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**AN ASSESSMENT OF STREET TREES
IN A SAMPLE NEIGHBORHOOD OF MENLO PARK**

Prepared at the Request of:
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Site Visit by:
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Assignment

I met Dianne Dryer on August 1, 2006, to begin an analysis of street trees in a sample neighborhood in Menlo Park.

The area of concern is bordered on the south by Santa Cruz Avenue, on the north by Valparaiso Avenue, on the east by Cotton Street and on the west by Elder Avenue.

The purpose of the report is to provide recommendations for preservation or removal of street trees encountered within that area, and where removal is recommended to offer a priority for removal and to recommend replacement species.

Observations

The majority of trees in the surveyed area are very mature American sweetgum (*Liquidambar styraciflua*). Several of them are grafted specimens of American sweetgum, probably of the 'Palo Alto', the most commonly available cultivar.

There are 174 sweetgums in the project area, 55 on Cotton St., 69 on Politzer St., 46 on Hesketh St., and 4 on Hesketh Court.

The second most common species is Modesto ash (*Fraxinus velutina* 'Glabra') of which 64 are found on Hillview Drive.

The third most common species is camphor tree (*Cinnamomii camphora*) with 26 trees on Hobart Street.

The soil of this area is so good and so deep that most species of trees are very successful here and develop into larger specimens than one might see in other areas in this part of California.

Sweetgums

We noted that the American sweetgums on these streets are, by and large, not producing the degree of pavement damage one might see in other settings. That is partly because they are in a lawn or landscape area behind the blacktop sidewalks as on Cotton St., and as a result, have root systems over a broader area than they would if they were growing in standard sidewalk and curb environments, but this is primarily due to the depth of the A-horizon soil and its excellent quality.

A genetic character of sweetgums is to produce inherently defective branch attachment angles, commonly called codominant leaders, usually with included bark at the joints. This structural defect often causes the attached branch to break out of the tree and leave a large wound in the main trunk.

Some individual trees on the other hand seem not to produce these defective limb attachments, and as a result, are individually far less susceptible to branch breakage.

In some cases, the hazard caused by these structural defects can be reduced by endweight reduction, but in many cases correction of the defect by removal of sufficient endweights to correct or reduce the hazard, leaves the remaining tree a poor thin specimen with insufficient leaf mass to remain a healthy specimen.

This species is also known for the production of 1-inch hard round seedpods which pose a trip hazard, especially for elderly people. Several cities have been sued for "trip and fall" injuries due to these seedpods.

Some individual trees are much less healthy than others. This weak canopy is usually exemplified by chlorotic foliage, a deficiency in total foliage canopy mass and often accompanied by dead branch ends. This condition is often created by root cutting which removes a large proportion of the tree's ability to absorb minerals and water with the loss of severed major roots, but is often merely a genetic character of the individual plant, and is unrelated to environmental conditions.

In many of these cases, considering all of the factors involved including the age of the trees, there is a necessity of a 5-year pruning cycle and the pavement damage either they are causing, or can be expected to create in the near future, suggests that the best management practice is removal of a specimen with defects like this, rather than attempting to correct the defects by pruning.

It should be noted that some of the specimens such as that at 1151 Cotton have at least one or sometimes several large girdling roots.

This defect was caused by retaining the plant in the nursery container so long that roots begin traveling in circles around the main trunk rather than spreading out into the surrounding soil area.

In the worst of these cases, the girdling roots gradually strangle the main trunk, at best causing weakness and reduction in vigor, or at worst causing tree failure.

It should be carefully noted that it will be necessary to continue the 5-year pruning cycle for sweetgum trees that have been assigned a Priority 2 or Priority 3 removal, because they will remain for a long enough period that limb drop could occur between now and the time trees like that are finally removed.

Modesto Ash Trees

Modesto ash is a selected form of Arizona ash, which was thought to be the perfect tree when it was introduced in the 1950's.

In most cases, in which large quantities of a new tree are planted in a given neighborhood or town or state, nature has responded to the monoculture use of that plant with severely debilitating diseases, several insects and susceptibility to root collar diseases.

Modesto ash are usually defoliated in spring by ash anthracnose, and in some years by sudden, overwhelming quantities of ash curl aphids.

They are very susceptible to artist's conk (*Ganoderma applanatum*), a disease which invades root collar wounds and decays the interior.

Their structure is composed of several main limbs attached at narrow-crotch angles (codominant leaders) with included bark in the interior of the attachment points. This genetic defect results in limbs dropping out of trees.

Camphor Trees

This Japanese native is very susceptible to Verticillium wilt (*Verticillium albo-atrum*) a bacterial disease which plugs vascular bundles and shuts off the water supply from the roots.

If the voracious, shallow, destructive roots are cut for installation of curbs or sidewalks, they commonly become infected with oak root fungus (*Armillaria mellea*).

Most of the camphor populations are declining for one or several reasons.

In summary, note that the sweetgum, the Modesto ash and the camphors in the area of study have several characteristics in common.

They are all of about the same age, they are all mature or over-mature, they all are species infamous for root damage to infrastructure and a large proportion of them have structural defects.

If a program of staged removal and replacement is not initiated, an increasing number of these failing trees will have to be removed as they die, possibly many of them dying in a given area within a short time-span.

A far better management practice is to remove 25% - 30% of the trees, and replace them with less troublesome species in each of 3 phases.

If carefully chosen individual trees are removed and replaced, those removals based upon the intent to avoid removals of too many trees in a given area at one time, the effect of the removal on a neighborhood can be minimized while solving the problems associated with waiting for failure of a large proportion at one time.

Replacement Criteria

Replacement trees on Cotton Ave., as an example, should be expected to perform over the long-term, the function of an 80-foot tall American sweetgum, providing the shady environment over the road and homes currently provided by the Liquidambar.

On the other hand, the species chosen should not develop the structural defects seen in the Liquidambar or cause the degree of pavement damage caused by Liquidambar and should certainly not produce the volume of spiky seedpods which are such a trip hazard which is created by the Liquidambar.

Furthermore, the danger of monoculture should be avoided (the use of only single species over a large area) resulting in all of the potential problems of a given species in such a large proportion that unforeseen problems result in loss of a large proportion of the tree inventory.

The International Society of Arboriculture (ISA) recommends that there be no more than 10% of any inventory within a neighborhood of a single species.

A diversity of textures offers more interest, fall color over a longer period, slightly different leaf color and most importantly, a better distribution of risk than if a single species is used over a large area.

As a result the recommendations included here are for several species that would perform the aesthetic and practical function of the existing liquidambar, but by using more than one species to fulfill that function.

Replacement Trees

Note that few trees indigenous to Menlo Park have been recommended here. This is not coincidental. It should be understood that most trees appearing naturally in a Mediterranean climate (receiving water naturally only during cool temperatures of winter) are poorly adapted to the frequent, shallow irrigation of turf during summer. Since most of the trees in the survey area are growing in or immediately adjacent to turf, planting our native oaks in these sites would doom them to death by oak root fungus (*Armillaria mellea*) as they mature or by watermold disease (*Phytophthora cinnamomii*) at a young age.

If individual homeowners feel strongly about having a native tree as a replacement and they are willing to remove lawn within 20 feet of the planting site there is no technical reason not to plant a coast live oak (*Quercus agrifolia*) or valley oak (*Quercus lobata*) as a replacement.

There is an aesthetic reason to use an excurrent (pyramidal form) tree, however, if you wish to replicate the form and fall color of the remaining Liquidambar trees in a neighborhood.

As an example of providing some continuity of texture while also avoiding monoculture on Cotton St., I would suggest the use of a mixture of Shumard oak (*Quercus shumardii*) and scarlet oak (*Q. coccinea*) as two of the deciduous trees which might replace Liquidambar. They also become 70-90 feet in height and produce spectacular fall color, but avoid being all of the same species with the danger that implies.

Species to be considered include:

- Red maple cultivars
 - Acer rubrum* 'October Glory'
 - Acer rubrum* 'Red Sunset'
 - Acer rubrum* 'Armstrong' - narrow, upright
- Elm
 - Ulmus x* 'Frontier'
- Ash
 - Fraxinus americana* 'Autumn Purple' - 'Autumn Purple' American Ash
 - Fraxinus pennsylvanica* 'Patmore' - 'Patmore' Green Ash
- Oaks
 - Quercus shumardii* - Shumard Oak

Quercus coccinea - Scarlet Oak

Quercus lobata - Valley Oak

- Linden
 - Tilia americana* 'Sterling' - 'Sterling' Silver Linden
 - Tilia x* 'Redmond' - 'Redmond' Linden
- Tupelo Tree - *Nyssa sylvatica*
- Evergreen Species
 - Tristania conferta* - Brisbane Box (syn. *Lophostemon confertus*)
 - Tristaniopsis laurina* 'Elegant' - 'Elegant' Swamp Myrtle
 - Quercus virginiana* - Southern Live Oak

Suggested Replacement Sites

North East (NE) side Cotton

Quercus shumardii - Shumard Oak

Quercus coccinea - Scarlet Oak

South West (SW) side Cotton

Acer rubrum 'Red Sunset' - 'Red Sunset' Red Maple

Nyssa sylvatica - Tupelo Tree

NE side Hobart

Fraxinus pennsylvanica 'Patmore' - 'Patmore' Green Ash

Nyssa sylvatica - Tupelo Tree

SW side Hobart

Tristaniopsis laurina 'Elegant' - 'Elegant' Swamp Myrtle

Tristania conferta - Brisbane Box (syn. *Lophostemon confertus*)

NE side Hillview

Fraxinus pennsylvanica 'Patmore' -- 'Patmore' Green Ash

Fraxinus americana 'Autumn Purple' - 'Autumn Purple' American Ash

SW side Hillview

Tristania conferta (syn. *Lophostemon confertus*) - Brisbane Box

Tristaniopsis laurina 'Elegant' - 'Elegant' Swamp Myrtle

NE side Politzer and Hesketh

Quercus shumardii - Shumard Oak

Quercus coccinea - Scarlet Oak

SW side Politzer and Hesketh

Quercus virginiana - Southern Live Oak

Nyssa sylvatica - Tupelo Tree

SE side of Politzer and Hesketh

Quercus shumardii - Shumard Oak

Quercus coccinea - Scarlet Oak

NW side Politzer and Hesketh

Quercus virginiana - Southern Live Oak

Tristania conferta - (*syn. Lophostemon confertus*) - Brisbane Box

Elder Ave. N side

Acer rubrum 'Red Sunset' - 'Red Sunset' Red Maple

Acer rubrum 'Armstrong' - 'Armstrong' Red Maple

Elder Court

Tristania conferta - (*syn. Lophostemon confertus*) - Brisbane Box

Quercus virginiana - Southern Live Oak

Hesketh Court

Acer rubrum 'Red Sunset' - 'Red Sunset' Red Maple

Santa Cruz Ave.

Scots Elm replacements

Ulmus 'Frontier' - Hybrid Elm

Quercus lobata - Valley Oak

Valparaiso

Tilia americana 'Sterling' - 'Sterling' Silver Linden

Ulmus 'Frontier' - Hybrid Elm

Respectfully submitted,

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BDC/sl

Encl.