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Draft Environmental Impact Report

(DRAFT EIR)

[STATE CLEARINGHOUSE NO. 2015021014]

for Los Angeles International Airport (LAX)
Landside Access Modernization Program

City of Los Angeles
Los Angeles World Airports

Appendix B



*Los Angeles
World Airports*

Appendix B
LAX Design Guidelines



LAX DESIGN GUIDELINES

09.08.2016 DRAFT





LAX DESIGN GUIDELINES

09.08.2016 DRAFT



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INTRODUCTION 1.0

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1.1 Overview and Purpose

The Los Angeles International Airport (LAX) Design Guidelines (Design Guidelines) establish LAWA's comprehensive vision for the passenger experience at LAX. They are intended to integrate the design of new and existing facilities and to create an improved passenger experience that honors LAX's history and Mid-Century Modern architecture, while providing design guidance for new construction and major renovations as part of the modernization of LAX.

The Design Guidelines apply to LAWA projects, including Land Access Modernization Program (LAMP) projects; terminal improvements in the Central Terminal Area (CTA), and CTA parking structures as shown on the LAX Design Guidelines Map on the next page. The LAMP project includes the Automated People Mover, Passenger Walkways, Intermodal Transportation Facilities, Consolidated Rental Car Facilities, and Roadway Improvements.

The overall purpose of the Design Guidelines is to provide a framework to enhance the visual quality of the environment in and around LAX in a way that is consistent with airport needs and existing area conditions. The Design Guidelines encourage the development of more sustainable and user friendly spaces with a focus on unified, high quality architecture and urban design, and a seamless interaction between a variety of users such as pedestrians, cyclists, transit riders, and automobile drivers with an emphasis on the passenger experience.

First established as an airport in 1928 with ad-hoc construction occurring over multiple decades and in various styles,

1.2 Vision and Goals

Vision

The goal setting and visioning process for the LAX Design Guidelines began with a study of existing conditions and future built conditions in the CTA extending east to the I-405, including land use, key entrances/exits, pedestrian and bicycle connections, primary and secondary vehicular streets, landscape, and sites with historic significance.

The study of existing conditions resulted in a vision and goals for specific elements of the LAX campus.

- Integrated, high quality, functional and attractive architecture and urban design that are a positive addition to and compliment LAX's modern design heritage.
- Sustainable landscaping that creates a unified, attractive, and functional environment.
- An efficient and balanced network of roadways and transit that enables multi-modal access to LAX.
- Pedestrian and bicycle connections integrated with other transportation modes.
- A unified and attractive streetscape in the public right-of-ways.
- An efficient, sustainable airport that conserves resources and supports surrounding communities.

Goal | Create a Unified Airport Campus

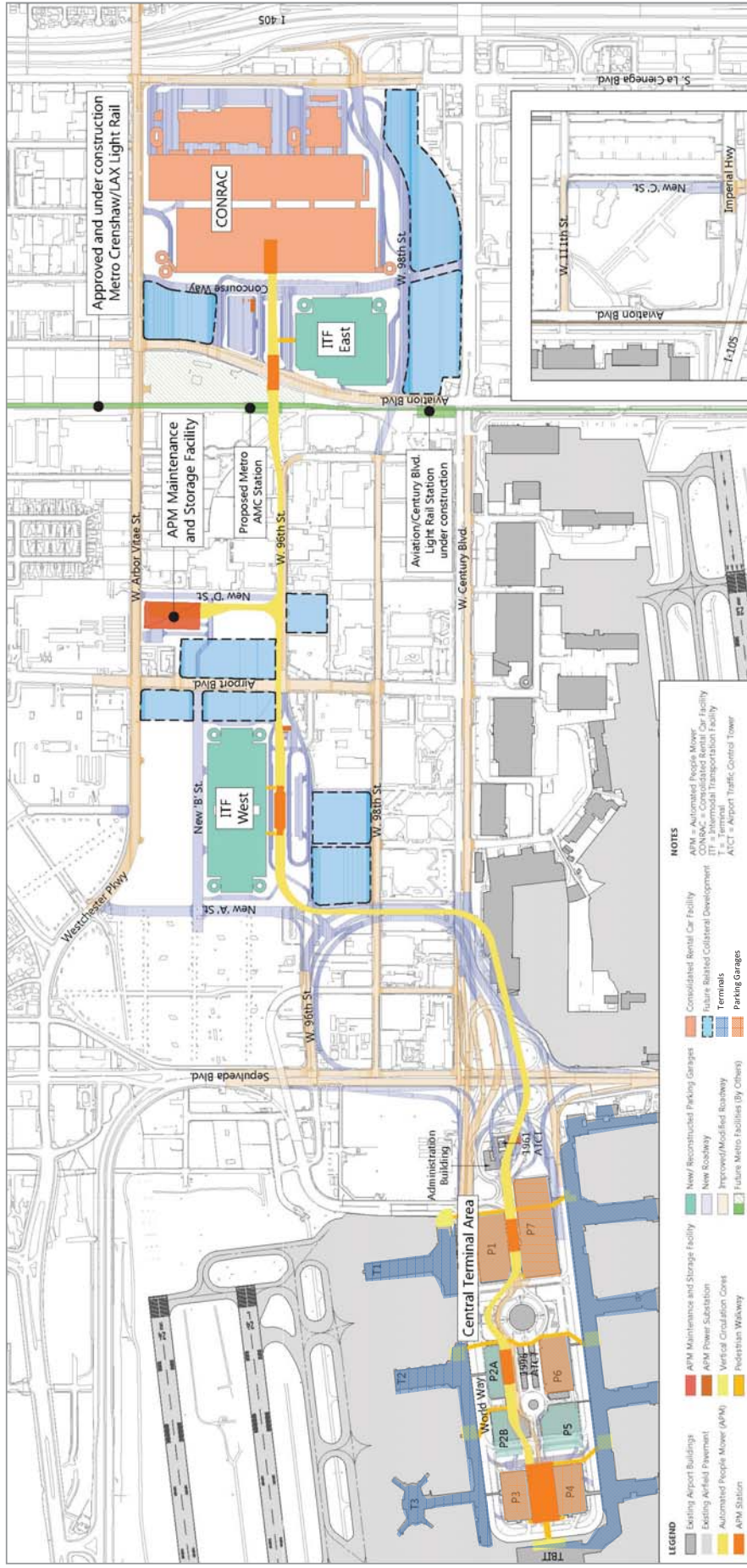
The goal of the Design Guidelines is to establish design directions for the new elements at LAX that will create a more positive user experience, a more functional airport and a more integrated LAX.

Strategies | Unify the Airport and Enhance the User Experience

The designs that are described in this document use the following strategies to achieve the stated goals.

- Create a more integrated campus by creating complementary relationships between new and existing LAX elements
- Employ a high degree of transparency in the new LAX elements to optimize views, safety and reduce visual clutter.
- Complement but do not mimic existing LAX architectural icons.
- Use simple repetitive elements in the design of the new LAX elements.
- Meet all functional, operational and maintenance criteria in the design of new LAX elements.

1.0 Introduction



1.3 Area Context

LAX is located approximately 15 miles southwest of downtown Los Angeles. The airport area context includes diverse communities, as well as the LAX CTA and airport-related facilities, existing ground transportation facilities, and signage and lighting.

1.3.1 Surrounding Communities

The community of Playa del Rey is located to the northwest, the community of Westchester is located to the north, the city of Inglewood is located to the north and east, the unincorporated area of Lennox is located to the east, the unincorporated area of Del Aire is located to the south, and the City of El Segundo is located to the south. The surrounding communities are composed of a mix of residential, commercial, community, public, and industrial uses, including hotels, office buildings and parking structures along Century Boulevard.

1.3.2 LAX CTA and Airport-Related Facilities

The CTA is located in the central portion of LAX property, west of Sepulveda Boulevard, and is accessed by a series of ramps and roads from Sepulveda Boulevard and Century Boulevard. It is composed of multi-story terminal buildings and concourses, facing three sides of the U-shaped double-deck access road, called World Way. The roadway serves arriving passengers on the lower level and departing passengers on



LAX Area Context Map

1.0 Introduction

the upper level. World Way encompasses an oblong central mall containing multi-level parking structures, the airport's Central Utility Plant (CUP), service facilities, the old (1961) Airport Traffic Control Tower, the 1996 Airport Traffic Control Tower, the administration building, the Theme Building, and the future automated people mover system.

1.3.3 Ground Transportation Facilities

The Design Guidelines Area extends east of the CTA to the Interstate 405 within a highly developed, urbanized area. The existing ground transportation uses in this area include surface parking lots, rental car facilities, bus and shuttle depots, and existing public streets.

1.3.4 Signage and Lighting

Signage and lighting at LAX and in the surrounding communities contributes to the context of the area. At LAX, iconic light pylons and monument signs announce arrival to the airport and extend the airport's visual identity along the Century Boulevard corridor. In addition to LAX-related signage and wayfinding, the area includes existing billboards that contribute to the visual identity of the area.

The photographs in this section are representative of the existing surrounding communities, LAX CTA and airport-related facilities, ground transportation facilities, and signage and lighting that provide the context for these Design Guidelines.



Surrounding Communities: View of Forum in the community of Inglewood.



Surrounding Communities: Downtown Westchester.



Surrounding Communities: Main Street El Segundo.



LAX CTA and Airport-Related Facilities: The Theme Building and Airport Traffic Control Tower.



LAX CTA and Airport-Related Facilities: View looking west of the LAX CTA.



LAX CTA and Airport-Related Facilities: View of Terminal 2 in the LAX CTA.

1.4 Organization and Content

The document consists of five chapters as follows: Chapter 1 provides an overview of the document and describes the vision and goals. Chapters 2, 3, and 4 contain the design guidelines and standards that will guide development in the Design Guidelines Area in terms of architecture and urban design, roadways and streetscape, landscape, and sustainability. Chapter 5 describes the implementation and process for specific project design and review

1.5 Relationship to other Documents

LAX is located in the City of Los Angeles and its development is governed by the City of Los Angeles' land use policy and related ordinances. The City of Los Angeles Citywide General Plan Framework defines the City's long-range comprehensive growth strategy, and sets forth policies, goals, and objectives to guide land use regulations for Community Plans. The City of Los Angeles General Plan Land Use Element consists of 35 local Community Plans that set forth land use regulations and zoning for specific areas. Relevant documents and ordinances that apply to LAX include:

LAX Plan: The LAX Plan is the City of Los Angeles General Plan Land Use Element for LAX. The LAX Plan promotes an



Ground Transportation Facilities: Vehicles entering departure and arrival areas in the CTA.



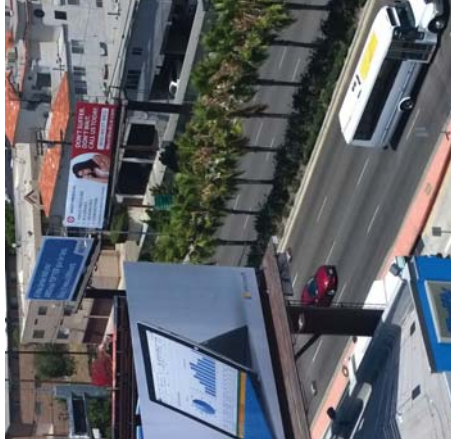
Ground Transportation Facilities: Vehicles, taxis, and shuttles in the CTA.



Ground Transportation Facilities: View from Century Blvd looking on to existing hotels and development



Signage and Lighting: LAX's iconic light pylons and gateway signage.



Signage and Lighting: Billboards along Century Boulevard.



Signage and Lighting: Tom Bradley Terminal signage and lighting.

arrangement of airport uses that encourages and contributes to the modernization of the airport in an orderly and flexible manner within the context of the City and region. It provides goals, objectives, policies, and programs that establish a framework for the development of facilities that promote the movement and processing of passengers and cargo within a safe and secure environment while continuing to serve as the region's principal international gateway.

LAX Specific Plan: The LAX Specific Plan implements the goals and objectives of the LAX Plan through zoning and development standards, and contains specific provisions for each subarea in the Specific Plan boundary. This document supplements the LAX Specific Plan with design guidelines and standards for the Airport Airside Subarea, Airport Landside Subarea, and Airport Landside Support Subareas.

LAX Design and Construction Handbook: Provides guidance for navigating projects through planning, design, construction, project acceptance, and closeout. Intended to help projects meet LAWA's expectations for achieving passenger and employee safety, limiting impacts to airport operations, and enhancing the overall LAWA service environment.

LAX Sign District: Ensures that off-site signs are responsive to and integrated with the aesthetic character of the structures on which they are located, and are positioned in a manner that is compatible with the surrounding architecture and other signage at the airport. The LAX Sign District regulates an area of the LAX Specific Plan that includes the LAX Central Terminal area and the area along Sepulveda Boulevard known as the Park One Property, and existing passenger boarding bridges located in the

Airport Airside Subarea east of Taxiway R and surrounding the Central Terminal Area.

Los Angeles Municipal Code: Includes regulatory provisions for development within the City of Los Angeles, including building regulations, noise standards, specific plans, and zoning.

Mobility Plan 2035: The Mobility Element of the General Plan. Provides the policy foundation for the City of Los Angeles achieving a transportation system that balances the needs of all road users incorporating "complete streets" principles to reflect all modes of transportation (vehicles, trucks, scooters, bicycles, and pedestrians).

Federal Aviation Administration Guidelines: Several Federal regulations intended to guide and control aviation noise, building heights, and uses adjacent to airports apply to the LAX Landside Subarea. These include, but are not limited to, Federal Aviation Regulation (FAR) Part 150, Airport Noise Compatibility Planning and FAR Part 77, Obstructions to Navigation.

Los Angeles County Airport Land Use Plan: Protects the public health, safety, and welfare by ensuring orderly expansion of airports and the adoption of land use measures that minimize the public's exposure to excessive noise and safety hazards within areas around public airports.

Century Corridor Streetscape Plan: Proposed guidelines and standards for streetscape elements along Century Boulevard. The goal of the document is to create a safe and attractive environment that encourages pedestrian activity within the corridor.

Additionally, other regulations, standards, support, and reference documents include:

- Mobility Complete Streets Manual
- California Manual on Uniform Traffic Control Devices
- Caltrans Highway Design Manual
- AASHTO Guide for the Development of Bicycle Facilities
- Bureau of Street Lighting, "Design Standards and Guidelines"
- FAA guidance on downward facing lighting
- Century Corridor Streetscape Plan (once adopted)
- Bureau of Engineering (BOE) Standard Plan S-450 for tree well standards and details
- BOE Standard Plan S-456-2 for root barrier and tree planting
- 2015 Model Water Efficient Landscape Ordinance

How to Use the Guidelines in Relation to Other Plans

The LAX Design Guidelines will supercede the guidelines found in other LAX documents in cases where they overlap or conflict. The regulatory requirements of other City, County, or Federal documents must be copied with, where applicable, and supercede the LAX Design Guidelines.

ARCHITECTURE AND 2.0 URBAN DESIGN

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2.1 Purpose

The architectural guidelines establish design direction for construction that will enhance the built environment by:

- creating cohesion and clarity,
- enhancing passenger way finding,
- providing a sense of place that clearly reflects Los Angeles, and
- respecting the historic aesthetic within the CTA and the surrounding environment outside the CTA.

In addition to the guidance presented herein, all projects must comply with applicable seismic and building codes.

2.2 Architecture and Urban Design Vision

To create an integrated style that respects the heritage of the original CTA character and context and continues to unify architectural elements, the architectural design for new facilities should be based on elements of the Modern design of the original CTA, calling for a clean, simple aesthetic. Design should emphasize clarity of purpose and passenger movement.

Distinctive traits of California Modern architecture include:

- openness with a strong connection to the outdoors;
- the use of glass to provide transparency; and
- clean, horizontal lines, simplicity rather than superfluous ornamentation.

New projects should retain the consistency, simplicity and clarity of form for functional buildings and structures to reflect the regional character of Southern California as expressed in the original conception of LAX.

New construction outside of the CTA and airport boundary should remain related to the architectural family of LAX structures, but should also be compatible with their surrounding environment. The architectural guidelines pay tribute to the history of a seminal modern airport plan, making the CTA and surrounding area easier to understand. They also provide for a reinterpretation of this aesthetic for new buildings.

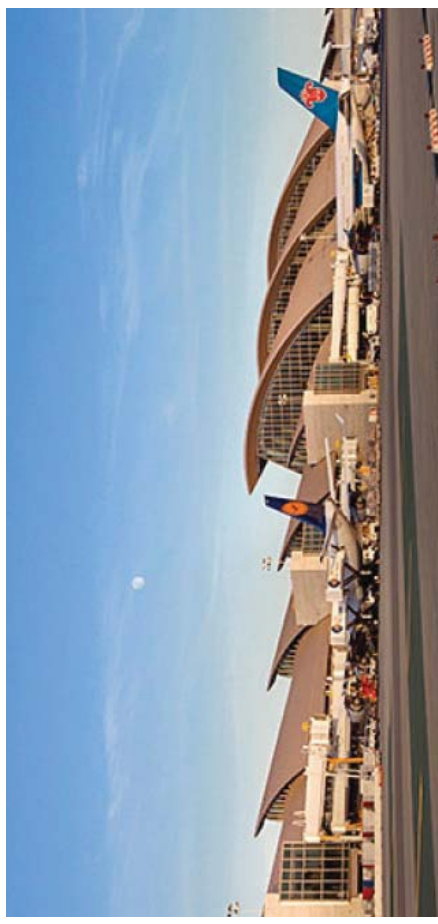
In addition, new facilities will respect the existing iconic elements and not attempt to mimic, repeat or recreate them. These iconic elements include:

- The Theme Building
- The Original Control Tower
- The "New" Control Tower
- The Light Pylons
- Bradley West International Terminal



Theme Building

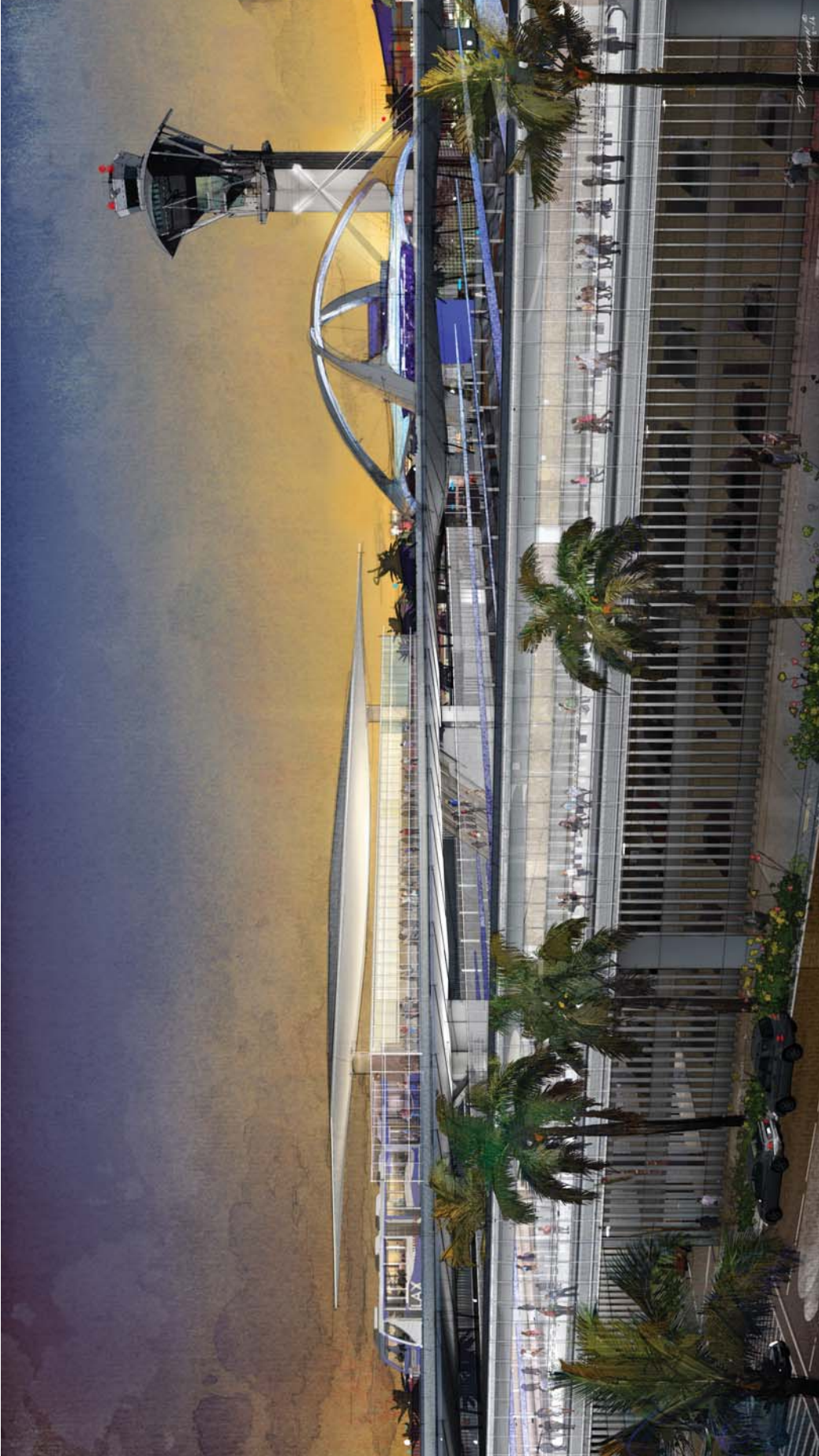
Source: *Favo Cirrus Photography, LAWA*



Tom Bradley International Terminal

Source: *Fentress Architects, LAWA*

2.0 Architecture and Urban Design



The architecture and urban design style is envisioned to include stations with strong horizontals and simple roof forms, a tapered gateway edge, and transparent pedestrian bridges. Conceptual drawing for illustrative purposes only. View looking southwest.

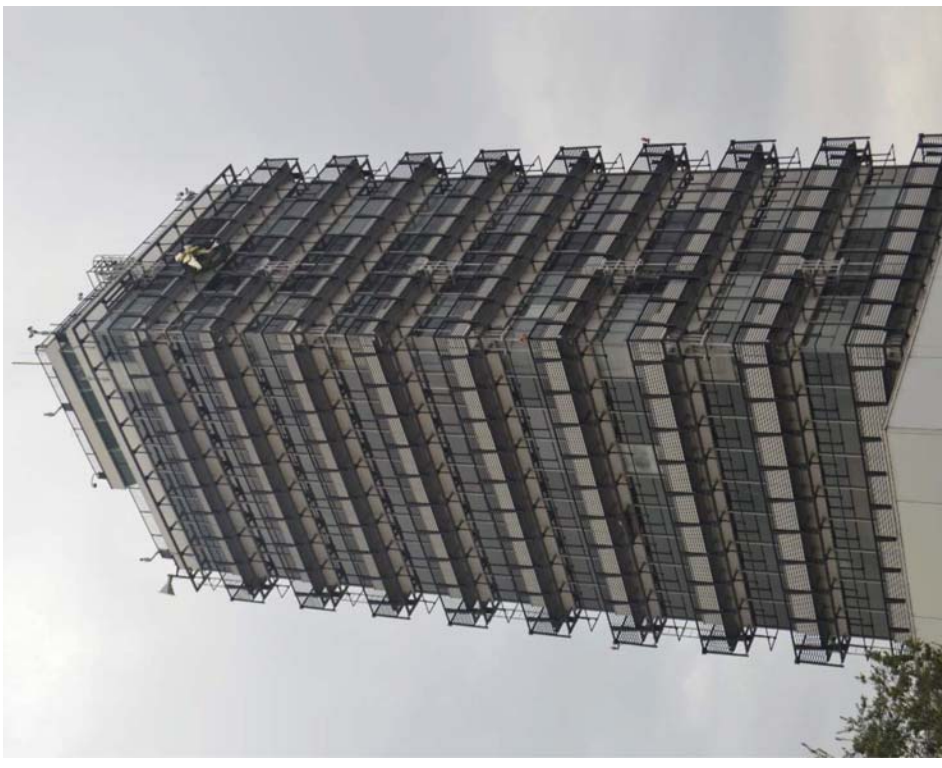
2.3 Historic Structures

Objective

LAX and its surrounding environment has a rich history of aviation, and historic resources should be respected. Refer to the LAX Preservation Plan for further guidance of identified historically significant buildings, objects and structures within the LAX Specific Plan area.

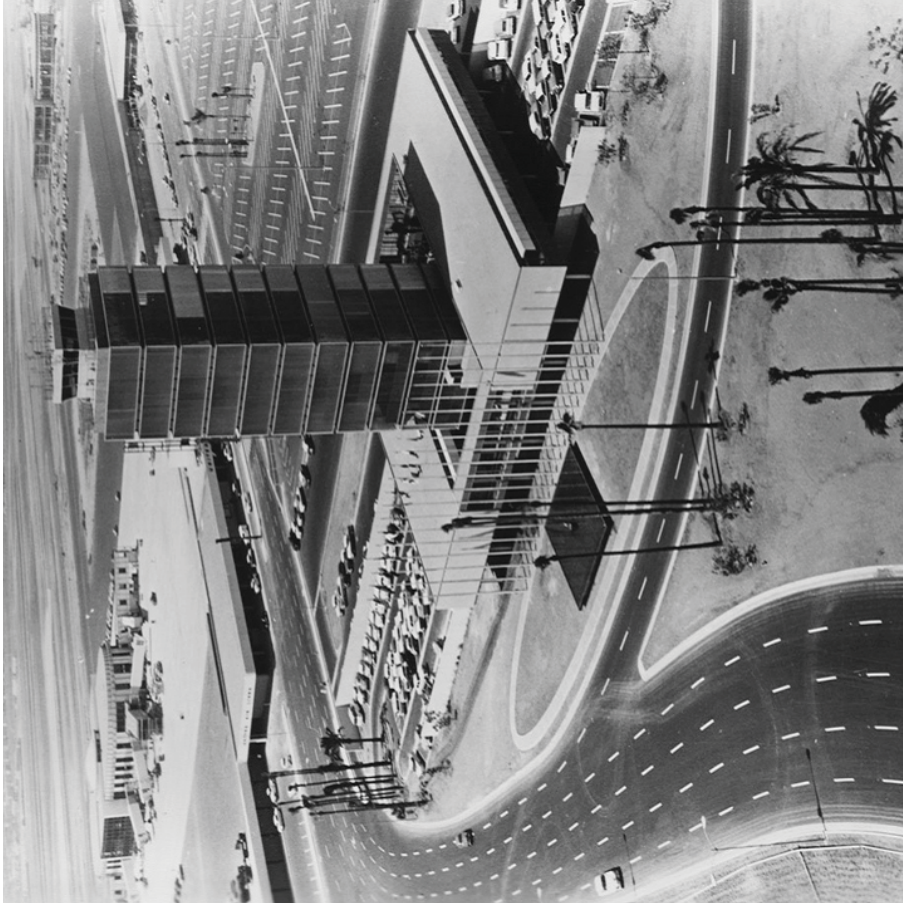
Guidelines

1. The Theme Building's integrity will be preserved and removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize the Theme Building and contribute to its eligibility shall be avoided.
2. The contributing setting of the Theme Building shall be protected and maintained.
3. Changes to the features and spatial relationships of the CTA shall be undertaken in a manner consistent with the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitation, and shall be compatible with the historic materials, features, size, scale and proportion, and massing of the Theme Building to protect the integrity of the historic resource and its environment.
4. The removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize the Theme Building and contribute to its eligibility shall be avoided.
5. Necessary alterations to the Theme Building and the Theme Building setting shall conform to the Secretary of the Interior's Standards for the Treatment of Historic Properties.
6. Changes to the features and spatial relationships of the CTA that may remove or alter features, spaces, and spatial relationships that characterize the Setting of the Theme Building and contribute to the Theme Building's eligibility shall also be avoided.
7. Changes to non-contributing features and spatial relationships of the CTA that may indirectly impact the Theme Building and Setting shall be undertaken in a manner consistent with the Secretary of the Interior's Standards for Rehabilitation, and shall be compatible with the historic materials, features, size, scale and proportion, and massing of the Theme Building to protect the integrity of the historic resource and its environment.
8. The design of the APM shall ensure that important contributing views of the north and south elevations of the Theme Building are not materially impaired.
9. Select form, materials, color and lighting of structures, buildings, stations, and elevated walkways surrounding historic structures to ensure that historic structures are visually distinguished and retain a level of visual prominence.
10. Include interpretive programming that may include historic photographic exhibits, audio/visual presentations, and/or interactive exhibits to be publicly located.

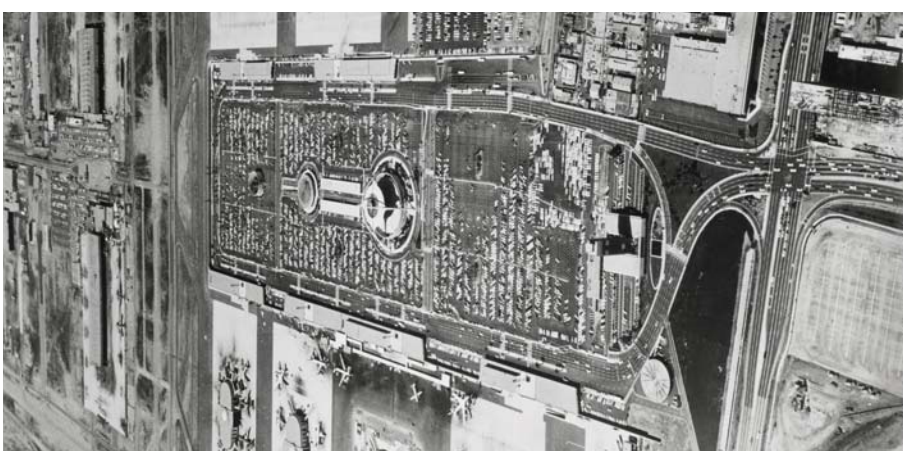


1961 ATCT Today
Source: Historic Resources Group, LAWA

2.0 Architecture and Urban Design



Central Terminal Area Completed 1961
Source: Los Angeles Water & Power Collection



LAX Aerial- 9/20/1963
Source: Los Angeles Public Library

2.4 Urban Design and Architecture Elements (General)

2.4.1 Building Orientation

Objective

Buildings that have pedestrian features should be oriented to promote a clear sense of place, ease of access for visitors, and a pedestrian environment along the sidewalk, where appropriate.

Guidelines

1. Design well-articulated, inviting building entrances that emphasize pedestrian orientation and provide connection to the streetscape.
2. Orient building entrances to provide convenient and clear access for visitors.
3. Orient building entrances to provide convenient access to the nearest transit options such as the Metro stations, APM transit stations, and bus bays, where appropriate.
4. The major architectural features of a building should face a public street, or along a publicly accessible paseo, courtyard, or plaza that opens onto the public street.



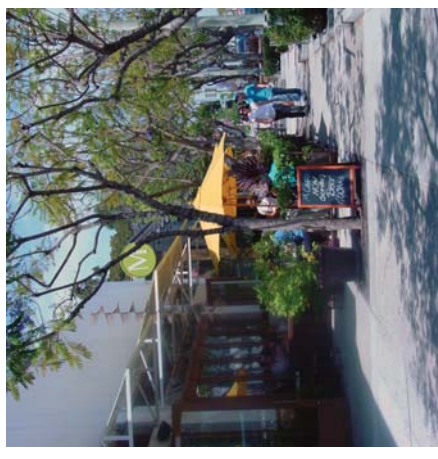
Lighting defines this entrance and creates a sense of security and safety for pedestrians.
Source: <http://www.architen.com/>



A glass curtain with metal fins create an iconic glass box entryway adjacent to the sidewalk.
Source: <http://hdencytphila.org/>



An integrated canopy adds comfort, articulates the building entrance and defines the pedestrian space.
Source: www.enr.com/



Building entrances and storefronts should be oriented to face the street
Source: Gruen Associates

2.0 Architecture and Urban Design

2.4.2 Massing

Objective

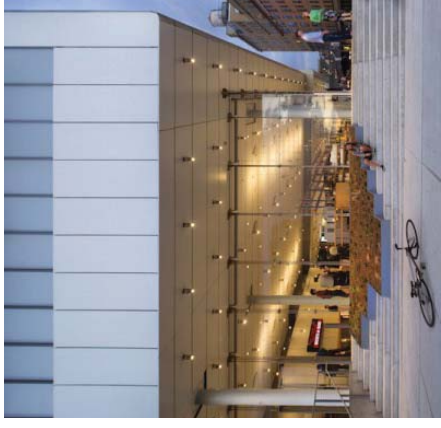
Design of the form and massing of structures should minimize potential impacts to the surrounding environment

Guidelines

1. All structures shall comply with Federal Aviation Administration (FAA) height restrictions and shall be designed not to interfere with safe airport operations.
2. Design buildings to mitigate their potential impact to the surrounding environment and to avoid bulk and visual monotony. Design techniques may include:
 - stepping larger structures down to compliment adjacent developments,
 - the use of vertical screen elements,
 - the use of articulated vertical circulation cores, structural elements and/or architectural façade elements to create visual interest,
 - landscape screening and/or an external skin, and
 - considering the use of "Piloti" (piers or supports that lift a building above ground) at the first floor level (ground floor typically, but also at the departures level in the CTA) for LAWA facilities such as the CONRAC, ITFs, and Terminal Buildings.
3. Promote a human scale environment, by providing a distinct ground floor featuring high quality materials that add scale, depth, texture and variety at the pedestrian level, and if possible provide active ground floor uses at corners or along the street frontage.
4. Elevations of floors above the ground floor should articulate multiple floor levels together, collecting them with the same screen wall, curtain wall or other treatment.
5. Building form should encourage horizontality.



Science Park, University of the Basque Country – ACXT | Leica, Spain
Source: <http://www.acxt.net/>



The Whitney Museum – Renzo Piano – New York, NY
Source: <http://www.rpbw.com/>



Cornell Parking Structure – Jon Anderson & Antoine Predock – Albuquerque, New Mexico
Source: <http://jonandersonarchitecture.com>

2.4.3 Roofs

Objective

The roof is a major character-defining feature of a structure and should be designed as part of the overall aesthetic of the structure.

Guidelines

1. Roof forms should conform to a family of related forms rather than individual roof expressions that may compete with one another.
2. Use roof forms to create visual interest and minimize the bulk of larger buildings.
3. Visible roof forms should be rectilinear in expression. "Floating" or cantilevered forms are encouraged when appropriate.
4. To reduce the urban heat island effect, roof surfaces should be light in color.
5. Where feasible, design structures with the ability to accommodate for photovoltaic panels on the roof.



Bascom Library and Community Center - Rob Quigley - San Jose, CA
Source: <http://robquigley.com>



Ferry Terminal - SANAA - Naosha, Japan
Source: <http://www.sanaa.co.jp/>

2.0 Architecture and Urban Design

2.4.4 Lighting

Objective

Building lighting serves a functional purpose for safety and security, yet also has the ability to aesthetically transform a building or structure at night. Providing well designed, energy efficient site lighting will contribute to a safe and inviting atmosphere without casting light into the night sky or adjacent properties.

Guidelines

1. Lighting should be designed to provide ambiance, safety and security.
2. Architectural light elements should complement each other and should avoid competition for attention.
3. Building lighting should be designed and placed to limit impacts on adjacent properties or disrupt the function of the airfield. All lighting within and on rooftops should be shielded so that light sources are not visible from adjacent property or rights-of-way.
4. Incorporate current energy-efficient fixtures and technology for building lighting.
5. Poles and fixtures should be designed to be architecturally compatible with structures and lighting on corresponding properties.
6. Energy efficient LED fixtures are preferred or solar powered with photovoltaics, if feasible.
7. Identify where lighting is needed and confine and minimize lighting to the extent necessary to meet safety purposes. Exterior lighting should be used for safe pedestrian passage and property identification, to the extent possible.
8. All building entrances should be well-lit.

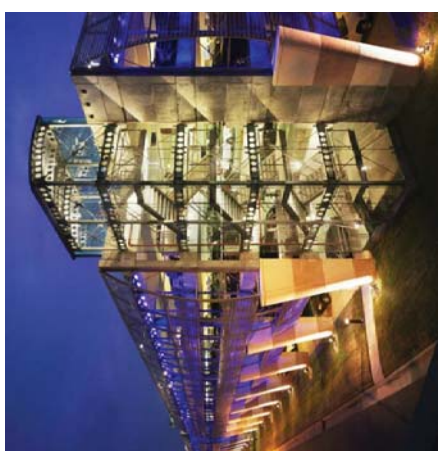
9. Illuminate all primary walkways, steps or ramps along pedestrian routes.
10. Use building mounted fixtures for walkways and gathering areas near buildings.
11. Where feasible, utilize "shut off" controls such as sensors, timers, motion detectors, and automatic controls to turn off lights when not needed.
12. Limit light spill across property lines.
13. Landscape lighting should enhance and complement the landscape materials but refrain from overpowering them with excessive light.
14. Lighting direction and shielding shall comply with applicable FAA requirements.



Parc Relais de la Soie Vaux-e-Velin,
Clement Vergely Architects
Source: <http://www.vergelyarchitectes.com>



Yerba Buena Center for the Arts
James Stewart Polshek - San Francisco, CA
Source: <http://www.embaed.com>



Charlotte Douglas Airport Parking Garage,
Charlotte, North Carolina
Source: CM Kling+Associates Inc

2.4.5 Glazing, Materials and Color Palette

Objective

The use of materials and color can be utilized to create a uniform and integrated setting.

Guidelines

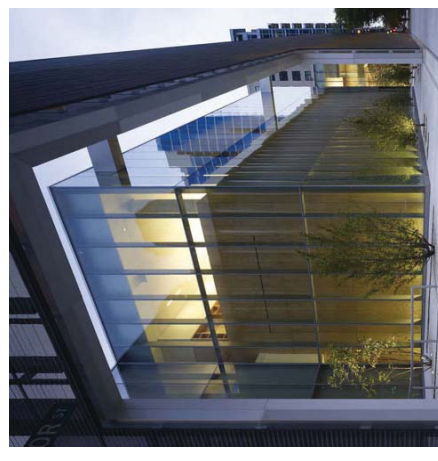
1. Within the CTA, retain the visual character, of materials (i.e., concrete, glazed ceramics, clear glass), finishes (smooth textures, mattes, glossy accents), and palettes (light value, cool hue, low chroma) to reflect the modern, technical, and sunwashed regional character of Southern California as expressed in the original conception of the CTA.
2. The color palette for future projects in the CTA should not compete with other existing elements of color such as the Theme Building lighting, Light Pylons, or Light Bands, and should be neutral in tone and not detract from the overall visual integration of facilities.
3. Glazing should be transparent.
4. Materials should be resistant to graffiti and vandalism and require minimum maintenance. Anti-graffiti firms or coatings should be used to protect glass surfaces and other finish materials such as tile or concrete.



CP Northern
Source: <http://www.cpnorthern.co.uk/>



National Theater of Bahrain - AS Architecture Studio
Source: <http://www.architecture-studio.fr/en/>



Poetry Foundation - John Ronan Architects - Chicago, IL
Source: <http://www.jrach.com/>

2.4.6 Facades

Objective

Facades make up the primary street wall and serve as a visual interface between the street and the building.

Guidelines

1. All surfaces should be easily maintained and be able to be washed down.
2. Surfaces should be low glare.
3. Entries should have a strong architectural gesture.
4. The use of highly transparent materials and vertical sun-shading is encouraged.



UTM Innovation Centre - Moriyama & Teshima Architects
Mississauga, ON, Canada
Source: <http://mtarch.com>



Gewers, Kuhn & Kuhn - Mero-Tisk
Source: <http://www.mero.de/>

2.4.7 Vertical Circulation

Objective

Vertical circulation is a key element by which users access multiple levels of a building or structure. This section applies to vertical circulation for APM and terminal area garages.

Guidelines

1. New vertical circulation cores within the CTA garages should be consistently designed.
2. Vertical circulation elements can be differentiated between CTA garages, terminal cores, and all other cores, including APM cores, however they should be consistently designed within a project.
3. Vertical circulation elements should be visible, readily identifiable, and clearly marked with the appropriate signage and wayfinding so that visitors can easily find and access these entry points.
4. The use of clear and translucent materials with metal panels is encouraged for vertical circulation elements.



Union Square, Aberdeen - The Light Lab
Source: <http://www.thelightlab.com/>



Santa Monica Garage
Source: Gruen Associates

2.4.8 Utilities and Service Areas

Objective

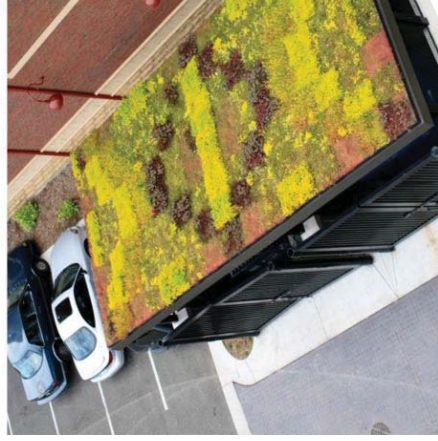
Although utility and service areas are essential to the function of buildings, design and placement of mechanical systems, trash and recycling, and roof mounted equipment should respect neighboring properties to limit adverse impacts.

Guidelines

1. All utility service equipment, including but not limited to meters, vaults, sprinkler risers, vacuum breakers, and all service and trash areas should be screened, to the extent feasible, from neighboring properties and the public right-of-way.
2. Service areas should be designed to minimize automobile and pedestrian conflicts.
3. Roof mounted equipment should be screened using similar materials and colors as the primary building.
4. Ancillary buildings should be built with permanent materials that relate in style and finish to the primary buildings with which they are associated.
5. Trash and recycling storage area should be located in the rear or sides of a building and should be screened from public view with walls, berms, or landscaping.
6. Sheet metal vents, pipe stacks, and flashing should be similar in finish and color to the adjacent roof or wall material.
7. Minimize roof top equipment to maximize available open area for solar collector placement and encourage all new construction to be solar ready, where feasible.



Rooftop HVAC equipment screens with Zero Roof Penetration.
Source: www.plaintub.com/



Trash enclosure located away from pedestrian walkways with unique landscape screening
Source: www.greenroofs.com/

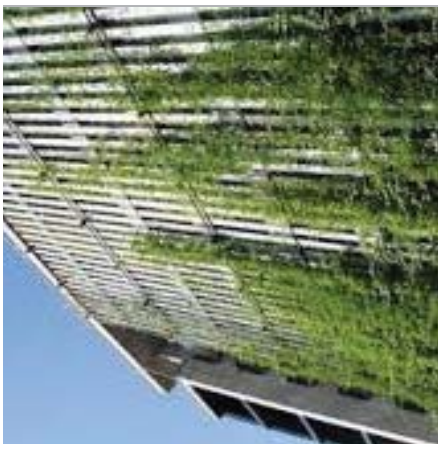
2.4.9 Walls and Fences

Objective

The use of walls and fences for security should be balanced with the need to create an attractive and welcoming environment.

Guidelines

1. Minimize visual barriers and enclosures to promote an inviting and accessible physical environment.
2. Design solid fences or walls with both sides articulated with similar or complementary materials and colors as the primary building with which they are associated.
3. Long expanses of wall should be broken up with projections or recessed elements, landscape pockets, changes in materials and texture.



Green screen landscape fence creates a softened edge.
Source: www.pinterest.com



Mid-Century Modern fence example.
Source: www.pinterest.com

2.5 Buildings

2.5.1 Terminals

Objective

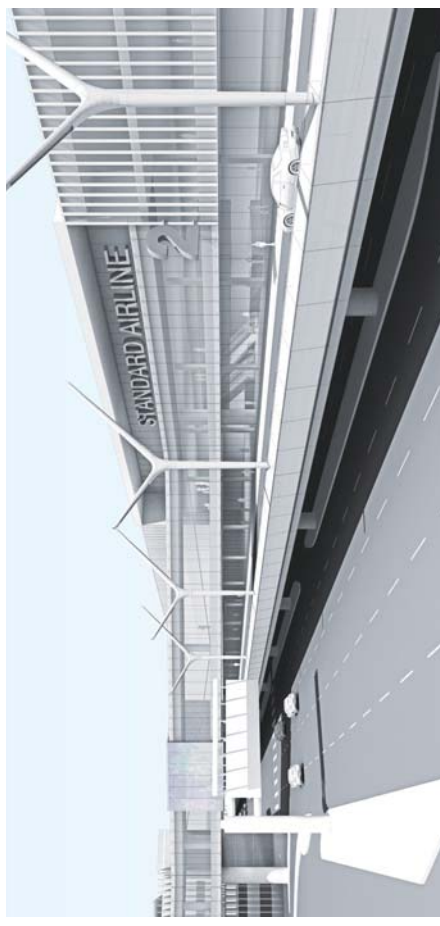
Terminal facades make up the primary street wall within the CTA at the outboard side of World Way, and serve as a visual interface between vehicular/pedestrian visitors and the CTA. New construction and rehabilitation of terminals should be compatible with the existing terminals and add cohesion to the overall CTA.

Guidelines

1. Façade treatment should use materials and language that promote the overall cohesion of the terminal buildings and terminal connectors.
2. Provide opportunities for airline and terminal identification that is clear and easy to identify.
3. Design the floor to cantilever forming a canopy over the sidewalk at the lower level roadway.
4. Reinforce the identity by creating clear and ceremonial front doors.
5. Airline logos and identification should be placed on the interior of the terminal façade, which can be seen through the transparent façade.



San Francisco International Airport - SOM - San Francisco, CA
Source: <http://www.som.com/>



Perspective sketch of facade treatment and terminal identification

2.5.2 Parking Structures

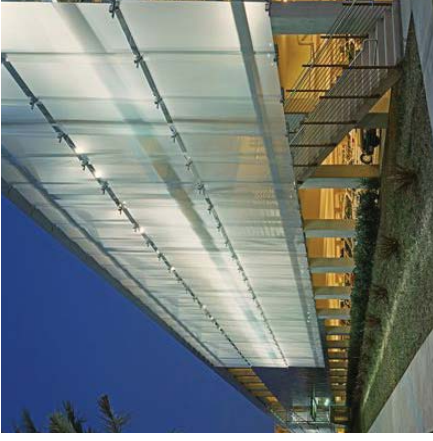
8. For parking structures outside the CTA, structures should be screened with landscaping or should have an external skin designed to improve the building's appearance.

Objective

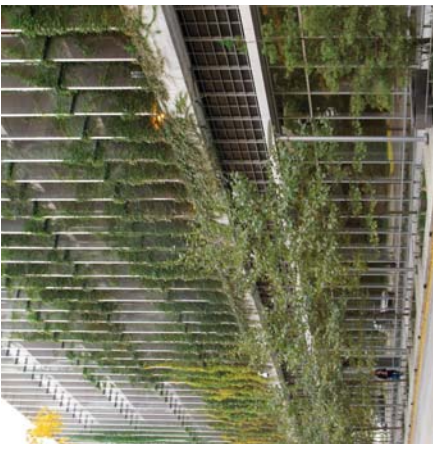
Parking structures serve a very functional purpose but should be compatible with the surrounding environment and be designed to minimize the structures' visual impacts. The following guidelines apply to LAMP facility parking structures or parking structures located in the CTA.

Guidelines

1. Design helical ramps with a clean and stylized aesthetic.
2. Pedestrian access should be directly connected to sidewalks and paths or pedestrian bridges that lead to buildings.
3. Design a pedestrian route through parking structures to accommodate for pedestrian flow and to minimize automobile and pedestrian conflicts.
4. Vertically grained screening on non-terminal facing facades is encourage to diffuse the appearance of stark solids and voids.
5. Provide a landscape buffer strip at the base of parking structures where pedestrian or vehicle access is not provided.
6. Due to the number of existing structures within the CTA, utilize neutral colors and materials such as concrete for parking structures within the CTA to add simplicity and to not compete with primary structures and focal points.
7. New parking structures should have a consistent design throughout the CTA.



California State University, Fullerton - Melendrez Fullerton, CA
Source: <http://www.melendrez.com/>



Rush University Medical Center - Walker Parking
Chicago, IL
Source: <http://greenscreen.com>



Figshospitalet Hospital - 3XN - Adam Mork - Copenhagen, Denmark
Source: <http://www.3xn.com/>

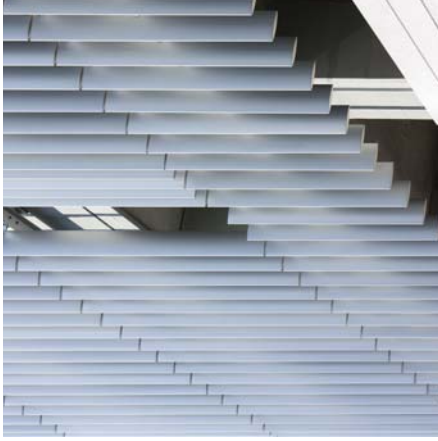
2.5.3 Consolidated Rental Car Center (CONRAC)

Objective

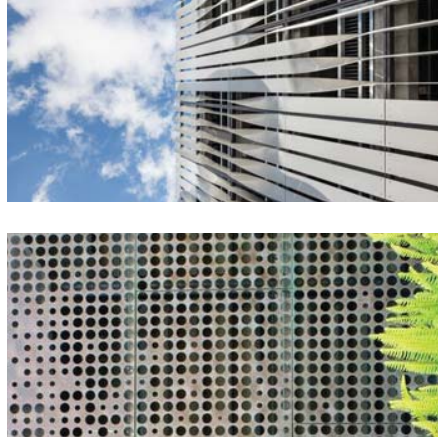
The CONRAC would be designed to consolidate car rental agencies in a centralized location with access to the CTA via the APM. Given the large size of the CONRAC, design should encourage the breakdown of building facades to achieve a human scale.

Guidelines

1. The main CONRAC building should be surrounded with landscaping and trees to soften the street edge.
2. The ancillary building should be heavily screened with landscaping.



Green Square Parking Deck - Pearce Brinkley Cease + Lee Raleigh, North Carolina
Source: <http://www.danknexsen.com>



Precedent Image: Perforated panels and organic slated vertical screening systems to create functional and visually striking façades



San Jose Airport Rental Car Facility, San Jose, CA
Source: <http://www.henselphelps.com/building/aviation>

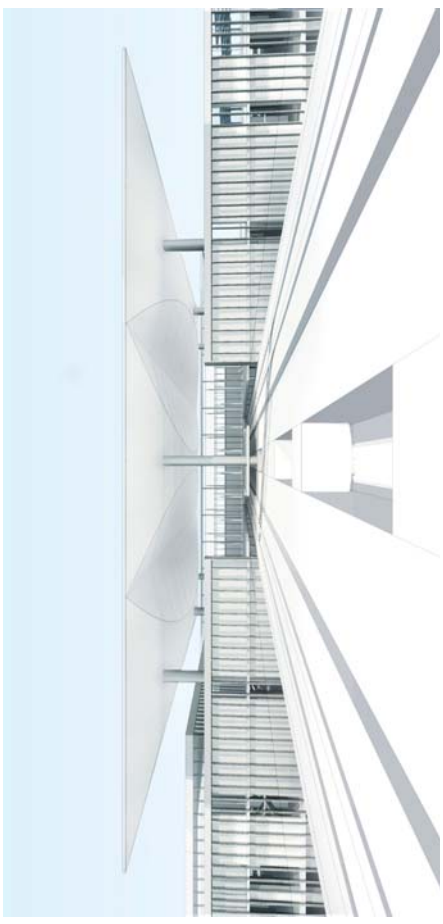


McCarran Rental Car Center, Las Vegas, NV
Source: <http://light-solutions.com/transportation/>

2.0 Architecture and Urban Design



CONRAC sketch illustrates the view of the approach from the APM station.



APM Terminus Canopy acts as the ceremonial front door to the CONRAC facility.



CONRAC facade sketch illustrates a horizontal form with vertical screen elements and a variety of roof heights creating visual interest.

2.5.4 Intermodal Transportation Facilities (ITFs)

Objective

The Intermodal Transportation Facilities will function as new gateways to LAX, by providing convenient, in-the-path-of-travel access to the APM system for those traveling to LAX in private or commercial vehicles. The ITFs would provide convenient locations outside of the CTA for passenger pick-up and drop-off by private vehicles and commercial shuttles or for passengers and employees to park and take the APM to the CTA.

Guidelines

1. Architectural screening and landscape screening is encouraged at the non-occupied ground level.
2. Pedestrian access should be designed to be directly connected to sidewalks and paths or pedestrian bridges that lead to the APM stations, where possible.
3. Provide canopies over plaza space, where feasible, to provide shade for visitors.
4. Provide clear wayfinding for vehicles, pedestrians, and others for access/egress to the site and to the APM-CTA.



Yale Hospital Parking Lot E - Yale, New Haven, Connecticut
Source: <http://www.sga-arch.com/>

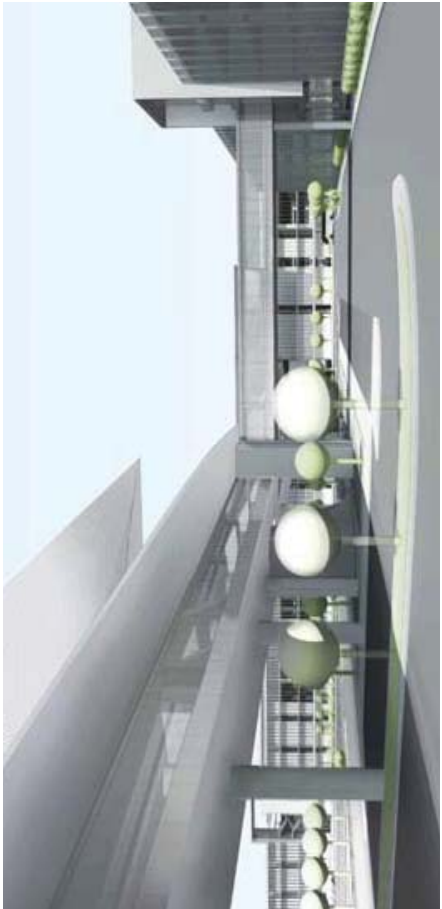


St Omer Station Canopy - Ney Partners, St Omer, France
Source: <http://www.ney.be/>



Fair & Exhibition Hall - Lacaton & Vaassal - Paris
Source: <http://www.lacatonvaassal.com/>

2.0 Architecture and Urban Design



View of ITF East at commercial vehicle curbside



View of ITF West and APM station

2.6 APM System Elements

5. Conduits on the guideway must be hidden.

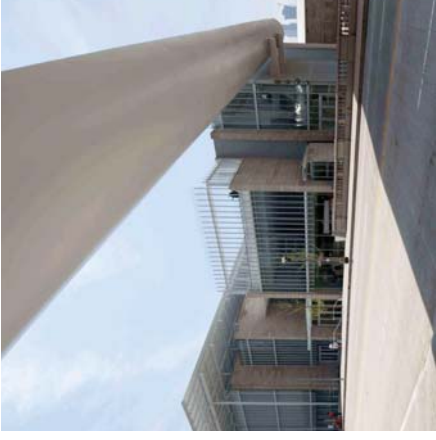
2.6.1 APM Guideway

Objective

The design of the Guideway within the visual area of the Theme Building will be compatible with, but distinctive from the Theme Building. The following guidelines apply in the visual proximity of the Theme Building.

Guidelines

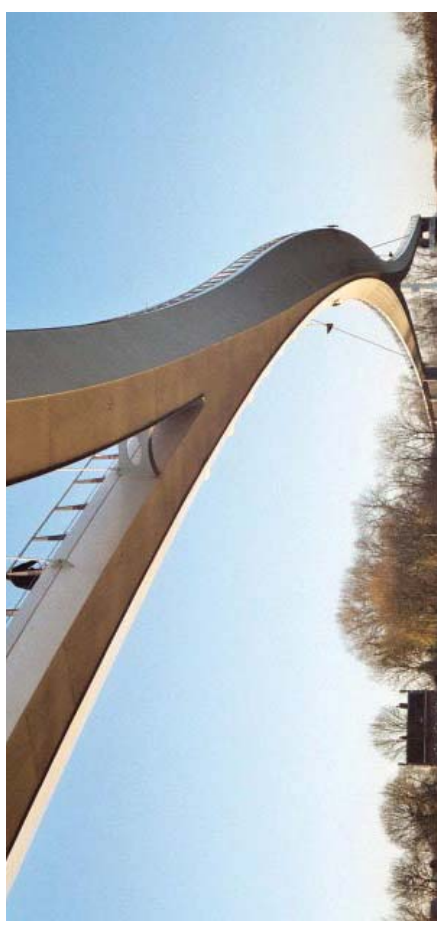
1. Maximize the span between column supports to minimize the impact on views throughout the CTA and surrounding environment, while having fewer potential physical conflicts with existing infrastructure. The column support span surrounding the historic Theme Building shall have a minimum distance of approximately 120'.
2. Encourage an elegant and consistent approach to column design to help unify the APM guideway system. Columns supports should be round.
3. Design the guideway structure to be rectilinear with a tapered edge profile to make the structure appear lighter and more refined. The guideway profile and columns shall have a simple, clean aesthetic. Articulated transverse beams should be avoided, where possible.
4. The underside of the aerial guideway should be sculpted smooth, when feasible.



Chicago Art Institute - Renzo Piano - Chicago, IL
Source: <http://www.rpbw.com/>



Nescio Bridge - W. Eyre - Amsterdam, The Netherlands
Source: <http://www.wikirsoneyre.com/>



Nescio Bridge - W. Eyre - Amsterdam, The Netherlands
Source: <http://www.wikirsoneyre.com/>

2.6.2 APM Stations

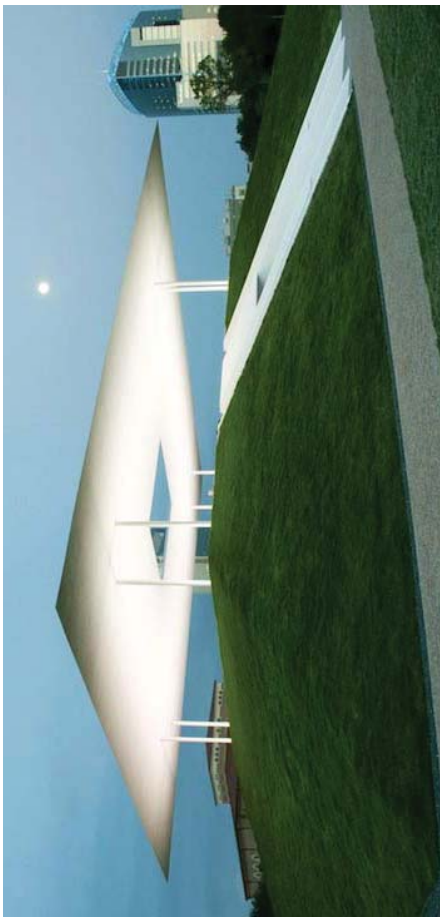
Objective

The designs of the APM stations are encouraged to enhance the user experience and the identity of the APM system. The APM stations have the potential to be strong architectural focal points, within and outside of the CTA, and should be the dominant feature of the APM system. The design of the APM stations is of one family, with the "end" stations at the CONRAC and the West CTA being adapted to express their integration within a larger building. The expression of the APM platform roof at these locations should be a dominant element of that particular structure.

Guidelines

1. Stations should emphasize a strong, clear systemwide identity for visitor circulation.
2. Stations should reflect the unique character of the LAX region.
3. The roof canopy design shall be light in appearance with a thin horizontal profile and shall provide sun and rain protection.
4. Provide a clear partial height enclosure to maximize views from the station platform.
5. Shield visitors from the elements yet allow for natural ventilation.
6. Shield floors and circulation areas so that they are dry and not exposed to the elements.
7. Stations should use transparency in their architecture design to convey security and functionality.

8. Emphasize the station entry, making it easy for users to locate and identify.
9. Provide safe and direct pedestrian access to the stations from surrounding streets and parking structures.
10. The terminus stations act as anchor stations and should be appropriately scaled with canopies.
11. Platforms shall be minimally obstructed, granting varied views of adjacent airport activities and the surrounding area context.
12. Stations should be articulated and use lighting to create a strong architectural focal point within and outside of the CTA.



Rice University, James Turrell, TX

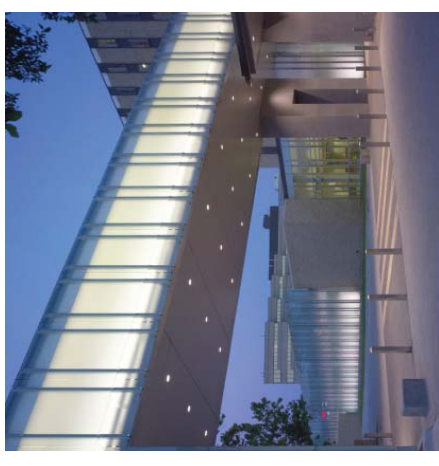


Ferry Terminal - SANAA - Naoshima, Japan
Source: <http://www.sanaa.co.jp/>

8. Bridges should be as transparent as possible, where appropriate, and should use transparency to support safety and wayfinding objectives and provide views for passengers moving to and from the terminals.



Leme Gallery - Metro Arquitetos Associados + Paulo Mendes da Rocha - São Paulo, Brazil
Source: <http://www.leonardofilippi.com/>



Seton Medical Center - Larry Speck - Austin, Texas
Source: <http://larryspeck.com/>

2.6.3 Pedestrian Bridges

Objective

Pedestrian bridges should be designed to enhance the passenger experience providing easy wayfinding and direct access to structures.

Guidelines

1. Design bridges to be functional and simple in form with clean lines to minimize the visual conflict with surrounding structures.
2. Bridges should have a horizontal form.
3. Due to complex connections between APM stations, parking structures, and/or passenger terminals, allow for the design of fluid and rounded corners at bends to navigate around existing architectural elements.
4. Utilize strong horizontal structural members that are as light as possible and tension elements to allow for bridges to span long distances without external cross braces and minimal supports.
5. Bridges should be naturally ventilated and have full protection from the elements, such as moisture.
6. Bridges should be able to accommodate LAX graphics, wayfinding signage and/or advertising within a designated area in lieu of a continuous wrapped surface.
7. The pedestrian bridge below the APM station platforms should be visually integrated with the station.



Pedestrian Bridge - SOLID Architecture - Vienna, Austria
Source: <http://www.solidarchitecture.at/>

STREETSCAPE, LANDSCAPE, AND PUBLIC REALM

3.0

DRAFT 09.08.2016

3.1 Purpose

Streetscape and roadway related guidelines establish a framework and overall vision for the streetscape. They build upon proposed LAWA improvements and land use plans and add an additional layer of information related to the pedestrian environment, active transportation, and aesthetics.

Landscape and public realm design guidelines for the properties adjoining the publicly owned streetscape help to create an attractive and functional environment for multiple users of the Airport. The guidelines presented here address the integration of LAWA facilities and future development with the surrounding area. They also discuss planting palette, landscape buffers to screen and soften architecture, street furnishings, visibility of structures, and opportunities for storm water management.

existing hotels, offices, and light industrial areas. Streetscapes and public rights-of-way are envisioned to contribute to LAX's unified design aesthetic.

Pedestrian and bicycle connections are envisioned to be seamlessly integrated with other transportation modes. Pedestrian movement will be clearly delineated on specified routes in order to provide the best pedestrian connectivity to proposed LAWA facilities and future developments. The passenger experience will be improved with enhanced amenities and wayfinding.

The design guidelines for streetscape, roadways, pedestrian and bicycle connections seek to:

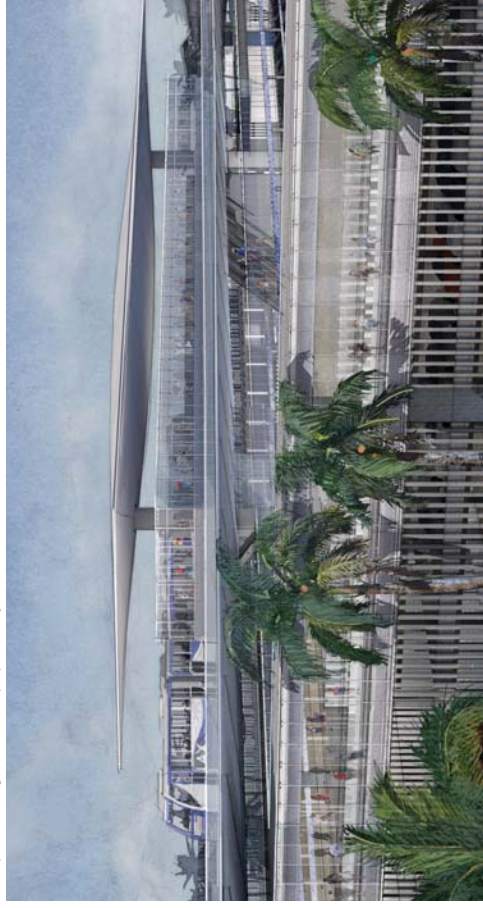
- Enhance major entry roadways into the LAX area so that they define the entrances, provide visual wayfinding cues through landscaping and signage, and establish a high quality visual image for the LAX area.
- Create "gateways" into the LAX area with a strong visual identity.
- Develop a streetscape framework and physical environment that supports LAWA's goal of creating a world-class airport focusing on the guest experience.
- Improve the passenger experience and ease of access to LAX through clarity of circulation, amenities, and wayfinding.
- Integrate pedestrian, bicycle and landscape improvements by creating a pleasant, attractive, multi-modal, balanced transportation network where pedestrian/cyclists can co-exist with shuttles/buses and automobiles.
- Create well-defined edges between the pedestrian and the vehicle realm
- Use a hierarchy of spaces that helps define the use of the pedestrian space
- Use attractive and functionally appropriate

3.2 Streetscape, Landscape, and Public Realm Vision

The future vision for streetscape is that a network of roadway improvements, new roadways, the APM and new Metro Light Rail (LRT) stations on the Crenshaw Line will connect the CTA, new LAWA Buildings (the ITFs, CONRAC), future development, and



LAX is envisioned to have multi-modal access and a balanced network of roadways and transit. Conceptual drawing for illustrative purposes only.



The Automated People Mover station is defined by a floating sculptural plane that is distinct, yet related to the sculptural forms of the Theme Building. Conceptual drawing for illustrative purposes only.

3.0 Streetscape, Landscape, and Public Realm

- pedestrian scaled lighting and a unified family of street furnishing
- Use street trees to provide wayfinding, shade, and a buffer from the street
- Encourage durable materials that reflect functional and aesthetic requirements
- Provide a sustainable environment through drought tolerant landscaping, storm water management, energy efficiency and pedestrian, bicycle and transit connections.

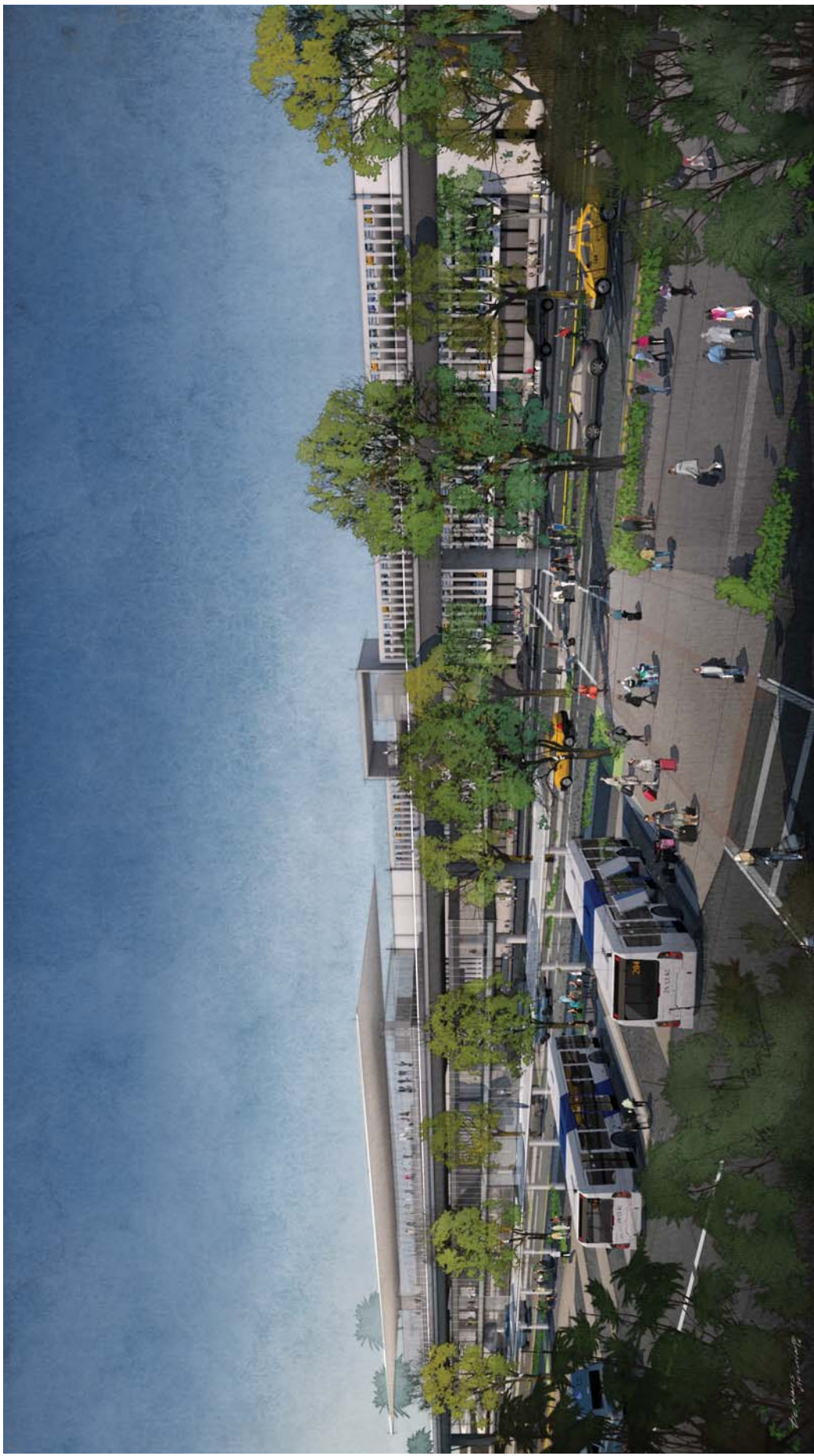
Landscaping is envisioned to be sustainable and to create a unified, attractive and functional environment for multiple users of the Airport. Landscaping will be used to integrate LAVA facilities, future development, and the surrounding community through a consistent plant palette, landscape buffers, and storm water management. Additionally, landscaping will be used to reinforce wayfinding related to pedestrian, bicycle, and vehicular movement. The landscape related design guidelines seek to:

- Create a sustainable landscape palette that is unified, attractive, and functional.
- Use landscaping to soften views and buffer new facilities.
- Utilize stormwater Best Management Practices in landscape areas, where possible.



Landscaping is envisioned to be sustainable and create a unified, attractive, functional environment.
Conceptual drawing for illustrative purposes only.

3.0 Streetscape, Landscape, and Public Realm



Streetscapes and public right-of-ways are envisioned to be unified and attractive.
Conceptual drawing for illustrative purposes only.

3.0 Streetscape, Landscape, and Public Realm



The APM is envisioned to connect LAX to existing and future development and the Metro light rail system.
Conceptual drawing for illustrative purposes only.

3.3 General Streetscape Guidelines

Objective

As part of its modernization program, LAWA will be making a series of roadway improvements for vehicular movement, bicycle use, and pedestrians. As part of these improvements, LAWA will follow the following guidelines.

Guidelines

1. Roadways, except the CTA roadways, should be lined with street trees, where feasible, near the curb, shading the sidewalks and creating an attractive and distinctive aesthetic appearance.
2. To facilitate pedestrian movement and provide room for amenities, sidewalks should be wide, ranging from 13' on collector streets to 18' on boulevards, when feasible and within the public right-of-way.
3. Adequate and distinctive lighting should be provided throughout the CTA and LAMP campus area. Street lights would be City-approved LED lighting. If there is a BID, City or LAWA agreement for maintenance, lighting on other special poles/fixtures similar to the CTA should be considered throughout the Design Guidelines area.
4. Century Boulevard should comply with the City's Century Corridor Streetscape Plan, once adopted, including wide sidewalk/parkway areas with a double row of street trees, where feasible, and

- a landscaped multi-use pathway on the south side. Pedestrian lighting should be introduced on both sides of the street complementing the existing light columns. Pedestrian connections from existing development along Century Boulevard and new future development should have a direct pedestrian connection to and from the CTA.
5. New future development should have clear, easy to navigate and attractive pedestrian and bicycle connections to the APM stations.
6. Landscaped medians and pedestrian refuge areas should be provided, where feasible, to reduce roadway crossing distances.
7. Streetscape areas should incorporate storm water management and drought-tolerant landscaping.
8. Wayfinding signage for vehicles, pedestrians and bicyclists should be integrated into the streetscape.
9. Vehicle bridges and overpasses should be designed to maintain the existing iconic light columns, to facilitate pedestrian/bicycle movement below, where appropriate, and accommodate lighting and landscaping of pathways.



Source: Land Perspectives.com



Source: Gruen Associates

3.4 Streetscape Guidelines for Individual Streets

Objective

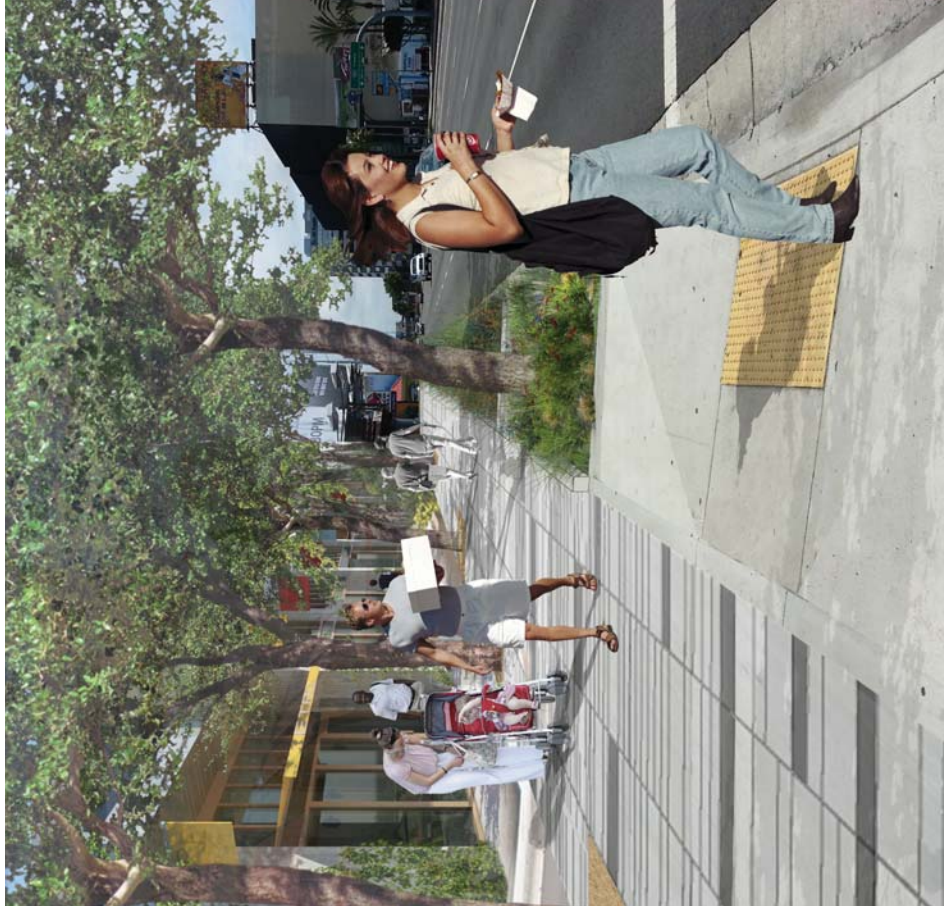
These guidelines provide additional guidance and vision for specific streets.

Guidelines and Vision

1. Century Boulevard, as the main ceremonial entry into the CTA, can be considered the backbone of the streets and boulevards in the area.
 - Refer to the Century Corridor Streetscape Plan.
 - Provide regularly spaced pedestrian-oriented lighting compatible with the existing light columns to create a strong nighttime image along the edges of the street.
 - Benches, trash cans, and other street furniture should be placed along the corridor and at transit stops.
 - CTA pedestrian access across Sepulveda Boulevard should be maintained for pedestrians to the CTA from existing and future uses along Century Boulevard.
2. 98th Street from New Street A to Aviation Boulevard is envisioned as a major entry roadway serving primarily private developments and some LAWА facilities.
3. 98th Street from Aviation to La Cienega Boulevard is envisioned as a new street serving as a major boulevard for arriving

vehicles from the 405 Freeway and ITF-East and as an entrance to CONRAC.

4. Westchester Parkway/Arbor Vitae Street would connect LAWА facilities with the 405 Freeway and vehicles accessing the Airport from the north.
 - Proposed protected bicycle lanes should be provided along Westchester Parkway from Sepulveda Boulevard to Airport Boulevard and a multi-use pathway on the south side from Aviation Boulevard to La Cienega Boulevard.
5. New Street A provides access to the CTA and ITF West via Sepulveda Boulevard and Westchester Parkway. South of 98th Street, it provides access to the ITF West from Century Boulevard as it parallels the new proposed APM guideway.
6. Airport Boulevard is envisioned as an exit boulevard from Westchester Parkway to the Intermodal Transfer Facility (ITF)-West and a major entry road for the remainder of the Design Guidelines area. Bike lanes are planned between Westchester Parkway and 98th Street.
7. Aviation Boulevard from Century Boulevard to Arbor Vitae Street is envisioned as a major entry boulevard and the remainder as a major vehicular entry to the proposed CONRAC and ITF-East and the Metro 96th Street station.
 - Provide a multi-use pathway on the west side of Aviation Boulevard from Arbor Vitae Street to 98th Street transitioning to the east side of Aviation at the 98th Street intersection.



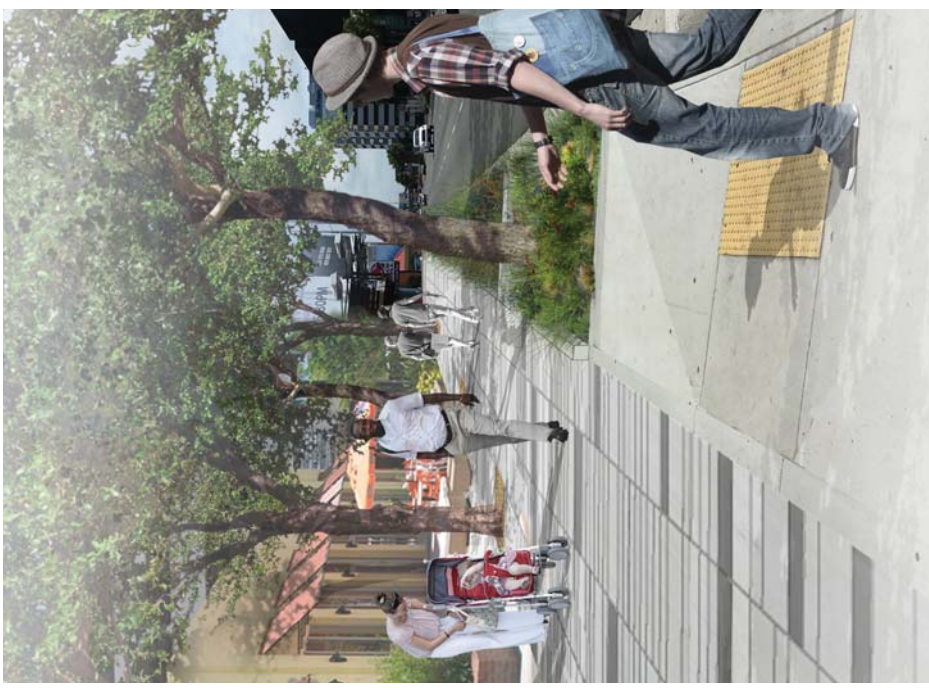
Typical view along Century Boulevard adjacent to future development

3.0 Streetscape, Landscape, and Public Realm

- Pedestrian-scaled lighting should be provided to illuminate the multi-use path.
- Provide a raised median with turn lanes at signalized intersections, with optional trees and landscaping.



Typical view along Century Boulevard.



Typical view along Century Boulevard.



Typical view along Century Boulevard.

3.0 Streetscape, Landscape, and Public Realm



Typical view along Airport Blvd.

3.5 Roadway/ Streetscape Elements

This section includes guidelines for key elements to consider in designing the streetscape of the Design Guidelines area. The public right-of-way includes the roadway, the bicycle network and the sidewalk area. In addition to the guidelines listed in this section for the roadway, bicycle network and pedestrian environment, the City of Los Angeles, has other more detailed standards and guidelines to achieve a safe, visually attractive and efficient, multi-modal complete street environment. These guidelines are complementary to the City of Los Angeles standards and guidelines and both should be considered along with other applicable City of Los Angeles documents.

Streetscape elements in the roadway may include crosswalks, landscaped medians, raised medians and bike facilities.

3.5.1 Crosswalks at Signalized Intersections

Objective

Crosswalks improve pedestrian safety and help to reduce collisions, injuries, and fatalities with pedestrians at street intersections. To promote safe pedestrian crossing areas, the Mayor, City Council, and the Los Angeles Department of Transportation (LADOT) adopted a Standard for Crosswalks. The design standard intends to create a higher visibility at intersections to alert motorists that pedestrians may be present.

Guidelines

1. Standard solid white banding should be used to enhance crosswalks at signalized intersections.
2. Sidewalks should have a minimum 24-inch wide multiple series of stripes at 36" spacing, for a vertical distance of 20 feet across the intersection. There should be a 5-foot set-back traffic limit line to reduce vehicular encroachment into the crosswalk.



Continental crosswalks at controlled intersections
Source: Gruen Associates

3.5.2 Push-Button Integrated Accessible Pedestrian Signals (APS)

Objective

Pedestrian signals ensure that pedestrians are given adequate time to cross the roadway and are not stranded in the crosswalk by signal lights with insufficient crossing time.

Guidelines

1. Push buttons should be provided at signalized intersections, including midblock crossings and should include locator tones.
2. Signal buttons should be located as close as possible to the curb ramp without reducing the width of the path. Signal buttons should be raised above or flush with their housings and be at least 2 inches in the smallest dimension.



Typical Signal Button
Source: <http://www.pelcon.com/traffic.aspx>



Countdown Signalized Crossing
Source: <http://at.usc.edu>

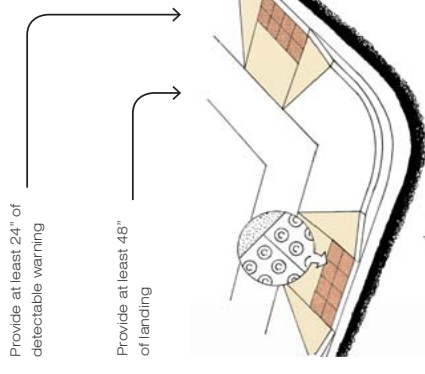
3.5.3 Crosswalk Ramps

Objective

Curb ramps provide accessibility and safer, convenient, and direct path of travel for pedestrians at the ramp.

Guidelines

1. Two curb ramps should be provided at each corner of an intersection aligned with the direction of travel are preferred to accommodate people in wheelchairs, in accordance with the Americans with Disabilities Act (ADA). Curb ramps should be aligned with crosswalks.
2. The ramps should be designed with detectable warning surfaces as shown in the photo and diagrams to the right.
3. Minimum width of a curb ramp should be 48 inches.



Provide at least 24" of detectable warning

Provide at least 48" of landing

Source: USDOT, Federal Highway Administration



Wausau pavers, ADA-70 truncated dome pattern
Source: <http://www.pccbkessafe.org>

3.5.4 Pedestrian Refuge Areas

Objective

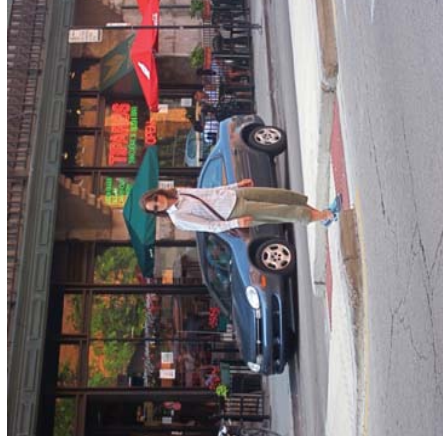
Traffic and pedestrian safety should be considered when determining the appropriate travel distances across intersections and from curbside. Pedestrian refuge islands provide a safe area for pedestrians waiting in the middle of wide streets with many travel lanes. The refuge area is connected to the sidewalk by a crosswalk.

Guidelines

1. Pedestrian refuge areas are recommended at intersections where roadway widths exceed 120'.
2. Where pedestrian refuge areas are provided within the public right-of-way, they should be a minimum of 4-feet wide, although a 6-foot wide size is recommended.



Pedestrian Refuge Island at mid-block crossing
Source: Gruen Associates



Pedestrian Island on Clark Street, Chicago, Illinois
Source: Bike Walk Lincoln Park

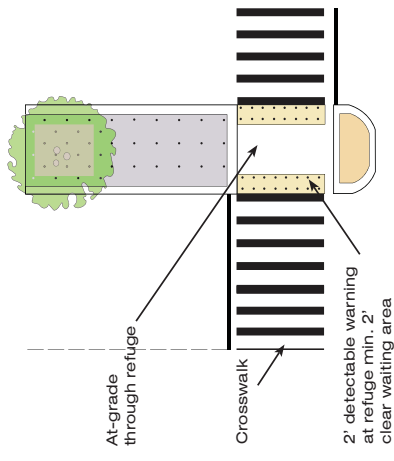
3.5.5 Medians and Median Landscaping

Objective

Raised medians with trees provide an opportunity for greening the corridor. Raised hardscape medians also help reduce the scale of a large roadway without removing travel lanes, as they are installed within existing center left-turn lanes.

Guidelines

1. Where provided, medians should be a minimum of 7' wide.
2. Other Considerations:
 - Tree spacing should be at least 50' from crosswalks to insure sight lines for vehicles.
 - Median landscaping or porous paving should be used to collect and infiltrate storm water.
 - Raised medians provide a visual separation for vehicles and promotes reduced speeds.
 - Trees in the median contribute to the identity and placemaking quality of the streetscape.



US Department of Transportation, FHA Standards



Landscaped Medians on Century Blvd
Source: Gruen Associates

3.6 Site Access and Circulation

Objective

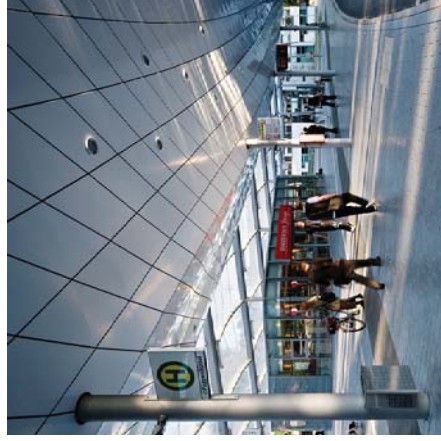
Access to a site and circulation should be clearly organized and designed to minimize potential conflicts between all users, including pedestrians and bicyclists.

Guidelines

1. Prioritize pedestrian connections for site access to minimize conflicts and increase safety. The pedestrian access routes should be clearly marked and may use techniques such as raised crosswalks, crosswalks with lights, signage, lighting, distinctive street trees and/or using distinct paving material to show the pedestrian route.
2. Design automobile and bus pick-up/drop-off locations to be easily accessible and to minimize pedestrian conflicts.
3. Where possible, design sites to separate the flow of traffic for the varying modes of transportation, such as automobiles, cyclists, pedestrians, and buses to improve efficiency and safety.
4. Bus staging areas should allow for safe pedestrian connections and minimize the visual impact of the large amount of paving required through the use of high quality paving materials and design.



Double row of street trees and simple paving material with non-standard scoring help to define the pedestrian route, Portland, OR. Source: Gruen/Associates



Poppenbittel Bus Station in Germany
Source: Malke Hansen

3.7 Pedestrian and Bicycle Network

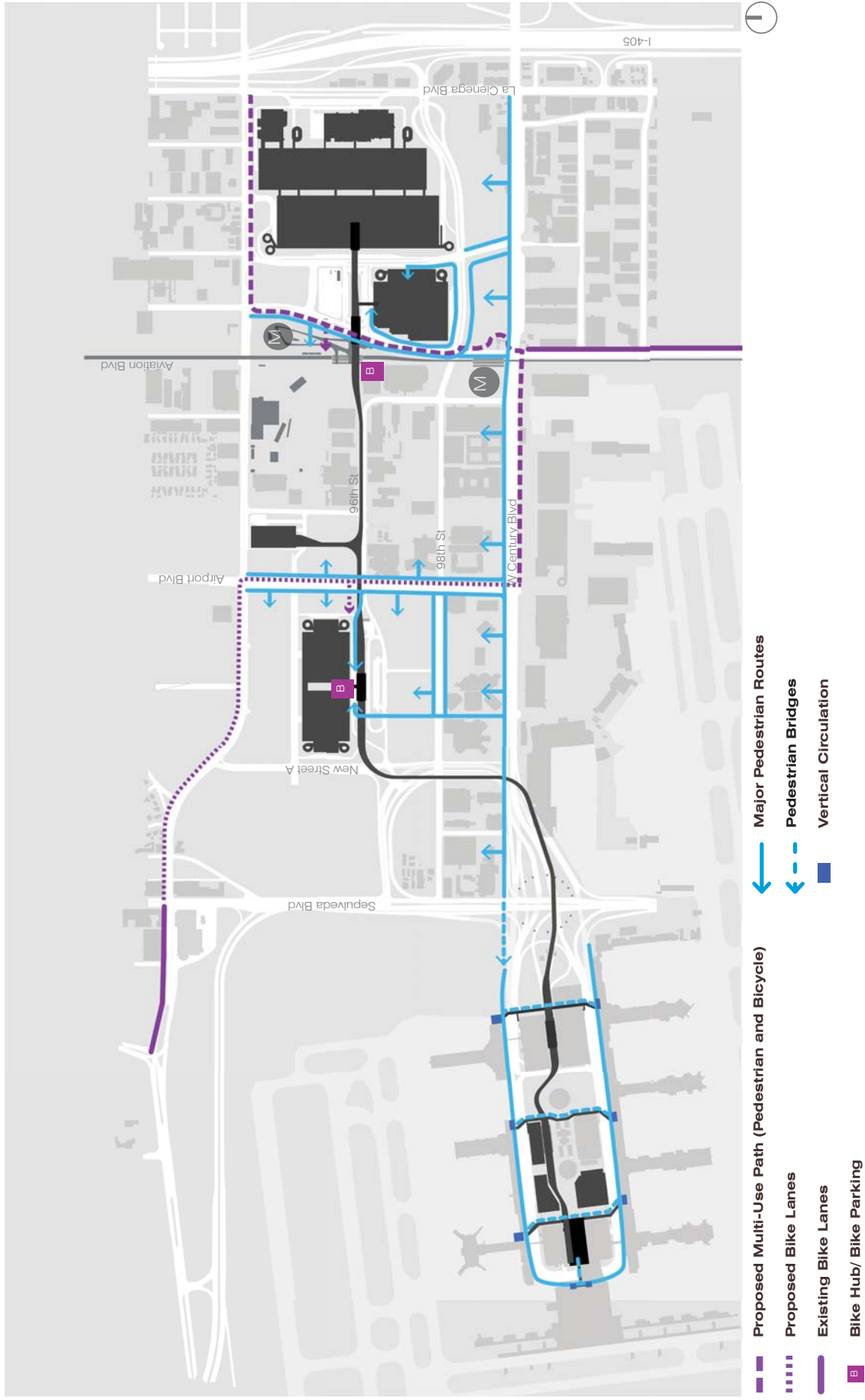
In addition to vehicles, buses and shuttles, visiting passengers and employees in the area will be walking or biking to and from APM stations, Metro transit stations, hotels, and offices. The pedestrian circulation system should connect buildings, streets, parking areas, and transit stops/stations to create an environment that supports all modes of transportation for the variety of needs of LAXA's guests.

Sidewalks are the most important component of the area's pedestrian circulation network. Sidewalks provide pedestrian access to virtually every activity and provide critical connections between other modes of travel, including the automobile, public transit, bicycles, and to land uses in the area.

Bicyclists have legal access to all city streets. While this document identifies specific streets that are designated as streets for bike lanes or multi-use paths, many cyclists will use any street within the area to reach their destination. The following key principles should guide the development of the bike network for the LAX Design Guidelines:

- Bike facilities should be clearly identified and easy for cyclists to use.
- The bicycle network should connect to the major destinations in the area and connect seamlessly to other modes of transportation such as the APM and the LRT stations. Bike Hubs are planned at the Metro 96th Street Station and TIF West.
- Bike facilities should connect to existing bike lanes and create connectivity throughout the area.
- Bike lanes and facilities should be designed free of hazards and minimal conflicts.

3.0 Streetscape, Landscape, and Public Realm



Pedestrian and Bicycle Connections Diagram

3.7.1 Bike Lanes in Roadway

Objective

Bicycle lanes or Class II (Tier 2) bicycle facilities are defined as a share of the roadway that has been designated by striping, signage, and pavement markings for the preferential or exclusive use of bicyclists. Bicycle lanes assist and provide bicyclists with their own lane within the roadway and allow cyclists to ride at their own speed and reduce conflicts with vehicles. Protected bicycle lanes (often called cycle tracks) are on-street bicycle facilities with either striping or a raised barrier separating the protected bike lanes from arterial traffic.

Guidelines

1. The width of a typical bike lane should vary from 5' minimum to 7' maximum recommended when adjacent to parking. The width of a protected bike lane should be a minimum 5' with a 3' striping or barrier.
2. When provided, bike lanes should have standard white striping; however, color concrete or asphalt may be considered with a maintenance agreement.
3. When provided, striping to separate the bike lane from traffic lane should be 6"; dashed white to delineate conflict areas.
4. Bicycle Lane Signs should be used at the beginning of bicycle lanes, at approaches, and at major changes in direction.
5. When provided, pavement markings should be graphic representations of a bicyclist with a directional arrow.



Protected Bike Lane on Rosemead Blvd. - Temple City, CA
Source: Gruen Associates



Buffered Bike Lane with striping
Source: LAWA

3.7.2 Multi-Use Pathway

Objective

A shared-use path serves as part of a transportation circulation system and supports multiple recreation opportunities, such as walking and bicycling. A shared-use path typically has a surface that is asphalt, or concrete. The 1999 American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities defines a shared-use path as being physically separated from motor vehicular traffic with an open space or barrier (AASHTO, 1999). Shared-use paths should always be designed to include pedestrians even if the primary anticipated users are bicyclists.

Guidelines

1. The width of a typical multi-use pathway should be a minimum of 17' to include a bi-directional bike path and a pedestrian walkway. Additional space could be required to allow for signage and street trees.
2. When provided, multi-use pathways should have standard white striping; however color concrete or asphalt for paving may be considered with a maintenance agreement.
3. Multi-use pathways should have signs that clearly describe the multi-use path conditions to enhance pedestrian access.
4. When provided, pavement markers should be 4" dashed yellow centerline, 4" solid white shoulder stripe, and hash marks to separate bicyclists from pedestrians.



Active transportation multi-use path along Toronto's waterfront
Source: Corrie Tsang for Waterfront Toronto



Metro Orange Line multi-use path along Canoga Blvd
Source: Gruen Associates

3.7.3 Pedestrian Zone

Objective

The Pedestrian Zone is the area intended for pedestrian travel and should be of adequate width to accommodate pedestrians, including those with disabilities.

Guidelines

1. A minimum width of 5' should be provided on all sidewalks and the area should be completely free of permanent or temporary objects. Additional sidewalk width should be provided consistent with the City of Los Angeles Mobility Element 2035, as amended.
2. Driveway aprons should not intrude into the minimum American Disabilities Act (ADA) Clear Area.
3. The minimum vertical clearance for through passage should be 60 inches, but may be reduced to 44 inches for vertical obstructions between 27 and 80 inches above the surface of the pedestrian access route.



NW 10th Avenue in Portland, Oregon
Source: Gruen Associates



Rosemead Boulevard, Temple City, CA.
Source: Gruen Associates

3.7.4 Pedestrian and Bicycle Orientation

Objective

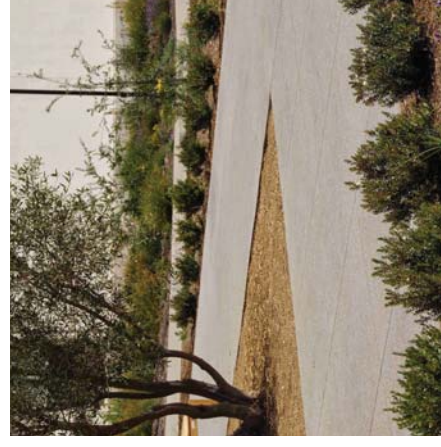
Design should support all modes of transportation for the variety of mobility needs at LAWA.

Guidelines

1. Encourage the design of mid-block passageways, pedestrian walkways or paseos, where appropriate.
2. Provide clear, direct, and attractive pedestrian and bicycle connections to transit options.
3. A direct pedestrian connection designated by distinct landscaping and paving materials should be provided between parking areas and the buildings they serve.
4. Bicycle parking where feasible, should be located in highly visible locations adjacent to building entrances or near pedestrian entrances of parking structures.



Covered bike shelter
Source: www.lacbrmanagementgroup.com



Pedestrian walkways should be enhanced with landscaping and ADA accessible paving materials.
Source: <http://pieceofeden.blogspot.com/>

3.8 Street Lighting

Well-lit streets and sidewalks provide a welcoming and safe environment for pedestrians. Well-designed lighting provides visibility and makes it easier to maintain security and discourage graffiti. A well-lit public space attracts people and customers. In these Design Guidelines, street lighting is proposed at different scales to enhance and promote safer streets.

- aesthetic may be used on other streets near LAWA facilities. The streets that could include these specialty roadway lighting should be: New Street A, New Street B, ITF West Rotary, New 98th Street, Concourse Way, and ITF East Rotary. See diagram below for areas described.



CTA Roadway Light Poles
Source: www.archlighting.com/

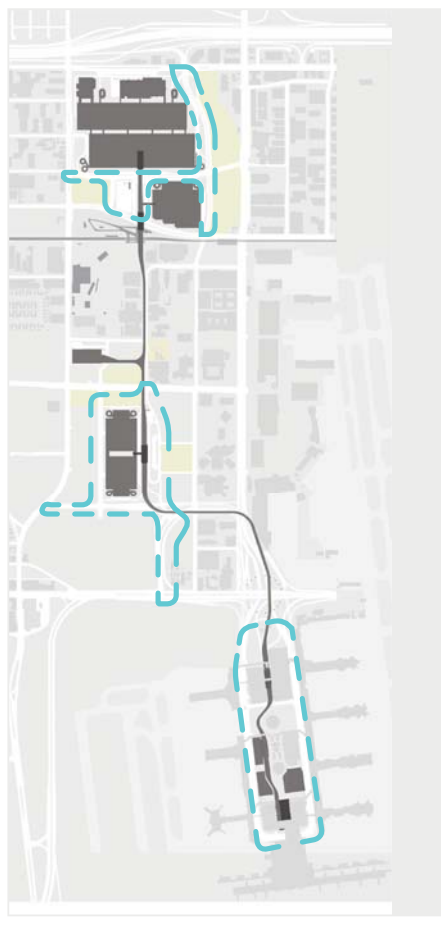
3.8.1 Roadway Street Lighting

Objective

Roadway lighting is a necessary way to increase visibility for drivers, cyclists and pedestrians. Appropriately designed roadway lighting allows drivers to quickly assess roadway conditions and creates a safe and accessible environment within the roadway and sidewalk area for all users.

Guidelines

1. Street dimensions and the major function of the street environment should be considered when determining the location and spacing of the roadway lighting.
2. LED lighting is the common choice for most roadway lighting designs.
3. Other Considerations:
 - Street tree placement should not conflict with the roadway lighting design and maintain the optimum visibility of the roadway at all times.
 - The distinctive light standards used within the CTA or another design



Potential Areas for distinctive lighting

3.0 Streetscape, Landscape, and Public Realm

3.8.2 Pedestrian Lights

Objective

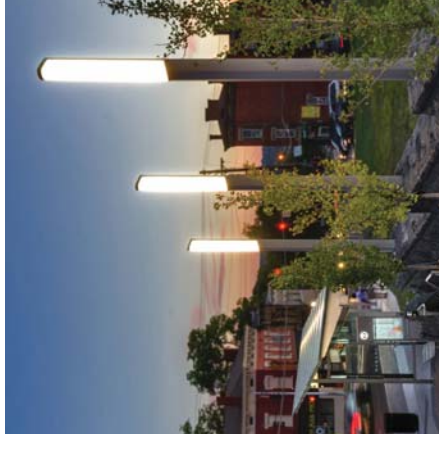
Pedestrian lighting creates a more comfortable level of light quality for pedestrians and contributes to the overall experience and identity of the street. It improves security and safety by properly illuminating sidewalks, curb ramps, barriers and informational signage for pedestrians, transit users and bicyclists.

Guidelines

1. Provide lights on sidewalks, in pedestrian walkways and public spaces to ensure pedestrian safety.
 2. Pedestrian lighting is typically 10'-15' in height but lower bollards are also effective in illuminating pathways. Pedestrian fixtures should be placed between existing street lights to provide more even, uniform distribution of light to enhance visibility and safety for the pedestrian experience.
 3. Comply with FAA guidance on downward facing lighting.
 4. Energy efficient LED fixtures or solar powered with photovoltaics shall be used, if feasible.
 5. Other Considerations:
 - Pedestrian lights should complement the design of the family of site furniture to help unify the streetscape experience. The design should also relate to the quality and character of the surrounding architecture.
 - The placement of lights can be in the pedestrian zone as long as a clear path of travel is maintained for ADA access.
 - Pedestrian lights improve security
- and safety by properly illuminating sidewalks, curb ramps, barriers and informational signage for pedestrians, transit users and bicyclists.
- Along other major streets adjacent to LAVA properties, placement of pedestrian lighting should occur on LAVA properties adjacent to the public right-of-way. If there is a special assessment for property owners to share the cost of installation and maintenance, the pedestrian lighting could be located in the portion of the sidewalk between the curb and the area intended for pedestrian travel.



Light Column specified for Century Blvd in the Century Blvd Streetscape Plan *Source: www.farms+surfaces.com*



Iconic lighting Uptown Transit Hub, Cincinnati, Ohio *Source: www.farms+surfaces.com*

3.9 Landscape Zones

3.9.1 Zones

In addition, within the LAWA Facilities Zone and the Landside Support Subarea, there are opportunities to consider usable open space, landscaping to buffer these large facilities and bioswales/storm water management.

These three major zones are illustrated on the diagram that follows and also indicate a potential landscape buffer zone around the ITFs, CONRAC, APM, and Maintenance Facility. This buffer zone could also include open space or bioswales/storm water management areas. The key open space/plaza, anticipated as part of the Future Landside Support Subarea along Century Boulevard is also shown on the diagram.

Objective

To develop zones and guidelines that establish a framework for designing the future landscape environment of the Design Guidelines Area.

Guidelines

The Design Guidelines Area consists of three major zones/subareas to consider when designing landscape improvements on LAWA-owned properties:

1. The Streetscape Zone includes the area within the public right-of-way in streets adjacent to LAWA properties and other surrounding properties, where feasible.
2. LAWA Facilities Zone include sites for existing and future LAWA facilities encompassing the ITFs, CONRAC, terminals, parking structures, parking lots, and APM, guideways and stations.
3. The Landside Support Subarea includes LAWA-owned properties anticipated for future development such as retail, hotel, restaurant or another similar uses.

3.0 Streetscape, Landscape, and Public Realm



Landscape Zone Diagram

LEGEND

- Streetscape Zone
- LAWA Facilities Zone and Landscape Buffer
- Landside Support Subarea
- Opportunity for Open Space/ Plaza



3.0 Streetscape, Landscape, and Public Realm

3.10 Plant Palette

Objective

To develop a drought-tolerant, low maintenance plant palette that can be applied to the zones outlined above.

Guidelines

1. The Plant Palette guidelines for each of the landscape zones are shown in Tables 3.10-1 through 3.10-4 and accompanying photos. In addition, these tables also indicate trees and plants recommended for open space, landscape buffers adjoining LAWA facilities, and bioswales/storm water management areas.

TABLE 3.10-1 // Trees

| SCIENTIFIC NAME | COMMON NAME | APPROXIMATE GROWTH H x W | COMMENTS | Streetscape Zone | LAWA Facilities Zone | Landside Support Subarea | Opportunity for Open Space | Bioswale/Stormwater Management |
|--|----------------------------|--------------------------|---|------------------|----------------------|--------------------------|----------------------------|--------------------------------|
| <i>Acacia stenophylla</i> | Shoestring Acacia | 35' X 20' | Low water/ Evergreen | X | X | X | X | |
| <i>Acacia pedula</i> | Weeping Acacia | 20' X 20' | Low water/ Evergreen | X | X | X | X | X |
| <i>Arbutus 'Marina'</i> | Marina Strawberry Tree | 40' X 30' | Low water/ CA Native | X | X | X | X | X |
| <i>Brahea Armata</i> | Mexican Blue Palm | 30' X 15' | Low water/ Evergreen/ CA Native | X | X | X | | |
| <i>Calocedrus Decurrens</i> | Incense Cedar | 50' X 30' | Low water/ Evergreen | X | X | | | |
| <i>Casuarina cunningghamiana</i> | River She-Oak | 70' X 30' | Low water/ Evergreen | | | X | | |
| <i>Cupressus arizonia</i> | Arizona Cypress | 40' X 20' | Low water/ Evergreen | | X | X | | |
| <i>Cupressus macrocarpa</i> | Monterey Cypress | 35' X 35' | Low water/ CA Native | | X | | | |
| <i>Cupressus forbesii</i> | Tecate Cypress | 35' X 35' | Low water/ Evergreen/ CA Native | | X | | | |
| <i>Glejeria parviflora</i> | Australian Willow | 35' X 25' | Low water/ Evergreen | X | | X | X | |
| <i>Koeleruteria bipinnata</i> | Chinese Flame Tree | 30' X 20' | Moderate water/ Deciduous | X | | X | X | |
| <i>Lophostemon confertus</i> | Brisbane Box | 40' X 25' | Low water/ Evergreen | X | | X | X | |
| <i>Lyonothamnus floribundus</i> | Catalina Ironwood | 30' X 20' | Low water/ Evergreen/ CA Native | X | X | X | | |
| <i>Lysiloma Watsonii</i> | Feather Bush | 35' X 25' | Low water/ Evergreen | | X | X | | |
| <i>Melaleuca quinquenervia</i> | Cajuput Tree | 40' X 25' | Low water/ Evergreen | | X | X | X | X |
| <i>Metrosideros excelsa</i> | New Zealand Christmas Tree | 25' X 15' | Low water/ Evergreen | X | X | X | X | |
| <i>Myrica californica</i> | Pacific Wax Myrtle | 30' X 20' | Low water/ Evergreen/ CA Native | | X | X | | |
| <i>Olea europaea</i> | Olive tree | 30' X 25' | Low water/ Evergreen/ Fruitless Variety | | | X | X | |
| <i>Parkinsonia x 'Desert Museum'</i> | Desert Museum Palo Verde | 25' X 25' | Low water/ Semi-deciduous/ CA Native | X | X | X | X | X |
| <i>Phoenix dactylifera</i> | Date Palm | 60' X 35' | Low water/ Evergreen | X | X | X | X | X |
| <i>Pinus eldarica</i> | Mondell Pine | 35' X 35' | Low water/ Evergreen | X | X | | | |
| <i>Pinus torreyana</i> | Torrey Pine | 40' X 40' | Low water/ CA Native | | X | X | | |
| <i>Platanus x acerifolia 'Bloodgood'</i> | Bloodgood London Plane | 40' X 40' | Low water/ Deciduous | X | | X | X | |
| <i>Platanus racemosa</i> | California Sycamore | 40' X 40' | Low water/ CA Native | X | X | X | X | X |
| <i>Quercus agrifolia</i> | Coast Live Oak | 40' X 40' | Low water/ CA Native | | X | X | | |
| <i>Rhus Lancea</i> | African Sumac | 30' X 30' | Low water/ Evergreen | | | X | | |
| <i>Tabebuia impetiginosa</i> | Pink Trumpet Tree | 30' X 30' | Moderate water/ Deciduous | X | | X | X | |
| <i>Ulmus parvifolia</i> | Chinese Evergreen Elm | 30' X 50' | Moderate water/ Semi-deciduous | X | | | X | |
| <i>Washingtonia Robusta</i> | Mexican Fan Palm | 80' X 15' | Low water | X | X | | X | X |

Source: Los Angeles BSS/ Gruen Associates

3.0 Streetscape, Landscape, and Public Realm

TABLE 3.10-2 // Small Trees & Large Shrubs

| SCIENTIFIC NAME | COMMON NAME | APPROXIMATE GROWTH H x W | COMMENTS | Streetscape Zone | LWA Facilities Zone | Landside Support Subarea | Opportunity for Open Space | Bioswale/Stormwater Management |
|--|-----------------------|-----------------------------|---|------------------|---------------------|--------------------------|----------------------------|--------------------------------|
| Adenanthos sericeus | Coastal Woollybush | 8' X 5' | Low water/ Full Sun | | X | X | X | |
| Aloe spp | Aloe | Varies (>36 inches) | Low water/ Sun or Shade/ Succulent | X | X | X | X | X |
| Aloe barberae | Tree Aloe | 20' X 10' | Low water/ Sun or Shade/ Succulent | | X | X | X | |
| Arctostaphylos spp. | Manzanita | Varies | Low to moderate water/ Full Sun/ CA Native | X | X | X | X | |
| Artemisia californica | California Sagebrush | 8' X 5' | Low water/ Full Sun/ CA Native | | X | X | X | |
| Banksia ericifolia Heath Banksia | Heath Banksia | 8' X 5' | Low water/ Full Sun | | X | X | X | X |
| Caesalpinia mexicana | Mexican Caesalpinia | 10' X 5' | Low water/ Full Sun | | X | X | X | |
| Callistemon 'Cane's Hybrid' | Cane's Bottlebrush | 8' X 10' | Low water/ Full Sun | | X | X | X | |
| Cassia leptophylla | Gold Medallion Tree | 15' X 15' | Low water/ Full Sun/ Deciduous | | X | X | X | |
| Ceanothus spp | California Wild Lilac | Varies (>36 inches) | Low water/ Full Sun/ Deciduous | | X | X | X | |
| Cercis Occidentalis | Western Redbud | 15' X 15' | Low water/ Sun or Shade/ CA Native | | X | X | X | |
| Chitalpa tashkentensis | NCN | 20' X 15' | Low water. CA Native | | X | X | X | X |
| Dracaena draco | Dragon Tree | 20' X 20' | Low water/ Full Sun | | X | X | X | |
| Fremontodendron 'California Glory' | Flannel Bush | 10' X 10' | Low water/ Full Sun/ CA Native | | X | X | X | |
| Furcraea macdougallii | Macdougall's Furcraea | 15' X 8' | Low water/ Full Sun | | X | X | X | |
| Grevillea 'Moonlight' | NCN | 10' X 7' | Low water/ Full Sun | | X | X | X | |
| Hakea suaveolens | Sweet Hakea | 10' X 8' | Low water/ Full Sun | | X | X | X | |
| Heteromeles arbutifolia | Toyon | 15' X 8' | Low water/ Sun or Shade/ CA Native | | X | X | X | |
| Laurus nobilis | Sweet bay | 30' X 20' | Low water/ Filtered Sun | | X | X | X | |
| Leptospermum laevigatum | Australian Tea Tree | 25' x 25' | Low water/ Full Sun | | X | X | X | |
| Leucadendron 'Safari Sunset' | Safari Conebush | 8' X 6" | Low water/ Full Sun | | X | X | X | |
| Ligustrum japonicum 'Texanum' | Waxleaf Privet | 10' X 4' | Medium water/ Sun or Shade | | X | X | X | |
| Lysiloma watsonii var. thornberi | Feather Bush | 20' X 20' | Low water/ Full Sun | | X | X | X | |
| Melaleuca nesophila | Pink Melaleuca | 18' x 20' | Low water/ Full Sun | | X | X | X | X |
| Metrosideros collina 'springfire' | Lehua | 18' X 18' | Low water/ Full Sun | | X | X | X | X |
| Pittosporum tenuifolium 'Silver Sheen' | Silver Sheen Kohuhu | 12' X 16' | Moderate water/ Sun or Shade | | X | X | X | |
| Protea spp | Protea | Varies (>36 inches) | Low water/ Full Sun | | X | X | X | |
| Salix exigua | Narrow-leaf Willow | 15' X 10' | Low water/ Deciduous/ CA Native | | | | | X |
| Salix lasioplalis | Arroyo Willow | 12' X 10' | Low water/ Deciduous/ CA Native | | | | | X |

3.0 Streetscape, Landscape, and Public Realm

TABLE 3.10-3 // Shrubs

| SCIENTIFIC NAME | COMMON NAME | APPROXIMATE GROWTH H x W | COMMENTS | Streetscape Zone | LWA Facilities Zone | Landside Support Subarea | Opportunity for Open Space | Bioswale/Stormwater Management |
|--|-------------------------------|---------------------------------|--|------------------|---------------------|--------------------------|----------------------------|--------------------------------|
| <i>Achillea millefolium</i> | Yarrow | Varies (must remain <36 inches) | Low water/ Full Sun/ CA Native | X | | | X | |
| <i>Aeonium</i> spp. | Aeonium | Varies | Low water/ Sun or Shade/ Succulent | X | X | X | X | |
| <i>Agave</i> spp. | Agave | Varies | Low water/ Full Sun/ Succulent | X | X | X | X | |
| <i>Agave deserti</i> | Desert Agave | 2' X 2' | Low water/ Full Sun/ Succulent/ CA Native | X | X | X | | |
| <i>Agave Desmentina</i> 'Variagata' | Variagated Desert Agave | 3' X 4' | Low water/ Full Sun/ Succulent | X | X | X | | |
| <i>Agave shawii</i> | Shaw agave | 2' X 3' | Low water/ Full Sun/ Succulent/ CA Native | X | X | X | | |
| <i>Aloe</i> spp | Aloe | Varies (<36 inches) | Low water/ Sun or Shade/ Succulent | X | X | X | X | X |
| <i>Arctostaphylos</i> 'Pacific Mist' | Pacific Mist Manzanita | 2' X 8' | Low water/ Sun or Shade/ CA Native | X | X | X | X | |
| <i>Baccharis pilularis</i> 'Pigeon Point' | Pigeon Point Coyote Brush | 24 inches | Low water/ CA Native | X | X | X | X | |
| <i>Bulbine frutescens</i> | NCN | 2' X 2' | Low water/ Full Sun/ Succulent | X | X | X | X | X |
| <i>Calliandra californica</i> | Red Baja Fairy Duster | 36 inches | Low water/ Full Sun/ CA Native | X | X | X | X | X |
| <i>Carex divulsa</i> | Foothill Sedge | 12-24 inches | Moderate water/ Sun or Shade | X | X | | | X |
| <i>Callistemon citrinus</i> 'Little John' | Dwarf Bottlebrush | 36 inches | Low water/ Full Sun | X | X | X | X | X |
| <i>Cistus</i> spp. | Rock rose | | Low water/ Full Sun | X | X | X | X | |
| <i>Ceanothus griseus</i> horizontalis 'Yankee Point' | Yankee Point California Lilac | 24-36 inches | Low water. Wide growth requires larger planter. CA Native | X | X | | | |
| <i>Ceanothus</i> spp | Ceanothus | Varies (<36 inches) | Low water/ Sun or Shade/ CA Native | X | X | X | X | |
| <i>Cereus hildmannianus</i> (C. peruvianus) | Hedge Cactus | Varies | Low water/ Full Sun/ Succulent | X | X | X | X | |
| <i>Chondropetalum tectorum</i> | Small Cape Rush | 24-36 inches | Low water. Tolerates a wide soil pH range | | | | X | X |
| <i>Cotyledon</i> spp | Cotyledon | Varies (<36 inches) | Low water/ Sun or Shade/ Succulent | X | X | X | X | |
| <i>Crassula multicaeva</i> | Fairy Crassula | 12-18 inches | Low water. Thrives in shade or sun/ Succulent | X | X | X | X | X |
| <i>Dasylirion Wheeleri</i> | Desert Spoon | 5' X 4' | Low water/ Full Sun | X | X | X | X | |
| <i>Dianella</i> spp. | Dianella | 24-36 inches | Low water/ Sun or Shade | X | X | X | X | |
| <i>Dianella revoliuta</i> Little Rev | Little Rev Flax Lily | 24-36 inches | Low water/ Sun or Shade | X | X | X | X | X |
| <i>Dudleya</i> spp. | Dudleya | 12-18 inches | Low water/ Sun or Shade/ CA Native | X | X | X | X | |
| <i>Echeveria</i> spp. | Hens and Chicks | 12-18 inches | Low water/ Sun or Shade/ Succulent | X | X | X | X | |
| <i>Echinocactus Grusonii</i> | Golden Barrel Cactus | 12-18 inches | Low water/ Full Sun/ Succulent/ | | X | X | X | |
| <i>Echium candicans</i> | Pride of Madeira | 5' X 5' | Low water/ Full Sun | | X | X | X | |
| <i>Encelia californica</i> | California Coast Sunflower | 3' X 2' | Low water/ Full Sun/ CA Native | | X | X | X | |
| <i>Epilobium canum</i> | California fuchsia | 3' X 5' | Low water/ Sun or Shade/ CA Native | | X | X | X | |

Source: Los Angeles BSS/ Gruen Associates

3.0 Streetscape, Landscape, and Public Realm

TABLE 3.10-3 // Shrubs Continued

| SCIENTIFIC NAME | COMMON NAME | APPROXIMATE GROWTH H x W | COMMENTS | Streetscape Zone | LAVA Facilities Zone | Landside Support Subarea | Opportunity for Open Space | Bioswale/Stormwater Management |
|--|------------------------------|-----------------------------|---|------------------|----------------------|--------------------------|----------------------------|--------------------------------|
| <i>Erigeron karvinskianus</i> | Santa Barbara Daisy | 2' X 2' | Low water/ Sun or Shade/ CA Native | X | X | X | X | X |
| <i>Eriogonum parvifolium</i> | Coast Buckwheat | 2' X 2' | Low water/ Full Sun/ CA Native | X | X | X | X | X |
| <i>Eriogonum fasciculatum</i> 'Warriner Lytle' | California Buckwheat | 1' X 4' | Low water/ Full Sun/ CA Native | X | X | X | X | X |
| <i>Festuca californica</i> | California Fescue | 2' X 2' | Low water/ Sun or Shade/ CA Native | | | | X | X |
| <i>Festuca mairei</i> 'Greenlee's Form' | Atlas Fescue | 2' X 3' | Wet to dry conditions. Tolerant of diverse soil types | | | | X | X |
| <i>Furcraea foetida</i> | Green Aloe | 3' X 6' | Low water/ Full Sun | | X | X | X | X |
| <i>Galvezia speciosa</i> | Island Snapdragon | 3' X 5' | Low water/ Full Sun/ CA Native | | X | X | X | X |
| <i>Gaura lindheimeri</i> | Gaura | 3' X 2' | Low water/ Full Sun | X | X | X | X | |
| <i>Grevillea</i> spp | Grevillea | Varies | Low water/ Full Sun | | X | X | | |
| <i>Hardenbergia violacea</i> 'Meema' | Meema Hardenbergia | 2' X 6' | Low water/ Sun or Shade | X | X | X | X | |
| <i>Hesperaloe parviflora</i> | Red Yucca | 3' X 3' | Low water/ Full Sun/ Succulent/ CA Native | X | X | X | X | |
| <i>Heuchera sanguinea</i> | Coralbells | 1' X 1' | Low water/ Filtered Sun/ CA Native | X | X | X | X | |
| <i>Juncus patens</i> | California Gray Rush | 1.5' X 1.5' | Low water. CA Native | | | | X | X |
| <i>Kalanchoe</i> spp | NCN | Varies | Low water/ Sun or Shade/ Succulent | | X | X | X | |
| <i>Lantana</i> x 'New Gold' | New Gold Lantana | 1.5' X 3' | Low water/ Full Sun | X | X | X | X | X |
| <i>Lomandra longifolia</i> 'Breeze' | Dwarf Mat Rush | 2' X 3' | Low water/ Sun or Shade | | | | | X |
| <i>Leymus condensatus</i> 'Canyon Prince' | Canyon Prince Wild Rye | 2' X 4' | Low water/ Full Sun/ CA Native | | X | X | X | X |
| <i>Melica imperfecta</i> | Coast Range Melic | 1' X 2' | Low water | | | | X | X |
| <i>Muhlenbergia rigens</i> | Deer Grass | 3' X 4' | Moist to dry conditions. CA Native | X | X | X | X | X |
| <i>Penstemon</i> spp | Penstemon | Varies | Low water/ Sun or Shade | X | X | X | X | X |
| <i>Phlomis frutescens</i> | Jerusalem Sage | 2' X 3' | Low water/ Full Sun | X | X | X | X | |
| <i>Phormium</i> spp. | New Zealand Flax | Varies (<36 inches) | Low to moderate water/ Sun or Shade | X | X | X | X | |
| <i>Phormium tenax</i> 'Jack Spratt' | Jack Spratt New Zealand Flax | 1.5' X 1' | Low water/ Sun or Shade | | | | | X |
| <i>Pittosporum crassifolium</i> 'Compactum' | Dwarf Karo | 2' X 4' | Low water/ Sun or Shade | | X | X | X | |
| <i>Portulacaria afra</i> | Elephant's Food | 6' X 5' | Low water/ Sun or Shade/ Succulent | | X | X | X | |
| <i>Rosmarinus officinalis</i> 'Roman Beauty' | Roman Beauty Rosemary | 24 inches | Low water/ Full Sun | | X | X | X | |
| <i>Rhamnus californica</i> 'Mound San Bruno' | Coffeeberry | 3' X 6' | Low water/ Sun or Shade/ CA Native | | X | X | X | |
| <i>Rhus integrifolia</i> | Lemonade Berry | 8' X 10' | Low water/ Full Sun/ CA Native | | X | X | X | |
| <i>Ribes viburnifolium</i> | Catalina Currant | 2' X 5' | Low water/ Sun or Shade/ CA Native | X | X | X | X | |

Source: Los Angeles BSS/ Gruen Associates

3.0 Streetscape, Landscape, and Public Realm

TABLE 3.10-3 // Shrubs Continued

| SCIENTIFIC NAME | COMMON NAME | APPROXIMATE GROWTH H x W | COMMENTS | Streetscape Zone | LAWA Facilities Zone | Landside Support Subarea | Opportunity for Open Space | Bioswale/Stormwater Management |
|--------------------------------------|---------------------------|-----------------------------|---------------------------------------|------------------|----------------------|--------------------------|----------------------------|--------------------------------|
| Salvia apiana | White Sage | 4' X 4' | Low water/ Full Sun/ CA Native | | X | X | X | |
| Salvia clevelandii | Cleveland Sage | 4' X 4' | Low water/ Full Sun/ CA Native | | X | X | X | X |
| Salvia leucophylla | Purple Sage | 2' X 8' | Low water/ Full Sun/ CA Native | | X | X | X | X |
| Salvia millifera | Black Sage | 2' X 4' | Low water/ Full Sun/ CA Native | | X | X | X | |
| Salvia spp | Sage, Non native spp | Varies | Low water/ Full Sun | | X | X | X | |
| Sansevieria cylindrica | Skyline Spear Sansevieria | 3' X 3' | Low water/ Light Shade | | X | X | X | |
| Senecio spp | Chalksticks | 18 inches | Low water/ Full Sun/ Succulent | X | X | X | X | X |
| Tagetes lemmonii | Mexican Marigold | 3' X 5' | Low water/ Full Sun | | X | X | X | |
| Teucrium chamaedrys | Germander | 1.5' X 2' | Low water/ Full Sun | | X | X | X | |
| Westringia fruticosa 'Morning Light' | Coast Rosemary | 3' X 3' | Low water/ Full Sun | | X | X | X | X |
| Verbena iliacina 'De La Mina' | Cedros Island Verbena | 3' X 3' | Low water. CA Native | | X | X | X | X |

Source: Los Angeles BSS/ Gruen Associates

3.0 Streetscape, Landscape, and Public Realm

TABLE 3.10-4 // Groundcover & Vines

| SCIENTIFIC NAME | COMMON NAME | APPROXIMATE GROWTH H x W | COMMENTS | Streetscape Zone | LAVA Facilities Zone | Landside Support Subarea | Opportunity for Open Space | Bioswale/Stormwater Management |
|-----------------------------|-----------------------------|---------------------------------|---|------------------|----------------------|--------------------------|----------------------------|--------------------------------|
| Arctostaphylos spp. | Manzanita | Varies (must remain <36 inches) | Low to moderate water/ CA Native | X | X | X | X | |
| Atriplex leucophylla | Beach Saltbush | 1' X 1' | Low water/ Full Sun/ CA Native | | | | | X |
| Bougainvillea spp | Bougainvillea | Spreading | Low water/ Full Sun | | X | X | X | |
| Calyptophus berlandieri | Sundrops | <12 inches | Low water | | X | X | X | |
| Calystegia macrostegia | Island Morning Glory | Climbing | Low water/ Sun or Shade/ CA Native | | X | X | X | |
| Carex praegracilis | Clustered Field Sedge | 4-12 inches | Good turf substitute/ CA Native | X | | | | X |
| Ceanothus 'Centennial' | Centennial Ceanothus | 12 inches | Low water/ Use low growing species only. CA Native | | X | X | X | |
| Delosperma cooperi | Hardy Iceplant | <12 inches | Low water/ Thrives with little care | X | | | | |
| Delosperma litorale | White trailing iceplant | <12 inches | Low water/ Full Sun | X | | | | |
| Distictis buccinatoria | Blood-red trumpet vine | Climbing | Good turf substitute. CA Native | | X | X | X | |
| Dymondia margaritae | Silver Carpet | <12 inches | Wet to dry. Tolerates some foot traffic | X | X | X | X | |
| Erigeron glaucus | Seaside daisy | <12 inches | Low water/ Full Sun | X | X | X | X | |
| Ficus pumila | Creeping Fig | Climbing | Moderate water/ Sun or Shade | | X | X | X | |
| Hardenbergia violacea | Purple Vine Lilac | Climbing | Low water/ Full Sun | | X | X | X | |
| Lantana spp. | Lantana | Varies | Low water/ Sun or Shade | | X | X | X | |
| Parthenocissus tricuspidata | Boston Ivy | Climbing | Moderate water/ Sun or Shade | | X | X | X | |
| Pandorea jasminoides | Bower Vine | Climbing | Moderate water/ Sun or Shade | | X | X | X | |
| Santolina chamaecyparissus | Lavender Cotton | <24 inches | Low water; Flowering | X | X | X | X | X |
| Scieranthus biflorus | Australian Astroturf | <12 inches | Low water. Full to part sun. Spreads easily to 24 inches. | X | X | X | X | |
| Senecio mandraliscae | Blue Chalksticks | 18 inches | Low water | X | X | X | X | X |
| Solanum laxum | Potato Vine | Climbing | Moderate water/ Sun or Shade | | X | X | X | |
| Vitis 'Rogers Red' | Rogers Red California Grape | Climbing | Low water/ Sun or Shade/ Deciduous/ CA Native | | X | X | X | |

Source: Los Angeles BSS/ Gruen Associates

3.0 Streetscape, Landscape, and Public Realm

Typical Plant Materials // Examples



CEANOTHUS griseus
horizontalis 'Yankee Point'
(Yankee Point California
Wild Lilac, California native,
fast-growing, durable
groundcover reaches 2 to
3 feet tall and spreads 8
or more feet wide. Bright
blue flower clusters in winter
through early spring. Full sun
to partial shade, low water
use.)



DIANELLA revoluta
'Little Rev' (Little Rev Flax
Lily, compact clumping
rhizomatous evergreen
perennial growing to 2-3 feet
tall and spreading, full sun to
moderate shade in most any
well-draining soil and irrigate
regularly to only occasionally
once established)



FESTUCA mairei (Atlas
Fescue, evergreen, clumping
grass that forms fountain-like
mounds to 18 to 24 inches
tall and wide with yellowish
gray-green foliage, full sun or
part shade in a well-drained
soil with occasional to regular
irrigation)



LANTANA x 'New Gold' (New
Gold Lantana, evergreen,
trailing growth is excellent
for use as groundcover,
Moderate grower to 12 to
15 in. tall, 18 to 24 in. wide,
once established, needs only
occasional watering)



CHONDROPETALUM
tectorum (Small Cape Rush,
clumping form with 2-3 foot
tall dark green unbranched
stems, low water use)



DYMONDIA margaritae
(Silver Carpet, Spreading
perennial. Green leaves
edged in silver, yellow flowers
in summer. Slow growing.
Needs well-drained soils and
does better near the coast;
okay for inland areas.)



HARDENBERGIA violacea
'Meema (Meema
Hardenbergia, an evergreen
groundcover that forms a
dense groundcover 1 to 2
feet tall by 6 feet wide with
sprays of pinkish-purple
flowers. Requires little water
once established.



LOMANDRA longifolia
'Breeze' (Dwarf Mat Rush,
evergreen perennial with
narrow deep green strap-
shaped leaves, full sun to
moderate shade. It is drought
tolerant once established
but can also tolerate regular
irrigation or even wet soils)



CRASSULA multicaeva (Fairy
Crassula, evergreen low-
growing plant that rarely
exceeds a foot tall. A shade-
loving plant that can also
grow in full coastal sun. It
is tolerant of extended dry
periods when growing in
shade.)



ERIOGONUM fasciculatum
'Warmer Lyle' (California
Buckwheat, A low growing
groundcover that on occasion
can grow to 2 feet tall but
is often more prostrate,
hugging the ground like a
mat to about 4 feet wide. It
has attractive fine-textured
dark green small needle-like
leaves and an arching habit.



HESPERALOE parviflora (Red
Yucca, stemless succulent
with clumps of arching and
spreading grass-like foliage
to 3 to 4 feet tall. Very
drought tolerant and tough.)



Melica imperfecta (Coast
Flange Melic, Clumping
perennial grass to 1' tall w/
green lvs. & 2-3' tall arching
stems of flwrs. Full sun
(coastal) to shade. Little to no
H2O. Hardy to 15F.)



DELOSPERMA cooperi
(Hardy Iceplant, Mat forming
3 to 6 in. tall, 2 ft. or more
wide, thrives with little care,
needs only occasional
watering, drought tolerant)



FESTUCA californica
(California Fescue, Blue-
green blades 1 1/2 ft. tall
with graceful flower stalks
rising another 2 ft. above the
foliage. They are drought
tolerant once established.)



JUNCUS patens (California
Gray Rush, An upright
evergreen grass-like plant
that forms dense clumps
from short rhizomes with thin
rounded gray-green leafless
stems that grow upright to a
height of about 18 to 24 in.
with inconspicuous golden-
brown flower clusters, from
spring to fall.)



MUHLENBERGIA rigens
(Deergrass, California native
forms dense, tight clumps of
narrow bright green leaves to
3 feet tall, tolerates moist to
dry conditions)

3.0 Streetscape, Landscape, and Public Realm

Typical Plant Materials // Examples



MYOPORUM panvifolium
'Putah Creek' (Creeping Myoporum, fast growing plant to 2 feet tall and will spread up to 15 feet. It has bright green leaves held close to the stem and small white flowers in summer. Plant in full sun to light shade. Irrigate regularly to occasionally)



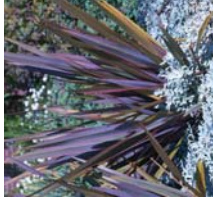
PERSICARIA capitata (Pink head Knot-weed, Frost sensitive ground cover, needs containment to manage its spreading habit when planted in warmer parts of California. Plantings damaged by cold quickly regrow and flower in spring.)



SENECIO mandraliscae (Blue Chalksticks, succulent that grows to 12 to 18 inches tall with 3 to 4 inch long blue gray pencil-like fleshy leaves. Forms a dense mat with leaves angled upward from the ground. Drought tolerant but tolerates regular irrigation. Plant in full sun to light shade)



NASSELLA pulchra (Purple Needle Grass, California native has slender foliage that forms a graceful clump 1 foot tall and wide, with beautiful airy flowers and seedheads that reach to 3 feet tall. Very adaptable to coastal or inland gardens, water or drought, clay or sandy soil.)



PHORMIUM spp. (New Zealand Flax, large strap-leaved evergreen perennials in shades of green, bronze, yellow and maroon can tolerate fairly dry conditions, sun or shade conditions)



WESTRINGIA fruticosa
'Morning Light' (Morning Light Coast Rosemary, An evergreen subshrub with a mounding habit 2 to 3 feet wide with cream colored variegation and green foliage and clusters of white flowers in spring, full to part sun, low water needs)



OSCULARIA deltoidea (Pink loeplant, Low growing gray succulent shrublet. This plant smothers the ground 6 inches to 1 foot tall by 2 to 3 feet wide with wiry dark pink stems and blue-green 3-angled fleshy leaves. Low water use and low maintenance)



PHORMIUM tenax (Jack Spratt' (Jack Spratt New Zealand Flax, clumps of burgundy-bronze sword-like leaves, can tolerate fairly dry conditions, sun or shade conditions)



VERBENA lilacina 'De La Mina' (Cedros Island Verbena, California Native evergreen subshrub with a mounding habit 2 to 3 feet wide with mid-green delicately dissected foliage and clusters of sweetly fragrant dark purple, star-shaped flowers with purple stamens, full to part sun, low water needs)



ROSMARINUS officinalis
'Roman Beauty' (Roman Beauty Rosemary, evergreen shrub that grows to 24 inches tall with arching stems with aromatic foliage. Once established needs only occasional water. Plant in full sun to light shade)



SCLERANTHUS biflorus
(Australian Astro turf, emerald green groundcover to 4 inches tall, low water)

3.11 Streetscape Zone Landscape Elements

3.11.1 Street Trees

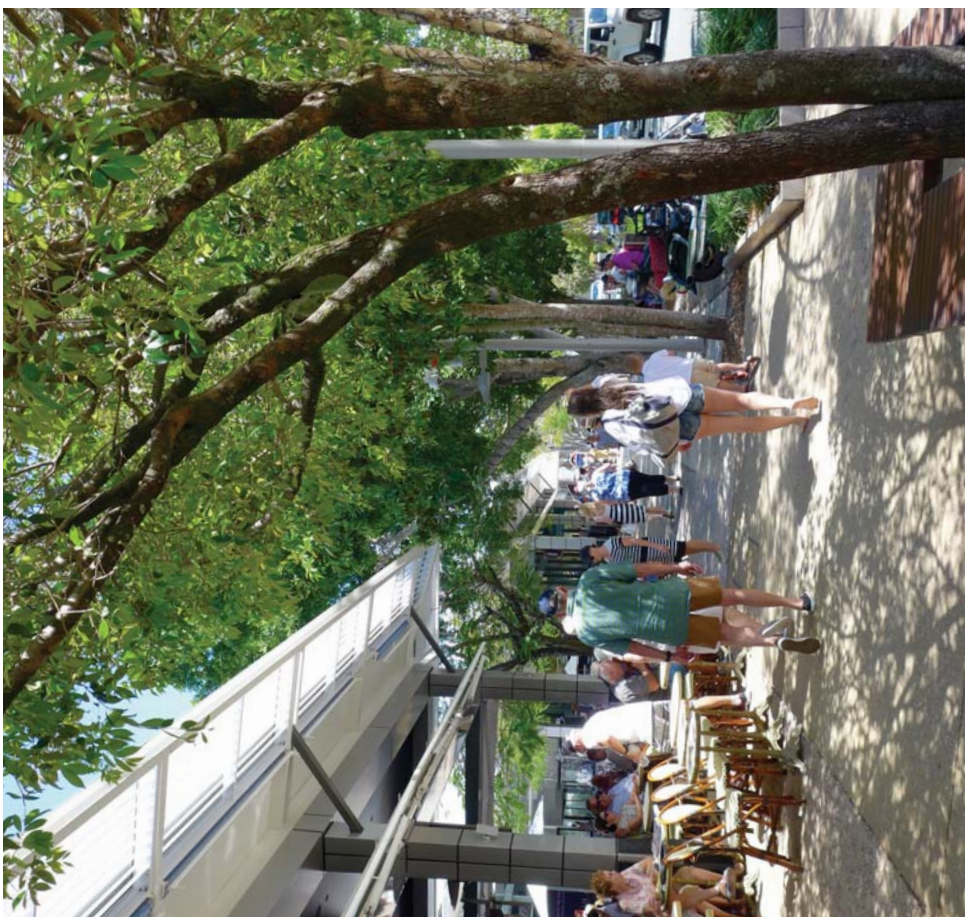
Objective

Trees should be selected to create a visual distinction between streets that predominantly serve the guest approach to the LAX area and the pedestrian focused streets.

Guidelines

1. Street trees should typically be planted between 25 to 35 feet on center, depending upon species and the desired canopy coverage. Street tree distances should follow City of Los Angeles Urban Forestry (UFD) spacing guidelines as follows:
 - 6' feet from driveway approaches;
 - 45' from Intersections;
 - 20' feet from light poles; and
 - 5' feet from utility meter boxes.A greater flexibility in tree spacing may be needed for select conditions. Consult with UFD for clearance variance and approval.
2. Refer to Section 3.10 for a list of recommended Street Trees.
3. Other Considerations:

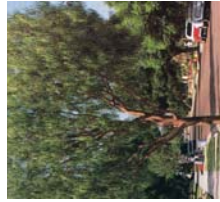
- Street trees should be used to complement street lighting, street furniture, and other amenities in creating a distinct design character for the individual streets, such as pedestrian focused streets.
- Trees should be accommodated in individual tree wells or along with other landscaping in continuous landscape strips.
- Tree wells may or may not include additional landscape planting depending upon context and maintenance responsibilities.
- Street tree selection, placement, and maintenance should be closely coordinated with the placement and design characteristics of street light fixtures to avoid conflicts between tree canopies and street lighting.
- Utility subsurface conditions may affect the location of the street trees. Allow for design changes to avoid conflicts.
- All street tree types and placement within the public right of way require approval from the city of LA Urban Forestry Division and Bureau of Street Services.



Street trees and landscaping transform streets for people
Source: grace.net

3.0 Streetscape, Landscape, and Public Realm

Typical Street Trees // Examples



GLEDITSIA pinnatifida
(Australian Willow, an attractive evergreen, typically growing 30 to 35 ft. tall and 20 ft. wide, with an upright, oval silhouette and rough dark gray bark)



METROSIDEROS excelsa
(New Zealand Christmas Tree, narrow upright evergreen that can reach up to 20-30 feet tall by about 12-15 ft. wide. Tree will take full sun and is drought tolerant. Scarlet flowers appear in spring through summer. It does well in seaside conditions.)



TABEBUIA impetiginosa
(Pink Trumpet Tree, deciduous tree to 25 ft tall with smooth dark green palmately compound leaves and light gray bark. Drought tolerant once established.)



KOELREUTERIA bipinnata
(Chinese Flame Tree, a small to medium-sized deciduous tree growing between 20-40 ft. tall. They are also one of the few trees that bloom in the summer. They can live from 50 to 150 years.)



PARKINSONIA x 'Desert Museum' (Palo Verde Tree, grows rapidly to about 20 ft. tall and 20 ft. wide in 3 to 5 years. It has small, bright green, compound leaves and smooth lime green bark. They are drought tolerant once established.)



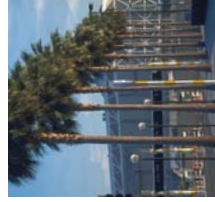
ULMUS parvifolia (Chinese Evergreen Elm, deciduous to evergreen tree depends on how cold the winter is. Fast growing to 40-60 ft tall and 50-70 ft wide. have very attractive bark patterns and large weeping umbrella shape, drought tolerant, fire resistant)



LOPHOSTEMON confertus
(Brisbane Box, an upright, evergreen tree that grows 40+ ft. tall which produces a beautiful, dense symmetrical rounded head with large glossy lance-shaped leaves. needs low water)



PLATANUS racemosa
(California Sycamore, a deciduous tree that grows about 40 ft. tall by 30 ft. wide. Native to Southern California, tolerant of heat and wind.)



WASHINGTONIA robusta
(Mexican Fan Palm, fast growing to 100 ft tall. Likes full sun and is very drought tolerant. Tall slender trunk with compact crown and dark green fronds)



LYONOTHAMNUS floribundus (Catalina Ironwood, moderate-growing evergreen tree 20-30 ft tall and 12-15 ft. with white flowers in early summer. It requires full sun.)



PHOENIX dactylifera (Date Palm, a tall evergreen palm with feather fronds; fronds held upright in "feather duster"-like arrangement, grows to 100 ft. and spread to 30 ft. needs full sun to shade, thrives in heat; also likes humidity)

3.11.2 Tree Wells

Objective

Generally, street trees do well with sufficient space for the intake of water, air and nutrients. Tree wells provide a permeable surface that supports the health of the tree by providing a space for the roots to grow.

Guidelines

1. Tree wells should be at least 6' wide on most streets unless this impedes the path of travel for pedestrians. The length of the tree well can vary in size although a preferred length is 8'.
2. The surface of the tree well can be decomposed granite, landscaping or a decorative tree grate. If used, decomposed granite (DG) surface should be 2" thick and compacted to 80% compaction. If used, the DG should be flush with adjacent grade and slope towards tree at a 1% slope.

3. Other Considerations:

- An 18" convenience strip along the curb should be provided for ease of maintenance in any landscaped tree well or parkway that is 10' or longer.

3.11.3

Parkways and Bioswale Areas

Objective

The City of Los Angeles must comply with the Los Angeles Regional Water Quality Control Board's Municipal Separate Storm Sewer System (MS4) Permit, which requires all jurisdictions in Los Angeles County to reduce contaminants in runoff to improve water quality in waterways. These requirements stem from National Pollutant Discharge Elimination System (NPDES) requirements of the Clean Water Act, as promulgated by the U.S. Environmental Protection Agency and delegated to the Los Angeles Regional Water Quality Control Board.

Guidelines

1. Infiltration planters and flow-through planters can be various widths and lengths but should be a minimum of 4' in width. All best management practices (BMPs) for stormwater infiltration and water quality improvements should conform to the details and requirements specified in the BOE standard plans.
2. Infiltration Planters:
 - Infiltration planters are only appropriate in site conditions where it is appropriate for storm water to infiltrate into surrounding soil.
 - Utility and infrastructure conflicts in the parkway may make infiltration planters infeasible due to water saturation around utility boxes.
 - A soil report may be required for infiltration planters to provide necessary soil data including soil type, infiltration rates, the depth to the groundwater, or soil contamination.
3. Flow-Through Planters:
 - Flow-through planters have



Bioswale parkways in Public Right of Way, Downtown L.A.
Source: Gruen Associates



Bioswale parkways in Public Right of Way
Source: www.belson.com

impermeable sides and bottom to prevent infiltration of stormwater into the surrounding native soil. Stormwater is captured and treated with the planting and excess water is drained to an adjacent storm drain system after it percolates through the planter.

- Flow-through planters are used in areas with soil contamination or poor infiltration rates.

4. Other Considerations:

- Curbs are required for all sides of stormwater planters for ADA compliance
- Stormwater planters are most effective when they are installed in groups so that stormwater runoff is distributed more evenly throughout the system.
- When stormwater planters are used with parking, there should be a 18" minimum convenience strip parallel to the curb to allow for access to parked cars.
- Plants should be chosen that can do well in a BMP planter. Refer to Section 3.10 for a list of recommended plants.
- Adjacent property owners or Business Improvement Districts are generally responsible for maintenance and installation of landscaping in a stormwater planter in the public right-of-way.
- All work must be performed and inspected under approved type B work permits in accordance with the Los Angeles City Municipal Code. Additional reviews and approvals, including but not limited to the Bureau of Sanitation (BOS), the Urban Forestry Division (UFD) of the Bureau of Street Services (BSS) and the Department of Transportation (DOT) may also be required. All BMPs should comply with standards of the ADA.

3.11.4 Understory Planting

Objective

Planting in the public realm is dictated by the street character, adjacent uses, and potential conflicts with infrastructure. Landscaping provides several environmental, visual, and health benefits.

Guidelines

1. Where understory plantings are provided, they should have a maximum height of 2' within 5' of driveways or curb cuts; and a maximum height of 3' in other locations.
2. See Section 3.10 for list of recommended plants. Generally avoid plants with sharp thorns that are adjacent to the curb or walkway. Plants that can tolerate drought, radiant heat from the adjacent hardscape surfaces and typical urban air pollution found along city streets are recommended.



Planting in the right-of-way on University Ave., Riverside, CA
Source: Gruen Associates

3.11.5 Irrigation

Objective

The design and installation of supplemental irrigation systems to sustain new landscape plantings in the public right-of-way might be necessary for the establishment of new planting. The goal is to encourage a reliance on natural rainfall after the first three years of planting.

Guidelines

1. Low volume drip and overhead spray irrigation systems should be used. Overhead spray systems should be used only when necessary and low-precipitation rate nozzles should be specified to decrease waste and overwatering.
2. Other Considerations:
 - Irrigation systems should be designed to minimize irrigation of any unplanted surface, and to minimize drainage of water onto any paved surface.
 - Irrigation should be automatically controlled and should include rain sensors.
 - Plantings in highly paved areas may require additional supplemental irrigation for an extended number of years to maintain the vitality of the landscape. In these cases, the use of drip irrigation systems is recommended where feasible.
 - Reclaimed Water, if available, would be suitable and be a direct beneficial use for landscaping in the public right-of-way.



Drip irrigation system
Source: Gruen Associates



Groundcover planting in tree wells along a Pedestrian focused street
Source: Gruen Associates

3.12 Site Furnishing

Objective

Public seating contributes to the pedestrian experience by making walkways and open space more comfortable. Seating opportunities along the path provide a short respite. Other site furniture such as bike racks, and trash receptacles provides amenities for airport passengers, employees and visitors to the area.

Guidelines

1. To avoid visual clutter, site furniture, when used, should be grouped at approximately every 200' in pedestrian focused zones with ground floor commercial uses.
2. Site furnishings should be located in areas with high pedestrian activity such as pedestrian walkways, entry plazas, building entrances, seating areas, and transit stops.
3. The aesthetic quality of the site furniture should complement the design and visual quality of the surrounding architecture. A single, unified family of site furniture should be utilized.
4. Other Considerations:
 - The placement of site furniture must comply with ADA requirements.
 - The location of seating should correspond to other site elements and purposes such as trash receptacles, pedestrian lighting and canopy trees for shade.
 - Seating should be permanently attached to the walkway.



"Balance" bench, a non-standard bench from Forms+Surfaces
Source: www.forms+surfaces.com



Integrated seating and seating wall at back of sidewalk
Source: www.equiparc.com



Recycling Trash Receptacles: By LandscapeForms
Source: www.landscapeforms.com



Standard bike racks
Source: www.balson.com

3.0 Streetscape, Landscape, and Public Realm



"Vector" Bench Seating: By Forms+Surfaces
Source: www.forms-surfaces.com



Multiplicity Collection Bike Rack identified for the Century Blvd Streetscape Plan to be maintained by the BID
Source: www.landscapiforms.com



Multiplicity Collection Bench identified for the Century Blvd Streetscape Plan to be maintained by the BID
Source: www.landscapiforms.com



"Dispatch" Trash Receptacle: By Forms+Surfaces
Source: www.forms-surfaces.com



"Neocombo Bench" Bench Seating: By LandscapeForms
Source: www.landscapiforms.com



Multiplicity Collection Bench identified for the Century Blvd Streetscape Plan to be maintained by the BID
Source: www.landscapiforms.com



Multiplicity Collection Trash Receptacle identified for the Century Blvd Streetscape Plan to be maintained by the BID
Source: www.landscapiforms.com

SUSTAINABILITY 4.0

DRAFT 09.08.2016



4.1 Purpose and Applicability

The sustainability guidelines establish a list of 'green' measures to be incorporated into the design, construction, and operations of facilities at LAX. These guidelines align with LAX's commitment to sustainability at LAX, as well as Mayor Garcetti's Sustainable City pLAN. These sustainability guidelines serve as a mechanism to promote LAX's commitment to reduce its environmental footprint and promote energy efficient design requirements, water conservation and water quality improvement projects, natural resource protection efforts, waste reduction and recycling, and numerous air quality emissions reduction policies and programs.

These sustainability guidelines are to be implemented to the greatest extent feasible for all construction projects covered by these Guidelines. Individual measures have been identified in the areas of planning and design, energy efficiency, water efficiency, material conservation, and environmental quality. However, not all of the measures will apply to all projects. For example, the majority of the measures will apply to regularly-occupied conditioned spaces such as the customer service area in the CONRAC, but a select few will apply to the guideway for the APM. Therefore, these design guidelines provide general guidance as well as element-specific measures for the CONRAC, ITFs, and the APM Maintenance and Storage Facility. Several measures have been identified as mandatory while others should be implemented if feasible. Nonetheless, all measures that are applicable are to be implemented, including for project-related facilities not specifically

identified. These facilities may include, but are not limited to, the APM guideway and stations, pedestrian walkways, and parking garages within the CTA.

In some cases, these guidelines provide multiple options for certain measures. For example, use of greywater versus use of recycled water for landscape irrigation. In such cases, select the feasible measure that has results in the greatest reduction in environmental impact.

4.2 Sustainability Vision

LAWA embraces the Airport Council International-North America's definition of sustainability, which is "a holistic approach to managing an airport so as to ensure the integrity of the [e]conomic viability, [o]perational efficiency, [n]atural resource conservation, and [s]ocial responsibility of the airport." LAWLA strives to improve sustainability performance across all areas, including the sustainable design of new facilities, ensuring emission controls for construction vehicles, vigilance concerning water conservation, innovative energy efficiency, and actively supporting surrounding communities, tenants, and employees.

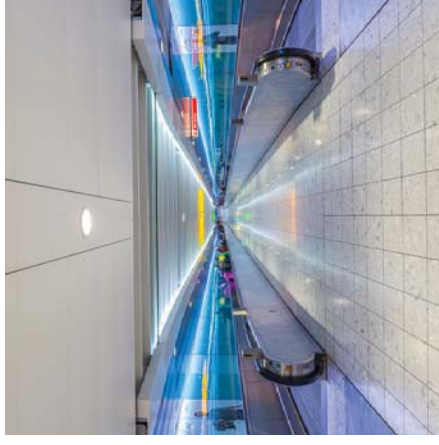
The design guidelines for sustainability seek to:

- Reduce direct and indirect greenhouse gas emissions through the provision of multi-modal transportation options, efficient building, and other measures.
- Proactively improve water use efficiency through drought-tolerant landscaping and efficient fixtures.

- Utilize sustainable construction practices such as use of low-emission equipment and trip reduction strategies.
- Maximize the energy efficiency of building systems through equipment technology, fuel efficiency, building controls, and operational practices.

4.3 General Guidelines

All built and landscape elements of the project should be designed to minimize their life cycle environmental impact and improve the health and comfort of the people that use them. Life cycle impacts are measured over the useful life, "life cycle" of the project. These impacts incorporate both the initial environmental impact of the materials and resources that go into construction as well as the ongoing impact of the operations of the project. Impacts to consider include initial and ongoing energy use, water use, materials use, transportation impacts, human health and comfort impacts, air and water quality impacts, and natural habitat impacts. A life cycle assessment (LCA) should be conducted to compare various design alternatives to identify the lowest impact approach.



LED lights at Heathrow Airport
Source: <http://glamox.com/gsx/references/heathrow-airport>



Clean air fleet at LAX
Source: www.lawa.org

4.3.1

Planning and Design

Objective

By considering sustainable design goals early in the process of planning and design, costs of implementation will be lowered while effectiveness will be increased.

Guidelines

4.3.1.1 Integrated Design

Projects should use an integrated design approach to arrive at design decisions. Integrated design brings together all major design disciplines including architecture, planning, structural, landscape, mechanical, electrical and plumbing engineers and other specialists to collaborate on the most effective way to meet programmatic goals with lowest lifecycle environmental impacts. Design teams should also consider including representatives from facilities maintenance and future users to make informed decisions about how projects will be used and maintained.

4.3.1.2 Site Planning

Building projects should look to incorporate landscaped outdoor spaces to the greatest extent possible. Where possible, site plans should accommodate 20% of available land for landscaped area. Projects must meet City of Los Angeles Low Impact Design (LID) requirements for handling storm water.

Reduce heat island impacts by using cool roof materials and light colored (high albedo) construction materials. Reduce hardscape

areas by increasing landscaped areas where possible. Landscaped areas can serve to reduce heat island effects while also functioning as storm water detention and treatment areas.

Plan projects to facilitate use of lower impact forms of transportation such as walking, bicycling, use of public transportation, carpooling, and use of electric and alternative fuel vehicles. Design stairways and pedestrian pathways to be easily identified, accessible, comfortable and visually appealing. Similarly, bike parking, carpool parking, electric vehicle charging stations and public transportation connections should be convenient and easy to locate.

1. Provide vegetated open space equal to 20% of the total project site area.
2. Implement strategies to reduce impact from storm water runoff. Project must conform with City of Los Angeles Low Impact Development standards (LID).
3. Provide secure bicycle parking for 5% of tenant-occupied motorized vehicle parking capacity, with a minimum of one space.
4. Provide changing/shower facilities to support bicycle commuting.
5. Provide designated parking for low-emitting, fuel-efficient and carpool/van pool vehicles
6. Provide infrastructure including electrical system capacity and raceways for future electric charging stations for 10% of total parking spaces.
7. With the approval of the enforcement authority, employ strategies to reduce on-site parking area by 20%.

8. Provide vegetative or man-made shading devices for all fenestration on east-, south- and west-facing walls.

9. For opaque wall areas use wall surfacing with SRI 25 (aged), for 75% of opaque wall areas.

10. Outdoor lighting systems shall be designed to preserve dark night skies and reduce glare on neighboring uses.

11. Reduce heat island effect- Hardscape. Use one or a combination of strategies 1 through 3 for 75% of site hardscape.
 - 1: Provide shade trees (mature within 5 years of occupancy).
 - 2: Use light colored materials with an initial solar reflectance value of at least .30.
 - 3: Use open-grid pavement system or pervious or permeable pavement system.
 - 4: Use solar panel arrays to create a canopy shade system.

12. Reduce heat island effect. Use roofing materials having a minimum 3-year aged solar reflectance and thermal emittance or install a roof with a thermal mass over the roof membrane, including areas of vegetated (green) roofs.

13. Design landscape areas to support low impact and integrated Pest Management (IPM) techniques that reduce the need for artificial fertilizer, pesticide and herbicide use and pest management.



Electric vehicle charging station
Source: Bigstock



Designated parking for fuel efficient vehicles
Source: www.wmward.hawaii.edu

4.3.2 Energy Efficiency and Renewable Energy

Objective

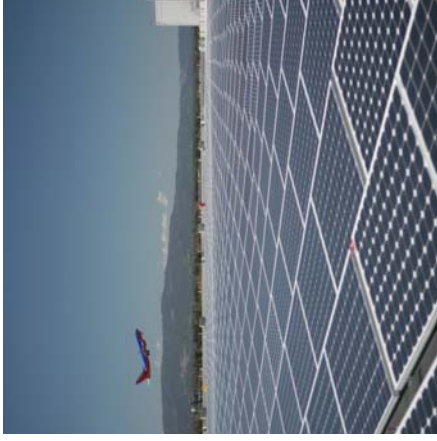
To achieve energy efficiency and maximize the use of renewable energy.

Guidelines

Where California Energy Efficiency Standards apply, all projects must be 15% more energy efficient than allowed. For areas with lighting but no conditioned space, lighting must use 15% less energy than allowed. For energy-using equipment not governed by California Energy Efficiency Standards, best available energy efficient technologies should be used. Advanced commissioning of building systems should be conducted to ensure systems are operating as designed.

To achieve energy use reduction, passive strategies taking advantage of the favorable local climate for natural daylighting and naturally ventilated and unconditioned spaces should be considered where feasible.

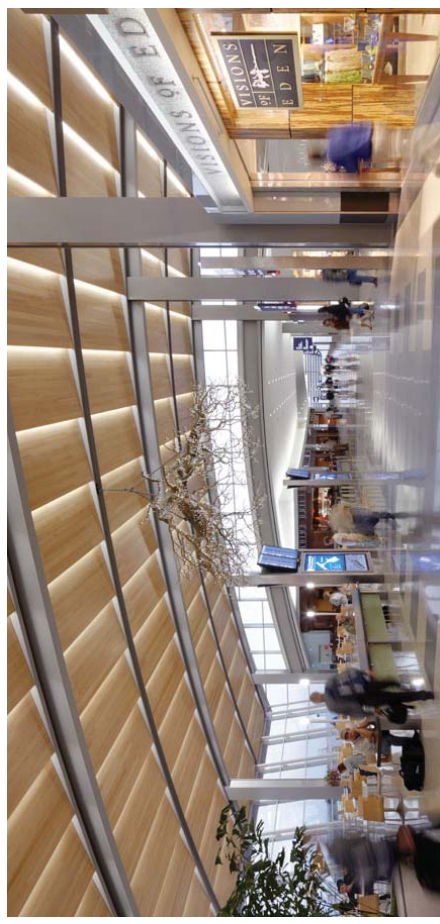
Maximize the use of on-site solar electricity generation where FAA has affirmed that glare from panels will have no impact on flight paths. Use solar canopies as shade structures in addition to roof-mounted solar. Solar Renewable Energy Credits (RECs) are to be retained by LAWA (or developer) and not sold. Any solar business model may be considered: system purchase with net metering, power purchase agreement, lease/buyback, Feed in Tariff (FIT).



Rooftop solar panels at Cochin International Airport
Source: www.newsanchal.com



On-site solar array at Indianapolis International Airport
Source: www.alleneng.com



Natural daylighting at Sacramento International Airport
Source: www.arup.com

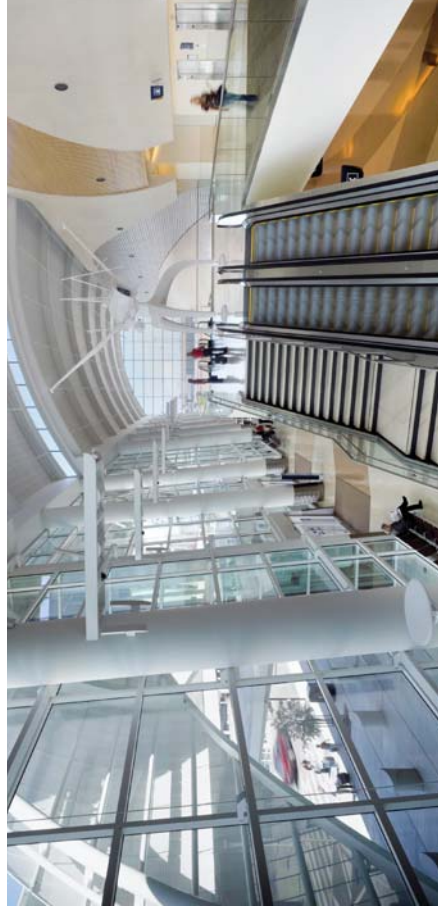
4.0 Sustainability

| GUIDELINES | CONRAC | ITF | APM Maintenance Facility |
|--|--------|-----|--------------------------|
| 1. Newly installed outdoor lighting power is no greater than 90% of the Title 24, Part 6 calculated value of allowed outdoor lighting power. | M | M | M |
| 2. For building projects that include indoor lighting or mechanical systems, but not both, the Energy Budget is no greater than 90% of the Title 24, Part 6 Energy Budget for the Proposed Design Building. Low water/ Full Sun/ CA Native | F | M | M |
| 3. For building projects that include indoor lighting and mechanical systems, the Energy Budget is no greater than 85% of the Title 24, Part 6 Energy Budget for the Proposed Design Building. | M | M | M |
| 4. Use on-site renewable energy for at least 1% of the annual electrical use. | F | M | F |
| 5. Participate in the local utility's renewable energy portfolio program that provides a minimum of 50% electrical power from renewable sources. Maintain documentation through utility billings. | F | M | F |
| 6. If solar is not immediately feasible, prewire for future rooftop electrical solar system. | M | M | M |
| 7. Traction elevators shall have a regenerative drive system that feeds electrical power back into the building grid when the elevator is in motion. | M | M | |
| 8. A parked elevator shall turn off its car lights and fan automatically until the elevator is called for use. | M | M | F |
| 9. An escalator shall have a VVVF motor drive system that is fully regenerative when the escalator is in motion. | M | M | |
| 10. Design for and employ techniques in steel framing to avoid thermal bridging. | M | | M |
| 11. Conduct whole building commissioning for all building systems covered by Title 24, Part 6, process systems and renewable energy systems. | M | M | M |

M= Mandatory, F= If Feasible



Renewable energy
Source: www.usj.com



Escalators at San Jose International Airport
Source: www.duranvirghia.wordpress.com

4.3.3 Water Efficiency and Conservation

Objective

To seek opportunities to reduce or eliminate potable water use indoors, in landscape, and for car and train washing.

| GUIDELINES | CONRAG | TF | APM Maintenance Facility |
|--|--------|----|--------------------------|
| 1. Capture rain water and reuse for toilet flushing, car/train washing, and/or irrigation. | F | | F |
| 2. Connect to and use municipal recycled water (purple pipe) for landscape irrigation, toilet flushing, or car or train washing. | F | | F |
| 3. Filter and reuse wash/rinse water for car/ train wash. | M | | M |
| 4. Reuse greywater for landscape irrigation. | F | | F |
| 5. Design xeriscape landscape to use no water irrigation once plants are established. | M | | M |
| 6. Use drought tolerant/ low water use plants with drip irrigation. | M | | M |
| 7. Use weather-based irrigation controller. | | | |
| 8. Install low flow faucets, low flow flush fixtures (HET) 1.28 gallons per flush or less. | M | | M |
| 9. Install showerheads with max flow rate of 2.0 gallons per minute or less (GPM). | M | | M |
| 10. Use best available water efficiency technologies for cooling towers. | M | | M |
| 11. Use recycled water (purple pipe) in place of potable water at concrete batch plant. | F | F | F |

M = Mandatory, F = Feasible



Separate water meters
Source: www.designhero90.org



Water saving faucet
Source: www.express.com

4.0 Sustainability

| GUIDELINES | CONRAC | ITF | APM Maintenance Facility |
|--|--------|-----|--------------------------|
| <p>12. Install separate submeters shall be installed as follows:</p> <ul style="list-style-type: none"> For each individual leased, rented or other tenant space within the building projected to consume more than 100 gal/day. Where separate submeters for individual building tenants are unfeasible, for water supplied to the following subsystems: <ol style="list-style-type: none"> Makeup water for cooling towers where flow through is greater than 500 gpm (30 L/s) Makeup water for evaporative coolers greater than 6 gpm (0.04 L/s) Steam and hot-water boilers with energy input more than 500,000 Btu/h (147 kW) | M | | M |

M= Mandatory, F= If Feasible



Irrigation controllers and sensor
Source: www.gardena.com



Low-flow faucet
Source: Getty Images



Water efficient landscaping at Sacramento International Airport
Source: www.inhabit.com

4.3.4 Material Conservation and Resource Efficiency

Objective

Reduce environmental impact from the use of construction materials by minimizing use of virgin materials, increasing use of recycled materials, using rapidly renewable materials, using local materials, using durable materials and looking for opportunities to reuse materials. Apply life cycle assessment (LCA) to determine the best approach to reducing overall environmental impact from use of materials.

| GUIDELINES | CONRAQ | | | TF | | APM Maintenance Facility |
|---|--------|--|--|----|--|--------------------------|
| | | | | | | |
| 1. Select building materials or products for permanent installation on the project that have been harvested or manufactured in California or within 500 miles of the project site. | M | | | M | | F |
| 2. Divert construction and demolition debris from the landfill. All projects must divert at least 75% of construction and demolition debris and 100% of uncontaminated land clearing debris (green waste, soil, rocks). | M | | | M | | M |
| 3. Use rapidly renewable materials made from plants harvested within a ten-year cycle. | M | | | M | | M |
| 4. Use salvaged, refurbished, refinished or reused materials. | M | | | M | | M |
| 5. Use materials, equivalent in performance to virgin materials, with a total (combined) recycled content value (RCV) of not be less than 15% of the total material cost of the project. | M | | | M | | M |
| 6. Use concrete made with recycled content such as fly ash or slag. | M | | | M | | M |
| 7. Use concrete made with recycled aggregate. | M | | | M | | M |
| 8. Conduct a whole building life cycle assessment, including operating energy, showing at least 10% improvement above baseline building. | F | | | F | | F |

M = Mandatory, F = If Feasible



Forest Stewardship Council Certified Wood
Source: www/fsc.org



Recycled concrete aggregate
Source: www/haulingaway.com

4.0 Sustainability

4.3.5 Environmental Quality

Objective

To create indoor environments that protect and enhance the health and comfort of occupants.

Guidelines

Regularly occupied spaces should be designed to protect and enhance human health and comfort. Spaces should maximize natural daylighting and access to views of the outdoors. Individual occupant comfort should also be considered in design of thermal and lighting systems by maximizing individual control. Indoor spaces shall use high efficiency air filtration (MERV 13). Walk off mats, isolation of chemicals and other means of reducing contamination of indoor spaces shall be implemented. Acoustic insulation shall be used to create a comfortable indoor acoustical environment.

Materials and systems shall be selected that will provide for a healthy indoor environment. Where options exist, materials with no added formaldehyde shall be used. Low or zero VOC paints, coatings, and sealants shall be used. Flooring materials must meet the CalGreen Tier2 emissions criteria.

Consideration shall be given to reduction of the global warming potential (GWP) of coolants used in HVAC and refrigeration systems.

| GUIDELINES | | CONRAG | TF | APM Maintenance Facility |
|------------|--|--------|----|--------------------------|
| 1. | Provide temporary ventilation during construction in accordance with Section 121 of the California Energy Code, CCR, Title 24, Part 6 and Chapter 4 of CCR, Title 8. | M | M | M |
| 2. | If the HVAC system is used during construction, use return air filters with a MERV of 8. | M | | M |
| 3. | Flush out the building with outside air prior to occupancy or perform Indoor Air Quality (IAQ) testing prior to occupancy. | M | | M |
| 4. | Cover duct openings and protect of mechanical equipment during construction. | M | | M |
| 5. | Select adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers and caulks that comply with local or regional air pollution control or air quality management district rules where applicable or SCAGQMD Rule 1168 VOC limits. | M | | M |
| 6. | Install low emitting carpet, carpet cushion and carpet adhesive in the building interior to meet the requirements of the Carpet and Rug Institute's Green Label program. | M | | M |
| 7. | Use materials with no added urea formaldehyde including insulation, wood products, particle board, fiberboard, and adhesives. | M | | M |
| 8. | Install entryway systems to prevent contaminants from entering buildings. | M | | M |
| 9. | In mechanically ventilated buildings, provide regularly occupied areas of the building with air filtration media for outside and return air prior to occupancy that provides at least a MERV of 13. | M | | M |
| 10. | Install CO2 monitors in regularly occupied areas. | M | | M |

M= Mandatory, F= If Feasible



Temporary HVAC system
Source: www.esmagazine.com



Covered duct openings
Source: www.ky.gov

4.0 Sustainability

| GUIDELINES | CONRAO | ITF | APM Maintenance Facility |
|---|--------|-----|--------------------------|
| 11. Design for thermal and lighting comfort by providing for individual workspaces to control their own environment and for the majority of shared spaces to have independent lighting and thermal controls.. | F | F | F |
| 12. Provide daylight spaces for building occupants. | F | M | M |
| 13. Design exterior wall and roof-ceiling assemblies for buildings exposed to a noise level of 65 dB Leq-1Hr during any hour of operation shall have exposed to the noise source meeting a composite STC rating of at least 45 (or OITC 35), with exterior windows of a minimum STC of 40 (or OITC 30). | M | | M |
| 14. Wall and floor-ceiling assemblies separating tenant spaces and tenant spaces and public places shall have an STC of at least 40. | M | | M |
| 15. Install HVAC and refrigeration equipment that does not contain HCFCs. | M | M | M |

M = Mandatory, F = If Feasible



Thermal Control

Source: [www.climatecontrol.me.com](http://climatecontrol.me.com)



Daylit interior at Shenzhen Bao an International Airport

Source: <http://interlockdesign.org/>

4.4 APM Guideway and Station Guidelines

Objective

To construct the APM guideway and stations in an efficient, sustainable manner, LAWA will encourage the contractor to include sustainability features, such those listed below, as applicable.

Guidelines

1. Reduce environmental impact from the use of construction materials by minimizing use of virgin materials, increasing use of recycled materials, using rapidly renewable materials, using local materials, using durable materials and looking for opportunities to reuse materials, when feasible.
2. Encourage energy efficiency and use best available energy efficient technologies when available and feasible.
3. To achieve energy use reduction, passive strategies taking advantage of the favorable local climate for natural daylighting and naturally ventilated and unconditioned spaces should be considered where feasible.
4. Maximize the use of on-site solar electricity generation where FAA has affirmed that glare from panels will have no impact on flight paths. Use solar canopies as shade structures in addition to roof-mounted solar.

5. Vertical transportation should use best available energy efficiency technologies such as regenerative drive systems for elevators and automatic shut off of car lights and fan in parked elevators. Escalators technologies should include a VVVF motor drive system that is fully regenerative when the escalator is in motion.



PLANNING AND 5.0 IMPLEMENTATION PROCESS

5.1 Review and Implementation

5.1.1 Applicability

These Design Guidelines apply to facilities located in the Area as specified in Chapter 1 of the Guidelines. The Design Guidelines do not apply to airfield projects, such as runways and taxiways, or to projects located in the LAX Northside Sub-Area of the LAX Specific Plan.

5.1.2 Authority and Implementation

The Executive Director or his/her designee shall have the authority to review each project for compliance with all applicable provisions of the LAX Specific Plan and this LAX Design Guidelines. Except as provided in the LAX Specific Plan or project specific contracts, no grading permit, foundation permit, building permit, use of land permit, or permit for a change of use shall be issued for any Project on any lot located in whole or in part within the Airport Airside, Airport Landside, and Airport Landside Support subareas of the LAX Specific Plan unless an approval of the Executive Directors Report by Board of Airport Commissioners has been issued pursuant to the procedures set forth in Section 7 of LAX Specific Plan compliance procedures. Except as provided in a project specific contract, no such approval shall be issued unless that project complies with all applicable provisions of the LAX Specific Plan, including compliance with all applicable guidelines.

5.2 Planning Process

5.2.1 Planning Process

While this document sets LAWA's overall vision and design guidelines for modernization projects, the specific design of each project will be developed through a collaborative, iterative process involving the community, elected leaders, Los Angeles City departments, and other stakeholders.

During the design phase, contractors will consult with applicable City of Los Angeles departments and other regulatory bodies, as well as the community in order to obtain input on draft designs.

In addition to required consultations, LAWA has developed a robust public engagement and consultation program, including a formal LAX Community Liaison. LAWA is committed to consulting with community members and partner agencies in order to refine project designs so that they meet airport and community needs.

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*Los Angeles
World Airports*