Appendix K. Tree Preservation Assessment

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Tree Preservation Assessment

State Route 82
El Camino Real Roadway Renewal Project
San Mateo County, CA

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BARTLETT CONSULTING
A Division of The I.A. Bartlett Tree Expert Company

Executive Summary

Tree Preservation Assessment
El Camino Real Roadway Renewal Project
San Mateo County, CA

In February 2021, HortScience | Bartlett Consulting (HBC), Divisions of the F. A. Bartlett Tree Expert Co., evaluated the health and structural condition of 226 trees located on El Camino Real, between Murchison Dr. and Peninsula Avenue.

Trees were assessed with the goal of identifying the best candidates for preservation and removal. Based on our observations and understanding of expected construction impacts, I identified 74 trees to consider for preservation. Appendix A (exhibits) provides recommended actions for each tree assessed. A summary of our methods and findings follows.

We visually assessed each tree from the ground, evaluating tree health and structural condition. Additionally, we noted and rated hardscape displacement adjacent to each assessed tree to anticipate impacts to tree roots that would occur in the repair or replacement of this infrastructure.

The majority of the trees were Eucalytpus (88%), with blue gum (57%), manna gum (15%) and red river gum (10%) the most common species encountered. There were 11 English elms (5% of population). Other species included *Eucalyptus* sp., red ironbark, sweetgum, silver dollar gum, London plane, coast live oak, Nichol's gum, Italian stone pine, compact blue gum and blackwood acacia.

Overall tree condition was fair (141 trees). Fifty-nine (59) trees were in poor condition, and 26 were in good or excellent condition. For trees in fair condition, the primary reason for the rating was their history of topping and crown reduction pruning and not their health. For trees in poor condition, it was primarily a result of poor health indicated by twig and branch dieback, as well as the presence of fungal fruiting bodies and poor tree form and structure.

- Sulfur fungus was noted on 35 of the trees, and was present at the base of 30.

The condition of hardscape features and proximity of these features to the trees was a secondary aspect of this survey. The limited growing space available to trees and proximity to concrete curbs and paved surfaces has caused injury to trees and damage to the infrastructure. Repair and replacement of this infrastructure will cause further injury to trees. The primary concerns related to infrastructure and trees were:

- Sidewalk damage was noted on 133 of the trees (60 minor, 47 moderate and 26 severe).
- Curb damage was noted on 101 of the trees (62 minor, 22 moderate and 17 severe).
- Root and root collars of 87 trees had damaged both the sidewalk and curb.
- 116 trees had filled the available growing space, including 60 that had grown over the adjacent curb and/or sidewalk.
- The trunks of 11 trees had grown into the roadway.

Opportunities for tree preservation exist where the tree is in good health, young to semi-mature and where there is sufficient space around the trees to move improvements (sidewalk, and utilities) away from trees, or where no or minor infrastructure damage has occurred on only one side of the tree. I identified 74 trees to consider for preservation and provided design recommendations to minimize root loss where appropriate (Table 3, page 16).

Constraints to tree preservation exist where trees are in poor condition, sulfur fungus is present, tree trunks, root collars, and/or roots have overgrown curbs and sidewalks, and/or trees have insufficient growing space to maintain good health. I identified 152 trees for removal based on these constraints, including 130 that had at least 2 constraints, 41 that had at least 3 constraints and 3 trees that had 4 constraints. Appendix A (**Exhibits**) provides a description of the recommended action for each tree, along with opportunities and constraints.

Tree Preservation Assessment

El Camino Real Roadway Renewal Project
San Mateo County, CA

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Tree Preservation Assessment

El Camino Real Roadway Renewal Project
San Mateo County, CA

I: *Introduction and Background*

State Route 82 (SR 82) in San Mateo County is a Caltrans facility. Also known as El Camino Real (ECR), this roadway is lined with mature trees planted by others, including the National Register of Historic Places listed Howard-Ralston Eucalyptus Tree Rows. In anticipation of a proposed roadway renewal project, and in collaboration with AECOM, HortScience | Bartlett Consulting (HBC), Divisions of the F. A. Bartlett Tree Expert Co., was asked to assess the health and structural condition of trees along ECR and identify opportunities and constraints to tree preservation, considering the proposed work. HBC was contracted through AECOM to perform the assessment.

Most of the trees within the project limits were part of the Howard-Ralston Eucalyptus Tree Rows, which was originally planted in the 1870's and extends from Ray Dr./Rosedale Ave. at the north end to Peninsula Avenue at the south end.

> "*The Howard-Ralston Eucalyptus Tree Row was recently added to the National Historic Registry. The original row included 557 trees flanking El Camino Real through the cities of Burlingame and Hillsborough. The tree rows were designed by landscape gardener John McLaren to beautify and protect from wind the portion of the County Highway leading to the grand estates of several San Francisco Peninsula property owners, including George H. Howard and William C. Ralston. The planting, undertaken between 1873 and 1876, was comprised primarily of English elms and eucalyptus*" (excerpted from the Burlingame Historical Society website).

The Tree Rows originally included several eucalyptus species planted as shelter trees for the English elms. Interestingly, the original plan was to remove the eucalyptus once the elms had established.

The current tasks included the following:

1. Perform a visual assessment from the ground of the health and structural condition of all of the trees identified by Caltrans.

2. Inspect existing hardscape adjacent to the trees for evidence of damage or displacement indicative of roots and rate the damage.

3. Identify if the trees had sufficient growing space.

4. Review site history, including existing and documented tree condition and management, as well as the proposed construction around the trees.

5. Identify opportunities for and constraints to tree preservation and recommend trees for preservation and removal

II: *Professional Qualifications*

In an effort to provide context to the methods and approaches used in this assessment, I was asked to provide a brief description of my qualifications. I have been a consulting arborist for 20 years, working with HortScience, Inc. since 2003 and now HortScience | Bartlett Consulting since 2018.

I am a Board Certified Master Arborist (International Society of Arborists) and a Registered Consulting Arborist (American Society of Consulting Arborists). Both are advanced levels of certification for the primary professional organizations in our field, but the BCMA is geared toward those practicing tree maintenance and the RCA is geared toward those consulting on tree management.

I specialize in urban forestry and risk assessment with many years of experience assessing sidewalk/curb/gutter damage from tree roots and providing management recommendations to abate the damage and minimize future damage. I have also been involved in many decay assessment projects, from individual trees to hundreds of trees, using primarily resistance drills, such as the Resistograph® decay detection device. I have worked for many municipalities, government agencies and companies around the Bay Area performing tree assessments and providing recommendations for managing trees that have impacted infrastructure.

III: *Tree Assessment Methods*

The tree evaluation was conducted in February 2021. Trees were located on both sides of ECR, between Murchison Ave. (north) and Peninsula Ave. (south). Caltrans staff had identified which trees were to be inspected. A total of 226 trees were assessed. Descriptions of individual trees are provided in the ***Tree Assessment Form*** and locations are shown on the ***Tree Assessment Map*** (provided by Caltrans).

Each tree was assessed in the following manner:

1. Identify the species.
2. Measure the trunk diameter at 54” above grade.
3. Visually inspect the tree from the ground, describing current health and structural condition.
4. Rate the health and structural condition using a scale of 1 – 5 based on external signs and symptoms:

    5 - A healthy, vigorous tree, reasonably free of signs and symptoms of disease, with good structure and form typical of the species.

    4 - Tree with slight decline in vigor, small amount of twig dieback, minor structural defects that could be corrected.

    3 - Tree with moderate vigor, moderate twig and small branch dieback, thinning of crown, poor leaf color, moderate structural defects that might be mitigated with regular care.

    2 - Tree in decline, epicormic growth, extensive dieback of medium to large branches, significant structural defects that cannot be abated.

    1 - Tree in severe decline, dieback of scaffold branches and/or trunk; most of foliage from epicormics; extensive structural defects that cannot be abated.
5. Assess hardscape (sidewalk, curb and driveway) adjacent to the trees for displacement indicative of roots. The degree of visible hardscape displacement was estimated where it appeared related to tree roots and rated as:
    - Minor – damage estimated to be between 1” and 5” of displacement.
    - Moderate – damage estimated to be between 6” and 10” of displacement.
    - Severe – damage estimated to be >10” of displacement.
6. Identify if the tree had ‘filled the available growing space’. Available space is the open soil area surrounded by pavement. If one side of the base of the tree was in contact with adjacent hardscape the tree was considered to have filled the available growing space (see Section VI for more information on opportunities and constraints analysis).
7. Identify if the base of the tree had grown, or ‘pillowed’ over the adjacent hardscape.
8. Based on the results of the visual assessment and infrastructure damage, identify opportunities for and constraints to tree preservation.

Evaluating structural condition
Examination of the entire tree structure for weaknesses or possible points of failure begins with an assessment of overall vigor and health, then focuses on an examination of root crown, trunk, scaffold limbs and branches. The entire inspection was performed from the ground.

The following are examples of structural defects:

History of failure - Trees that have failed in the past tend to do so again. This is true for individual trees, as well as for trees within a stand. Any broken stubs, split out limbs and fallen trees were noted.

Recent exposure - Trees that used to be protected by other vegetation or structures are more likely to fail if their neighbors are removed, leaving the tree more exposed to wind.

Root injury - Trees with root decay or severed roots (construction, sidewalk repair) may be more likely to fail.

Lack of basal flare - Lack of flare may indicate fill soil has been placed around the trunk. The tree should be checked further for decay in the buttress roots.

Cracks - Cracks in branches and trunks indicate areas of weakness.

Bark - Loss of bark, especially in non-uniform patterns; buckled bark, horizontal cracks and "popping off" of pieces may indicate wood under tension or compression. Internal cracks may be indicated by bulges and ridges in the bark.

Decay - Decayed wood is weak and more likely to fail.

Crooks - Crooks are formed primarily as a result of pruning. Branches with crooks tend to break.

Seams - A seam is a line formed by included bark at branch and stem junctions, or when two edges of woundwood meet at the center of a wound (behind which there may be decay). They indicate areas of weakness.

Narrow branch attachments with included bark - Branches with narrow angles of attachment do not form connective tissue between the branch and trunk. As tree and branch sizes increase, the branches tend to split out.

Clustered scaffold branches (poor vertical distribution) - Where several scaffold branches of similar size arise from one level, weakness occurs.

Dead branches - Dead branches quickly decay, making them more likely to break out of the tree.

Limbs with poor taper and end weight - Limbs with poor taper and end-weight tend to break easliy.

Topping - Branches in topped trees are likely to fail because of weak attachment of the regrowth, dense regrowth limiting taper formation, and decay in the headed branch.

IV: *Summary of Tree Assessment*

There were 111 trees on the east side of El Camino Real and 105 on the west side. Tree #837 was located on Easton Dr. and #977 and 980-987 were growing in the median. Descriptions of each tree are provided in the ***Tree Assessment Form*** and locations are shown on the ***Tree Assessment Map***.

Species composition, age and growing conditions:
The 226 trees assessed were comprised of 14 species. Blue gum eucalyptus (130 trees), manna gum (34 trees) and red river gum (22 trees), were the most common species encountered (Table 1). Along with the 11 English elms included in the assessment, these species represented the majority of the original plantings from the 1870's.

Several other species of eucalyptus, including an unidentified eucalyptus species (13 trees), red ironbark (4 trees), silver dollar gum (2 trees), Nichol's gum (1 tree) and compact blue gum (1 tree) had been planted over the years between the original plantings. These species, along with sweetgum (2 trees), London plane (2 trees), coast live oak (2 trees), Italian stone pine (1 tree) and blackwood acacia (1 tree) were not part of the original plantings.

The trees planted in the 1870's are now approximately 150 years old. Among those original trees, the blue gums had trunk diameters between 29" and 105", with an average of 58". The original manna gum plantings had trunk diameters between 22" and 98", with an average of 54". The original red river gums had trunk diameters between 34" and 76", with an average of 52". In general, these trees were considered over-mature.

Trees planted subsequent to the 1870's effort had trunk diameters between 11" and 52", with an average of 24". These trees were considered young, semi-mature and mature.

Growing conditions varied widely from block to block and from the east side to the west side of ECR. The vast majority of the trees on the east side were located between the sidewalk and curb, with private and commercial driveways cut between the trees (Photo 1).

Photo 1: Looking south at blue gum #69, shows the typical growing conditions and available growing space around trees on the east side of El Camino Real.

The exceptions on the east side of ECR were adjacent to trees #2-20, where there was a wide swath of undeveloped land east of the trees (Photo 2) and around trees #23-38, where there was some undeveloped land between the trees and Highway Rd., which parallels ECR (Photo 3).

Photo 2 (L): Looking south at blue gum #15. A substantial undeveloped area existed east of trees #2-20, however several of the trees in this area were still growing at the edge of ECR.

Photo 3 (R): Looking north at blue gum #23, with ECR on the left and Highway Rd. on the right. Although not as extensive, there was some undeveloped land between the trees and Highway Rd.

Trees on the west side of ECR had more variable growing conditions. The majority were located behind (west of) the sidewalk, in what was essentially the landscape of the adjacent residential and commercial buildings (Photo 4). Some were growing 5' to 6' above the adjacent sidewalk elevation, with others preserved in very tight spaces between driveways (Photo 5).

Among the trees we assessed on the west side of ECR, the following had notably different growing conditions:

- Trees #303-321, where there was no sidewalk or curb and only a dirt trail existed between the trees and the private properties to the west (Photo 6),
- Trees #394-398, where the sidewalk meandered west of the trees and appeared to have been constructed up from the existing elevation of the trees.
- Trees #484-509, which were preserved on a slope between ECR and the sidewalk to the west (Photo 7).

Photo 4 (above L): Looking north at blue gum #353-355, which were growing behind the sidewalk and in what is essentially the landscape of the adjacent apartment complex. This was typical of the growing conditions on the west side of ECR.

Photo 5 (above R): Looking south at blue gum #333. It had been preserved in a very small cut-out in the concrete between two driveways.


Photo 6 (above L): Looking south at the base of blue gum #319, showing the growing condition adjacent to trees #303-321. Neither sidewalk nor curb and gutter were present in this area.

Photo 7 (above R): Looking south at blackwood acacia #979. The tree was growing on a slope on the west side of ECR, with the sidewalk to the west (L) at a higher grade than ECR to the east (R).

Tree condition
Average condition for all of the trees was fair, with 141 trees or 62% of the population in this category (Table 1). Fifty-nine (59) trees were in poor condition and 26 were in good or excellent condition.

Table 1: Condition ratings and frequency of occurrence of trees.
El Camino Real Roadway Renewal Project, San Mateo County

Common name	Scientific name	Condition			
		Poor (1-2)	Fair (3)	Good (4-5)	Total
Blackwood acacia	*Acacia melanoxylon*	1	-	-	1
Red river gum	*Eucalyptus camaldulensis*	3	15	4	22
Blue gum	*Eucalyptus globulus*	37	84	9	130
Compact blue gum	*Eucalyptus globulus* 'compacta'	1	-	-	1
Nichols gum	*Eucalyptus nicholii*	-	1	-	1
Silver dollar gum	*Eucalyptus polyanthemos*	-	1	1	2
Red iron bark	*Eucalyptus sideroxylon*	2	2	-	4
Manna gum	*Eucalyptus viminalis*	5	24	5	34
Eucalyptus. sp.	*Eucalyptus. sp.*	5	7	1	13
Sweetgum	*Liquidambar styraciflua*	1	1	-	2
Italian stone pine	*Pinus pinea*	-	1	-	1
London plane	*Platanus x hispanica*	-	-	2	2
Coast live oak	*Quercus agrifolia*	-	-	2	2
English elm	*Ulmus procera*	4	5	2	11
Total		**59**	**141**	**26**	**226**
		26%	62%	12%	100%

The mature eucalyptus trees have been pruned over the years to remove dead and dying branches and to reduce branch extension over ECR and other targets beneath the trees. Pruning has typically involved reducing tree canopies significantly through topping of upright leaders and reduction of lateral branches in an effort to reduce the risk of tree failure. This has resulted in most of the trees having small crowns relative to their trunk diameters (Photo 8).

Intensive pruning directly impacts tree health and structure in several ways:

- Loss of photosynthetic material slows tree growth and limits their physiological capacity to respond to site changes.
- Pruning cuts wounds the tree, creating many/large potential entry points for establishment of decay organisms.
- Topping permanently alters tree structure and often has to be repeated, as new growth emerging at/below the topping points is weakly attached and at an elevated risk for failure.

In general, trees in fair condition had moderate sized crowns and fair structure. These trees had larger canopies and better vitality than those in poor condition. In the majority of cases the trees were rated in fair condition because of their degraded structure and not poor health.

Photo 8 (R): Looking south at blue gum #144. The tree had the typical form and structure of a majority of the eucalyptus trees assessed along ECR.

Upright leaders had been topped and lateral branches reduced, producing a tree with a narrow form and relatively small crown for a 56” diameter trunk.

Trees in good condition had larger crowns and more abundant, healthy foliage (Photo 9). Tree structure had not been negatively altered by topping and reduction pruning.

Trees in poor condition had poor form and structure, very small crowns, extensive twig and branch dieback and low vitality (Photo 10).

A total of 179 of the trees assessed had been topped and reduced, including 168 of the original plantings and 11 of the later plantings. Some were topped to provide clearance from overhead utility lines on the west side of ECR and the rest to address overhanging limbs.

Photo 9 (L): Looking north at manna gum #437. Although the tree had been topped and reduced, it was in good condition, with better form and structure than those in fair condition.

Photo 10 (R): Looking southwest at blue gum #243. It was in poor condition, with a very sparse crown and moderate dieback of twigs and branches throughout the crown.

Sulfur fungus

Sulfur fungus (*Laetiporus gilbertsonii*) is a common decay organism of eucalyptus. After years of infection and when decay is advanced, it produces soft, fleshy, bright orange to creamy yellow fruiting bodies annually. Fruiting bodies typically appear in late summer and early fall (Photo 11). Fruiting bodies degrade over a couple of months, becoming hard, crumbly and chalky white (Photo 12). The fungus causes brown rot of tree roots and trunks and fruiting bodies are often associated with root and trunk wounds or cavities. When a significant amount of decay is present, the structural stability of infected trees may be compromised. Sulfur fungus decay is a contributing factor to Eucalyptus tree failures.

We noted the presence of sulfur fungus fruiting bodies on 35 of the trees. For 30 of the trees, the fruiting body was at the base of the tree or on the roots. For the remaining 5 trees it was present on the lower trunk from 3’ to 10’ above the ground. Due to the timing of our February inspections, all of the sulfur fungus we observed was in a deteriorated state.

Decay in the lower trunk or at the base of the tree is considered an indicator of possible decay in the roots of the tree. Decay present in the roots is difficult to assess and has the potential to affect root holding strength and therefore, tree stability.

Photo 11 (L): A typical fruiting body of sulfur fungus on a blue gum eucalyptus (not one of the trees assessed on ECR). Fruiting bodies form in late summer and early fall in the Bay Area, starting as soft, fleshy and orange and degrading to dry, chalky and white.

Photo 12 (R): Looking at the base of blue gum #113, shows the degraded fruiting body of sulfur fungus (circle). All of the sulfur fungus observed as part of our field work was in a degraded state.

Infrastructure damage and growing space

As part of the assessment, we noted and estimated the level of infrastructure damage adjacent to each tree where it appeared related to tree roots. Our focus was on the sidewalk and curb specifically, but we also noted driveway and retaining wall damage where they were present.

Displacement was estimated as minor (1-5” of displacement), moderate (6-10”) and severe (>10”). The following summarizes the level of damage observed:

- A total of 133 trees had displaced the adjacent sidewalk, including 60 where damage was minor, 47 where damage was moderate and 26 where it was severe (Photo 14).
- A total of 101 trees had displaced the adjacent curb, including 62 where damage was minor, 22 where damage was moderate and 17 where it was severe (Photo 13).
- A total of 87 of the trees had caused some amount of damage to both the sidewalk and curb, including 27 where damage to sidewalk and curb was minor.

Damage to both the sidewalks and curb was more prevalent on the east side of ECR. Seventy-seven (77) of the trees causing damage to the sidewalk and 65 of the trees causing damage to the curb were located on the east side of ECR. This is at least in part due to the lack of a sidewalk and curb in stretches along the west side of ECR.

In addition to estimating the level of infrastructure damage caused by the trees, we identified if the tree had ‘pillowed’ over the adjacent infrastructure and/or ‘outgrown the available planting space’. Pillowing occurs when the base of the tree grows over the adjacent infrastructure (Photo 15). If a tree has pillowed, it has filled the available growing space.

A total of 116 trees had outgrown the available growing space, including 60 that had grown over the adjacent infrastructure. We noted 11 trees where the trunk had grown into the road, most of which had been struck at some point, resulting in trunk wounds and damage (Photo 16).

Photos 13 (R) and **14** (above): Show the level of damage to curb and sidewalk caused by the base of blue gum #477.

In this case, the base of the tree had outgrown the available growing space, causing severe damage to both the adjacent sidewalk and curb.

Photo 15 (R): Looking south at the base of tree #193. The trunk had pillowed over the curb (circle) and the tree had outgrown the available space.

Although displacement of the curb was minor there is no way to repair or replace the curb without cutting into the trunk of the tree.

Photo 16 (L): Looking north at the trunk of blue gum #139. The trunk had been struck multiple times, causing permanent damage.

Forty-four (44) of the trees had not only outgrown the available space but had portions of their trunks encroaching into the roadway. Table 2 provides a list of trees whose trunks had overgrown the curb and encroached into the roadway.

Beyond infrastructure displacement and outgrowing the available space, the sheer size of the trunks had also impacted the usability of access points for residents and businesses along this stretch of ECR (Photo 17).

Photo 17 (R): Looking south from the driveway of 1324 ECR. This location represents one example of the proximity of trees to access points and the impact of the size of the trees.

The address is an apartment building with a driveway flanked by blue gums #68 and 69, both of which measure 65" in trunk diameter. The sheer size of the trunks creates a narrow passage for vehicles to enter/exit ECR.

Table 2: Trees with portions of trunk in road
El Camino Real Roadway Renewal Project, San Mateo County

Tag #	Species	Diameter	Consideration
139	Red river gum	74	Trunk in roadway
193	Red river gum	55	Trunk in roadway
195	Manna gum	61	Trunk in roadway
215	Manna gum	45	Trunk in roadway
226	Manna gum	57	Trunk in roadway
237	Blue gum	61	Trunk in roadway
241	Blue gum	78	Trunk in roadway
245	Blue gum	75	Trunk in roadway
264	Blue gum	51	Trunk in roadway
271	Blue gum	73	Trunk in roadway
837	Blue gum	61	Trunk in roadway

V: *Decay Assessment*

As part of the original scope of the project, we were tasked with performing decay assessments for those trees where decay was identified or suspected. To accomplish this, we used the Rinntech Resistograph® drill to assess the proportion of decayed wood to sound wood. The goal was to confirm the presence of decay and identify the extent of the decay in the areas being tested.

Sound wood is wood that has not been colonized by decay organisms. Decay organisms degrade the cellular structure of the wood, compromising wood strength and increasing the likelihood of failure. However, wood decay is a normal process as trees age. It is the proportion of decayed wood to sound wood that is used to help determine the likelihood of failure.

The Resistograph®, is a device that pushes a 20" long by 1.5mm diameter bit through wood and records the resistance to torque on a graph. When the wood is sound, the graph will gradually rise, proceeding from left to right (Image 1, following page). A drop in the line or a flat line usually indicates that decay, a crack or other internal defect, is present.

I identified 49 trees where decay was suspected or identified based on the presence of sulfur fungus, cavities and wounds. During the first day of decay detection work, we tested 7 trees and broke or lost 5 needles. Eucalyptus is notoriously hard wood, making decay detection work with the Resistograph® difficult.

Results of the initial decay testing were inconclusive. Where we were able to get a full test without breaking a needle, the 20" needle was too short to provide sufficient information to justify the testing. To accurately assess the amount of sound wood to decayed wood in these large-diameter trees would require a much longer needle or a different decay detection method. In addition, even with the best sterilization techniques, each time you drill the tree, you are potentially introducing decay organisms into otherwise uninfected wood and/or breaking through the chemical and physical barriers the tree has established against the decay.

In addition, 37 of the trees had fruiting bodies or cavities at or near the base of the tree. In these situations, a primary concern is if the decay is present in the roots. Unfortunately, the Resistograph® can't be used to test decay in the roots. For these reasons, we did not proceed with the decay detection portion of the project and felt a constraints analysis would provide more meaningful information on tree preservation opportunities. However, the presence and location of decay were used as part of the constraints analysis and in the recommendations for action.

Alternative decay detection methods, specifically the use of sonic tomography, was considered for this project. However, in our experience and based on past projects where blue gum eucalyptus trees were assessed with the sonic tomography and later dissected for comparison to the tomography results, sonic tomography is not reliable for large-diameter blue gum eucalyptus.

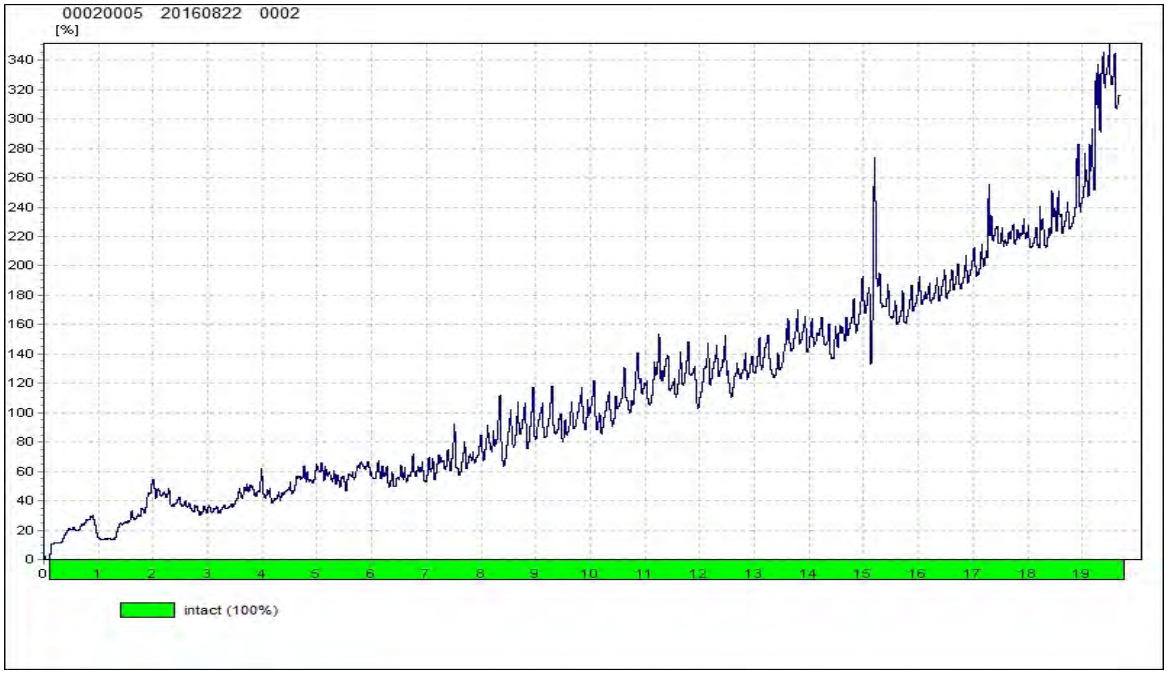

Image 1: An 'ideal' Resistograph® reading, representing a typical reading for a hardwood species with no internal decay.

VI: *Opportunities and Constraints Analysis*

Tree preservation identifies a practical match between the location, health and structure of the trees and the nature and intensity of the proposed construction activities. Although no plans were available showing the specifics of the proposed changes (i.e. grading, drainage and utility plans), the general ECR roadway renewal project proposes to:

- Remove and replace existing sidewalks, requiring from 6" to 12" of excavation,
- Remove and replace existing curbs and gutters or install new curbs and gutters where none exist, requiring 2' to 3' of excavation within ECR,
- Remove the existing roadbed, requiring 2' to 3' of excavation within ECR.
- Replace existing drainage infrastructure (storm drain and inlets) and other utilities.

Based on our field observations of tree health, structure and level of infrastructure damage, I have identified the following opportunities for and constraints to tree preservation.

Opportunities for tree preservation exist where:

- There is sufficient space around trees to place improvements away from trees or to design improvements to minimize root loss.
- No or minimal sidewalk or curb damage exists and impacts from the proposed project can be confined to one side of the tree. The exceptions to this are where no sidewalk or curb currently exists.
- Trees are young to semi-mature and/or in good health. These trees are more tolerant of the anticipated root loss associated with the proposed work.

Constraints to tree preservation exist where:

- Tree trunks have grown into the lane of travel. These trees are being repeatedly injured by vehicle strikes, creating wounds that can become colonized by decay organisms, potentially affecting tree stability over time.

- Trees have grown over sidewalks and curbs. These are trees where replacing damaged sidewalk or curb would require cutting into that portion of the trunk that has pillowed. We do not recommend cutting into the trunk of a tree. This would create a significant wound that if colonized by decay organisms, such as sulfur fungus, could degrade root or trunk tissue and compromise tree stability.
- Trees have outgrown the available space. These are trees where replacing the damaged infrastructure in its existing location may be possible (provided the existing sidewalk or curb damage is minor), but future infrastructure damage should be expected.
- Trees with poor health and/or structure that are unlikely to improve. In general, trees in poor health have limited physiological capacity to respond to the proposed changes, such as by growing new roots. We do not recommend preservation of trees with poor structure in areas where people and/or property are present.
- Trees that have caused moderate or severe infrastructure damage. Where sidewalk or curb displacement is more than 5", replacing the infrastructure can be expected to cause significant root loss because of excavation needed to make repairs that meet ADA requirements.
- Trees requiring root pruning on both sides of the tree. We do not recommend pruning roots on two sides of the tree at the same time, as tree stability can be compromised.
- Trees with sulfur fungus. These trees are infected with a decay organism known to compromise the structural integrity of trunk and root tissue in eucalyptus. Where sulfur fungus conks were located at or near the soil line, the decay is present in the roots and reducing their strength. There is legitimate concern for whole tree failure resulting from loss of roots/root strength to decay in these cases.

Opportunities for Tree Preservation and Design Considerations
A total of 74 trees have been identified as the best candidates to consider for preservation. Appendix A (Exhibits) provides a description of the recommended action for each tree, along with opportunities and constraints.

The following summarizes the results of the opportunity analysis and provides specific design considerations where appropriate. This information is summarized in Table 3 (following page).

- Fifteen (15) of the trees (#2, 9, 11-13, 17, 19, 20, 25, 29, 37, 488, 502, 934 and 978), appear to have sufficient space to construct a sidewalk with limited root loss and damage to trees. For trees #25, 29, 37, 488, 502 and 978, there is room to meander the existing sidewalk farther from the trees, provided there are no ADA constraints.

  The primary design consideration for these trees would be to keep the sidewalk a minimum of 15' from the trees or to minimize the depth of the excavation where work will encroach within 15'.

- For 35 trees (#40, 42, 50, 51, 70, 72, 83, 99, 180, 182, 202, 208, 224, 227, 232, 234, 240, 275, 284, 292, 324, 332, 338, 353, 364, 375, 387, 388, 394, 395, 397, 976, 977, 980 and 981) no or minimal sidewalk and curb damage was noted.

  In general, no design modifications are recommended for improvements adjacent to these trees. However, trees #42 and 234 had grown over the pavement. To preserve these trees, it would be necessary to retain that portion of curb or sidewalk in contact with the tree in place (saw cutting around the embedded section).

- For 16 trees (#303-310, 312-314, 316-318, 320 and 321), there was no existing curb or sidewalk present. There may be room to the west to construct a sidewalk with modifications.

  To preserve these trees, the sidewalk would need to be designed on top of grade to minimize root loss. Root loss can still be expected where roots are close to the ground surface as well as from the road renewal work. Soil can be built up on either side of the raised sidewalk to minimize any drop-off.

- Six trees (#280, 285, 293, 295, 375 and 388) were located behind the sidewalk, such that sidewalk and road improvements would be confined to one side of the tree. That said, trees 280, 293, 295, 375 and 388 had caused moderate to severe sidewalk damage and root loss can be expected as a result of the sidewalk repair and road renewal work.

  Where sidewalk damage is moderate to severe, some amount of ramping and/or meandering/narrowing of the sidewalk will be required adjacent to these trees.

- The remaining 4 trees included:
  - #77 – this semi-mature tree was in fair condition but is expected to tolerate the root loss associated with repairing the moderate sidewalk damage.
  - #184 – this mature silver dollar gum was in good health but had caused severe sidewalk damage and moderate curb damage. Design modification would be to meander/narrow the sidewalk.
  - #435 – this mature London plane was in good condition and the species is tolerant of anticipated root loss associated with repairing the severe sidewalk damage. Design modification would be to meander/narrow the sidewalk.
  - #485 – there is no existing sidewalk or curb and it is not clear where it would be installed.

Preservation of trees #83, 184, 280, 292, 293, 295, 387, 435 and 934 will require modifications to the sidewalk and monitoring of demolition and construction activities. These modifications will include meandering or narrowing the sidewalk and/or ramping the sidewalk adjacent to the tree to minimize root loss and/or avoid the base of the tree. Ramping the sidewalk often requires removal of additional linear feet of concrete to allow a gentle (ADA compliant) ramp to be achieved.

Table 3: Summary of opportunities for tree preservation
El Camino Real Roadway Renewal Project, San Mateo County

Tree #'s	Opportunity	Design considerations
2, 9, 11-13, 17, 19, 20, 25, 29, 37, 488, 502, 934 and 978	Space to install sidewalk away from tree	Locate sidewalk 15' from trees or minimize depth of excavation if closer than 15'
40, 42, 50, 51, 70, 72, 83, 99, 180, 182, 202, 208, 224, 227, 232, 234, 240, 275, 284, 292, 324, 332, 338, 353, 364, 375, 387, 388, 394, 395, 397, 976, 977, 980 and 981	No or minimal sidewalk and curb damage	Consider leaving sections of exist. sidewalk and curb where trees #42 and 234 have pillowed. No other design modifications required. Root loss will be associated with road renewal work.
303-310, 312-314, 316, 317, 318, 320 and 321	No existing sidewalk or curb	Sidewalk must be designed to be placed on grade. Root loss will be associated with both sidewalk construction and road renewal work
280, 285, 293, 295, 375 and 388	Behind sidewalk/away from road	No design modifications needed. Root loss will be associated with sidewalk replacement adj. to #335, 375 and 388
77, 184, 435 and 485	Semi-mature, in good condition and species tolerant of root loss	Evaluate meandering or narrowing the sidewalk adj. to #184 and 435 to avoid base of tree

In summary, I identified 74 trees where opportunities exist for preservation. However:

1. Not all of the trees listed above can be preserved. Depending on the final design of sidewalks, curb/gutter, roads and utilities placement or installation, additional trees may be identified for removal.
2. Fourteen (14) of the trees identified for preservation have outgrown the available space and future damage can be expected as a result of ongoing trunk and root growth.

Constraints to Tree Preservation
One hundred and fifty-two (152) have been identified for removal. The following provides a break-down of the primary factor considered in making this recommendation.

- For 11 trees, the trunk projects into the roadway and have been damaged by vehicle strikes. These trees are identified in **Table 2** (page 12).
- For 11 trees the proposed curb design, drainage work (drain inlet and drain line replacement), driveway replacement or sidewalk widening would be immediately adjacent to the base of the tree and is expected to be beyond the tolerance of the tree.
- For 30 trees, the primary constraint is that they have grown over the adjacent curb or sidewalk. We do not recommend cutting into the trunk tissue that would be required for repairs. These trees can be expected to continue to damage the surrounding infrastructure.
- For 35 trees, the primary constraint is that impacts from the proposed sidewalk and road renewal work would be on two sides of the trees. These trees have caused either moderate or severe sidewalk damage (6" or greater of displacement) and root loss would be expected as a result of both the sidewalk and road work. Many of the trunks and roots had also filled the available growing space.
- For 42 trees, the primary constraint is that they were in poor health and are not good candidates for retention, irrespective of the proposed sidewalk and road renewal work. Many of these had also filled the available growing space.
- For 23 trees, the primary constraint is the presence sulfur fungus and the resulting elevated risk of tree failure. Many of these were in poor health and/or had filled the available growing space.

In summary, I identified 152 trees for removal (**Appendix A**, Exhibits). Although the above lists the primary factor considered in recommending tree removal, 130 of the trees had at least 2 constraints to preserving them, 41 had at least 3 constraints and 3 trees had 4 constraints.

VII: *Next Steps*

As plans are developed and refined each design decision has the potential to impact the Tree Rows. Making the trees an equal priority as other design considerations (i.e. safety, roadway geometry, operations, etc.) during this process can help ensure impacts are clearly understood and appropriate decisions are made about which trees to preserve and where to spend valuable time and resources. Any plan developed must be consistent with the Secretary of the Interior's Treatment of Historic Properties.

The following provides a very general outline of the next steps to take during the design, construction and post-construction phases of the project. I have also attached the preliminary ***Tree Preservation Guidelines***. As plans are refined and more information about the nature, location and intensity of construction activities adjacent to trees are available, more detailed ***Tree Preservation Guidelines*** can be developed.

- Continue to engage with the Consulting Arborist during the design phase to help answer questions about tree preservation opportunities, constraints and best practices, as needed.

- Have any plan affecting trees reviewed by the Consulting Arborist with regard to tree impacts, on an as needed basis. These include, but are not limited to, demolition plans, grading, drainage, utility plans, as well as landscape and irrigation plans.

- In consultation with the Consulting Arborist, establish a **TREE PROTECTION ZONE** around each tree to be preserved. The concept is to limit all work within this zone to protect tree trunks, roots and soil. For many of these trees, the work zone will be immediately adjacent to the trees. Work will be allowed within the **TREE PROTECTION ZONE** but only under the supervision of the Consulting Arborist or representative. Specific **TREE PROTECTION ZONES** can be developed once we know which trees are be preserved and what and where construction activities will take place.

- Where possible, design underground services including utilities, sub-drains, water or sewer to be routed around the **TREE PROTECTION ZONE**. Where encroachment cannot be avoided, special construction techniques such as bore and jack, hand digging or tunneling under roots should be employed to minimize root injury.

- Plan to involve the Consulting Arborist in the demolition and construction phases. Contracting with a Consulting Arborist to attend a construction meeting prior to demolition and construction is important to establishing tree protection protocols and expectations. Additionally, a Consulting Arborist, or their representative, should be on site to monitor construction activities adjacent to trees, as needed.

- The Consulting Arborist has been retained to contribute to the development of a replacement planting plan. This is outside the scope of this Preservation Assessment, but is planned to occur during the design phase of the project with the goal of developing a planting approach for establishing replacement trees appropriate to the site.

VIII: *Closing Remarks*

The majority of the trees assessed were part of the Howard-Ralston Eucalyptus Tree Rows. The Tree Rows were planted approximately 145 years ago and many of the original planting are considered contributing features to the National Historic Register of Historic Places designation of the Tree Rows.

The trees are over mature specimens with a history of topping, crown reduction and root injury that has led to decay. Many have caused moderate to severe damage to the surrounding sidewalk, curbs and gutters and travel lanes on ECR. Several are in poor condition and/or have been infected by sulfur fungus.

Currently, I consider the trees to be inappropriate for their locations, given their size, the damage they have caused, the volume and speed of traffic on ECR and the density of the urban environment that has been built up around them. This is not to say the species was inappropriate at the time of planting, as there was considerably more room for their growth and development and the urban pressures on them were dramatically less.

Just as wholesale tree removal is not an option for both environmental and political reasons, neither is doing nothing. An incremental and logical plan for the removal and replacement of the trees should be developed and implemented to address the current infrastructure deficiencies and to perpetuate the Tree Rows and the benefits it provides the community into the future. Again, any plan developed must be consistent with the Secretary of the Interior's Treatment of Historic Properties.

Appropriate design, good species selection and regular maintenance of new trees, including early training of trees for structure and early and frequent root pruning, will help reduce the potential for the same situation to reoccur.

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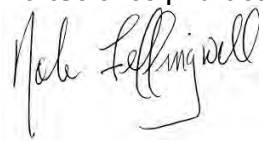

John Leffingwell
Board Certified Master Arborist #WE 3966B
Registered Consulting Arborist #442

Exhibits

Tree Assessment Form

Tree Assessment Map
(Provided by Caltrans)

Appendix A: Preservation Opportunities and Constraints

Preliminary Tree Preservation Guidelines

Tree Assessment

Ralston Historic Tree Row
Burlingame, California
February 2021

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TREE No.	SPECIES	SIZE DIAMETER (in inches)	CONDITION 1=POOR 5=EXCELLENT	COMMENTS	TOPPED	PILLOWED	OUTGROWN AVAILABLE SPACE	TRUNK IN ROAD	SULFUR FUNGUS	SIDEWALK DAMAGE	CURB DAMAGE
2	Blue gum	51	3	Codominant trunks at 10’; upright form; topped at 50’; trunk wound E.; moderate dieback in upper crown.	Yes	--	--	--	--	None	None
4	Blue gum	69	3	Multiple attachments at 10’; topped at 50’; trunk wounds; sulfur fungus W. at 3’; dieback in upper crown.	Yes	--	--	--	Yes	None	None
7	Blue gum	102	4	Multiple attachments at 10’; topped in upper crown; old cable; basal wounds; dieback in upper crown.	Yes	--	--	--	--	None	None
9	Blue gum	41	3	Upright form; topped in upper crown; laterals reduced.	Yes	--	--	--	--	None	None
11	English elm	19	4	Codominant trunks at 8’; good form.	--	--	--	--	--	None	None
12	Blue gum	77	3	Multiple attachments at 20’; topped in upper crown; basal wounds; dieback in upper crown.	Yes	--	--	--	--	None	None
13	English elm	18	3	Multiple attachments at 8’; cavity below attachments; one sided S.	--	--	--	--	--	None	None
15	Blue gum	88	4	Multiple attachments at 15’-20’; old sulfur fungus 3’ SE. of base but unclear where it came from; topped in upper crown; basal wounds; dieback in upper crown.	Yes	--	--	--	Yes	None	None
17	Blue gum	77	3	Multiple attachments at 10’; topped in upper crown; dieback in upper crown.	Yes	--	--	--	--	None	None
19	Blue gum	83	3	Multiple attachments at 15’-20’; topped in upper crown; a little sparse.	Yes	--	--	--	--	None	None
20	Blue gum	57	3	Codominant trunks at 15’; upright form; topped in upper crown; a little sparse.	Yes	--	--	--	--	None	None
23	Blue gum	105	3	Multiple attachments at 15’; old cable; topped in upper crown; basal wounds on roadside; displaced sidewalk 18".	Yes	--	Yes	--	--	Severe	None
25	Manna gum	35	3	Codominant trunks at 15’; slight lean W.; topped in upper crown & reduced; a little sparse; displaced sidewalk 1-2".	Yes	--	--	--	--	Minor	None
28	Blue gum	64	3	Codominant trunks at 20’; topped in upper crown & reduced; basal wounds on roadside; displaced sidewalk 18".	Yes	--	Yes	--	--	Severe	None
29	English elm	26	3	Codominant at 15’; cavity S. at 8’; asymmetric form.	--	--	--	--	--	None	None
31	Blue gum	72	3	Multiple attachments at 25’; topped in upper crown & reduced; exposed roots damaged; basal wounds on roadside.	Yes	--	Yes	--	--	None	None
33	Blue gum	84	3	Multiple attachments at 25’; topped in upper crown & reduced; a little sparse; basal wounds on roadside.	Yes	--	Yes	--	--	None	None
37	Blue gum	61	4	Codominant trunks at 30’; upright form; topped in upper crown & reduced; basal wound E.	Yes	--	--	--	--	None	None
38	Blue gum	85	3	Multiple attachments at 20’; upright form; topped in upper crown & reduced.	Yes	--	Yes	--	--	None	None
40	Eucalyptus sp.	22	4	Slight lean W.; small branch failure; vertical growth cracks; displaced sidewalk 4".	--	--	--	--	--	Minor	None
42	London plane	28	5	Multiple attachments at 10’; good form and structure; pillowing over & displacing sidewalk 4” & curb 2".	--	Yes	Yes	--	--	Minor	Minor
48	Eucalyptus sp.	20	2	Multiple attachments at 10’; strong lean E.; branch failure at attachment; large girdling root W.; displaced sidewalk 2".	--	--	--	--	--	Minor	None
49	Blue gum	85	3	Multiple attachments at 20’; upright form; topped in upper crown & reduced; displaced curb 8".	Yes	--	Yes	--	--	None	Moderate
50	Eucalyptus sp.	7,6	3	Codominant trunks at base; narrow attachment; slight lean W.; twig dieback.	--	--	--	--	--	None	None
51	Red river gum	15	3	Upright, narrow form; small branch dieback; displaced curb 1".	--	--	--	--	--	None	Minor
52	Red river gum	14	2	Codominant trunks at 12’; slight lean E.; poor form; small branch dieback; displaced sidewalk 2".	Yes	--	--	--	--	Minor	None
68	Blue gum	65	3	Multiple attachments at 20’; upright form; topped in upper crown & reduced; pillowed over sidewalk; displaced curb 4".	Yes	Yes	Yes	--	--	None	Minor
69	Blue gum	65	3	Codominant trunks at 10’ & multiple attachments at 20’; upright form; topped in upper crown & reduced; displaced & pitched sidewalk 8”; displaced curb 4".	Yes	--	Yes	--	--	Moderate	Minor
70	English elm	22	3	Upright, narrow form; small cavity at 25’.	--	--	--	--	--	None	None
71	Blue gum	84	3	Multiple attachments at 30’; upright form; topped in upper crown & reduced; displaced asphalt sidewalk 10”; pillowing over & displacing curb 3".	Yes	Yes	Yes	--	--	Moderate	Minor

Tree Assessment

Ralston Historic Tree Row
Burlingame, California
February 2021

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TREE No.	SPECIES	SIZE DIAMETER (in inches)	CONDITION 1=POOR 5=EXCELLENT	COMMENTS	TOPPED	PILLOWED	OUTGROWN AVAILABLE SPACE	TRUNK IN ROAD	SULFUR FUNGUS	SIDEWALK DAMAGE	CURB DAMAGE
72	English elm	22	3	Narrow form; leans W.; reduced over Hwy. 82	--	--	--	--	--	None	None
74	Blue gum	49	3	Codominant trunks at 25'; upright form; topped in upper crown & reduced; basal wound & trunk wounds W.; sulfur fungus in basal wound & at base NW.; girdling rope at 25'; displaced sidewalk 3"; pillowing over curb.	Yes	Yes	Yes	--	Yes	Minor	Minor
76	Blue gum	62	3	Upright form; stems removed; topped in upper crown & reduced; displaced sidewalk 10"; pillowing over curb.	Yes	Yes	Yes	--	--	Moderate	Minor
77	Eucalyptus sp.	24	3	Multiple attachments at 12'; small branch dieback; displaced sidewalk 6".	Yes	--	--	--	--	Moderate	None
79	Eucalyptus sp.	13	2	Strong lean E.; branch failure at attachment; large girdling root W.; displacing sidewalk 1".	--	--	--	--	--	Minor	None
83	English elm	36	4	Codominant trunks in upper crown; good, upright form; suckers in lower 1/3 of trunk; displaced & pitched sidewalk 8"; displaced curb 4".	--	--	--	--	--	Moderate	Minor
86	Sweetgum	20	3	Upright form; large basal wound W.; displacing sidewalk 6-8" over long distance N.; displaced curb 10".	--	--	--	--	--	Moderate	Severe
87	Eucalyptus sp.	18	3	Codominant trunks at 12'; suppressed & one sided SW.; history of branch failure; displaced sidewalk & curb 1".	--	--	--	--	--	Minor	Minor
99	Eucalyptus sp.	13	3	Multiple attachments at 10'; leans N.; reduced E.; in small cut out; displacing sidewalk 1".	--	--	--	--	--	Minor	None
100	Blue gum	67	3	Codominant trunks at 15'; slight lean W.; topped in upper crown & reduced; pillowing over & displacing sidewalk 10".	Yes	Yes	Yes	--	--	Moderate	None
101	Blue gum	60	3	Multiple attachments at 15'; old cables; topped in upper crown & reduced; pillowing over & displaced sidewalk 6"; pillowing over & displaced curb 2".	Yes	Yes	Yes	--	--	Moderate	Minor
105	Blue gum	95	4	Multiple attachments at 15'; upright & vigorous; topped in upper crown & reduced; pillowing over & displaced sidewalk 6"; pillowing over & displaced curb 10".	Yes	Yes	Yes	--	--	Moderate	Severe
107	Blue gum	76	3	Multiple attachments at 15'; upright form; topped in upper crown & reduced; pillowing over & displaced sidewalk 10"; pillowing over & displaced curb 6".	Yes	Yes	Yes	--	--	Moderate	Moderate
108	Manna gum	76	3	Codominant trunks at 30'; slight lean W.; topped in upper crown & reduced; basal wounds W.; pushed retaining wall E.; pillowing over & displaced sidewalk 6"; pillowing over & displaced curb	Yes	Yes	Yes	--	--	Moderate	Minor
113	Blue gum	71	3	Multiple attachments at 15'; upright form; topped in upper crown & reduced; sulfur fungus at bases S. & N.; pillowing over & displaced sidewalk 8"; pillowing over & displaced curb 4".	Yes	Yes	Yes	--	Yes	Moderate	Minor
117	Blue gum	84	3	Multiple attachments at 15'; dense w/ epicormics; topped in upper crown & reduced; little space remains/surrounded by concrete; displaced sidewalk 6-8" & curb 8-12"	Yes	--	Yes	--	--	Moderate	Severe
122	Eucalyptus sp.	55	3	Codominant trunks at 15'; one stem dominates; smaller stem leans N.; displaced & pushed sidewalk 12"-24"; displaced curb 4".	--	--	Yes	--	--	Severe	Minor
123	Red river gum	76	3	Multiple attachments at 10'; topped in upper crown & reduced; displaced sidewalk 24" & curb 8".	Yes	--	Yes	--	--	Severe	Moderate
125	Red river gum	59	3	Multiple attachments at 10'; mostly upright; topped in upper crown & reduced; pillowing over & displaced sidewalk 10"; displaced curb 8".	Yes	Yes	Yes	--	--	Moderate	Moderate
126	English elm	23	1	Dead top; large cavity N.; displaced & pitched sidewalk 2".	--	--	--	--	--	Minor	None
128	Red river gum	52	3	Codominant trunks at 20'; slight lean W.; topped in upper crown & reduced; displaced & pitched asphalt sidewalk 18".	Yes	--	Yes	--	--	Severe	None
129	English elm	25	2	Moderate dieback in upper crown; epicormic shoots along trunks; displaced & pitched sidewalk 2".	--	--	--	--	--	Minor	None
130	Eucalyptus sp.	57	3	Codominant trunks at 25'; leans W.; topped in upper crown and reduced; lots of burls on lower trunk; displaced & pushed sidewalk 4".	Yes	--	Yes	--	--	Minor	None
133	Blue gum	84	3	Multiple attachments at 25'; topped in upper crown & reduced; sulfur fungus N. at base; displaced asphalt sidewalk 12-24".	Yes	--	Yes	--	Yes	Severe	None
135	Blue gum	84	3	Multiple attachments at 15'-20'; slight lean SW.; topped in upper crown & reduced; basal wound N.; displaced sidewalk 8".	Yes	--	Yes	--	--	Moderate	None

Tree Assessment

Ralston Historic Tree Row
Burlingame, California
February 2021

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TREE No.	SPECIES	SIZE DIAMETER (in inches)	CONDITION 1=POOR 5=EXCELLENT	COMMENTS	TOPPED	PILLOWED	OUTGROWN AVAILABLE SPACE	TRUNK IN ROAD	SULFUR FUNGUS	SIDEWALK DAMAGE	CURB DAMAGE
136	Blue gum	53	3	Multiple attachments at 15'-20'; upright form; topped in upper crown & reduced; displaced asphalt sidewalk 10"; pillowing over curb.	Yes	Yes	Yes	--	--	Moderate	Minor
137	Red river gum	41	3	Codominant trunks at 20'; one sided W.; topped in upper crown & reduced; basal wounds W.; pillowing over & displaced sidewalk 4"; pillowing over & displaced curb 2".	Yes	Yes	Yes	--	--	Minor	Minor
138	Red river gum	42	3	Codominant trunks at 15'; cabled to #139; topped in upper crown & reduced; displaced asphalt sidewalk 6".	Yes	--	Yes	--	--	Moderate	Minor
139	Red river gum	74	3	Multiple attachments at 15'-20'; cabled to #138 & 140; trunk wounds W. where trunk is in roadway; topped in upper crown & reduced; displaced asphalt sidewalk 18"; pillowing over/swallowed curb.	Yes	--	Yes	Yes	--	Severe	Severe
140	Red river gum	34	2	One sided W.; cabled to #139; topped in upper crown & reduced; displaced sidewalk 6".	Yes	--	--	--	--	Moderate	None
141	Red river gum	68	3	Codominant trunks at 10' & 15'; cabled; topped in upper crown & reduced; displaced sidewalk 18" & curb 6"	Yes	--	Yes	--	--	Severe	Moderate
144	Red river gum	56	3	Multiple attachments at 15'; cavity where stem removed E. @ 10'; topped in upper crown & reduced; pitched sidewalk 3"; pillowed over curb.	Yes	Yes	Yes	--	--	Minor	Minor
145	Red river gum	52	2	Poor form; stem removed SE. at 10'; topped in upper crown & reduced; pitched sidewalk 4"; pillowing over curb.	Yes	Yes	Yes	--	--	Minor	Minor
146	Red river gum	59	3	Codominant trunks at 15'; topped in upper crown & reduced.; cabled to #145; basal wounds; displacing sidewalk & curb 2-4".	Yes	--	Yes	--	--	Minor	Minor
158	Eucalyptus sp.	18	2	Poor form and structure; stem removed at 10'; all weight N.; new sidewalk.	--	--	--	--	--	None	None
159	Eucalyptus sp.	18	2	Codominant trunks at 18'; stem removed below attachments; one sided N.; new sidewalk; branch failures; displaced curb 1".	--	--	--	--	--	None	Minor
170	Red river gum	47	3	Multiple attachments at 15'; topped in upper crown & reduced; cables; new sidewalk; pillowed over & displaced curb 4".	Yes	Yes	Yes	--	--	None	Minor
173	Red river gum	43	3	Codominant trunks at 12'; slight lean E.; topped in upper crown & reduced; new sidewalk; pillowed over & displaced curb 2".	Yes	Yes	Yes	--	--	None	Minor
174	Red river gum	43	3	Codominant trunks at 15'; stems removed at 10' E.; small basal cavity W.; topped in upper crown & reduced; pillowed over & displaced sidewalk & curb 3".	Yes	Yes	Yes	--	--	Minor	Minor
180	Silver dollar gum	28	3	Slight lean N.; a little sparse; some reduction cuts; displacing sidewalk & curb 3".	--	--	--	--	--	Minor	Minor
182	Blue gum	36	3	Codominant trunks at 15'; one stem upright, other leans E.; some reduction cuts; displaced sidewalk & curb 2-4".	--	--	--	--	--	Minor	Minor
184	Silver dollar gum	35	4	Codominant trunks at 15'; some reduction cuts; displacing sidewalk 18" & curb 6".	--	--	--	--	--	Severe	Moderate
193	Red river gum	55	3	Codominant trunks at 20'; narrow attachments; trunk wound NW.; topped in upper crown & reduced; displaced sidewalk 6"; pillowed over curb; trunk in roadway.	Yes	Yes	Yes	Yes	--	Moderate	Minor
195	Manna gum	61	3	Multiple attachments at 15'; bleeding on low trunk; S. stem w/ ropes at 20'; topped in upper crown & reduced; displaced sidewalk 10"; pillowed over curb; trunk in roadway.	Yes	Yes	Yes	Yes	--	Moderate	Minor
199	Manna gum	57	3	Codominant trunks at 15'; small old sulfur fungus in root S.; topped in upper crown & reduced; pitched new sidewalk; pillowed over & pushed curb 4".	Yes	Yes	Yes	--	Yes	Minor	Minor
200	Manna gum	46	3	Codominant trunks at 12'; slack cable; old sulfur fungus at base NW.; topped in upper crown & reduced; root damage N.	Yes	--	--	--	Yes	None	None
201	Manna gum	36	2	Codominant trunks at 12'; cabled; narrow form; topped in upper crown & reduced; root damage N.	Yes	--	--	--	--	None	None
202	Manna gum	46	3	Multiple attachments at 15'; narrow/fused attachment S.; cabled; topped in upper crown & reduced; root damage N.	Yes	--	--	--	--	None	None
203	Manna gum	36	2	Codominant trunks at 12'; small, one sided crown SW.; old sulfur fungus at base NW.; topped hard at 30-35' & reduced; displaced sidewalk 2".	Yes	--	--	--	Yes	Minor	None

Tree Assessment

Ralston Historic Tree Row
Burlingame, California
February 2021

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TREE No.	SPECIES	SIZE DIAMETER (in inches)	CONDITION 1=POOR 5=EXCELLENT	COMMENTS	TOPPED	PILLOWED	OUTGROWN AVAILABLE SPACE	TRUNK IN ROAD	SULFUR FUNGUS	SIDEWALK DAMAGE	CURB DAMAGE
207	Manna gum	36	3	Very one sided crown N.; some reduction cuts; displaced sidewalk 18” & curb 5”.	--	--	--	--	--	Severe	Minor
208	Manna gum	46	3	Multiple attachments at 15’; one sided crown S.; base a little buried; some reduction cuts; displaced sidewalk 5” & curb 2”.	--	--	--	--	--	Minor	Minor
209	Blue gum	42	3	Multiple attachments at 20’; a little sparse; basal wounds some reduction cuts; displaced sidewalk 8” & pillowed over curb.	--	Yes	Yes	--	--	Moderate	Moderate
210	Blue gum	36	3	Upright form; a little sparse; basal wounds some reduction cuts; displaced sidewalk 15” & curb 3".	--	--	Yes	--	--	Severe	Minor
211	Blue gum	34	3	Codominant trunks at 20’; upright form; some reduction cuts; displaced/pushed sidewalk 6” & curb 4”.	--	--	Yes	--	--	Moderate	Minor
212	Blue gum	70	3	Codominant trunks at 25’ & 30’; upright form; topped in upper crown & reduced; displaced/pushed sidewalk & ret. wall 24” & pillowed over curb.	Yes	Yes	Yes	--	--	Severe	Moderate
213	Blue gum	37	3	Codominant trunks at 20’; one sided SW.; topped in upper crown & reduced; displaced sidewalk 6” & pillowed over curb.	Yes	Yes	Yes	--	--	Moderate	Moderate
215	Manna gum	45	3	Codominant trunks at 12’; one sided S.; basal wounds W.; displaced sidewalk 18” & pillowed over & displaced curb/gutter 8”; trunk in roadway.	Yes	Yes	Yes	Yes	--	Severe	Moderate
218	Manna gum	30	3	Codominant trunks at 20’; very one sided W.; history of branch failure; some reduction cuts; displaced sidewalk 18” & pillowed over & displaced curb 6”.	--	Yes	Yes	--	--	Severe	Moderate
220	Manna gum	30	3	Codominant trunks at 12’; upright form; sulfur fungus at base W.; topped in upper crown & reduced; displaced sidewalk 5”; pillowed over & destroyed curb.	Yes	Yes	Yes	--	Yes	Minor	Severe
224	Manna gum	28	3	Codominant trunks at 20’; high, narrow crown; minor reduction cuts; displaced curb 3”.	--	--	Yes	--	--	None	Minor
225	Manna gum	44	3	Multiple attachments at 10’; asymmetric form; trunk wound NW. @ 6’ where stem removed; topped in upper crown & reduced; displaced sidewalk 6”; pillowed over & destroyed curb.	Yes	Yes	Yes	--	--	Moderate	Severe
226	Manna gum	57	3	Codominant trunks at 15’; basal wounds/burl W.; topped in upper crown & reduced; displaced sidewalk 5”; pillowed over & destroyed curb; trunk in roadway.	Yes	Yes	Yes	Yes	--	Minor	Severe
227	Blue gum	57	3	Multiple attachments at 15’; small cavity S.; girdling guy wire on S. stem @ 18’; topped in upper crown & reduced; new sidewalk & curb.	Yes	--	Yes	--	--	None	None
232	Blue gum	44	4	Codominant trunks at 15’; upright form; trunk wounds; topped in upper crown & reduced; new sidewalk & curb.	Yes	--	Yes	--	--	None	None
234	Blue gum	36	3	Multiple attachments at 35’; upright form; low branches removed at 10’; topped in upper crown & reduced; new sidewalk & curb; pillowing over curb.	Yes	Yes	Yes	--	--	None	None
237	Blue gum	61	3	Multiple attachments at 15’; asymmetric form; basal wounds W.; topped in upper crown & reduced; displaced new sidewalk 8”; pillowed over & destroyed curb; trunk in roadway.	Yes	Yes	Yes	Yes	--	Moderate	Severe
240	Red river gum	23	5	Codominant trunks at 18’; good form and structure; displaced new sidewalk 1”.	--	--	--	--	--	Minor	None
241	Blue gum	78	3	Multiple attachments at 15’; upright form; basal wounds W.; topped in upper crown & reduced; displaced new sidewalk 2”; pillowed over & destroyed curb; trunk in roadway.	Yes	Yes	Yes	Yes	--	Minor	Severe
243	Blue gum	44	2	Multiple attachments at 15’; upright form; very sparse crown/moderate dieback; topped in upper crown & reduced; displaced sidewalk 3”; pillowed over & displaced curb 2”.	Yes	Yes	Yes	--	--	Minor	Minor
245	Blue gum	75	3	Multiple attachments at 20’; upright form; basal wounds W.; topped in upper crown & reduced; displaced sidewalk 18”; pillowed over & destroyed curb; trunk in roadway.	Yes	Yes	Yes	Yes	--	Severe	Severe
246	Blue gum	67	3	Multiple attachments at 15’; basal wounds W.; topped in upper crown & reduced; displaced sidewalk 15”; pillowed over curb.	Yes	Yes	Yes	--	--	Severe	Minor
250	Blue gum	75	2	Multiple attachments at 20’; sparse crown; significant basal wounds W.; topped in upper crown & reduced; displaced sidewalk 18”; pillowed over & destroyed curb.	Yes	Yes	Yes	--	--	Severe	Severe
255	Blue gum	50	3	Multiple attachments at 15’; upright form; topped in upper crown & reduced; displaced sidewalk 2”; pillowed over & displaced curb 1”.	Yes	Yes	Yes	--	--	Minor	Minor

Tree Assessment

Ralston Historic Tree Row
Burlingame, California
February 2021

HORT SCIENCE
BARTLETT CONSULTING

TREE No.	SPECIES	SIZE DIAMETER (in inches)	CONDITION 1=POOR 5=EXCELLENT	COMMENTS	TOPPED	PILLOWED	OUTGROWN AVAILABLE SPACE	TRUNK IN ROAD	SULFUR FUNGUS	SIDEWALK DAMAGE	CURB DAMAGE
257	Blue gum	58	2	Multiple attachments at 25’; sparse crown/moderate dieback; sulfur fungus at base W.; topped in upper crown & reduced; displaced sidewalk 12”; destroyed curb.	Yes	--	Yes	--	Yes	Moderate	Severe
260	Blue gum	50	3	Multiple attachments at 15’; sulfur fungus on cut root NW.; topped in upper crown & reduced; displaced sidewalk 14”; displaced curb 4”.	Yes	--	Yes	--	Yes	Severe	Minor
262	Blue gum	49	3	Multiple attachments at 15’; stem removed N.; sulfur fungus at base E.; topped in upper crown & reduced; displaced sidewalk 10”; displaced/pushed curb 8”.	Yes	--	Yes	--	Yes	Severe	Moderate
263	Blue gum	54	2	Multiple attachments at 15’; stem removed E.; sulfur fungus at base N. & where stem removed E.; topped in upper crown & reduced; displaced sidewalk 3”; pillowed over & displaced curb 6”.	Yes	Yes	Yes	--	Yes	Minor	Moderate
264	Blue gum	51	3	Multiple attachments at 20’; upright form; topped in upper crown & reduced; displaced sidewalk 2”; pillowed over & destroyed curb; trunk in roadway.	Yes	Yes	Yes	Yes	--	Minor	Severe
268	Blue gum	64	3	Multiple attachments at 15’; upright form; topped in upper crown & reduced; displaced sidewalk 5”; pillowed over & destroyed curb.	Yes	Yes	Yes	--	--	Minor	Severe
271	Blue gum	73	3	Multiple attachments at 15’; upright form; basal wounds W.; sulfur fungus at base NW.; topped in upper crown & reduced; displaced sidewalk 18”; pillowed over & destroyed curb; trunk in roadway.	Yes	Yes	Yes	Yes	Yes	Severe	Moderate
274	Blue gum	64	2	Multiple attachments at 15’; slight lean S.; sulfur fungus at base W.; topped in upper crown & reduced; displaced & pillowed over sidewalk 6” & curb 1".	Yes	Yes	Yes	--	Yes	Moderate	Minor
275	Blue gum	52	3	Multiple attachments at 20’; slight lean S.; crown one sided N.; topped in upper crown & reduced; displaced sidewalk 4” & curb 1".	Yes	--	--	--	--	Minor	Minor
276	Blue gum	64	3	Codominant trunks at 15’; slight lean & one sided NW.; topped in upper crown & reduced; displaced asphalt sidewalk & curb 4-6”.	Yes	--	Yes	--	--	Minor	Moderate
277	Blue gum	57	2	Multiple attachments at 15’-20’; sparse crown/moderate dieback; cabled; sulfur fungus at base W.; topped in upper crown & reduced; pitched sidewalk 3” & curb 1".	Yes	--	--	--	Yes	Minor	Minor
278	Blue gum	35	2	Codominant trunks at 15’; sparse crown/moderate dieback; poor form; topped in upper crown & reduced.	Yes	--	--	--	--	None	None
279	Manna gum	44	3	Codominant trunks at 25’; one sided W.; sulfur fungus at base SE.; topped in upper crown & reduced; displaced sidewalk 4” & curb 1".	Yes	--	--	--	Yes	Minor	Minor
280	Manna gum	77	3	Codominant trunks at 30’; upright form; topped in upper crown & reduced; displaced/pitched asphalt sidewalk 12” & curb 6".	Yes	--	Yes	--	--	Severe	Moderate
281	Blue gum	66	3	Multiple attachments at 12’; sulfur fungus at base NW.; topped in upper crown & reduced; pitched sidewalk 8” & curb 1".	Yes	--	Yes	--	Yes	Moderate	Minor
282	Blue gum	55	2	Codominant trunks at 20’; one sided NW.; topped in upper crown & reduced; displaced/pitched sidewalk 4” & curb 1".	Yes	--	Yes	--	--	Minor	Minor
284	Blue gum	55	3	High crown; topped in upper crown & reduced; displaced asphalt sidewalk & curb 3”.	Yes	--	Yes	--	--	Minor	Minor
285	Blue gum	54	4	Multiple attachments at 20’; one sided W.; some reduction cuts; large girdling roots.	--	--	--	--	--	None	None
291	Blue gum	68	3	Codominant trunks at 15’; sulfur fungus where stem removed @ 15’ E.; topped in upper crown & reduced; displaced/pitched sidewalk 3” & curb 2".	Yes	--	Yes	--	Yes	Minor	Minor
292	Manna gum	75	3	Multiple attachments at 15’; one sided W.; cabled to #291; topped in upper crown & reduced; pillowed over & pitched sidewalk 4” & curb 2".	Yes	Yes	Yes	--	--	Minor	Minor
293	Blue gum	65	3	Multiple attachments at 18’; a little sparse; cabled; topped in upper crown & reduced; displaced sidewalk 12” & curb 1".	Yes	--	Yes	--	--	Severe	Minor
295	Blue gum	61	3	Multiple attachments at 15’; basal cavity S. w/ embedded concrete; topped in upper crown & reduced; displaced/pitched sidewalk 8” & curb 3".	Yes	--	Yes	--	--	Moderate	Minor
300	Blue gum	48	2	Codominant trunks at 25’; one sided SW.; moderate dieback; topped in upper crown & reduced; displaced asphalt sidewalk & curb 3”.	Yes	--	Yes	--	--	Minor	Minor

Tree Assessment

Ralston Historic Tree Row
Burlingame, California
February 2021

HORT SCIENCE
BARTLETT CONSULTING

TREE No.	SPECIES	SIZE DIAMETER (in inches)	CONDITION 1=POOR 5=EXCELLENT	COMMENTS	TOPPED	PILLOWED	OUTGROWN AVAILABLE SPACE	TRUNK IN ROAD	SULFUR FUNGUS	SIDEWALK DAMAGE	CURB DAMAGE
301	Blue gum	53	3	Codominant trunks at 20”; one sided NW.; sulfur fungus at base E.; topped in upper crown & reduced; displaced asphalt sidewalk & curb 2”.	Yes	--	Yes	--	Yes	Minor	Minor
302	Blue gum	55	3	Multiple attachments at 20”; sulfur fungus at base S. (but not clear where it came from) topped in upper crown & reduced; displaced asphalt sidewalk & curb 3”.	Yes	--	Yes	--	Yes	Minor	Minor
303	Manna gum	87	3	Codominant trunks at 15’; trunk wounds & kino SW. topped in upper crown & reduced;girdling rope tied to power pole.	Yes	--	--	--	--	None	None
304	Blue gum	50	3	Codominant trunks at 18’; high, narrow crown; topped in upper crown & reduced.	Yes	--	--	--	--	None	None
305	Blue gum	53	3	Codominant trunks at 20’; stems fused to 25’; very narrow crown; topped in upper crown & reduced.	Yes	--	--	--	--	None	None
306	Blue gum	48	3	High, narrow crown; topped in upper crown & reduced.	Yes	--	--	--	--	None	None
307	Blue gum	63	3	High, narrow crown; one sided NW.; topped in upper crown & reduced.	Yes	--	--	--	--	None	None
308	Blue gum	71	3	Upright, narrow form; topped in upper crown & reduced.	Yes	--	--	--	--	None	None
309	Manna gum	58	3	Codominant trunks at 15’; stems bowed NW.; topped in upper crown & reduced; guyed to power pole.	Yes	--	--	--	--	None	None
310	Manna gum	62	4	Codominant trunks at 25’; slight lean W.; small basal wound W.; topped in upper crown & reduced; guyed to power pole.	Yes	--	--	--	--	None	None
311	Blue gum	49	2	High, narrow crown; dead top; topped in upper crown & reduced.	Yes	--	--	--	--	None	None
312	Blue gum	39	3	High, narrow crown; basal wound & cavity NE.; topped in upper crown & reduced.	Yes	--	--	--	--	None	None
313	Blue gum	58	3	Codominant trunks at 20’ & 25’; crown bowed NW.; basal wound NE.; topped in upper crown & reduced.	Yes	--	--	--	--	None	None
314	Blue gum	62	3	Codominant trunks at 20’; high, narrow crown; topped in upper crown & reduced.	Yes	--	--	--	--	None	None
315	Blue gum	70	3	Codominant trunks at 20’; slight lean W.; sulfur fungus in basal wound E.; topped in upper crown & reduced.	Yes	--	--	--	Yes	None	None
316	Blue gum	71	4	Upright form; a little one sided W.; topped in upper crown & reduced.	Yes	--	--	--	--	None	None
317	Blue gum	64	3	Multiple attachments at 15’; upright, narrow form; topped in upper crown & reduced.	Yes	--	--	--	--	None	None
318	Blue gum	66	4	Multiple attachments at 15'; upright form; topped in upper crown & reduced; dead branches to 4".	Yes	--	--	--	--	None	None
319	Blue gum	40	2	Suppressed; small crown bowed NW.; large girdling root; topped in upper crown & reduced.	Yes	--	--	--	--	None	None
320	Manna gum	76	4	Multiple attachments at 20’; basal burl; topped in upper crown & reduced.	Yes	--	--	--	--	None	None
321	Blue gum	55	3	High crown; a little one sided W.; topped in upper crown & reduced.	Yes	--	--	--	--	None	None
322	Blue gum	45	2	Codominant trunks at 20’; one sided S.; moderate dieback; topped in upper crown & reduced.	Yes	--	Yes	--	--	None	None
323	Blue gum	52	3	Codominant trunks at 20’; upright, narrow form; sulfur fungus at base SE.; topped in upper crown & reduced.	Yes	--	Yes	--	Yes	None	None
324	Blue gum	77	3	Multiple attachments at 20’; one sided W.; root damage E.; topped in upper crown & reduced; pitched sidewalk 2".	Yes	--	Yes	--	--	Minor	None
325	Blue gum	42	1	Codominant trunks at 20’; topped hard at 45’; little remains.	Yes	--	Yes	--	--	Minor	None
326	Blue gum	98	4	Multiple attachments at 20’; one sided W.; topped in upper crown & reduced; displaced & pitched sidewalk 10” & curb 4”.	Yes	--	Yes	--	--	Severe	Minor
327	Blue gum	41	1	Topped hard at 55’; one sided W.; little remains; displaced sidewalk 2”.	Yes	--	Yes	--	--	Minor	None
328	Blue gum	31	1	Topped hard at 55’; one sided W.; little remains; cavity E. at 10’.	Yes	--	--	--	--	None	None
329	Manna gum	67	2	Multiple attachments at 20’; sulfur fungus on burl W.; lots of kino & basal wounds; topped in upper crown & reduced.	Yes	--	Yes	--	Yes	None, but driveway damage NW.	None
330	Blue gum	39	2	Topped hard at 55’; one sided W.; stem removed E. at 10’.	Yes	--	Yes	--	--	None	None

Tree Assessment

Ralston Historic Tree Row
Burlingame, California
February 2021

HORT SCIENCE
BARTLETT CONSULTING

TREE No.	SPECIES	SIZE DIAMETER (in inches)	CONDITION 1=POOR 5=EXCELLENT	COMMENTS	TOPPED	PILLOWED	OUTGROWN AVAILABLE SPACE	TRUNK IN ROAD	SULFUR FUNGUS	SIDEWALK DAMAGE	CURB DAMAGE
331	Blue gum	43	2	Topped hard at 55'; one sided W.; moderate dieback; stem removed E. at 10'.	Yes	--	--	--	--	None	None
332	Blue gum	58	3	Codominant trunks at 25'; one sided W.; dieback; stem removed E. at 10'; topped in upper crown and reduced; growing in raised planter.	Yes	--	--	--	--	None	None
333	Blue gum	42	2	Topped hard at 55'; one sided W.; moderate dieback; stem removed E. at 10'; in tiny space between driveways.	Yes	--	Yes	--	--	None	None
334	Blue gum	51	3	Codominant trunks at 25'; one sided W.; sulfur fungus at base E.; topped in upper crown and reduced; displaced sidewalk & curb 6".	Yes	--	--	--	Yes	Moderate	Moderate
335	Blue gum	53	3	Codominant trunks at 15'; one sided NW.; topped in upper crown and reduced; displaced sidewalk & curb 8".	Yes	--	--	--	--	Moderate	Moderate
336	Blue gum	31	1	Topped hard at 50'; one sided W.; little remains; growing in small space between driveway & stairs.	Yes	--	--	--	--	None	None
337	Blue gum	42	2	Codominant trunks at 10'; narrow form; topped in upper crown and reduced; displaced sidewalk 3".	Yes	--	--	--	--	Minor	None
338	Manna gum	47	3	Codominant trunks at 10'; one sided W.; branch wounds in upper crown; topped in upper crown & reduced; pillowing over & displacing sidewalk 6".	Yes	--	Yes	--	--	Minor	None
339	Blue gum	49	2	One sided W.; topped and reduced; stem removed at 10' E.; sulfur fungus at base N.; growing in small space between driveways.	Yes	--	Yes	--	Yes	None	None
340	Sweetgum	11	2	Codominant trunks at 6'; topped at 15'; growing in raised planter.	Yes	--	--	--	--	None	None
351	Blue gum	79	3	Multiple attachments at 20'; bee hive & sulfur fungus below burl at 10' SW.; topped in upper crown & reduced; pillowing over sidewalk.	Yes	Yes	Yes	--	Yes	Minor	None
352	Manna gum	45	2	Crown bowed W.; topped in upper crown & reduced.	Yes	--	--	--	--	None	None
353	Blue gum	53	3	Multiple attachments at 10'; upright, narrow form; topped in upper crown & reduced.	Yes	--	--	--	--	None	None
354	Blue gum	49	2	High crown; one sided NW.; stem removed at 10' SE; topped in upper crown & reduced.	Yes	--	--	--	--	None	None
355	Blue gum	29	2	Codominant trunks at 20'; very one sided W.; moderate dieback; topped in upper crown & reduced.	Yes	--	--	--	--	None	None
363	Blue gum	32	1	Topped hard at 50'; one sided W.; cavity where stem failed E.; little remains.	Yes	--	--	--	--	None	None
364	Blue gum	73	3	Codominant trunks at 20' & 25'; topped in upper crown & reduced; displaced sidewalk & curb 4".	Yes	--	--	--	--	Minor	Minor
365	Blue gum	43	2	Codominant trunks at 10'; one sided S.; slack cable; topped in upper crown & reduced; displaced ret. wall 8" & sidewalk & curb 2".	Yes	--	--	--	--	Moderate	Minor
375	Manna gum	52	3	Leans W.; topped in upper crown & reduced; base of tree ~6' above sidewalk w/ roots exposed; displaced & pitched sidewalk 8".	Yes	--	--	--	--	Moderate	None
376	Manna gum	22	2	Topped at 35'; base of tree ~6' above sidewalk w/ roots exposed; sulfur fungus on exposed root.	Yes	--	--	--	Yes	None	None
387	Blue gum	76	3	Multiple attachments at 15'; upright form; topped in upper crown & reduced; pillowing over & displaced sidewalk 8" & curb 6".	Yes	Yes	Yes	--	--	Moderate	Moderate
388	Blue gum	38	3	Multiple attachments at 15'; upright, narrow form; topped in upper crown & reduced; displaced sidewalk 6" & curb 4".	Yes	--	--	--	--	Moderate	Minor
389	Blue gum	39	2	Stems removed at 12' N.; narrow form; moderate dieback; topped in upper crown & reduced; pitched sidewalk 4".	Yes	--	--	--	--	Minor	None
390	Blue gum	54	3	Codominant trunks at 15'; one sided NW.; girdling rope attached to power pole; topped in upper crown & reduced; pillowing over & pitching sidewalk 6".	Yes	Yes	Yes	--	--	Moderate	None
394	Blue gum	63	3	Codominant trunks at 20'; one sided SW.; dieback; topped in upper crown & reduced.	Yes	--	--	--	--	None	None
395	Blue gum	46	3	Codominant trunks at 15'; one sided W.; basal wound E.; dieback; topped in upper crown & reduced.	Yes	--	--	--	--	None	None

Tree Assessment

Ralston Historic Tree Row
Burlingame, California
February 2021

HORT SCIENCE
BARTLETT CONSULTING

TREE No.	SPECIES	SIZE DIAMETER (in inches)	CONDITION 1=POOR 5=EXCELLENT	COMMENTS	TOPPED	PILLOWED	OUTGROWN AVAILABLE SPACE	TRUNK IN ROAD	SULFUR FUNGUS	SIDEWALK DAMAGE	CURB DAMAGE
396	Manna gum	46	3	Multiple attachments at 15'-20'; sulfur fungus on basal wound E.; cabled to #397; topped in upper crown & reduced.	Yes	--	--	--	Yes	None	None
397	Blue gum	75	3	Multiple attachments at 20'; one sided W.; topped in upper crown & reduced.	Yes	--	--	--	--	None	None
398	Blue gum	39	2	Codominant trunks at 20'; one sided NW.; moderate dieback; topped in upper crown & reduced.	Yes	--	Yes	--	--	None	None
416	Blue gum	78	3	Multiple attachments at 20'; upright form; lots of kino & burls; topped in upper crown & reduced; pillowing over & displaced sidewalk 12" & curb 2".	Yes	Yes	Yes	--	--	Moderate	Minor
419	Blue gum	52	2	Upright form; large trunk wounds E.; topped in upper crown & reduced; pillowing over sidewalk.	Yes	Yes	Yes	--	--	None	None
420	English elm	40	1	Codominant trunks at 20'; dead top; bark sloughing NW. @ 25'; lots of epicormics; pillowing over sidewalk.	Yes	Yes	Yes	--	--	None	None
427	Blue gum	60	3	Codominant trunks at 25'; stems fused below attachment; topped in upper crown and reduced; pillowing over & pitched sidewalk 6".	Yes	Yes	Yes	--	--	Moderate	None
428	Blue gum	79	3	Codominant trunks at 25'; upright form; topped in upper crown and reduced; pillowing over & pitched sidewalk 12" & curb 4".	Yes	Yes	Yes	--	--	Severe	Minor
435	London plane	28	4	Multiple attachments at 8'; good form; pitched sidewalk 12" & curb 2".	--	--	Yes	--	--	Severe	Minor
437	Manna gum	98	4	Codominant trunks at 20'; cabled; topped in upper crown & reduced; displaced sidewalk 6" and curb 8".	Yes	--	Yes	--	--	Moderate	Moderate
441	Blue gum	51	2	Multiple attachments at 20'-25'; sulfur fungus at base SW.; topped in upper crown & reduced; displaced sidewalk 3".	Yes	--	Yes	--	Yes	Minor	None
442	Blue gum	66	2	Multiple attachments at 20'-25'; moderate dieback; sulfur fungus at base W.; topped in upper crown & reduced; pillowed over & displaced sidewalk 3".	Yes	Yes	Yes	--	Yes	Minor	None
467	Blue gum	66	3	Multiple attachments at 15'; moderate dieback; basal cavity & decay E.; topped in upper crown & reduced; pillowed over sidewalk & displaced driveway N. 8"; swallowed curb.	Yes	Yes	Yes	--	--	Moderate	Moderate
475	Manna gum	71	3	Multiple attachments in upper crown; burls & kino; topped in upper crown & reduced; displaced sidewalk 6" & curb 14".	Yes	--	Yes	--	--	Moderate	Severe
476	Manna gum	69	3	Codominant trunks at 20'; burls & kino; topped in upper crown & reduced; displaced sidewalk 6"; pillowed over & displaced curb 10".	Yes	Yes	Yes	--	--	Moderate	Severe
477	Manna gum	91	4	Upright form; reduced; displaced sidewalk 36"; displaced curb 10".	--	--	Yes	--	--	Severe	Severe
478	Red iron bark	26	2	Topped and reduced; poor form & structure; pillowing over & displacing sidewalk & curb 4".	Yes	Yes	Yes	--	--	Minor	Minor
479	Red iron bark	17	2	Topped and reduced; poor form and structure; displacing sidewalk & curb 3".	Yes	--	Yes	--	--	Minor	Minor
480	Red iron bark	27	3	Upright form; topped and reduced; pillowing over & displacing sidewalk 4".	Yes	Yes	Yes	--	--	Minor	None
481	Red iron bark	25	3	Codominant trunks at 6'; poor form and structure; topped and reduced; pillowing over & displacing sidewalk & curb 8".	Yes	Yes	Yes	--	--	Moderate	Moderate
484	Blue gum	43	2	Very one sided SW.; poor form and structure.	--	--	--	--	--	None	None
485	Blue gum	44	3	High crown; sight lean E.; history of branch failures.	--	--	--	--	--	None	None
487	English elm	36	2	Multiple attachments at 10'; dead top; topped & reduced; displaced asphalt sidewalk 1".	Yes	--	--	--	--	Minor	None
488	English elm	33	3	Codominant trunks at 7'; one sided S.; displaced asphalt sidewalk 2".	--	--	--	--	--	Minor	None
491	Blue gum	50	2	One sided W.; base cut in SW. corner; topped in upper crown & reduced; displaced asphalt sidewalk 10".	Yes	--	--	--	--	Moderate	None
492	Blue gum	32	2	One sided NW.; topped in upper crown & reduced; displaced asphalt sidewalk 4".	Yes	--	--	--	--	Minor	None
502	Red river gum	52	4	Codominant trunks at 18'; reduced W. for overhead utilities; displacing asphalt sidewalk 14".	--	--	Yes	--	--	None	None
821	Coast live oak	40	4	Multiple attachments at 15'; good form and structure; long laterals SW.	--	--	--	--	--	None	None
823	Blue gum	36,34	3	Codominant trunks at 2'; topped a couple of times; one sided W.	Yes	--	--	--	--	None	None
837	Blue gum	61	2	Multiple attachments at 10'; extensive dieback; basal wound w/ sulfur fungus N.; topped in upper crown & reduced; pillowed over & displaced curb 4"; trunk in roadway.	Yes	Yes	Yes	--	Yes	None	Minor

Tree Assessment

Ralston Historic Tree Row
Burlingame, California
February 2021

HORT SCIENCE
BARTLETT CONSULTING

TREE No.	SPECIES	SIZE DIAMETER (in inches)	CONDITION 1=POOR 5=EXCELLENT	COMMENTS	TOPPED	PILLOWED	OUTGROWN AVAILABLE SPACE	TRUNK IN ROAD	SULFUR FUNGUS	SIDEWALK DAMAGE	CURB DAMAGE
934	Nichols gum	19	3	Crowded; leans NW.; trunk wound N. @ 10'; sparse crown.	--	--	--	--	--	None	None
975	Manna gum	43	4	Multiple attachments at 7'; one sided W.; dead branches to 2"; sulfur fungus on roots SE. (not clear where they came from); displaced asphalt sidewalk 4".	--	--	--	--	Yes	Moderate	None
976	Italian stone pine	18,17,10,8	3	Multiple attachments at 1-4'; one sided W.; displaced asphalt sidewalk 2".	--	--	--	--	--	Minor	None
977	Red river gum	20	3	In median; multiple attachments at 10'; asymmetric form; history of branch failures; 6" laterals over roadway E. & W.; displaced median bricks 1".	--	--	--	--	--	None	None
978	Coast live oak	7,6,5	5	Multiple attachments at base; compact form; beneath overhead utilities; asphalt sidewalk W. displaced 8" but unlikely associated w/ tree.	--	--	--	--	--	Moderate	None
979	Blackwood acacia	41	1	Multiple attachments at 7'; stems splitting apart; topped for overhead utilities; displaced asphalt sidewalk 8".	Yes	--	--	--	--	Moderate	None
980	Red river gum	43	4	In median; codominant trunks at 8'; good form; topped at 30'; new curb E.	Yes	--	--	--	--	None	None
981	Red river gum	50	4	In median; multiple attachments at 8'; spreading form; topped at 25'; branch wound on underside E.; displaced sidewalk 1"; new curb E.	Yes	--	--	--	--	Minor	None
982	Eucalyptus sp.	11,10,10,10	2	In median; multiple attachments at base; very sparse crown.	--	--	--	--	--	None	None
983	Eucalyptus sp.	49	3	In median; codominant trunks at 5'; central leader removed at 10'; large basal cavity SE.; sulfur fungus around cavity.	--	--	--	--	Yes	None	None
984	Blue gum	28	2	In median; upright, narrow form; sulfur fungus at 4' SE.; topped in upper crown and reduced; pillowing over & displaced curb W. 2".	Yes	Yes	Yes	--	Yes	None	Minor
985	Blue gum	28	1	In median; topped hard at 30'; little remains.	Yes	--	--	--	--	None	None
986	Blue gum	15	1	In median; topped hard at 25'; little remains.	Yes	--	--	--	--	None	None
987	Compact blue gum	52	2	In median; multiple attachments at 4'; moderate dieback in upper crown.	--	--	--	--	--	None	None

Trees Identified to be Reviewed

0 37.5 75 150 225 300 Feet

N

Legend

- Existing Sidewalk or Curb
- Existing Utility Pole
- Existing Retaining Wall
- Existing Driveway
- Existing Tree
- Identified to be Reviewed

Caltrans D4 Office of Landscape Architecture
2/06/2021

Trees Identified to be Reviewed

0 37.5 75 150 225 300 Feet

N

Legend

- Existing Sidewalk or Curb
- Existing Utility Pole
- Existing Retaining Wall
- Existing Driveway
- Existing Tree
- Identified to be Reviewed

Caltrans D4 Office of Landscape Architecture
2/06/2021
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Trees Identified to be Reviewed

0 37.5 75 150 225 300 Feet

N

Legend

- Existing Sidewalk or Curb
- Existing Utility Pole
- Existing Retaining Wall
- Existing Driveway
- Existing Tree
- Identified to be Reviewed

Caltrans D4 Office of Landscape Architecture
2/06/2021

Trees Identified to be Reviewed

0 37.5 75 150 225 300 Feet

N

Legend

- Existing Sidewalk or Curb
- Existing Utility Pole
- Existing Retaining Wall
- Existing Driveway
- Existing Tree
- Identified to be Reviewed

Caltrans D4 Office of Landscape Architecture
2/06/2021

Trees Identified to be Reviewed

0 37.5 75 150 225 300 Feet

N

Legend

- Existing Sidewalk or Curb
- Existing Utility Pole
- Existing Retaining Wall
- Existing Driveway
- Existing Tree
- Identified to be Reviewed

Caltrans D4 Office of Landscape Architecture
2/06/2021

Trees Identified to be Reviewed

0 37.5 75 150 225 300 Feet

N

Legend

- Existing Sidewalk or Curb
- Existing Utility Pole
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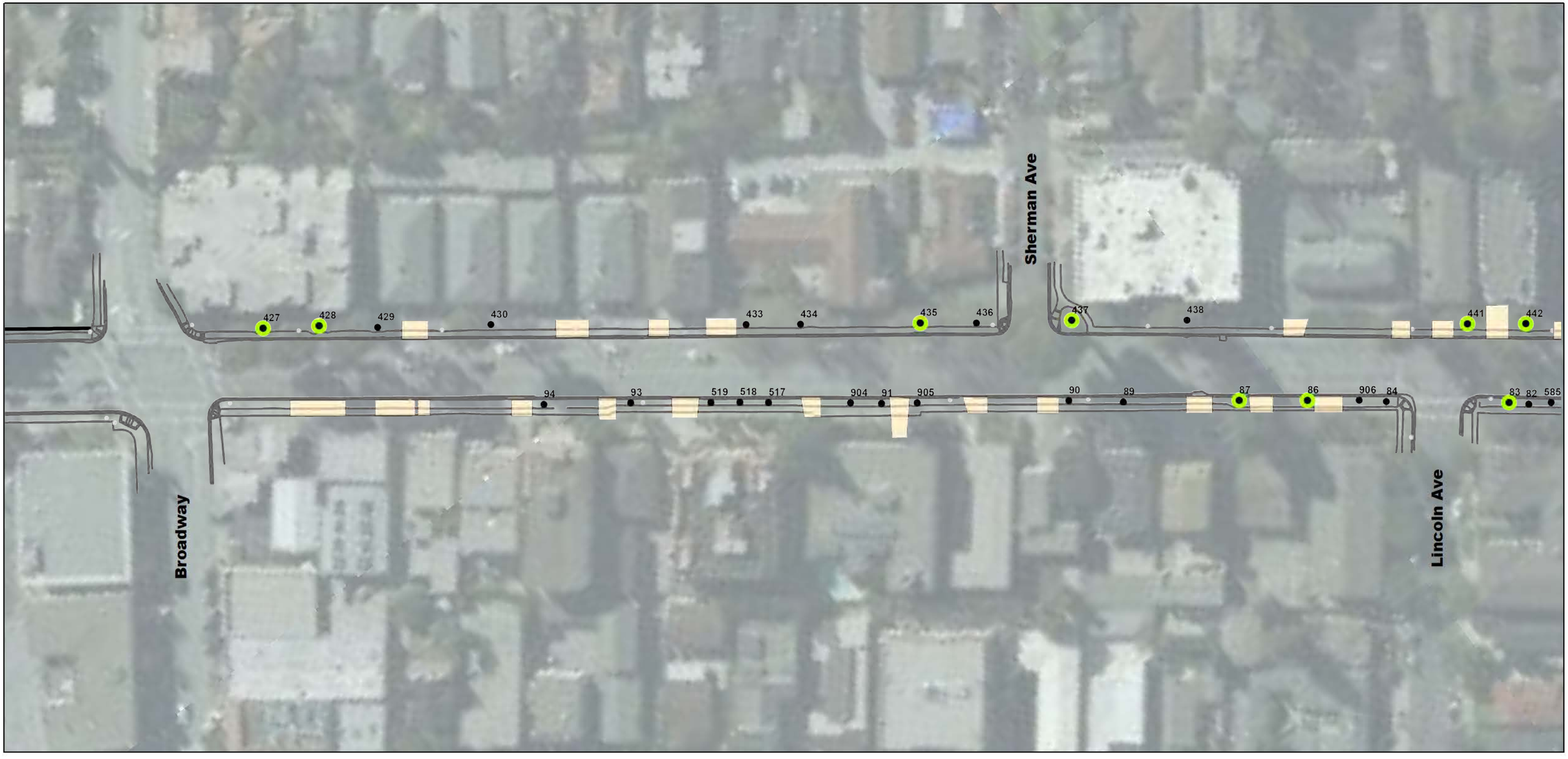
Caltrans D4 Office of Landscape Architecture
2/06/2021



Trees Identified to be Reviewed

0 37.5 75 150 225 300 Feet

Legend

- Existing Sidewalk or Curb
- Existing Utility Pole
- Existing Retaining Wall
- Existing Driveway
- Existing Tree
- Identified to be Reviewed

N

Caltrans D4 Office of Landscape Architecture
2/06/2021
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Trees Identified to be Reviewed

0 37.5 75 150 225 300 Feet

N

Legend

- Existing Sidewalk or Curb
- Existing Utility Pole
- Existing Retaining Wall
- Existing Driveway
- Existing Tree
- Identified to be Reviewed

Caltrans D4 Office of Landscape Architecture
2/06/2021

Trees Identified to be Reviewed

0 37.5 75 150 225 300 Feet

N

Legend

- Existing Sidewalk or Curb
- Existing Utility Pole
- Existing Retaining Wall
- Existing Driveway
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Caltrans D4 Office of Landscape Architecture
2/06/2021

Trees Identified to be Reviewed

0 37.5 75 150 225 300 Feet

N

Legend

- Existing Sidewalk or Curb
- Existing Utility Pole
- Existing Retaining Wall
- Existing Driveway
- Existing Tree
- Identified to be Reviewed

Caltrans D4 Office of Landscape Architecture
2/06/2021

Trees Identified to be Reviewed

Feet

N

Legend

- Existing Sidewalk or Curb
- Existing Utility Pole
- Existing Retaining Wall
- Existing Driveway
- Existing Tree
- Identified to be Reviewed

Trees Identified to be Reviewed

Legend

- Existing Sidewalk or Curb
- Existing Utility Pole
- Existing Retaining Wall
- Existing Driveway
- Existing Tree
- Identified to be Reviewed

Feet

N

Caltrans D4 Office of Landscape Architecture
added 2/16/2021
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Trees Identified to be Reviewed

Legend

- Existing Sidewalk or Curb
- Existing Utility Pole
- Existing Retaining Wall
- Existing Driveway
- Existing Tree
- Identified to be Reviewed

Feet

N

Caltrans D4 Office of Landscape Architecture
added 2/16/2021
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Appendix A - Preservation Opportunities and Constraints
Howard-Ralston Historic blue gums, Burlingame, CA

Tree #	Tree Condition			Opportunites for Preservation			Constraints to Preservation				Recommendations	Considerations
	Species	Trunk diameter (inches)	Condition rating 1=poor; 5=excellent	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary	Quaternary		
2	Blue gum	51	3	Room for new sidewalk E.	--	--	No curb	--	--	--	Consider for preservation	Design sidewalk to be as far from tree as possible; Expect root loss from road/curb work
4	Blue gum	69	3	Room for new sidewalk E.	--	--	Sulfur fungus	No curb	--	--	Remove	Sulfur fungus
7	Blue gum	102	4	Room for new sidewalk E.	Good health	--	No curb	--	--	--	Remove	Impacted by new curb close to trunk
9	Blue gum	41	3	Room for new sidewalk E.	--	--	No curb	--	--	--	Consider for preservation	Design sidewalk to be as far from tree as possible; Expect root loss from road/curb work
11	English elm	19	4	Room for new sidewalk E.	Good health	--	No curb	--	--	--	Consider for preservation	Design sidewalk to be as far from tree as possible; Expect root loss from road/curb work
12	Blue gum	77	3	Room for new sidewalk E.	--	--	No curb	--	--	--	Consider for preservation	Design sidewalk to be as far from tree as possible; Expect root loss from road/curb work
13	English elm	18	3	Room for new sidewalk E.	Semi-mature tree	--	No curb	--	--	--	Consider for preservation	Design sidewalk to be as far from tree as possible; Expect root loss from road/curb work
15	Blue gum	88	4	Room for new sidewalk E.	Good health	--	Sulfur fungus	No curb	--	--	Remove	Sulfur fungus
17	Blue gum	77	3	Room for new sidewalk E.	--	--	No curb	--	--	--	Consider for preservation	Design sidewalk to be as far from tree as possible; Expect root loss from road/curb work
19	Blue gum	83	3	Room for new sidewalk E.	--	--	No curb	--	--	--	Consider for preservation	Design sidewalk to be as far from tree as possible; Expect root loss from road/curb work
20	Blue gum	57	3	Room for new sidewalk E.	--	--	No curb	--	--	--	Consider for preservation	Design sidewalk to be as far from tree as possible; Expect root loss from road/curb work
934	Nichols gum	19	3	Room for new sidewalk E.	Semi-mature tree	--	No curb	--	--	--	Consider for preservation	Meander/ramp sidewalk to minimize root loss. Expect root loss from road/curb work
23	Blue gum	105	3	Room to meander sidewalk E.	--	--	Outgrown available space	Severe sidewalk damage	No curb	--	Remove	Impacts on both sides
25	Manna gum	35	3	Room for new sidewalk E.	Minor sidewalk damage	--	No curb	--	--	--	Consider for preservation	Design sidewalk to be as far from tree as possible; Expect root loss from road/curb work
28	Blue gum	64	3	Room to meander sidewalk E.	--	--	Outgrown available space	Severe sidewalk damage	No curb	--	Remove	Impacts on both sides
29	English elm	26	3	Room for new sidewalk E.	--	--	No curb	--	--	--	Consider for preservation	Design sidewalk to be as far from tree as possible; Expect root loss from road/curb work
31	Blue gum	72	3	Room for new sidewalk E.	--	--	Outgrown available space	No curb	--	--	Remove	Impacted by new curb close to trunk

Appendix A - Preservation Opportunities and Constraints
Howard-Ralston Historic blue gums, Burlingame, CA

Tree #	Tree Condition			Opportunites for Preservation			Constraints to Preservation				Recommendations	Considerations
	Species	Trunk diameter (inches)	Condition rating 1=poor; 5=excellent	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary	Quaternary		
33	Blue gum	84	3	Room for new sidewalk E.	--	--	Outgrown available space	No curb	--	--	Remove	Impacted by new curb close to trunk
37	Blue gum	61	4	Room for new sidewalk E.	Minor sidewalk damage	Good health	No curb	--	--	--	Consider for preservation	Design sidewalk to be as far from tree as possible; Expect root loss from road/curb work; **Moniitor during construction**
38	Blue gum	85	3	Room for new sidewalk E.	--	--	Outgrown available space	No curb	--	--	Remove	Impacted by new curb close to trunk
40	Eucalyptus sp.	22	4	Minor sidewalk damage	Good health	No curb damage	--	--	--	--	Consider for preservation	
42	London plane	28	5	Minor sidewalk damage	--	--	Outgrown available space	--	--	--	Consider for preservation	Consider retaining exist. sidewalk; Expect root loss from road/curb work; Expect future damage
48	Eucalyptus sp.	20	2	Minor sidewalk damage	No curb damage	--	Poor health & structure	--	--	--	Remove	Poor health
49	Blue gum	85	3	Sidewalk already meandered	--	--	Drain inlet at base of tree	Outgrown available space	Moderate curb damage	--	Remove	Impacted by curb and drain inlet replacement
50	Eucalyptus sp.	7,6	3	No sidewalk or curb damage	Young tree	--	--	--	--	--	Consider for preservation	
51	Red river gum	15	3	Minor curb damage	Semi-mature tree	--	--	--	--	--	Consider for preservation	
52	Red river gum	14	2	Minor sidewalk damage	No curb damage	Semi-mature tree	Poor health & structure	--	--	--	Remove	Poor health
68	Blue gum	65	3	Minor sidewalk & curb damage	--	--	Outgrown available space	--	--	--	Remove	Fiiled available space/pillowed
69	Blue gum	65	3	Minor curb damage	--	--	Outgrown available space	Moderate sidewalk damage	--	--	Remove	Impacts on both sides
70	English elm	22	3	No sidewalk or curb damage	--	--	--	--	--	--	Consider for preservation	Design driveway to provide additional space/minimize root loss
71	Blue gum	84	3	Minor curb damage	--	--	Outgrown available space	Severe sidewalk damage	--	--	Remove	Fiiled available space/pillowed
72	English elm	22	3	No sidewalk or curb damage	--	--	--	--	--	--	Consider for preservation	
74	Blue gum	49	3	Minor sidewalk & curb damage	--	--	Outgrown available space	--	--	--	Remove	Fiiled available space/pillowed
76	Blue gum	62	3	Minor curb damage	--	--	Outgrown available space	Severe sidewalk damage	--	--	Remove	Fiiled available space/pillowed
77	Eucalyptus sp.	24	3	Semi-mature tree	--	--	Moderate sidewalk damage	--	--	--	Consider for preservation	Expect root loss from sidewalk repair; Design driveway to provide additional space/minimize root loss
79	Eucalyptus sp.	13	2	Minor sidewalk damage	No curb damage	--	Poor health & structure	--	--	--	Remove	Poor health
83	English elm	36	4	Minor curb damage	Good health	--	Moderate sidewalk damage	--	--	--	Consider for preservation	Expect root loss from sidewalk repair; meander sidewalk away from tree if possible
86	Sweetgum	20	3	--	--	--	Severe curb damage	Moderate sidewalk damage	--	--	Remove	Impacts on both sides

Appendix A - Preservation Opportunities and Constraints
Howard-Ralston Historic blue gums, Burlingame, CA

Tree #	Tree Condition			Opportunites for Preservation			Constraints to Preservation				Recommendations	Considerations
	Species	Trunk diameter (inches)	Condition rating 1=poor; 5=excellent	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary	Quaternary		
87	Eucalyptus sp.	18	3	Minor sidewalk & curb damage	Semi-mature tree	--	Drain inlet at base of tree	--	--	--	Remove	Impacted by drain inlet replacement
99	Eucalyptus sp.	13	3	Minor sidewalk & curb damage	Semi-mature tree	--	--	--	--	--	Consider for preservation	
100	Blue gum	67	3	--	--	--	Outgrown available space	Moderate sidewalk damage	--	--	Remove	Fiiled available space/pillowed
101	Blue gum	60	3	No curb damage	--	--	Outgrown available space	Moderate sidewalk damage	--	--	Remove	Fiiled available space/pillowed
105	Blue gum	95	4	--	--	--	Outgrown available space	Severe curb damage	Moderate sidewalk damage	--	Remove	Impacts on both sides
107	Blue gum	76	3	--	--	--	Outgrown available space	Moderate sidewalk & curb damage	--	--	Remove	Fiiled available space/pillowed
108	Manna gum	76	3	Minor curb damage	--	--	Outgrown available space	Moderate sidewalk & curb damage	--	--	Remove	Fiiled available space/pillowed
113	Blue gum	71	3	Minor curb damage	--	--	Outgrown available space	Moderate sidewalk damage	--	--	Remove	Fiiled available space/pillowed
117	Blue gum	84	3	--	--	--	Outgrown available space	Severe curb damage	Moderate sidewalk damage	--	Remove	Impacts on both sides
122	Eucalyptus sp.	55	3	Minor curb damage	--	--	Outgrown available space	Severe sidewalk damage	--	--	Remove	Impacts on both sides
123	Red river gum	76	3	--	--	--	Outgrown available space	Severe sidewalk damage	Moderate curb damage	--	Remove	Impacts on both sides
125	Red river gum	59	3	--	--	--	Outgrown available space	Severe sidewalk damage	Moderate curb damage	--	Remove	Fiiled available space/pillowed
126	English elm	23	1	Minor sidewalk damage	No curb damage	--	Poor health & structure	--	--	--	Remove	Poor health
128	Red river gum	52	3	No curb damage	--	--	Outgrown available space	Severe sidewalk damage	--	--	Remove	Impacts on both sides
129	English elm	25	2	Minor sidewalk damage	No curb damage	--	Poor health & structure	--	--	--	Remove	Poor health
130	Eucalyptus sp.	57	3	Minor sidewalk damage	--	--	Non-standard sidewalk	Outgrown available space	--	--	Remove	Impacted by sidewalk widening
133	Blue gum	84	3	No curb damage	--	--	Outgrown available space	Severe sidewalk damage	--	--	Remove	Impacts on both sides
135	Blue gum	84	3	No curb damage	--	--	Outgrown available space	Moderate sidewalk damage	--	--	Remove	Impacts on both sides
136	Blue gum	53	3	Minor curb damage	--	--	Outgrown available space	Moderate sidewalk damage	--	--	Remove	Fiiled available space/pillowed
137	Red river gum	41	3	Minor sidewalk & curb damage	--	--	Outgrown available space	--	--	--	Remove	Fiiled available space/pillowed
138	Red river gum	42	3	Minor curb damage	--	--	Outgrown available space	Moderate sidewalk damage	--	--	Remove	Impacts on both sides
139	Red river gum	74	3	--	--	--	Trunk in roadway	Outgrown available space	Severe sidewalk & curb damage	--	Remove	Trunk in roadway

Appendix A - Preservation Opportunities and Constraints
Howard-Ralston Historic blue gums, Burlingame, CA

Tree #	Tree Condition			Opportunites for Preservation			Constraints to Preservation				Recommendations	Considerations
	Species	Trunk diameter (inches)	Condition rating 1=poor; 5=excellent	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary	Quaternary		
140	Red river gum	34	2	No curb damage	--	--	Moderate sidewalk damage	Poor health & structure	--	--	Remove	Impacts on both sides; Poor health
141	Red river gum	68	3	--	--	--	Outgrown available space	Severe sidewalk damage	Moderate curb damage	--	Remove	Impacts on both sides
144	Red river gum	56	3	Minor sidewalk & curb damage	--	--	Outgrown available space	--	--	--	Remove	Fiiled available space/pillowed
145	Red river gum	52	2	Minor sidewalk damage	Minor curb damage	--	Outgrown available space	--	Poor health & structure	--	Remove	Filled available space/pillowed; Poor health
146	Red river gum	59	3	Minor sidewalk & curb damage	--	--	Non-standard driveway	Outgrown available space	--	--	Remove	Impacted by driveway replacement
158	Eucalyptus sp.	18	2	New sidewalk	No curb damage	Semi-mature tree	Poor health & structure	--	--	--	Remove	Do not expect structure to improve without intensive management
159	Eucalyptus sp.	18	2	New sidewalk	Minor curb damage	Semi-mature tree	Poor health & structure	--	--	--	Remove	Do not expect structure to improve without intensive management
170	Red river gum	47	3	New sidewalk	Minor curb damage	--	Outgrown available space	--	--	--	Remove	Fiiled available space/pillowed
173	Red river gum	43	3	New sidewalk	Minor curb damage	--	Outgrown available space	--	--	--	Remove	Fiiled available space/pillowed
174	Red river gum	43	3	Minor sidewalk damage	Minor curb damage	--	Outgrown available space	--	--	--	Remove	Fiiled available space/pillowed
180	Silver dollar gum	28	3	Minor sidewalk damage	--	--	--	--	--	--	Consider for preservation	
182	Blue gum	36	3	Minor sidewalk damage	--	--	--	--	--	--	Consider for preservation	
184	Silver dollar gum	35	4	Good health	--	--	Severe sidewalk damage	Moderate curb damage	--	--	Consider for preservation	Meander/ramp sidewalk to minimize root loss
193	Red river gum	55	3	--	--	--	Trunk in roadway	Outgrown available space	Moderate sidewalk damage	--	Remove	Trunk in roadway
195	Manna gum	61	3	Room to ramp sidwalk	--	--	Trunk in roadway	Outgrown available space	Moderate sidewalk damage	--	Remove	Trunk in roadway
199	Manna gum	57	3	Minor sidewalk & curb damage	--	--	Outgrown available space	--	--	--	Remove	Fiiled available space/pillowed
200	Manna gum	46	3	No sidewalk or curb damage	--	--	Sulfur fungus	--	--	--	Remove	Sulfur fungus
201	Manna gum	36	2	No sidewalk or curb damage	--	--	Poor health & structure	--	--	--	Remove	Poor health
202	Manna gum	46	3	No sidewalk or curb damage	--	--	--	--	--	--	Consider for preservation	
203	Manna gum	36	2	No sidewalk or curb damage	--	--	Sulfur fungus	--	--	--	Remove	Sulfur fungus; Poor health
207	Manna gum	36	3	Minor curb damage	--	--	Severe sidewalk damage	--	--	--	Remove	Impacts on both sides
208	Manna gum	46	3	Minor sidewalk & curb damage	--	--	--	--	--	--	Consider for preservation	

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Howard-Ralston Historic blue gums, Burlingame, CA

Tree #	Tree Condition			Opportunites for Preservation			Constraints to Preservation				Recommendations	Considerations
	Species	Trunk diameter (inches)	Condition rating 1=poor; 5=excellent	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary	Quaternary		
209	Blue gum	42	3	--	--	--	Outgrown available space	Moderate sidewalk & curb damage	--	--	Remove	Fiiled available space/pillowed
210	Blue gum	36	3	Minor curb damage	--	--	Outgrown available space	Severe sidewalk damage	--	--	Remove	Impacts on both sides
211	Blue gum	34	3	Minor curb damage	--	--	Outgrown available space	Moderate sidewalk damage	--	--	Remove	Impacts on both sides
212	Blue gum	70	3	--	--	--	Outgrown available space	Severe sidewalk & ret. wall damage	Moderate curb damage	--	Remove	Impacts on both sides
213	Blue gum	37	3	--	--	--	Outgrown available space	Moderate sidewalk & curb damage	--	--	Remove	Fiiled available space/pillowed
215	Manna gum	45	3	--	--	--	Trunk in roadway	Outgrown available space	Severe sidewalk damage	--	Remove	Trunk in roadway
218	Manna gum	30	3	--	--	--	Outgrown available space	Severe sidewalk damage	Moderate curb damage	--	Remove	Impacts on both sides
220	Manna gum	30	3	Minor sidewalk damage	--	--	Sulfur fungus	Outgrown available space	Severe curb damage	--	Remove	Sulfur fungus
224	Manna gum	28	3	No sidewalk damage	Minor curb damage	--	Outgrown available space	--	--	--	Consider for preservation	Expect root loss from road/curb work; Expect future damage
225	Manna gum	44	3	--	--	--	Outgrown available space	Severe curb damage	Moderate sidewalk damage	--	Remove	Impacts on both sides
226	Manna gum	57	3	Minor sidewalk damage	--	--	Trunk in roadway	Outgrown available space	Severe curb damage	--	Remove	Trunk in roadway
227	Blue gum	57	3	New sidewalk & curb	--	--	Outgrown available space	--	--	--	Consider for preservation	New sidewalk, curb/gutter
232	Blue gum	44	4	New sidewalk & curb	Good health	--	Non-standard driveway	Outgrown available space	--	--	Consider for preservation	Expect root loss from road/curb/driveway work; Expect future damage
234	Blue gum	36	3	New sidewalk	--	--	Outgrown available space	--	--	--	Consider for preservation	Consider retaining exist. curb; Expect root loss from road/curb work; Expect future damage
237	Blue gum	61	3	--	--	--	Trunk in roadway	Outgrown available space	Severe curb damage	--	Remove	Trunk in roadway
240	Red river gum	23	5	Minor sidewalk damage	--	--	--	--	--	--	Consider for preservation	
241	Blue gum	78	3	Minor sidewalk damage	--	--	Trunk in roadway	Outgrown available space	Severe curb damage	--	Remove	Trunk in roadway
243	Blue gum	44	2	Minor sidewalk damage	Minor curb damage	--	Poor health & structure	Outgrown available space	--	--	Remove	Poor health
245	Blue gum	75	3	--	--	--	Trunk in roadway	Outgrown available space	Severe sidewalk & curb damage	--	Remove	Trunk in roadway
246	Blue gum	67	3	Minor curb damage	--	--	Outgrown available space	Severe sidewalk damage	--	--	Remove	Impacts on both sides
250	Blue gum	75	2	--	--	--	Outgrown available space	Severe sidewalk & curb damage	--	--	Remove	Impacts on both sides; Poor health

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255	Blue gum	50	3	Minor sidewalk damage	Minor curb damage	--	Outgrown available space	--	--	--	Remove	Fiiled available space/pillowed
257	Blue gum	58	2	--	--	--	Outgrown available space	Severe curb damage	Moderate sidewalk damage	--	Remove	Impacts on both sides
260	Blue gum	50	3	--	--	--	Outgrown available space	Severe sidewalk damage	--	--	Remove	Impacts on both sides
262	Blue gum	49	3	--	--	--	Outgrown available space	Severe sidewalk damage	Moderate curb damage	--	Remove	Impacts on both sides
263	Blue gum	54	2	Minor sidewalk damage	--	--	Outgrown available space	Moderate curb damage	Sulfur fungus	Poor health & structure	Remove	Filled available space/pillowed; Sulfur fungus
264	Blue gum	51	3	Minor sidewalk damage	--	--	Trunk in roadway	Outgrown available space	Severe curb damage	--	Remove	Trunk in roadway
268	Blue gum	64	3	Minor sidewalk damage	--	--	Outgrown available space	Severe curb damage	--	--	Remove	Fiiled available space/pillowed
271	Blue gum	73	3	--	--	--	Trunk in roadway	Sulfur fungus	Outgrown available space	--	Remove	Trunk in roadway, sulfur fungus
274	Blue gum	64	2	Minor curb damage	--	--	Sulfur fungus	Outgrown available space	Moderate sidewalk damage	Poor health & structure	Remove	Sulfur fungus; Poor health
275	Blue gum	52	3	Minor sidewalk & curb damage	--	--	--	--	--	--	Consider for preservation	Expect root loss from road/curb work
276	Blue gum	64	3	Minor sidewalk damage	--	--	Outgrown available space	Moderate curb damage	--	--	Remove	Impacts on both sides
277	Blue gum	57	2	Minor sidewalk & curb damage	--	--	Sulfur fungus	--	--	--	Remove	Sulfur fungus; Poor health
278	Blue gum	35	2	No sidewalk or curb damage	--	--	Poor health & structure	--	--	--	Remove	Poor health
279	Manna gum	44	3	Minor sidewalk & curb damage	--	--	Sulfur fungus	--	--	--	Remove	Sulfur fungus
280	Manna gum	77	3	--	--	--	Outgrown available space	Severe sidewalk damage	Moderate curb damage	--	Consider for preservation	Expect root loss from sidewalk/road/curb work; Expect future damage. Meander/ramp sidewalk to minimize root loss
281	Blue gum	66	3	Minor curb damage	--	--	Outgrown available space	Moderate sidewalk damage	Sulfur fungus	--	Remove	Impacts on both sides; Sulfur fungus
282	Blue gum	55	2	Minor sidewalk damage	Minor curb damage	--	Poor health & structure	Outgrown available space	--	--	Remove	Poor health
284	Blue gum	55	3	Minor sidewalk damage	Minor curb damage	--	Outgrown available space	--	--	--	Consider for preservation	Expect root loss from road/curb work; Expect future damage
285	Blue gum	54	4	Good health	--	--	--	--	--	--	Consider for preservation	
821	Coast live oak	40	4	Good health	--	--	Drainage culvert at base	--	--	--	Remove	Impacted by drain line replacement
823	Blue gum	36,34	3	No sidewalk or curb damage	--	--	Drainage culvert at base	--	--	--	Remove	Impacted by drain line replacement
291	Blue gum	68	3	Minor sidewalk & curb damage	--	--	Sulfur fungus	Outgrown available space	--	--	Remove	Sulfur fungus

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Howard-Ralston Historic blue gums, Burlingame, CA

Tree #	Tree Condition			Opportunites for Preservation			Constraints to Preservation				Recommendations	Considerations
	Species	Trunk diameter (inches)	Condition rating 1=poor; 5=excellent	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary	Quaternary		
292	Manna gum	75	3	Minor sidewalk damage	Minor curb damage	--	Outgrown available space	--	--	--	Consider for preservation	Meander/ramp sidewalk to minimize root loss.
293	Blue gum	65	3	Room to ramp sidewalk	Minor curb damage	--	Outgrown available space	Severe sidewalk damage	--	--	Consider for preservation	Meander/ramp sidewalk to minimize root loss.
295	Blue gum	61	3	Room to ramp sidwalk	Minor curb damage	--	Outgrown available space	Moderate sidewalk & curb damage	--	--	Consider for preservation	Meander/ramp sidewalk to minimize root loss.
300	Blue gum	48	2	Minor sidewalk damage	Minor curb damage	--	Poor health & structure	Outgrown available space	--	--	Remove	Poor health
301	Blue gum	53	3	Minor sidewalk & curb damage	--	--	Sulfur fungus	Outgrown available space	--	--	Remove	Sulfur fungus
302	Blue gum	55	3	Minor sidewalk & curb damage	--	--	Sulfur fungus	Outgrown available space	--	--	Remove	Sulfur fungus
303	Manna gum	87	3	Room for new sidewalk W.?	--	--	No sidewalk	No curb	--	--	Consider for preservation	Explore installing sidewalk W.; Expect root loss from road/curb work
304	Blue gum	50	3	Room for new sidewalk W.?	--	--	No sidewalk	No curb	--	--	Consider for preservation	Explore installing sidewalk W.; Expect root loss from road/curb work
305	Blue gum	53	3	Room for new sidewalk W.?	--	--	No sidewalk	No curb	--	--	Consider for preservation	Explore installing sidewalk W.; Expect root loss from road/curb work
306	Blue gum	48	3	Room for new sidewalk W.?	--	--	No sidewalk	No curb	--	--	Consider for preservation	Explore installing sidewalk W.; Expect root loss from road/curb work
307	Blue gum	63	3	Room for new sidewalk W.?	--	--	No sidewalk	No curb	--	--	Consider for preservation	Explore installing sidewalk W.; Expect root loss from road/curb work
308	Blue gum	71	3	Room for new sidewalk W.?	--	--	No sidewalk	No curb	--	--	Consider for preservation	Explore installing sidewalk W.; Expect root loss from road/curb work
309	Manna gum	58	3	Room for new sidewalk W.?	--	--	No sidewalk	No curb	--	--	Consider for preservation	Explore installing sidewalk W.; Expect root loss from road/curb work
310	Manna gum	62	4	Room for new sidewalk W.?	--	--	No sidewalk	No curb	--	--	Consider for preservation	Explore installing sidewalk W.; Expect root loss from road/curb work
311	Blue gum	49	2	No sidewalk or curb damage	--	--	Poor health & structure	--	--	--	Remove	Poor health
312	Blue gum	39	3	Room for new sidewalk W.?	--	--	No sidewalk	No curb	--	--	Consider for preservation	Explore installing sidewalk W.; Expect root loss from road/curb work
313	Blue gum	58	3	Room for new sidewalk W.?	--	--	No sidewalk	No curb	--	--	Consider for preservation	Explore installing sidewalk W.; Expect root loss from road/curb work
314	Blue gum	62	3	Room for new sidewalk W.?	--	--	No sidewalk	No curb	--	--	Consider for preservation	Explore installing sidewalk W.; Expect root loss from road/curb work
315	Blue gum	70	3	No sidewalk or curb damage	--	--	Sulfur fungus	No curb	--	--	Remove	Sulfur fungus
316	Blue gum	71	4	Room for new sidewalk W.?	--	--	No sidewalk	No curb	--	--	Consider for preservation	Explore installing sidewalk W.; Expect root loss from road/curb work
317	Blue gum	64	3	Room for new sidewalk W.?	--	--	No sidewalk	No curb	--	--	Consider for preservation	Explore installing sidewalk W.; Expect root loss from road/curb work
318	Blue gum	66	4	Room for new sidewalk W.?	--	--	No sidewalk	No curb	--	--	Consider for preservation	Explore installing sidewalk W.; Expect root loss from road/curb work

Appendix A - Preservation Opportunities and Constraints
Howard-Ralston Historic blue gums, Burlingame, CA

Tree #	Tree Condition			Opportunites for Preservation			Constraints to Preservation				Recommendations	Considerations
	Species	Trunk diameter (inches)	Condition rating 1=poor; 5=excellent	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary	Quaternary		
319	Blue gum	40	2	No sidewalk or curb damage	--	--	Poor health & structure	--	--	--	Remove	Poor health
320	Manna gum	76	4	Room for new sidewalk W.?	--	--	No sidewalk	No curb	--	--	Consider for preservation	Explore installing sidewalk W.; Expect root loss from road/curb work
321	Blue gum	55	3	Room for new sidewalk W.?	--	--	No sidewalk	No curb	--	--	Consider for preservation	Explore installing sidewalk W.; Expect root loss from road/curb work
322	Blue gum	45	2	No sidewalk or curb damage	--	--	Poor health & structure	Outgrown available space	--	--	Remove	Poor health
323	Blue gum	52	3	No sidewalk or curb damage	--	--	Sulfur fungus	Outgrown available space	--	--	Remove	Sulfur fungus
324	Blue gum	77	3	Minor sidewalk damage	No curb damage	--	Outgrown available space	--	--	--	Consider for preservation	Expect root loss from road/curb work; Expect future damage
325	Blue gum	42	1	Minor sidewalk damage	No curb damage	--	Poor health & structure	Outgrown available space	--	--	Remove	Poor health
326	Blue gum	98	4	Minor curb damage	--	--	Outgrown available space	Severe sidewalk damage	--	--	Remove	Impacts on both sides
327	Blue gum	41	1	Minor sidewalk damage	No curb damage	--	Poor health & structure	Outgrown available space	--	--	Remove	Poor health
328	Blue gum	31	1	No sidewalk or curb damage	--	--	Poor health & structure	--	--	--	Remove	Poor health
329	Manna gum	67	2	No sidewalk or curb damage	--	--	Sulfur fungus	Poor health & structure	Outgrown available space	--	Remove	Sulfur fungus; Poor health
330	Blue gum	39	2	No sidewalk or curb damage	--	--	Poor health & structure	Outgrown available space	--	--	Remove	Poor health
331	Blue gum	43	2	No sidewalk or curb damage	--	--	Poor health & structure	--	--	--	Remove	Poor health
332	Blue gum	58	3	No sidewalk or curb damage	--	--	--	--	--	--	Consider for preservation	
333	Blue gum	42	2	No sidewalk or curb damage	--	--	Poor health & structure	Outgrown available space	--	--	Remove	Poor health
334	Blue gum	51	3	--	--	--	Outgrown available space	Moderate sidewalk & curb damage	Sulfur fungus	--	Remove	Impacts on both sides; Sulfur fungus
335	Blue gum	53	3	No curb damage	--	--	Non-standard driveway	Moderate sidewalk damage	--	--	Remove	Impacted by driveway replacement
336	Blue gum	31	1	Minor sidewalk damage	No curb damage	--	Poor health & structure	Outgrown available space	--	--	Remove	Poor health
337	Blue gum	42	2	Minor sidewalk damage	No curb damage	--	Poor health & structure	Outgrown available space	--	--	Remove	Poor health
338	Manna gum	47	3	Minor sidewalk damage	No curb damage	--	Outgrown available space	--	--	--	Consider for preservation	Expect root loss from road/curb work; Expect future damage
339	Blue gum	49	2	No sidewalk or curb damage	--	--	Sulfur fungus	Poor health & structure	Outgrown available space	--	Remove	Sulfur fungus; Poor health
340	Sweetgum	11	2	No sidewalk or curb damage	Young tree	--	Poor health & structure	--	--	--	Remove	Poor health

Appendix A - Preservation Opportunities and Constraints
Howard-Ralston Historic blue gums, Burlingame, CA

Tree #	Tree Condition			Opportunites for Preservation			Constraints to Preservation				Recommendations	Considerations
	Species	Trunk diameter (inches)	Condition rating 1=poor; 5=excellent	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary	Quaternary		
351	Blue gum	79	3	Minor sidewalk damage	--	--	Sulfur fungus	Outgrown available space	--	--	Remove	Sulfur fungus
352	Manna gum	45	2	No sidewalk or curb damage	--	--	Poor health & structure	--	--	--	Remove	Poor health
353	Blue gum	53	3	No sidewalk or curb damage	--	--	--	--	--	--	Consider for preservation	
354	Blue gum	49	2	No sidewalk or curb damage	--	--	Poor health & structure	--	--	--	Remove	Poor health
355	Blue gum	29	2	No sidewalk or curb damage	--	--	Poor health & structure	--	--	--	Remove	Poor health
363	Blue gum	32	1	No sidewalk or curb damage	--	--	Poor health & structure	--	--	--	Remove	Poor health
364	Blue gum	73	3	Minor sidewalk damage	--	--	--	--	--	--	Consider for preservation	
365	Blue gum	43	2	Minor curb damage	--	--	Poor health & structure	Moderate ret. wall damage	--	--	Remove	Poor health
375	Manna gum	52	3	No curb damage	--	--	Moderate sidewalk damage	--	--	--	Consider for preservation	Expect root loss from sidewalk repair
376	Manna gum	22	2	No sidewalk or curb damage	--	--	Sulfur fungus	Poor health & structure	--	--	Remove	Sulfur fungus; Poor health
387	Blue gum	76	3	Minor sidewalk damage	--	--	Outgrown available space	Moderate sidewalk & curb damage	--	--	Consider for preservation	Meander/ramp sidewalk to minimize root loss. Expect root loss from road/curb work
388	Blue gum	38	3	No curb damage	--	--	Moderate sidewalk damage	--	--	--	Consider for preservation	Expect root loss from sidewalk repair
389	Blue gum	39	2	Minor sidewalk damage	No curb damage	--	Poor health & structure	--	--	--	Remove	Poor health
390	Blue gum	54	3	No curb damage	--	--	Outgrown available space	Moderate sidewalk damage	--	--	Remove	Fiiled available space/pillowed; Impacts on both sides
394	Blue gum	63	3	No sidewalk or curb damage	--	--	--	--	--	--	Consider for preservation	
395	Blue gum	46	3	No sidewalk or curb damage	--	--	--	--	--	--	Consider for preservation	
396	Manna gum	46	3	No sidewalk or curb damage	--	--	Sulfur fungus	--	--	--	Remove	Sulfur fungus
397	Blue gum	75	3	No sidewalk or curb damage	--	--	--	--	--	--	Consider for preservation	
398	Blue gum	39	2	No sidewalk or curb damage	--	--	Poor health & structure	Outgrown available space	--	--	Remove	Poor health
416	Blue gum	78	3	Minor curb damage	--	--	Outgrown available space	Moderate sidewalk damage	--	--	Remove	Fiiled available space/pillowed; Impacts on both sides
419	Blue gum	52	2	No sidewalk or curb damage	--	--	Poor health & structure	Outgrown available space	--	--	Remove	Filled available space/pillowed; Poor health
420	English elm	40	1	No sidewalk or curb damage	--	--	Poor health & structure	Outgrown available space	--	--	Remove	Poor health

Appendix A - Preservation Opportunities and Constraints
Howard-Ralston Historic blue gums, Burlingame, CA

Tree #	Tree Condition			Opportunites for Preservation			Constraints to Preservation				Recommendations	Considerations
	Species	Trunk diameter (inches)	Condition rating 1=poor; 5=excellent	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary	Quaternary		
427	Blue gum	60	3	No curb damage	--	--	Outgrown available space	Moderate sidewalk & curb damage	--	--	Remove	Fiiled available space/pillowed; Impacts on both sides
428	Blue gum	79	3	Minor curb damage	--	--	Outgrown available space	Severe sidewalk damage	--	--	Remove	Impacts on both sides
435	London plane	28	4	Species tolerant of root loss	Good health	--	Outgrown available space	Severe sidewalk damage	--	--	Consider for preservation	Meander/ramp sidewalk to minimize root loss. Expect root loss from road/curb work
437	Manna gum	98	4	--	--	--	Outgrown available space	Moderate sidewalk damage	--	--	Remove	Impacts on both sides
441	Blue gum	51	2	Minor sidewalk damage	No curb damage	--	Sulfur fungus	Poor health & structure	Outgrown available space	--	Remove	Sulfur fungus; Poor health
442	Blue gum	66	2	Minor sidewalk damage	No curb damage	--	Sulfur fungus	Poor health & structure	Outgrown available space	--	Remove	Sulfur fungus; Poor health
837	Blue gum	61	2	Minor sidewalk damage	--	--	Trunk in roadway	Outgrown available space	Sulfur fungus	Poor health	Remove	Trunk in roadway
467	Blue gum	66	3	--	--	--	Outgrown available space	Moderate sidewalk & curb damage	--	--	Remove	Fiiled available space/pillowed; Impacts on both sides
475	Manna gum	71	3	--	--	--	Outgrown available space	Severe curb damage	Moderate sidewalk damage	--	Remove	Impacts on both sides
476	Manna gum	69	3	--	--	--	Outgrown available space	Severe curb damage	Moderate sidewalk damage	--	Remove	Impacts on both sides
477	Manna gum	91	4	--	--	--	Outgrown available space	Severe sidewalk & curb damage	--	--	Remove	Impacts on both sides
478	Red iron bark	26	2	Minor sidewalk damage	Minor curb damage	--	Poor health & structure	Outgrown available space	--	--	Remove	Poor health
479	Red iron bark	17	2	Minor sidewalk & curb damage	Semi-mature tree	--	Poor health & structure	Outgrown available space	--	--	Remove	Poor health
480	Red iron bark	27	3	Minor sidewalk damage	No curb damage	--	Outgrown available space	--	--	--	Remove	Fiiled available space/pillowed
481	Red iron bark	25	3	--	--	--	Outgrown available space	Moderate sidewalk & curb damage	--	--	Remove	Fiiled available space/pillowed; Impacts on both sides
484	Blue gum	43	2	No sidewalk or curb damage	--	--	Poor health & structure	--	--	--	Remove	Poor health
485	Blue gum	44	3	--	--	--	No sidewalk	No curb	--	--	Consider for preservation	Explore installing sidewalk E.; Expect root loss from road/curb work
487	English elm	36	2	Minor sidewalk damage	No curb damage	--	Poor health & structure	--	--	--	Remove	Poor health
488	English elm	33	3	Room to meander W.	--	--	No curb	--	--	--	Consider for preservation	Design sidewalk to be as far from tree as possible; Expect root loss from road/curb work
491	Blue gum	50	2	--	--	--	Poor health & structure	Moderate sidewalk damage	No curb	--	Remove	Impacts on both sides; Poor health
492	Blue gum	32	2	Minor sidewalk damage	No curb damage	--	Poor health & structure	--	--	--	Remove	Poor health

Appendix A - Preservation Opportunities and Constraints
Howard-Ralston Historic blue gums, Burlingame, CA

Tree #	Tree Condition			Opportunites for Preservation			Constraints to Preservation				Recommendations	Considerations
	Species	Trunk diameter (inches)	Condition rating 1=poor; 5=excellent	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary	Quaternary		
502	Red river gum	52	4	Room to meander W.	Good health	--	Outgrown available space	No sidewalk	No curb	--	Consider for preservation	Design sidewalk to be as far from tree as possible; Expect root loss from road/curb work; Expect future damage
975	Manna gum	43	4	Minor sidewalk damage	Good health	--	Sulfur fungus	No curb	--	--	Remove	Sulfur fungus
977	Red river gum	20	3	Minor median damage	--	--	--	--	--	--	Consider for preservation	
976	Italian stone pine	18,17,10,8	3	Minor sidwalk damage	--	--	--	--	--	--	Consider for preservation	
979	Blackwood acacia	41	1	No curb damage	--	--	Poor health & structure	Moderate sidewalk damage	--	--	Remove	Poor health; Impacts on both sides
978	Coast live oak	7,6,5	5	Room to meander E.	--	--	--	--	--	--	Consider for preservation	
980	Red river gum	43	4	New curb E.	Good health	--	--	--	--	--	Consider for preservation	
981	Red river gum	50	4	Minor sidewalk damage	New curb E.	Good health	--	--	--	--	Consider for preservation	
982	Eucalyptus sp.	11,10,10,10	2	--	--	--	Poor health & structure	No sidewalk	--	--	Remove	Poor health
983	Eucalyptus sp.	49	3	No sidewalk or curb damage	--	--	Sulfur fungus	Poor health & structure	No sidewalk	--	Remove	Sulfur fungus
984	Blue gum	28	2	No sidewalk or curb damage	--	--	Outgrown available space	No sidewalk	Sulfur fungus	--	Remove	Sulfur fungus; Poor health
985	Blue gum	28	1	No sidewalk or curb damage	--	--	Poor health & structure	--	--	--	Remove	Poor health
986	Blue gum	15	1	No sidewalk or curb damage	--	--	Poor health & structure	--	--	--	Remove	Poor health
987	Compact blue gum	52	2	No sidewalk or curb damage	--	--	Poor health & structure	--	--	--	Remove	Poor health

Preliminary Tree Preservation Guidelines

The goal of tree preservation is not merely tree survival during development but maintenance of tree health and beauty for many years. Trees retained on sites that are either subject to extensive injury during construction or are inadequately protected become a liability rather than an asset. The response of individual trees will depend on the amount of excavation and grading, the care with which demolition is undertaken, and the construction methods.

The following recommendations will help reduce impacts to trees from development and maintain and improve their health and vitality through the clearing, grading and construction phases.

Design recommendations

1. All plans affecting trees shall be reviewed by the Consulting Arborist with regard to tree impacts. These include, but are not limited to, demolition plans, grading and utility plans, landscape and irrigation plans.

2. Preservation of trees #83, 184, 280, 292, 293, 295, 387, 435 and 934 will require modifications to the sidewalk and monitoring of demolition and construction activities. These modifications will include meandering or narrowing the sidewalk and/or ramping the sidewalk adjacent to the tree to minimize root loss and/or avoid the base of the tree.

3. Consider curb design modifications adjacent to trees #7, 31 and 33 that could allow for preservation of these trees.

4. A **TREE PROTECTION ZONE** shall be established around each tree to be preserved. For design purposes, the **TREE PROTECTION ZONE** shall be the dripline. No grading, excavation, construction or storage of materials shall occur within that zone without consultation and monitoring by the Consulting Arborist.

5. Work will occur within the **TREE PROTECTION ZONE** but must be reviewed, approved and likely monitored by the Consulting Arborist. The primary goal of the **TREE PROTECTION ZONE** is to protect the above and below ground portions of trees identified for preservation by limiting activities that can damage tree parts.

6. Underground services including utilities, sub-drains, water or sewer shall be routed around the **TREE PROTECTION ZONE**. Where encroachment cannot be avoided, special construction techniques such as hand digging or tunneling under roots shall be employed where necessary to minimize root injury.

7. **Tree Preservation Notes**, prepared by the Consulting Arborist, should be included on all relevant plans.

8. Any herbicides placed under paving materials must be safe for use around trees and labeled for that use.

9. Irrigation systems must be designed so that no trenching will occur within the **TREE PROTECTION ZONE**.

Pre-construction/demolition treatments and recommendations

1. The demolition contractor and construction superintendent shall meet with the Consulting Arborist before beginning work to discuss work procedures and tree protection.

2. Where possible, cap and abandon all existing underground utilities within the **TPZ** in place. Removal of utility boxes by hand is acceptable but no trenching should be performed within the **TPZ** in an effort to remove utilities, irrigation lines, etc.

3. Tree(s) to be removed that have branches extending into the canopy of tree(s) to remain must be removed by a qualified arborist and not by demolition or construction contractors. The qualified arborist shall remove the tree in a manner that causes no damage to the tree(s) and understory to remain. Stumps shall be ground below grade.

4. Removal of trees shall be performed in such a way as to avoid pulling and breaking of roots of trees to be preserved. If roots are entwined, the consultant may require first severing the major woody root mass before extracting the trees, or grinding the stump below ground.

5. If structures and underground features have to be removed within the **TREE PROTECTION ZONE** it shall be done by hand or using the smallest equipment, and operate from outside the **TREE PROTECTION ZONE**. The Consulting Arborist shall be on-site during all operations within the **TREE PROTECTION ZONE** to monitor demolition activity.

6. Fence all trees to be retained to completely enclose the **TREE PROTECTION ZONE** prior to demolition, grubbing or grading. Fences shall be 6 ft. chain link or equivalent as approved by Consulting Arborist. Fences are to remain until all grading, construction and landscaping is completed. Place weather proof signs, 2' x 2', on the fencing that read "**TREE PROTECTION ZONE** Keep Out" (eg. one sign for each of the four compass points).

7. If fencing is not practical, protect tree trunks from incidental damage during demolition and construction by wrapping the trunks to a height of 8' with straw wattle and orange snow fencing to provide a visual cue and protection from incidental contact.

8. Prune trees to be preserved to clean the crown and to provide clearance. All pruning shall be done by a State of California Licensed Tree Contractor (C61/D49). All pruning shall be done by Certified Arborist or Certified Tree Worker in accordance with the Best Management Practices for Pruning (International Society of Arboriculture, 2002) and adhere to the most recent editions of the American National Standard for Tree Care Operations (Z133.1) and Pruning (A300).

9. All tree work shall comply with the Migratory Bird Treaty Act as well as California Fish and Wildlife code 3503-3513 to not disturb nesting birds. To the extent feasible tree pruning and removal should be scheduled outside of the breeding season. Breeding bird surveys should be conducted prior to tree work. Qualified biologists should be involved in establishing work buffers for active nests.

10. Apply and maintain 4-6" of wood chip mulch within the **TREE PROTECTION ZONE.**

Tree protection during construction

1. Prior to beginning work, all contractors working in the vicinity of trees to be preserved are required to meet with the Consulting Arborist at the site to review all work procedures, access routes, storage areas and tree protection measures.

2. Any excavation within the dripline or other work that is expected to encounter tree roots should be approved and monitored by the Consulting Arborist. Roots shall be cut by manually digging a trench and cutting exposed roots with a sharp saw. The Consulting Arborist will identify where root pruning is required and monitor all root pruning activities.

3. If injury should occur to any tree during construction, it should be evaluated as soon as possible by the Consulting Arborist so that appropriate treatments can be applied.

4. All underground utilities, drain lines or irrigation lines shall be routed outside the **TREE PROTECTION ZONE**. If lines must traverse through the protection area, they shall be tunneled or bored under the tree as directed by the Consulting Arborist.

5. No materials, equipment, spoil, waste or wash-out water may be deposited, stored, or parked within the **TREE PROTECTION ZONE** (fenced area).

6. Any additional tree pruning needed for clearance during construction must be performed by a qualified arborist and not by construction personnel.

7. Any roots damaged during grading or construction shall be exposed to sound tissue and cut cleanly with a saw.

8. If temporary haul or access roads must pass over the root area of trees to be retained, a road bed of 6” of mulch or gravel shall be created to protect the soil. The road bed material shall be replenished as necessary to maintain a 6” depth.

9. Spoil from trench, footing, utility or other excavation shall not be placed within the **TREE PROTECTION ZONE**, neither temporarily nor permanently.

End of guidelines