



APPENDIX J

Introduction

Federal Aviation Administration (FAA) FAR Part 77 airspace protection regulations were designed to ensure that structures and other uses do not cause hazards to aircraft in flight within the vicinity an airport. Hazards to flight include physical obstructions to the navigable airspace, wildlife hazards, particularly bird strikes, and land use characteristics that create visual or electronic interference with aircraft navigation or communication. Typically, proposed structures that penetrate FAR Part 77, Subpart B are considered an airspace obstruction and require an aeronautical review by the FAA. However, FAR Part 77, Subpart B, Section 77.15 of the regulations also stipulate that “FAA review is not required for new structures that would penetrate the airport’s airspace surfaces if the proposed structure would be shielded by existing structures of a permanent and substantial character of equal or greater height or by natural terrain or topographic features of equal or greater height, and would be located in the congested area of a city, town, or settlement where it is evident beyond all reasonable doubt that the structure so shielded will not adversely affect safety in air navigation.”

High Terrain Zone Study Area Setting

The underlying topography of an airport’s airspace imaginary surfaces can play a significant factor in determining the allowable height of a structure. Allowable heights north of ONT are reduced due to the rising terrain sloping upwards towards the San Gabriel Mountains and, in some areas, the natural terrain pierces the imaginary surfaces. The rising terrain area north of ONT, referred to as the High Terrain Zone within this study, is confined to portions of Upland, Ontario and Rancho Cucamonga. The High Terrain Zone study area is highly developed with a combination of residential, industrial and commercial land uses with a limited number of vacant parcels scattered throughout that could accommodate infill development.

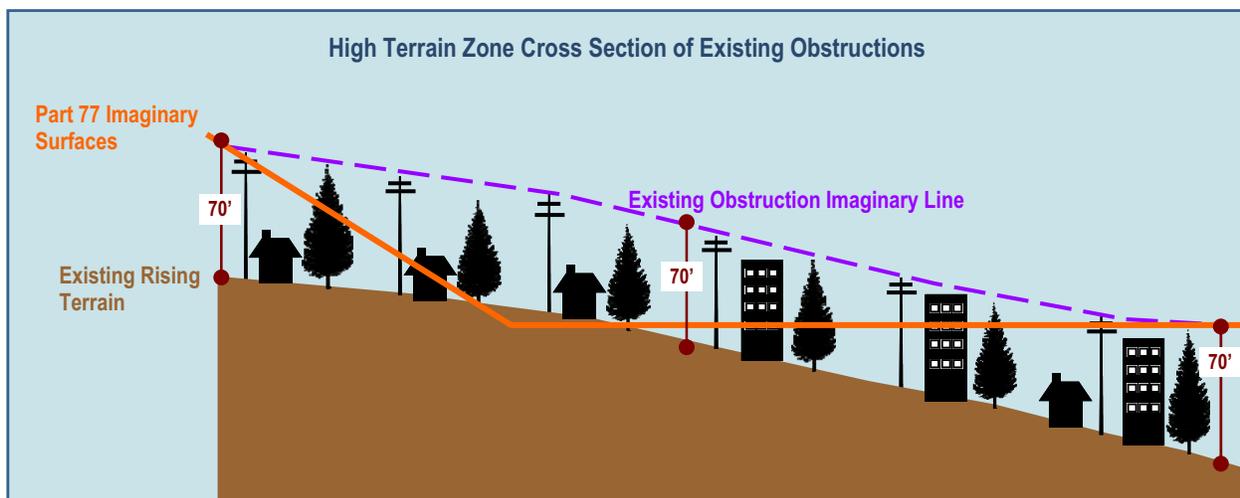
Methodology

This study utilized GIS methods and field surveys to identify existing obstructions within the High Terrain Zone study area. GIS 3D Analyst modeling techniques were utilized to calculate the allowable heights by taking the underlying ground elevation and comparing it to the elevation of the controlling portions of the FAR Part 77, TERPS, and OEI surfaces. The GIS 3D Analyst produced a 2-dimensional color-banded map with each color band representing a range of the distance, measured in vertical feet, between the ground and overlying surface. The map illustrates the allowable height range of a structure. The color coded bands are typically divided at 10 or 20 foot intervals as shown in Figure J-1. The areas north of ONT resulted in a series of concentric like elliptical shapes, with the inner-most elliptical shapes having allowable heights of less than 30

feet. The outer-most elliptical shapes have allowable heights of up to 120 feet. The 70 foot color-coded concentric elliptical shape was digitized into a shapefile and is identified as the High Terrain Zone and the project study area.

A windshield reconnaissance survey was conducted establishing that trees and Southern California Edison (SCE) power poles are the tallest objects in the vicinity. SCE was contacted for GIS pole height and location data but they did not have that data available. However, SCE did indicate that pole heights vary and SCE poles north of the airport varied in size, with some poles reaching heights greater than 80 feet. Since SCE pole data was not available, the City of Ontario conducted a sample survey of existing SCE pole heights within the High Terrain Zone study area. There were a total of 28 poles examined by City of Ontario surveyors. The City surveyors recorded an elevation height at the top and base of each pole to determine each SCE pole height. Figure J1 identifies the locations of the SCE poles surveyed and displays the allowable heights within the High Terrain Zone study area. The sample survey of SCE poles are cataloged on pages J9 - J17, showing a detail of the pole location and pole data. Figure J2 displays the entire study area and shows the location of each pole with the associated pole height labeled above its location. Figure J2 also demonstrates how existing SCE poles have heights of up to 70 feet within areas of allowable heights of less than 30 feet.

An important note to make regarding the High Terrain Zone study area is that the outermost concentric elliptical shape allows for heights of up to 70 feet and the inner most elliptical shape allows heights that are significantly reduced and, in some areas, less than 0 feet. The diagram below illustrates the rising terrain, the Part 77 imaginary airspace protection surfaces, and existing obstructions imaginary line.



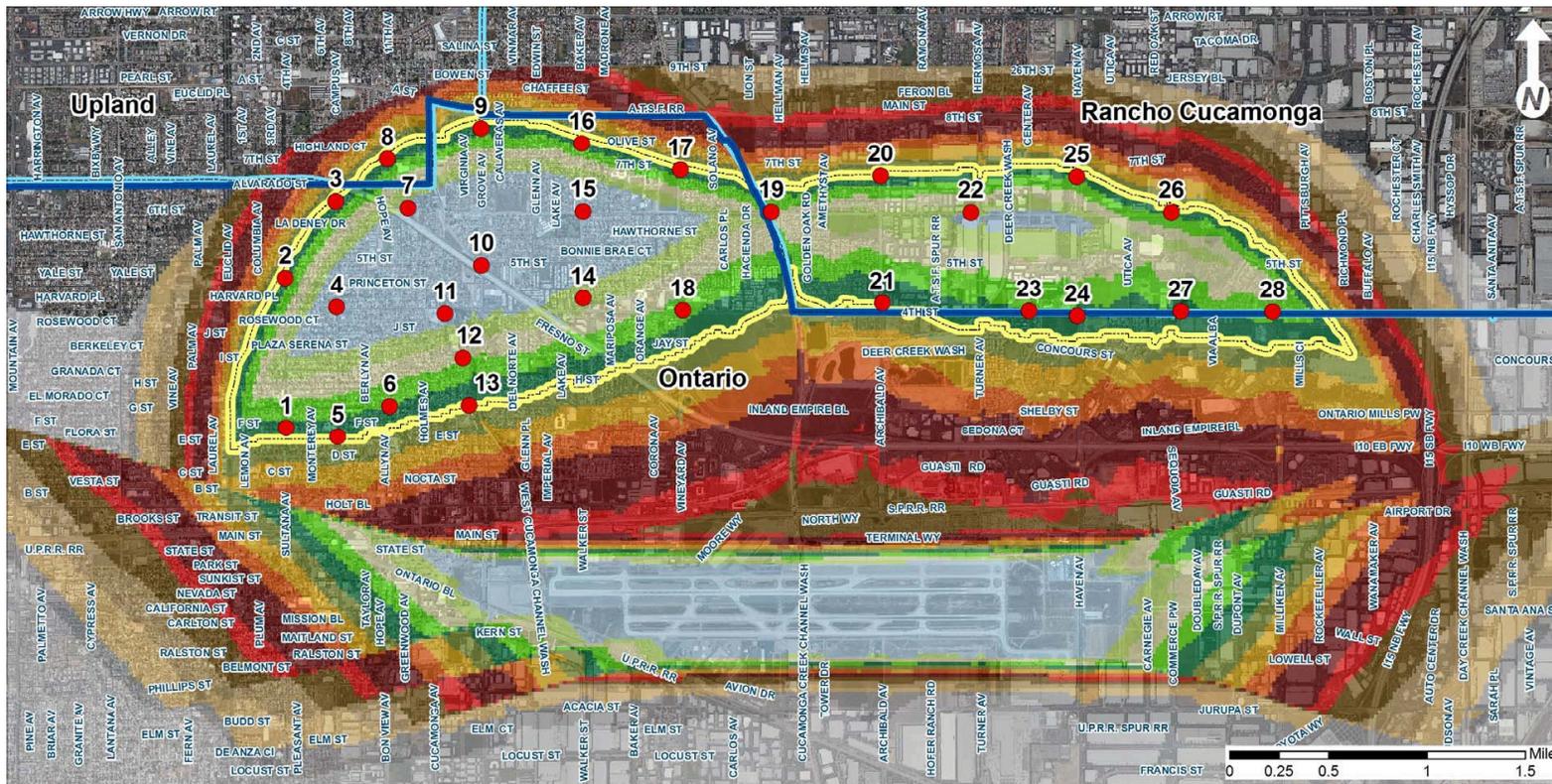
This survey also focused on locating concentrations of trees that pierce the imaginary surfaces. Figures J3 and J4 show the tree locations within the public right-of-way in conjunction with the associated height range. Figures J3 and J4 reflect street tree information for the City of Ontario. The City of Rancho Cucamonga did not have GIS data available for street trees within the public

right-of-way but did provide their “Street Tree Designations per Street” document. This study relied on city street tree documents, SCE pole data and reconnaissance information to document existing airspace obstructions within the High Terrain Zone study area. The existing conditions and obstructions documented within the study area concentrated around major streets focusing on street trees, SCE Poles and any other obstructions can be found on pages J18 - J32. Street Tree information for the City of Rancho Cucamonga can be found on pages J33 - J36.

Findings/Recommendations

The City of Ontario conducted this study to document existing obstructions and help establish a threshold for new construction within the High Terrain Zone study area. Based on evidence provided in this study, it is recommended that a threshold of 70 feet be established within the High Terrain Zone study area for new construction due to the height of existing obstructions, which is consistent with FAR Part 77, Subpart B, Section 77.15. Therefore, a proposed structure of up to 70 feet in height (subject to local agency zoning limits) within the High Terrain Zone Study Area should be exempt from FAA aeronautical reviews.

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This figure, J1 shows the geographic location of each SCE Pole surveyed and outlines the High Terrain Zone study area. This figure also illustrates the results of the GIS 3D Analyst which calculated the allowable heights by taking the underlying ground elevation and comparing it to the elevation of the controlling portions of the FAR Part 77, TERPS, and OEI surfaces. The 2-dimensional map produced a color banded map, with each color band representing a range of allowable heights.

Also, included as part of this exhibit is the table below which lists the average SCE pole separation on the major streets, where SCE poles were surveyed. The distance between SCE poles within the study area range from 100ft to 200ft apart. Although, the map only shows the location of poles surveyed, there is a multiple number of obstructions within the study area that are no more than 200 feet apart.

Legend

- SCE Pole Locations
- ▭ Ontario City Limits
- ▭ City Limits
- ▭ High Terrain Zone Study Area

Allowable Structure/Bldg. Height

0' - 30'	61' - 70'	101' - 120'	171' - 190'
31' - 40'	71' - 80'	121' - 130'	191' - 200'
41' - 50'	81' - 90'	131' - 150'	201' and Greater
51' - 60'	91' - 100'	151' - 170'	

Figure J1
High Terrain Zone Study Area
& SCE Pole Locations

Street Name (Orientation)	Pole separations (average in feet)
Sultana Avenue (North - South)	130 ft - 200 ft
Campus Avenue (North - South)	120 ft - 200 ft
Grove Avenue (North - South)	100ft - 150 ft
Vineyard Avenue (North - South)	200ft
Archibald Avenue (North - South)	150 ft - 200 ft
Haven Avenue (North - South)	150 ft
Sixth Street (East - West)	100ft - 230 ft
Fourth Street (East - West)	120ft - 190 ft

Figure J2, shows the geographic location of each SCE pole and its associated surveyed height. This figure only illustrates the location of poles surveyed, SCE pole distances were also examined and are listed on Figure J1. Although, this map does not show each SCE pole obstruction there is a multiple number of obstructions within the study area that are no more than approximately 200 feet apart. Also, the black dashed lines on the map highlight the major streets that were examined as part of this study.

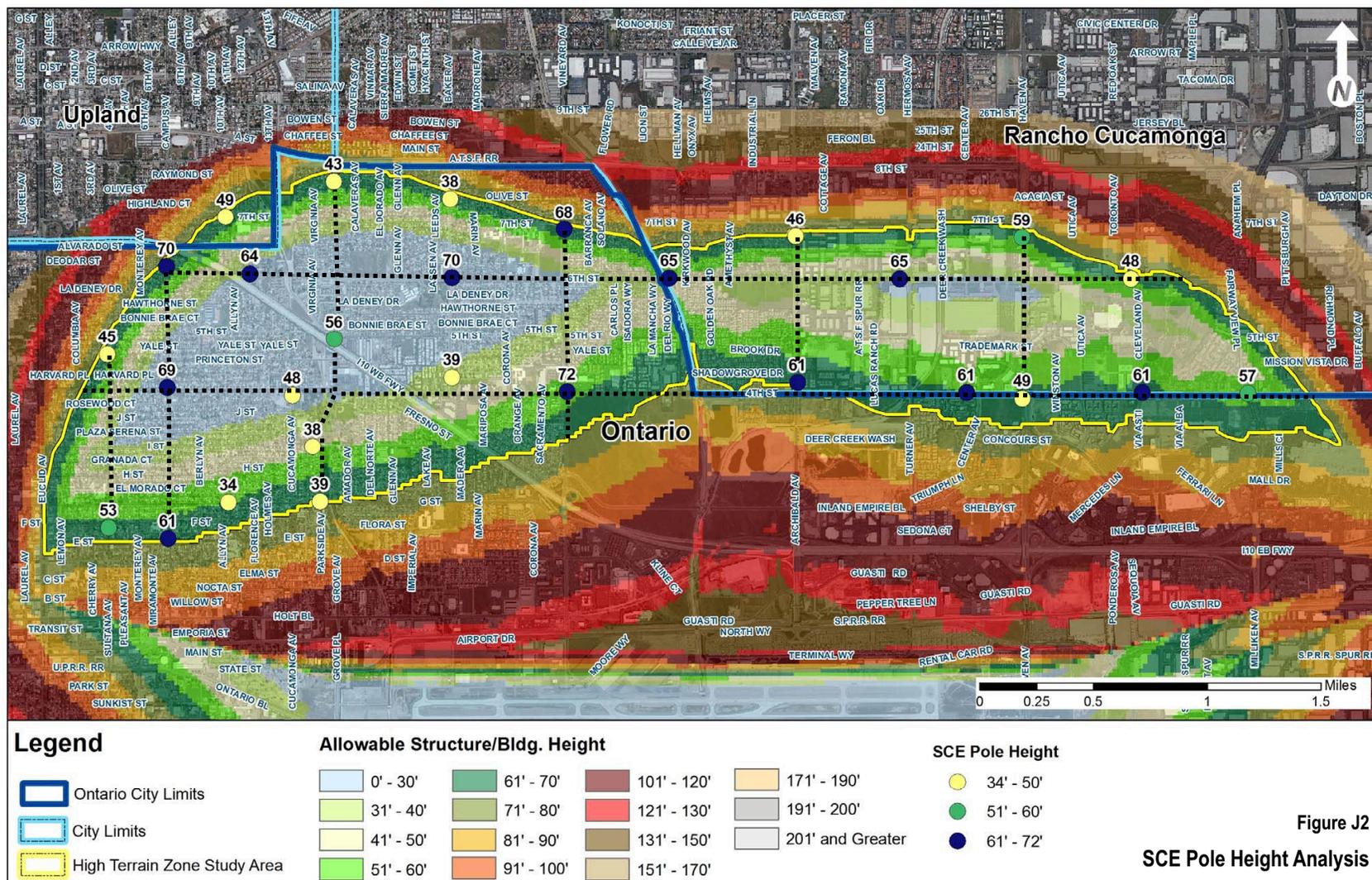


Figure J2
SCE Pole Height Analysis

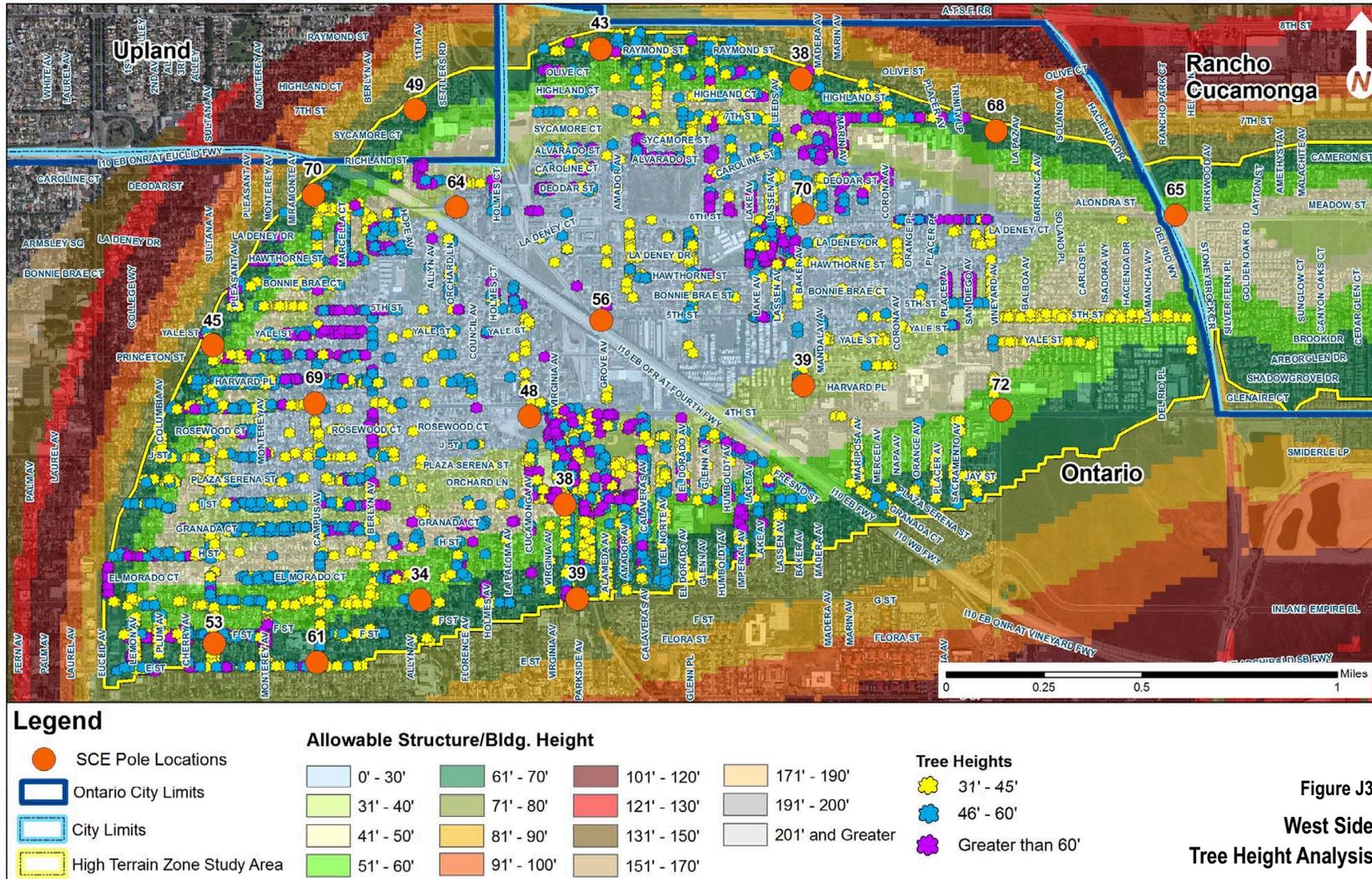
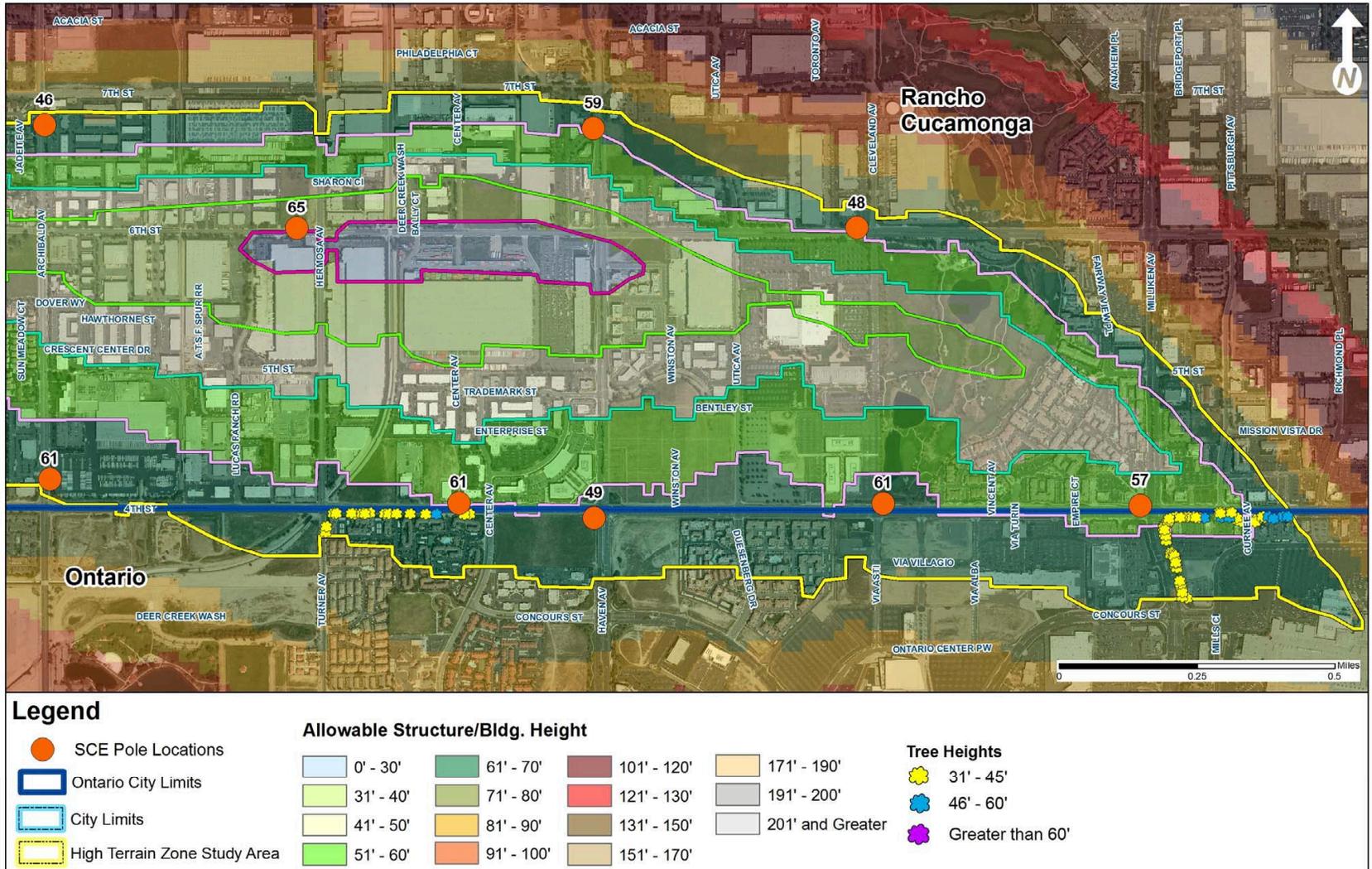


Figure J3, focuses on street trees within the public-right-of-way in conjunction with their associated heights. This map also includes SCE pole locations and surveyed tree height.

This figure also demonstrates the concentration of established street trees within areas of the western portion of the high terrain zone study area.

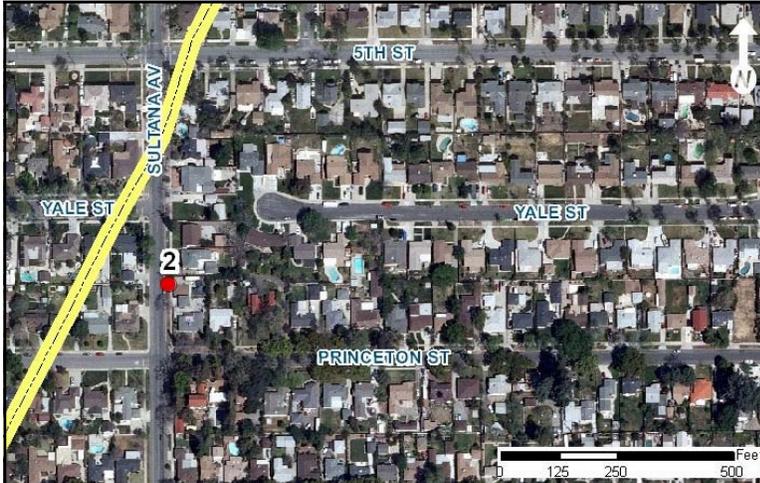
Figure J4, focuses on street trees within the public-right-of-way on the eastern half of the High Terrain Zone study area in conjunction with their associated heights. This figure only concentrates on street tree information for the City of Ontario. Information on street trees for the City of Rancho Cucamonga is provided on pages J33 - J36 of this appendix.





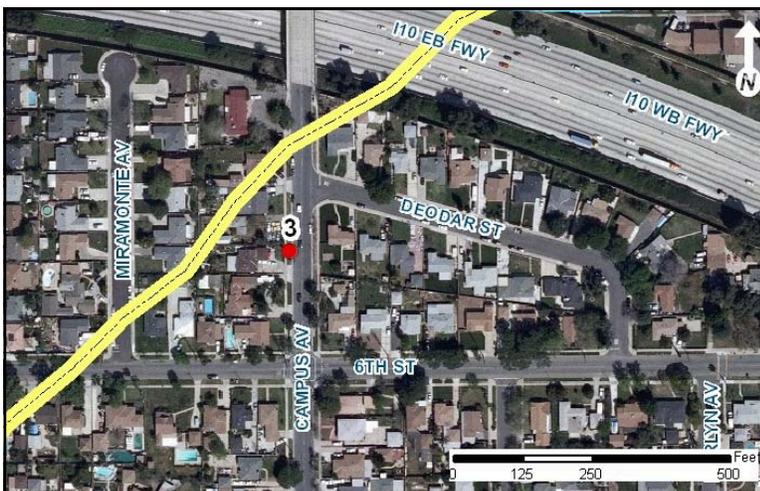
Pole ID	1
Pole #	748823E
Pole Height	53.10 ft
Pole MSL	1085.85 Top 1032.75 Base

Notes:



Pole ID	2
Pole #	748842
Pole Height	44.63 ft
Pole MSL	1148.46 Top 1103.83 Base

Notes:



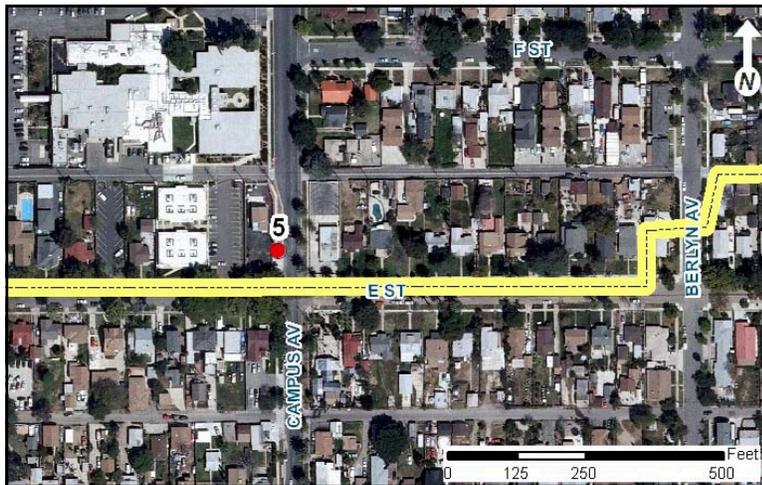
Pole ID	3
Pole #	4387034E
Pole Height	70.07 ft
Pole MSL	1210.42 Top 1140.35 Base

Notes:



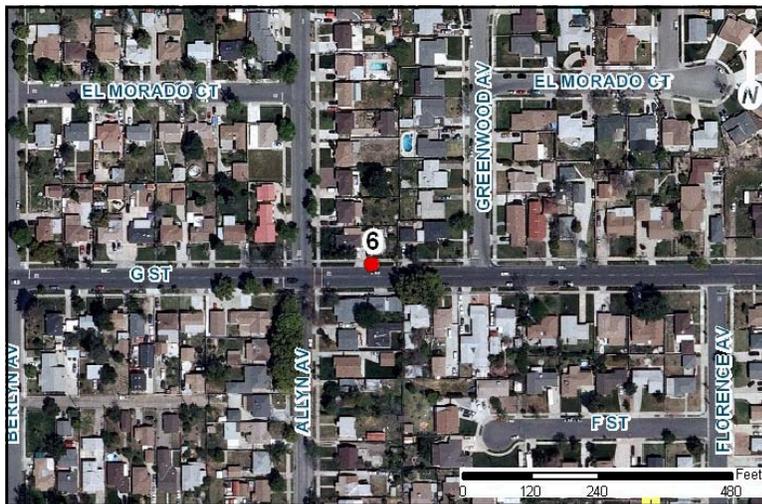
Pole ID	4
Pole #	870510E
Pole Height	68.93 ft
Pole MSL	1155.20 Top 1086.27 Base

Notes:



Pole ID	5
Pole #	1683056E
Pole Height	61.23 ft
Pole MSL	1086.77 Top 1025.54 Base

Notes:



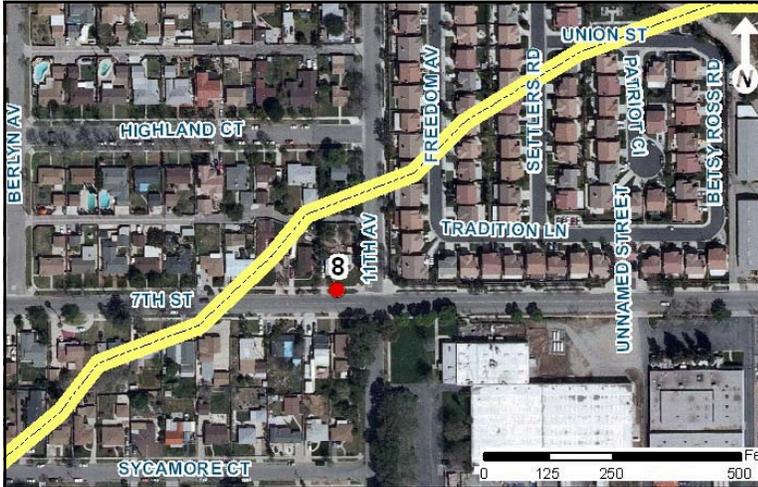
Pole ID	6
Pole #	H4214V
Pole Height	34.19 ft
Pole MSL	1069.04 Top 1034.85 Base

Notes:



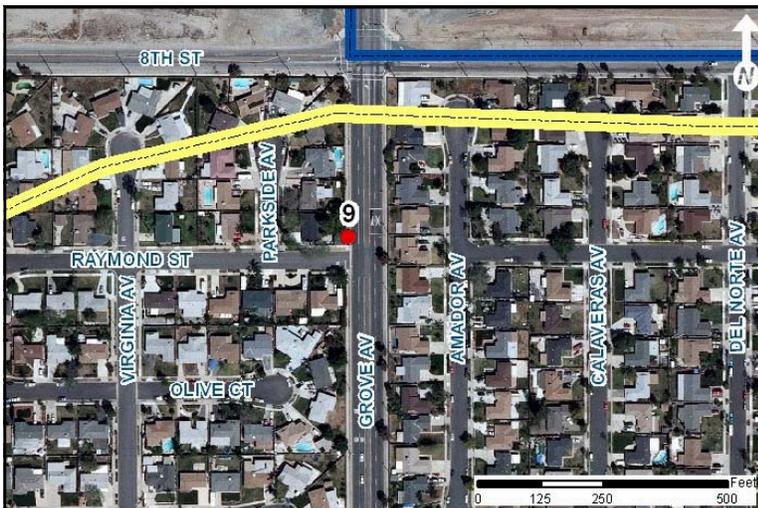
Pole ID	7
Pole #	1986184E
Pole Height	63.38 ft
Pole MSL	1194.70 Top 1131.32 Base

Notes:



Pole ID	8
Pole #	4310171E
Pole Height	48.44 ft
Pole MSL	1206.83 Top 1158.39 Base

Notes:



Pole ID	9
Pole #	1138368E
Pole Height	43.13 ft
Pole MSL	1202.98 Top 1159.85 Base

Notes:



Pole ID	10
Pole #	1527073E
Pole Height	56.26 ft
Pole MSL	1145.28 Top 1089.02 Base

Notes:



Pole ID	11
Pole #	1240442E
Pole Height	47.83 ft
Pole MSL	1119.37 Top 1071.54 Base

Notes:



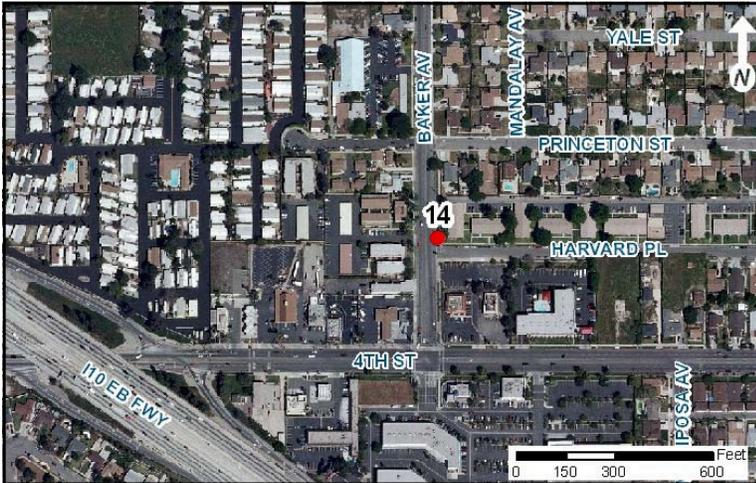
Pole ID	12
Pole #	987288E
Pole Height	37.44 ft
Pole MSL	1085.16 Top 1047.72 Base

Notes:



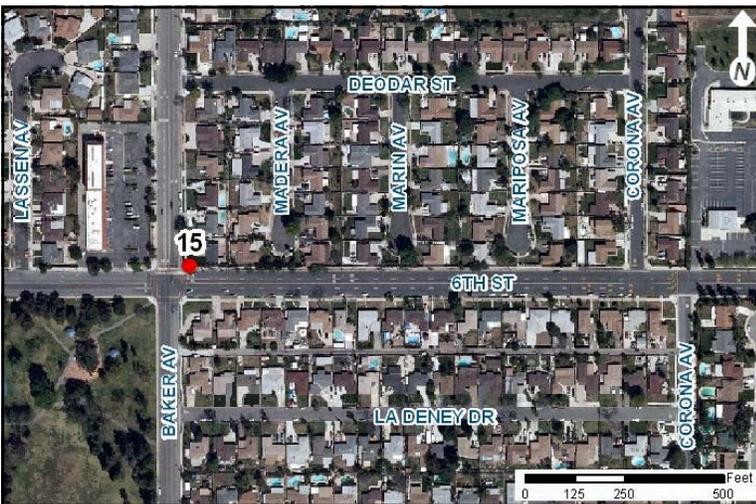
Pole ID	13
Pole #	4568409E
Pole Height	38.84 ft
Pole MSL	1062.76 Top 1023.92 Base

Notes:



Pole ID	14
Pole #	H30853Y
Pole Height	38.71 ft
Pole MSL	1094.89 Top 1056.18 Base

Notes:



Pole ID	15
Pole #	309726E
Pole Height	69.42 ft
Pole MSL	1165.93 Top 1096.51 Base

Notes:



Pole ID	16
Pole #	H16749Y
Pole Height	37.87 ft
Pole MSL	1164.81 Top 1126.94 Base

Notes:



Pole ID	17
Pole #	4270031E
Pole Height	67.50 ft
Pole MSL	1157.08 Top 1089.58 Base

Notes:



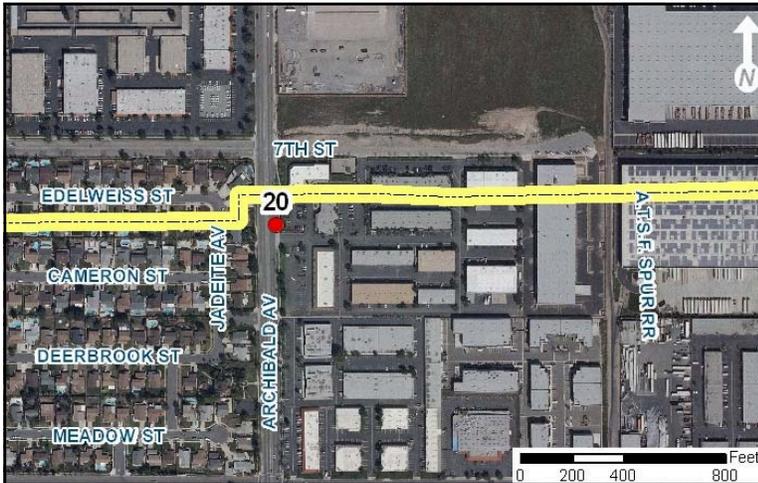
Pole ID	18
Pole #	4439574E
Pole Height	71.78 ft
Pole MSL	1108.87 Top 1037.09 Base

Notes:



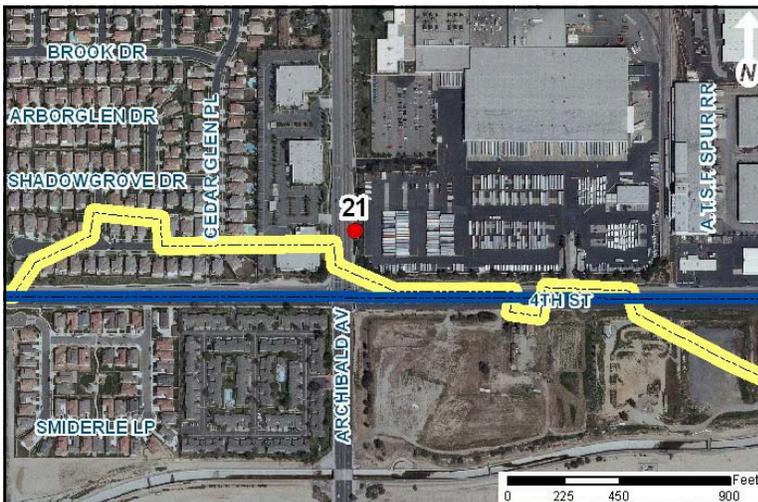
Pole ID	19
Pole #	4568409E
Pole Height	64.68 ft
Pole MSL	1122.78 Top 1058.10 Base

Notes:



Pole ID	20
Pole #	452282E
Pole Height	46.00 ft
Pole MSL	1124.13 Top 1078.13 Base

Notes:



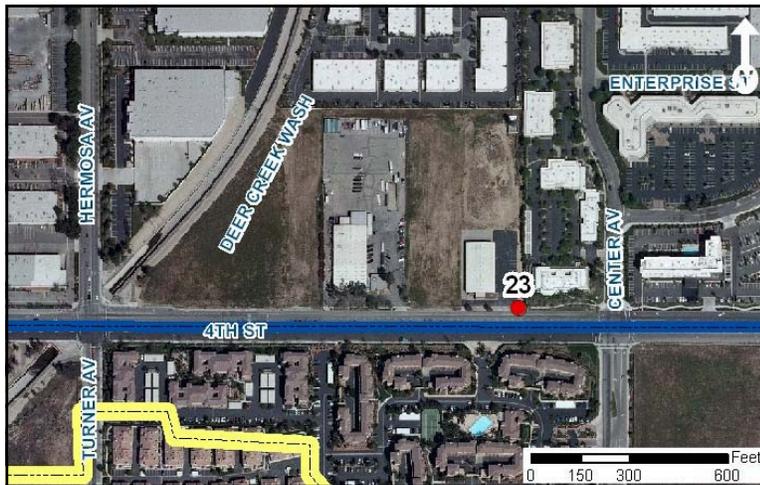
Pole ID	21
Pole #	4168379E
Pole Height	60.38 ft
Pole MSL	1084.82 Top 1024.44 Base

Notes:



Pole ID	22
Pole #	4072044E
Pole Height	64.92 ft
Pole MSL	1134.83 Top 1069.91 Base

Notes:



Pole ID	23
Pole #	4428319E
Pole Height	60.86 ft
Pole MSL	1091.88 Top 1031.02 Base

Notes:



Pole ID	24
Pole #	4024696E
Pole Height	49.18 ft
Pole MSL	1078.32 Top 1029.14 Base

Notes:



Pole ID	25
Pole #	1377501E
Pole Height	58.64 ft
Pole MSL	1147.25 Top 1088.61 Base

Notes:



Pole ID	26
Pole #	4246899E
Pole Height	47.49 ft
Pole MSL	1114.70 Top 1067.21 Base

Notes:



Pole ID	27 28
Pole #	4632148E 4087861E
Pole Height	60.83 ft 56.75 ft
Pole MSL	1089.55 Top 1028.72 Base 1092.20 Top 1035.45 Base

A Looking North on Sultana Ave at E St Intersection



B Looking East on H St on Euclid Ave Intersection



C Looking North on Sultana Ave at E St Intersection



D Looking East on H St near Euclid Ave Intersection



E Looking East on 4th St at Columbia Ave Intersection



F Looking South on Sultana Ave at Princeton St Intersection



Notes:

G Looking South on Campus Ave at H Street Intersection



H Looking East on 6th Street on Campus Ave Intersection



I Looking West on Yale St at Campus Ave Intersection



J Looking West on Princeton St at Campus Ave Intersection



K Looking East on 4th St at Campus Ave Intersection



L Looking East on F St at Campus Ave Intersection



Notes:

M Looking North on Campus Ave at E St Intersection



N Looking West on Granada Ct at Berlyn Ave Intersection



O Looking West on 5th St at Berlyn Ave Intersection



P Looking South on Berlyn Ave at 6th St Intersection



Q Looking East on 7th St at 11th Ave Intersection



R Looking East on 6th St near Hope Ave Intersection



Notes:

S Looking East on G St at Allyn Ave Intersection



T Looking North on Berlyn Ave at E St Intersection



U Looking North on Cucamonga Ave at G St Intersection



V Looking North on Grove Ave at G St Intersection



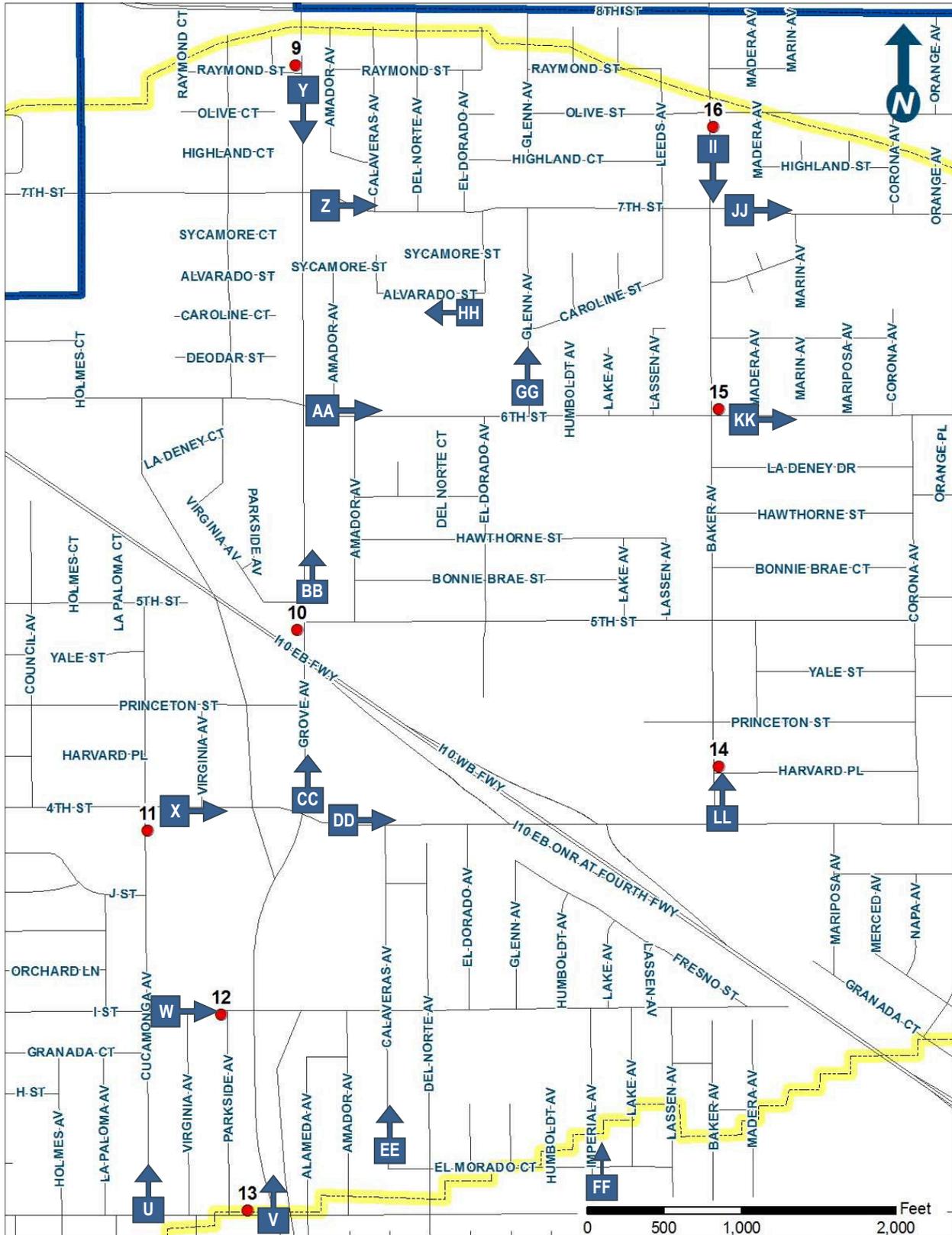
W Looking East on I St at Cucamonga Ave Intersection



X Looking East on 4th St at Cucamonga Ave Intersection



Notes:



Y Looking East on G St at Allyn Ave Intersection



Z Looking North on Berlyn Ave at E St Intersection



AA Looking North on Cucamonga Ave at G St Intersection



BB Looking North on Grove Ave at G St Intersection



CC Looking East on I St at Cucamonga Ave Intersection



DD Looking East on 4th St at Cucamonga Ave Intersection



Notes:

EE Looking North on Calaveras Ave at El Morado Ct Intersection



FF Looking North on Imperial Ave at El Morado Ct Intersection



GG Looking North Glenn Ave at 6th St Intersection



HH Looking West on Alvarado St



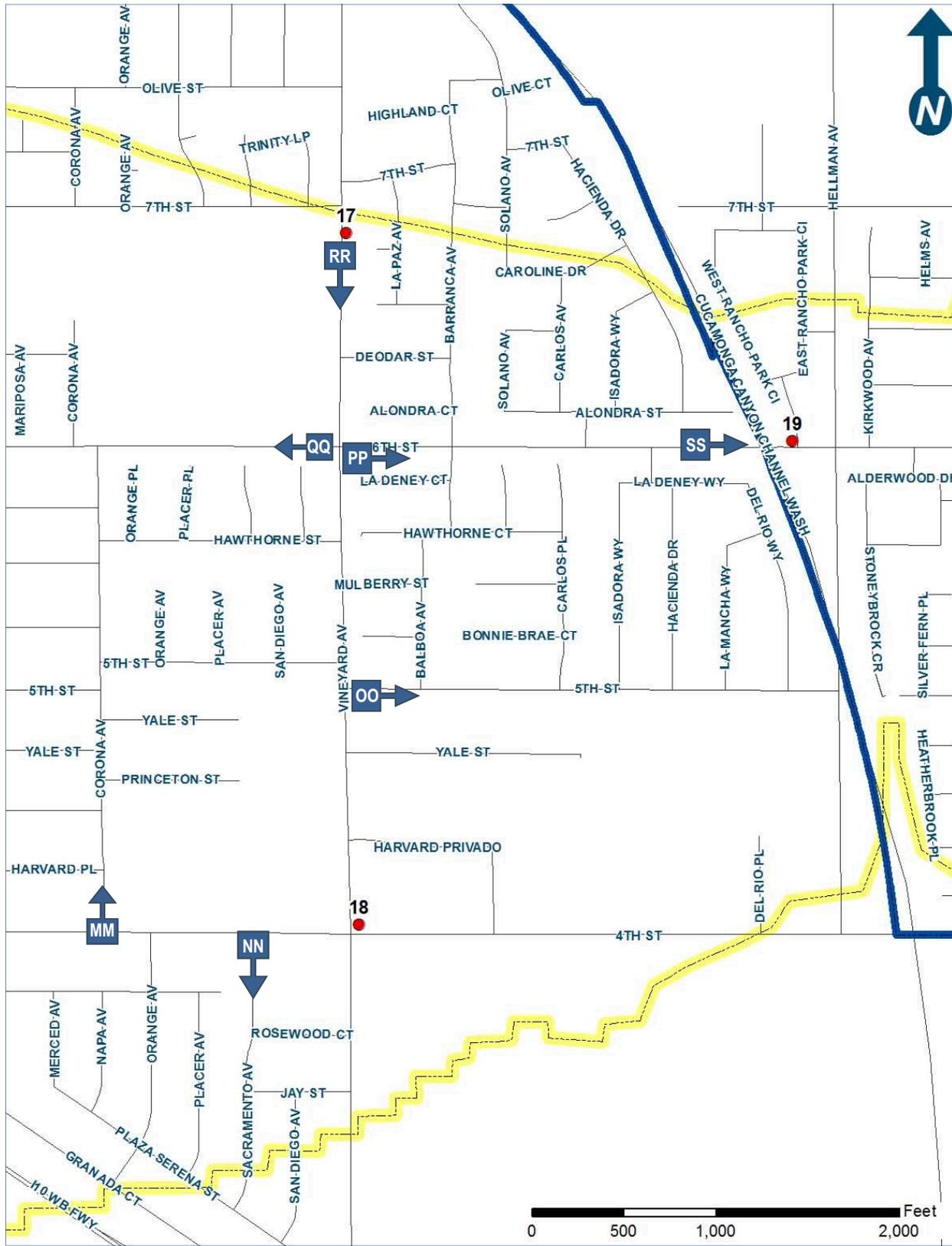
II Looking South on Baker Av at Olive St Intersection



JJ Looking East on 7th St at Baker Av Intersection



Notes:



Notes:

KK Looking East on 6th St at Baker Ave Intersection



LL Looking North on Baker Ave at 4th St Intersection



MM Looking South on Sacramento Ave at 4th St Intersection



NN Looking North on Vineyard Ave at Jay St Intersection



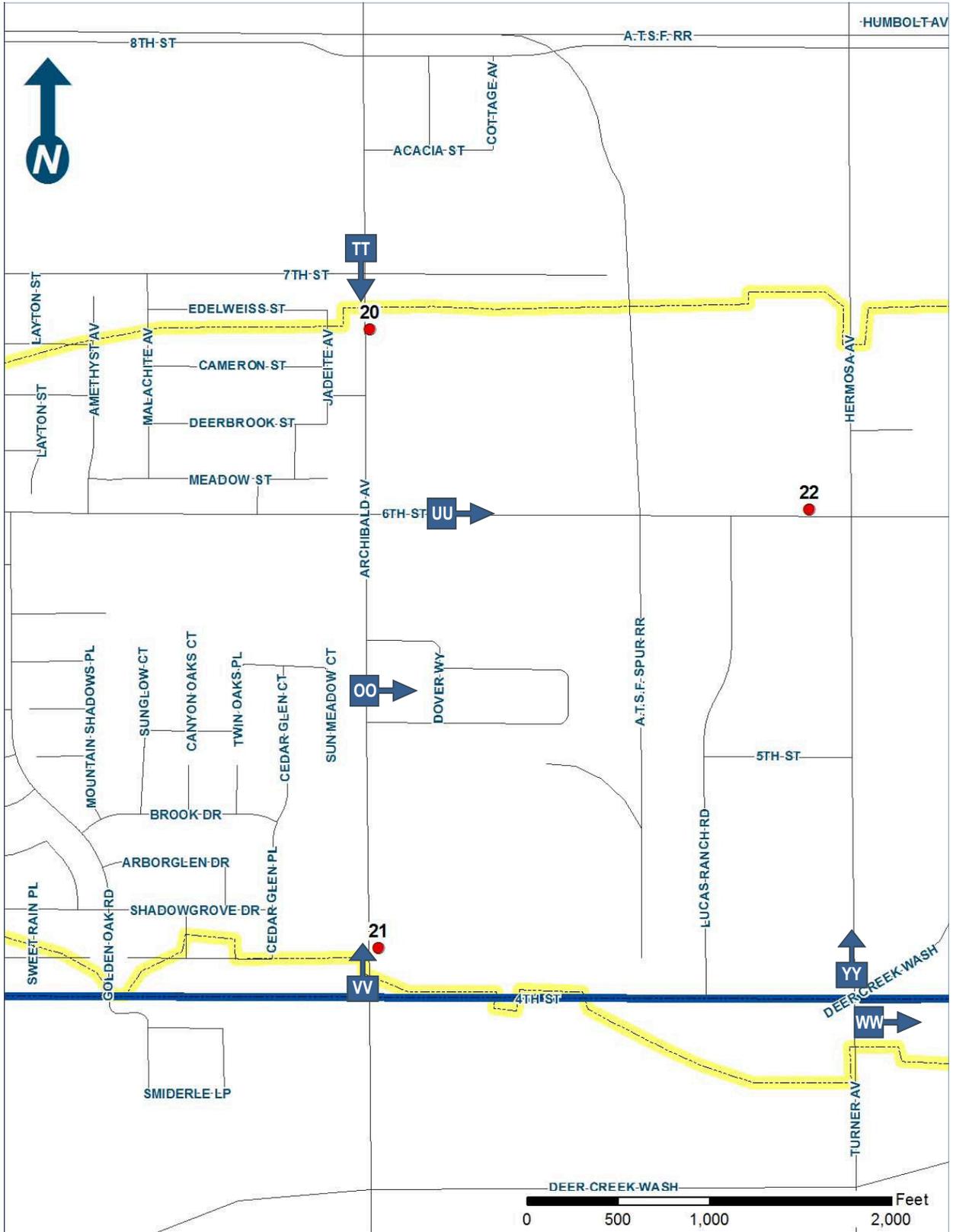
OO Looking East on 5th St at Vineyard Ave Intersection



PP Looking East on 6th St at Vineyard Ave Intersection



Notes:



QQ Looking West on 5th St at Vineyard Ave Intersection



RR Looking South on Vineyard Ave at 7th St Intersection



SS Looking East on 6th St at Cucamonga Canyon Wash Bridge



TT Looking South on Archibald Ave near 7th St Intersection



UU Looking East on 6th St at Archibald Ave Intersection



VV Looking North on Archibald Ave at 4th St Intersection



Notes:



WW Looking East on 4th St at Turner Ave Intersection



XX Looking North on Hermosa Ave at 4th St Intersection



YY Looking South on Hermosa Ave near 6th St Intersection



ZZ Looking North on Haven Ave at 4th St Intersection



AAA Looking East on 4th St at Haven Ave Intersection



BBB Looking South on Haven Ave at 7th St Intersection



Notes:

CCC Looking West on 6th St at Cleveland Ave Intersection



DDD Looking North on Cleveland Ave at 4th St Intersection



EEE Looking North on Milliken Ave at 4th St Intersection



FFF Looking West on 4th St at Milliken Ave Intersection



GGG Looking South on Milliken at 5th St Intersection



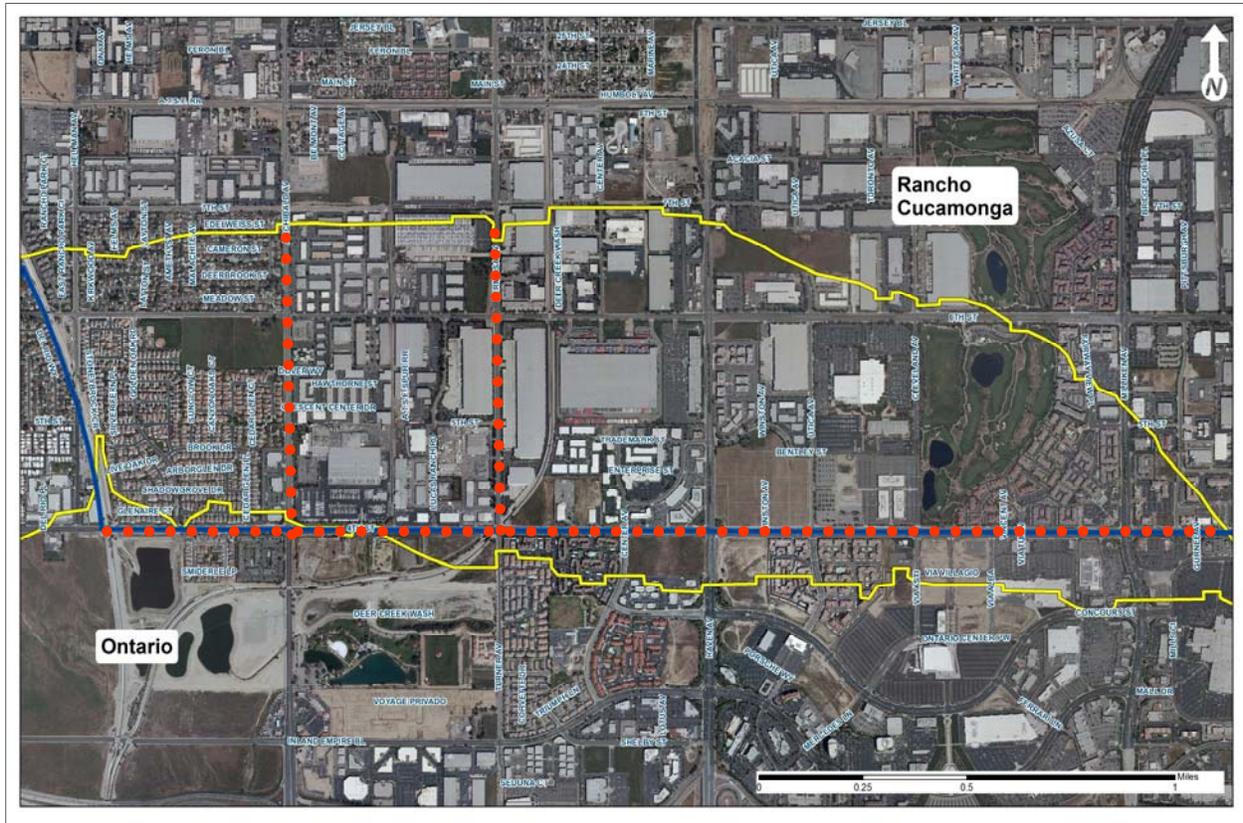
Notes:

Rancho Cucamonga Street Tree Information

Common Name:	London Plane Tree
Botanical Name:	Platanus acerifolia
Mature Height Range:	40 ft - 80 ft
Spread:	30 ft - 40 ft



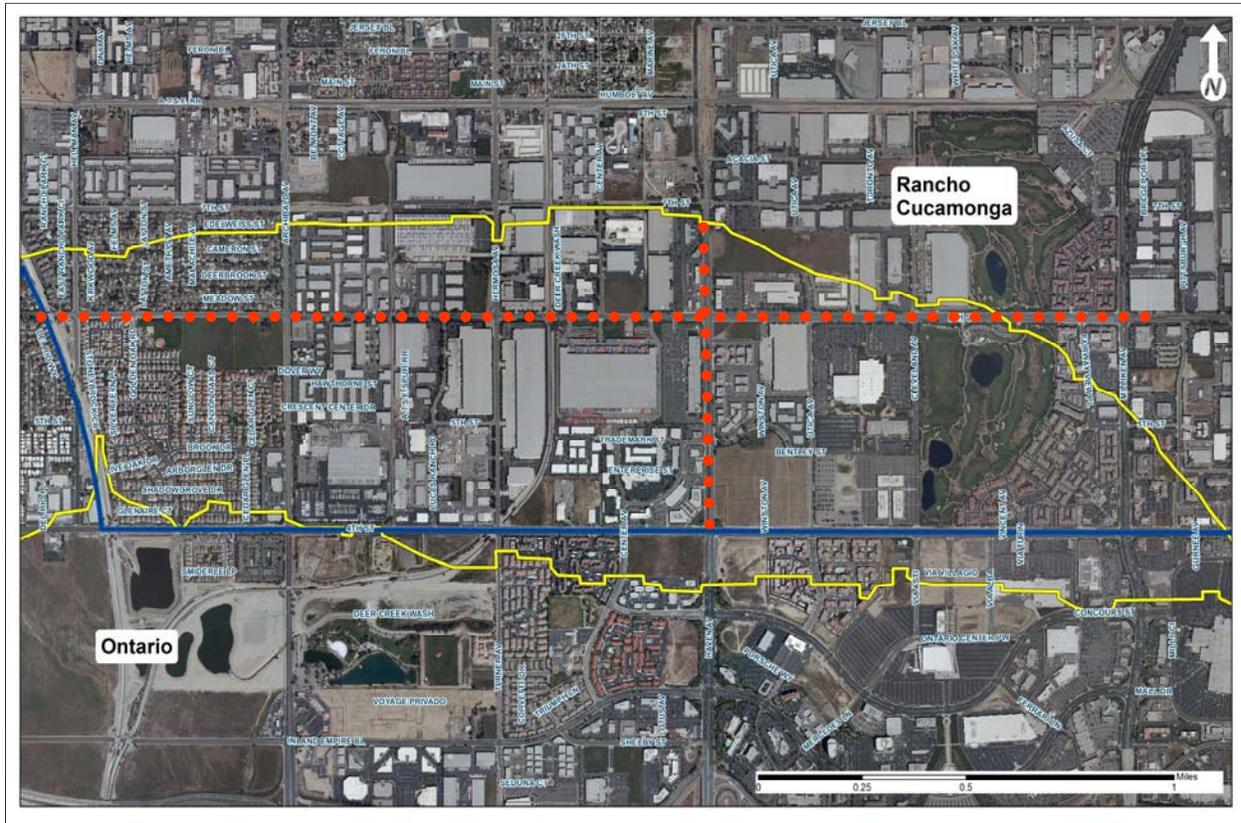
The map below identifies the streets where the London Plane Tree can be found within the City of Rancho Cucamonga. Tree information was obtained from the *Sunset Western Garden Book*.



Rancho Cucamonga Street Tree Information

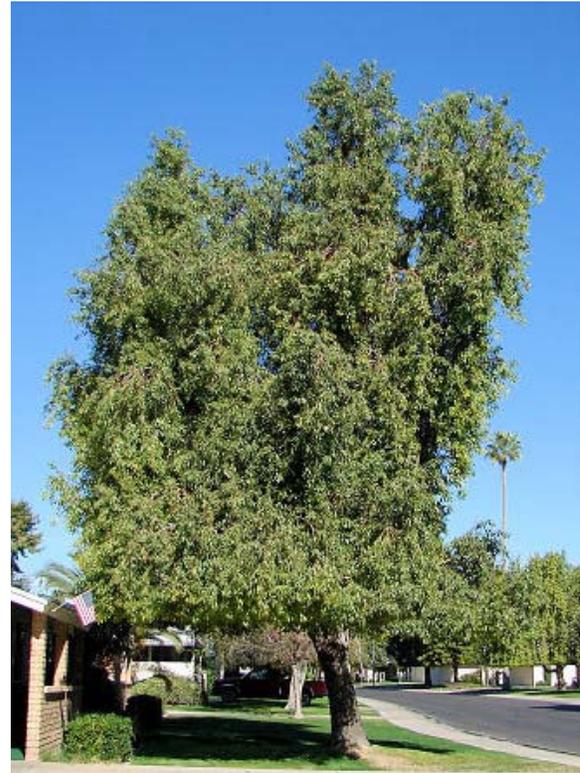
Common Name:	n/a
Botanical Name:	Magnolia Grandiflora 'Majestic Beauty'
Mature Height Range:	35 ft - 50 ft
Spread:	20 ft

The map below identifies the streets where the Magnolia Grandiflora can be found within the City of Rancho Cucamonga. Tree information was obtained from the *Sunset Western Garden Book*.

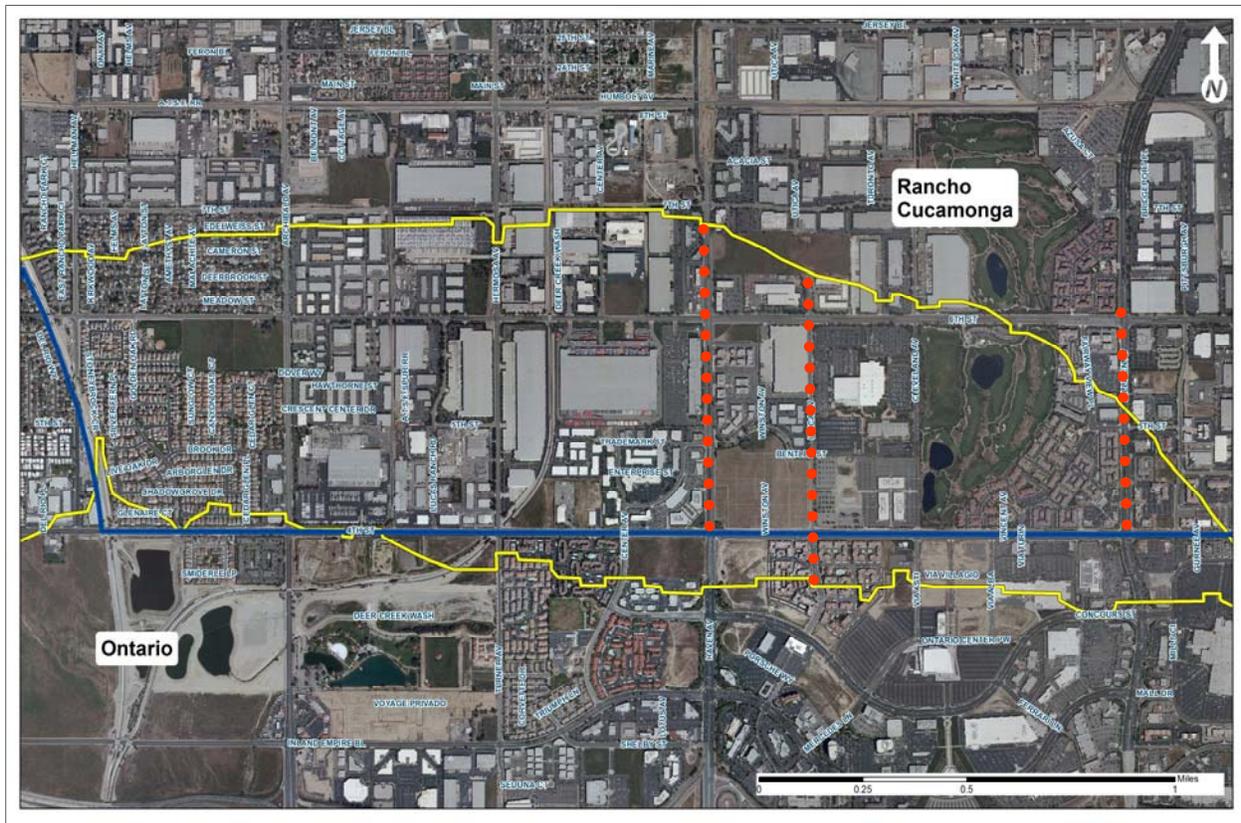


Rancho Cucamonga Street Tree Information

Common Name:	Bottle Tree
Botanical Name:	Brachychiton populneus
Mature Height Range:	30 ft - 50 ft
Spread:	30 ft



The map below identifies the streets where the Bottle Tree can be found within the City of Rancho Cucamonga. Tree information was obtained from the *Sunset Western Garden Book*.



Rancho Cucamonga Street Tree Information

Common Name:	Canary Island Pine
Botanical Name:	Pinus canariensis
Mature Height Range:	50 ft - 80 ft
Spread:	20 ft - 35 ft



The map below identifies the streets where the Canary Island Pine can be found within the City of Rancho Cucamonga. Tree information was obtained from the *Sunset Western Garden Book*.

