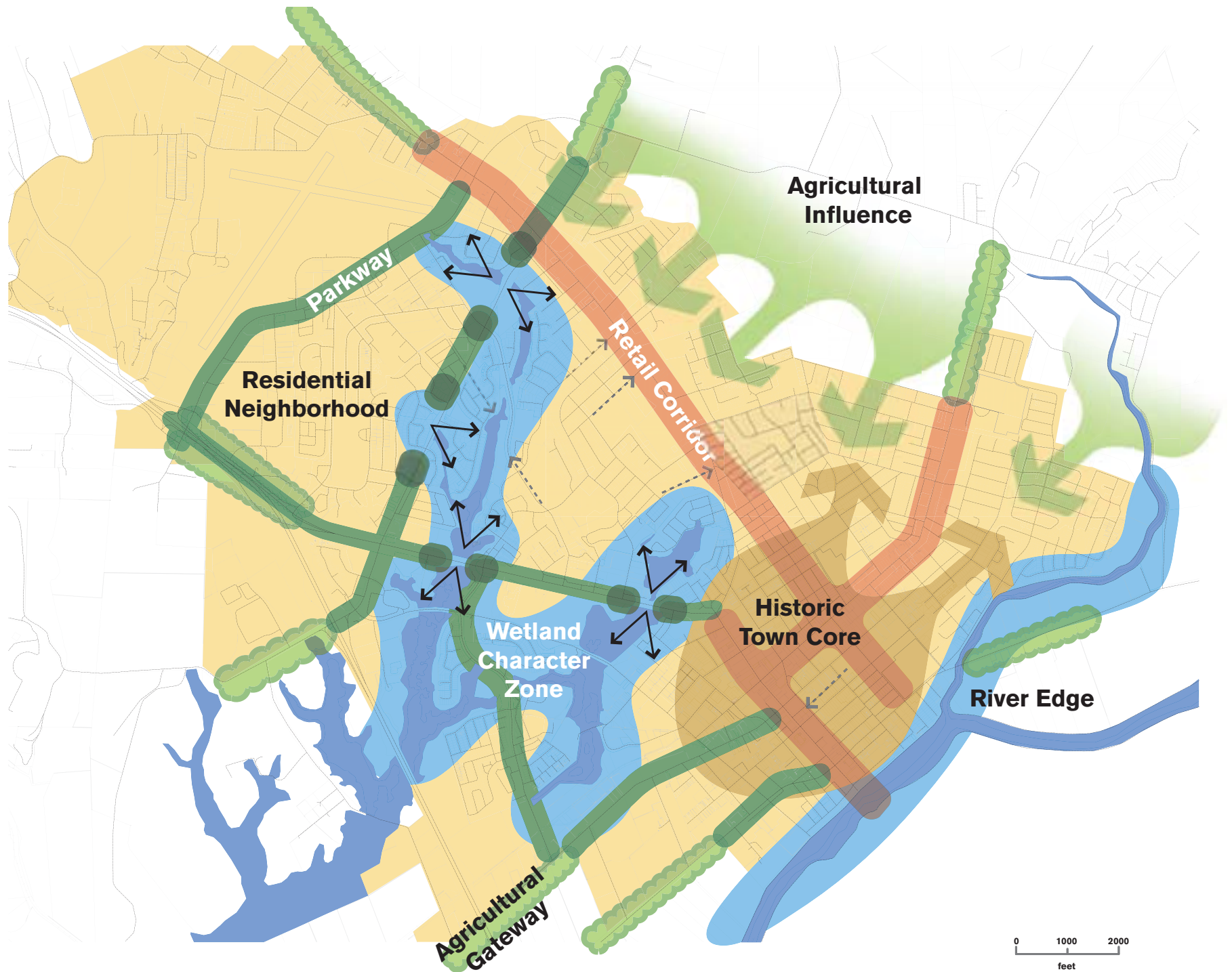
The agricultural gateways might be expressed with tree plantings that reflect the agricultural vernacular, such as windrows and orchard plantings.

PARKWAYS

The parkways are neighborhood collector streets or arterials that have an arboretum-like character which could be enhanced. These corridors generally have significant space within the right-of-way for tree planting, where larger trees or tree clusters might be appropriate.

RETAIL CORRIDORS

The retail corridors could be marked by special street trees. Lower Main St. is already lined with uniform rows of Flowering Pear trees. Freedom Blvd. and East Lake St. could be enhanced with street trees that improve the experience of shopping on these streets. The unique characteristics of each of these streets suggest different street-tree planting solutions, which are described below in the specific implementation plans.



Street Tree Program Framework Diagram

Street Tree Planting Opportunities Overview

Throughout Watsonville, the standard sidewalk width is seven feet. This width is too narrow to plant a viable street tree in a tree well within the existing sidewalk zone. A minimum width of four feet is required for accessibility and a three-foot wide tree well would not give the trees enough soil to be healthy or long-lived. This plan recommends alternative opportunities for planting street trees that will ensure larger, healthier and longer-living trees. The main opportunities examined during the planning process are as follow.

FRONT-YARD PLANTING INCENTIVES

Possibly Watsonville's most important potential for street-tree planting is in the front yards of private residences. In most of Watsonville's residential neighborhoods, the homes have ample front yards that could support wonderful street trees that would significantly enhance the streetscape environment. Incentivizing front-yard tree planting would probably be the most cost-effective way for Watsonville to achieve its tree-canopy goals. Incentive programs could take many forms, but in general they would consist of the city purchasing the trees and helping the residents to plant them by providing tools, materials, and possibly labor. The city may choose to provide periodic pruning services, especially in the first several years of the tree's growth. Residents would commit to maintaining the tree. It should be stressed that tree maintenance generally requires little other than watering during establishment; maintenance costs would be a negligible increase to the resident's water bill – measured in pennies per year.

MIXED-USE STREETS: PLANT WHERE POSSIBLE

Many of Watsonville's mixed-use commercial corridors do not have room for sidewalk widening because of the traffic volumes they handle. Similar to the front-yard tree-planting potential in Watsonville's residential neighborhoods, these mixed-use commercial corridors contain many unpaved areas along the back-of-walk within the private properties where trees could be planted. A similar incentive program geared toward business- and property-owners could add a significant number of trees to these corridors. Individual business- and property-owners could select trees to highlight their businesses, or a merchants association along a street or street segment could select a single species to give a corridor a distinctive identity.

WIDENING SIDEWALKS

Many of Watsonville's streets are wider than necessary to accommodate the necessary traffic volumes. In these cases, sidewalks could be widened to provide room for traditional street-tree planting in tree wells along the back-of-curb. Typically, a sidewalk-widening project would be part of an overall streetscape improvement project, potentially including new streetlights, street furnishings, public art and other amenities. Sidewalks wider than Watsonville's standard seven feet would be most beneficial along commercial or mixed-use corridors. As the city may reconstruct streets in the future—whether to replace or repair damaged pavement or utilities, or as part a development plan—opportunities for sidewalk widening and tree planting should be sought and incorporated into the designs. Innovative technologies such as structural soil and modular underground structural framework systems (e.g., Silva Cell) can be incorporated into street improvement projects in coordination with civil engineering efforts.

PLANTING WITHIN ROADWAY: STORMWATER MANAGEMENT ZONES, TREE-ISLANDS, PLANTING STRIPS

Where streets are wider than necessary in residential neighborhoods, planting areas could be added within the existing roadway area. These planting areas could take the form of traditional planting strips behind the curb and at the level of the sidewalk. Alternatively, the planting areas could be graded to provide drainage swales (known as bioswales, rain-gardens, or bioretention areas) to filter and absorb stormwater, preventing pollution and erosion of the city's wetlands and rivers. Such planting areas would offer multiple benefits: room for street trees and other planting, stormwater management, traffic-calming, and a buffer zone between pedestrians and vehicular traffic. In some cases, where there is an excess of on-street parking supply, these planting areas could be located in place of the existing parking lane on one or both sides of the street. In cases where there is demand for on-street parking, "tree-islands" could be located within the parking lane, displacing some but not all of the existing on-street parking. Tree islands could serve as stormwater-management planting areas, or they could be traditional curbed planting areas.



Street tree in historic downtown

Proposed Priority Implementation Projects

This plan identifies eight proposed priority implementation projects: Freedom Blvd., Martinelli St., East Lake Ave., Clifford Ave., Upper Main St., Bockius St. (and similar residential streets), and Riverside Dr. These streets were selected as priority implementation projects because they:

- Represent typical case studies for each of Watsonville’s typical street types (described above under “Street and Gateways”);
- Are equitably distributed throughout the city, offering maximum exposure to demonstration projects;
- Represent each of the zones identified in the Street Tree Planting Framework described above;
- Reinforce a contiguous network throughout the city.

The implementation of each of these projects would require further study. In some cases, traffic and parking-demand analyses would be required. In other cases, an incentive program would need to be developed to encourage participation by private land-owners. Each of these projects should emphasize continued public input from the beginning of the process as they are developed further.

These priority implementation projects are shown on the opposite page and described in detail below.



Proposed Priority Implementation Map

FREEDOM BOULEVARD

The proposed area for the Freedom Blvd. street tree planting stretches from the city border at Buena Vista Drive in the north to Lincoln Street to the south. (The segment from Lincoln St. south to Main St. has been improved with new sidewalks which include tree wells, and should be planted with a species consistent with the rest of Freedom Blvd.) There are currently no street trees in the public right-of-way along Freedom Boulevard, with the exception of a paved median with tree wells between Alta Vista Ave. and Crestview Dr. In several isolated locations along Freedom Blvd., trees that are planted on adjacent private property affect the character of the street, but the vast majority of the street is devoid of trees. The street has two lanes of traffic in each direction with a center turn lane and seven-foot-wide sidewalks.

Freedom Boulevard Project Summary

Short-term Project

Number of trees:	130 (approx.)
Tree Spacing:	Where possible on private properties
Tree size:	24" box
R.O.M. cost:	\$52,000
Assumes no irrigation and no planting other than trees.	

Long-term Project

Number of trees:	680 (with tree grates)
Tree spacing:	30'
Tree size:	24" box
Street reconfiguration:	Sidewalk widening to 10', lane re-striping
R.O.M. cost:	\$24 Million - \$30 Million

Includes contractor mobilization, demolition, standard concrete sidewalks, irrigation for trees, minimal utility work. Does not include street furnishings, new lighting, utility undergrounding or major utility work.



Freedom Boulevard priority implementation project 1"= 800'



This plan proposes two street tree planting concepts: a near-term plan and a long-term vision. The near-term planting plan takes advantage of the significant amount of unpaved planting area that is within the private properties along Freedom Blvd. Planting trees in the existing unpaved planting areas would enhance Freedom Blvd. significantly. The resulting tree pattern would be irregular, since some of the properties do not have planting areas. Planting trees in the unpaved planting areas on private properties could be achieved through tree-planting incentives and with the cooperation of the property owners. Property owners could select trees from a longer list of possible species, which would create an eclectic tree palette in keeping with the eclectic tree palette found in much of Watsonville. Property and business owners could select trees that would highlight entrances to their businesses and which would be compatible with their signage. Large expanses of parking could be screened from view.

The long-term tree-planting vision for Freedom Blvd. is consistent with the Vista 2030 proposed development plan, which describes Freedom Blvd. as a mixed-use pedestrian-oriented corridor. Freedom Blvd. would become a tree-lined street more like those found in Watsonville's downtown, with a consistent species. To achieve this vision, the sidewalks would have to be widened to a minimum of eight feet, or a preferable width of ten feet. This plan illustrates several possible configurations for the ultimate design of Freedom Blvd., pending traffic analysis, public input, and the further refinement of the long-term development strategy.



Current condition of Freedom boulevard: an auto-oriented corridor



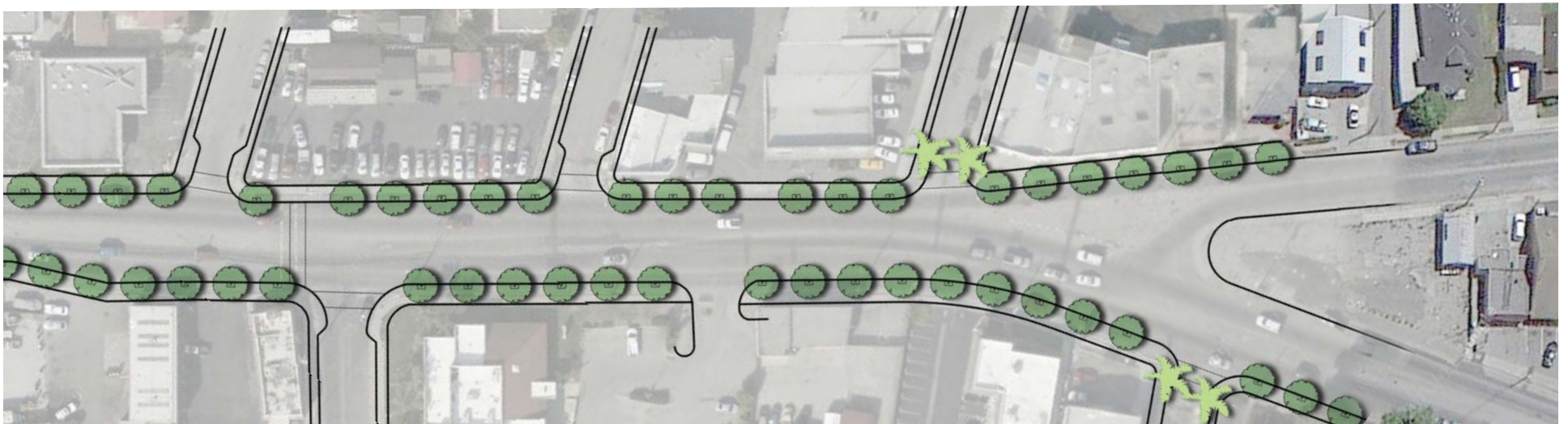
Freedom Boulevard priority implementation project typical area enlargement (1"=100')



Freedom Corridor Concept from Vista 2030 proposed development plan



Before and after rendering depicting future condition for Freedom Boulevard from Vista 2030 proposed development plan

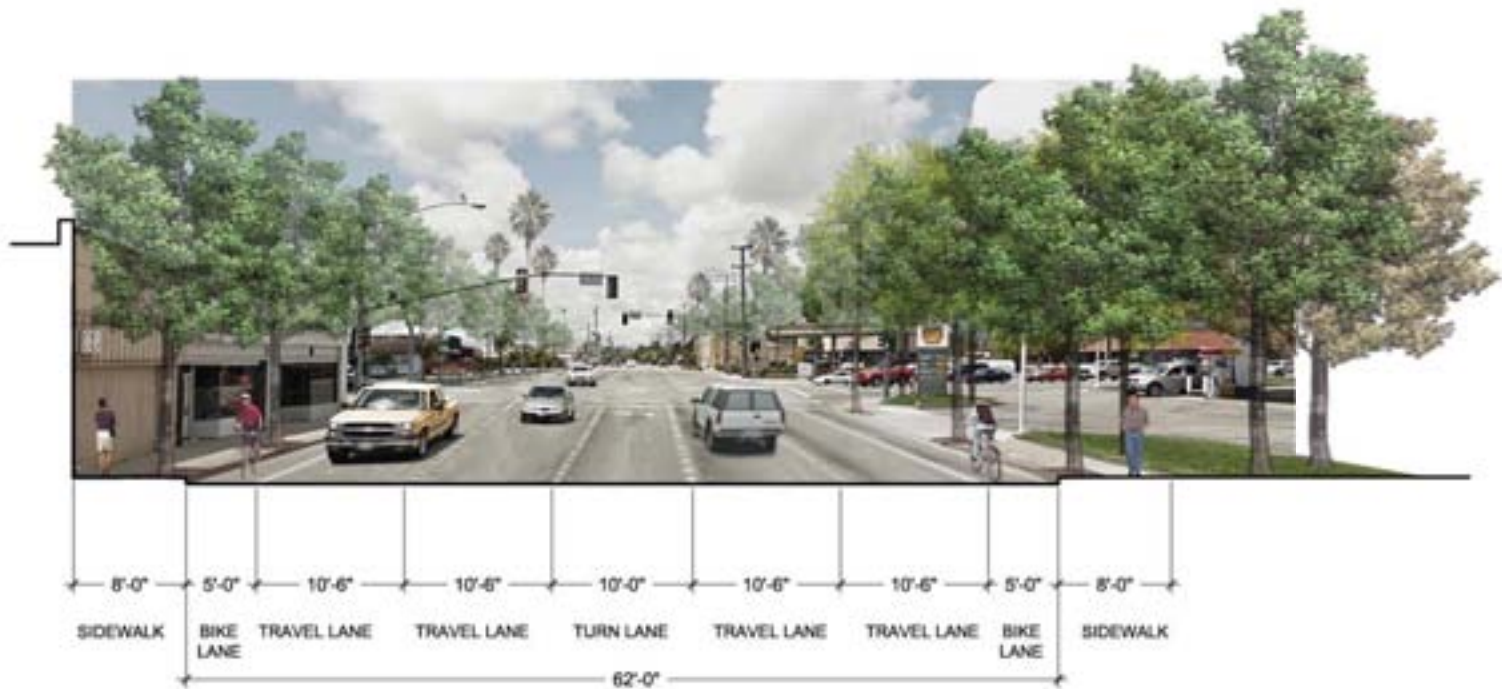




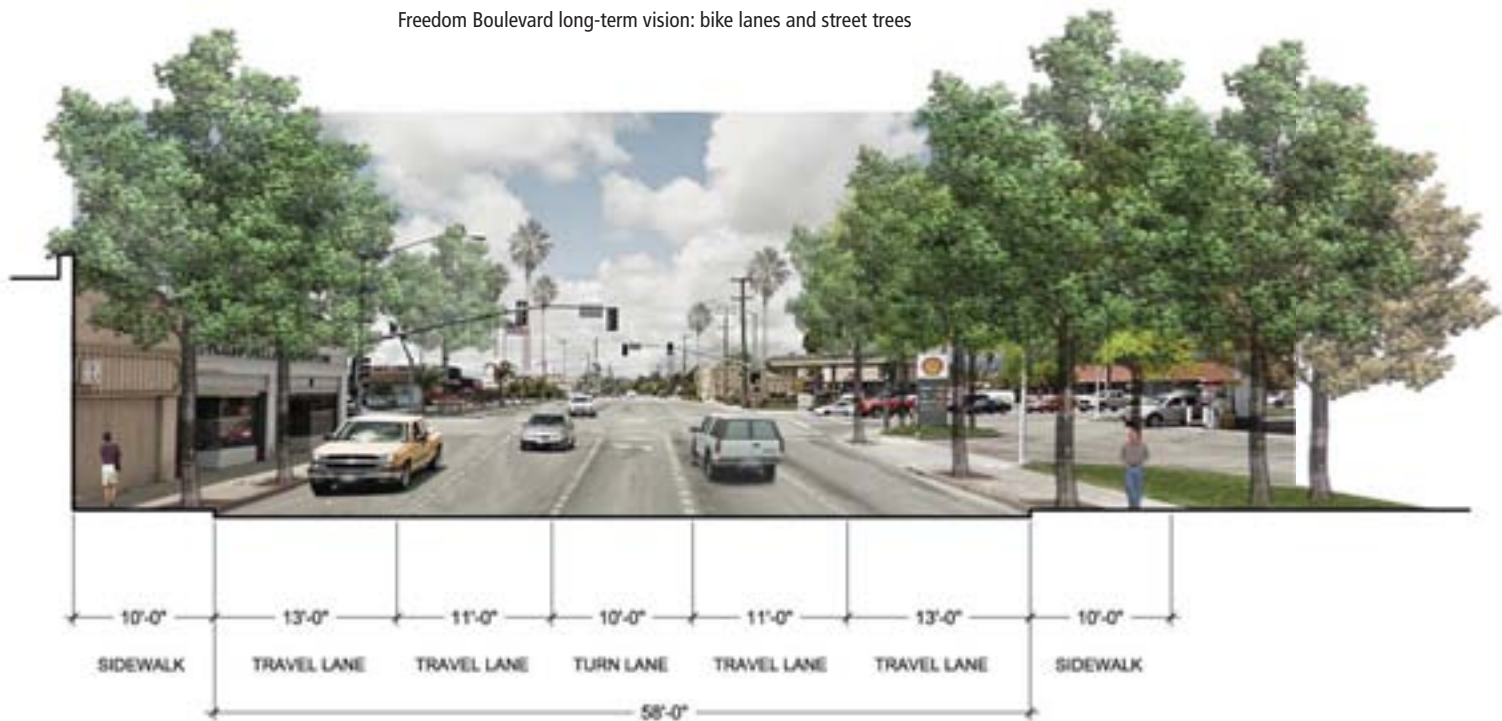
Freedom Boulevard existing condition



Freedom Boulevard near-term vision: trees in private properties



Freedom Boulevard long-term vision: bike lanes and street trees



Freedom Boulevard long-term vision: wide sidewalk and street trees

MARTINELLI STREET

Martinelli St. connects East Lake Ave. to Freedom Blvd. through the Martinelli residential neighborhood. The street is residential, and the houses have generous front yards. Some of the front yards contain large trees that contribute significantly to the streetscape. Most of the front yards do not have trees, and, as with most of Watsonville, a tree-planting incentive program could go a long way toward transforming Martinelli St. into a beautifully tree-lined street.

In addition to a front-yard planting program, Martinelli St. offers the opportunity for tree planting within the public right-of-way. The 40-foot curb-to-curb width provides ample room for one travel lane in each direction and parking on both sides of the street. In addition to meeting the parking and traffic needs, there may be the opportunity to incorporate planting areas within the existing roadway. These planting areas would serve several purposes: providing space for street trees and other planting, providing rain-gardens or bioswales for stormwater filtration and infiltration, calming traffic, and providing a buffer between the sidewalk and roadway.

These planting areas could take various forms to accommodate different levels of parking demand. Since the houses along Martinelli have garages and driveway space for off-street parking, it may be the case that on-street parking could be reduced to provide the benefits of the planting areas without eliminating the needed parking spaces. A parking-demand study should be done prior to the next stage of design for these proposed improvements.

This plan proposes a range of possible tree-planting options, depending on the amount of on-street parking that is needed. The first option is a full-length stormwater-management planting area, with interruptions only for driveways and intersections. Because homes along Martinelli tend to be sited on their lots so that driveways are clustered, there are long uninterrupted zones for linear planting areas. This concept allows for parking on one side of the street. The parking lane could be located consistently on one side of the street, or the parking aisle could alternate from one side of the street to the other from block to block, or even within one block. In that case, the lane-shifts could provide additional traffic-calming.

If more parking is required along Martinelli, the linear planting areas could be subdivided to provide parking spaces within the planting zone, similar to what has been done in the Seaview Ranch development (below, right).



Martinelli Street existing conditions



Sea View Ranch Development



Martinelli Street priority implementation project 1" = 800'

Planting within the planting areas could be either uniform and maintained by the City, or varied and maintained by the home-owners. A minimal approach could be for the City to install a very simple low-water landscape with no irrigation system and use a water truck to establish the plant material. In planting areas that are more significant, a single irrigation system may be warranted, providing a basic level of irrigation to low-water/drought-tolerant plantings. This could be operated and maintained by the City and serve the entire project. If residents or an organized group of residents wish to apply to the City to supplement this system to support a more robust planting area, separate, supplemental irrigation could be tied into each property's system, to be operated and maintained by the home-owners. Both public and private maintenance and control over this type of planting area have been successful in other cities. Successful examples of the private-maintenance model can be found in South Livermore and Second Avenue NW in Seattle, Washington.

The planting design for the stormwater-management planting areas should emphasize drought-tolerant species that are adapted to wintertime inundation. The plants should be low-maintenance species. Moreover, the unique character of Watsonville could be expressed by planting an eclectic mix of the types of plants found in many gardens in Watsonville, such as succulent rock-gardens.

Martinelli St. was chosen as a priority implementation project partly because it is in the agricultural influence zone. The street tree species should reflect that influence. Within the stormwater-management areas, the street trees should be selected from among the species that are adapted to seasonal inundation. Fruit trees could be planted to complement these street trees, either in the adjacent front yards, or along the edges of the stormwater-management zones which will not be inundated. Because Martinelli St. is named after the famous apple producer, apple trees would be a particularly meaningful choice.

Additional design considerations for the planting areas include:

- Providing access to parked cars with narrow paved walkways along the back-of-curb and across the planting areas at certain points;
- Providing paved areas for garbage and recycling receptacles to be placed on pick-up days;
- Allowing for street-sweeping operations.
- Plant appropriate trees under powerlines.



Martinelli Street priority implementation project, typical area enlargement (1"=60')



Martinelli Street Project Summary

Front-yard Tree Planting

Number of trees:	100 (approx.)
Tree Spacing:	Where possible on private properties
Tree size:	24" box
R.O.M. cost:	\$40,000
Assumes no irrigation and no planting other than trees.	

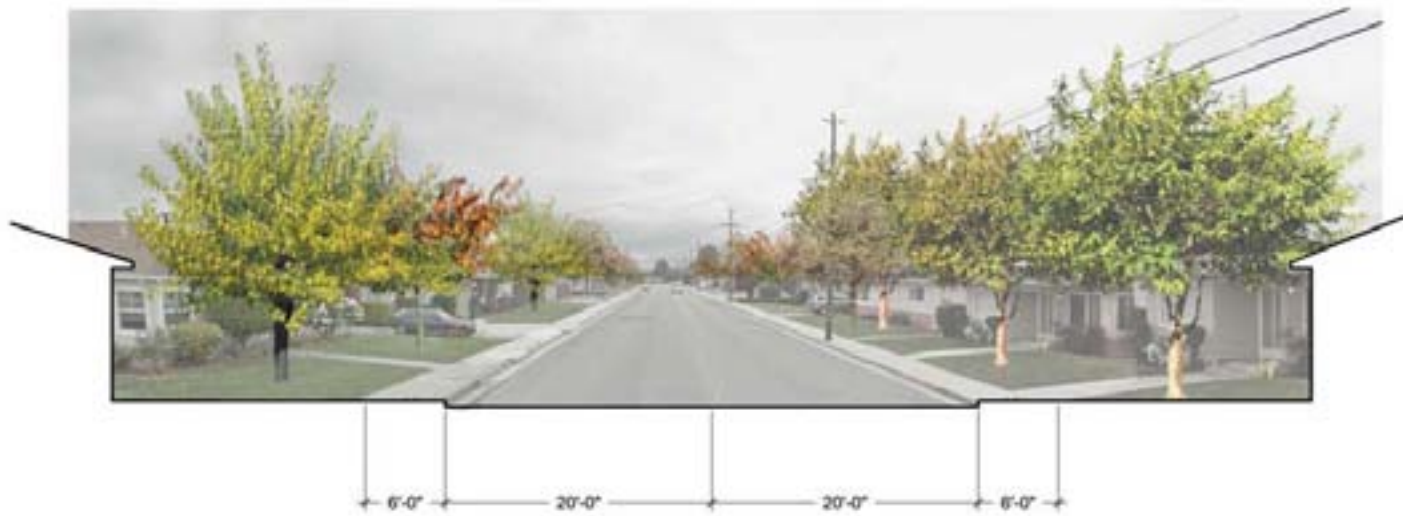
Tree Planting Within Public Right-of-Way (Opt. 2, p. 35)

Number of trees:	260
Tree spacing:	30'
Tree size:	24" box
Planting area:	54,000 square feet (stormwater management area)
Street reconfiguration:	Add stormwater management planting area, new sidewalk lane re-striping
R.O.M. cost:	\$12 Million - \$15 Million

Includes contractor mobilization, demolition, standard concrete sidewalks, import engineered stormwater management soil, irrigation, minimal utility work. Does not include street furnishings, new lighting, utility undergrounding or major utility work.



Martinelli Street existing condition



Martinelli Street near-term vision: trees in private properties



Martinelli Street long-term option 1: full stormwater management swale



Martinelli Street long-term option 2: planting islands alternating with parking

EAST LAKE AVENUE

East Lake Ave. is a busy mixed-use retail corridor with two lanes of traffic in each direction. There is not room within the curb-to-curb roadway for tree planting. The sidewalk is 7 feet wide, which is not wide enough for tree wells. The main opportunity for street tree planting lies within the residential and commercial private properties. There are many existing unpaved areas along the street that could be used for tree planting. The detail plan shows the potential number of trees that could be planted in one segment of East Lake Ave.

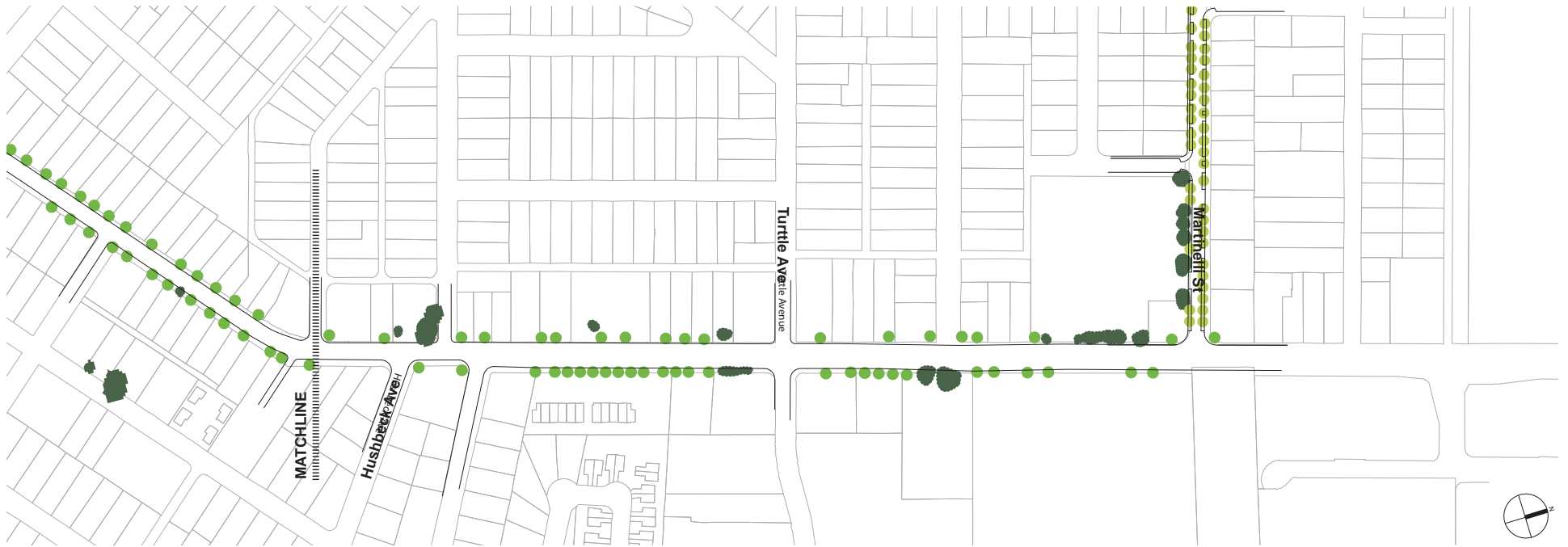
Building on the few existing trees along East Lake Ave., this plan proposes expanding the eclectic mix of trees through an incentive program. Individual property and business owners could choose trees from the list of approved street trees. (For planting under power lines, the list of trees approved for use under power lines should be used.) The resulting mix of trees could highlight and accentuate certain institutions and businesses with unique tree species and larger groupings of signature trees.

Where business signage might be hidden by trees, taller trees should be planted. Over time, these trees can be pruned (“limbed up”) so that the lowest branches are above the sight-lines to the signs. Often, smaller trees are planted in front of businesses in the hopes that they will not obscure signage, however, smaller trees tend to grow just to the signage height, blocking the signs more that larger trees would.

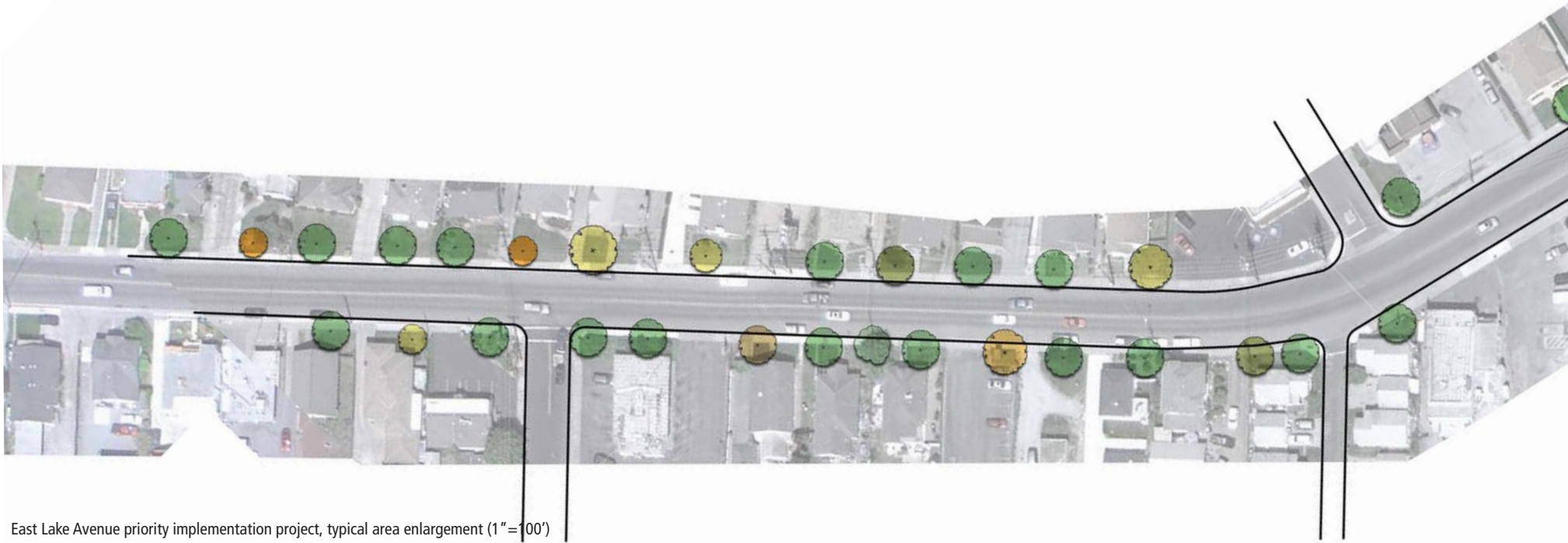


East Lake Avenue existing conditions

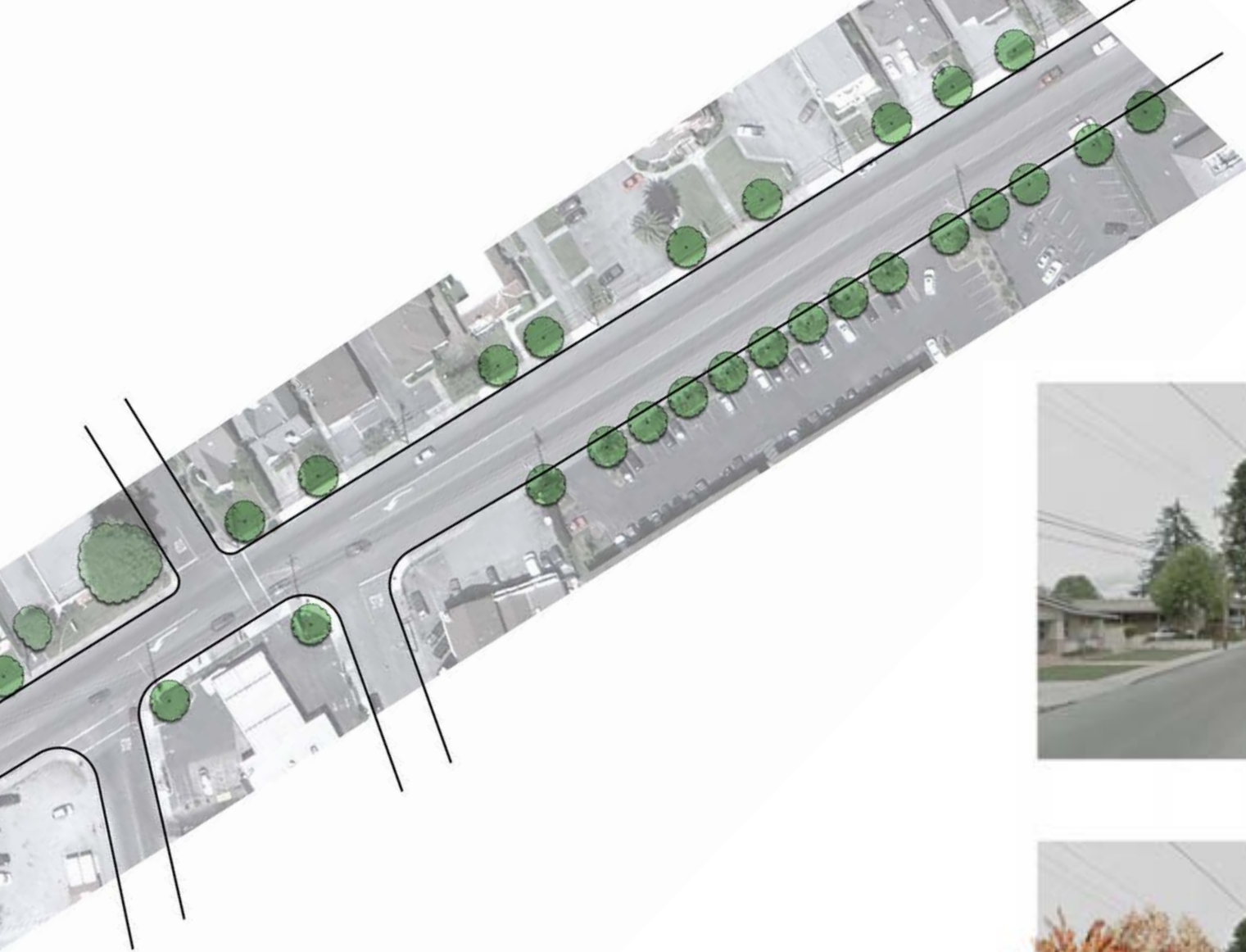
East Lake Avenue Project Summary	
Number of trees:	120 (approx.)
Tree Spacing:	Where possible within private properties
Tree size:	24" box
R.O.M. Cost:	\$48,000
Assumes no irrigation and no planting other than trees.	



East Lake Avenue priority implementation project 1"=800'



East Lake Avenue priority implementation project, typical area enlargement (1"=100')



Before and after view showing proposed eclectic mix of tree planting in private property

UPPER MAIN STREET

Upper Main St. is a major gateway into Watsonville from Highway 1. This plan proposes enhancing Upper Main Street's gateway function by creating a linear gateway sequence. There are substantial planting areas on each side of the street within the public right of way, in which large-stature trees can be planted. There are many existing large-stature trees that can influence the tree-planting design. Also, there is an existing sequence of experiences from the forest-like western portion to the shopping-center zone to the slough-crossing to a finer-grained commercial zone.

Upper Main St. was selected as a priority implementation project because of its role as a major gateway into the city, because of the potential to plant trees in the abundant planting area, and because it is typical of what this report refers to as the "green arterial" type of street. The "green arterials" throughout Watsonville could be characterized with an arboretum-type planting of a variety of large-stature trees.

The proposed design enhances the western forest-like zone by adding large stature trees to create the experience of passing through a tunnel of trees before arriving at the slough-crossing. At the Watsonville Square Shopping Center, the large-stature trees would continue, while accommodating the shopping-center signage through tree spacing and higher-limbed trees. Riparian trees would announce the slough crossing before a break in the trees to provide views north and south to the slough itself. East of the slough, the tree planting would consist of a dense planting of large stature trees, with a more formal, urban character.



Upper Main Street priority implementation project 1"=800'

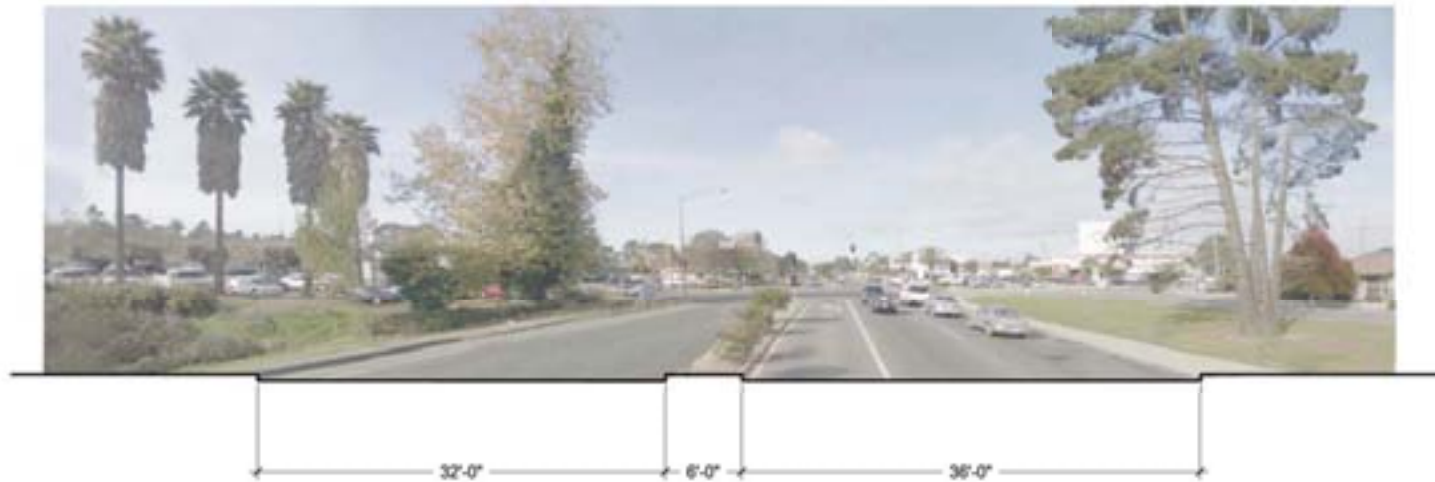
Upper Main Street Project Summary

Number of trees:	370
Tree Spacing:	25' - 30'
Tree size:	170 @ 24" Box; 200 @ 15 gal.
Planting Area:	173,000 sf
R.O.M. Cost:	\$2 Million - \$2.5 Million
Includes irrigation, soil preparation, shrub and groundcover planting and mulch.	



Upper Main Street existing conditions





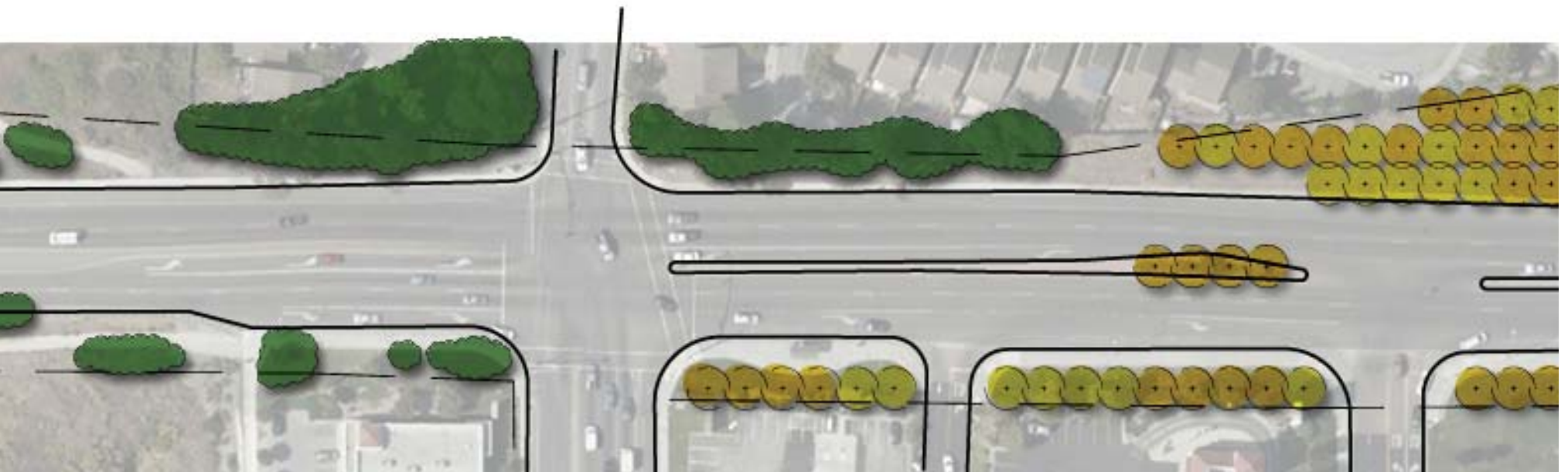
Upper Main Street existing conditions



Upper Main Street priority implementation project, area enlargement showing existing trees and shrubs at slough crossing, with gateway trees on either side (1"=100')



Upper Main Street proposed planting



CLIFFORD AVENUE

Clifford Ave. is a residential street that runs between Freedom Blvd. and Upper Main St. to the east of Struve Slough. The street has three distinct zones. Toward Freedom Blvd., the street is straight and has narrow sidewalks with no tree-planting strip. This segment is typical of many post-war neighborhoods of single-family detached homes in the western part of Watsonville (including a rolled curb and gutter detail). The middle segment is a relatively short stretch running from the middle of the 200 block to Lassen Way that has a planting strip between the sidewalk and curb on both sides of the street. The third segment, between Lassen Way and Upper Main St. has no planting strip between the sidewalk and curb, and is dominated by multi-unit apartment buildings. The larger residential developments have large planting areas behind the sidewalk, some of which contain significant trees while others are treeless and poorly maintained.

Similar to Martinelli St., Clifford Ave. may be wider than necessary for the amount of traffic it handles. There is the opportunity to incorporate significant tree-planting area within the existing roadway. The middle segment shows the potential to add planting strips along the rest of the street. Where the slope is flat enough, these planting areas could function as stormwater-management areas.

The three segments offer the opportunity for a varied tree palette that corresponds to the different street configurations and land-use types. In the upper area, the street functions as a direct connector from the residential neighborhood to Freedom Blvd. This segment could be planted with a consistent species in a formal pattern that emphasizes this connection.

Along the middle segment, the existing planting strip should be planted with additional trees. As the middle segment is marked by a grade change and the road becomes curvy, the tree species could change from the upper, formal and consistent zone. Because of the slope and curviness of the street, views come into view at points which could be highlighted with a change in the tree species.



Section of Clifford Avenue with multi-unit apartment buildings.



Section of Clifford Avenue with existing planting strips.



Clifford Avenue priority implementation project 1"=800'

As the lower segment passes through multi-unit developments, the large planting areas on those properties offer a great opportunity to create a very lush environment by incentivizing tree planting on the private properties, in addition to the tree-planting strips in the public right of way. This lush environment could be punctuated with groupings of tree species at significant nodes, such as the Pennsylvania Dr. crossing and the entrance to the Struve Slough trail entrance at Montebello Dr.

Clifford Ave. was selected as a priority implementation project partly because it is in the wetland influence zone. The plantings along Clifford Ave. should reflect a connection to the wetland through the planting of riparian (or related) species, especially at nodes where there are views of the wetland, and at the Montebello Dr. intersection.

Clifford Ave. was selected also because neighbors have complained of speeding along the street. Clifford Ave. is crossed at many points by students because there are many schools nearby to the east and west of the street. Traffic calming should be a priority for the street, and would be a significant benefit of narrowing the street and adding street trees.

Clifford Avenue Project Summary

Tree Planting in Private Properties

Number of trees:	150 (approx.)
Tree Spacing:	Where possible on single-unit properties; 30' on multi-unit properties
Tree size:	24" box
R.O.M. cost:	\$60,000
Assumes no irrigation and no planting other than trees.	

Planter Strip in Public Right-of-Way

Number of trees:	320
Tree spacing:	30'
Tree size:	24" box
Street reconfiguration:	Move curb, add planting strip, replace sidewalks.
Assumes management	half of new planting area will be stormwater area.
R.O.M. cost:	\$10 Million - \$13 Million
Includes contractor mobilization, demolition, standard concrete sidewalks, minimal utility work. Does not include street furnishings, new lighting, utility undergrounding or major utility work.	



Clifford Avenue priority implementation project, typical area enlargement (1"=100')



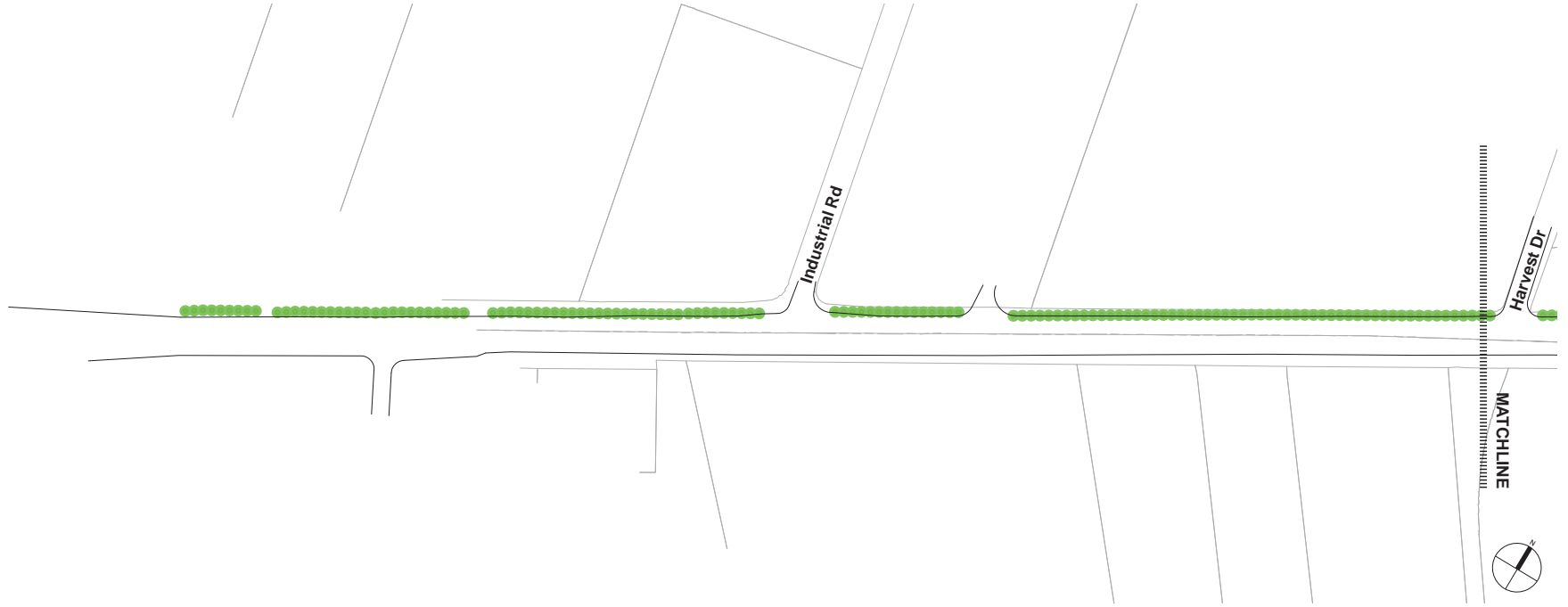
RIVERSIDE DRIVE

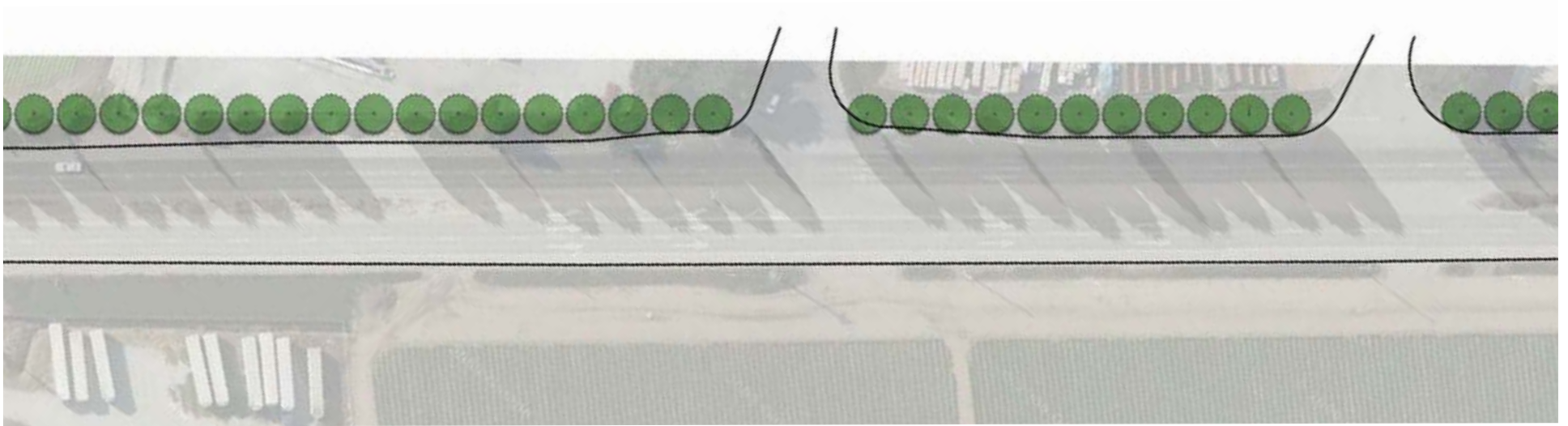
Riverside Dr. was selected as a priority implementation project as an example of an agricultural gateway. The agricultural gateways would be planted with tree species and patterns that are typical of the agricultural landscape. Notably, agricultural plantings are often different on each side of a street. The proposed planting for Riverside Dr. and the other agricultural gateways would therefore be asymmetrical, with trees on one side of the street only. The trees could either be windrows of tightly-spaced tall, columnar trees, or orchards of fruit and nut trees found typically in the region. The orchard planting would be at least two rows deep, and so would require more space than the windrows, which could be planted in relatively constrained areas. These agricultural gateway plantings would typically occur on the private farmland, and would require the cooperation of the land-owner.



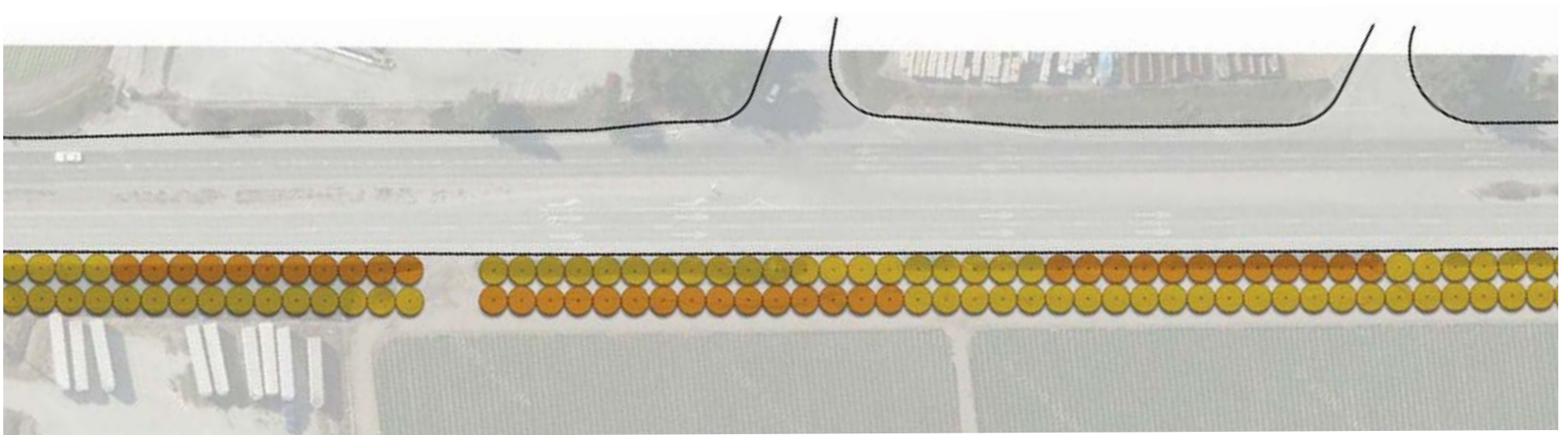
Riverside Drive existing conditions

Riverside Drive Project Summary	
Number of trees:	450 (windrow), 800 (orchard)
Tree Spacing:	20'
Tree size:	15 gal.
Planting Area:	N/A
R.O.M. Cost:	\$90,000 - \$160,000





Riverside Drive priority implementation project windrow option, typical area enlargement (1"=100')



Riverside Drive priority implementation project orchard option, typical area enlargement (1"=100')



Before and after view showing proposed windrow trees as gateway to Watsonville.

BOCKIUS STREET

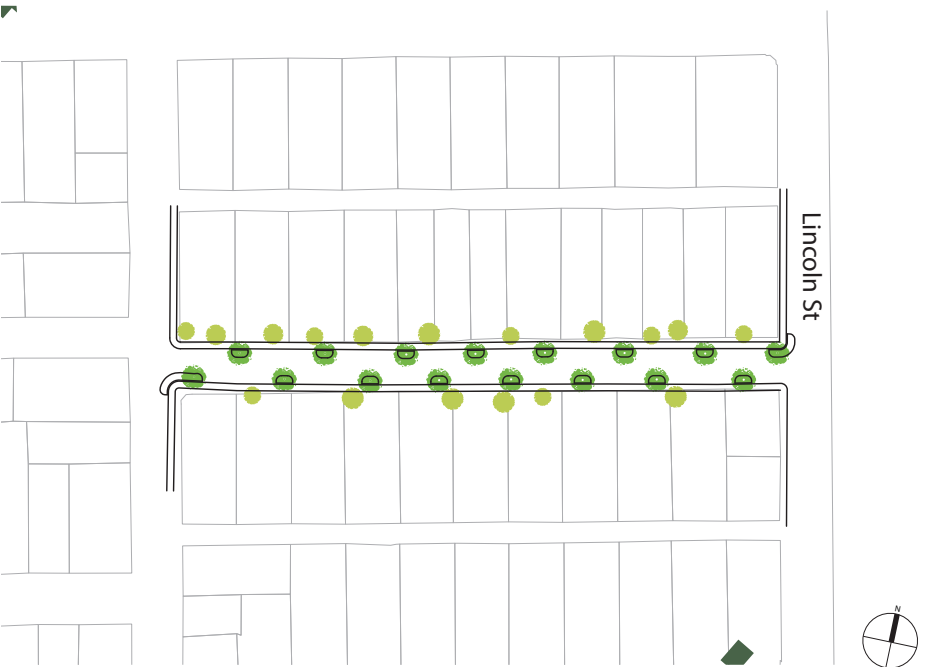
Bockius St. is a small residential street in the historic core of Watsonville. The street is typical of Watsonville’s narrowest streets, with parking on both sides, two travel lanes, and seven-foot-wide sidewalks without planting strips between the curb and sidewalks. In the historic core neighborhoods, there is limited off-street parking; the on-street parking is heavily used. The main opportunity for tree planting is in the front yards of the private residences, which could be encouraged through incentive programs as described above. Additional trees could be planted in tree islands on the street where there is currently no parking, such as between driveways and at corner bulb-outs. If tree islands are installed, the planting and irrigation strategy could be similar to that described for Martinelli above.

The tree species for front-yard plantings should be an eclectic mix that reinforces the exuberance typical of Watsonville’s residential neighborhoods. There is a wide range of small-sized trees that would be appropriate under the power lines. Where there is room for tree islands, the species planted within the roadway could be a consistent species on each block or in each neighborhood.

The intent of the Bockius St. concept presented here is that more than one similar street within the city could become part of a priority implementation project, depending on funding. Ideally groups of several similar streets within several neighborhoods could be funded as one implementation project. A front-yard tree-planting incentive program could require that a certain percentage of a block’s residents agree to plant trees, so that the trees have a significant impact on the streetscape. Funding could be distributed throughout the city on a block-by-block basis, as each block gathers enough support among neighbors. Trees and planting supplies could be delivered to each block on a tree-planting day which would become a community event.

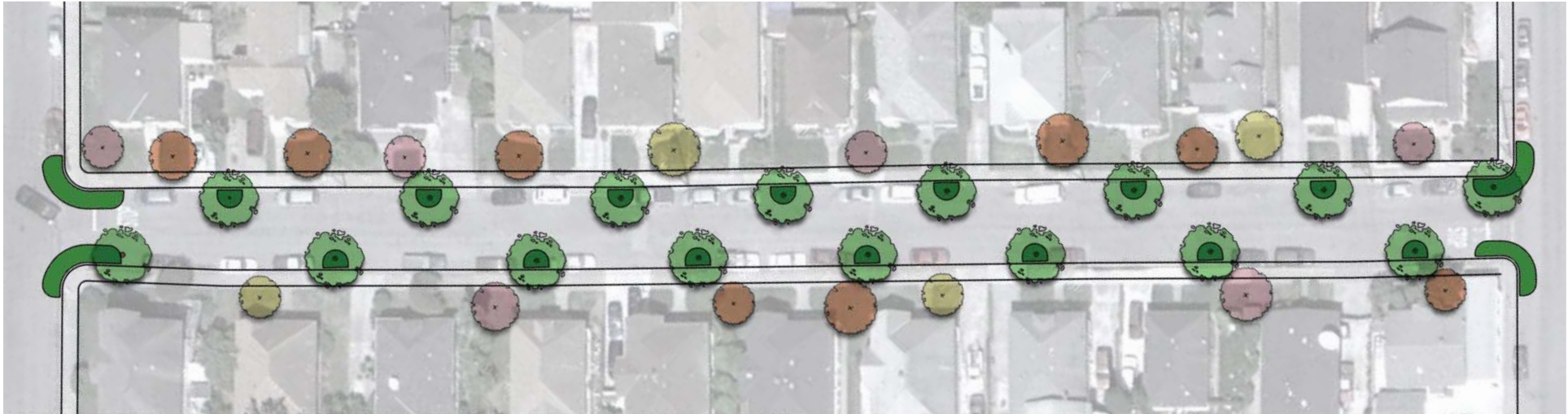


Bockius Street existing conditions



Bockius Street priority implementation project 1"=400'

Bockius Street Project Summary	
Number of trees:	24 (one per home) + 8 in tree-islands or bulb-outs
Tree Spacing:	N/A
Tree size:	24" box
Planting Area:	N/A
R.O.M. Cost:	\$9,600 (basic) - \$70,000 with tree-islands and bulb-outs



Bockius Street priority implementation project 1" = 60'



Bockius Street existing condition



Bockius Street private residence planting option



Bockius Street tree island planting option

Watsonville Tree Planting Palette

The following is a list of approved trees for street tree planting in the City of Watsonville. The list is divided into the three influence zones described in the “Understanding Watsonville” and “Street Tree Program Framework” sections above. The tree types are: Broadleaf Deciduous Large, Medium and Small (BDL, BDM, BDS); Broadleaf Evergreen Large, Medium and Small (BEL, BEM, BES); Conifer Evergreen Large, Medium and Small (CEL, CEM, CES); and Palm Evergreen Large, Medium and Small (PEL, PEM, PES). “RPI” refers to the relative performance index. An

RPI value of 1.0 or better indicates that the species is performing as well or better than average when compared to the other species currently found in Watsonville. “BVOC Emissions” refers to biogenic volatile organic compounds. While all tree species emit some BVOCs, most species contribute benefits to overall air quality that far outweigh these emissions. “SPL” and “RST” are susceptible and resistant, respectively. The community types are Agricultural Orchard (AO), Agricultural Edge (AE), Cultural Corridor (CC), Cultural Neighborhood (CN), Cultural Specimen (CS), and Native Riparian (NR). Several species fit into more than one community type.

Scientific Name	Common Name	Tree Type	Watsonville RPI ≥ 1.0	Utility Friendly	Allergen	Hardscape Damage Potential	BVOC Emissions	Edible Fruit	Anthracnose	Powdery Mildew Resistant	Community Type
Agricultural Influence Zone											
<i>Acca sellowiana</i> 'coolidge'	Coolidge pineapple guava	BES		Ut				F			AO
<i>Citrus paradisi</i>	Grapefruit	BES		Ut	A	M	M	F			AO
<i>Citrus sinensis</i>	Orange	BES		Ut	A		M	F			AO
<i>Diospyros kaki</i>	Japanese persimmon	BDM		Ut				F			AO
<i>Diospyros texana</i>	Texas persimmon	BDS		Ut				F			AO
<i>Diospyros virginiana</i>	American persimmon	BDS				M		F			AO
<i>Fortunella margarita</i>	Kumquat	BES		Ut	A			F			AO
<i>Juglans nigra</i>	Black walnut	BDL			A	H		F	SPL		AO
<i>Persea americana</i>	Avacado	BEM						F			AO
<i>Persea americana</i> x <i>drymifolia</i>	Avacado	BES			A			F	SPL		AO
<i>Prunus amygdalus</i>	Almond	BDS			A			F		SPL	AO
<i>Prunus angustifolia</i>	Chicksaw plum	BDS		Ut				F			AO
<i>Prunus armeniaca</i>	Apricot	BDS		Ut	A			F		SPL	AO
<i>Prunus avium</i>	Sweet cherry	BDM			A	M		F		SPL	AO
<i>Pyrus communis</i>	Pear	BDS			A			F		SPL	AO
<i>Brahea armata</i>	Mexican blue palm	PES						F			CC AE CS
<i>Eucalyptus globulus</i>	Blue gum	BEL									AE
<i>Populus nigra</i>	Lombardy poplar	BDL									AE
<i>Washingtonia filifera</i>	California fan palm	PES			A	M	M				CS AE
Cultural Influence Zone											
<i>Acer rubrum</i>	Red maple	BDM			A		M				CC
<i>Nyssa sylvatica</i>	Tupelo	BDM			A						CC
<i>Sophora japonica</i> 'Regent'	Regent Japanese pagoda	BDM								SPL	CC
<i>Brahea armata</i>	Mexican blue palm	PES						F			CC AE CS
<i>Fraxinus american</i> 'Autumn Purple'	Autumn purple ash	BDM				H			SPL		CC CN
<i>Gleditsia triacanthos</i>	Honeylocust	BDM	x								CC CN
<i>Jacaranda mimosifolia</i>	Jacaranda	BDM	x								CC CN
<i>Lagerstroemia indica</i> 'biloxi'	Biloxy crapemyrtle	BDS		Ut						SPL	CC CN
<i>Magnolia grandiflora</i>	Southern magnolia	BEM	x		A	H	M				CC CN
<i>Pistacia chinensis</i>	Chinese pistache	BDM	x		A		M				CC CN
<i>Platanus acerifolia</i>	London planetree	BDL	x		A	H	H		SPL	SPL	CC CN
<i>Platanus acerifolia</i> 'bloodgood'	Bloodgood London planetree	BDL							RST		CC CN
<i>Platanus acerifolia</i> 'Columbia'	Columbia London planetree	BDL									CC CN
<i>Platanus acerifolia</i> 'Yarwood'	Yarwood London Planetree	BDL								RST	CC CN
<i>Pyrus calleryana</i> 'Chanticleer'	Chanticleer pear	BDS									CC CN
<i>Ulmus parvifolia</i> 'Drake'	Drake Chinese elm	BDM			A	M					CC CN
<i>Ceratonia siliqua</i>	Carob	BEM				H	M	F			CC CS
<i>Arbutus unedo</i>	Strawberry tree	BES	x		A			F	SPL		CN
<i>Celtis australis</i>	European hackberry	BDL			A	M		F			CN
<i>Celtis occidentalis</i>	Common hackberry	BDL			A	M		F			CN
<i>Malus arnoldiana</i>	Arnold crabapple	BDS		Ut	A			F		SPL	CN
<i>Malus atrosanguinea</i>	Carmine crabapple	BDS		Ut	A			F			CN

<i>Malus 'dolgo'</i>	Malus 'dolgo'	BDS			A			F			CN
<i>Malus 'hopa'</i>	Hopa crabapple	BDS		Ut	A			F			CN
<i>Malus 'red jade'</i>	Red-jade crabapple	BDS		Ut	A			F		SPL	CN
<i>Podocarpus macrophyllus</i>	Yew pine	BES						F			CN
<i>Aesculus carnea 'Briotii'</i>	Red Horsechestnut	BDM									CN
<i>Agonis flexuosa</i>	Peppermint tree	BES				M	H				CN
<i>Albizia julibrissin</i>	Silk tree	BDM			A	M	M				CN
<i>Arbutus 'Marina'</i>	Marina madrone	BEM							SPL		CN
<i>Bauhinia variegata</i>	Purple orchid tree	BDS					M				CN
<i>Brachychiton acerifolius</i>	Flame tree	BDM				M					CN
<i>Brachychiton populneus</i>	Bottle tree	BEM				M					CN
<i>Callistemon citrinus</i>	Lemon bottlebrush	BES	x		A		H				CN
<i>Celtis laevigata 'all seasons'</i>	All seasons hackberry	BDL				H					CN
<i>Cercis canadensis</i>	Eastern Redbud	BDS		UT	A				SPL		CN
<i>Lagerstroemia fauriei</i>	Japanese crapemyrtle	BDM								SPL	CN
<i>Lagerstroemia indica 'Muskogee'</i>	Crepemyrtle	BDS		UT					RST		CN
<i>Lagerstroemia indica 'Natchez'</i>	Crepemyrtle	BDS		UT					RST		CN
<i>Lagerstroemia indica 'Tuscarora'</i>	Crepemyrtle	BDS		UT					RST		CN
<i>Magnolia soulangiana 'speciosa'</i>	Speciosa suacer magnolia	BDS		Ut							CN
<i>Maytenus boaria</i>	Mayten	BEM				M					CN
<i>Melaleuca linarifolia</i>	Flaxleaf paperbark	BES					H				CN
<i>Melaleuca quinqueneriva</i>	Cajeput	BES			A		H				CN
<i>Nyssa sinensis</i>	Chinese tupelo	BDM									CN
<i>Photinia serrulata 'aculeata'</i>	Aculeata Chinese photinia	BES		Ut							CN
<i>Quercus flacata</i>	Southern red oak	BDM		Ut							CN
<i>Quercus rubra</i>	Northern red oak	BDL	x								CN
<i>Quercus shumardii</i>	Shumard oak	BDM									CN
<i>Quercus suber</i>	Cork oak	BEL			A	M	H				CN
<i>Tilia americana 'Redmond'</i>	American linden	BDM							SPL	SPL	CN
<i>Eriobotrya japonica</i>	Loquat	BES						F			CN AO
<i>Eriobotrya japonica 'coppertone'</i>	Coppertone loquat	BES		Ut				F			CN AO
<i>Morus alba</i>	White mulberry	BDM	x		A	H		F			CN AO
<i>Cinnamomum camphora</i>	Camphor	BEL			A	H			SPL		CN CS
<i>Araucaria bidwillii</i>	Bunya-bunya	CEL				M		F			CS
<i>Butia capitata</i>	Pindo palm	PES						F			CS
<i>Ficus macrophylla</i>	Moreton bay fig	BEL				H	H	F			CS
<i>Pinus pinea</i>	Italian stone pine	CEL			A	M		F			CS
<i>Cedrus deodara</i>	Deodar cedar	CEL	x		A	M					CS
<i>Juniperus silicicola</i>	Southern red cedar	CEM									CS
<i>Prunus serrulata</i>	Kwanzan cherry	BDS	x								CS
<i>Quercus acuta</i>	Japanese evergreen oak	BES		Ut							CS
<i>Quercus rober</i>	English oak	BDL			A	M	H			SPL	CS
<i>Quercus virginiana</i>	Southern live oak	BEM			A	M	H				CS
<i>Syagrus romanzoffianum</i>	Queen palm	PES	x								CS
<i>Yucca gloriosa</i>	Moundlily yucca	PES	x								CS
<i>Washingtonia filifera</i>	California fan palm	PES			A	M	M				CS AE

Native Habitat Influence Zone

<i>Juglans hindsii</i>	California black walnut	BDL			A	M	M	F			NR
<i>Prunus ilicifolia</i>	Hollyleaf cherry	BDS						F			NR
<i>Sambucus mexicana</i>	Hairy blue elderberry	BDS		Ut				F			NR
<i>Acer macrophyllum</i>	Bigleaf maple	BDL			A		M				NR
<i>Aesculus californica</i>	California buckeye	BDS		Ut	A					SPL	NR
<i>Alnus rhombifolia</i>	White Alder	BDL			A					SPL	NR
<i>Platanus racemosa</i>	California Sycamore	BDL			A		H		SPL		NR
<i>Sambucus canadensis</i>	American elderberry	BDS						F		SPL	NR
<i>Sambucus canadensis 'aurea'</i>	Aurea American elderberry	BDS		Ut				F		SPL	NR
<i>Quercus agrifolia</i>	Coast live oak	BDL			A	M	H				NR CN

Conclusion and Next Steps

Individually, each of the proposed priority implementation projects represents a case study for a typical street type and influence zone described in the Street Tree Program Framework. As these projects are implemented, they should serve as models for street-tree planting that can be duplicated throughout the city. Together, these projects also form a cohesive network throughout the city that reinforces the urban form and character, and is equitably distributed throughout the city's neighborhoods. As such, it would be best to implement these projects concurrently, if possible. Several of the projects could be implemented in short-term and long-term phases, depending on available funds. For all of the projects, the public should be involved from the beginning of the next phase of planning and design. Short-term and long-term implementation strategies are described below.

SHORT-TERM IMPLEMENTATION: TREE PLANTING INCENTIVES

All of the priority implementation projects could begin immediately with the same short-term strategy: incentivizing tree planting in the setbacks on private properties. Depending on available funding sources, the incentive strategy will need to be determined. A community-organizing process (e.g., town-hall meetings and a publicity campaign) could be used to develop a "critical mass" of property owners who agree to tree-planting before the implementation begins. This would take advantage of the incentive program's momentum and maximize the impact of the project. Tree species selection could be left up to individual property owners, or a unified concept could be developed through a community process.

Trees planted on private properties should be located at least 5 feet from adjacent paving and neighboring property lines to prevent damage, and should be a maximum of 10 feet from the street right-of-way to maximize the positive effect on the public realm. (These dimensions refer to the distance to the tree trunk.)

Because so much of Watsonville's tree-planting potential is within the front yards of private properties, front-yard tree-planting initiatives should be encouraged and fostered throughout the city, whether or not they are associated with these priority implementation projects. Such city-wide greening efforts could be ongoing and concurrent with the implementation of the priority projects.

LONG-TERM IMPLEMENTATION: SCHEMATIC DESIGN, DESIGN DEVELOPMENT AND CONSTRUCTION DOCUMENTATION

This document provides design concepts that will serve as the starting point for the Schematic Design phase, which would then lead to Design Development and Construction Documentation phases. Public input should be gathered through public meetings and workshops at regular intervals throughout the Schematic Design and Design Development phases. Each of the priority implementation projects has a unique long-term strategy, described below.

Freedom Boulevard: Sidewalk widening and overall streetscape improvements

Sidewalk widening will be necessary in order to plant trees in the public right-of-way. This would entail a redesign of Freedom Boulevard, including traffic analysis and civil engineering as well as landscape architecture. The Schematic Design phase would begin with a traffic analysis to determine the potential to narrow or otherwise reconfigure the traffic lanes, and an analysis of the underground utilities that might be affected. These factors will determine the amount of sidewalk widening that is possible, as well as the required construction budget. Additional streetscape design considerations, such as street furnishings and lighting, should be considered during the Schematic Design phase. It is anticipated that the Schematic Design, Design Development and Construction Documentation phases would take approximately 18 months, total. Given the high cost of full implementation, the improvements could be phased over several separate construction projects.

Martinelli Street and Clifford Avenue: Stormwater management and roadway narrowing

The Schematic Design phase of the Martinelli Street and Clifford Avenue projects would begin with a traffic and parking-demand analyses to determine the potential to narrow or otherwise reconfigure the traffic lanes and remove on-street parking. The results of this analysis will determine the extent of the planting areas, and set the framework for the design. The stormwater management design would begin with setting stormwater-management goals, which depend on the drainage area, the area available for stormwater management planting areas, and the local soil conditions and infiltration potential. These factors should be analyzed by a stormwater management expert (civil engineer or hydrologist). In the case of Martinelli Street, this plan proposes that all of the new planting areas be stormwater management areas.

Along Clifford Avenue, the slopes in some areas may be too great for all of the planting areas to serve stormwater management purposes, so a determination of the extent of stormwater management areas would be part of the analysis. The traffic and parking reconfiguration and stormwater management design would together become the basis for the streetscape design. It is anticipated that the Schematic Design, Design Development and Construction Documentation phases would take approximately 18 months, total. Given the high cost of full implementation, the improvements could be phased over several separate construction projects.

Upper Main Street and Riverside Drive: Large-scale gateways

Both Upper Main Street and Riverside Drive are conceived as large-scale gateways that depend on planting in the setbacks on public and private properties. The implementation of these projects should start with outreach to the private property owners along the streets to assess their willingness to help implement the project, and to determine any special criteria they have, such as maintaining signage visibility. The Riverside Drive concept is simple enough that the design process would be relatively short. The design concept does depend on a certain length of contiguous planting on adjacent properties to create the desired windrow effect. The Upper Main Street concept will require a thorough Schematic Design and Design Development process, including public input. As neither of these gateway concepts requires sidewalk widening or street reconfiguration, traffic and stormwater management analyses would not be a necessary next step, however stormwater management could be incorporated into either design. It is anticipated that the Upper Main Street design phases would take approximately 12 months, total. The Riverside Drive project could be implemented as soon as construction funding is available and the planting areas are committed.

East Lake Avenue and Bockius Street: Setback tree-plantings on private properties

East Lake Avenue and Bockius Street primarily require plantings on private properties and would be implemented through an incentive strategy. As mentioned above, a critical mass of participants would take best advantage of grant funding as well as creating the highest impact. The concept described for Bockius Street could be implemented on any number of small-scale

residential streets throughout the city. It may be best to offer a tree-planting incentive program to the entire neighborhood—or even city-wide—and implement the planting on the blocks that garner the largest participation rates in each neighborhood or region of the city. Tree-islands and bulb-outs should be considered on a case-by-case basis. Both of these projects could be implemented as soon as construction funding is available and the planting areas are committed.