4.7.2 Safety

4.7.2.1 Introduction

The safety analysis addresses whether and how the SPAS alternatives could affect the potential for aviation incidents and accidents,[379] including birdstrikes,[380] as well as runway incursions,[381] at LAX. Appendix G2, *Safety - Aviation Accidents, Incidents, and Incursion Data for LAX*, contains more detailed information and data on the accident, incident, and incursion history at LAX between 2001 and 2011. Discussion of planning documents indirectly related to airport safety, specifically the California Department of Transportation *California Airport Land Use Planning Handbook* and the *Los Angeles County Airport Land Use Plan*, is provided in Section 4.9, *Land Use and Planning*. Emergency response is addressed in Sections 4.7.3, *Hazardous Materials*, and 4.11.1, *Fire Protection*.

LAX facilities that handle large volumes of toxic or flammable materials include: the Central Utility Plant (CUP) located in the Central Terminal Area (CTA); Liquefied Natural Gas (LNG)/Compressed Natural Gas (CNG) facilities (a LAWA-operated LNG/CNG Facility on World Way West near the Continental Airlines leasehold and a privately-operated CNG Station on the United Airlines leasehold); and the LAXFUEL Fuel Farm located between the FedEx Maintenance Facility and Coast Guard Road, north of World Way West. None of the improvements associated with the SPAS alternatives would alter or otherwise affect the CUP and LNG/CNG facilities. As described in Chapter 2, *Project Description*, under Alternative 3, the overall footprint of the fuel farm would be reduced from approximately 20 acres to approximately 14 acres in order to accommodate north airfield modifications, but the fuel farm would retain its existing capacity and remain at its existing location. Some tanks would require relocation on the fuel farm site. Alternatives 5 and 7 may similarly require the relocation of tanks within the fuel farm site or other protective measures. There are numerous safety features currently in place to reduce the risk of upset at the LAXFUEL Fuel Farm. Such safety features would also be implemented as part of any reconfiguration of the LAXFUEL Fuel Farm under Alternatives 3, 5, and 7. Continued compliance with all applicable setback and regulatory requirements would further reduce a risk of upset at the fuel farm. Therefore, risk of upset related to the CUP, LNG/CNG facilities, and LAXFUEL Fuel Farm is not addressed any further within this section.

4.7.2.2 Methodology

Birdstrikes

For the purposes of the birdstrike hazards analysis herein, "baseline conditions" are as of December 2011, the last full year for which birdstrike data for LAX are available.

The baseline conditions (2011) with respect to birdstrike hazards were evaluated by identifying existing bird attractants, the birdstrike occurrence history at LAX, and the measures currently implemented to avoid birdstrike hazards. In accordance with FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, the locations of any solid waste disposal facilities within 10,000 feet of runways were identified. The conditions with respect to birdstrike hazards under the alternatives were evaluated qualitatively by examining proposed improvements and changes in open space that may serve as bird attractants.

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379 According to NTSB Regulation Part 830, "aircraft accident" means an occurrence associated with the operation of an aircraft that takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage. "Incident" means an occurrence other than an accident, associated with the operation of an aircraft, which affects or could affect the safety of operations.

380 A birdstrike is a collision between a bird and an aircraft.

381 As of October 2007, FAA uses the definition for a runway incursion that has been adopted by the International Civil Aviation Organization: "Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and take-off of aircraft."

Although the number of aircraft operations is a factor in the occurrence of birdstrikes, the occurrence of birdstrikes is dependent upon several factors, most importantly the presence or absence of bird attractants on or very near the airfield.

Aviation Accidents, Incidents, and Runway Incursions

For the purposes of the aviation safety impacts analysis herein, "baseline conditions" are as of December 2011, the last full year for which accident, incident, and runway incursions data for LAX are available. With respect to LAX north airfield operating conditions, "baseline conditions" are as of 2010, the year in which the most recent of the north airfield safety studies were conducted and published, as described later in this section.

Section 4.7.2.3 below provides an overview of the accident, incident, and runway incursion history at LAX, and how aviation safety at LAX has changed over time, based on information compiled by the National Transportation Safety Board (NTSB), FAA's Aviation Safety Information Analysis and Sharing (ASIAS) System, and LAWA. More detailed information is included in Appendix G2, *Safety - Aviation Accidents, Incidents, and Incursion Data for LAX*. Section 4.7.2.3 also provides an overview of the baseline operating conditions in the north airfield. The analysis herein evaluates the extent to which the SPAS alternatives would increase the safe and efficient movement of aircraft at LAX compared to baseline conditions. This is done primarily in terms of assessing the extent to which the airfield layout proposed under each alternative complies with FAA design standards and requirements, given that such standards and requirements are specifically intended to support the safe and efficient movement of aircraft, consistent with FAA's mission. The analysis also takes into account other key considerations typically associated with safe airfield operations, as described in various safety studies completed by subject matter experts for the north airfield at LAX.

4.7.2.3 Existing Conditions

Birdstrikes

FAA guidelines recommend that landfills not be located near airports due to concerns that these may attract birds and increase the chances that birdstrikes will interfere with aircraft engine operation or damage an airframe. Any hazardous wildlife attractant, including sanitary landfills, are considered incompatible if located within 10,000 feet of a runway end used or planned to be used by turbine powered aircraft. They are also considered incompatible if located within a five-mile radius of a runway that attracts or sustains hazardous bird movement into, or across, the runways or approach and departure patterns of aircraft.[382]

Currently, no active solid waste landfills are located within a five-mile radius of LAX. Existing bird attractants at LAX include the Pacific Ocean, Dockweiler State Beach, Playa del Rey beach, and the Los Angeles/El Segundo Dunes (Dunes) west of the airport, and the Argo Drainage Channel that lies to the north of, and approximately parallel to, Runway 6L/24R. Birds are also attracted to the open space on the airfield, particularly toward the western end and within the LAX Northside property.

The numbers of birdstrikes at LAX between the years 2001 through 2011 are shown in **Table 4.7.2-1**. Birds can be discouraged from frequenting the airport vicinity through various means. LAX uses anti-perching devices on structures such as signs, lights, fences, and building edges. In accordance with FAA Advisory Circular 150/5200-33B, Hazardous Wildlife Attractants on or Near Airports,[383] the airfield is maintained to avoid the ponding of water, the growth of vegetation, and the development of other conditions that may serve as attractants to nuisance wildlife, including birds.

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382 U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5200-33B, Hazardous Wildlife Attractants on or Near Airports, 2007.

383 U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5200-33B, Hazardous Wildlife Attractants on or Near Airports, 2007.

Table 4.7.2-1

Birdstrikes at LAX by Year - 2001 to 2011

Year	Number of Birdstrikes
2001	66
2002	65
2003	59
2004	67
2005	68
2006	75
2007	39
2008	44
2009	75
2010	87
2011	78

Source: Federal Aviation Administration, Wildlife Strike Database, Available: http://wildlife-mitigation.tc.faa.gov, accessed December 2011.

Aviation Accidents, Incidents, and Runway Incursions

Responsibilities for Ensuring Aviation Safety

Aviation today is one of the safest forms of public transportation, particularly in the U.S., as a result of the combined efforts of FAA and the aviation industry. This was not always the case. Early in the development of aviation as a mode of transportation, aviation safety was threatened by the use of untested and poorly equipped airplanes and inexperienced pilots, as well as a lack of airport emergency management systems, safety regulations, and facility standards. This environment, combined with airlines fighting for economic survival, made for a difficult start to a budding industry with great potential to serve the transportation needs of a sprawling country. Starting with the establishment of the 1926 Air Commerce Act through the establishment of the FAA as a branch of the U.S. Department of Transportation (USDOT) and up to the present day, aviation safety has become one of the highest priorities of the federal government.

The FAA is responsible for regulating all aspects of air transportation, including airports. These regulations ensure a high level of safety in airport operations. This regulatory process begins with airport planning and continues through design, construction, operation, and maintenance of all facilities. The existing operation and maintenance of LAX as a commercial airport is inspected and certified by the FAA.[384] All aspects of the existing (baseline) LAX design and operation are subject to FAA standards. Where current design standards cannot be met, operational restrictions and conditions are in place at FAA's direction to limit the use of certain facilities so as to maintain the prescribed standard level of safety. The FAA requires ongoing review of the LAX design and operation as standards are updated over time.

Aviation safety for aircraft in flight and for people on the ground is enhanced by the efforts of various levels of government to control land use around airports. The FAA takes an active role in protecting air navigation through promoting control over land uses, such as tall structures and bird attractants (e.g., landfills), that threaten air safety near airports and along airways. The State of California promotes control over land use around airports through the establishment of Airport Land Use Commissions (ALUCs). Los Angeles County, through its ALUC, exercises control over land use to help ensure the

[384] U.S. Department of Transportation, Federal Aviation Administration, FAR Part 139 Certification of Airports, 2004.

safety of people living near airports in the county. The City of Los Angeles further protects its residents, property owners, and users of LAX (and its other airports) by also exercising control over building heights and land uses within the Hazard Area established by its Planning and Zoning Code. These guidelines and standards are also addressed in Section 4.9, *Land Use and Planning*, and are discussed below.

Federal Aviation Administration

The FAA is charged with regulating, promoting, developing, and ensuring the safety of civil airports, including LAX. The FAA is also mandated to provide safe and efficient airspace for use by civilian and military aircraft by designating, maintaining, and governing federal airways and their associated navigation facilities. The impacts of an airport's projects on airspace are typically addressed in a separate analysis performed by the FAA following completion of environmental review.

One of the FAA's primary roles is to develop and enforce the civil air regulations for safety standards, including those associated with airfield layout and operations, aircraft operation, and examination and inspection of facilities and personnel. To protect human health and welfare from the risk of aircraft incidents and accidents, the FAA has established extensive safety regulations governing the operation of aircraft as well as the design of airports. These safety regulations are incorporated into FAA's Airport Design Standards.[385]

The requirements contained in FAA's Airport Design Standards are based on the requirements for safe aircraft takeoff, landing, and ground movement. They have evolved as experience and research have increased FAA's understanding of what is necessary to enhance aviation safety. In support of promoting the safe and efficient movement of aircraft, the strict enforcement of FAA Airport Design Standards is intended to provide uniformity at all airports, thereby reducing the need for pilots to be aware of and/or adapt to non-standard situations particular to individual airports and also reducing the workload on air traffic controllers who must manage the operation of the airfield in real-time.

All development carried out on federally-regulated airports, such as LAX, must be conducted in accordance with an approved Airport Layout Plan (ALP). Before any major changes are undertaken in airport facilities involving the runways and taxiways, FAA must approve the ALP. FAA evaluates the safety of the plan and its compliance with FAA regulations. The ALP should, to the extent practicable, conform to FAA Airport Design Standards, with exceptions due to local conditions approved on a case-by-case basis. The operation of aircraft on FAA-regulated airfields that do not meet FAA Airport Design Standards require operational restrictions, waivers, modifications of standards (MOS), or some combination thereof, all of which must be reviewed and approved by FAA on a case-by-case basis. Furthermore, those restrictions, waivers, and modification of standards (MOS) must be taken into account by air traffic control as it manages the airfield.

The ALP for LAX was updated in conjunction with the FAA's issuance of the Record of Decision in 2005 for the LAX Master Plan Improvements. That ALP update includes a plan sheet for future conditions (i.e., buildout of the LAX Master Plan improvements) and a plan sheet for current airport conditions. The ALP plan sheet for current airport conditions is in the process of being updated by LAWA, in coordination with the FAA, to incorporate improvements completed since 2005, such as the South Airfield Improvement Project (SAIP), the Crossfield Taxiway Project (i.e., Taxilane R), and the new Airport Rescue and Fire Fighting (ARFF) station, as well as other recent and pending near-term improvements at LAX. Depending on the outcome of the SPAS process, the LAX ALP may need to be amended to reflect the airport modifications identified by LAWA. Such amendment of the LAX ALP would first require completion of the NEPA review process by the FAA and issuance of a Record of Decision specific to the proposed ALP modifications.

It is common at airports throughout the country to have facilities depicted on ALPs that depart from FAA Airport Design Standards in order to meet local site conditions and constraints. Such differences do not

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385 U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5300-13, Airport Design, September 29, 1989, as amended by Changes 1 - 18, December 30, 2011.

compromise safety. Operational changes and restrictions are made to preserve an acceptable level of safety.

FAA Airport Design Standards include safety compatibility criteria to which airports must conform. The basic objective of safety compatibility criteria is to minimize the risk associated with potential aircraft accidents.

Airspace Surfaces

Federal Aviation Regulation (FAR) Part 77, *Objects Affecting Navigable Airspace*,[386] serves as a means of monitoring and protecting the airspace required for safe operation of aircraft at or near an airport. This regulation establishes imaginary surfaces extending outward from the runways in which it is required that the FAA be notified of any proposed development or structural changes that would obstruct the path of operating aircraft. These "imaginary surfaces" are three dimensional starting at ground level around each runway and sloping upward and outward at various angles for various distances. The standards that define these imaginary surfaces provide guidance to state and local governments in their efforts to control land use around airports so as to protect aircraft in flight and people on the ground. **Figure 4.7.2-1** illustrates the various imaginary surfaces associated with FAR Part 77.

The FAR Part 77 imaginary surfaces are primarily intended to serve as a means of identifying objects that require more detailed analyses specific to the types of airspace operations and related safety requirements that occur within those surfaces. Such airspace operations and safety requirements include what are referred to as "TERPS" (FAA Order 8260.3B, *United States Standard for Terminal Instrument Procedures*, which provides procedures for different types of aircraft operations and events occurring under Instrument Landing System conditions), Obstacle Clearance Surfaces (OCSs), and one-engine inoperative (i.e., one engine fails during take-off resulting in a lower-than-normal climb rate) OCS. It is not unusual for there to be numerous objects near an airfield that penetrate the runway Part 77 Surfaces, including natural elevations, vegetation (i.e., trees and bushes), signs, street lights on nearby roadways, antennas, and buildings/structures and appurtenances. Based on the nature, location, and extent of a penetration into a Part 77 surface and its relationship to specific airspace operations and safety requirements, such as those mentioned above, there are various means of dealing with the object. Options can range from doing nothing (i.e., for low-risk objects), to placing high-visibility markings and lighting on the object to make it highly visible to pilots and indicating such objects on avigation maps, to lowering, reducing, or removing the object. In some cases, an approach or departure procedure will be modified to allow aircraft to safely navigate around or above an object that penetrates a Part 77 surface.

There are numerous objects that currently penetrate the Part 77 Surfaces for LAX, including around the north airfield, mostly consisting of streetlight poles, signs, antennas, natural topography (i.e., Dunes area), and vegetation. Buildings within the Part 77 Surfaces for the north airfield currently include, but are not limited to, multi-story structures to the southeast, including hotels and offices on Century Boulevard and Sepulveda Boulevard, and a multi-story parking structure and office to the northeast.

Airfield Surfaces

The FAA has numerous policies, standards, and requirements related to improvements, uses, activities, and safety considerations within airfield operations areas. Of particular relevance to evaluation of the SPAS alternatives are those pertaining to runway and taxiway design. The following describes key FAA considerations for runways and taxiways.

Runway Separation Distances

FAA standards regarding minimum allowable distances between runways and between runways and adjacent taxiways take into account the types of airfield operations, weather (visibility) conditions, and aircraft sizes. The separation requirements are greater for weather conditions where the approach

386 U.S. Department of Transportation, Federal Aviation Administration, FAR Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace, January 18, 2011.

visibility for pilots is less than one-half mile[387] and is also greater for larger aircraft. For example, the design standards for runway to taxiway separations vary by visibility conditions and aircraft size. Of particular relevance to the SPAS alternatives are the runway to taxiway separation requirements related to large aircraft, as follows:

- Aircraft Design Group (ADG) V Aircraft (e.g., B747)
  - 400 feet - Good visibility (approach visibility ≥1/2 mile)
  - 500 feet - Low visibility (approach visibility <1/2 mile)
- ADG VI Aircraft (e.g., A380)
  - 500 feet - Good visibility (approach visibility ≥1/2 mile)
  - 550 feet - Low visibility (approach visibility <1/2 mile)

Relative to the existing (baseline) configuration of the north airfield at LAX, the two existing runways (Runways 6L/24R and 6R/24L) are separated by 700 feet, which allows simultaneous arrivals and departures during good visibility conditions. In low visibility conditions, Air Traffic Control (ATC) will not land or depart aircraft simultaneously on Runways 6R/24L and 6L/24R; however, ATC can clear two aircraft for landing on adjacent runways if the trailing aircraft has a visual sighting of the aircraft ahead. In addition, ATC has a procedure called "2 increasing to 3" where they can clear an aircraft to land in low visibility conditions after an aircraft on the adjacent runway has begun its takeoff roll, as long as the arriving aircraft is at least two miles out.

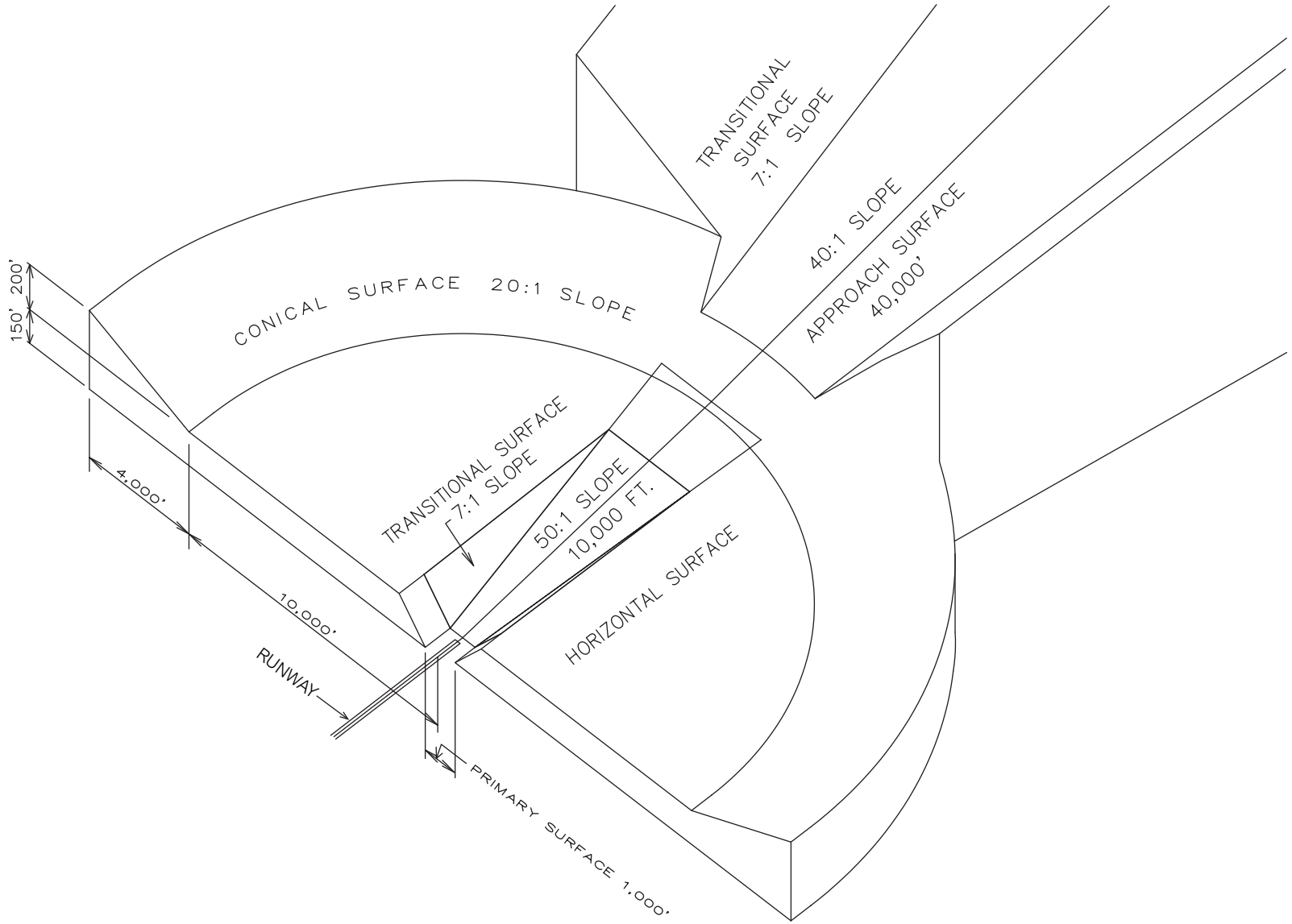
To the south of Runway 6R/24L is Taxiway E, which meets FAA Airport Design Standards for ADG V aircraft during periods of good visibility. The movement of the A380, an ADG VI aircraft, on Taxiway E during poor visibility conditions is only allowed with the observance of several restrictions and special conditions set forth by FAA, specific to that taxiway. During good visibility conditions, the A380 can operate on the full length of Taxiway E with no restrictions on 6R/24L due to an approved MOS from FAA. Vehicular traffic on the adjacent service road is restricted anytime an A380 is on Taxiway E. During CAT I conditions, not more than one ADG VI aircraft can be on the first 3,000 feet of the taxiway from the runway threshold.

South of Taxiway E is Taxilane D, which is separated by 300 feet, with a service road between them for most of its length. Based on FAA design standards, the maximum size aircraft that can operate on this existing taxilane ranges from ADG III in the eastern portion to ADG VI between Taxiway R and Taxiway S in the western portion, with the difference being defined by variations in its and the service road's alignment and nearby obstructions (i.e., parked aircraft, etc.).

Critical Runway Surfaces

FAA Airport Design Standards set forth specific restrictions for certain areas and zones surrounding runways. While the specific nature, purpose, and criteria for such restrictions may differ between these regulated areas and zones, all share the common objective of promoting airport safety. The four most notable regulated areas for runways are described below:

[387] Meteorological conditions whereby approach visibility is equal to or greater than one-half mile combined with a "decision height" (i.e., the minimum height above ground at which the pilot must have adequate visual reference to the landing environment -- approach or runway lighting -- in order to continue the descent to a landing or else must carry out a missed approach) of 200 feet above touchdown zone elevation constitute what is referred to as Category I (CAT I) conditions. Meteorological conditions with more restricted visibility are CAT II and CAT III conditions.



Prepared by: CDM Smith, 2012.

LAX Specific Plan Amendment Study Draft EIR	Part 77 Imaginary Surfaces	Figure 4.7.2-1

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Runway Safety Area (RSA): "a defined surface surrounding the runway and extending beyond the runway end, prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or veer off the runway…[that] provides greater accessibility for firefighting and rescue equipment during such incidents." Based on FAA statistical data, the RSA should capture 90 percent of undershoots and overruns. In addition to the two-dimensional standards, FAA has longitudinal and transverse gradient standards for RSAs. The RSA should be cleared, drained, and graded, and is usually turfed. Under dry conditions, this area should be capable of supporting occasional aircraft that could overrun the runway without causing structural damage to the aircraft, as well as fire fighting and snow removal equipment (in cold climates). All objects, except for frangible (i.e., capable of being broken; breakable) navigational aids, are precluded from being in the RSA. This also precludes vehicle service roads, taxiing, holding, and parked aircraft. For airports serving the sizes and types of aircraft operating at LAX, the RSA extends 1,000 feet out from each end of the useable runway area and 250 feet out from the runway centerline (500 foot total width along the length of the runway).

- **Runway Object Free Area (OFA):** a two-dimensional ground clearance area surrounding the runway and extending beyond the runway end. Within the OFA, parked aircraft and natural or man-made objects are prohibited, except aviation/navigation objects that are fixed by their function. For airports serving the sizes and types of aircraft operating at LAX, the OFA extends 1,000 feet out from each end of the useable runway area and 400 feet out from the runway centerline (800 foot total width along the length of the runway).
- **Runway Protection Zones (RPZs):** trapezoidal-shaped areas located at ground level beyond each end of a runway. Land uses are limited in RPZs to preclude obstruction to aircraft operations proximate to the runway. The purpose of the RPZ is to enhance the protection of people and property on the ground. RPZs vary in size depending upon the type of landing approach available at an airport and the characteristics of the critical aircraft operating at the airport. RPZs are divided into "object free" and "controlled activity" areas. FAA guidelines state that "it is desirable to clear the entire RPZ of all above ground objects." The FAA recommends that airport operators control the land within the RPZ. For airports serving the sizes and types of aircraft operating at LAX, RPZs extend 2,500 feet from the approach ends of runways, and the trapezoidal shape begins at a width of 1,000 feet at the end of the runway and gradually widens to a 1,750 at the outward end of the RPZ. Within that trapezoidal area, the central portion that is of primary interest is approximately 800 feet wide (400 feet on each side of runway centerline) and extends along the 2,500 foot length of the RPZ. The controlled activity area includes the remainder of the RPZ outside of the aforementioned central portion (i.e., the "wing" portions of the RPZ). Additional information regarding the existing RPZs associated with the north airfield at LAX is provided in the next section below.
- **Obstacle Free Zone (OFZ):** similar to an OFA, a two-dimensional ground clearance area surrounding the runway and extending beyond the runway end. An OFZ is intended to provide physical and visual clearances for runway operations and missed approaches. It precludes all objects except frangible visual navigational aids, and also precludes taxiing, holding, and parked aircraft. For airports serving the sizes and types of aircraft operating at LAX, the OFZ extends 2,600 feet out from each end of the useable runway area and 200 feet out from the runway centerline (400 foot total width along the length of the runway).

Figure 4.7.2-2 provides a summary of the information presented above.

Figure 4.7.2-3 shows the current layout of the RSA, OFA (which would also encompass the OFZ), and the arrival and departure RPZ zones associated with the north airfield at LAX.

As indicated above, RSAs for airports serving the sizes and types of aircraft operating at LAX are currently required to be 1,000 feet long (beyond the end of the runway) and 500 feet wide (centered on the runway centerline). Prior to 1988, the size of RSAs varied greatly from airport to airport. At that time, the FAA encouraged airports to have RSAs that were 1,000 long beyond the ends of all runways and 500 feet wide, but these dimensions were not required. The RSAs were standardized in 1988 with the

adoption of Airport Design Advisory Circular 150/5300-13, Change 5.[388] FAA has recognized in the past that many airports could not reasonably provide this additional safety area beyond the end of an existing runway and maintain the current runway length. With this reality in mind, FAA permitted these non-standard RSAs to remain in place at LAX until such time as new or reconstructed runways are considered to replace the existing runways. **Table 4.7.2-2** delineates the existing RSA dimensions for the runways in the north airfield. As shown, non-standard RSAs currently exist at LAX.

Table 4.7.2-2

Existing Runway Safety Area Dimensions at LAX - North Airfield

Runway	Length Beyond Runway End (feet)	Width (feet)
Runway 24L	165	500
Runway 6R	885	500
Runway 24R	1,000	500
Runway 6L	841	500

Source: LAWA, 2011.

The FAA completed an RSA evaluation and analysis for LAX in 2006, in accordance with FAA Order 5200.8, Runway Safety Area Program, to reconsider the adequacy of existing RSAs at LAX.[389] The FAA determined that none of the RSAs at LAX met current standards but all are practicable to improve. U.S. Congressional House Rule 3058 provides the statutory requirements that airports must comply with current RSA requirements by December 31, 2015.

In light of the above, a Runway Safety Area Practicability Study was conducted by LAWA identifying, evaluating, and recommending preferred RSA improvement solutions for LAX runways within operational, environmental, and financial constraints.[390] The Runway 7L/25R Study was finalized and submitted to the FAA for their review and determination in December 2009. These improvements are currently scheduled to take place in 2013.

Identification of potential solutions for noncompliant RSAs in the north airfield was included in an evaluation completed in April 2010.[391] The analysis noted that permanent RSA compliance solutions for these runways can be integrated into all the SPAS build alternatives, such as by extending the eastern end of Runway 6R/24L and by covering the eastern portion of the Argo Drainage Channel for Runway 6L/24R. The FAA has acknowledged that implementation of solutions to RSA compliance issues in the north airfield may not be practicable by December 31, 2015, particularly given overall runway improvements associated with the SPAS alternatives, including RSA improvements, are not proposed to be completed by 2015. The FAA and LAWA are coordinating on the identification and evaluation of potential interim solutions.

388 U.S. Department of Transportation, Federal Aviation Administration, Airport Design Advisory Circular 150/5300-13, Change 5, 1989.

389 U.S. Department of Transportation, Federal Aviation Administration, Runway Safety Area Evaluation and Analysis for Los Angeles International Airport, June 14, 2006.

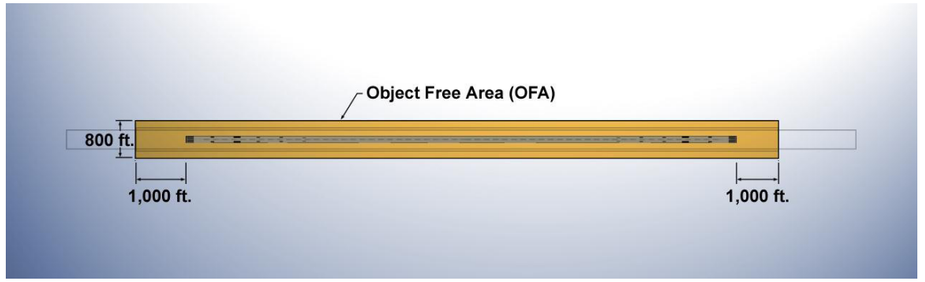
390 Although the 2006 RSA evaluation by FAA found none of the RSAs at LAX to comply with current requirements, the FAA acknowledged that RSA improvements for Runway 7R/25L would be made with the LAX Runway 25L Relocation and Outer Taxiway Project (South Airfield Improvement Project), which has since been completed. As such, it was not necessary to identify solutions for Runway 7R/25L in the Runway Safety Area Practicability Study; however, RSA improvements to the other runway within the south airfield complex - Runway 7L/25R - would still be needed and were, therefore, addressed in the Practicability Study.

391 Ricondo & Associates, Inc., Runway 6L-24R & 6R-24L Safety Area (RSA) Practicability Study, April 2010.

Runway Safety Area (RSA)

- Intended to reduce risk of damage to aircraft deviating from runway
- Precludes all objects except frangible NAVAIDS
- Precludes taxiing, holding & parked aircraft

Object Free Area (OFA)

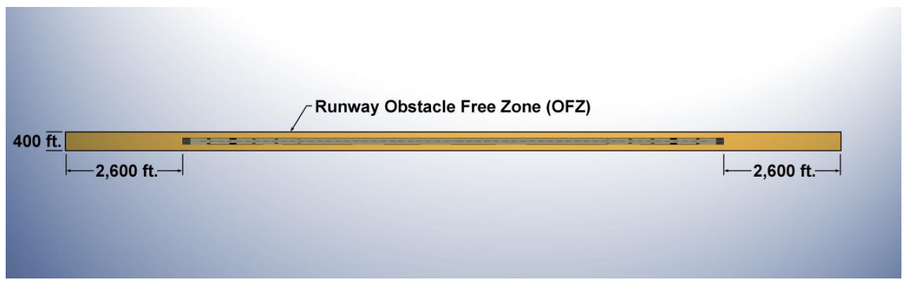


- Intended to enhance operational safety by providing fixed object clearance
- Precludes all fixed objects except NAVAIDS
- Precludes parked aircraft & agricultural operations

Runway Protection Zone (RPZ)

- Intended to enhance protection of people and property on the ground
- Airport control of RPZ required
- Precludes incompatible objects and activities

Obstacle Free Zone (OFZ)



- Intended to provide physical and visual clearance for runway operations and missed approaches
- Precludes all objects except frangible visual NAVAIDS
- Precludes taxiing, holding & parked aircraft

Source: Ricondo & Associates, 2011.
Prepared by: CDM Smith, 2012.

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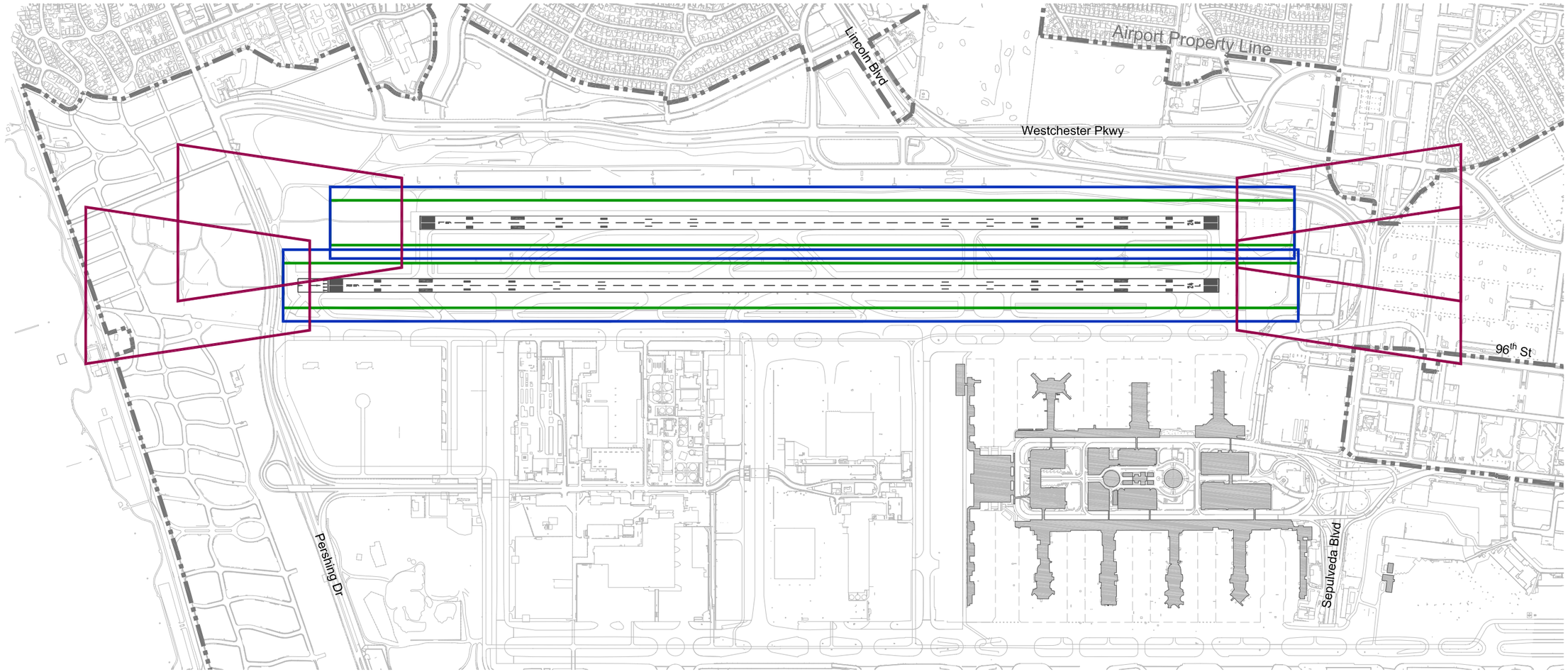

Legend

- Runway Safety Area (RSA)
- Runway Object Free Area (OFA)
- Runway Protection Zone (RPZ)

0 1,200 ft
Scale north

Source: HNTB Corp., Los Angeles International Airport Layout Plan, August 2010; Ricondo & Associates, Inc., December 2011.
Prepared by: Ricondo & Associates, Inc., December 2011.

LAX Specific Plan Amendment Study Draft EIR

North Airfield Runway Safety Areas
Baseline Conditions (2010)

Figure
4.7.2-3

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Runway Protection Zones (RPZs)

As indicated above, RPZs are trapezoidal-shaped areas located at ground level beyond each end of a runway. **Figure 4.7.2-4** delineates the existing approach and departure RPZs, including the central portion of each RPZ, for the north airfield, and also indicates the nature and location of developed uses within the RPZ areas (including parcels that are entirely or even just partially located with the RPZ). **Table 4.7.2-3** provides a summary tabulation of the developed parcels within the existing RPZs for the north airfield. As indicated, there are 41 developed parcels within the existing RPZs, the majority being used for parking.

Table 4.7.2-3

Parcels Within RPZ - Baseline Conditions (2010)

Parcels Inside Existing Runway Protection Zones[1]		Commercial			Residential					
Approach End	Area	Parking	Sales and Services	Offices	Single	Multi	Vacant	Govern-ment	Misc.[2]	Total
Runway 6L	Approach RPZ	-	-	-	-	-	-	-	-	0
	Central Portion of RPZ	-	-	-	-	-	-	-	-	0
	Departure RPZ	-	-	-	-	-	-	-	-	0
	Total 6L Parcels	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Runway 24R	Approach RPZ	7	8	2	8	1	4	1	-	31
	Central Portion of RPZ	4	7	1	-	-	1	-	-	13
	Departure RPZ	1	7	0	-	-	-	-	-	8
	Total 24R Parcels	**7**	**8**	**2**	**8**	**1**	**4**	**1**	**0**	**31**
Runway 6R	Approach RPZ	-	-	-	-	-	-	-	5	5
	Central Portion of RPZ	-	-	-	-	-	-	-	-	0
	Departure RPZ	-	-	-	-	-	-	-	-	0
	Total 6R Parcels	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**5**
Runway 24L	Approach RPZ	4	1	-	-	-	-	-	-	5
	Central Portion of RPZ	-	-	-	-	-	-	-	-	0
	Departure RPZ	-	-	-	-	-	-	-	-	0
	Total 24L Parcels	**4**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**5**
Existing Total[3]		**11**	**9**	**2**	**8**	**1**	**4**	**1**	**5**	**41**

1 This analysis excludes all parcels that fall within the airport property boundary.
2 Rights of way, streets, transmission lines, sewer, utility lines, rivers and lakes.
3 Existing total may not equal the sum of the approach end parcels due to parcels falling within multiple approach end RPZs.

Source: U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5300-13, Airport Design, September 29, 1989, as amended by Changes 1 - 18, December 30, 2011; Ricondo & Associates, Inc., May 2012.

Declared Distances

FAA has established a mechanism for allowing existing airports to continue operating unimpeded through the declaration of safe aircraft operating parameters known as "declared distances." Guidance on the application of this methodology is contained in FAA Advisory Circular 150/5300-13 - Airport Design.

The general principal in the application of declared distances is the independent treatment of each of the four aircraft runway performance distances:

- Take-Off Run - The distance to accelerate from brake release to lift-off, plus safety factors.
- Take-Off Distance - The distance to accelerate from brake release past lift-off to start of takeoff climb, plus safety factors.
- Accelerate Stop Distance - The distance to accelerate from brake release to V_1[392] and then decelerate to a stop, plus safety factors.
- Landing Distance - The distance from the threshold (i.e., the designated beginning of the runway that is available and suitable for the landing of aircraft) to complete the approach, touchdown, and decelerate to a stop, plus safety factors.

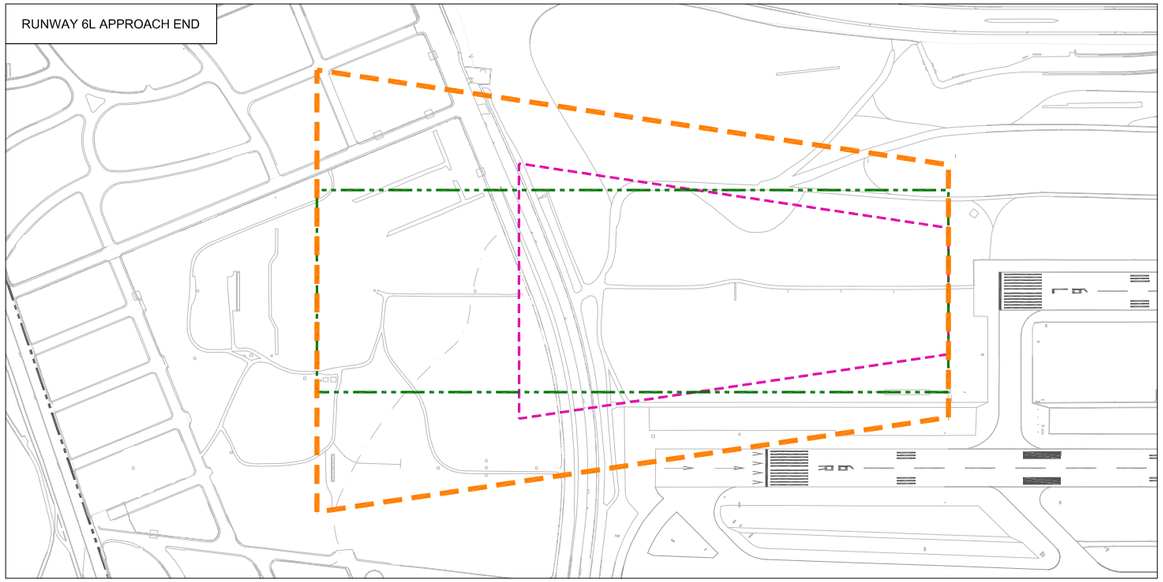
The ALP is used to specify the available runway length for each runway in each direction of use. FAA reviews and approves the ALP and publishes declared distances in its Facility Directory for use by pilots and airline dispatchers. The following are the four types of declared distances:

- Take-Off Run Available (TORA) - The length of runway declared available and suitable for satisfying takeoff run requirements.
- Take-Off Distance Available (TODA) - The TORA plus the length of any remaining runway or clearway beyond the far end of the TORA available for satisfying takeoff distance requirements.
- Accelerate Stop Distance Available (ASDA) - The length of runway plus stop way declared available and suitable for satisfying accelerate-stop distance requirements.
- Landing Distance Available (LDA) - The length of runway declared available and suitable for satisfying landing distance requirements.

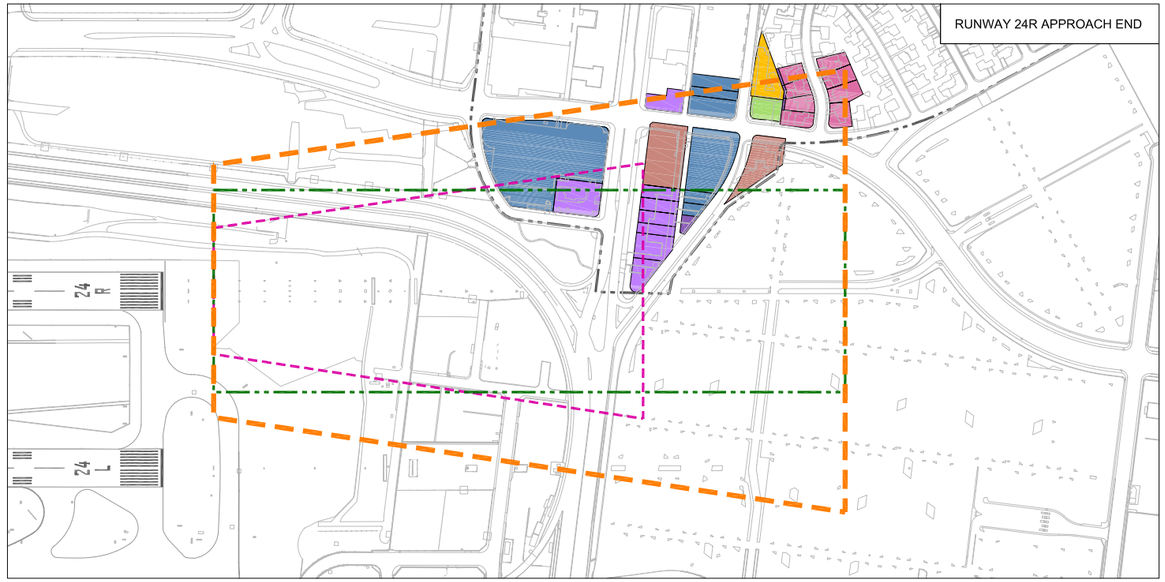
Based on FAA guidelines, **Table 4.7.2-4** delineates the calculated declared distances for runways in the north airfield. To date, declared distances for LAX have not been added to the ALP.

392 "V_1" is, for turbojet aircraft, the maximum speed during takeoff that the pilot may abort the takeoff and stop the airplane within the accelerate-stop distance.

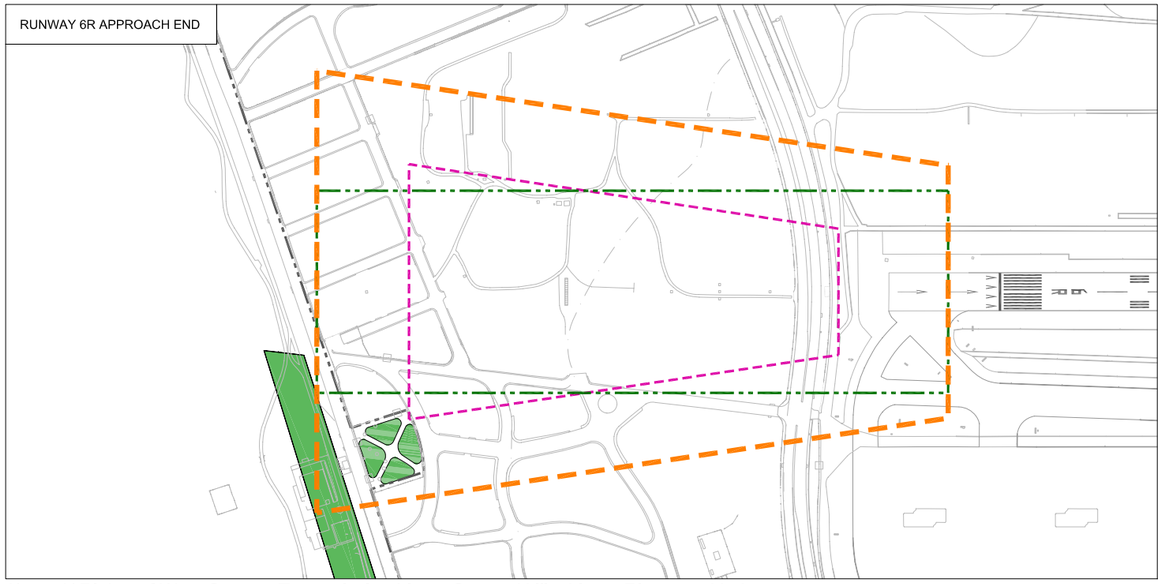
RUNWAY 6L APPROACH END



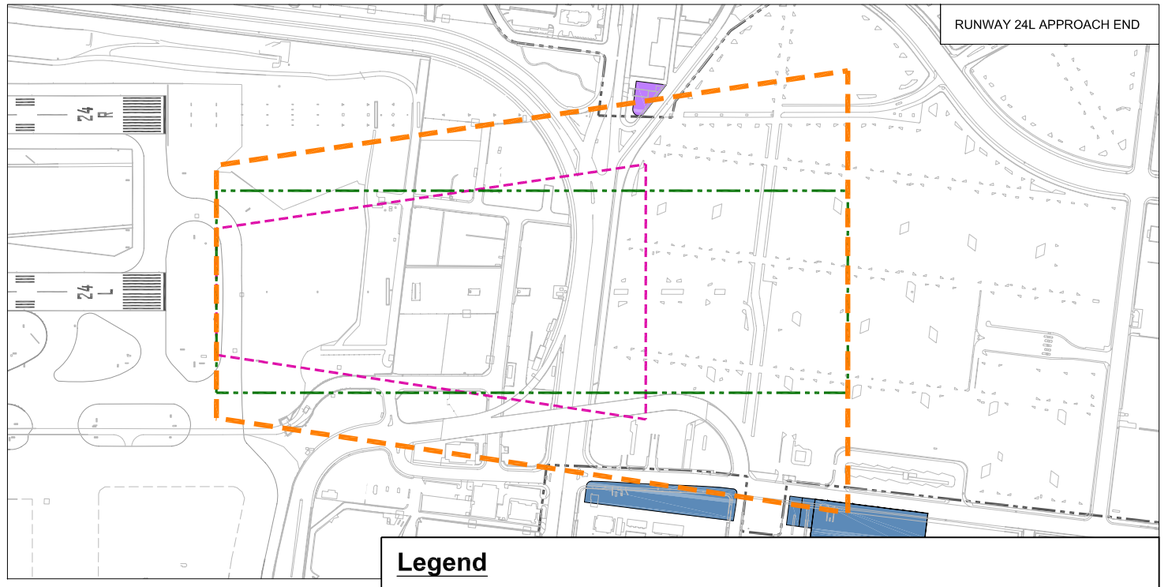
RUNWAY 24R APPROACH END



RUNWAY 6R APPROACH END



RUNWAY 24L APPROACH END



Notes: 1/ Rights of Way, Streets, Transmission Lines, Sewer, Utility Lines, Rivers and Lakes.
2/ This analysis excludes all parcels that fall within the airport property boundary.
3/ For planning purposes, all runways are assumed to have approaches with minimums less than 3/4 mile.

0 600 ft.
Scale

north

Prepared by: Ricondo & Associates, Inc., 2012.

Legend

- Approach RPZ
- Departure RPZ
- Central Portion of the RPZ
- Airport Property Boundary
- Commercial - Offices
- Commercial - Sales and Services
- Commercial - Parking
- Misc. - See Note 1
- Vacant
- Government
- Residential - Single Family
- Residential - Multi Family

LAX Specific Plan Amendment Study Draft EIR

Parcels Within RPZ
Baseline Conditions (2010)

Figure
4.7.2-4

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Table 4.7.2-4

North Airfield Runway Declared Distances

	Runway			
Baseline (2010) Conditions	**6R**	**24L**	**6L**	**24R**
Take-Off Run Available (TORA)	10,285 feet	10,285 feet	8,925 feet	8,925 feet
Take-Off Distance Available (TODA)	10,285 feet	10,285 feet	8,925 feet	8,925 feet
Accelerate Stop Distance Available (ASDA)	10,285 feet	10,285 feet	8,925 feet	8,925 feet
Landing Distance Available (LDA)	9,954 feet	10,285 feet	8,925 feet	8,925 feet
Alternatives 1, 5, and 6				
TORA	10,285 feet	11,535 feet	9,529 feet	9,529 feet
TODA	10,285 feet	11,535 feet	9,529 feet	9,529 feet
ASDA	10,535 feet	10,700 feet	9,529 feet	9,529 feet
LDA	10,100 feet	9,450 feet	8,925 feet	8,925 feet
Alternative 2				
TORA	10,285 feet	11,535 feet	8,925 feet	8,925 feet
TODA	10,285 feet	11,535 feet	8,925 feet	8,925 feet
ASDA	10,535 feet	10,700 feet	8,566 feet	8,925 feet
LDA	10,100 feet	9,450 feet	8,566 feet	8,925 feet
Alternative 3				
TORA	11,700 feet	11,700 feet	10,420 feet	10,420 feet
TODA	11,700 feet	12,000 feet	11,420 feet	10,920 feet
ASDA	10,700 feet	10,700 feet	10,420 feet	10,420 feet
LDA	9,700 feet	9,700 feet	9,420 feet	9,420 feet
Alternative 4				
TORA	10,285 feet	11,120 feet	8,925 feet	8,925 feet
TODA	10,285 feet	11,120 feet	8,925 feet	8,925 feet
ASDA	10,285 feet	10,285 feet	8,566 feet	8,925 feet
LDA	9,850 feet	9,450 feet	8,566 feet	8,925 feet
Alternative 7				
TORA	10,285 feet	11,535 feet	8,925 feet	8,925 feet
TODA	10,285 feet	11,535 feet	8,925 feet	8,925 feet
ASDA	10,535 feet	10,736 feet	8,566 feet	8,925 feet
LDA	10,136 feet	9,486 feet	8,566 feet	8,925 feet

Source: Ricondo & Associates, 2012.

Other FAA/LAWA Safety Measures

The FAA and LAWA have worked together in recent years to deploy new technologies and enhanced training to improve airfield safety at LAX. The following provides a summary of these recent and ongoing improvements:

- Airport Movement Area Safety System (AMASS) was installed and fully operational at LAX in 2003. AMASS is a radar-based system that tracks ground movements and provides an automatic visual and audio alert to tower controllers when it detects potential incursions or collisions on runways and taxiways.
- Enhanced airfield signs, lighting, and pavement markings to FAA updated standards have been installed.
- In 2009, Airport Surface Detection Equipment, Model X (ASDE-X) was installed at LAX. ASDE-X provides a more precise surface detection technology than AMASS by providing accurate target position and identification information and thus gives controllers a more reliable view of airport

operations. A Phase 1 upgrade to the multilateration receiver units was completed in 2011 and a Phase 2 enhancement and upgrade to the ASDE-X equipment is scheduled for installation at LAX in 2013.

- Recurrent training takes place with all airport, airline, and FAA personnel with access to or control of the LAX airfield movement areas (runways, taxiways, and service roads).
- The FAA and LAWA are deploying Runway Status Lights (RWSL) technology at LAX. This tool increases situational awareness for aircrews and airport vehicles and thus serves as an additional layer of runway safety against incursions. A Prototype Program (Phase 1) has been installed and operating since June 2009. LAX was the first airport to have RWSLs installed on multiple runways.
- In February 2010, LAWA and the FAA entered into a Memorandum of Agreement for a full implementation (Phase 2) of RWSL technology. This is to include upgrading existing prototype equipment and new installations on both north and south runway complexes. The design was completed in May 2011; however, the FAA informed LAWA that same month that the implementation schedule was on hold due to budgetary constraints. Based on discussions between LAWA and the FAA in December 2011, the FAA is re-evaluating the scope and budget with the goal of initiating the implementation in 2012. In order for the safety benefit of this technology to be fully realized, an airfield geometry designed to accommodate modern aircraft is needed.
- As part of the overall goal of improving operational safety at LAX, the FAA has made procedural changes since 2007 that are related to airspace operations.

North Airfield Safety Studies

In conjunction with the SPAS process, a number of studies addressing the safety of the north airfield at LAX have been conducted.

Seven independent assessments of north airfield safety were completed. The following is a summary of each of these studies.

- LAX North Airfield Special Peer Review, March 2007 - A special peer review process involving airport industry experts was formed to objectively review the facts concerning the north airfield improvements (i.e., various options for increasing the separation distance between Runways 6L/24R and 6R/24L, adding a centerfield parallel taxiway, and modifying the locations designs of taxiway/runway intersections) and to provide the group's insight and advice on the best solution and way to move forward. The Peer Review Group consisted of 13 aviation experts from the private, airport, and public sector with experience in planning, engineering and operations of major U.S. airports.

  The Peer Review Group[393] evaluated the north airfield from the perspectives of operational safety, airfield balance, and efficiencies. They found that there is a definite need for improvements to the north airfield, that doing nothing is not an option, and massive terminal demolition is not feasible. The Group concluded that shifting the northerly runway 340 feet northward offers maximum safety, balance, and efficiency advantages. This option provides for new large aircraft operations, does not impact the apron/gate terminal infrastructure, presents fewer construction phasing impacts, and provides for a full-length center taxiway to promote safe and efficient aircraft landing and takeoff operations.
- Analysis of LAX North Airfield Alternatives, May 2007 - An analysis of LAX north airfield alternatives was prepared by the International Aviation Management Group, Inc.,[394] an aviation planning firm headed by a professor of Airport Operations and Management from Embry Riddle Aeronautical University. The purpose of this study was to provide expert and objective guidance as to which alternatives being considered for the SPAS at the time (i.e., provide more separation between runways by moving Runway 6L/24R north by either 100 feet or 340 feet, or moving Runway 6R/24L

393 DMJM Harris-AECOM and Peer Review Group, LAX North Airfield Special Peer Review, Summary Report, March 2007.

394 International Aviation Management Group, Inc., Analysis of LAX North Airfield Alternatives, May 2007.

south by either 100 feet or 340 feet, or keeping runways in current locations) were most appropriate for further study as they relate to operational safety, aircraft compatibility, capacity, and environmental considerations.

The study determined that the alternatives that provided an additional runway separation of 340 feet (LAX Master Plan Alternative D [340 feet south] and 340-foot north alternative) were the most appropriate for further study, while the least appropriate alternatives were the no additional separation and the 100-foot south concepts.

- Los Angeles International Airport North Airfield Assessment, May 2007 - A north airfield assessment was prepared by URS Corporation,[395] a large multi-disciplinary worldwide aviation-consulting and engineering firm. The study examined options for reconfiguring the north airfield to address airfield safety related to runway incursions, the need to accommodate ADG VI aircraft, operational efficiencies, and cost factors.

  The study concluded that several aircraft types create operational challenges to the existing airfield and that addition of a center taxiway, which could occur if there was more separation between the existing runways, would eliminate several risks and problems. The study recommended, based upon FAA standards, pursuing relocating Runway 6L/24R 350 feet northerly and increasing its runway takeoff length. Current FAA design standards require greater separation between parallel runways and between runways and taxiways than what exists in the north airfield today, to safely and efficiently accommodate larger aircraft.

- Los Angeles International Airport Modernization - Tomorrow is Now, May 2007 - Twenty-two members of the Airline Pilots Association (ALPA)[396] formed a committee to present their findings and recommendations in a presentation entitled "Los Angeles International Airport Modernization - Tomorrow is Now." ALPA is an international organization of over 60,000 pilots representing over 40 airlines that is heavily engaged in safety issues and improvements for the airline industry.

  The ALPA Committee recommended that Runway 6L/24R be relocated northward to provide 623 feet, but not less than 550 feet, of runway to taxiway separation and that mirroring the separation on the south airfield is not an option.

- LAX North Airfield Proposed Runway Configuration - Safety Risk Assessment, May 2007 - The Washington Consulting Group, Inc. (WCG)[397] led a panel of subject matter experts through a safety risk assessment on the north airfield proposed runway configurations. WCG is an Air Traffic Management Systems and Air Traffic Controller Training firm that is expert in conducting an FAA defined Safety Risk Management (SRM) Study. The SRM panel was to identify operational hazards, analyze associated risks, and establish mitigating strategies to ensure the safe and expeditious management of air traffic and then specifically develop and prioritize improvements that will increase the level of airfield safety.

  The analysis by panel produced a list of ten preliminary hazards associated with aircraft operating on the existing north airfield. **Table 4.7.2-5** describes the ten hazards.

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395 City of Los Angeles, Los Angeles World Airports, Los Angeles International Airport North Airfield Assessment, prepared by URS Corporation, May 2007.

396 Airline Pilots Association, Los Angeles International Airport Modernization - Tomorrow is Now, May 18, 2007.

397 Washington Consulting Group, Inc., LAX North Airfield Proposed Runway Configuration - Safety Risk Assessment, May 2007.

Table 4.7.2-5

Preliminary Hazard List from 2007 North Airfield Safety Risk Assessment

Hazard Number	Summary of Hazard Description	Summary of Possible Effect
LAX 001	Aircraft landing on Runway 24R, crossing Runway 24L without Air Traffic Control Tower (Control Tower) clearance at Taxiway (Twy) Y or Twy Z with a non-heavy aircraft departing on 24L	Reduction of separation by a high severity operational error that could lead to an aircraft collision, large reduction in safety margin, serious or fatal injury, physical distress and excessive workload
LAX 002	Same as LAX 001 above, but with a heavy aircraft departing on Runway 24L	Same as LAX 001 above
LAX 003	Aircraft landing on Runway 24R, crossing Runway 24L without Control Tower clearance at Twy AA or Twy BB with a heavy aircraft departing Runway 24L	Significant increase in ATC and Flight Crew workload; reduction in safety margin and physical discomfort of passengers
LAX 004	Same as LAX 003 above, but with a non-heavy aircraft departing on Runway 24L	Slight reduction in ATC capability, slight increase in Flight Crew workload, reduction in safety margin and physical discomfort of passengers
LAX 005	Arrival and departure occurring simultaneously on Runway 24L	Reduction of separation by a moderate severity operational error, significant increase in Flight Crew workload, significant reduction in safety margin, physical distress to passengers or possible injury
LAX 006	Arrival and departure occurring simultaneously on Runway 24R	Same as LAX 005 above
LAX 007	An arrival off of Runway 24R is holding at Twy AA or Twy BB when there is both a departure on Runway 24L and a new (trailing) arrival on Runway 24R, resulting in the aircraft at Twy AA or BB being within an area designated as an Obstacle Free Zone (OFZ)	Reduction of separation by a high severity operational error that could lead to an aircraft collision, large reduction in safety margin, serious or fatal injury, physical distress and excessive workload
LAX 008	Runway 24L in use for (sequenced) arrivals and departures and Taxiway E in use with an Aircraft Design Group (ADG) V aircraft (i.e., B747-400) or ADG VI aircraft (i.e., A380), resulting in the taxiing aircraft tail impeding on the runway OFZ	Reduction of separation by a moderate severity operational error, significant increase in Flight Crew workload, significant reduction in safety margin, physical distress to passengers or possible injury
LAX 009	Runways 6R/24L and 6L/24R in use with increase of complexity associated with new fleet mix of ADG V/VI aircraft	Same as LAX 008 above
LAX 010	Runway 24R in use and Aircraft Rescue and Fire Fighting (ARFF) equipment operating in runway safety area northeast of the runway, resulting in ARFF equipment inadvertently being within the runway OFZ	Slight increase of ATC complexity, no effect on Flight Crew, inconvenience

Source: CDM Smith, 2012, as summarized from Washington Consulting Group, Inc. LAX North Airfield Proposed Runway Configuration - Safety Risk Assessment, May 2007.

The panel evaluated each of the ten risks using the FAA SRM process and data specific to the design and operation of the north airfield, and rated each risk in terms of severity of safety consequences and likelihood of occurrence. The panel then reevaluated each of the ten risks assuming relocation of Runway 6L/24R 340 feet northward with a westward extension for a total length of 10,420 feet, addition of a centerfield parallel taxiway, eastward extension of Runway 6R/24L for a total length of

11,700 feet departure length, and realignment of exit taxiways. In light of these improvements, the risk levels of three of the hazards were eliminated due to the benefits of a centerfield taxiway, six were reduced, and the one hazard that did not change was a low risk to begin with. **Figure 4.7.2-5** provides a copy of the summary matrix delineating the shifts in existing risk characteristics for the ten hazards if the aforementioned airfield improvements were implemented. The conclusions of the evaluation indicated that the risk reductions associated with those improvements directly relate to the removal of the midfield high speed turnoffs to the immediate and adjacent parallel runway, increased distance between the parallel runways and operational opportunity for large/heavy aircraft to fully clear a runway after landing, and the change to procedures for aircraft taxiing on Taxiway E, as facilitated by and/or associated with, the addition of a centerfield parallel taxiway.

- LAX North Airfield Safety Study (NASS) - Following the completion of the five studies described above, City of Los Angeles elected officials requested preparation of an additional independent safety study, referred to as the LAX NASS, and formed the North Runway Safety Advisory Committee (NRSAC) composed of LAX stakeholders to oversee the study. The study's objective was to "inform decision makers on the scope and severity of operational safety problems of the north airfield and a range of potential solutions." The primary aim of the study was to estimate as specifically as possible the level of future safety associated with each of the alternate configurations of the north airfield, and, secondarily, look at capacity implications of each. In support of the safety study, LAWA contracted with NASA Ames in May 2008, to perform detailed airfield simulation modeling, and with a six-member Academic Panel in July 2008, made up of distinguished professors and aviation safety efficiency experts from the Massachusetts Institute of Technology; Virginia Polytechnic Institute and State University (Virginia Tech); University of California, Berkeley; George Mason University; and University of Maryland.

  The Preliminary NASS Report was released in February 2010, and the Final Report with all supportive documentation was submitted in May 2010.[398] The following were the Academic Panel's main conclusions:

  - The LAX north airfield is extremely safe under the current configuration for the projected 2020 forecast.
  - New configurations of the north airfield that include increased runway separation and the addition of a centerfield taxiway would reduce by a substantial percentage (40-55 percent) the risk of a fatal runway collision.
  - Since the baseline level of risk is so low, reducing that risk by a substantial level is of "limited practical importance."
  - The 340-foot north alternative significantly improves the operational efficiency of LAX and it would improve safety.
  - Based on safety grounds alone, the Panel found it hard to argue for reconfiguring the north airfield.

- FAA's Response to the NASS Report - In response to the NASS Report, the FAA's Office of Airports, Office of Accident Investigation and Prevention, Runway Safety Office, Western Pacific Regional Flight Standards Division, and the Air Traffic Organization conducted a detailed review of the study and identified several critical flaws in the assumptions, methodology, and conclusions. In April 2010, the FAA Administrator provided FAA's comments and position on the NASS and the north airfield in a letter to the Mayor of Los Angeles and to Los Angeles World Airports.[399]

  The FAA stated that they strongly disagree with the study's main conclusion that reducing the risk of a fatal runway collision is of limited practical importance and the study's conclusion that reconfiguring

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398 Academic Panel, Los Angeles International Airport North Airfield Safety Study, May 11, 2010.

399 Babbitt, Randolph J., FAA Administrator, Letter to Mayor Villaraigosa, Los Angeles International Airport North Airfield Safety Study, April 2, 2010.

the north airfield on the grounds of safety alone is not a compelling argument. Besides taking issue with several of the assumptions, methodologies, and uses of data in the report, the FAA made the following statements:

- The only complete and single-most significant solution for LAX's safety and efficiency needs must include airfield geometry designed to accommodate modern aircraft. Everything possible must be done to make the north airfield as safe as it can be.
- North airfield safety and efficiency would be greatly improved by further separating the two runways and constructing a center taxiway between them. This would address equally important issues of standards, safety, and efficiency.
- FAA firmly believes the 40-55 percent reduction in risk would be more than sufficient justification for the reconfiguration of the north airfield on safety grounds alone.

Interim Taxiway Safety Improvement Project (ITSIP)

As a result of the north airfield evaluations described above and the short-term technological improvements that have already been implemented at LAX as also described above, the LAWA Board of Airport Commissioners (BOAC) requested that additional interim improvements in airfield design, and subsequent risk assessment to address as many identified hazards as possible, go forward while the long-term future layout for the north airfield continues to be addressed through SPAS. The main goals and objectives of the subject assessment, referred to as the Interim Taxiway Safety Improvement Project (ITSIP), were to identify changes to the existing north airfield that would mitigate, or lessen the degree of, identified airfield hazards and reduce the level of safety risk without adversely affecting operational efficiency and Runway Occupancy Time (ROT).

In November 2007, the FAA released Engineering Brief No. 75, *Incorporation of Runway Incursion Prevention into Taxiway and Apron Design*,[400] that contained design recommendations for exit taxiways between runways to promote safety. Particularly applicable to ITSIP were the preferences for aircraft to cross in the last third of the runway and to have a 90 degree angle at the intersection of a taxiway and runway in order to enhance pilot visibility to the end of the runway to be crossed. Using this guidance as well as other modeling analysis, several airfield concepts were developed and evaluated using the SRM process. The results were recorded in a July 2010 Comparative Safety Risk Assessment Interim Taxiways Safety Improvement Project Report[401] prepared by Ricondo & Associates, in association with CDM, Johnson Aviation, and WCG.

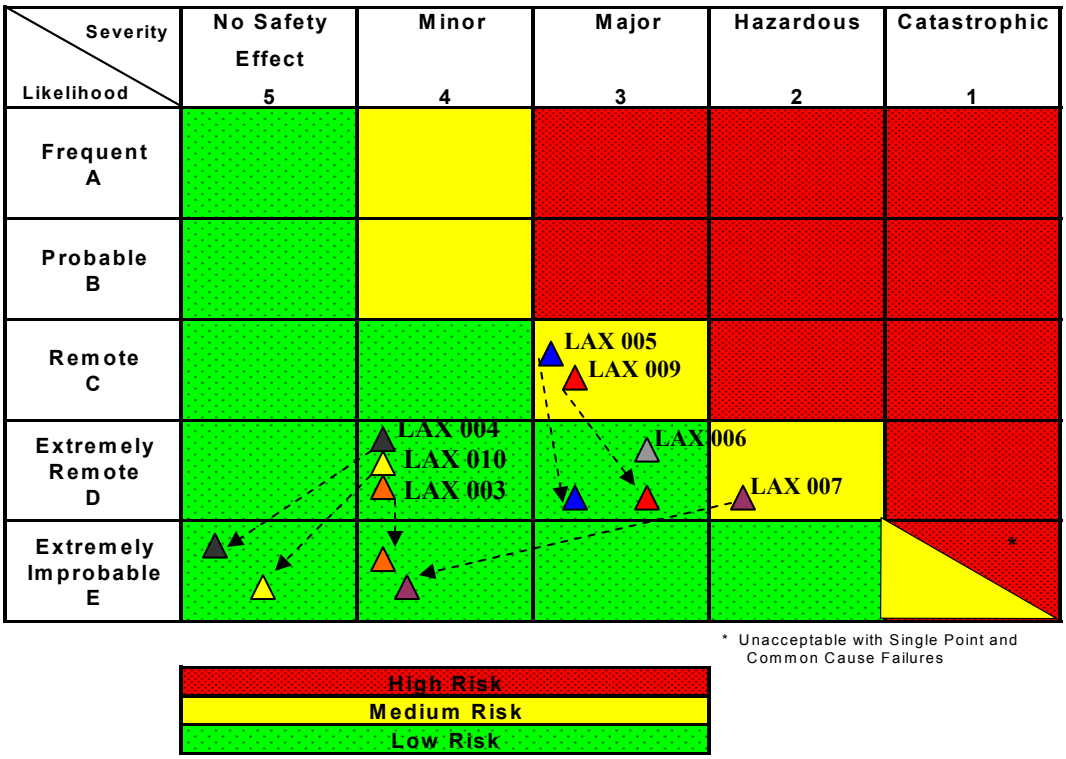
An LAX Safety Panel, comprised of subject matter experts assembled to develop recommendations for the ITSIP design, concluded that relocating Taxiways Y and Z from their current locations to new locations further east and west, respectively, would be a less hazardous situation and reduce the likelihood of a collision. This airfield design change would lower the risk of two identified hazards from a medium risk to a low risk classification.

400 U.S. Department of Transportation, Federal Aviation Administration, Engineering Brief 75: Incorporation of Runway Incursion Prevention Into Taxiways and Aprons, November 19, 2007.

401 Ricondo & Associates, Inc., Comparative Safety Risk Assessment Interim Taxiways Safety Improvement Project, July 2010.

Figure 5

The Washington Consulting Group, Inc. used the severity and likelihood chart below to represent the matrix of the residual and significant improvements from the proposed design of the North Airfield Complex vs. the hazards associated with the current complex design. This is further defined in Section 6, 7 and 8 of this document



Summary of residual hazards and risks from current airfield configuration to proposed airfield configuration

Notes:

- **LAX 001 Eliminated as a hazard from a medium risk in the current configuration**
- **LAX 002 Eliminated as a hazard from a medium risk in the current configuration**
- **LAX 003 Remained a low risk**
- **LAX 004 Reduced to no safety effect from a minor low risk**
- **LAX 005 Reduced to a low risk from a medium risk in the current configuration**
- **LAX 006 Remained a low risk**
- **LAX 007 Reduced to a low risk from a medium risk in the current configuration**
- **LAX 008 Eliminated as a hazard from a medium risk in the current configuration**
- **LAX 009 Reduced to a low risk from a medium risk in the current configuration**
- **LAX 010 Reduced to no safety effect from a minor low risk**

Source: Washington Consulting Group, Inc., LAX North Airfield Proposed Runway Configuration - Safety Risk Assessment, May 2007.
Prepared by: CDM Smith, 2012.

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Aviation Accidents, Incidents, and Runway Incursions at LAX

Information regarding accidents, incidents, and runway incursions at LAX was obtained from the FAA ASIAS System, NTSB Accident Database and Synopses, and LAWA. **Table 4.7.2-6** presents the accident history of LAX for the 11-year period ending in the year 2011. As shown in **Table 4.7.2-6**, between 2001 and 2011, there were 12 accidents at LAX, with no loss of life occurring in any of the accidents. **Table 4.7.2-7** presents the incident and runway incursion history of LAX including severity of runway incursions. Factors affecting the severity of a runway incursion include: proximity of the aircraft and/or vehicle; geometry of the encounter; evasive or corrective action; available reaction time; environmental conditions; and factors that affect system performance.[402]

Table 4.7.2-6

Aircraft Accidents at LAX (2001-2011)

Year	Accidents	Fatal Injuries	Location
2001	0	0	--
2002	0	0	--
2003	1	0	West Helipads
2004	1	0	In-flight
2005	3	0	South Airfield(2), In-flight(1)
2006	0	0	--
2007	1	0	South Airfield
2008	2	0	Taxiway(1), Gate(1)
2009	1	0	Gate
2010	2	0	Gate(1), In-flight(1)
2011	1	0	Gate

Source: National Transportation Safety Board, Accident Database and Synopses, Available: http://www.ntsb.gov/aviationquery/index.aspx, accessed December 19, 2011.

402 U.S. Department of Transportation, Federal Aviation Administration, Aviation Safety Information Analysis and Sharing System, Available: http://www.asias.faa.gov/portal/page/portal/asias_pages/asias_home/, accessed December 15, 2011.

Table 4.7.2-7

Runway Incursions/Incidents at LAX (2001-2011)

	Runway Incursions									
	Category A[1]		Category B[2]		Category C[3]		Category D[4]		Incidents[5]	
Year	North Airfield	South Airfield	North Airfield	South Airfield	North Airfield	South Airfield	North Airfield	South Airfield	North Airfield	South Airfield
2001	0	0	0	1	0	3	0	4	4	9
2002	0	0	0	2	1	1	0	2	1	8[6]
2003	0	0	0	0	0	1	2	8	2	3
2004	0	0	1[9]	0	0	2	1	1	0	5
2005	0	0	0	0	0	1	1	4	5	6
2006[7]	0	1	0	1	0	0	2	4	0	3[8,10]
2007	0	0	2	0	1	2	2	5	2	12[8]
2008	0	0	0	0	2	0	1	4	0	0
2009	0	0	0	0	0	4	3	2	2[8]	0
2010	0	0	0	0	3	7	1	2	0	3
2011	0	0	0	0	7	4	1	6	0	0

1 Category A = A serious incident in which a collision was narrowly avoided.
2 Category B = An incident in which separation decreases and there is a significant potential for collision, which may result in a time critical corrective/evasive response to avoid a collision.
3 Category C = An incident characterized by ample time and/or distance to avoid a collision.
4 Category D = An incident that meets the definition of a runway incursion such as incorrect presence of a single vehicle/person/aircraft on the protected area of a surface designated for the landing and take-off of aircraft but with no immediate safety consequences.
5 Annual number of incidents listed include those listed on FAA's ASIAS System which had an overall higher number of incidents listed than LAWA.
6 Of the eight incidents that occurred in 2002, seven occurred in the south airfield. It is unknown where the incident on February 1, 2002 occurred. For purposes of this table, this incident has been included in the total for the south airfield.
7 FAA had one of the events from 2006 listed as an "incident," whereas LAWA had the same event listed as a runway incursion, Category D. For purposes of this table, this event is counted as an incident.
8 Of these incidents, one was only listed on the NTSB Accident Database and Synopses as "incidents" and it is therefore included in this total.
9 FAA and LAWA identified the event on August 19, 2004 as a runway incursion, category B while the NTSB identified the same event as an incident. For purposes of this table, it is included as a runway incursion, Category B.
10 The incident from NTSB included here did not occur on the north or south airfield, rather while the plane was in-flight. For purposes of this table, it is included in the south airfield total.

Sources: Federal Aviation Administration, Aviation Safety Information Analysis and Sharing System, Available: http://www.asias.faa.gov/portal/page/portal/asias_pages/asias_home/, accessed December 15, 2011; LAWA, LAX Airport Operations, 2011; National Transportation Safety Board, Accident Database and Synopses, Available: http://www.ntsb.gov/aviationquery/index.aspx, accessed December 19, 2011.

As of October 2007, FAA has been using the definition for a runway incursion adopted by the International Civil Aviation Organization (ICAO): "Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and take-off of aircraft." The biggest difference between the ICAO definition and the definition previously utilized by the FAA is that ICAO defines a runway incursion as any unauthorized intrusion onto a runway, regardless of whether or not an aircraft presents a potential conflict. For the FAA, an incident without an aircraft in potential conflict -- such as an unauthorized aircraft crossing an empty runway -- was previously defined as a "surface incident" and not a runway incursion. The new definition means that some incidents formerly classified as surface incidents are instead classified as C or D category runway incursions, which are low-risk incidents with ample time and/or distance to avoid a collision. The classification of the most serious kinds of runway incursions, Categories A and B, remains unchanged.[403]

403 U.S. Department of Transportation, Federal Aviation Administration, "Fact Sheet - FAA Adopts ICAO Definition for Runway Incursions," October 1, 2007, Available: http://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=9612.

As such, the data in **Table 4.7.2-7** indicate that the number of Category C incursions on the south airfield increased following completion of the SAIP, compared to prior years; however, that comparative increase is the result of the definition change and is not a reflection of actual events, as evidenced by the concomitant decrease in the number of (surface) incidents listed after 2007 for the south airfield. Prior to the change in definition, surface incidents included events such as aircraft not following a prescribed route as instructed by ATC, as well as the improper movement of aircraft onto the runway where there was no conflict with arriving or departing aircraft. The first incident described above occurred on a taxiway whereas the second occurred on a runway. Under today's definition, surface incidents that remain incidents would be those events that fall outside the new definition of a runway incursion: "Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and take-off of aircraft" such as the aircraft not following a prescribed route. In essence, surface incidents would entail all events that occur outside the runway environment.

4.7.2.4 Thresholds of Significance

A significant safety impact would occur if the direct and indirect changes in the environment that may be caused by the particular SPAS alternative would result in one or more of the following future conditions:

- Construction of runways within 10,000 feet of a solid waste landfill.
- Construction of facilities or implementation of operational conditions that would serve as attractants to birds.
- A compromise in aviation safety or an aviation safety hazard for people in the project area.

The first two thresholds were adapted from FAA guidance on the location of solid waste disposal facilities, a potential bird attractant, with respect to airport runways.[404] The third threshold was developed specifically to address potential impacts associated with the SPAS alternatives relative to aviation safety, including the question VIII.e in Appendix G of the State CEQA Guidelines, which asks whether the project would result in a safety hazard for people residing or working in the project area, and related to airport land use safety compatibility guidance included in the Caltrans *California Airport Land Use Planning Handbook*.

4.7.2.5 Applicable LAX Master Plan Commitments and Mitigation Measures

No LAX Master Plan commitments or mitigation measures for safety were identified in the LAX Master Plan Mitigation Monitoring and Reporting Program (MMRP).

4.7.2.6 Impacts Analysis

4.7.2.6.1 Alternative 1

Birdstrikes

Under Alternative 1, the Dunes west of the airport, an existing bird attractant at LAX, would not be modified in any way that would increase its attractiveness to birds or otherwise increase birdstrike hazards. Improvements within the Dunes would be limited to the relocation of navigational aids; no water features, ornamental landscaping (including trees), or other facilities that may serve as attractants to birds, and therefore increase the potential for birdstrikes, would be installed/planted within the Dunes, In conjunction with the relocation of Runway 6L/24R 260 feet northward, the entire length of the Argo Drainage Channel would be structurally covered, removing an existing bird attractant from the LAX vicinity. In addition, the total undeveloped area within the airfield, a potential attractant to birds, would

404 U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5200-33B, Hazardous Wildlife Attractants on or Near Airports, 2007.

also be reduced as discussed in Section 4.3, *Biological Resources*. Given the smaller amount of open space available on the airfield for potential use by birds, there would likely be a related reduction in the potential for birdstrikes.

Alternative 1 would result in the extension of Runway 6R/24L and the extension and relocation of Runway 6L/24R in the north airfield; however, no runways would be located within 10,000 feet of a solid waste landfill. No new facilities would be constructed or operational conditions implemented that would serve as attractants to birds. In accordance with FAA requirements, the airfield would continue to be maintained to avoid the ponding of water, the growth of vegetation, and the development of other conditions that may serve as attractants to nuisance wildlife, including birds. Therefore, under Alternative 1, impacts with respect to birdstrikes would be less than significant.

Aviation Accidents, Incidents, and Runway Incursions

Airspace Surfaces

Implementation of Alternative 1 would include relocating Runway 6L/24R 260 feet northward, extending it 604 feet westward, and establishing dual displaced landing thresholds. The northern relocation would shift the existing Part 77 "Transitional Surface" northward and the establishment of the displaced landing threshold at the east end of the runway (i.e., Runway 24R) would shift the existing Approach Surface westward (i.e., in conjunction with the westward extension of the runway, the landing threshold would also move 604 feet westward, allowing the touchdown point for aircraft to occur farther down the runway than under current baseline conditions). The establishment of a displaced landing threshold at the west end of the runway (Runway 6L) would effectively require aircraft to land (touchdown) at the same location they do today even though the runway was extended on the west end by 604 feet. As such, there would be no shift in the existing Approach Surface for Runway 6L.

The northerly shift of the Part 77 Transitional Surface would result in the southern portion of the existing apartment complex near Westchester Parkway and Lincoln Boulevard extending into that imaginary surface.

The relocation of Runway 6L/24R under Alternative 1 would also shift the existing Approach Surface for Runway 24R northward, resulting in a penetration of that imaginary surface by the upper portion the existing 5-story office building located at the northwest corner of Sepulveda Boulevard and Westchester Parkway. In addition to the upper portion of the building, the rooftop utilities (i.e., air conditioning and mechanical equipment) and a rooftop billboard would also extend into the Approach Surface. The upper portions of that building and utilities are currently within the Part 77 Transitional Surface of Runway 6L/24R.

Upper portions of the existing multi-story parking structure located immediately south of the aforementioned office building, which currently penetrate the Part 77 Transitional Surface of Runway 6L/24R, may also fall within the runway Approach Surface as a result of the runway relocation proposed under Alternative 1.

Part 77 imaginary surfaces provide a means of identifying objects that require a more detailed safety analysis. This analysis, performed by the FAA, considers the airspace operations and safety requirements applicable to the Part 77 surface, as well as the nature, location, and extent of the object's penetration into the Part 77 surface. The analysis requires detailed runway design and engineering data not available at this conceptual level of planning, and would occur during the normal course of FAA review and approval of proposed airfield improvements. The analysis would set forth and define the appropriate means and measures to address potential safety concerns related to objects located within the Part 77 surface. As described above in Section 4.7.2.3, options for addressing potential safety hazards associated with objects located within controlled airspace areas can range widely and can include (1) doing nothing (i.e., for low-risk objects); (2) placing high-visibility markings and lighting on the object to make it highly visible to pilots and indicating such objects on avigation maps; (3) lowering, reducing, or removing the object, and; (4) modifying an approach or departure procedure to allow aircraft to safely navigate around or above an object that penetrates a Part 77 surface. The most appropriate

option(s) would be determined in conjunction with detailed airfield improvement engineering and would be subject to FAA review and concurrence prior to FAA approval of an ALP amendment for such an airfield modification. Such measures would reduce this safety impact to a level that is less than significant. Secondary or indirect impacts associated with implementation of such options could range from no impact, such as in the case of low-risk objects that do not require any safety measures, to impacts typically associated with removal of an object/structure, such as temporary construction-related air quality, noise, and traffic impacts, visual impacts (i.e., changes in existing appearance), and land use impacts. Additional discussion and analysis of such secondary or indirect impacts is provided below at the end of the impacts analysis for Alternative 1.

Airfield Surfaces

In conjunction with the northward relocation of Runway 6L/24R under Alternative 1, construction of a centerfield parallel taxiway, along with associated exits and connections between the taxiway and two adjacent runways, would occur. Also occurring would be various extensions and realignments of Taxiway E and Taxilane D and the associated service road. The resultant runway and taxiway separation distances and allowances for various safety zone requirements (e.g., OFZ) would improve the ability of the north airfield to accommodate large aircraft including ADG V and ADG VI aircraft, compared to baseline conditions (2010). **Table 4.7.2-8** delineates, for baseline conditions (2010) and each alternative, the maximum size aircraft, in terms of ADG, for which the runways and parallel taxiways would meet FAA Airport Design Standards without needing approval of special operations restrictions, MOS, or waivers from FAA, unless otherwise noted in **Table 4.7.2-8**.

As indicated in **Table 4.7.2-8**, implementation of Alternative 1 would increase the separation distance between Runways 6L/24R and 6R/24L from 700 feet to 960 feet, but would not change the existing capabilities relative to allowing simultaneous arrivals and departures.

Under Alternative 1, improvements to Taxiway E include straightening the western 2,190 feet and extending the east end by 950 feet (in conjunction with the easterly extension of Runway 6R/24L). Under Alternative 1, improvements to Taxilane D would include extending it 745 feet west to provide a full-length taxilane and various segment relocations to straighten it and provide for ADG V capabilities. In conjunction with these taxiway/lane improvements, the adjacent vehicle service road would be relocated from between the active surface areas of those facilities to the northerly limit of the aircraft parking apron, south of Taxilane D. The improvements would enhance the accommodation of ADG IV, V, and VI aircraft on the north airfield.

The runway improvements proposed under Alternative 1 would modify several existing safety areas such as the RSA, runway OFA, RPZ, and runway OFZ. **Figure 4.7.2-6** shows the runway safety areas associated with Alternative 1. For Runway 6L/24R, the 260-foot northerly relocation would shift the runway safety areas accordingly, which, in turn, would require the realignment of Lincoln Boulevard, as shown in **Figure 4.7.2-6**, and the covering of the Argo Drainage Channel. The combination of the runway improvements, associated improvements to Lincoln Boulevard and the Argo Drainage Channel, and establishment of displaced thresholds would bring all RSAs for the north airfield into compliance with FAA standards.

The proposed relocation of Runway 6L/24R 260 feet northward would shift the associated RPZ northward by that same amount, which would extend over existing developed uses near the east end of the runway that are not currently within the existing RPZ. **Figure 4.7.2-7** delineates the location and current use of parcels within the RPZs associated with Alternative 1 and **Table 4.7.2-9** summarizes the affected land uses. Although the RPZs would shift northward, the establishment of dual displaced landing thresholds would shift the existing approach RPZ for Runway 6L eastward by 104 feet and would shift the existing approach RPZ for Runway 24R westward by 604 feet. That westward shift would place the RPZ outside of any existing residential development (i.e., residences located east of Runway 24R would no longer be within the RPZ). Similarly, the establishment of dual displaced thresholds for Runway 6R/24L would maintain the length of the existing RPZ for Runway 24L even though the runway pavement would be extended eastward.

Table 4.7.2-8

Summary of North Airfield Runways and Parallel Taxiways Compliance with FAA Airport Design Standards

	Baseline Conditions (2010)	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7
Maximum Aircraft Size (ADG Size) on Runways[1]								
Runway-to-Runway Separation								
Distance Between Rwy 6L/24R and Rwy 6R/24L	700 feet	960 feet	700 feet	1,040 feet	700 feet	1,050 feet	800 feet	800 feet
Simultaneous Arrivals and Departures								
In Visual Meteorological Conditions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
In Instrument Meteorological Conditions	No	No	No	No	No	No	No	No
Runway-to-Taxiway Separation								
Distance Between Rwy 6L/24R and Centerfield Parallel Taxiway	NA[5]	500 feet	NA[5]	520 feet	NA[5]	550 feet	400 feet	400 feet
Good Weather - Maximum ADG Allowed On Runway 6L/24R[2]	NA[5]	VI[3]	NA[5]	VI[6]	NA[5]	VI	V[3]	V[3]
Poor Weather - Maximum ADG Allowed On Runway 6L/24R[4]	NA[5]	V	NA[5]	VI[6]	NA[5]	VI	IV	IV
Distance Between Rwy 6R/24L and Centerfield Parallel Taxiway/Taxiway E (Centerfield Taxiway/Taxiway E)	NA[5]/400 feet	460/400 feet	NA[5]/400 feet	520/400 feet	NA[5]/400 feet	500/500 feet	400/400 feet	400/500 feet
Good Weather - Maximum ADG Allowed On Runway 6R/24L[3]	VI[7]	V[9]	VI[10]	V	VI[10]	VI	V	V
Poor Weather - Maximum ADG Allowed On Runway 6R/24L (Departures Only)[7]	VI[8]	V[9]	VI[10]	V	VI[10]	VI	V	V
Maximum Aircraft Size (ADG Size) on Taxiways/lanes[1]								
Centerfield Parallel Taxiway - Maximum ADG Size Allowed (Distance between Runway 6L/24R and Runway 6R/24L)	NA[5]	500/460 feet	NA[5]	520/520 feet	NA[5]	550/500 feet	400/400 feet	400/400 feet
Good Weather[2]	NA[5]	V	NA[5]	VI[6]	NA[5]	VI	V	V
Poor Weather[3]	NA[5]	V	NA[5]	VI[6]	NA[5]	VI	IV	IV
Taxiway E - Maximum ADG Size Allowed	VI[8]	VI[10]	VI[10]	V	VI[8]	VI	VI[10]	VI
Taxilane D - Maximum ADG Size Allowed	III/VI[11]	V[12]	V[12]	V[12]	III/IV[11]	V[12]	V[12]	V[12]

1 "Maximum ADG Allowed" defined as the largest aircraft, in terms of Aircraft Design Group (ADG), for which the subject runway or taxiway/lane meets FAA's Airport Design Standards without needing approval of special operations restrictions, modifications of standards (MOS), or waivers from FAA.
2 Good Weather = Approach visibility not lower than 1/2 mile.
3 Although separation meets standards for approach visibility above 1/2 mile, an MOS will be required because the runway is certified for approach visibility below 1/2 mile.
4 Poor Weather = Approach visibility below 1/2 mile; assumes Runway 6L/24R retains approach visibility minimums less than 1/2 mile.
5 No centerfield taxiway under this scenario.
6 Approved Master Plan ALP allows ADG VI operation based on 520' separation, which varies from current standard.
7 Runway 6R/24L is designed to accommodate approaches when visibility is at or above 1/2 mile; departures may operate but no landings are permitted when approach visibility is below 1/2 mile.

Table 4.7.2-8

Summary of North Airfield Runways and Parallel Taxiways Compliance with FAA Airport Design Standards

	Baseline Conditions (2010)	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7

[8] Approved MOS allows ADG VI operations based on 400-foot separation.
[9] Approved MOS allowing ADG VI operations based on 400-foot separation is applicable only to Taxiway E; assumes 460-foot separation between Runway 6R/24L and centerfield taxiway is controlling dimension dictating Maximum ADG size allowed.
[10] Approved MOS allows ADG VI operations based on 400-foot separation and is assumed extension to east and/or realignment to west will not affect current MOS status.
[11] Taxilane D currently exists in only the eastern half of the north airfield and, due to variations in its alignment and nearby obstructions, ADG design compliance ranges from ADG III in the eastern portion to ADG IV in most of the western portion, and ADG VI between Taxiways R and S.
[12] New ADG capability would apply consistently along entire length of taxilane, including the western extension under this alternative, which would create a full length taxiway.

Source: CDM Smith, Ricondo and Associates, 2012.

Table 4.7.2-9

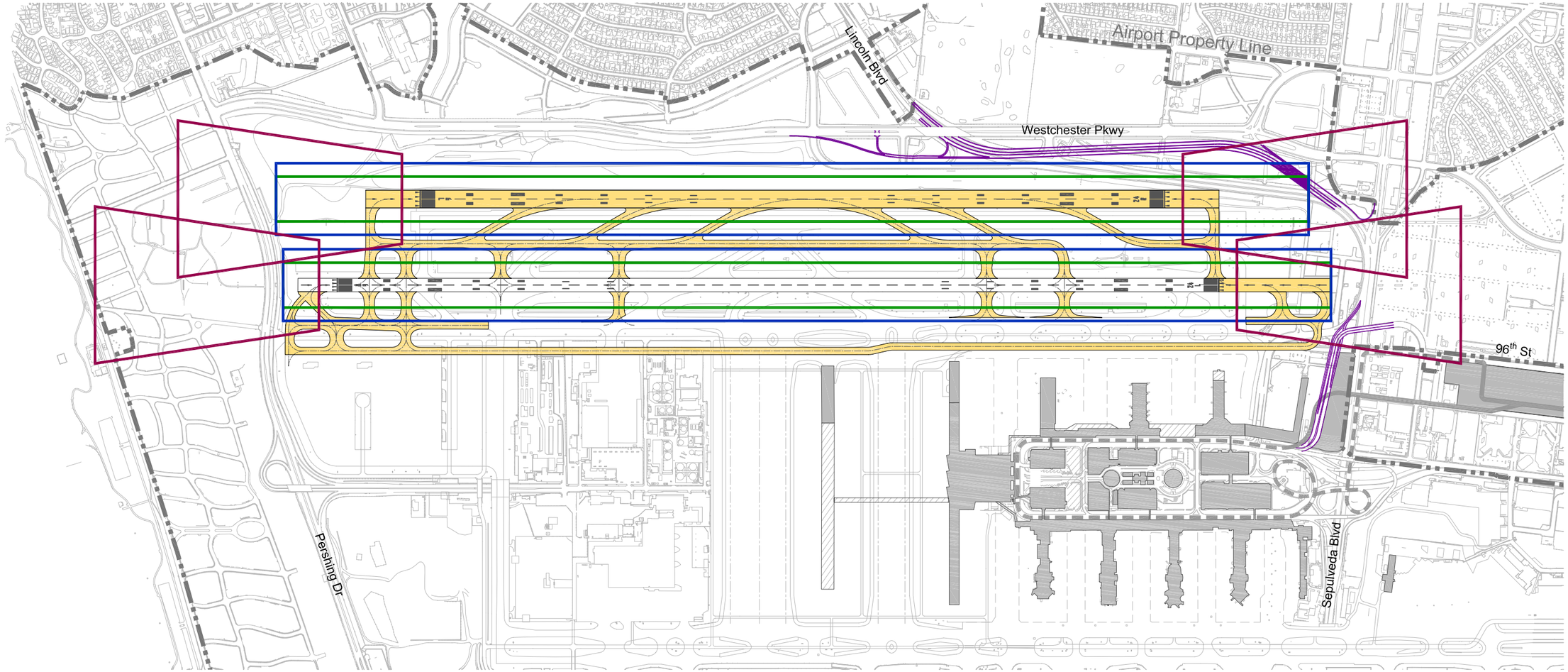
Parcels Within RPZ - Alternative 1

Parcels Inside Alternative 1 Runway Protection Zones[1]		Commercial			Residential					
Approach End	Area	Parking	Sales and Services	Offices	Single	Multi	Vacant	Govern-ment	Misc.[2]	Total
Runway 6L	Approach RPZ	-	-	-	-	-	-	-	-	0
	Central Portion of RPZ	-	-	-	-	-	-	-	-	0
	Departure RPZ	-	-	-	-	-	-	-	-	0
	Total 6L Parcels	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Runway 24R	Approach RPZ	12	12	5	-	-	1	-	-	30
	Central Portion of RPZ	4	7	1	-	-	1	-	-	13
	Departure RPZ	1	7	2	-	-	-	-	-	10
	Total 24R Parcels	**12**	**12**	**5**	**0**	**0**	**1**	**0**	**0**	**30**
Runway 6R	Approach RPZ	-	-	-	-	-	-	-	5	5
	Central Portion of RPZ	-	-	-	-	-	-	-	-	0
	Departure RPZ	-	-	-	-	-	-	-	-	0
	Total 6R Parcels	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**5**
Runway 24L	Approach RPZ	4	1	-	-	-	-	-	-	5
	Central Portion of RPZ	-	-	-	-	-	-	-	-	0
	Departure RPZ	-	-	-	-	-	-	-	-	0
	Total 24L Parcels	**4**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**5**
Alternative Total[3]		**16**	**13**	**5**	**0**	**0**	**1**	**0**	**5**	**40**

[1] This analysis excludes all parcels that fall within the airport property boundary.
[2] Rights of way, streets, transmission lines, sewer, utility lines, rivers and lakes.
[3] Existing total may not equal the sum of the approach end parcels due to parcels falling within multiple approach end RPZs.

Source: U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5300-13, Airport Design, September 29, 1989, as amended by Changes 1 - 18, December 30, 2011; LAWA Environmental Services Division, April 2011; Ricondo & Associates, Inc., May 2012.

Implementation of Alternative 1 would result in a change in the composition of land uses within the RPZ for Runway 6L/24R compared to baseline conditions. The presence of such uses under Alternative 1 may be considered incompatible with FAA design recommendations that RPZ areas be clear of all obstructions and occupied uses; however, it is not considered to pose a significant safety hazard compared to baseline conditions. The FAA, as the federal agency with primary responsible for aviation safety, takes into consideration the presence of potential obstructions and land uses within RPZ areas in the review of ALP amendments. Additionally, the FAA takes into consideration potential hazards, including but not limited to, obstructions and safety areas, as part of ongoing monitoring of requirements necessary for LAX to maintain federal Part 139 Airport Certification (14 CFR Part 139). Should the FAA determine that structures or land uses within RPZ areas pose a significant aviation safety hazard, appropriate means to reduce such potential hazards to acceptable levels would be identified. Such options can include, but not be limited to, marking/lighting obstructions, vacating occupied structures, or clearing a site of all uses and structures. Recognizing that neither FAA nor LAWA own the parcels within the RPZ for Runway 6L/24R that are highlighted in **Figure 4.7.2-4**, the implementation of such measures would likely require that LAWA obtain sufficient control interest in the affected parcels, either through acquisition or establishment of an easement. In the event that FAA determines that structures or uses within the RPZ areas pose a significant safety hazard and measures such as those described above are required, implementation of those measures could result in impacts to the environment. Such potential secondary or indirect impacts are described below, at the end of the impacts analysis for Alternative 1.



Note: Improvements depicted are conceptual only and do not represent engineered design.

Legend

- Runway Safety Area (RSA)
- Runway Object Free Area (OFA)
- Runway Protection Zone (RPZ)

0 1,200 ft
Scale

north

Prepared by: Ricondo & Associates, Inc., May 2012.

LAX Specific Plan Amendment Study Draft EIR

North Airfield Runway Safety Areas
Alternative 1

Figure
4.7.2-6

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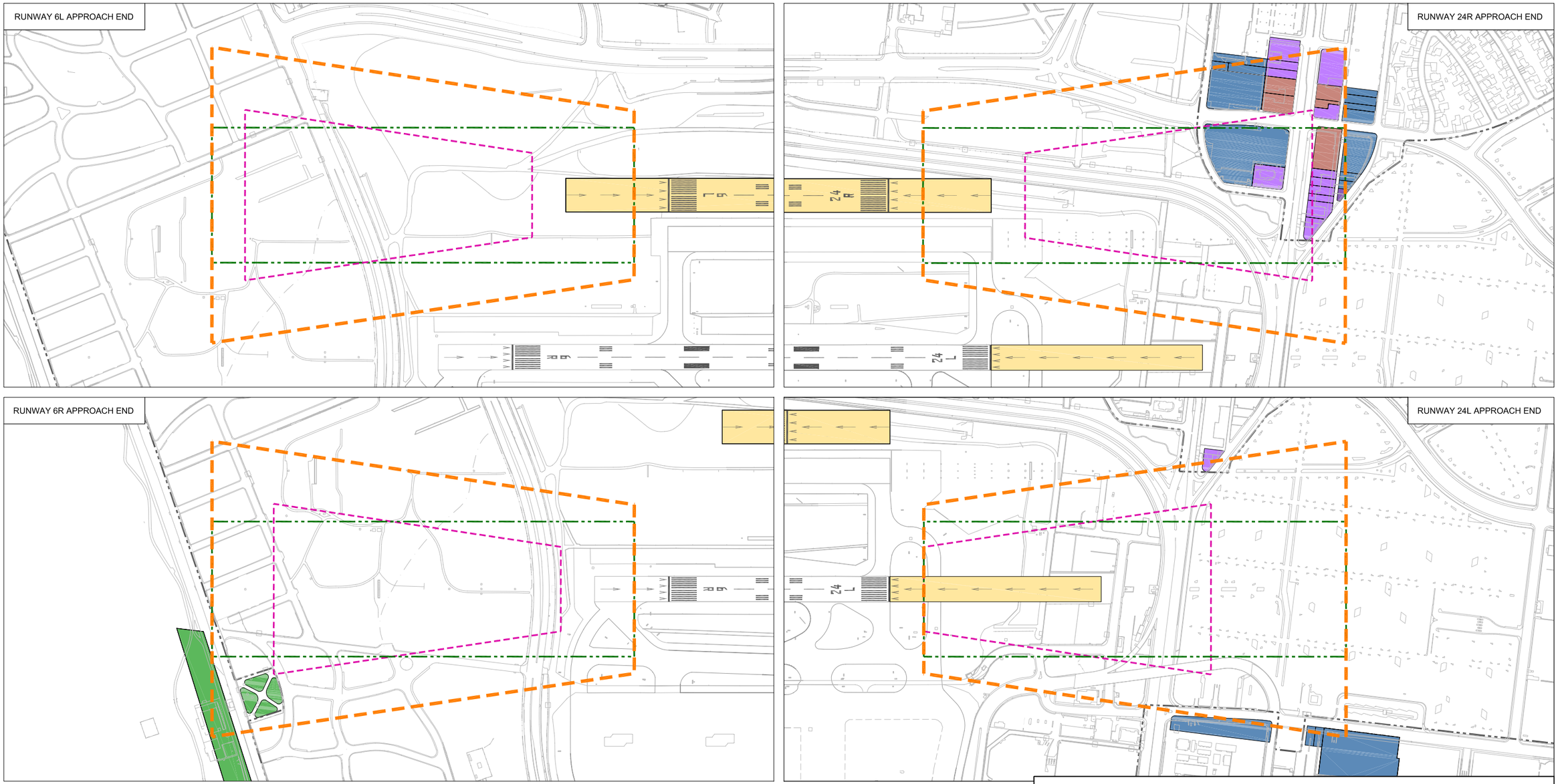

Notes: 1/ Rights of Way, Streets, Transmission Lines, Sewer, Utility Lines, Rivers and Lakes.
2/ This analysis excludes all parcels that fall within the airport property boundary.
3/ For planning purposes, all runways are assumed to have approaches with minimums less than 3/4 mile.

0 600 ft.
Scale north

Prepared by: Ricondo & Associates, Inc., 2012.

LAX Specific Plan Amendment Study Draft EIR

Parcels Within RPZ
Alternative 1

Figure
4.7.2-7

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The combination of physical lengthening of runways and establishment of displaced thresholds would change the existing declared distances for runways within the north airfield. **Table 4.7.2-4** delineates the TORA, TODA, ASDA, and LDA distances resulting from implementation of Alternative 1. As can be seen, in comparison to baseline conditions (2010), the majority (11 of 16) of the existing declared distances would increase in length, one would decrease in length (LDA for 24L), and the remaining four would remain unchanged. Increased distance provides greater length for aircraft to use, which is better particularly for large/heavy aircraft. Most commercial aircraft need approximately 8,000 linear feet for landing operations. In general, the changes in declared distances associated with Alternative 1 would benefit aircraft landing operations, particularly for large/heavy aircraft. The reduced length in the LDA for Runway 24L would still be well above the 8,000 feet normally required for most aircraft landing operations. Additionally, that runway is used primarily for departures, which would have additional take-off distances under this alternative.

Other Safety Considerations

As described above in Section 4.7.2.3, numerous safety studies have been prepared relative to aircraft operations on the north airfield. While the nature, approach, and scope of analysis may differ between the studies, there is general consensus between the studies that increased separation between runways and the addition of a centerfield parallel taxiway can reduce the potential for a runway collision or incursion and enhance safety, particularly as related to future operations involving a greater number of large aircraft. Additionally, the safety benefits of relocated and redesigned runway crossing points along the last-third of Runway 6R/24L, including the advantage of pilot visibility to the end of the runway, were noted in some of the studies. The airfield improvements proposed under Alternative 1 provide for these desired safety improvements.

Summary Conclusions Regarding Alternative 1

Implementation of Alternative 1 would enhance the safety and efficiency of aircraft operating in the north airfield, compared to baseline conditions (2010), as follows:

- Achieves full compliance with RSA requirements;
- Shifts the arrival RPZ for Runway 24R westward, resulting in residences and the vehicle staging area west of Sepulveda Boulevard no longer being located within the RPZ;
- Provides greater amount of runway and taxiway facilities that meet FAA Airport Design Standards for ADG V and VI aircraft, particularly as related to separation requirements, thereby reducing the need for special operations restrictions, MOS, and waivers from FAA;
- Provides increased separation between runways and between runways and taxiways, which better enables taxiing and holding aircraft to stay clear of runway OFZ and RSA surfaces;
- Allows addition of a centerfield parallel taxiway that includes high-speed exits from Runway 6L/24R, which provides more time and options for FAA air traffic controllers to handle aircraft exiting the runway; more time and distance for the pilot of an arriving aircraft to exit the runway, slow down and hold before crossing Runway 6R/24L; and reduced potential for safety hazards/incursions;
- Improves the locations and design of crossing points (i.e., 90-degree crossing angle) at Runway 6R/24L, which provides better pilot visibility down Runway 6R/24L before crossing;
- Realigns/straightens Taxilane D to provide a full-length parallel taxiway designed for ADG V aircraft;
- Relocates vehicle service road adjacent to Taxiway E and Taxilane D out from between two active surfaces; and
- Provides more aircraft holding areas near the end of runways, thereby improving the ability for sequencing departures.

Implementation of Alternative 1 would not involve construction of a runway within 10,000 feet of a solid waste landfill or create an attractant to birds. In general, implementation of this alternative would

enhance aircraft safety and efficiency, as summarized above, particularly with respect to better achieving compliance with FAA Airport Design Standards for operation of large aircraft.

The 260-foot northward shift of Runway 6L/24R would, however, result in a northward shift of the Part 77 imaginary surfaces placing or increasing portions of two multi-story structures within Part 77 Surfaces. As described above, a detailed safety evaluation would be completed in conjunction with FAA review of runway plans and an ALP amendment to determine what, if any, measures are warranted to address potential safety hazards associated with objects being located within controlled airspace areas. Such measures range from doing nothing (i.e., for low-risk objects), to placing high-visibility markings and lighting on the object to make it highly visible to pilots and indicating such objects on avigation maps, to lowering, reducing, or removing the object, and, in some cases, an approach or departure procedure will be modified to allow aircraft to safely navigate around or above an object that penetrates a Part 77 surface. Such measures would reduce this safety impact to a level that is less than significant. Secondary or indirect impacts associated with implementation of such options could range from no impact, such as in the case of low-risk objects that do not require any safety measures, to impacts typically associated with removal of an object/structure, such as temporary construction-related air quality, noise, and traffic impacts, visual impacts (i.e., changes in existing appearance), and land use impacts. Such secondary or indirect impacts are further addressed below. Implementation of Alternative 1 would result in a change in the composition of land uses within the RPZ for Runway 6L/24R compared to baseline conditions. The presence of such uses under Alternative 1 may be considered incompatible with FAA design recommendations that RPZ areas be clear of all obstructions and occupied uses; however, it is not considered to pose a significant safety hazard compared to baseline conditions. In the event that the FAA, as the lead federal agency responsible for aviation safety at LAX, considers that the structures and uses within the existing or future RPZ pose an aviation hazard, modifications to, or removal of, structures and uses in the RPZ may be required.

Potential Secondary or Indirect Impacts Associated with Measures to Address Potential Airspace Obstructions (Part 77) or Incompatible Structures/Uses Within RPZ Areas

To the extent that implementation of measures required to address potential airspace obstructions or incompatible structures/uses with RPZ areas, as determined in conjunction with FAA reviews, contemplates the removal or modification of existing structures and/or uses, the following types of secondary or indirect environmental impacts may occur. It is important to note that the certainty, timing, nature, and extent of, and the approach to, such removals or modifications have not been determined at this programmatic level of conceptual planning. Such information would be developed at more detailed levels of planning and is subject to consultation with the FAA. It should also be noted that if/when such removal or modification actions are required, the discretional approval(s) associated with such activity would be subject to CEQA compliance, at which time additional CEQA review specific to the proposed activity would be completed.

Aesthetics

To the extent that implementation of any measures required to address potential airspace obstructions or incompatible structures/uses requires the removal or modification of existing structures, it is not anticipated that there would be impacts related to obstructing, interrupting, or diminishing existing views, or impacts related to the introduction of features that conflict/contrast with the aesthetic elements of the area (such as theme, style, setbacks, density, massing, etc.). The removal or substantial modification of existing structures could impact the existing aesthetic character of the southern portion of the Westchester business district. It is possible that such an impact would be significant; however, given that the need for, and nature and timing of, any such removal or modification actions are currently unknown, it would be premature and speculative to reach a final conclusion of significance at this time.

Given the existing developed/urbanized nature of the affected areas, significant impacts related to new sources of light and glare are not expected to occur. It is likely that there would be a change in existing lighting and lighting intensity if/as existing structures and uses are removed or modified. Such impacts

are anticipated to be less than significant; however, as noted above, it would be premature and speculative to reach a final significance conclusion at this time regarding this type of potential secondary impact.

Air Quality

The removal of existing structures, if required to address potential airspace obstructions or incompatible structures/uses, would result in construction-related air quality impacts from equipment operations, worker commute, materials deliveries, hauling off of demolition debris, and ground disturbance. Such activities would be greatest for the removal of multi-story structures located along Sepulveda Boulevard and on Westchester Parkway. Most notable from the equipment operation would be emissions from diesel-powered equipment, which can be particularly high in oxides of nitrogen (NO_x) emissions. This would also be the case for emissions associated with the use of diesel-powered trucks associated with the transport of materials to and from the work site. Such impacts would be reduced through implementation of the LAX Master Plan mitigation measures presented in Section 4.2, *Air Quality*, for construction-related air quality impacts. For larger demolition projects involving substantial amounts of large equipment or scheduled to be completed within a relatively short period of time, it is possible that air quality impacts would be significant and unavoidable even with mitigation. As noted above, however, it would be premature and speculative to reach a final significance conclusion at this time regarding this type of potential secondary impact.

Regarding operations-related air quality impacts, it is anticipated that pollutant emissions at each affected site would be reduced from existing conditions, based on the removal of existing uses; however, to the extent that affected uses move to other locations nearby, there would only be a partial reduction in existing emissions. As noted above, it would be premature and speculative to reach a final significance conclusion at this time regarding this type of potential secondary impact.

Biological Resources

Areas most likely to be affected would be those that are currently developed (i.e., pose obstruction hazard or are an incompatible use), which, for the most part, are devoid of notable biological resources. Impacts to such resources would likely be less than significant; however, as noted above, it would be premature and speculative to reach a final significance conclusion at this time regarding this type of potential secondary impact.

Coastal Resources

Potentially affected areas are located on the east side of the north airfield. No impacts to coastal resources would occur.

Cultural Resources

To the extent that implementation of any measures required to address potential airspace obstructions or incompatible structures/uses requires removal or modification of existing structures and site grading, there is the potential for impacts to cultural resources including historic and archaeological resources, if any. Based on a review of aerial photographs of the Westchester business district in the 1950s and 1960s, it is possible that some structures along Sepulveda Boulevard within potentially affected areas are more than 45 years old, which would qualify them as being potentially historic. Depending on whether a formal evaluation(s) of such properties confirms that they meet all the requirements to be considered an historical resource, the removal or modification of existing structures could result in a significant impact. Such an impact could be reduced through implementation of the LAX Master Plan commitment and mitigation measures presented in Section 4.5, *Cultural Resources*, for historical resources; however, given the possibility that complete removal of a structure(s) may be necessary, there is the potential that impacts to historical resources would be significant and unavoidable. As noted above, it would be premature and speculative to reach a final significance conclusion at this time regarding this type of potential secondary impact.

The subject area is largely developed/urbanized and natural surfaces and shallow subsurface areas have been subject to disturbance. As such, the potential for significant archaeological or paleontological

resources to be present is generally considered to be low, particularly in instances where the necessary action is only to lower/remove a structure down to surface level. Implementation of the LAX Master Plan mitigation measures presented in Section 4.5, *Cultural Resources*, for archaeological, would add to the likelihood that potential impacts to archaeological resources would be reduced to a level that is less than significant. Similarly, compliance with the LAX Master Plan MMRP Paleontological Management Treatment Plan[405] would reduce potential impacts to paleontological resources to a level that is less than significant.

Greenhouse Gases

Similar to air quality above, implementation of the measures identified above would likely result in emissions of greenhouse gases in conjunction with construction activities associated with removal or modification of existing structures, and a possible reduction in greenhouse gas emissions associated with the operation of existing uses within the affected areas. The reduction in operations-related greenhouse gas emissions would be partially offset or neutralized by the likelihood that many, if not most, affected uses would relocate elsewhere and continue operations. Greenhouse gas emissions could be significant; however, as noted above, it would be premature and speculative to reach a final significance conclusion at this time regarding this type of potential secondary impact.

Hazards/Hazardous Materials

To the extent that implementation of any measures required to address potential airspace obstructions or incompatible structures/uses requires the removal or modification of existing structures, such activities could encounter hazardous materials, primarily in the form of hazardous building materials such as asbestos, lead-based paint, polychlorinated biphenyls (PCBs), and the like. Based on past and present uses within and around the area being mostly commercial, office, and residential, it is not anticipated that major subsurface contamination exists within the area. More thorough investigations, such as preliminary site assessments (PSAs), Phase I/II site investigations, building inspections, etc., would be necessary to determine more definitely the nature and extent of hazardous materials/contamination, if any. Compliance with LAWA's *Procedure for the Management of Contaminated Materials Encountered During Construction*, (which facilitates the implementation of LAX Master Plan Commitment HM-2, Handling of Contaminated Materials Encountered During Construction), would address such potential impacts. In light of the existing uses within the potentially affected areas being primarily office and commercial, current operations are unlikely to be notable users/generators of hazardous materials. The removal of existing uses or replacement with lower intensity uses is not expected to result in significant operations-related impacts for hazardous materials; however, as noted above, it would be premature and speculative to reach a final significance conclusion at this time regarding this type of potential secondary impact.

Hydrology/Water Quality

Potentially affected areas are mostly developed/urbanized; hence, surface hydrology is characterized primarily by runoff flowing across impervious surfaces into the existing storm drain system, and water quality is characterized by typical urban stormwater pollutants (i.e., oil and grease, metals, nitrogen, fecal coliform, trash, etc.). Implementation of the above measures could result in reduced surface runoff to the extent that existing structures and impervious surfaces are removed, and also reduce or change urban stormwater pollutants to the extent existing urban uses are taken out of service or replaced with lower intensity uses. Construction activities associated with the removal or modification of existing structures could result in short-term erosion and sedimentation and other construction-related water quality pollutants (i.e., from fueling/servicing of construction equipment, storage of materials including temporary stockpiles of demolition debris, etc.). Mitigation of such construction-related pollutants would be accomplished through adherence with the requirement of the State Water Resources Control Board General (Construction) Permit (2009-0009-DWQ). Hydrology and water quality impacts are anticipated to

405 City of Los Angeles, Los Angeles World Airports, LAX Master Plan Mitigation Monitoring and Reporting Program, Paleontological Management Treatment Plan, December 2005.

be less than significant; however, as noted above, it would be premature and speculative to reach a final significance conclusion at this time regarding this type of potential secondary impact.

Land Use and Planning

The potentially affected areas are designated in the City's General Plan for Commercial (Community) land use. Similarly, the subject areas are zoned for commercial uses, primarily C1-Light Commercial and C2-General Commercial. The removal of existing uses would not require a General Plan amendment or a change in zoning. The potential replacement of existing uses with other uses compatible with an RPZ would need to be reviewed in light of the provisions of the existing zoning relative to permitted and conditional uses. In general, however, the removal of existing uses and replacement with lower intensity uses is not expected to conflict with the existing land use plans for the area. Similarly, it not expected to create physical or functional incompatibility with existing land uses nearby. To the extent that implementation of any measures required to address potential airspace obstructions or incompatible structures/uses requires the removal of existing uses, implementation of LAX Master Plan Commitment RBR-1, *Residential and Business Relocation Program*, and LAX Master Plan Mitigation Measure MM-RBR-1, *Phasing for Business Relocations*, would reduce impacts associated with business relocation. With implementation of the commitment and mitigation measure, impacts related to business relocation would likely be reduced to a level that is less than significant; however, as noted above, it would be premature and speculative to reach a final significance conclusion at this time regarding this type of potential secondary impact.

Noise

To the extent that implementation of any measures required to address potential airspace obstructions or incompatible structures/uses requires the removal or modification of existing structures and site grading, construction-related noise could impact noise-sensitive receptors (i.e., residential development, a school, and a church) located along the east side of Sepulveda Eastway. These noise-sensitive receptors are located approximately 300 feet from structures along Sepulveda Boulevard. Based on the typical construction noise level of 89 dBA Community Noise Equivalent Level (CNEL) described in Section 4.10.3, *Construction Traffic and Equipment Noise*, and an estimated existing ambient exterior noise level of approximately 70 dBA CNEL (based on the LAX Noise Standards Quarterly Report for Fourth Quarter 2010), construction-related noise at these receptors would be approximately 77 dBA CNEL. This would be more than 5 dBA above the existing ambient noise level and is considered a significant impact. Implementation of the LAX Master Plan commitments and mitigation measures presented in Section 4.10.3, *Construction Traffic and Equipment Noise*, would reduce construction noise impacts. However, given that the design and effectiveness of such measures, such as the noise control plan, depend on site- and project-specific conditions that would be addressed at future, more detailed levels of planning, it cannot be definitively concluded at this time that all construction equipment noise impacts would be reduced to levels that are less than significant.

Public Services

To the extent that implementation of any measures required to address potential airspace obstructions or incompatible structures/uses requires the removal of existing uses or replacement with lower intensity uses, it is anticipated that the need for public services at the site would, in general, be reduced. No significant impacts to public services are expected to occur; however, as noted above, it would be premature and speculative to reach a final significance conclusion at this time regarding this type of potential secondary impact.

Transportation

To the extent that implementation of any measures required to address potential airspace obstructions or incompatible structures/uses requires the removal of existing uses or replacement with lower intensity uses, it is anticipated that existing trip generation within affected areas would, in general, be reduced. Construction activities associated with the removal or modification of existing structures would result in temporary construction-related traffic and possible lane closures and detours. The LAX Master Plan

commitments and mitigation measure presented in Section 4.12.2, *Off-Airport Transportation*, would reduce construction traffic impacts. The specific application and efficacy of such measures are dependent on the particular characteristics of the construction activities, such as location, timing, and approach. Such information would be developed in the future as plans for removal/modification of structures are formulated. As such, it cannot be definitively concluded at this time that all construction traffic impacts would be reduced to levels that are less than significant.

Utilities

To the extent that implementation of any measures required to address potential airspace obstructions or incompatible structures/uses requires the removal of existing uses or replacement with lower intensity uses, it is anticipated that existing demands on utilities would, in general, be reduced. No significant impacts to utilities are expected to occur; however, as noted above, it would be premature and speculative to reach a final significance conclusion at this time regarding this type of potential secondary impact.

4.7.2.6.2 Alternative 2

Birdstrikes

As with Alternative 1, under Alternative 2, the Dunes west of the airport, an existing bird attractant at LAX, would not be modified in any way that would increase its attractiveness to birds or otherwise increase birdstrike hazards. Improvements within the Dunes would be limited to the relocation of navigational aids; no water features, ornamental landscaping (including trees), or other facilities that may serve as attractants to birds, and therefore increase the potential for birdstrikes, would be installed/planted within the Dunes. Unlike Alternative 1, the majority of the Argo Drainage Channel would remain uncovered, with the exception of 750 feet at the eastern end, which are required to be covered under baseline conditions (2011) to comply with RSA requirements. This partial covering of the Argo Drainage Channel would remove a portion of an existing bird attractant from the LAX vicinity. Given the smaller amount of the uncovered channel available for potential use by birds compared to existing conditions, there would likely be a related reduction in the potential for birdstrikes. In addition, the total undeveloped area within the airfield, a potential attractant to birds, would also be reduced as discussed in Section 4.3, *Biological Resources*. Given the smaller amount of open space available on the airfield for potential use by birds, there would likely be a related reduction in the potential for birdstrikes.

Alternative 2 would result in the extension of Runway 6R/24L in the north airfield; however, no runways would be located within 10,000 feet of a solid waste landfill. No new facilities would be constructed or operational conditions implemented that would serve as attractants to birds. In accordance with FAA requirements, the airfield would continue to be maintained to avoid the ponding of water, the growth of vegetation, and the development of other conditions that may serve as attractants to nuisance wildlife, including birds. Therefore, under Alternative 2, impacts with respect to birdstrikes would be less than significant.

Aviation Accidents, Incidents, and Runway Incursions

Airspace Surfaces

Implementation of Alternative 2 would not relocate either runway in the north airfield or provide for development of a centerfield parallel taxiway; however, Runway 6R/24L would be extended eastward by approximately 1,250 feet. A displaced landing threshold would be established on Runway 24L, which would keep the aircraft landing point the same as it is under baseline conditions (2010). There would be no notable change in the existing Part 77 imaginary surfaces for the north airfield.

Airfield Surfaces

In the absence of any runway relocation under Alternative 2, no centerfield parallel taxiway would be added. As indicated in **Table 4.7.2-8**, the existing separation distance between Runways 6L/24R and 6R/24L would remain at 700 feet.

Under Alternative 2, improvements to Taxiway E and Taxilane D would be the same as described above for Alternative 1.

Figure 4.7.2-8 shows the runway safety areas associated with Alternative 2. There would be no change in the existing runway safety areas including the RPZs for Runway 24R, which currently encompasses numerous businesses and residences in Westchester. **Figure 4.7.2-9** delineates the location and current use of parcels within the RPZs associated with Alternative 2 and **Table 4.7.2-10** summarizes the affected land uses. Given that there would be no change in RPZs under Alternative 2, the affected land uses shown in **Figure 4.7.2-9** and **Table 4.7.2-10** are the same as delineated in Section 4.7.2.3 for baseline conditions (2010).

Table 4.7.2-10

Parcels Within RPZ - Alternative 2

Parcels Inside Alternative 2 Runway Protection Zones[1]		Commercial			Residential					
Approach End	Area	Parking	Sales and Services	Offices	Single	Multi	Vacant	Govern-ment	Misc.[2]	Total
Runway 6L	Approach RPZ	-	-	-	-	-	-	-	-	0
	Central Portion of RPZ	-	-	-	-	-	-	-	-	0
	Departure RPZ	-	-	-	-	-	-	-	-	0
	Total 6L Parcels	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Runway 24R	Approach RPZ	7	8	2	8	1	4	1	-	31
	Central Portion of RPZ	4	7	1	-	-	1	-	-	13
	Departure RPZ	1	7	0	-	-	-	-	-	8
	Total 24R Parcels	**7**	**8**	**2**	**8**	**1**	**4**	**1**	**0**	**31**
Runway 6R	Approach RPZ	-	-	-	-	-	-	-	5	5
	Central Portion of RPZ	-	-	-	-	-	-	-	-	0
	Departure RPZ	-	-	-	-	-	-	-	-	0
	Total 6R Parcels	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**5**
Runway 24L	Approach RPZ	4	1	-	-	-	-	-	-	5
	Central Portion of RPZ	-	-	-	-	-	-	-	-	0
	Departure RPZ	-	-	-	-	-	-	-	-	0
	Total 24L Parcels	**4**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**5**
Alternative Total[3]		**11**	**9**	**2**	**8**	**1**	**4**	**1**	**5**	**41**

1 This analysis excludes all parcels that fall within the airport property boundary.
2 Rights of way, streets, transmission lines, sewer, utility lines, rivers and lakes.
3 Existing total may not equal the sum of the approach end parcels due to parcels falling within multiple approach end RPZs.

Source: U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5300-13, Airport Design, September 29, 1989, as amended by Changes 1 - 18, December 30, 2011; LAWA Environmental Services Division, April 2011; Ricondo & Associates, Inc., May 2012.

The improvements proposed at the east end of Runway 6R/24L and the covering of the eastern end of the Argo Drainage Channel would bring the RSAs for the north airfield into compliance with FAA standards.

As can be seen in **Table 4.7.2-4**, implementation of Alternative 2 would change about half of the existing declared distances, with five getting longer and three getting shorter. As noted above, increased distance provides greater length for aircraft to use, with most commercial aircraft needing approximately 8,000 linear feet for landing operations. In general, the changes in declared distances associated with Alternative 2 would benefit aircraft landing operations, particularly for large/heavy aircraft. The reduced lengths in the ASDA and the LDAs for Runway 6L and 24L would still be well above the 8,000 feet normally required for most aircraft landing operations, although one of the affected runways -- Runway 6L -- is the primary runway for arrivals during east flow conditions (i.e., aircraft landing from the west towards the east).

Other Safety Considerations

As described above in Section 4.7.2.3, numerous safety studies have been prepared relative to aircraft operations on the north airfield. While the nature, approach, and scope of analysis may differ between the studies, there is general consensus between the studies that increased separation between runways and the addition of a centerfield parallel taxiway can reduce the potential for a runway collision or incursion and enhance safety, particularly as related to future operations involving a greater number of large aircraft. Additionally, the safety benefits of relocated and redesigned runway crossing points along the last-third of Runway 6R/24L, including the advantage of pilot visibility to the end of the runway, were noted in some of the studies. The airfield improvements proposed under Alternative 2 do not include increased separation distance between runways or the addition of a centerfield parallel taxiway, but do provide for relocated high-speed exits and improved crossing angles at Runway 6R/24L. Those improved high-speed exits and crossing angles reflect the recommendations of the LAX Safety Plan that provided the basis of the ITSIP described earlier in Section 4.7.2.2.

Summary Conclusions Regarding Alternative 2

Implementation of Alternative 2 would enhance the safety and efficiency of aircraft operating in the north airfield, compared to baseline conditions (2010), as follows:

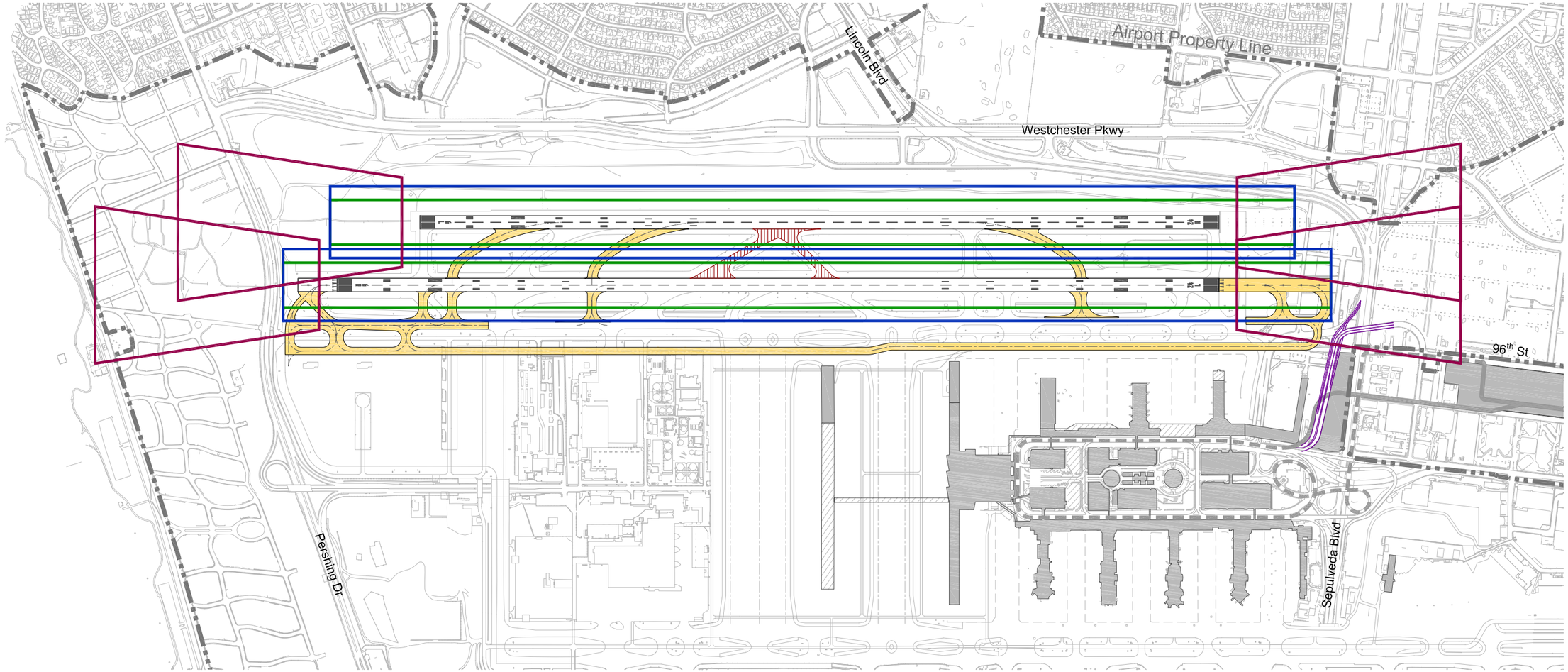
- Achieves full compliance with RSA requirements;
- Provides greater amount of taxiway facilities that meet FAA Airport Design Standards for ADG V and VI aircraft, particularly as related to separation requirements, thereby reducing the need for special operations restrictions, MOS, and waivers from FAA;
- Improves the locations for high-speed exits from Runway 6L/24R and improves crossing angles at Runway 6R/24L with better pilot visibility down Runway 6R/24L before crossing;
- Realigns/straightens Taxilane D to provide a full-length parallel taxiway designed for ADG V aircraft;
- Relocates vehicle service road adjacent to Taxiway E and Taxilane D out from between two active surfaces; and
- Provides more aircraft holding areas near the end of runways, thereby improving the ability for sequencing departures.

Implementation of Alternative 2 would not involve construction of a runway within 10,000 feet of a solid waste landfill, create an attractant to birds, compromise aviation safety, or result in a potential aviation safety hazard for people in the project area. No significant safety impacts would occur.

4.7.2.6.3 Alternative 3

Birdstrikes

Under Alternative 3, impacts with respect to birdstrikes would be the same as those described previously for Alternative 2. As with Alternative 2, implementation of Alternative 3 would not involve construction of a runway within 10,000 feet of a solid waste landfill or create an attractant to birds; therefore, impacts would be less than significant.



Note: Improvements depicted are conceptual only and do not represent engineered design.

Legend

- Runway Safety Area (RSA)
- Runway Object Free Area (OFA)
- Runway Protection Zone (RPZ)

0 1,200 ft
Scale

north

Prepared by: Ricondo & Associates, Inc., May 2012.

LAX Specific Plan Amendment Study Draft EIR	**North Airfield Runway Safety Areas Alternative 2**	Figure **4.7.2-8**

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RUNWAY 6L APPROACH END

RUNWAY 24R APPROACH END

RUNWAY 6R APPROACH END

RUNWAY 24L APPROACH END

Notes: 1/ Rights of Way, Streets, Transmission Lines, Sewer, Utility Lines, Rivers and Lakes.
2/ This analysis excludes all parcels that fall within the airport property boundary.
3/ For planning purposes, all runways are assumed to have approaches with minimums less than 3/4 mile.

0 600 ft.
Scale

north

Prepared by: Ricondo & Associates, Inc., 2012.

Legend

- Approach RPZ
- Departure RPZ
- Central Portion of the RPZ
- Airport Property Boundary
- Commercial - Offices
- Commercial - Sales and Services
- Commercial - Parking
- Misc. - See Note 1
- Vacant
- Government
- Residential - Single Family
- Residential - Multi Family

LAX Specific Plan Amendment Study Draft EIR

Parcels Within RPZ
Alternative 2

Figure
4.7.2-9

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Aviation Accidents, Incidents, and Runway Incursions

Airspace Surfaces

Implementation of Alternative 3 would include relocating Runway 6R/24L 340 feet southward, extending it 135 feet westward and 1,280 eastward, and establishing dual displaced landing thresholds. Runway 6L/24R would be extended 1,495 feet westward. The southern relocation and eastern extension of Runway 6R/24L would shift the runway's imaginary surfaces, including the Approach Surface and the Part 77 Transitional Surface, which could result in multi-story structures along Sepulveda Boulevard and Century Boulevard penetrating those surfaces, either as new penetrations or increased penetrations. A more detailed analysis of building heights, better accomplished at more detailed levels of planning, would be needed to confirm that possibility, as well as determine whether other structures in the local area would penetrate Part 77 Surfaces.

Part 77 imaginary surfaces provide a means of identifying objects that require a more detailed safety analysis. This analysis, performed by the FAA, considers the airspace operations and safety requirements applicable to the Part 77 surface, as well as the nature, location, and extent of the object's penetration into the Part 77 surface. The analysis requires detailed runway design and engineering data not available at this conceptual level of planning, and would occur during the normal course of FAA review and approval of proposed airfield improvements. The analysis would set forth and define the appropriate means and measures to address potential safety concerns related to objects located within the Part 77 surface. As described above in Section 4.7.2.3, options for addressing potential safety hazards associated with objects located within controlled airspace areas can range widely and can include (1) doing nothing (i.e., for low-risk objects); (2) placing high-visibility markings and lighting on the object to make it highly visible to pilots and indicating such objects on avigation maps; (3) lowering, reducing, or removing the object, and; (4) modifying an approach or departure procedure to allow aircraft to safely navigate around or above an object that penetrates a Part 77 surface. Implementation of appropriate measures, as determined and required through the normal FAA review and approval process for proposed runway improvements, would reduce potential aviation safety impacts to a level that is less than significant.

Airfield Surfaces

In conjunction with the southward relocation of Runway 6R/24L under Alternative 3, construction of a centerfield parallel taxiway, along with associated exits and connections between the taxiway and two adjacent runways, would occur. Also occurring would be the southward relocation and extension of Taxiway E and Taxilane D. The resultant runway and taxiway separation distances and allowances for various safety zone requirements (e.g., OFZ) would improve the ability of the north airfield to accommodate large aircraft including ADG V and ADG VI aircraft, compared to baseline conditions (2010). **Table 4.7.2-8** delineates, for baseline conditions (2010) and each alternative, the maximum size aircraft, in terms of ADG, for which the runways and parallel taxiways would meet FAA Airport Design Standards without needing approval of special operations restrictions, MOS, or waivers from FAA.

As indicated in **Table 4.7.2-8**, implementation of Alternative 3 would increase the separation distance between Runways 6L/24R and 6R/24L from 700 feet to 1,040 feet, but would not change the existing capabilities relative to allowing simultaneous arrivals and departures.[406]

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[406] Although the separation distance between Runways 6L/24R and 6R/24L under Alternative 3 would not change the existing capabilities relative to allowing simultaneous arrivals and departures on those two runways, the 340-foot southward relocation of Runway 6R/24L would move it closer to Runway 7L/25R in the south airfield. The existing separation between Runways 6R/24L and 7L/25R of 4,535 feet would be reduced to approximately 4,195 feet. The FAA design standard for dual simultaneous ILS approaches calls for 4,300 feet of separation. As such, implementation of Alternative 3, unlike all of the other airfield alternatives, would lose simultaneous dual ILS approach capabilities relative to the two inboard runways. The operational implications of this design constraint exclusive to Alternative 3 would, however, be tempered by the fact that the percentage of time when ILS conditions occur at LAX is relatively low, there is a limited likelihood of needing to use the two inboard runways for dual simultaneous approaches under such conditions, and there are potential combinations of runways at LAX that could be used for dual simultaneous approaches.

The southward relocation and full-length construction of Taxiway E and Taxilane D would be designed to accommodate ADG V aircraft on Taxiway E and ADG VI aircraft on Taxilane D.

The runway improvements proposed under Alternative 3 would modify several existing runway safety areas. **Figure 4.7.2-10** shows the runway safety areas associated with Alternative 3. The southward relocation of Runway 6R/24L and the extensions on both ends would shift the associated runway safety areas accordingly, as would also the westward extension of Runway 6L/24R. There would be no notable change in the runway safety areas at the eastern end of Runway 6L/24R, including the RPZ which currently encompasses numerous businesses and residences in Westchester. **Figure 4.7.2-11** delineates the location and current use of parcels within the RPZs associated with Alternative 3 and **Table 4.7.2-11** summarizes the affected land uses.

Table 4.7.2-11

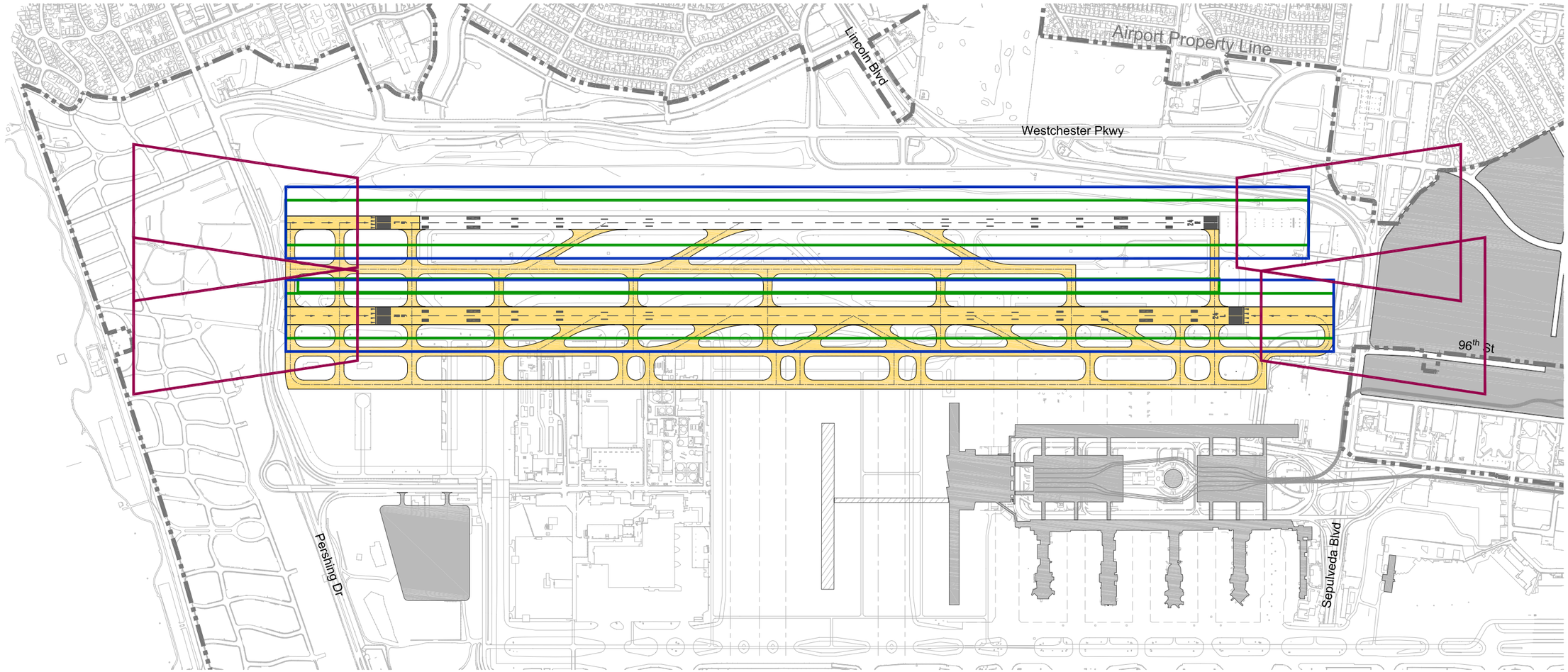
Parcels Within RPZ - Alternative 3

Parcels Inside Alternative 3 Runway Protection Zones[1]		Commercial			Residential					
Approach End	Area	Parking	Sales and Services	Offices	Single	Multi	Vacant	Govern-ment	Misc.[2]	Total
Runway 6L	Approach RPZ	-	-	-	-	-	-	-	-	0
	Central Portion of RPZ	-	-	-	-	-	-	-	-	0
	Departure RPZ	-	-	-	-	-	-	-	-	0
	Total 6L Parcels	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Runway 24R	Approach RPZ	7	8	2	8	1	4	1	-	31
	Central Portion of RPZ	4	7	1	-	-	1	-	-	13
	Departure RPZ	1	7	0	-	-	-	-	-	8
	Total 24R Parcels	**7**	**8**	**2**	**8**	**1**	**4**	**1**	**0**	**31**
Runway 6R	Approach RPZ	-	-	-	-	-	-	-	-	0
	Central Portion of RPZ	-	-	-	-	-	-	-	-	0
	Departure RPZ	-	-	-	-	-	-	-	4	4
	Total 6R Parcels	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**4**
Runway 24L	Approach RPZ	5	-	-	-	-	2	-	2	9
	Central Portion of RPZ	-	-	-	-	-	-	-	-	0
	Departure RPZ	-	-	-	-	-	-	-	-	0
	Total 24L Parcels	**5**	**0**	**0**	**0**	**0**	**2**	**0**	**2**	**9**
Alternative Total[3]		**12**	**8**	**2**	**8**	**1**	**6**	**1**	**6**	**44**

[1] This analysis excludes all parcels that fall within the airport property boundary.
[2] Rights of way, streets, transmission lines, sewer, utility lines, rivers and lakes.
[3] Existing total may not equal the sum of the approach end parcels due to parcels falling within multiple approach end RPZs.

Source: U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5300-13, Airport Design, September 29, 1989, as amended by Changes 1 - 18, December 30, 2011; LAWA Environmental Services Division, April 2011; Ricondo & Associates, Inc., May 2012.

The combination of the runway improvements, establishment of displaced thresholds, and covering of the eastern portion of the Argo Drainage Channel would bring all RSAs for the north airfield into compliance with FAA standards.



Note: Improvements depicted are conceptual only and do not represent engineered design.

Legend

- Runway Safety Area (RSA)
- Runway Object Free Area (OFA)
- Runway Protection Zone (RPZ)

0 1,200 ft
Scale

north

Prepared by: Ricondo & Associates, Inc., May 2012.

LAX Specific Plan Amendment Study Draft EIR	**North Airfield Runway Safety Areas** **Alternative 3**	Figure **4.7.2-10**

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RUNWAY 6L APPROACH END

RUNWAY 24R APPROACH END

RUNWAY 6R APPROACH END

RUNWAY 24L APPROACH END

Notes: 1/ Rights of Way, Streets, Transmission Lines, Sewer, Utility Lines, Rivers and Lakes.
2/ This analysis excludes all parcels that fall within the airport property boundary.
3/ For planning purposes, all runways are assumed to have approaches with minimums less than 3/4 mile.

0 600 ft.
Scale

north

Prepared by: Ricondo & Associates, Inc., 2012.

Legend

- Approach RPZ
- Departure RPZ
- Central Portion of the RPZ
- Airport Property Boundary
- Commercial - Offices
- Commercial - Sales and Services
- Commercial - Parking
- Misc. - See Note 1
- Vacant
- Government
- Residential - Single Family
- Residential - Multi Family

LAX Specific Plan Amendment Study Draft EIR

Parcels Within RPZ
Alternative 3

Figure
4.7.2-11

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The combination of physical lengthening of runways and establishment of displaced thresholds would change the existing declared distances for runways within the north airfield. **Table 4.7.2-4** delineates the TORA, TODA, ASDA, and LDA distances resulting from implementation of Alternative 3. As can be seen, in comparison to baseline conditions (2010), all of the declared distances would increase in length, except for the LDAs on Runway 6R/24L, which would decrease in length. As noted above, increased distance provides greater length for aircraft to use and most commercial aircraft need approximately 8,000 linear feet for landing operations. In general, the changes in declared distances associated with Alternative 3 would benefit aircraft landing operations, particularly for large/heavy aircraft. The reduced length in the LDAs for Runways 6R/24L would still be well above the 8,000 feet normally required for most aircraft landing operations.

Other Safety Considerations

As described above in Section 4.7.2.3, numerous safety studies have been prepared relative to aircraft operations on the north airfield. While the nature, approach, and scope of analysis may differ between the studies, there is general consensus between the studies that increased separation between runways and the addition of a centerfield parallel taxiway can reduce the potential for a runway collision or incursion and enhance safety, particularly as related to future operations involving a greater number of large aircraft. Additionally, the safety benefits of relocated and redesigned runway crossing points along the last-third of Runway 6R/24L, including the advantage of pilot visibility to the end of the runway, were noted in some of the studies. The airfield improvements proposed under Alternative 3 provide for these desired safety improvements.

Summary Conclusions Regarding Alternative 3

Implementation of Alternative 3 would enhance the safety and efficiency of aircraft operating in the north airfield, compared to baseline conditions (2010) as follows:

- Achieves full compliance with RSA requirements;
- Provides greater amount of runway and taxiway facilities that meet FAA Airport Design Standards for ADG V and VI aircraft, thereby reducing the need for special operations restrictions, MOS, and waivers from FAA;
- Provides increased separation between runways and between runways and taxiways, which better enables taxiing and holding aircraft to stay clear of runway OFZ and RSA surfaces;
- Allows addition of a centerfield parallel taxiway that includes high-speed exits from Runway 6L/24R, which provides more time and options for FAA air traffic controllers to handle aircraft exiting the runway; more time and distance for the pilot of an arriving aircraft to exit the runway, slow down and hold before crossing Runway 6R/24L; and reduced potential for safety hazards/incursions;
- Improves the locations and design of crossing points (i.e., 90-degree crossing angle) at Runway 6R/24L, which provides better pilot visibility down Runway 6R/24L before crossing;
- Realigns/straightens Taxilane D to provide a full-length parallel taxiway designed for ADG VI aircraft; and
- Provides more aircraft holding areas near the end of runways, thereby improving the ability for sequencing departures.

Implementation of Alternative 3 would not involve construction of a runway within 10,000 feet of a solid waste landfill or create an attractant to birds. In general, implementation of this alternative would enhance aircraft safety and efficiency, as summarized above, particularly with respect to better achieving compliance with FAA Airport Design Standards for operation of large aircraft. The 340-foot southward shift of Runway 6R/24L could, however, result in a southward shift of the Part 77 imaginary surfaces possibly placing additional and/or increased portions of multi-story structures along Sepulveda Boulevard within Part 77 Surfaces. As described above, there are several options available to address potential safety hazards associated with objects being located within controlled airspace areas, ranging from doing nothing (i.e., for low-risk objects), to placing high-visibility markings and lighting on the object to make it

highly visible to pilots and indicating such objects on avigation maps, to lowering, reducing, or removing the object, and, in some cases, an approach or departure procedure will be modified to allow aircraft to safely navigate around or above an object that penetrates a Part 77 surface. The most appropriate option(s) would be determined in conjunction with detailed airfield improvement engineering and would be subject to FAA review and concurrence prior to FAA approval of an ALP amendment for such an airfield modification. Such measures would reduce this safety impact to a level that is less than significant. Secondary or indirect impacts associated with implementation of such options could range from no impact, such as in the case of low-risk objects that do not require any safety measures, to impacts typically associated with removal of an object/structure, such as temporary construction-related air quality, noise, and traffic impacts, visual impacts (i.e., changes in existing appearance), and land use impacts. Such secondary or indirect impacts would be similar to those described at the end of the impacts analysis for Alternative 1 above.

The southward relocation of Runway 6R/24L would also move the RPZ southward, resulting in additional developed parcels being located within the RPZ. The presence of such uses under Alternative 3 may be considered incompatible with FAA design recommendations that RPZ areas be clear of all obstructions and occupied uses; however, it is not considered to pose a significant safety hazard compared to baseline conditions. In the event that the FAA, as the lead federal agency responsible for aviation safety at LAX, considers that the structures and uses within the existing or future RPZ pose an aviation hazard, modifications to, or removal of, structures and uses in the RPZ may be required. Potential secondary or indirect impacts associated with such measures, if required by the FAA, would be similar to those described at the end of the impacts analysis for Alternative 1 above.

4.7.2.6.4 Alternative 4

Birdstrikes

Under Alternative 4, impacts with respect to birdstrikes would be the same as those described previously for Alternative 2. As with Alternative 2, implementation of Alternative 4 would not involve construction of a runway within 10,000 feet of a solid waste landfill or create an attractant to birds; therefore, impacts would be less than significant.

Aviation Accidents, Incidents, and Runway Incursions

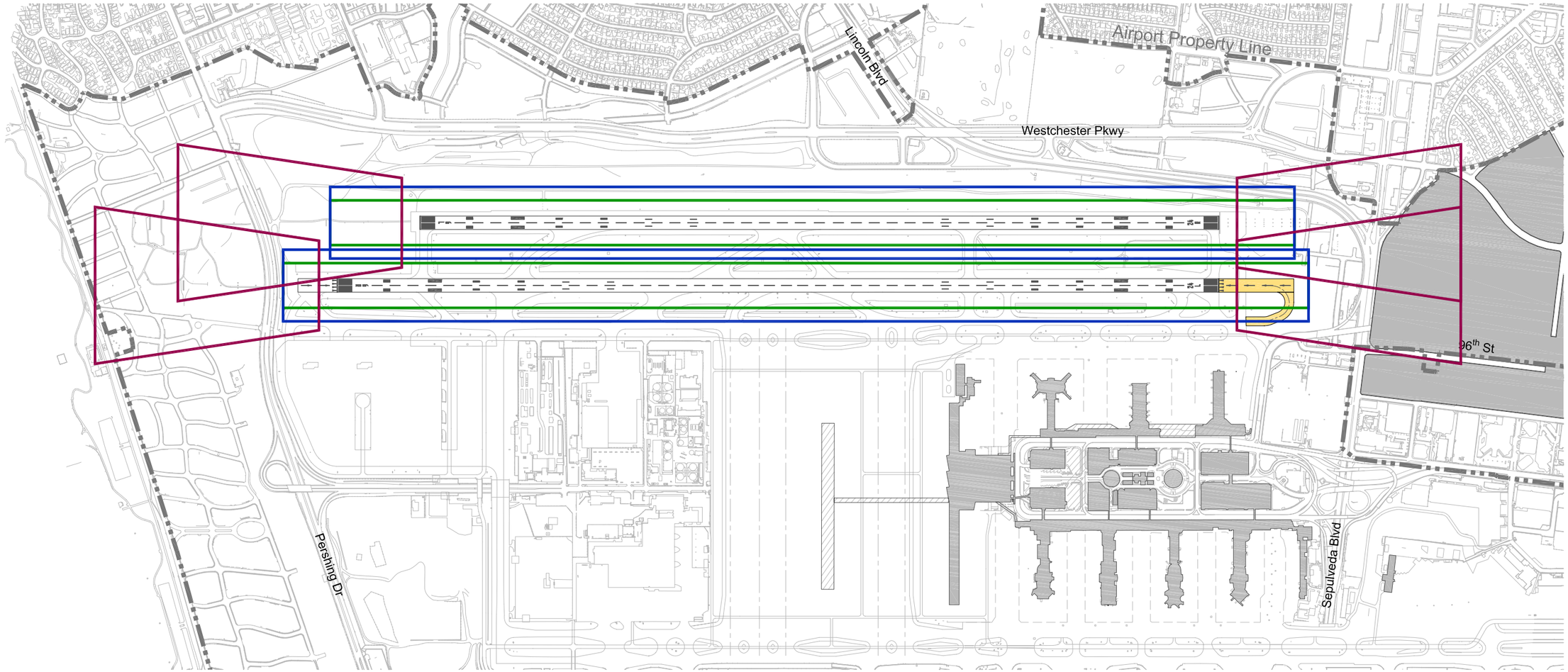
Airspace Surfaces

Under Alternative 4, there would be no runway improvements that would alter the existing Part 77 Surfaces for the north airfield.

Airfield Surfaces

In the absence of any runway relocation under Alternative 4, no centerfield parallel taxiway would be added. As indicated in **Table 4.7.2-8**, the existing separation distance between Runways 6L/24R and 6R/24L would remain at 700 feet.

The only existing runway safety areas modified under Alternative 4 would be those associated with the eastward extension of Runway 6R/24L. **Figure 4.7.2-12** shows the runway safety areas associated with Alternative 2. There would be no change in the existing runway safety areas that extend off-airport, including the RPZ for Runway 24R which currently encompasses numerous businesses and residences in Westchester. **Figure 4.7.2-13** delineates the location and current use of parcels within the RPZs associated with Alternative 4 and **Table 4.7.2-12** summarizes the affected land uses. Given that there would be no change in RPZs under Alternative 4, the affected land uses shown in **Figure 4.7.2-13** and **Table 4.7.2-12** are the same as delineated in Section 4.7.2.3 for baseline conditions (2010).



Note: Improvements depicted are conceptual only and do not represent engineered design.

Legend

- Runway Safety Area (RSA)
- Runway Object Free Area (OFA)
- Runway Protection Zone (RPZ)

0 1,200 ft
Scale

north

Prepared by: Ricondo & Associates, Inc., May 2012.

LAX Specific Plan Amendment Study Draft EIR	**North Airfield Runway Safety Areas Alternative 4**	Figure **4.7.2-12**

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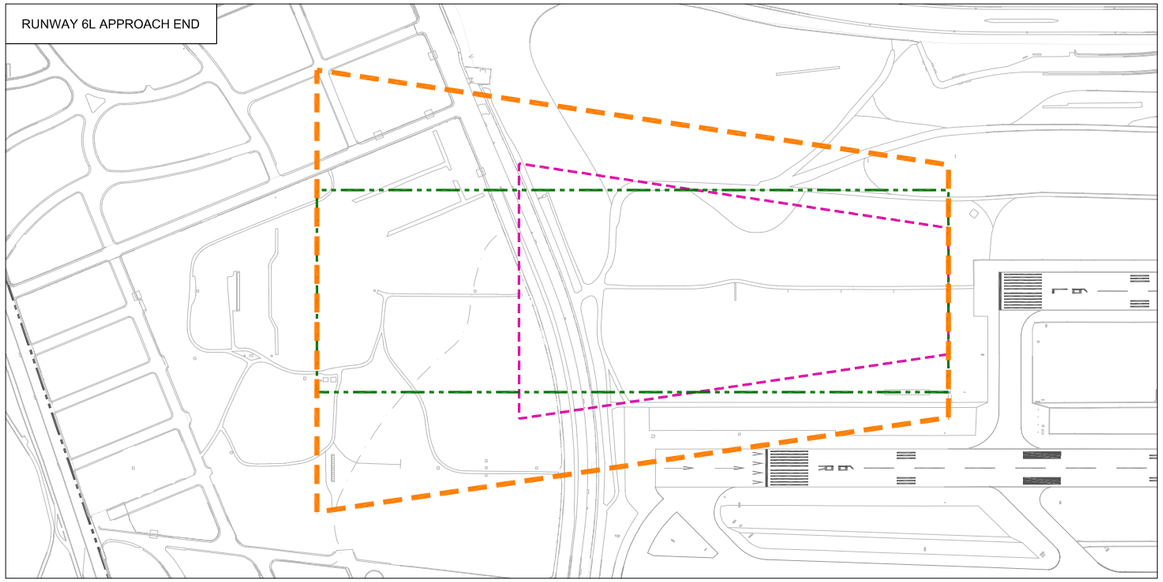
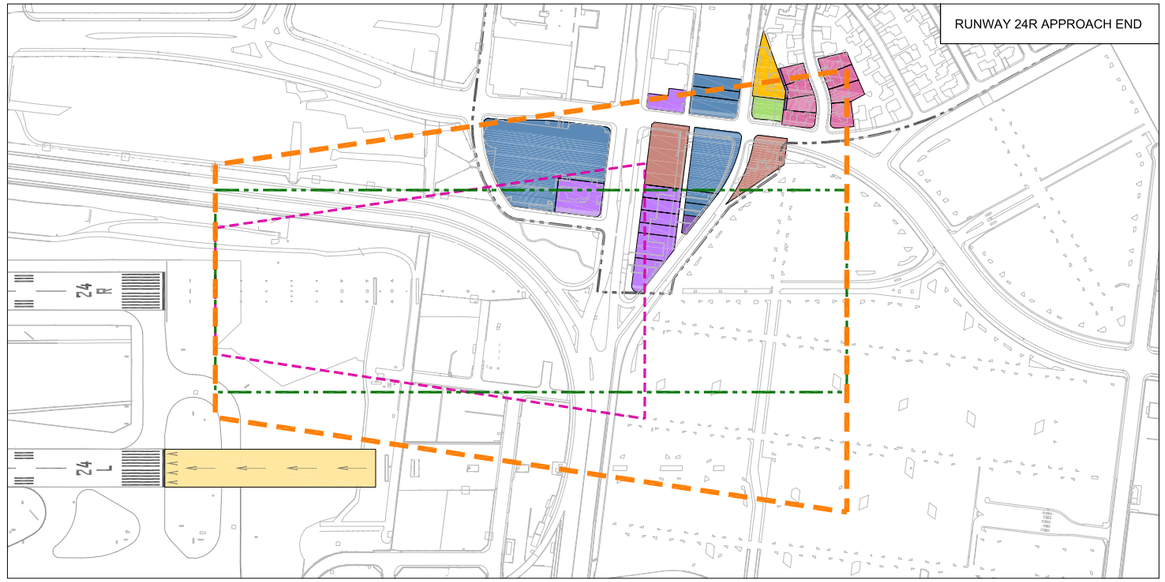
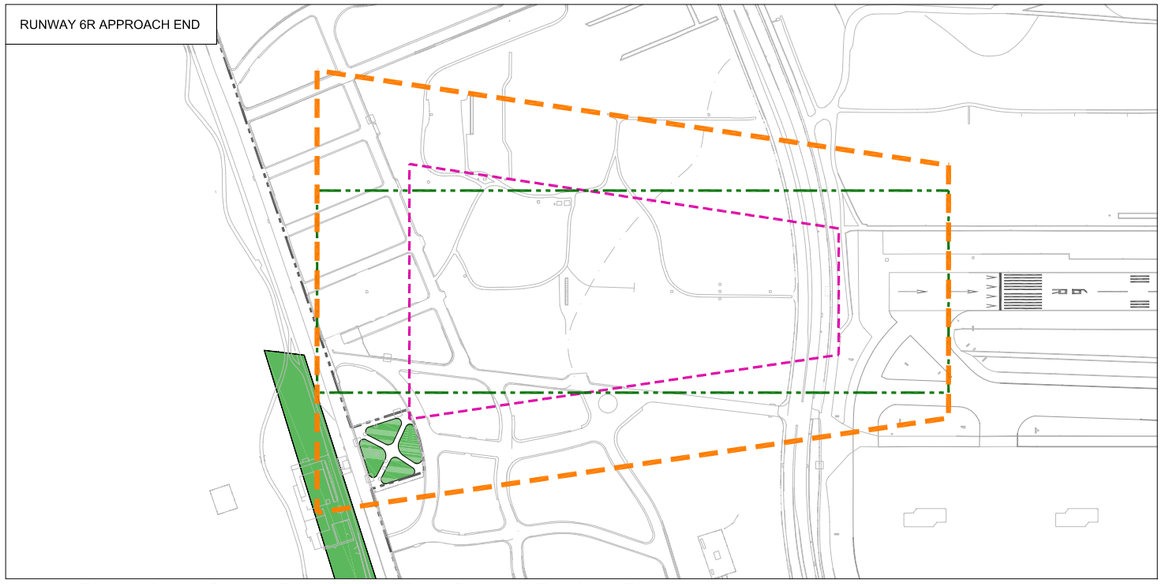
RUNWAY 6L APPROACH END



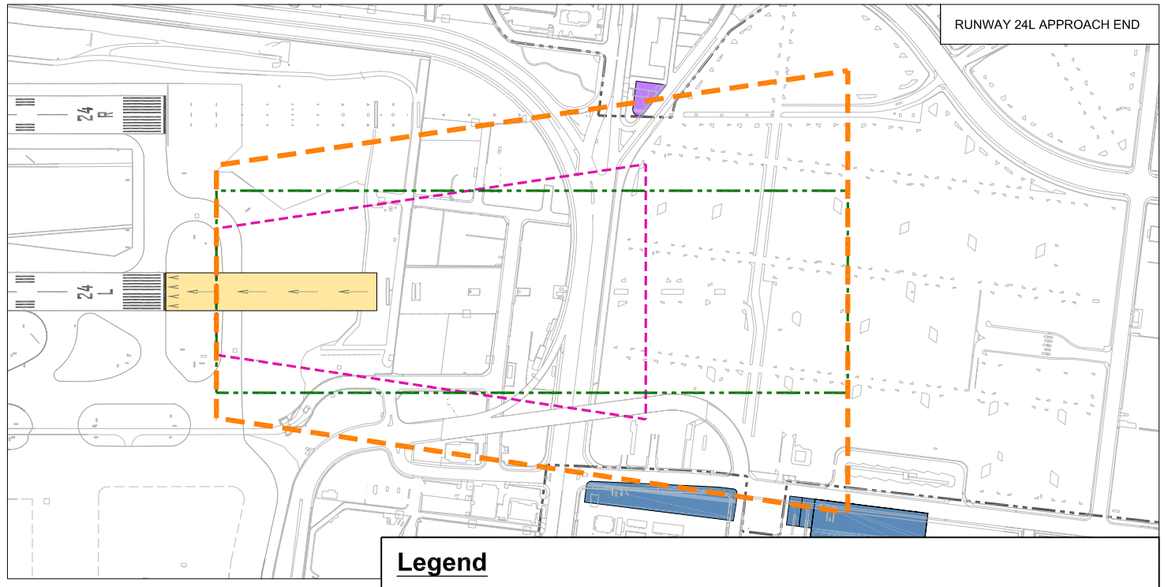
RUNWAY 24R APPROACH END



RUNWAY 6R APPROACH END



RUNWAY 24L APPROACH END



Notes: 1/ Rights of Way, Streets, Transmission Lines, Sewer, Utility Lines, Rivers and Lakes.
2/ This analysis excludes all parcels that fall within the airport property boundary.
3/ For planning purposes, all runways are assumed to have approaches with minimums less than 3/4 mile.

0 600 ft.
Scale

north

Prepared by: Ricondo & Associates, Inc., 2012.

Legend

- Approach RPZ
- Departure RPZ
- Central Portion of the RPZ
- Airport Property Boundary
- Commercial - Offices
- Commercial - Sales and Services
- Commercial - Parking
- Misc. - See Note 1
- Vacant
- Government
- Residential - Single Family
- Residential - Multi Family

LAX Specific Plan Amendment Study Draft EIR

Parcels Within RPZ
Alternative 4

Figure
4.7.2-13

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Table 4.7.2-12

Parcels Within RPZ - Alternative 4

Parcels Inside Alternative 4 Runway Protection Zones[1]		Commercial			Residential					
Approach End	**Area**	**Parking**	**Sales and Services**	**Offices**	**Single**	**Multi**	**Vacant**	**Govern-ment**	**Misc.[2]**	**Total**
Runway 6L	Approach RPZ	-	-	-	-	-	-	-	-	0
	Central Portion of RPZ	-	-	-	-	-	-	-	-	0
	Departure RPZ	-	-	-	-	-	-	-	-	0
	Total 6L Parcels	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Runway 24R	Approach RPZ	7	8	2	8	1	4	1	-	31
	Central Portion of RPZ	4	7	1	-	-	1	-	-	13
	Departure RPZ	1	7	0	-	-	-	-	-	8
	Total 24R Parcels	**7**	**8**	**2**	**8**	**1**	**4**	**1**	**0**	**31**
Runway 6R	Approach RPZ	-	-	-	-	-	-	-	5	5
	Central Portion of RPZ	-	-	-	-	-	-	-	-	0
	Departure RPZ	-	-	-	-	-	-	-	-	0
	Total 6R Parcels	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**5**
Runway 24L	Approach RPZ	4	1	-	-	-	-	-	-	5
	Central Portion of RPZ	-	-	-	-	-	-	-	-	0
	Departure RPZ	-	-	-	-	-	-	-	-	0
	Total 24L Parcels	**4**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**5**
Alternative Total[3]		**11**	**9**	**2**	**8**	**1**	**4**	**1**	**5**	**41**

[1] This analysis excludes all parcels that fall within the airport property boundary.
[2] Rights of way, streets, transmission lines, sewer, utility lines, rivers and lakes.
[3] Existing total may not equal the sum of the approach end parcels due to parcels falling within multiple approach end RPZs.

Source: U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5300-13, Airport Design, September 29, 1989, as amended by Changes 1 - 18, December 30, 2011; LAWA Environmental Services Division, April 2011; Ricondo & Associates, Inc., May 2012.

The improvements proposed at the east end of Runway 6R/24L and the covering of the eastern end of the Argo Drainage Channel would bring the RSAs for the north airfield into compliance with FAA standards.

Only minor changes to the existing declared distances for runways within the north airfield would occur under Alternative 4, as can be seen in **Table 4.7.2-4**. Most (10 of 16) existing declared distances would not change, while three would increase in length and three would decrease in length. As noted above, increased distance provides greater length for aircraft to use and most commercial aircraft need approximately 8,000 linear feet for landing operations. The implications of these changes in declared distances would be the same as described above for Alternative 2.

Other Safety Considerations

As described above in Section 4.7.2.3, numerous safety studies have been prepared relative to aircraft operations on the north airfield. While the nature, approach, and scope of analysis may differ between the studies, there is general consensus between the studies that increased separation between runways and the addition of a centerfield parallel taxiway can reduce the potential for a runway collision or incursion and enhance safety, particularly as related to future operations involving a greater number of large aircraft. Additionally, the safety benefits of relocated and redesigned runway crossing points along

the last-third of Runway 6R/24L, including the advantage of pilot visibility to the end of the runway, were noted in some of the studies. The airfield improvements proposed under Alternative 4 only provides benefits associated with RSA compliance for Runway 6R/24L.

Summary Conclusions Regarding Alternative 4

Implementation of Alternative 4 would enhance the safety of aircraft operating in the north airfield, compared to baseline conditions (2010) as follows:

- Achieves full compliance with RSA requirements.

Implementation of Alternative 4 would not involve construction of a runway within 10,000 feet of a solid waste landfill, create an attractant to birds, compromise aviation safety, or result in a potential aviation safety hazard for people in the project area. No significant safety impacts would occur.

4.7.2.6.5 Alternative 5

Birdstrikes

Under Alternative 5, impacts with respect to birdstrikes would be the same as those described previously for Alternative 1. As with Alternative 1, implementation of Alternative 5 would not involve construction of a runway within 10,000 feet of a solid waste landfill or create an attractant to birds; therefore, impacts would be less than significant.

Aviation Accidents, Incidents, and Runway Incursions

Airspace Surfaces

The airfield improvements proposed under Alternative 5 are very similar to those described above for Alternative 1, except that Runway 6L/24R would be relocated 350 feet northward instead of 260 feet. The northern relocation would shift the existing Part 77 Transitional Surface northward.

The northerly shift of the Part 77 Transitional Surface would result in the southern portion of the existing apartment complex near Westchester Parkway and Lincoln Boulevard extending into that imaginary surface.

The relocation of Runway 6L/24R under Alternative 5 would also shift the existing Approach Surface for Runway 24R northward, resulting in a penetration of that imaginary surface by the upper portion the existing 5-story office building located at the northwest corner of Sepulveda Boulevard and Westchester Parkway. In addition to the upper portion of the building, the rooftop utilities (i.e., air conditioning and mechanical equipment) and a rooftop billboard would also extend into the Approach Surface. The upper portions of that building and utilities are currently within the Part 77 Transitional Surface of Runway 6L/24R.

Upper portions of the existing multi-story parking structure located immediately south of the aforementioned office building, which currently penetrate the Part 77 Transitional Surface of Runway 6L/24R, may also fall within the runway Approach Surface as a result of the runway relocation proposed under Alternative 5. A more detailed analysis of building heights, better accomplished at more detailed levels of planning, would be needed to confirm that possibility, as well as determine whether other structures in the local area would penetrate Part 77 Surfaces.

Part 77 imaginary surfaces provide a means of identifying objects that require a more detailed safety analysis. This analysis, performed by the FAA, considers the airspace operations and safety requirements applicable to the Part 77 surface, as well as the nature, location, and extent of the object's penetration into the Part 77 surface. The analysis requires detailed runway design and engineering data not available at this conceptual level of planning, and would occur during the normal course of FAA review and approval of proposed airfield improvements. The analysis would set forth and define the appropriate means and measures to address potential safety concerns related to objects located within the Part 77 surface. As described above in Section 4.7.2.3, options for addressing potential safety

hazards associated with objects located within controlled airspace areas can range widely and can include (1) doing nothing (i.e., for low-risk objects); (2) placing high-visibility markings and lighting on the object to make it highly visible to pilots and indicating such objects on avigation maps; (3) lowering, reducing, or removing the object, and; (4) modifying an approach or departure procedure to allow aircraft to safely navigate around or above an object that penetrates a Part 77 surface. Implementation of appropriate measures, as determined and required through the normal FAA review and approval process for proposed runway improvements, would reduce potential aviation safety impacts to a level that is less than significant.

Airfield Surfaces

In conjunction with the northward relocation of Runway 6L/24R under Alternative 5, construction of a centerfield parallel taxiway, along with associated exits and connections between the taxiway and two adjacent runways, would occur. Also occurring would be various extensions and realignments of Taxiway E and Taxilane D and the associated service road. The resultant runway and taxiway separation distances and allowances for various safety zone requirements (e.g., OFZ) would improve the ability of the north airfield to accommodate large aircraft including ADG V and ADG VI aircraft, compared to baseline conditions (2010). **Table 4.7.2-8** delineates, for baseline conditions (2010) and each alternative, the maximum size aircraft, in terms of ADG, for which the runways and parallel taxiways would meet FAA Airport Design Standards without needing approval of special operations restrictions, MOS, or waivers from FAA.

As indicated in **Table 4.7.2-8**, implementation of Alternative 5 would increase the separation distance between Runways 6L/24R and 6R/24L from 700 feet to 1,050 feet, but would not change the existing capabilities relative to allowing simultaneous arrivals and departures.

Under Alternative 5, improvements to Taxiway E include the southward relocation and reconstruction of the entire taxiway length, which would accommodate ADG VI aircraft. Under Alternative 5, improvements to Taxilane D would include relocation and reconstruction, which would accommodate ADG VI aircraft. In conjunction with these taxiway/lane improvements, the adjacent vehicle service road would be relocated from between the active surface areas of those facilities to the northerly limit of the aircraft parking apron, south of Taxilane D.

The runway improvements proposed under Alternative 5 would modify several existing runway safety areas such as the RSA, runway OFA, RPZ, and runway OFZ. **Figure 4.7.2-14** shows the runway safety areas associated with Alternative 5. For Runway 6L/24R, the 350-foot northerly relocation would shift the runway safety areas accordingly, which, in turn, would require the realignment of Lincoln Boulevard, as shown in **Figure 4.7.2-14**, and the covering of the Argo Drainage Channel. The combination of the runway improvements, associated improvements to Lincoln Boulevard and the Argo Drainage Channel, and establishment of displaced thresholds would bring all RSAs for the north airfield into compliance with FAA standards.

The proposed relocation of Runway 6L/24R 350 feet northward would shift the associated RPZ northward by that same amount, which would extend over existing developed uses near the east end of the runway that are not currently within the existing RPZ. **Figure 4.7.2-15** delineates the location and current use of parcels within the RPZs associated with Alternative 5 and **Table 4.7.2-13** summarizes the affected land uses. Although the RPZs would shift northward, the establishment of dual displaced landing thresholds would shift the existing approach RPZ for Runway 6L eastward by 104 feet and would shift the existing approach RPZ for Runway 24R westward by 604 feet. That westward shift would place the RPZ outside of any existing residential development (i.e., residences located east of Runway 24R would no longer be within the RPZ). Similarly, the establishment of dual displaced thresholds for Runway 6R/24L would maintain the length of the existing RPZ for Runway 24L even though the runway pavement would be extended eastward.

Table 4.7.2-13

Parcels Within RPZ - Alternative 5

Parcels Inside Alternative 5 Runway Protection Zones[1]		Commercial			Residential					
Approach End	Area	Parking	Sales and Services	Offices	Single	Multi	Vacant	Govern-ment	Misc.[2]	Total
Runway 6L	Approach RPZ	-	-	-	-	-	-	-	-	0
	Central Portion of RPZ	-	-	-	-	-	-	-	-	0
	Departure RPZ	-	-	-	-	-	-	-	-	0
	Total 6L Parcels	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Runway 24R	Approach RPZ	14	14	5	-	-	1	-	-	34
	Central Portion of RPZ	5	8	2	-	-	1	-	-	16
	Departure RPZ	2	7	2	-	-	-	-	-	11
	Total 24R Parcels	**14**	**14**	**5**	**0**	**0**	**1**	**0**	**0**	**34**
Runway 6R	Approach RPZ	-	-	-	-	-	-	-	5	5
	Central Portion of RPZ	-	-	-	-	-	-	-	-	0
	Departure RPZ	-	-	-	-	-	-	-	-	0
	Total 6R Parcels	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**5**
Runway 24L	Approach RPZ	4	1	-	-	-	-	-	-	5
	Central Portion of RPZ	-	-	-	-	-	-	-	-	0
	Departure RPZ	-	-	-	-	-	-	-	-	0
	Total 24L Parcels	**4**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**5**
Alternative Total[3]		**18**	**15**	**5**	**0**	**0**	**1**	**0**	**5**	**44**

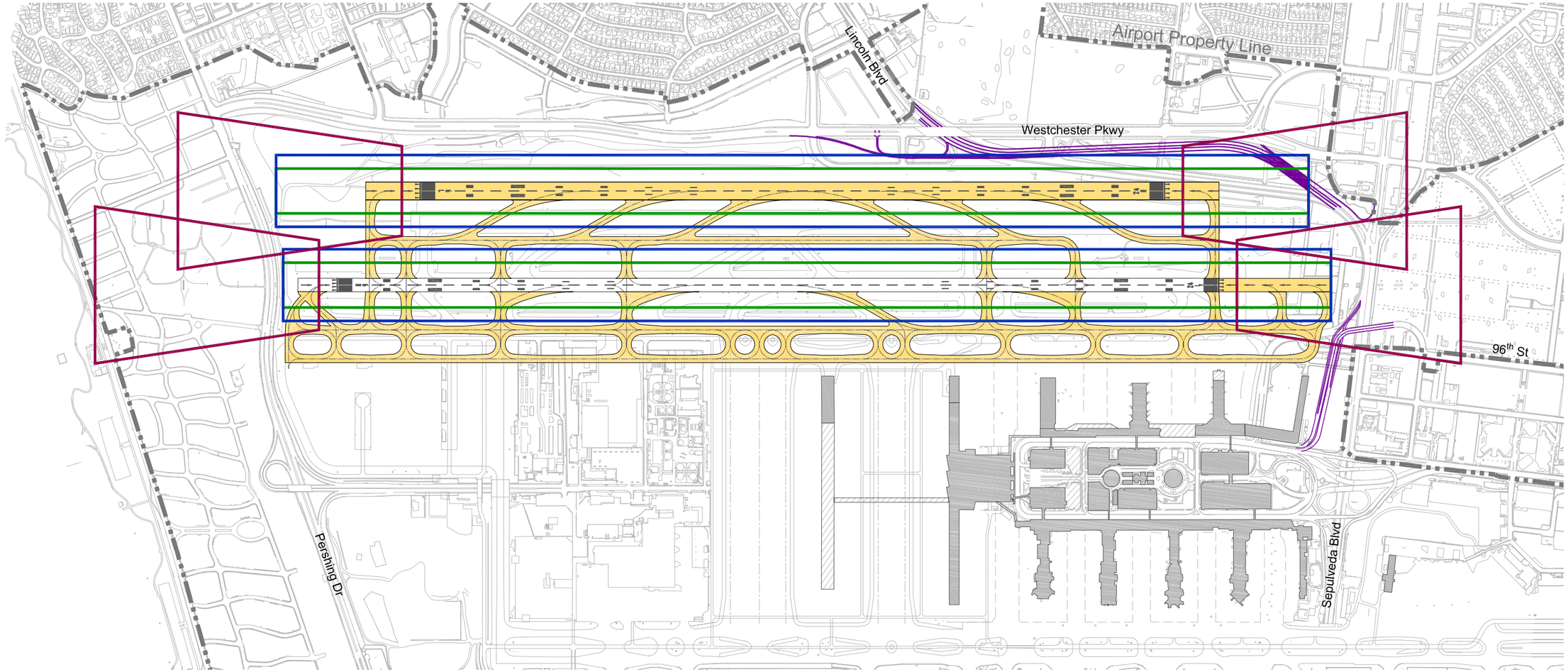
1 This analysis excludes all parcels that fall within the airport property boundary.
2 Rights of way, streets, transmission lines, sewer, utility lines, rivers and lakes.
3 Existing total may not equal the sum of the approach end parcels due to parcels falling within multiple approach end RPZs.

Source: U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5300-13, Airport Design, September 29, 1989, as amended by Changes 1 - 18, December 30, 2011; LAWA Environmental Services Division, April 2011; Ricondo & Associates, Inc., May 2012.

The combination of physical lengthening of runways and establishment of displaced thresholds would change the existing declared distances for runways within the north airfield. The changes associated with Alternative 5 would be the same as described above for Alternative 1.

Other Safety Considerations

As described above in Section 4.7.2.3, numerous safety studies have been prepared relative to aircraft operations on the north airfield. While the nature, approach, and scope of analysis may differ between the studies, there is general consensus between the studies that increased separation between runways and the addition of a centerfield parallel taxiway can reduce the potential for a runway collision or incursion and enhance safety, particularly as related to future operations involving a greater number of large aircraft. Additionally, the safety benefits of relocated and redesigned runway crossing points along the last-third of Runway 6R/24L, including the advantage of pilot visibility to the end of the runway, were noted in some of the studies. The airfield improvements proposed under Alternative 5 provide for these desired safety improvements.



Note: Improvements depicted are conceptual only and do not represent engineered design.

Legend

- Runway Safety Area (RSA)
- Runway Object Free Area (OFA)
- Runway Protection Zone (RPZ)

0 1,200 ft
Scale

north

Prepared by: Ricondo & Associates, Inc., May 2012.

LAX Specific Plan Amendment Study Draft EIR

North Airfield Runway Safety Areas
Alternative 5

Figure
4.7.2-14

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RUNWAY 6L APPROACH END

RUNWAY 24R APPROACH END

RUNWAY 6R APPROACH END

RUNWAY 24L APPROACH END

Notes: 1/ Rights of Way, Streets, Transmission Lines, Sewer, Utility Lines, Rivers and Lakes.
2/ This analysis excludes all parcels that fall within the airport property boundary.
3/ For planning purposes, all runways are assumed to have approaches with minimums less than 3/4 mile.

0 600 ft.
Scale

north

Prepared by: Ricondo & Associates, Inc., 2012.

Legend

- Approach RPZ
- Departure RPZ
- Central Portion of the RPZ
- Airport Property Boundary
- Commercial - Offices
- Commercial - Sales and Services
- Commercial - Parking
- Misc. - See Note 1
- Vacant

LAX Specific Plan Amendment Study Draft EIR

Parcels Within RPZ
Alternative 5

Figure
4.7.2-15

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Summary Conclusions Regarding Alternative 5

Implementation of Alternative 5 would enhance the safety and efficiency of aircraft operating in the north airfield, compared to baseline conditions (2010) as follows:

- Achieves full compliance with RSA requirements;
- Shifts the arrival RPZ for Runway 24R westward, resulting in residences and the vehicle staging area west of Sepulveda Boulevard no longer being located within the RPZ;
- Provides greater amount of runway and taxiway facilities that meet FAA Airport Design Standards for ADG V and VI aircraft, particularly as related to separation requirements, thereby reducing the need for special operations restrictions, MOS, and waivers from FAA;
- Provides increased separation between runways and between runways and taxiways, which better enables taxiing and holding aircraft to stay clear of runway OFZ and RSA surfaces;
- Allows addition of a centerfield parallel taxiway that includes high-speed exits from Runway 6L/24R, which provides more time and options for FAA air traffic controllers to handle aircraft exiting the runway; more time and distance for the pilot of an arriving aircraft to exit the runway, slow down and hold before crossing Runway 6R/24L; and reduced potential for safety hazards/incursions;
- Improves the locations and design of crossing points (i.e., 90-degree crossing angle) at Runway 6R/24L, which provides better pilot visibility down Runway 6R/24L before crossing;
- Realigns/straightens Taxilane D to provide a full-length parallel taxiway designed for ADG VI aircraft;
- Relocates vehicle service road adjacent to Taxiway E and Taxilane D out from between two active surfaces; and
- Provides more aircraft holding areas near the end of runways, thereby improving the ability for sequencing departures.

Implementation of Alternative 5 would not involve construction of a runway within 10,000 feet of a solid waste landfill or create an attractant to birds. In general, implementation of this alternative would enhance aircraft safety and efficiency, as summarized above, particularly with respect to better achieving compliance with FAA Airport Design Standards for operation of large aircraft. The 350-foot northward shift of Runway 6L/24R would, however, result in a northward shift of the Part 77 imaginary surfaces placing portions of two multi-story structures within Part 77 Surfaces. As described above, there are several options available to address potential safety hazards associated with objects being located within controlled airspace areas, ranging from doing nothing (i.e., for low-risk objects), to placing high-visibility markings and lighting on the object to make it highly visible to pilots and indicating such objects on avigation maps, to lowering, reducing, or removing the object, and, in some cases, an approach or departure procedure will be modified to allow aircraft to safely navigate around or above an object that penetrates a Part 77 surface. The most appropriate option(s) would be determined in conjunction with detailed airfield improvement engineering and would be subject to FAA review and concurrence prior to FAA approval of an ALP amendment for such an airfield modification. Such measures would reduce this safety impact to a level that is less than significant. Secondary or indirect impacts associated with implementation of such options could range from no impact, such as in the case of low-risk objects that do not require any safety measures, to impacts typically associated with removal of an object/structure, such as temporary construction-related air quality, noise, and traffic impacts, visual impacts (i.e., changes in existing appearance), and land use impacts. Such secondary or indirect impacts would be similar to those described at the end of the impacts analysis for Alternative 1 above.

The northward runway relocation would also move the RPZ northward, resulting in additional businesses in Westchester being located within the RPZ, and the 604-foot westward shift in the displaced landing threshold for Runway 24R would move the RPZ westward such that the RPZ would no longer encompass any residences. As such, implementation of Alternative 5 would result in a change in the composition of land uses within the RPZ for Runway 6L/24R compared to baseline conditions. The presence of such uses under Alternative 5 may be considered incompatible with FAA design recommendations that RPZ areas be clear of all obstructions and occupied uses; however, it is not considered to pose a significant

safety hazard compared to baseline conditions. In the event that the FAA, as the lead federal agency responsible for aviation safety at LAX, considers that the structures and uses within the existing or future RPZ pose an aviation hazard, modifications to, or removal of, structures and uses in the RPZ may be required. Potential secondary or indirect impacts associated with such measures, if required by the FAA, would be similar to those described at the end of the impacts analysis for Alternative 1 above.

4.7.2.6.6 Alternative 6

Birdstrikes

Under Alternative 6, impacts with respect to birdstrikes would be similar to those described previously for Alternative 1, although unlike Alternatives 1 and 5, only 1,400 feet of the Argo Drainage Channel (an existing bird attractant) would be structurally covered. This partial covering of the Argo Drainage Channel would remove a portion of an existing bird attractant from the LAX vicinity. Given the smaller amount of the uncovered channel available for potential use by birds compared to existing conditions, there would likely be a related reduction in the potential for birdstrikes. As with Alternative 1, implementation of Alternative 6 would not involve construction of a runway within 10,000 feet of a solid waste landfill or create an attractant to birds; therefore, impacts would be less than significant.

Aviation Accidents, Incidents, and Runway Incursions

Airspace Surfaces

The airfield improvements proposed under Alternative 6 are very similar to those described above for Alternative 1, except that Runway 6L/24R would be relocated 100 feet northward instead of 260 feet. The northern relocation would shift the existing Part 77 Surfaces northward.

The relocation of Runway 6L/24R under Alternative 6 would also shift the existing Approach Surface for Runway 24R northward, possibly resulting in a penetration of that imaginary surface by the upper portion the existing 5-story office building located at the northwest corner of Sepulveda Boulevard and Westchester Parkway. In addition to the upper portion of the building, the rooftop utilities (i.e., air conditioning and mechanical equipment) and a rooftop billboard would also extend into the Approach Surface. The upper portions of that building and utilities are currently within the Part 77 Transitional Surface of Runway 6L/24R.

Upper portions of the existing multi-story parking structure located immediately south of the aforementioned office building, which currently penetrate the Part 77 Transitional Surface of Runway 6L/24R, may also fall within the runway Approach Surface as a result of the runway relocation proposed under Alternative 6. A more detailed analysis of building heights, better accomplished at more detailed levels of planning, would be needed to confirm that possibility, as well as determine whether other structures in the local area would penetrate Part 77 Surfaces.

Part 77 imaginary surfaces provide a means of identifying objects that require a more detailed safety analysis. This analysis, performed by the FAA, considers the airspace operations and safety requirements applicable to the Part 77 surface, as well as the nature, location, and extent of the object's penetration into the Part 77 surface. The analysis requires detailed runway design and engineering data not available at this conceptual level of planning, and would occur during the normal course of FAA review and approval of proposed airfield improvements. The analysis would set forth and define the appropriate means and measures to address potential safety concerns related to objects located within the Part 77 surface. As described above in Section 4.7.2.3, options for addressing potential safety hazards associated with objects located within controlled airspace areas can range widely and can include (1) doing nothing (i.e., for low-risk objects); (2) placing high-visibility markings and lighting on the object to make it highly visible to pilots and indicating such objects on avigation maps; (3) lowering, reducing, or removing the object, and; (4) modifying an approach or departure procedure to allow aircraft to safely navigate around or above an object that penetrates a Part 77 surface. Implementation of appropriate measures, as determined and required through the normal FAA review and approval process

for proposed runway improvements, would reduce potential aviation safety impacts to a level that is less than significant.

Airfield Surfaces

In conjunction with the northward relocation of Runway 6L/24R under Alternative 6, construction of a centerfield parallel taxiway, along with associated exits and connections between the taxiway and two adjacent runways, would occur. Also occurring would be various extensions and realignments of Taxiway E and Taxilane D and the associated service road. The resultant runway and taxiway separation distances and allowances for various safety zone requirements (e.g., OFZ) would improve the ability of the north airfield to accommodate large aircraft including ADG V and ADG VI aircraft, compared to baseline conditions (2010). **Table 4.7.2-8** delineates, for baseline conditions (2010) and each alternative, the maximum size aircraft, in terms of ADG, for which the runways and parallel taxiways would meet FAA Airport Design Standards without needing approval of special operations restrictions, MOS, or waivers from FAA.

As indicated in **Table 4.7.2-8**, implementation of Alternative 6 would increase the separation distance between Runways 6L/24R and 6R/24L from 700 feet to 800 feet, but would not change the existing capabilities relative to allowing simultaneous arrivals and departures.

Under Alternative 6, improvements to Taxiway E and Taxilane D, and relocation of the vehicle service road, would be the same as described above for Alternative 1.

The runway improvements proposed under Alternative 6 would modify several existing runway safety areas such as the RSA, runway OFA, RPZ, and runway OFZ. **Figure 4.7.2-16** shows the runway safety areas associated with Alternative 6. For Runway 6L/24R, the 100-foot northerly relocation would shift the runway safety areas accordingly, which, in turn, would require the realignment of Lincoln Boulevard, as shown in **Figure 4.7.2-16**, and the covering the eastern 1,400 feet of the Argo Drainage Channel. The combination of the runway improvements, associated improvements to Lincoln Boulevard and the Argo Drainage Channel, and establishment of displaced thresholds would bring all RSAs for the north airfield into compliance with FAA standards.

The proposed relocation of Runway 6L/24R 100 feet northward would shift the associated RPZ northward by that same amount, which would extend over existing developed uses near the east end of the runway that are not currently within the existing RPZ. **Figure 4.7.2-17** delineates the location and current use of parcels within the RPZs associated with Alternative 6 and **Table 4.7.2-14** summarizes the affected land uses. Although the RPZs would shift northward, the establishment of dual displaced landing thresholds would shift the existing approach RPZ for Runway 6L eastward by 104 feet and would shift the existing approach RPZ for Runway 24R westward by 604 feet. That westward shift would place the RPZ outside of any existing residential development (i.e., residences located east of Runway 24R would no longer be within the RPZ). Similarly, the establishment of dual displaced thresholds for Runway 6R/24L would maintain the length of the existing RPZ for Runway 24L even though the runway pavement would be extended eastward.

Table 4.7.2-14

Parcels Within RPZ - Alternative 6

Parcels Inside Alternative 6 Runway Protection Zones[1]		Commercial			Residential					
Approach End	Area	Parking	Sales and Services	Offices	Single	Multi	Vacant	Govern-ment	Misc.[2]	Total
Runway 6L	Approach RPZ	-	-	-	-	-	-	-	-	0
	Central Portion of RPZ	-	-	-	-	-	-	-	-	0
	Departure RPZ	-	-	-	-	-	-	-	-	0
	Total 6L Parcels	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Runway 24R	Approach RPZ	9	9	5	-	-	1	-	-	24
	Central Portion of RPZ	4	7	1	-	-	1	-	-	13
	Departure RPZ	1	7	1	-	-	-	-	-	9
	Total 24R Parcels	**9**	**9**	**5**	**0**	**0**	**1**	**0**	**0**	**24**
Runway 6R	Approach RPZ	-	-	-	-	-	-	-	5	5
	Central Portion of RPZ	-	-	-	-	-	-	-	-	0
	Departure RPZ	-	-	-	-	-	-	-	-	0
	Total 6R Parcels	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**5**
Runway 24L	Approach RPZ	4	1	-	-	-	-	-	-	5
	Central Portion of RPZ	-	-	-	-	-	-	-	-	0
	Departure RPZ	-	-	-	-	-	-	-	-	0
	Total 24L Parcels	**4**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**5**
Alternative Total[3]		**13**	**10**	**5**	**0**	**0**	**1**	**0**	**5**	**34**

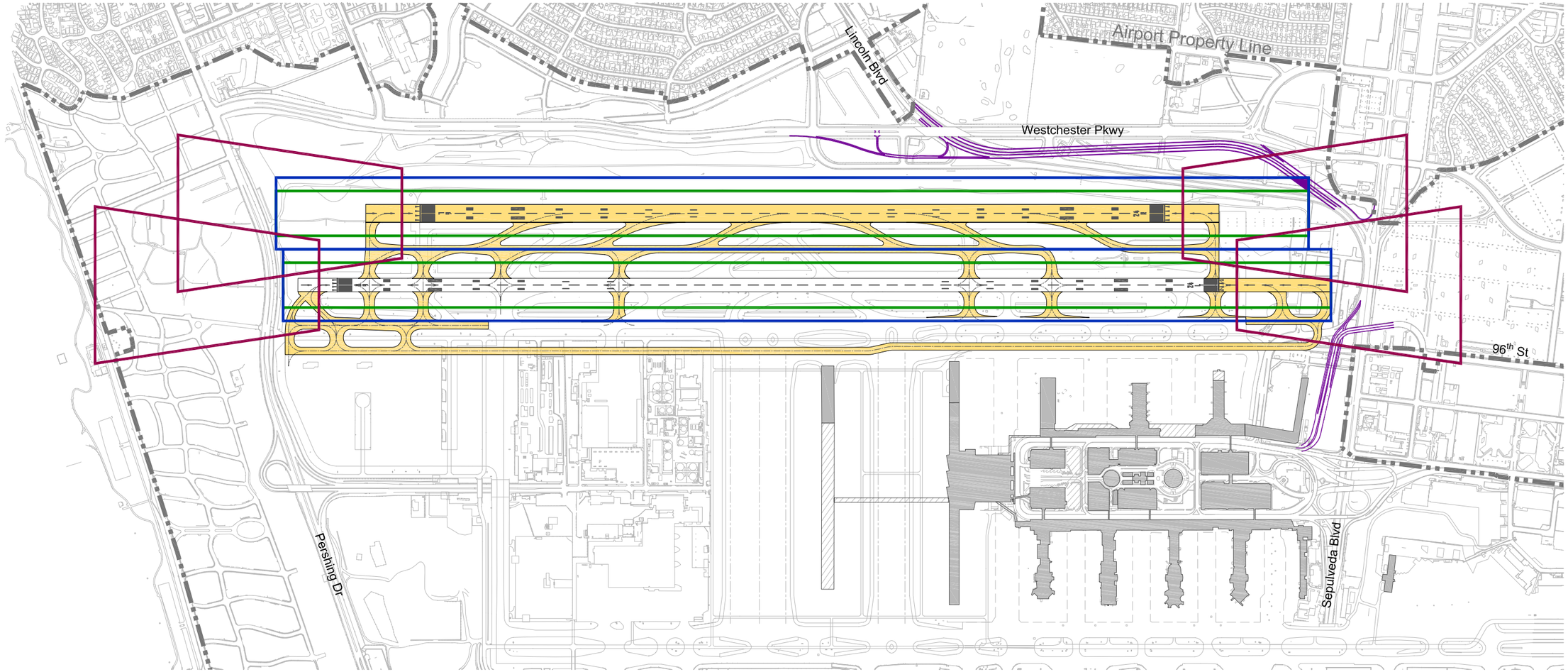
[1] This analysis excludes all parcels that fall within the airport property boundary.
[2] Rights of way, streets, transmission lines, sewer, utility lines, rivers and lakes.
[3] Existing total may not equal the sum of the approach end parcels due to parcels falling within multiple approach end RPZs.

Source: U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5300-13, Airport Design, September 29, 1989, as amended by Changes 1 - 18, December 30, 2011; LAWA Environmental Services Division, April 2011; Ricondo & Associates, Inc., May 2012.

The combination of physical lengthening of runways and establishment of displaced thresholds would change the existing declared distances for runways within the north airfield. The changes associated with Alternative 6 would be the same as described above for Alternative 1.

Other Safety Considerations

As described above in Section 4.7.2.3, numerous safety studies have been prepared relative to aircraft operations on the north airfield. While the nature, approach, and scope of analysis may differ between the studies, there is general consensus between the studies that increased separation between runways and the addition of a centerfield parallel taxiway can reduce the potential for a runway collision or incursion and enhance safety, particularly as related to future operations involving a greater number of large aircraft. Additionally, the safety benefits of relocated and redesigned runway crossing points along the last-third of Runway 6R/24L, including the advantage of pilot visibility to the end of the runway, were noted in some of the studies. The airfield improvements proposed under Alternative 6 provide for these desired safety improvements.



Note: Improvements depicted are conceptual only and do not represent engineered design.

Legend

- Runway Safety Area (RSA)
- Runway Object Free Area (OFA)
- Runway Protection Zone (RPZ)

0 1,200 ft
Scale

north

Prepared by: Ricondo & Associates, Inc., May 2012.

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North Airfield Runway Safety Areas
Alternative 6

Figure
4.7.2-16

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RUNWAY 6L APPROACH END

RUNWAY 24R APPROACH END

RUNWAY 6R APPROACH END

RUNWAY 24L APPROACH END

Notes: 1/ Rights of Way, Streets, Transmission Lines, Sewer, Utility Lines, Rivers and Lakes.
2/ This analysis excludes all parcels that fall within the airport property boundary.
3/ For planning purposes, all runways are assumed to have approaches with minimums less than 3/4 mile.

0 600 ft.
Scale

north

Prepared by: Ricondo & Associates, Inc., 2012.

Legend

- Approach RPZ
- Departure RPZ
- Central Portion of the RPZ
- Airport Property Boundary
- Commercial - Offices
- Commercial - Sales and Services
- Commercial - Parking
- Misc. - See Note 1
- Vacant

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Parcels Within RPZ
Alternative 6

Figure
4.7.2-17

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Summary Conclusions Regarding Alternative 6

Implementation of Alternative 6 would enhance the safety and efficiency of aircraft operating in the north airfield, compared to baseline conditions (2010), as follows:

- Achieves full compliance with RSA requirements;
- Shifts the arrival RPZ for Runway 24R westward, resulting in residences and the vehicle staging area west of Sepulveda Boulevard no longer being located within the RPZ;
- Provides greater amount of runway and taxiway facilities that meet FAA Airport Design Standards for ADG V and VI aircraft, particularly as related to separation requirements, thereby reducing the need for special operations restrictions, MOS, and waivers from FAA;
- Provides increased separation between runways and between runways and taxiways, which better enables taxiing and holding aircraft to stay clear of runway OFZ and RSA surfaces;
- Allows addition of a centerfield parallel taxiway that includes high-speed exits from Runway 6L/24R, which provides more time and options for FAA air traffic controllers to handle aircraft exiting the runway; more time and distance for the pilot of an arriving aircraft to exit the runway, slow down and hold before crossing Runway 6R/24L; and reduced potential for safety hazards/incursions;
- Improves, to a more limited degree than Alternatives 1, 3, and 5, the locations and design of crossing points (i.e., 90-degree crossing angle) at Runway 6R/24L, which provides better pilot visibility down Runway 6R/24L before crossing;
- Realigns/straightens Taxilane D to provide a full-length parallel taxiway designed for ADG V aircraft;
- Relocates vehicle service road adjacent to Taxiway E and Taxilane D out from between two active surfaces; and
- Provides more aircraft holding areas near the end of runways, thereby improving the ability for sequencing departures.

Implementation of Alternative 6 would not involve construction of a runway within 10,000 feet of a solid waste landfill or create an attractant to birds. In general, implementation of this alternative would enhance aircraft safety and efficiency, as summarized above, particularly with respect to better achieving compliance with FAA Airport Design Standards for operation of large aircraft. The 100-foot northward shift of Runway 6L/24R would, however, result in a northward shift of the Part 77 imaginary surfaces placing portions of a multi-story structure within Part 77 Surfaces. As described above, there are several options available to address potential safety hazards associated with objects being located within controlled airspace areas, ranging from doing nothing (i.e., for low-risk objects), to placing high-visibility markings and lighting on the object to make it highly visible to pilots and indicating such objects on avigation maps, to lowering, reducing, or removing the object, and, in some cases, an approach or departure procedure will be modified to allow aircraft to safely navigate around or above an object that penetrates a Part 77 surface. The most appropriate option(s) would be determined in conjunction with detailed airfield improvement engineering and would be subject to FAA review and concurrence prior to FAA approval of an ALP amendment for such an airfield modification. Such measures would reduce this safety impact to a level that is less than significant. Secondary or indirect impacts associated with implementation of such options could range from no impact, such as in the case of low-risk objects that do not require any safety measures, to impacts typically associated with removal of an object/structure, such as temporary construction-related air quality, noise, and traffic impacts, visual impacts (i.e., changes in existing appearance), and land use impacts. Such secondary or indirect impacts would be similar to those described at the end of the impacts analysis for Alternative 1 above.

The northward runway relocation would also move the RPZ northward, resulting in additional businesses in Westchester being located within the RPZ, and the 604-foot westward shift in the displaced landing threshold for Runway 24R would move the RPZ westward such that the RPZ would no longer encompass any residences. As such, implementation of Alternative 6 would result in a change in the composition of land uses within the RPZ for Runway 6L/24R compared to baseline conditions. The presence of such uses under Alternative 6 may be considered incompatible with FAA design recommendations that RPZ

areas be clear of all obstructions and occupied uses; however, it is not considered to pose a significant safety hazard compared to baseline conditions. In the event that the FAA, as the lead federal agency responsible for aviation safety at LAX, considers that the structures and uses within the existing or future RPZ pose an aviation hazard, modifications to, or removal of, structures and uses in the RPZ may be required. Potential secondary or indirect impacts associated with such measures, if required by the FAA, would be similar to those described at the end of the impacts analysis for Alternative 1 above.

4.7.2.6.7 Alternative 7

Birdstrikes

Under Alternative 7, impacts with respect to birdstrikes would be the same as those described previously for Alternative 2. As with Alternative 2, implementation of Alternative 7 would not involve construction of a runway within 10,000 feet of a solid waste landfill or create an attractant to birds; therefore, impacts would be less than significant.

Aviation Accidents, Incidents, and Runway Incursions

Airspace Surfaces

Implementation of Alternative 7 would include relocating Runway 6R/24L 100 feet southward and extending it 1,250 feet eastward. The southern relocation and eastern extension of Runway 6R/24L would shift the runway's imaginary surfaces, including the Approach Surface and the Part 77 Transitional Surface, which could result in multi-story structures along Sepulveda Boulevard and Century Boulevard penetrating those surfaces, either as new penetrations or increased penetrations. A more detailed analysis of building heights, better accomplished at more detailed levels of planning, would be needed to confirm that possibility, as well as determine whether other structures in the local area would penetrate Part 77 Surfaces.

Part 77 imaginary surfaces provide a means of identifying objects that require a more detailed safety analysis. This analysis, performed by the FAA, considers the airspace operations and safety requirements applicable to the Part 77 surface, as well as the nature, location, and extent of the object's penetration into the Part 77 surface. The analysis requires detailed runway design and engineering data not available at this conceptual level of planning, and would occur during the normal course of FAA review and approval of proposed airfield improvements. The analysis would set forth and define the appropriate means and measures to address potential safety concerns related to objects located within the Part 77 surface. As described above in Section 4.7.2.3, options for addressing potential safety hazards associated with objects located within controlled airspace areas can range widely and can include (1) doing nothing (i.e., for low-risk objects); (2) placing high-visibility markings and lighting on the object to make it highly visible to pilots and indicating such objects on avigation maps; (3) lowering, reducing, or removing the object, and; (4) modifying an approach or departure procedure to allow aircraft to safely navigate around or above an object that penetrates a Part 77 surface. Implementation of appropriate measures, as determined and required through the normal FAA review and approval process for proposed runway improvements, would reduce potential aviation safety impacts to a level that is less than significant.

Airfield Surfaces

In conjunction with the southward relocation of Runway 6R/24L under Alternative 7, construction of a centerfield parallel taxiway, along with associated exits and connections between the taxiway and two adjacent runways, would occur. Also occurring would be the southward relocation and extension of Taxiway E and Taxilane D. The resultant runway and taxiway separation distances and allowances for various safety zone requirements (e.g., OFZ) would improve the ability of the north airfield to accommodate ADG V aircraft, but not ADG VI aircraft, compared to baseline conditions (2010). **Table 4.7.2-8** delineates, for baseline conditions (2010) and each alternative, the maximum size aircraft,

in terms of ADG, for which the runways and parallel taxiways would meet FAA Airport Design Standards without needing approval of special operations restrictions, MOS, or waivers from FAA.

As indicated in **Table 4.7.2-8**, implementation of Alternative 7 would increase the separation distance between Runways 6L/24R and 6R/24L from 700 feet to 800 feet, but would not change the existing capabilities relative to allowing simultaneous arrivals and departures.

The southward relocation and full-length construction of Taxiway E and Taxilane D would be designed to accommodate ADG VI aircraft on Taxiway E and ADG V aircraft on Taxilane D. In conjunction with these taxiway/lane improvements, the adjacent vehicle service road would be relocated from between the active surface areas of those facilities to the northerly limit of the aircraft parking apron, south of Taxilane D.

The runway improvements proposed under Alternative 7 would modify some of the existing runway safety areas. **Figure 4.7.2-18** shows the runway safety areas associated with Alternative 7. **Figure 4.7.2-19** delineates the location and current use of parcels within the RPZs associated with Alternative 7 and **Table 4.7.2-15** summarizes the affected land uses.

Table 4.7.2-15

Parcels Within RPZ - Alternative 7

Parcels Inside Alternative 7 Runway Protection Zones[1]		Commercial			Residential					
Approach End	Area	Parking	Sales and Services	Offices	Single	Multi	Vacant	Govern-ment	Misc.[2]	Total
Runway 6L	Approach RPZ	-	-	-	-	-	-	-	-	0
	Central Portion of RPZ	-	-	-	-	-	-	-	-	0
	Departure RPZ	-	-	-	-	-	-	-	-	0
	Total 6L Parcels	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Runway 24R	Approach RPZ	7	8	2	8	1	4	1	-	31
	Central Portion of RPZ	4	7	1	-	-	1	-	-	13
	Departure RPZ	1	7	0	-	-	-	-	-	8
	Total 24R Parcels	**7**	**8**	**2**	**8**	**1**	**4**	**1**	**0**	**31**
Runway 6R	Approach RPZ	-	-	-	-	-	-	-	5	5
	Central Portion of RPZ	-	-	-	-	-	-	-	-	0
	Departure RPZ	-	-	-	-	-	-	-	1	1
	Total 6R Parcels	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**5**
Runway 24L	Approach RPZ	5	-	-	-	-	2	-	-	7
	Central Portion of RPZ	-	-	-	-	-	-	-	-	0
	Departure RPZ	-	-	-	-	-	-	-	-	0
	Total 24L Parcels	**5**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**7**
Alternative Total[3]		**12**	**8**	**2**	**8**	**1**	**6**	**1**	**5**	**43**

1 This analysis excludes all parcels that fall within the airport property boundary.
2 Rights of way, streets, transmission lines, sewer, utility lines, rivers and lakes.
3 Existing total may not equal the sum of the approach end parcels due to parcels falling within multiple approach end RPZs.

Source: U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5300-13, Airport Design, September 29, 1989, as amended by Changes 1 - 18, December 30, 2011; LAWA Environmental Services Division, April 2011; Ricondo & Associates, Inc., May 2012.

The combination of the runway improvements, establishment of displaced thresholds, and covering of the eastern end of the Argo Drainage Channel would bring all RSAs for the north airfield into compliance with FAA standards.

The combination of physical lengthening of runways and establishment of displaced thresholds would change the existing declared distances for runways within the north airfield. As can be seen in **Table 4.7.2-4**, implementation of Alternative 7 would change about half of the existing declared distances, with five getting longer and three getting shorter. The implications of these changes in declared distances would be the same as described above for Alternative 2.

Other Safety Considerations

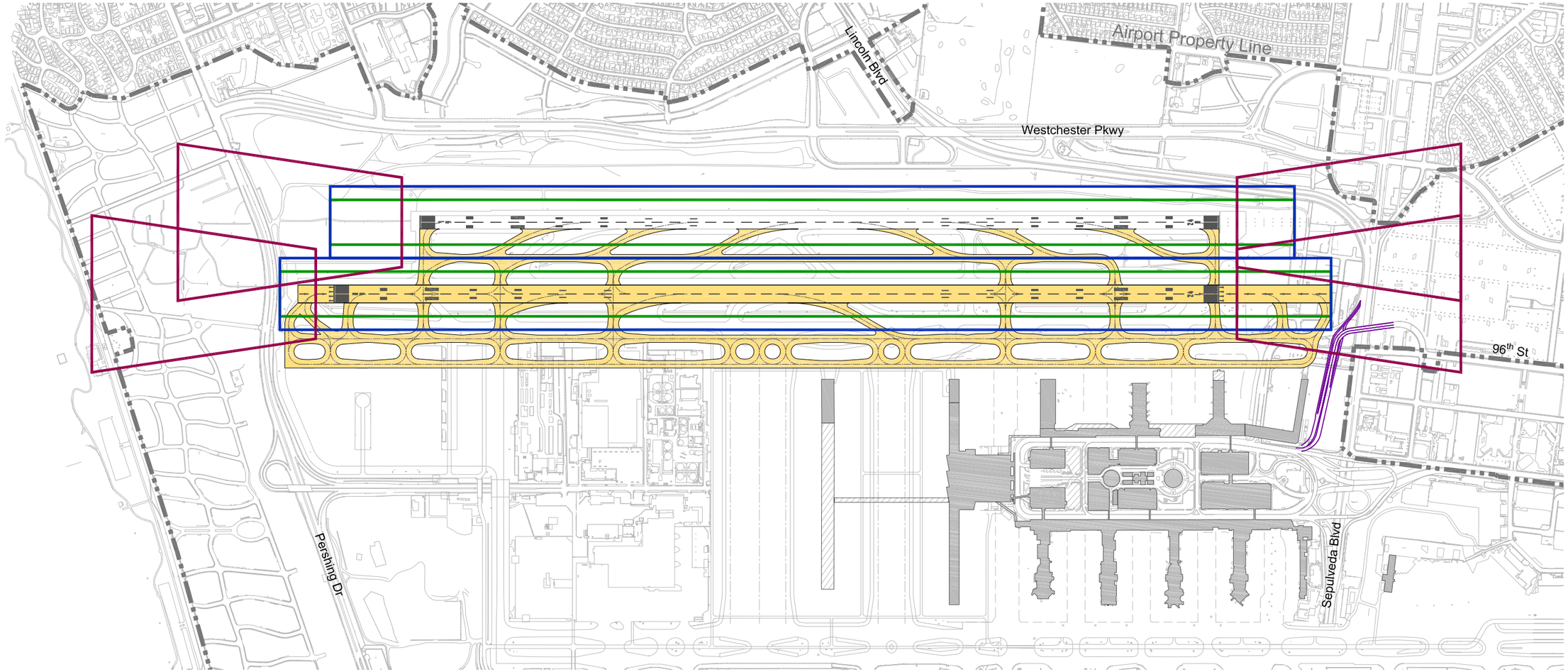
As described above in Section 4.7.2.3, numerous safety studies have been prepared relative to aircraft operations on the north airfield. While the nature, approach, and scope of analysis may differ between the studies, there is general consensus between the studies that increased separation between runways and the addition of a centerfield parallel taxiway can reduce the potential for a runway collision or incursion and enhance safety, particularly as related to future operations involving a greater number of large aircraft. Additionally, the safety benefits of relocated and redesigned runway crossing points along the last-third of Runway 6R/24L, including the advantage of pilot visibility to the end of the runway, were noted in some of the studies. The airfield improvements proposed under Alternative 7 provide for these desired safety improvements.

Summary Conclusions Regarding Alternative 7

Implementation of Alternative 7 would enhance the safety and efficiency of aircraft operating in the north airfield, compared to baseline conditions (2010), as follows:

- Achieves full compliance with RSA requirements;
- Shifts the arrival RPZ for Runway 24R westward, resulting in residences and the vehicle staging area west of Sepulveda Boulevard no longer being located within the RPZ;
- Provides greater amount of runway and taxiway facilities that meet FAA Airport Design Standards for ADG V and VI aircraft, particularly as related to separation requirements, thereby reducing the need for special operations restrictions, MOS, and waivers from FAA;
- Provides increased separation between runways and between runways and taxiways, which better enables taxiing and holding aircraft to stay clear of runway OFZ and RSA surfaces;
- Allows addition of a centerfield parallel taxiway that includes high-speed exits from Runway 6L/24R, which provides more time and options for FAA air traffic controllers to handle aircraft exiting the runway; more time and distance for the pilot of an arriving aircraft to exit the runway, slow down and hold before crossing Runway 6R/24L; and reduced potential for safety hazards/incursions;
- Improves, to a more limited degree than Alternatives 1, 3, and 5, the locations and design of crossing points (i.e., 90-degree crossing angle) at Runway 6R/24L, which provides better pilot visibility down Runway 6R/24L before crossing;
- Realigns/straightens Taxilane D to provide a full-length parallel taxiway designed for ADG V aircraft;
- Relocates vehicle service road adjacent to Taxiway E and Taxilane D out from between two active surfaces; and
- Provides more aircraft holding areas near the end of runways, thereby improving the ability for sequencing departures.

Implementation of Alternative 7 would not involve construction of a runway within 10,000 feet of a solid waste landfill or create an attractant to birds. In general, implementation of this alternative would enhance aircraft safety and efficiency, as summarized above, particularly with respect to better achieving compliance with FAA Airport Design Standards for operation of large aircraft. The 100-foot southward shift of Runway 6R/24L could, however, result in a southward shift of the Part 77 imaginary surfaces



Note: Improvements depicted are conceptual only and do not represent engineered design.

Legend

- Runway Safety Area (RSA)
- Runway Object Free Area (OFA)
- Runway Protection Zone (RPZ)

0 1,200 ft
Scale

north

Prepared by: Ricondo & Associates, Inc., May 2012.

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North Airfield Runway Safety Areas
Alternative 7

Figure
4.7.2-18

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RUNWAY 6L APPROACH END

RUNWAY 24R APPROACH END

RUNWAY 6R APPROACH END

RUNWAY 24L APPROACH END

Notes: 1/ Rights of Way, Streets, Transmission Lines, Sewer, Utility Lines, Rivers and Lakes.
2/ This analysis excludes all parcels that fall within the airport property boundary.
3/ For planning purposes, all runways are assumed to have approaches with minimums less than 3/4 mile.

0 600 ft.
Scale

north

Prepared by: Ricondo & Associates, Inc., 2012.

Legend

- Approach RPZ
- Departure RPZ
- Central Portion of the RPZ
- Airport Property Boundary
- Commercial - Offices
- Commercial - Sales and Services
- Commercial - Parking
- Misc. - See Note 1
- Vacant
- Government
- Residential - Single Family
- Residential - Multi Family

LAX Specific Plan Amendment Study Draft EIR

Parcels Within RPZ
Alternative 7

Figure
4.7.2-19

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possibly placing structures along Sepulveda Boulevard within Part 77 Surfaces. As described above, there are several options available to address potential safety hazards associated with objects being located within controlled airspace areas, ranging from doing nothing (i.e., for low-risk objects), to placing high-visibility markings and lighting on the object to make it highly visible to pilots and indicating such objects on avigation maps, to lowering, reducing, or removing the object, and, in some cases, an approach or departure procedure will be modified to allow aircraft to safely navigate around or above an object that penetrates a Part 77 surface. The most appropriate option(s) would be determined in conjunction with detailed airfield improvement engineering and would be subject to FAA review and concurrence prior to FAA approval of an ALP amendment for such an airfield modification. Such measures would reduce this safety impact to a level that is less than significant. Secondary or indirect impacts associated with implementation of such options could range from no impact, such as in the case of low-risk objects that do not require any safety measures, to impacts typically associated with removal of an object/structure, such as temporary construction-related air quality, noise, and traffic impacts, visual impacts (i.e., changes in existing appearance), and land use impacts. Such secondary or indirect impacts would be similar to those described at the end of the impacts analysis for Alternative 1 above.

4.7.2.6.8 Alternative 8

Alternative 8 focuses on ground access improvements and would not affect aviation safety.

4.7.2.6.9 Alternative 9

Alternative 9 focuses on ground access improvements and would not affect aviation safety.

4.7.2.6.10 Summary of Impacts

Currently, no active solid waste landfills are located within a five-mile radius of LAX. Therefore, none of the alternatives would relocate a runway to within 10,000 feet of a solid waste landfill. Under all of the alternatives, no new facilities would be constructed or operational conditions implemented that would serve as attractants to birds. In accordance with FAA requirements, the airfield would continue to be maintained to avoid the ponding of water, the growth of vegetation, and the development of other conditions that may serve as attractants to nuisance wildlife, including birds. Therefore, impacts under all of the alternatives with respect to birdstrikes would be less than significant.

Implementation of Alternatives 1, 2, 3, 4, 5, 6, and 7 would enhance the safety and efficiency of aircraft operating in the north airfield, compared to baseline conditions (2010). Alternatives 8 and 9 focus on ground access improvements and would not affect the safety and efficiency of aircraft operating in the north airfield.

Table 4.7.2-16 provides a summary of the safety and efficiency enhancements to the north airfield operations that would occur with implementation of airfield improvements under Alternatives 1, 2, 3, 4, 5, 6, and 7.

Table 4.7.2-16

Summary of Safety and Efficiency Enhancements to the North Airfield Operations

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7
Achieves full compliance with RSA requirements	X	X	X	X	X	X	X
Shifts the arrival RPZ for Runway 24R westward, resulting in residences and the vehicle staging area west of Sepulveda Boulevard no longer being located within the RPZ	X				X	X	

Table 4.7.2-16

Summary of Safety and Efficiency Enhancements to the North Airfield Operations

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7
Provides greater amount of runway and taxiway facilities that meet FAA Airport Design Standards for ADG V and VI aircraft, particularly as it relates to separation requirements	X	X	X[1]		X[1]	X	X[1]
Reduces the need for special operations restrictions, modifications of standards, and waivers from FAA	X	X	X		X	X	X
Provides increased separation between runways and between runways and taxiways, which better enables taxiing and holding aircraft to stay clear of runway OFZ and RSA surfaces	X		X		X	X	X
Allows addition of a centerfield parallel taxiway that includes high-speed exits from Runway 6L/24R, which provides more time and options for FAA air traffic controllers to handle aircraft exiting the runway; more time and distance for the pilot of an arriving aircraft to exit the runway, slow down and hold before crossing Runway 6R/24L; and reduced potential for safety hazards/incursions	X		X		X	X	X
Improves the locations and design of crossing points (i.e., 90-degree crossing angle) at Runway 6R/24L, which provides better pilot visibility down Runway 6R/24L before crossing	X		X		X	X[2]	X[2]
Realigns/straightens Taxilane D to provide a full-length parallel taxiway designed for ADG V aircraft	X	X				X	X
Realigns/straightens Taxilane D to provide a full-length parallel taxiway designed for ADG VI aircraft			X		X		
Relocates vehicle service road adjacent to Taxiway E and Taxilane D out from between two active surfaces	X	X			X	X	X
Provides more aircraft holding areas near the end of runways, thereby improving the ability for sequencing departures	X	X	X		X	X	X
Improves the locations for high-speed exits from Runway 6L/24R and improves crossing angles at Runway 6R/24L with better pilot visibility down Runway 6R/24L before crossing	X	X	X		X	X	X

Notes:

RSA = Runway Safety Area
RPZ = Runway Protection Zone
ADG = Aircraft Design Group
OFZ = Obstacle Free Zone

[1] Improves to a greater degree than Alternatives 1, 2, and 6.
[2] Improves to a more limited degree than Alternatives 1, 3, and 5.

Source: CDM Smith, 2012.

The northward relocation of Runway 6L/24R under Alternatives 1, 5, and 6 would move the RPZ northward, resulting in additional businesses in Westchester being located within the RPZ, and the 604-foot westward shift in the displaced landing threshold for Runway 24R would move the RPZ westward such that the RPZ would no longer encompass any residences. The southward relocation of Runway 6R/24L under Alternative 3 would move the RPZ southward, resulting in additional developed parcels being located within the RPZ. The impacts associated with the change of uses within RPZ areas,

compared to baseline conditions, would be less than significant. In summary, as discussed in the impacts analysis above, none of the SPAS alternatives would compromise aviation safety or result in an aviation safety hazard for people in the project area.

4.7.2.7 Mitigation Measures

Alternatives 1 through 9 would not have a significant impact with respect to safety; therefore, no mitigation is required.

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