

City of East Palo Alto



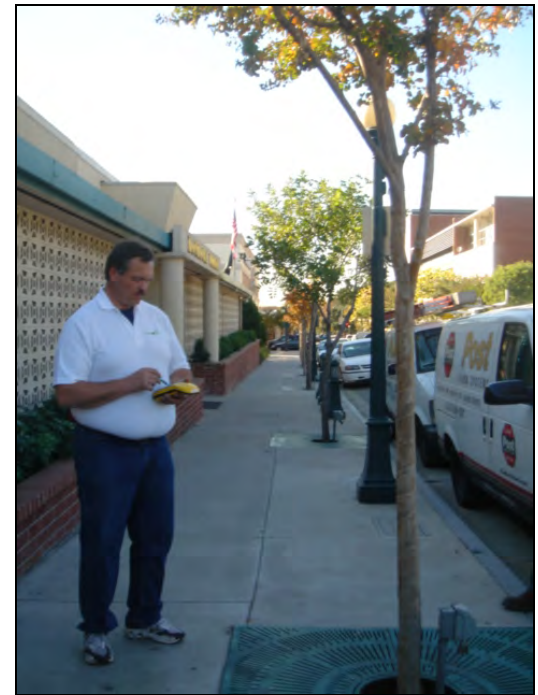
GIS Based Tree Inventory and Urban Forest Management System

ArborPro, Inc. Services



ArborPro, Inc. is a professional arboriculture consulting firm, we specialize in:

- * GPS Tree and Asset Inventory data collection by certified arborists
- * Hazard Tree/Value Assessment using visual tree assessment and CTLA
- * Urban Forest Management Software
- * Arborist Consulting Services
- * Urban Forest and Open Space Management Plans
- * We have provided our services for over 200 clients nationwide



ArborPro, Inc. Experience



Our Customer Base includes:

Municipalities

City of East Palo Alto, CA

City of Oakley, CA

City of Orange, CA

City of Malibu, CA

City of West Hollywood

City of Santa Clarita, CA

City of Simi Valley, CA

City of Thousand Oaks, CA

City of Fountain Valley, CA

City of Highland, CA

City of Calabasas, CA

City of San Luis Obispo, CA

City of San Marino, CA

County of San Diego, CA

City of Vista, CA

City of New Orleans – Disaster Relief

City of Kansas City

City of Sleepy Hollow

City of Boca Raton

City of Birmingham

City of Fargo

City of Largo

City of Pompano Beach

City of Port St Lucie

City of Sanford

City of Wood Buffalo

City of Bowling Green

City of San Antonio

City of Sylvania

City of Minot

City of New Rochelle

ArborPro, Inc. Experience



Our Customer Base includes:

Municipalities

Universities

Santa Clara University

San Jose State University

Mills College

SFSU

SDSU

University of Southern California

Point Loma University

Pomona College

Cal Poly Pomona

Cal Tech

Cal State Long Beach

Cal State San Bernardino

Chapman University

Cal Poly SLO

Jefferson Davis, Alabama

University of Tennessee at Knoxville

ArborPro, Inc. Experience



Our Customer Base includes:

Municipalities

Universities

Federal Agencies

Jet Propulsion Laboratory - NASA
Lawrence Livermore National Lab
Grand Forks Air Force Base
El Toro Marine Base
FEMA – Hurricane Katrina Relief
FEMA – Hurricane Sandy

ArborPro, Inc. Experience



Our Customer Base includes:

Municipalities

Universities

Federal Agencies

Various Other Properties

Disneyland

San Diego Wild Animal Park

Cemeteries

Various Zoos

Homeowners Associations

Golf Courses

San Diego Wild Animal Park

Long Beach Unified School District

Arrowhead Lake Association

Utility Agencies - EWEB

GPS Technology



GPS Equipment

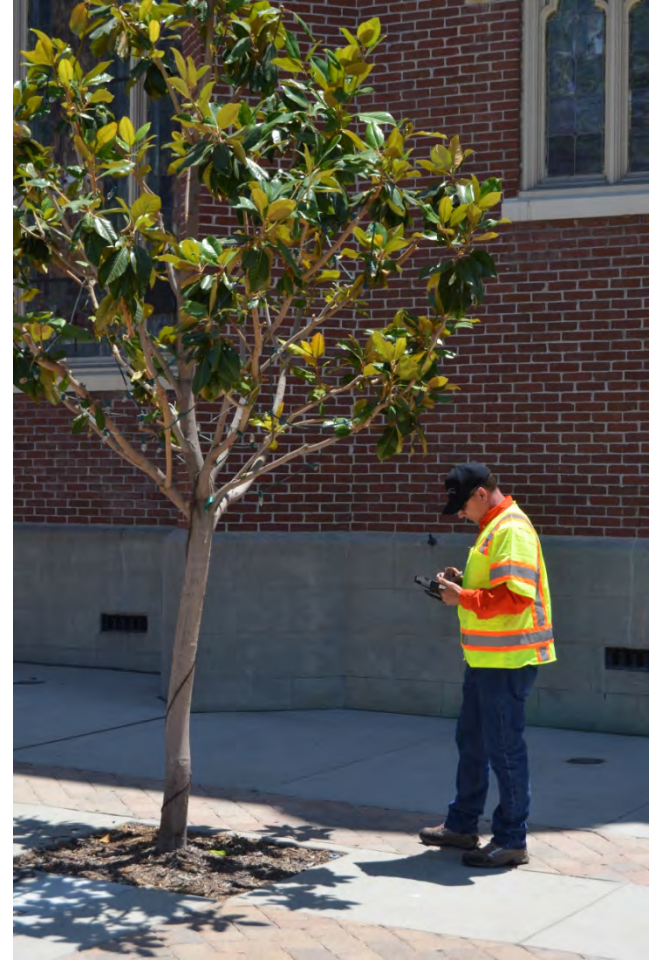
GEO XH Handheld

Satellite Receiver records precise
Positional Data (Longitude and Latitude).
Accuracy is set at sub-meter or better.

Handheld Computer – Panasonic Toughpad
Records Tree Attribute Data

Laser Range Finder

Offset Tree up to 500 feet.





TABLET 4

Panasonic FZ-G1

TOUGHPAD

Tree ID: 501018 - Active Tree

Tree Age: 12

Field	Value
Tree Tag	Active Tree
Status	OK
Location	Field
Condition	Good
Species	Oak
Height	15m
DBH	10cm
Age	12
Health	Healthy
Notes	

Map showing tree location

Buttons: A1, A2, Home, Power

EPA – Project Milestones



April 24, 2012 – Cal Fire awards the City of East Palo Alto with Grant

September 7, 2012 – East Palo Alto accepts RFP responses for Project

November 2012 – East Palo Alto awards contract to ArborPro, Inc.

February – March 2013 – ArborPro Data Collection

March 2013 – ArborPro creates draft of Urban Forest Management Report

April 2013 – Master Plan is finalized and delivered to the City

April 2013 – ArborPro presents findings at Planning Commission Meeting and City Council Meeting.

April 2013 – ArborPro Software Delivery and Training.

Tree Inventory Project



Pre Job Meeting

Discussion Topics Included

Project Schedule

Detailed Attribute Definitions

Maintenance Zone Clarifications

Right of Way Issues

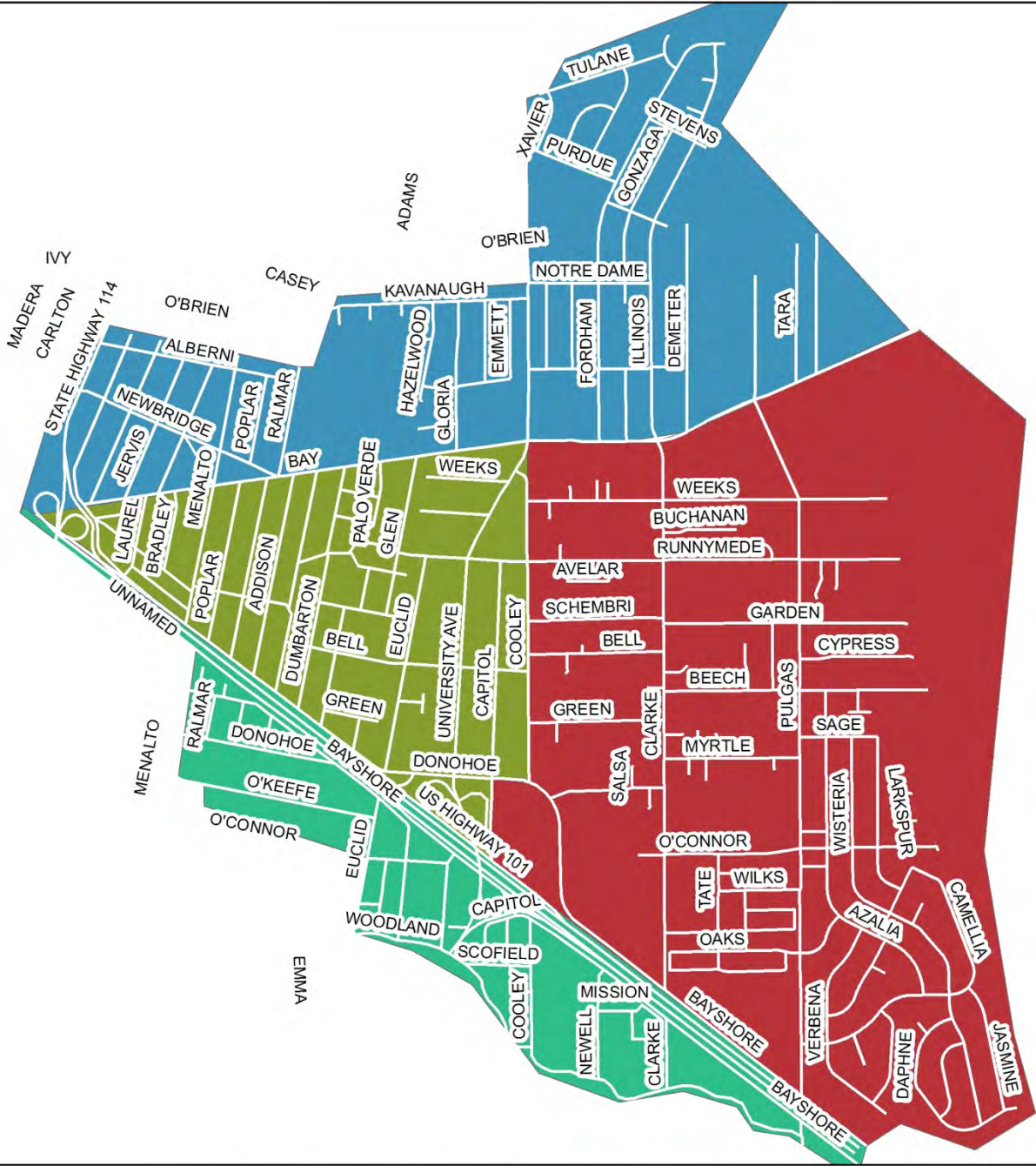
GIS Data provided by the City

Legend

Streets

Id

- Zone 1
- Zone 2
- Zone 3
- Zone 4

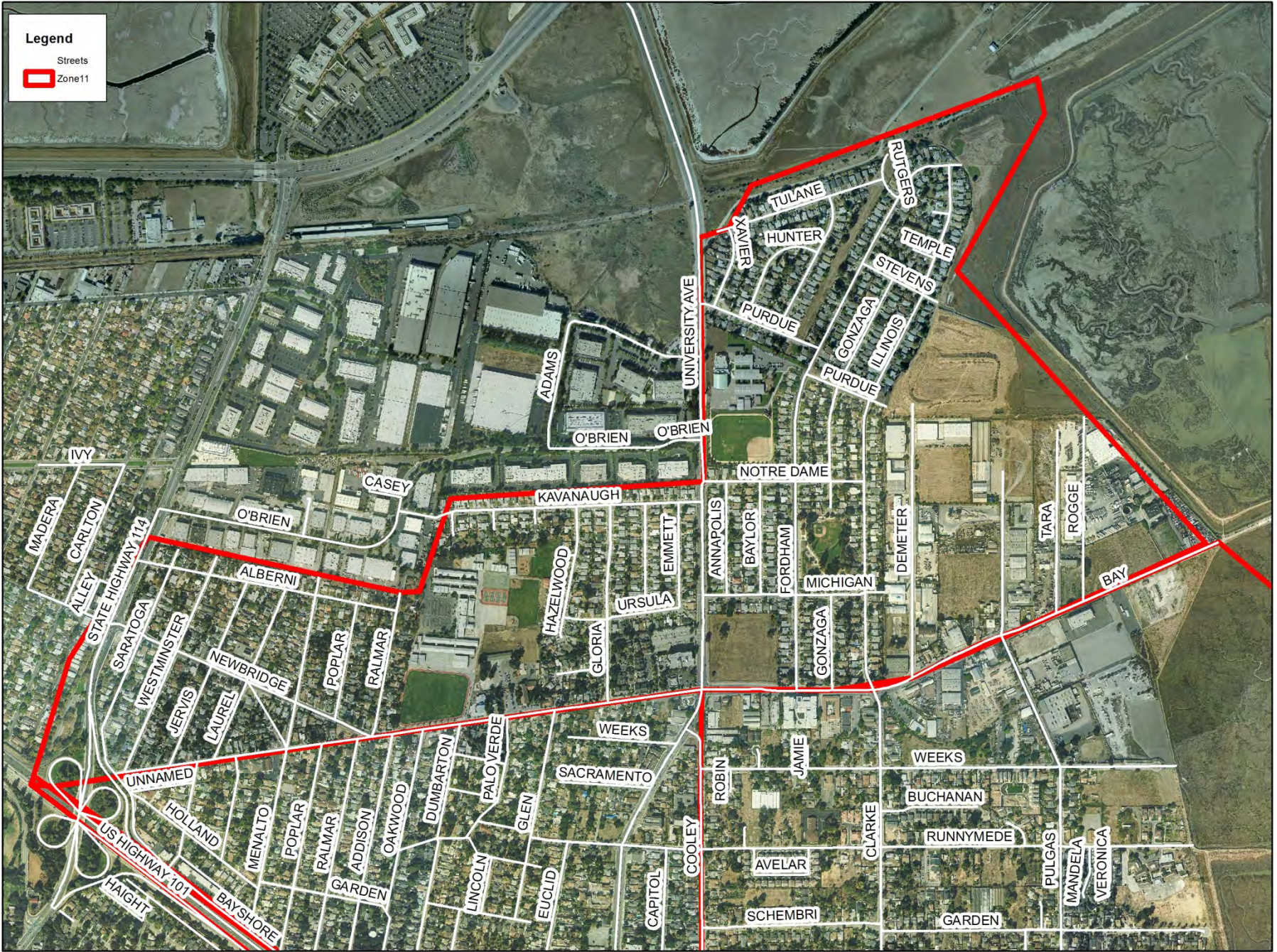


City of East Palo Alto - Zone Map

Legend

Streets

Zone 11



City of East Palo Alto - Zone 1

Tree Inventory Project



Weekly Progress Reports

Progress Reports delivered to EPA every week- Including

Summary Analysis

Species Frequency Report

Detailed Maps of Completion Area

ROW Variance Identification



City of East Palo Alto - Progress Report 3/5/2013

Community Outreach



ArborPro, Inc. conducted two City Tree Walks

ArborPro's Arborist walked with community members through a neighborhood describing the techniques used for the tree inventory and the benefits of the Urban Forest

ArborPro provided detailed maps of the Tree Walk Area



Legend

EPA Trees

● EPA Trees

— Streets

City of East Palo Alto

Urban Forest Management Plan



Sections Included

- Inventory Summary and Analysis
- Economic Benefits Analysis
- Tree Maintenance Recommendations
- Tree Planting Recommendations
- Construction Management
- Special Tree Management Situations

Tree Inventory Statistics



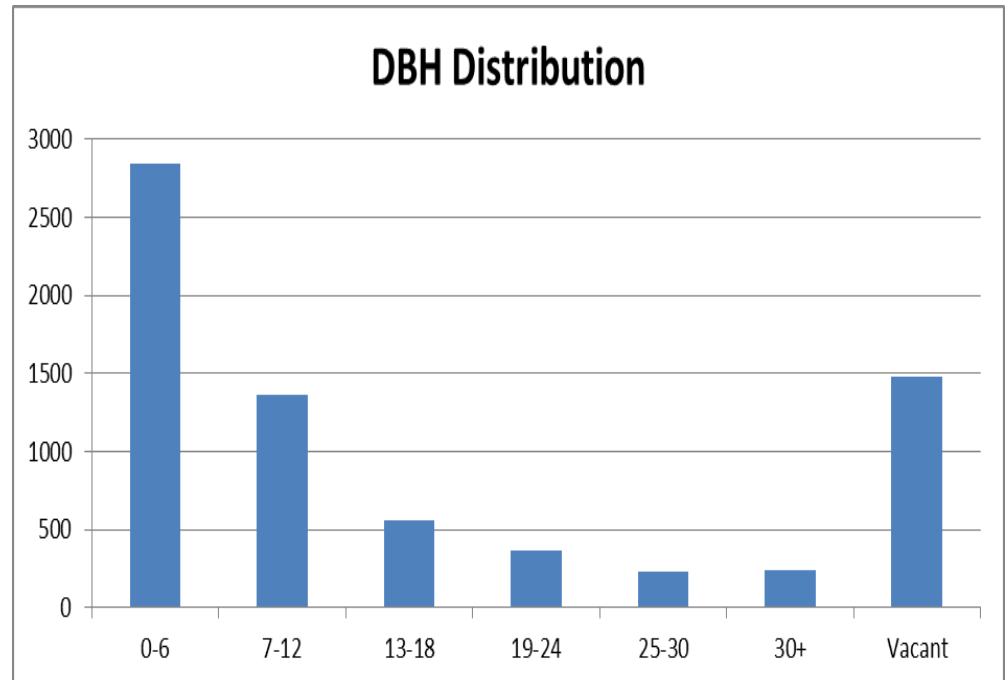
Total Tree Sites Inventoried	7,073
Different varieties of tree species	261
Potential Tree Planting Sites	1,480
Existing Stumps	108

Tree Inventory Statistics



Diameter at Breast Height

Dbh Range	Tree Count
0-6	2844
7-12	1362
13-18	558
19-24	361
25-30	232
30+	236
Vacant	1,480
Total	7,073

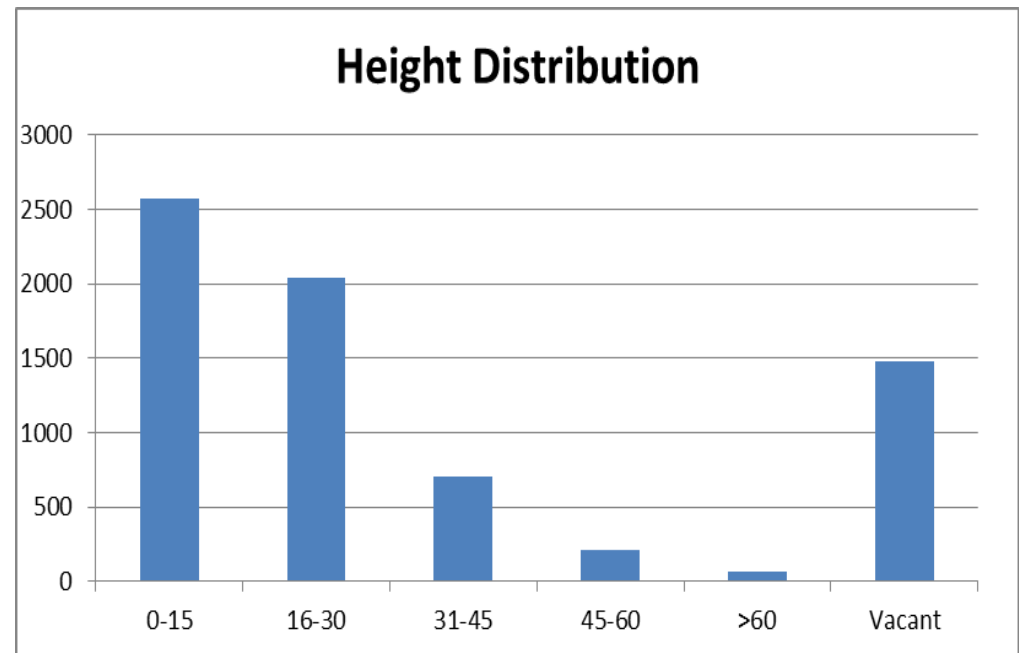


Tree Inventory Statistics



Tree Height

Height Range	Tree Count
0-15	2567
16-30	2043
31-45	703
45-60	211
>60	69
Vacant	1480
Total	7,073



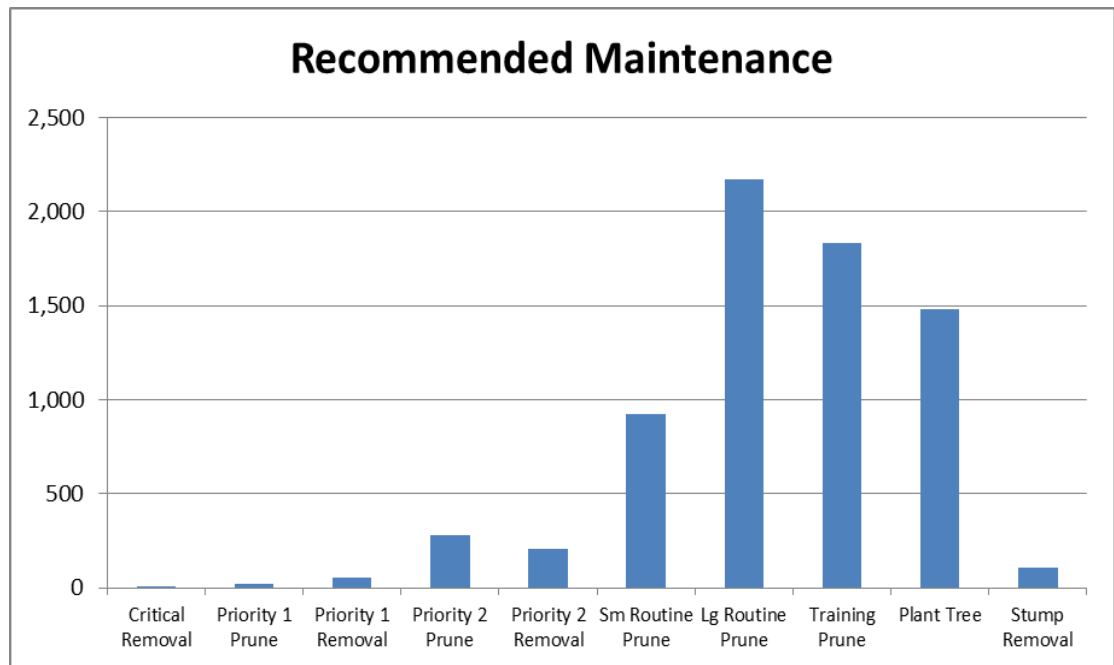
Tree Inventory Statistics



Maintenance Recommendations

<u>Recommended Maintenance</u>	<u>Tree Count</u>
Critical Removal	1
Priority 1 Prune	22
Priority 1 Removal	53
Priority 2 Prune	276
Priority 2 Removal	206
Sm Routine Prune	925
Lg Routine Prune	2,169
Training Prune	1,833
Plant Tree	1,480
Stump Removal	108
Total	7,073

Recommended Maintenance





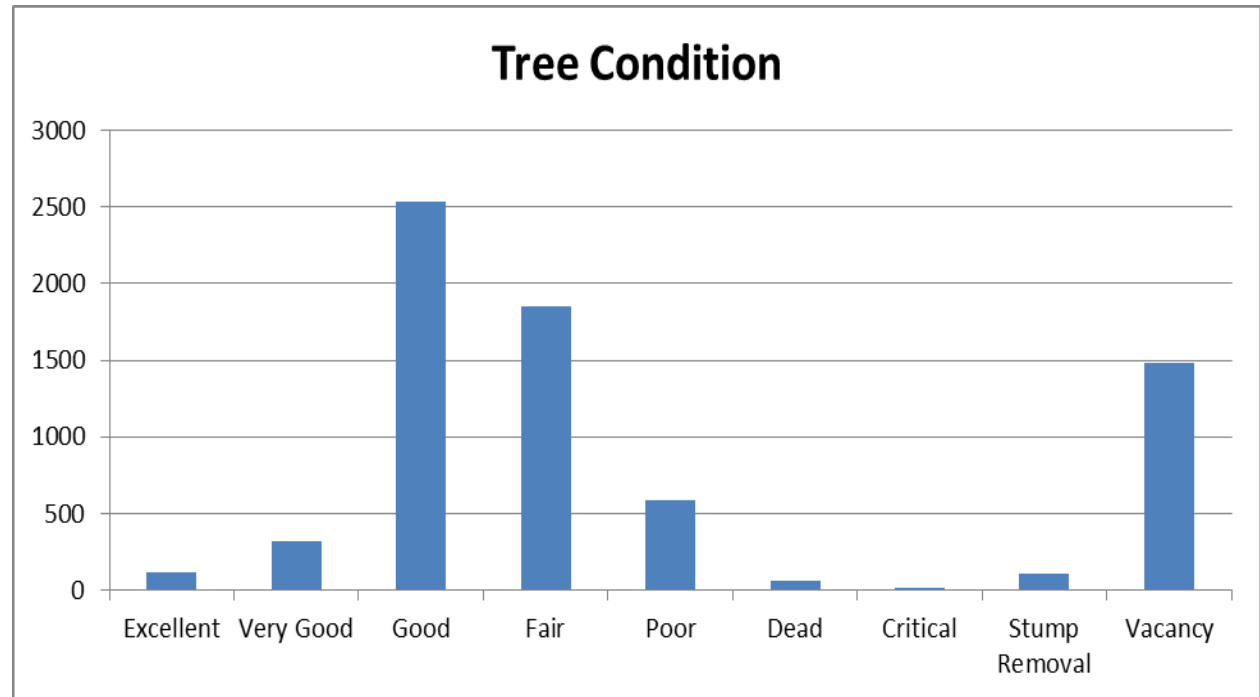
City of East Palo Alto - Recommended Maintenance

Tree Inventory Statistics



Tree Condition

Tree Condition	Tree Count
Excellent	116
Very Good	323
Good	2539
Fair	1856
Poor	584
Dead	62
Critical	5
Stump Removal	108
Vacancy	1480
Total	7,073





City of East Palo Alto - Tree Condition

Species Frequency



Top Five Species

Botanical Name	Common Name	Tree Count
Platanus x acerifolia	London Plane Tree	420
Quercus agrifolia	Coast Live Oak	341
Ligustrum lucidum	Glossy Privet	268
Lagerstroemia indica	Crape Myrtle	239
Cupressus sempervirens	Italian Cypress	223

Species Frequency



Top Five Species

London Plane



Species Frequency



Top Five Species

Coast Live Oak



Species Frequency



Top Five Species

Glossy Privet



Species Frequency



Top Five Species

Crape Myrtle



Species Frequency



Top Five Species

Italian Cypress



Economic Benefit Analysis



ArborPro Software Exports dataset into the I-Tree Suite

Summary

Stormwater - Public trees in East Palo Alto intercept 5,372,467 gallons of water annually for a savings of \$21,491.

Public trees in East Palo Alto capture 341,551 pounds of atmospheric CO₂ per year. Annual savings including indirect costs are \$6,067. Street trees also store approximately 17,968,977 pounds of atmospheric CO₂ for a total savings of \$134,767.

Air Quality - The annual savings from air quality improvements including indirect cost is \$ 8,827.

Energy Savings - Public trees in East Palo Alto save approximately 406.3 MWH of electricity and 7,226.6 Therms of natural gas annually for a savings of \$63,186.

Economic Benefit Analysis



East Palo Alto

Total Annual Benefits of Public Trees by Species (\$)

3/19/201

Species	Energy	CO ₂	Air Quality	Stormwater	Aesthetic/Other	Total (\$)	Standard Error	% of Total \$
Common crapemyrtle	2,442	370	789	461	7,590	11,651	(=0)	3.8
Chinese privet	3,974	405	1,971	1,775	13,054	21,179	(=0)	6.9
London planetree	6,155	553	2,856	2,922	11,437	23,923	(=0)	7.8
Catalina cherry	1,902	227	665	364	4,508	7,667	(=0)	2.5
Coastal live oak: Cali	3,418	467	-3,015	1,686	13,454	16,011	(=0)	5.2
Strawberry tree	535	28	84	141	7,529	8,316	(=0)	2.7
Italian cypress	3,697	166	870	928	7,528	13,189	(=0)	4.3
Cherry plum	1,873	158	701	364	2,522	5,619	(=0)	1.8
Water gum: kanooka	796	50	211	252	6,138	7,447	(=0)	2.4
Levantine Live oak	256	32	-216	65	5,625	5,762	(=0)	1.9
Olive	1,806	184	892	800	5,789	9,470	(=0)	3.1
Queen palm	299	22	75	64	903	1,363	(=0)	0.4
Bradford pear	1,369	58	664	301	1,147	3,539	(=0)	1.2
Loquat tree	1,384	98	821	568	4,438	7,309	(=0)	2.4
Raywood Ash 2	2,648	321	1,104	730	9,936	14,738	(=0)	4.8
Japanese maple	1,139	80	312	238	3,179	4,949	(=0)	1.6
Chinese pistache	812	31	192	179	502	1,717	(=0)	0.6
Common plum	862	79	312	167	1,443	2,864	(=0)	0.9
Peach	529	65	173	100	1,511	2,379	(=0)	0.8
Star pine	124	11	-14	36	2,371	2,528	(=0)	0.8
Sweetgum	2,254	120	-1,539	531	5,289	6,656	(=0)	2.2
Callery pear	823	35	371	177	1,126	2,532	(=0)	0.8
Urbane oak	85	12	-74	30	2,329	2,381	(=0)	0.8
European white birch	849	77	204	182	3,834	5,145	(=0)	1.7
Cork oak	1,021	139	-902	492	3,988	4,738	(=0)	1.6
Moundlily yucca	194	11	51	43	489	787	(=0)	0.3
OTHER STREET TR	21,940	2,268	1,270	7,894	78,370	111,742	(=0)	36.6
Citywide Total	63,186	6,067	8,827	21,491	206,029	305,601	(=0)	100.0

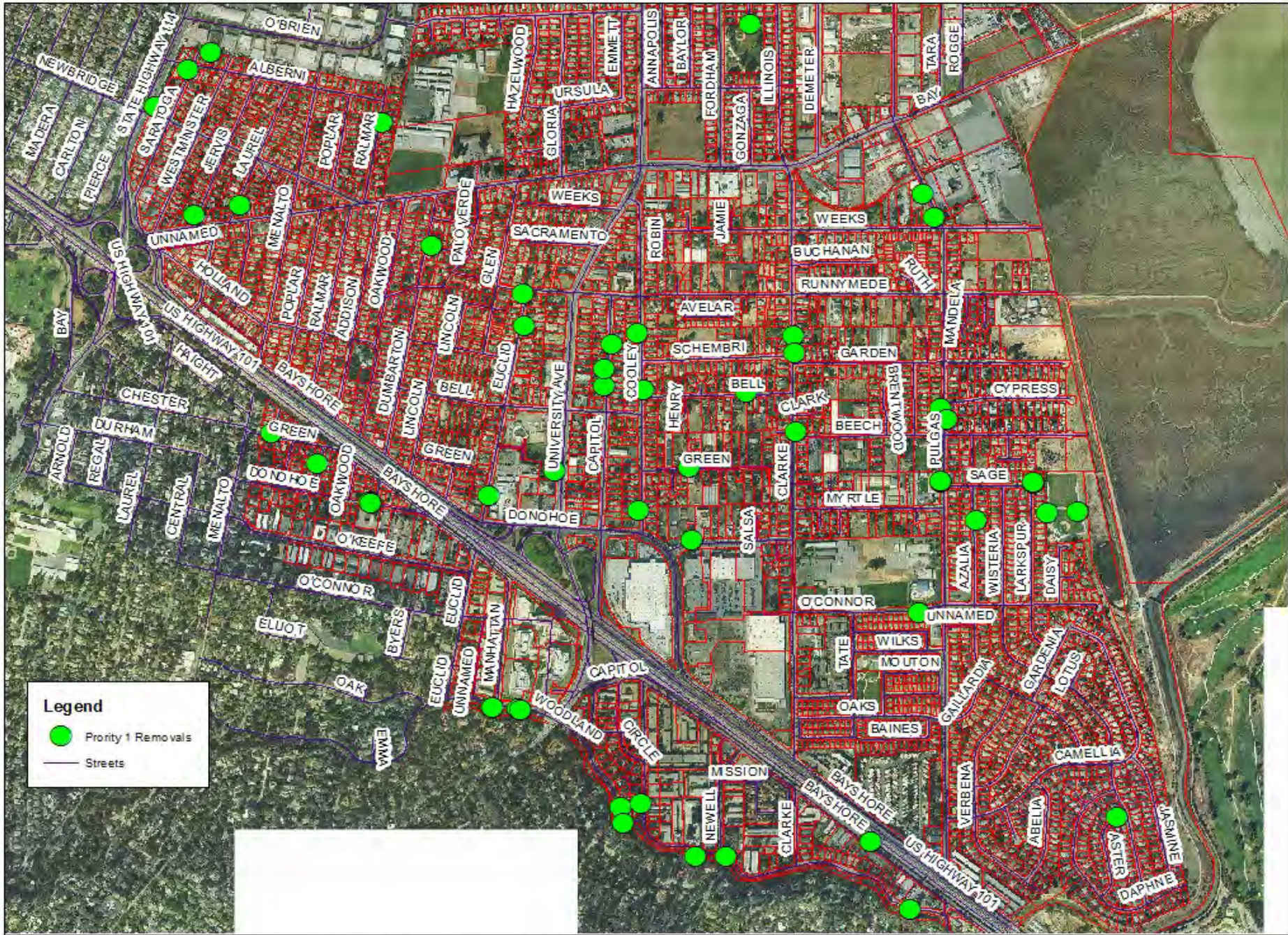
Maintenance Recommendations



Long Term Maintenance Recommendations Include

Hazard Eradication – Priority 1 Removals and Priority 1 Prunes

Utilizing ArborPro the City created an RFP to eliminate Urban Forest Hazards



Legend

- Priority 1 Removals
- Streets

City of East Palo Alto - Recommended Maintenance

Maintenance Recommendations



Long Term Maintenance Recommendations Include

Hazard Eradication – Priority 1 Removals and Priority 1 Prunes

Utilizing ArborPro the City created an RFP to eliminate Urban Forest Hazards

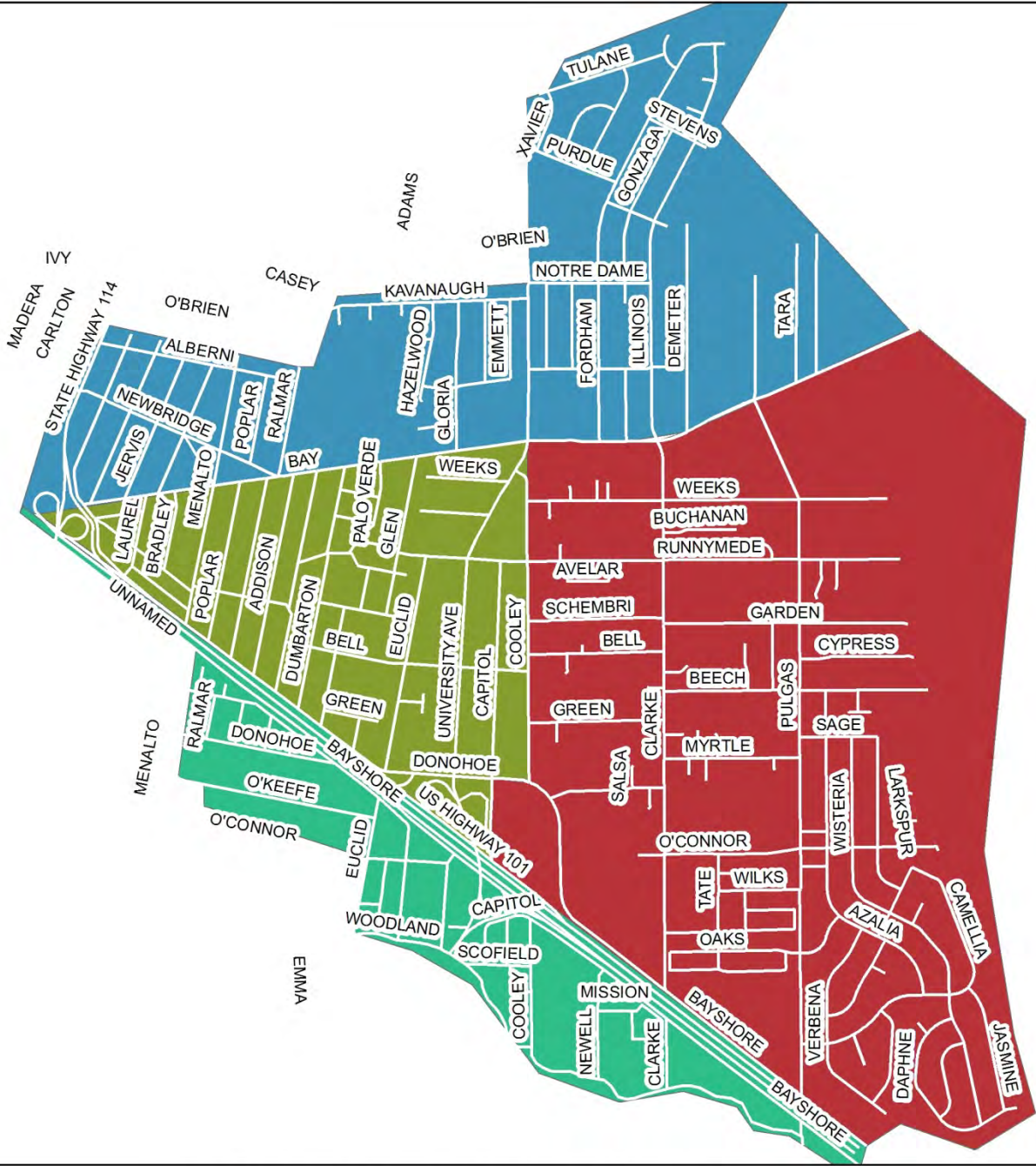
Routine Pruning – Develop a 4 Year Pruning Cycle based on the Maintenance Zones.

Legend

Streets

Id

- Zone 1
- Zone 2
- Zone 3
- Zone 4



City of East Palo Alto - Zone Map

Maintenance Recommendations



Long Term Maintenance Recommendations Include

Hazard Eradication – Priority 1 Removals and Priority 1 Prunes

Utilizing ArborPro the City created an RFP to eliminate Urban Forest Hazards

Routine Pruning – Develop a 4 Year Pruning Cycle based on the Maintenance Zones.

Update the City Ordinance for Urban Forest Guidelines and Support Initiatives

Utilize ArborPro Software for Scheduling, Budgeting, Work Orders and Work History

Tree Planting Plan

Tree Planting Palette



Species Recommendations

Botanical Name	Common Name	Parkway Size (in feet)	Plant Under Utilities
<i>Lagerstroemia indica</i> hybrids	Crape Myrtle hybrids	2	Yes
<i>Chionanthus retusus</i>	Chinese Fringe Tree	2	Yes
<i>Pittosporum crassifolium</i>	Karo	2	Yes
<i>Podocarpus macrophyllus</i>	Yew Pine	2	Yes
<i>Rhaphiolepis</i> 'Majestic Beauty'	'Majestic Beauty' Indian Hawthorn	2	Yes
<i>Syagrus romazoffianum</i>	Queen Palm	2	No
<i>Trachycarpus fortunei</i>	Windmill Palm	2	Yes
<i>Tristaniopsis laurina</i>	Water Gum	2	Yes
<i>Arbutus</i> 'Marina'	'Marina' Arbutus	3	Yes
<i>Carpinus betulus</i> 'Fastigiata'	Upright European Hornbeam	3	Yes
<i>Eriobotrya</i> (<i>XRhaphiobotrya</i>)	'Coppertone' Loquat	3	Yes
<i>Eucalyptus torquata</i>	Coral Gum	3	Yes
<i>Hymenosporum flavum</i>	Sweetshade	3	No
<i>Koelreuteria bipinnata</i>	Chinese Flame Tree	3	Yes
<i>Koelreuteria paniculata</i>	Goldenrain Tree	3	Yes
<i>Prunus cerasifera</i>	Purple-leafed Plum	3	Yes
<i>Washingtonia robusta</i>	Mexican Fan Palm	3	No
<i>Xylosma congestum</i>	Shiny Xylosma	3	Yes
<i>Acer buergeranum</i>	Trident Maple	4	Yes



Sample Photos

Camphor Tree



Sample Photos



Sycamore Tree in Public ROW



Sample Photos



Priority 1 Removal





Sample Photos

Priority 1 Removal



Sample Photos



Wrong Tree in the Wrong Place



Sample Photos



Encroachment Issues



Thank you for your time

