



# Century Villages at Cabrillo Campus Landscape Barrier

Schools and Related Sites  
Port of Long Beach Grant Mitigation Program

August 2011 Update



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## Site Location & Description

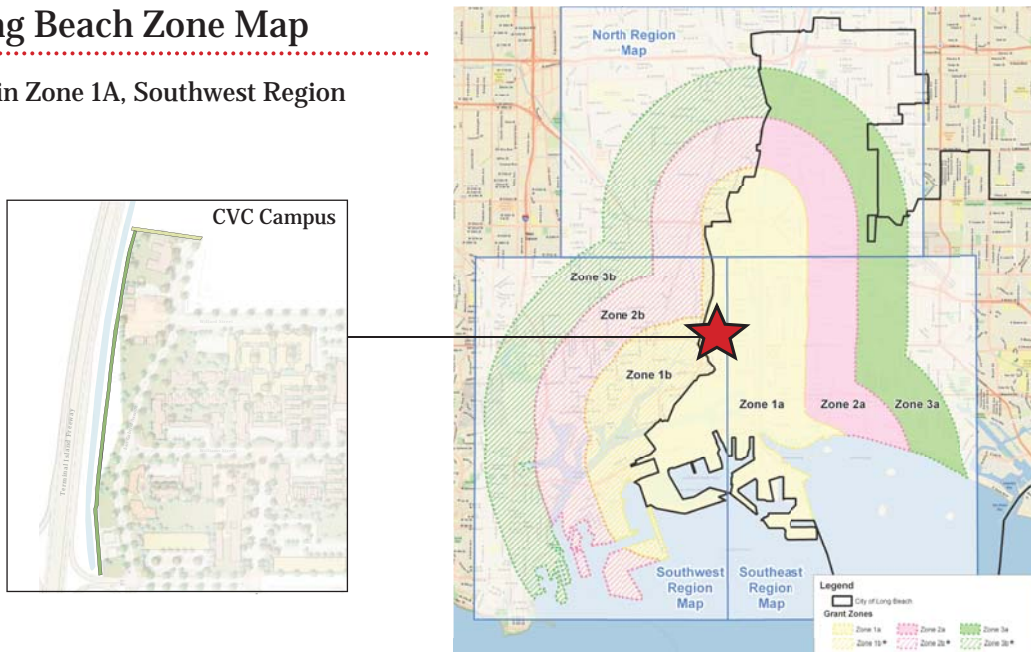
- The site is located in Zone 1A on property owned by the City of Long Beach along the Terminal Island Freeway, a heavily used route for trucks carrying cargo to and from the Ports of Los Angeles and Long Beach.
- As the site is on City-owned property, Century Villages at Cabrillo (CVC) has secured permission to install barrier planting at this site so as to locate the barrier as close as possible to the Freeway, or primary source of pollution.
- The site is less than a mile away from major port operations at the Ports of Los Angeles and Long Beach and the 710 Freeway, another major route for cargo trucks, and is also 1/4 mi. from a freight rail line that runs parallel to the Freeway.
- CVC is a residential community offering supportive housing for homeless veterans, families, and children. Around 414 children are served at any point in time on the CVC campus.
- As shown in the table below, approximately 16,600 cars and trucks pass the project site each day on average. Trucks account for 58% of this, a majority of which run on diesel and emit significant amounts of harmful particulate matter into the air.

## 2008 Annual Average Daily Traffic (AADT) - Source: www.dot.ca.gov

	AADT All Vehicles	AADT Truck (% of All Vehicles)
Terminal Island Freeway at I-710 (Begin Route 103)	16,600	9,679 (58%)
Terminal Island Freeway at Anaheim Street	13,700	N/A

## Port of Long Beach Zone Map

CVC is located in Zone 1A, Southwest Region



## Existing Conditions



The site's Terminal Island Freeway edge currently provides little to no vegetative buffer.



Children learn and play within mere feet of the Terminal Island Freeway.



Industrial and shipping-related activities surround the site.



The Terminal Island Freeway is a heavily used route for trucks carrying cargo to and from the Ports of Los Angeles and Long Beach.

## Tree Species Selection Criteria

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- Low rating on Biogenic Emissions (UEFI) or 1-5 BVOC rating (i-Tree)
- 1-5 Air Pollutant Removal rating (i-Tree)
- Ability to sequester greenhouse gases
- Minimal maintenance requirements to reduce emissions related to landscape equipment
- Low to Medium water requirements. (For South Coastal California Climate, WUCOLS)
- Suitability to local soil conditions
- No poisonous attributes
- Sunset Zones 21-24 and USDA Hardiness Zones 8-10
- Low allergenic output, 1-5 Ogren Plant Allergy Scale (OPALS) rating. (On OPALS scale, 1=low, 10=high)\*
- Year-round foliage (evergreen)
- Minimum anticipated trunk caliper (diameter) of 2.5” at maturity

## Design Intent

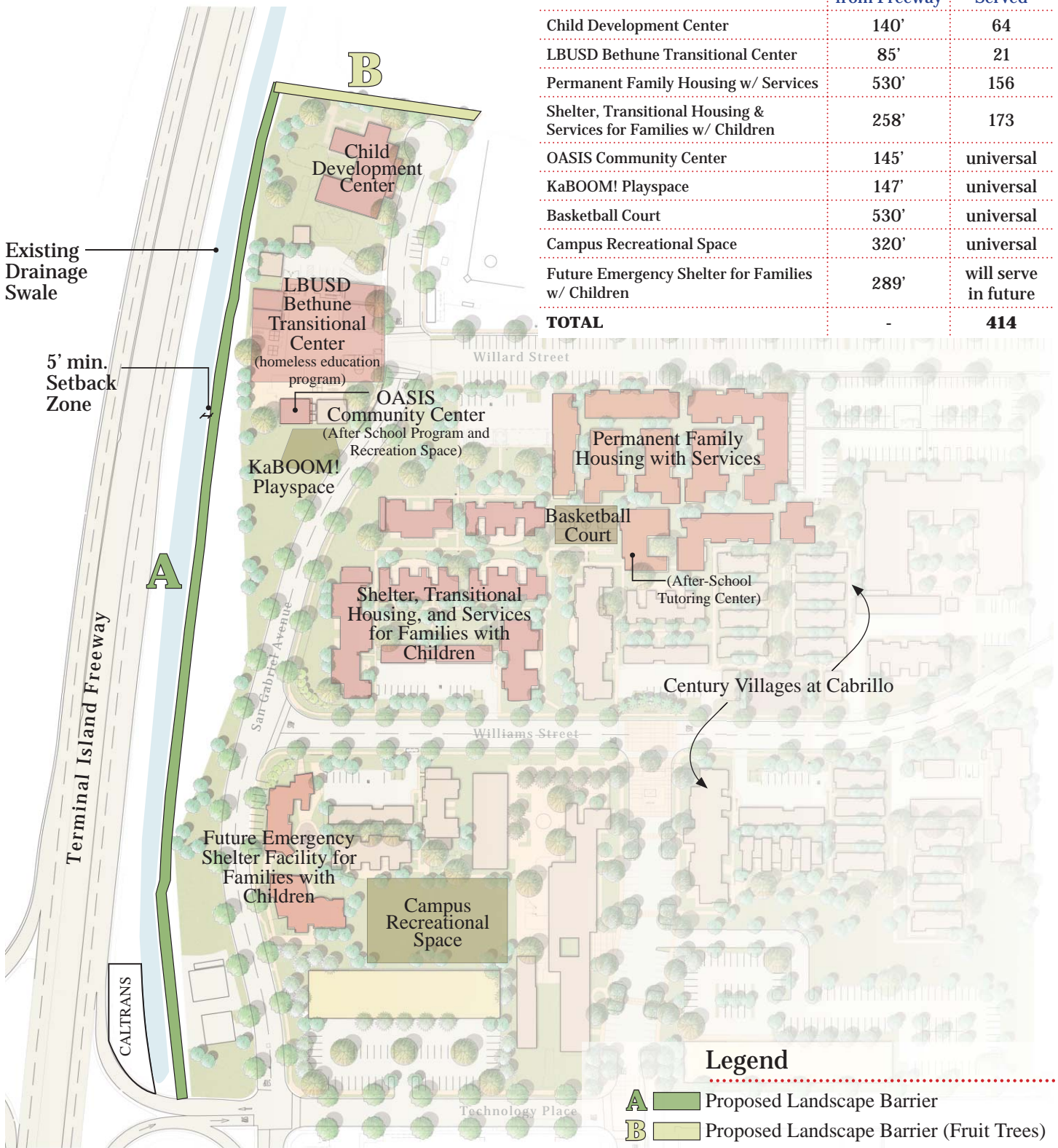
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- This plan proposes a 9’ wide planting area to accommodate a landscape barrier that functions as a “living air filter,” or “biofilter,” removing potentially harmful airborne particulate matter (PM) generated by diesel and automobile exhaust from the Terminal Island Freeway, a major route for cargo trucks traveling to and from the Ports of Los Angeles and Long Beach. Barrier canopy height and width will exceed the 9’ planting area (see Pg. 5 for more information on tree species dimensions).
- The proposed landscape buffer will run parallel to the Freeway, along the east side of the drainage swale that runs parallel to north-bound lanes of traffic. At the north side of the project area the buffer turns eastward and runs inside the fence line along the north edge of the Child Development Center.
- The landscape barrier is situated along an existing drainage swale so as to maximize available, underutilized space along the Freeway edge of the site and still maintain the minimum 9’ width required to accommodate trees with sufficient vegetative surface area. From the south, the barrier stretches along the east side of the swale continuing to the northernmost portion of the site.
- Evergreen canopy and understory tree planting also provide a year-round buffer from the noise, odors, and visual impact of the Freeway and surrounding uses, such as the Tesoro refinery and railroad lines.
- Proposed trees are all, with one exception, found on the Port of Long Beach tree list entitled *Examples of Suitable Tree Species* from *Guidelines for the Port of Long Beach Mitigation Grant Programs, Schools & Related Sites*. The lone exception, Deodar Cedar (*Cedrus deodara*), was chosen due to its high efficacy in PM removal, cited in a 2008 study of PM removal rates by UC Davis<sup>1</sup> and referenced in the Application Guidelines for this grant. Although not all proposed trees are CA natives, all are water-wise and suitable for local climatic conditions. General considerations for species selection include: high pollutant removal rates; low BVOC emissions; ability to sequester greenhouse gases; low maintenance and water requirements; climate appropriateness; suitability to local soil conditions; low allergenic output; minimum mature trunk caliper of 2.5”, and size after 20 years (see above for a full list of selection criteria).
- Fruit trees (avocado and loquat) are proposed for the barrier along the north edge of the Child Development Center, maximizing PM removal while also providing user benefit.

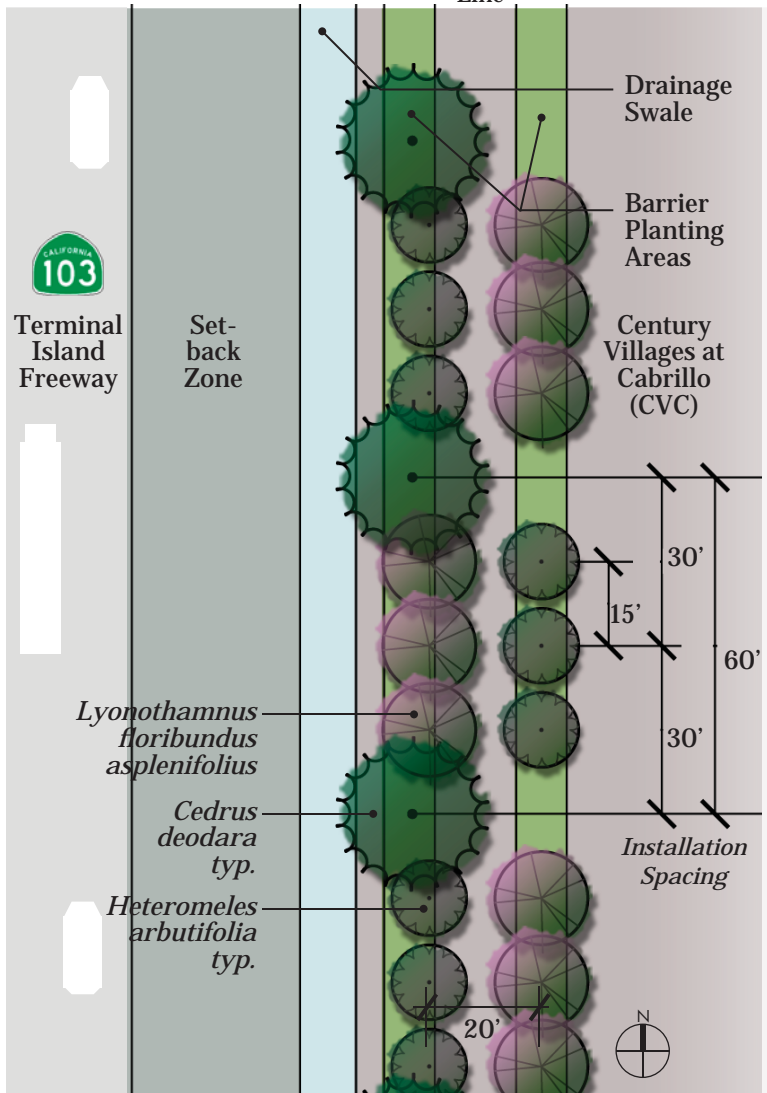
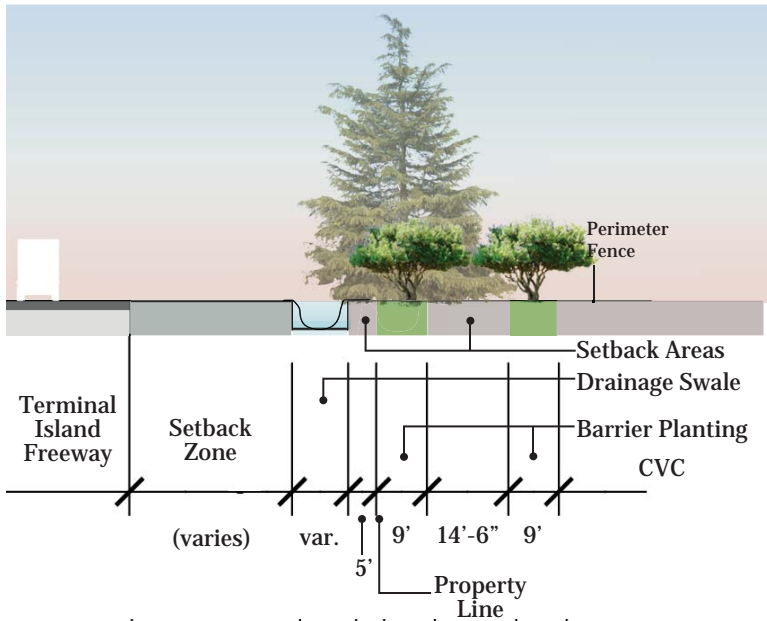
<sup>1</sup> Cahill, Tom. Delta Group. “Removal Rates of Particulate Matter onto Vegetation as a Function of Particle Size.” University of California, Davis for Breathe California of Sacramento - Emigrant Trails, April 2008. (<http://www.sacbreathe.com/Local%20Studies/Vegetation%20Study.pdf>)



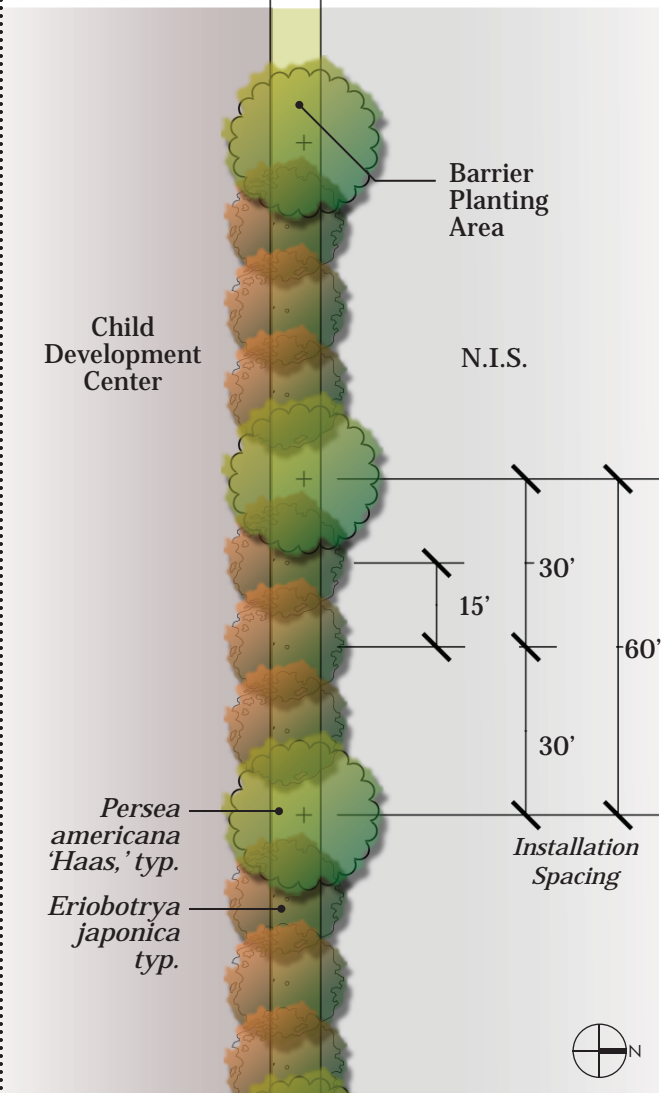
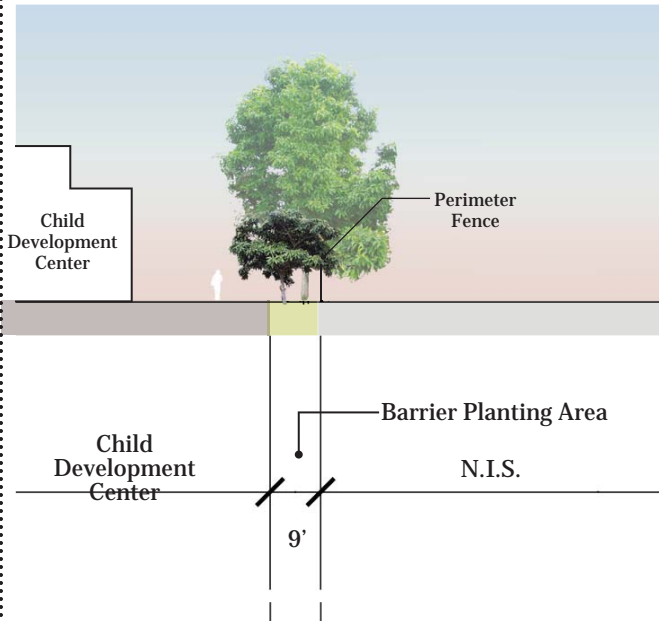
Child-Serving Uses	Distance from Freeway	# Children Served
Child Development Center	140'	64
LBUSD Bethune Transitional Center	85'	21
Permanent Family Housing w/ Services	530'	156
Shelter, Transitional Housing & Services for Families w/ Children	258'	173
OASIS Community Center	145'	universal
KaBOOM! Playspace	147'	universal
Basketball Court	530'	universal
Campus Recreational Space	320'	universal
Future Emergency Shelter for Families w/ Children	289'	will serve in future
<b>TOTAL</b>	-	<b>414</b>



**Barrier Segment A** Looking North



**Barrier Segment B** Looking West





## Barrier Segment A

### Canopy Tree



**Deodar Cedar *Cedrus deodara***  
Install at 36" box  
Min. 12-14' height; 5-6' spread at installation  
80' height; 40' spread at maturity

### Understory Tree



**Toyon *Heteromeles arbutifolia***  
Install at 24" box  
Min. 3' height; 3' spread at installation  
10-25' height; 10-25' spread at maturity



**Catalina Ironwood *Lyonothamnus floribundus asplenifolius***  
Install at 24" box  
Min. 10-12' height; 4-5' spread at instal.  
15-35' height; 15' spread at maturity

## Barrier Segment B

### Canopy Tree



**'Haas' Avocado  
*Persea americana 'Haas'***  
Install at 24" box  
Min. 6-8' height; 4-5' spread at installation  
60-80' height; 40-60' spread at maturity

### Understory Tree



**Loquat *Eriobotrya japonica***  
Install at 24" box  
Min. 5-6' height; 4-5' spread at installation  
20-30' height; 20-30' spread at maturity

## Tree Count

		Height Level	Installation Size	Quantity
<b>Barrier Segment A</b>				
<i>Cedrus deodara</i>	Deodar Cedar	Canopy	36" box	25
<i>Heteromeles arbutifolia</i>	Toyon	Understory	24" box	72
<i>Lyonothamnus floribundus asplenifolius</i>	Catalina Ironwood	Understory	24" box	72
<b>Barrier Segment B</b>				
<i>Persea Americana 'Haas'</i>	'Haas' Avocado	Canopy	24" box	5
<i>Eriobotrya japonica</i>	Loquat	Understory	24" box	17
<b>TOTAL</b>				<b>191</b>

## Species Suitability

(based on Attachment A: Examples of Suitable Tree Species - Guidelines for the Port of Long Beach Mitigation Grant Programs, Schools & Related Sites)

		Port Ap-proved List	CA Native (UFEI)	i-Tree Air Pollutant Removal	i-Tree BVOC Emissions Rating	i-Tree Carbon Storage Rating	Biogenic Emissions (UFEI)	Height (20 Years)	Water Requirement (WUCOLS)	Ogren Plant Allergy Scale (OPALS)*
<i>Cedrus deodara</i>	Deodar Cedar	N*	N	N/A	N/A	N/A	Low	50'	Low	1
<i>Eriobotrya japonica</i>	Loquat	Y	N	2	2	8	Low	25'	Med	3
<i>Heteromeles arbutifolia</i>	Toyon	Y	Y	N/A	N/A	N/A	Low	25'	Low	3
<i>Lyonothamnus floribundus asplenifolius</i>	Catalina Ironwood	Y	Y	N/A	N/A	N/A	Low	35'	Low	4
<i>Persea americana 'Haas'</i>	'Haas' Avocado	Y	N	1	1	3	Low	50'	Med	3