
**FINAL
ENVIRONMENTAL ASSESSMENT**

PROPOSED RUNWAY 6R-24L RUNWAY SAFETY AREA (RSA)
IMPROVEMENTS PROJECT

Los Angeles International Airport
Los Angeles, Los Angeles County, California

Prepared for:

LOS ANGELES WORLD AIRPORTS

**U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION**

As lead Federal Agency pursuant to the National Environmental Policy Act of 1969

Prepared by:

Ricondo and Associates, Inc.

May 2015

This environmental assessment becomes a Federal document when evaluated, signed and dated by the Responsible FAA Official.



Responsible FAA Official

May 21, 2015

Date

GENERAL INFORMATION ABOUT THIS DOCUMENT

WHAT'S IN THIS DOCUMENT? This document contains a Final Environmental Assessment (EA) for the Los Angeles World Airports (LAWA) proposed Runway 6R-24L Runway Safety Area (RSA) Improvements Project (Proposed Action), which includes improvements to the RSAs of Runway 6R-24L at Los Angeles International Airport (LAX). This document discloses the analysis and findings of the potential impacts associated with the City of Los Angeles proposal, the No Action Alternative, and other reasonable alternatives.

BACKGROUND. *The Transportation, Treasury, Housing and Urban Development, the Judiciary, the District of Columbia, and Independent Agencies Appropriations Act, 2006* (Public Law [P.L.] 109-115), requires completion of Runway Safety Area improvements by airports in the United States that hold a certificate issued by the Federal Aviation Administration (FAA), under Title 49 of the *United States Code*, Section 44706, to meet FAA airport design standards for RSA required by Title 14, Code of Federal Regulations, Part 139 by December 31, 2015. The City of Los Angeles, as owner and operator of Los Angeles International Airport, has developed its Proposed Action to meet the requirements of P.L. 109-115 for Runway 6R-24L.

The Draft EA was released for public and agency review on March 12, 2015. The notice of availability of the Draft EA was advertised in three local newspapers to inform the general public and other interested parties.

The document presented herein represents the Final EA for the federal decision-making process, in fulfillment of FAA's policies and procedures relative to NEPA and other related federal requirements. Copies of the document are available for inspection at libraries in the cities of Los Angeles, El Segundo, and Inglewood, LAWA Administrative Offices, and the FAA Western-Pacific Region Office in Hawthorne. The addresses for these locations are provided in Chapter 5 of this Final EA.

WHAT SHOULD YOU DO? Read this Final EA to understand the actions that LAWA and FAA intend to take relative to the Proposed Action at LAX.

WHAT HAPPENS AFTER THIS? Following review of the Final EA, the FAA will either issue a Finding of No Significant Impact/Record of Decision (FONSI/ROD) or decide to prepare an Environmental Impact Statement (EIS).

Volume 1 - Table of Contents

1.	Purpose and Need	1-1
1.1	Introduction.....	1-1
1.2	Background Information	1-2
1.2.1	DESCRIPTION OF EXISTING AIRPORT	1-2
1.2.2	EXISTING RUNWAYS AND RUNWAY SAFETY AREAS.....	1-3
1.3	Description of the Proposed Action	1-17
1.3.1	SHIFT RUNWAY 6R END	1-22
1.3.2	SHIFT RUNWAY 24L END	1-29
1.3.3	DECLARED DISTANCES	1-35
1.3.4	SERVICE ROADS	1-36
1.3.5	CONSTRUCTION STAGING AREAS.....	1-39
1.4	Purpose and Need	1-39
1.4.1	PURPOSE OF THE PROPOSED ACTION	1-39
1.4.2	NEED FOR THE PROPOSED ACTION	1-43
1.4.3	FAA PURPOSE AND NEED.....	1-43
1.5	Requested Federal Action	1-43
1.6	General Implementation Timeframe	1-44
1.7	Document Requirements and Organization.....	1-45
2.	Alternatives	2-1
2.1	Introduction.....	2-1
2.1.1	SCOPE OF THE ALTERNATIVE ANALYSIS.....	2-1
2.1.2	REQUIREMENTS OF THE FAA AND NATIONAL ENVIRONMENTAL POLICY ACT	2-2
2.2	RSA Alternatives Screening and Evaluation	2-3
2.2.1	RSA ALTERNATIVES SCREENING EVALUATION CRITERIA.....	2-4
2.2.2	EVALUATION OF OFF-SITE AND OPERATIONAL ALTERNATIVES CONSIDERED	2-8
2.2.3	DESCRIPTION OF ON-SITE ALTERNATIVES CONSIDERED	2-9
2.2.4	EVALUATION OF ON-SITE RSA DEVELOPMENT ALTERNATIVES	2-15
2.2.5	PRELIMINARY REVIEW AND REFINEMENT OF RSA ALTERNATIVES	2-29

Table of Contents (Continued)

2.3	RSA Alternatives Carried Forward for Evaluation.....	2-59
2.3.1	SPONSOR'S PREFERRED ALTERNATIVE.....	2-60
2.4	Permits Required	2-62
2.5	Federal Laws and Regulations Considered	2-63
3.	Affected Environment	3-1
3.1	Introduction.....	3-1
3.1.1	STUDY AREAS.....	3-1
3.1.2	STUDY YEARS	3-5
3.2	Noise.....	3-5
3.2.1	NOISE DESCRIPTORS	3-6
3.2.2	NOISE REGULATORY ENVIRONMENT	3-6
3.2.3	METHODOLOGY.....	3-7
3.2.4	EXISTING (2013) NOISE ENVIRONMENT	3-8
3.2.5	EXISTING NOISE MANAGEMENT PROGRAM	3-8
3.2.6	LAND USE COMPATIBILITY.....	3-9
3.3	Compatible Land Use	3-9
3.3.1	EXISTING LAND USE.....	3-10
3.3.2	LOCAL PLANS AND LAND USE REGULATIONS.....	3-14
3.4	Department of Transportation Act, Section 4(f) and Land and Water Conservation Fund Act, Section 6(f) Resources	3-25
3.4.1	SECTION 4(F) RESOURCES LOCATED WITHIN THE GSA	3-26
3.4.2	SECTION 6(F) RESOURCES LOCATED WITHIN THE GSA	3-26
3.5	Demographic, Socioeconomic, and Transportation Characteristics	3-29
3.5.1	POPULATION.....	3-29
3.5.2	ETHNICITY OF POPULATION AND POVERTY STATUS	3-33
3.5.3	EMPLOYMENT.....	3-34
3.5.4	2010 INCOME AND HOUSING DISTRIBUTION	3-36
3.5.5	LIMITED ENGLISH PROFICIENCY COMMUNITIES	3-38
3.5.6	CHILDREN'S ENVIRONMENT HEALTH AND SAFETY	3-39
3.5.7	SURFACE TRANSPORTATION AND TRAFFIC.....	3-39

Table of Contents (Continued)

3.6	Air Quality	3-43
3.6.1	EXISTING AMBIENT AIR QUALITY.....	3-46
3.6.2	SOURCES OF AIRPORT AIR EMISSIONS.....	3-46
3.6.3	GREENHOUSE GASES AND HAZARDOUS AIR POLLUTANTS.....	3-47
3.7	Water Resources	3-47
3.7.1	SURFACE AND STORMWATER.....	3-47
3.7.2	GROUNDWATER.....	3-51
3.7.3	WATER SUPPLY.....	3-51
3.7.4	SANITARY WASTEWATER AND TREATMENT.....	3-51
3.8	Fish, Wildlife, and Plants	3-52
3.8.1	PLANT COMMUNITIES	3-52
3.8.2	PLANTS	3-54
3.8.3	WILDLIFE.....	3-54
3.8.4	PROTECTED SPECIES.....	3-54
3.9	Wetlands	3-64
3.10	Floodplains	3-66
3.11	Coastal Resources	3-71
3.11.1	PRIOR REGULATORY APPROVALS.....	3-75
3.11.2	EXISTING FACILITIES WITHIN THE COASTAL ZONE.....	3-75
3.12	Historic, Architectural, Archaeological, and Cultural Resources	3-76
3.12.1	COMPLIANCE WITH SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT	3-76
3.12.2	AREA OF POTENTIAL EFFECT (APE).....	3-76
3.12.3	ARCHAEOLOGICAL AND HISTORIC ARCHITECTURAL RESOURCES.....	3-77
3.13	Light Emissions and Visual Character	3-81
3.14	Natural Resources and Energy Supply	3-82
3.14.1	NATURAL RESOURCES	3-82
3.14.2	ENERGY SUPPLY.....	3-82
3.15	Hazardous Materials, Pollution Prevention, and Solid Waste	3-83
3.15.1	HAZARDOUS MATERIALS REGULATIONS.....	3-83
3.15.2	KNOWN/POTENTIAL SITES.....	3-84
3.15.3	SOLID WASTE COLLECTION AND DISPOSAL.....	3-89
3.16	Past, Present, and Reasonably Foreseeable Future Actions	3-90

Table of Contents (Continued)

4.	Environmental Consequences	4-1
4.1	Introduction.....	4-1
4.2	Noise.....	4-6
4.2.1	OVERVIEW OF IMPACTS.....	4-6
4.2.2	METHODOLOGY.....	4-7
4.2.3	CONSTRUCTION IMPACTS.....	4-15
4.2.4	OPERATIONAL IMPACTS	4-23
4.2.5	MITIGATION MEASURES	4-56
4.3	Compatible Land Use	4-56
4.3.1	OVERVIEW OF IMPACTS.....	4-56
4.3.2	METHODOLOGY.....	4-56
4.3.3	CONSTRUCTION IMPACTS.....	4-57
4.3.4	OPERATIONAL IMPACTS	4-58
4.3.5	MITIGATION MEASURES	4-60
4.4	Socioeconomic Impacts, Environmental Justice, Children’s Environmental Health and Safety Risk, and Surface Transportation	4-60
4.4.1	OVERVIEW OF IMPACTS.....	4-60
4.4.2	METHODOLOGY.....	4-60
4.4.3	CONSTRUCTION IMPACTS.....	4-62
4.4.4	OPERATIONAL IMPACTS	4-64
4.4.5	MITIGATION MEASURES	4-65
4.5	Air Quality.....	4-65
4.5.1	OVERVIEW OF IMPACTS.....	4-67
4.5.2	METHODOLOGY.....	4-68
4.5.3	CONSTRUCTION IMPACTS.....	4-73
4.5.4	OPERATIONAL IMPACTS	4-74
4.5.5	HAZARDOUS AIR POLLUTANTS.....	4-76
4.5.6	GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE	4-80
4.5.7	MITIGATION MEASURES	4-82

Table of Contents (Continued)

4.6	Water Resources	4-82
4.6.1	OVERVIEW OF IMPACTS	4-83
4.6.2	METHODOLOGY.....	4-83
4.6.3	CONSTRUCTION IMPACTS	4-84
4.6.4	OPERATIONAL IMPACTS	4-87
4.6.5	MITIGATION MEASURES	4-89
4.7	Fish, Wildlife, and Plants	4-89
4.7.1	OVERVIEW OF IMPACTS	4-89
4.7.2	METHODOLOGY.....	4-90
4.7.3	CONSTRUCTION IMPACTS	4-90
4.7.4	OPERATIONAL IMPACTS	4-95
4.7.5	MITIGATION MEASURES	4-96
4.8	Coastal Resources	4-98
4.8.1	OVERVIEW OF IMPACTS	4-99
4.8.2	METHODOLOGY.....	4-99
4.8.3	CONSTRUCTION IMPACTS	4-101
4.8.4	OPERATIONAL IMPACTS	4-103
4.8.5	MITIGATION MEASURES	4-104
4.9	Light Emissions and Visual Impacts	4-105
4.9.1	OVERVIEW OF IMPACTS	4-105
4.9.2	METHODOLOGY.....	4-105
4.9.3	CONSTRUCTION IMPACTS	4-106
4.9.4	OPERATIONAL IMPACTS	4-106
4.9.5	MITIGATION MEASURES	4-109
4.10	Natural Resources and Energy Supply	4-109
4.10.1	OVERVIEW OF IMPACTS	4-109
4.10.2	METHODOLOGY.....	4-109
4.10.3	CONSTRUCTION IMPACTS	4-110
4.10.4	OPERATIONAL IMPACTS	4-111
4.10.5	MITIGATION MEASURES	4-112
4.11	Hazardous Materials, Pollution Prevention, and Solid Waste	4-112
4.11.1	OVERVIEW OF IMPACTS	4-112
4.11.2	METHODOLOGY.....	4-113

Table of Contents (Continued)

4.11.3	CONSTRUCTION IMPACTS	4-114
4.11.4	OPERATIONAL IMPACTS	4-115
4.11.5	MITIGATION MEASURES	4-115
4.12	Cumulative Impacts.....	4-115
4.12.1	NOISE.....	4-116
4.12.2	COMPATIBLE LAND USE.....	4-117
4.12.3	SOCIOECONOMIC IMPACTS, ENVIRONMENTAL JUSTICE, CHILDREN’S ENVIRONMENTAL HEALTH AND SAFETY RISK.....	4-119
4.12.4	AIR QUALITY	4-121
4.12.5	WATER RESOURCES	4-122
4.12.6	FISH, WILDLIFE, AND PLANTS	4-125
4.12.7	COASTAL RESOURCES.....	4-126
4.12.8	LIGHT EMISSIONS AND VISUAL IMPACTS.....	4-128
4.12.9	NATURAL RESOURCES AND ENERGY SUPPLY	4-129
4.12.10	HAZARDOUS MATERIALS, POLLUTION PREVENTION, AND SOLID WASTE.....	4-130
5.	Coordination and Public Involvement	5-1
5.1	Introduction.....	5-1
5.2	Agency Consultation	5-1
5.3	Public Involvement.....	5-2
5.4	Public Workshop and Hearing.....	5-2
5.5	Comments on the Draft EA	5-3
5.6	Final EA.....	5-3
6.	List of Preparers.....	6-1
6.1	Principal Federal Aviation Administration Reviewers	6-1
6.2	Los Angeles World Airports/City of Los Angeles.....	6-1
6.3	Ricondo & Associates, Inc.	6-2
7.	References	7-1
8.	List of Abbreviations and Acronyms	8-1

List of Tables

Table 1-1: FAA Airport Reference Code Classifications	1-9
Table 1-2: RSA Dimensional Requirements for Runway Design Code D-V Aircraft	1-10
Table 1-3: Runway 6R-24L Declared Distances	1-36
Table 2-1: Runway Safety Area Dimensions	2-7
Table 2-2: Runway 6R-24L RSA Alternatives Comparison Matrix	2-19
Table 2-3: Runway 6R-24L RSA Alternative Refinements Comparison Matrix	2-34
Table 2-4: Summary of RSA Alternatives Screening Evaluation	2-60
Table 2-5: Preliminary List of Permits Required for the Proposed Action	2-63
Table 2-6: Federal Laws and Statutes Considered	2-63
Table 2-7: Executive Orders Considered	2-65
Table 2-8: FAA Orders, Advisory Circulars, and Federal Regulations Considered	2-65
Table 3-1: Existing Conditions Aircraft Noise Exposure (2013) ^{1/} – All Jurisdictions	3-10
Table 3-2: Land Use Compatibility with Yearly Day-Night Average Sound Levels	3-13
Table 3-3: Sensitive Land Uses within ¼-Mile of GSA	3-17
Table 3-4: Municipal Population Trends	3-30
Table 3-5: GSA Population Trends	3-33
Table 3-6: Race and Poverty	3-34
Table 3-7: 2010 Employment Characteristics	3-35
Table 3-8: Unemployment Trends	3-36
Table 3-9: 2010 Income and Housing Information	3-37
Table 3-10: 2012 English Proficiency	3-38
Table 3-11: National Ambient Air Quality Standards (NAAQS)	3-44
Table 3-12: South Coast Air Basin Attainment Status	3-45
Table 3-13: Southwest Coastal Los Angeles and South Coastal Los Angeles County Monitoring Station Ambient Air Quality Data	3-46
Table 3-14: Airport-Related Sources of Air Emissions	3-47
Table 3-15: Listed Plant Species Potential for Occurrence within the DSA	3-56
Table 3-16: Listed Wildlife Species Potential for Occurrence within the DSA	3-61
Table 3-17: Previously Recorded Cultural Resources within the Study Area	3-79
Table 3-18: Regulatory Agencies Involved in Hazardous Materials, Pollution, and Solid Waste in Los Angeles County	3-85
Table 3-19: Relevant Potential Hazardous Waste Release Sites Within and Adjacent to DSA	3-89
Table 3-20: LAX Development Project Not Related to the Proposed Project Elements	3-91

List of Tables (continued)

Table 4-1: Existing and Forecast LAX Aircraft Flight Operations.....	4-14
Table 4-2: Land Use Noise Exposure by Sensitive Land Use (2016 Construction)	4-16
Table 4-3: No Action Alternative Land Use Noise Exposure by Sensitive Land Use (2016)	4-23
Table 4-4: No Action Alternative Land Use Noise Exposure by Sensitive Land Use (2021)	4-24
Table 4-5: Proposed Action Alternative and Refinement #1 Alternative Land Use Noise Exposure by Sensitive Land Use (2016).....	4-29
Table 4-6: Proposed Action Alternative and Refinement #1 Alternative Land Use Noise Exposure by Sensitive Land Use (2021).....	4-30
Table 4-7: Land Use Noise Exposure by Sensitive Land Use Comparison, No Action Alternative, Proposed Action Alternative and Refinement #1 Alternative	4-40
Table 4-8: Refinement #7 Alternative Land Use Noise Exposure by Sensitive Land Use (2016)	4-45
Table 4-9: Refinement #7 Alternative Land Use Noise Exposure by Sensitive Land Use (2021)	4-46
Table 4-10: Land Use Noise Exposure by Sensitive Land Use Comparison, No Action Alternative and Refinement #7 Alternative.....	4-55
Table 4-11: No Action Alternative and Proposed Action Alternative Traffic Impacts for 2016 and 2021	4-66
Table 4-12: Comparison of Taxi Times during Construction Year	4-70
Table 4-13: Total Aircraft Operations and Taxi Times, by Calendar Year.....	4-71
Table 4-14: General Conformity <i>De Minimis</i> Thresholds.....	4-72
Table 4-15: 2016 Proposed Action Alternative Construction Emissions Inventory.....	4-74
Table 4-16: No Action Alternative Operational Emissions Inventories	4-75
Table 4-17: Proposed Action Alternative and Refinement #1 Alternative Operational Emissions Inventories	4-75
Table 4-18: Refinement #7 Alternative Operational Emissions Inventories.....	4-76
Table 4-19: Comparison of Alternatives with <i>de minimis</i> Thresholds	4-77
Table 4-20: No Action Alternative Emissions of HAPs.....	4-78
Table 4-21: Proposed Action Alternative Emissions of HAPs	4-79
Table 4-22: Operational CO ₂ e Emissions (MTCO ₂ e)	4-81
Table 4-23: Cumulative Construction Emissions.....	4-122
Table 5-1: Locations Where Draft EA is Available	5-2

List of Exhibits

Exhibit 1-1: General Location and Vicinity Map	1-5
Exhibit 1-2: Existing Airfield Configuration	1-7
Exhibit 1-3: Runway 6R-24L Existing Conditions	1-13
Exhibit 1-4: Runway 6R-24L Areas of Non-Compliance	1-15
Exhibit 1-5: Proposed Action	1-19
Exhibit 1-6: Proposed Action, Runway 6R Detail	1-25
Exhibit 1-7: MALSR Station Photographs	1-27
Exhibit 1-8: MALSR Single Flasher Station Photographs	1-31
Exhibit 1-9: Proposed Action, Runway 24L Detail	1-33
Exhibit 1-10: Taxicab Staging Lot Detail.....	1-37
Exhibit 1-11: Proposed Construction Staging Areas	1-41
Exhibit 2-1: RSA Alternative Screening Process	2-5
Exhibit 2-2: Sample Engineered Materials Arresting System (EMAS) Installations	2-13
Exhibit 2-3: Runway 6R-24L Construct Standard RSA Alternative	2-17
Exhibit 2-4: Runway 6R-24L Reduce Runway Length Alternative	2-21
Exhibit 2-5: Runway 6R-24L Declared Distances Alternative	2-25
Exhibit 2-6: Runway 6R-24L Relocate, Shift or Realign Runway Alternative(s).....	2-27
Exhibit 2-7: Runway 6R-24L Standard EMAS Alternative	2-31
Exhibit 2-8: Runway 6R-24L Refinement #1 Alternative	2-35
Exhibit 2-9: Runway 6R-24L Refinement #2 Alternative	2-39
Exhibit 2-10: Runway 6R-24L Refinement #3 Alternative	2-41
Exhibit 2-11: Runway 6R-24L Refinement #4 Alternative	2-45
Exhibit 2-12: Runway 6R-24L Refinement #5 Alternative.....	2-47
Exhibit 2-13: Runway 6R-24L Refinement #6 Alternative.....	2-51
Exhibit 2-14: Runway 6R-24L Refinement #7 Alternative	2-55
Exhibit 2-15: Runway 6R-24L Refinement #8 Alternative	2-57
Exhibit 3-1: Study Areas and Area of Potential Effect.....	3-3
Exhibit 3-2: Existing (2013) CNEL Contours and Existing Land Use in the Vicinity of LAX.....	3-11
Exhibit 3-3: Existing Zoning in the Vicinity of LAX.....	3-15
Exhibit 3-4: Sensitive Land Uses Within and in the Vicinity of the GSA	3-19
Exhibit 3-5: Section 4(f) Properties Within and Adjacent to the Generalized Study Area.....	3-27
Exhibit 3-6: Generalized Study Area Census Tracts	3-31

List of Exhibits (Continued)

Exhibit 3-7: Principal Access Routes	3-41
Exhibit 3-8: Drainage Sub-Basins.....	3-49
Exhibit 3-9: Wetlands.....	3-67
Exhibit 3-10: Floodplains.....	3-69
Exhibit 3-11: Coastal Zone Boundary.....	3-73
Exhibit 3-12: Hazardous Material/Clean-up Sites within the Generalized Study Area.....	3-87
Exhibit 3-13: Locations of Related Projects.....	3-95
Exhibit 4-1: Proposed Action Construction – Phase 1.....	4-9
Exhibit 4-2: Proposed Action Construction – Phase 2.....	4-11
Exhibit 4-3: Dwelling Units Temporarily Exposed to CNEL 65 dB Noise Levels, Future (2016 Construction) Proposed Action Alternative and Refinement #1 Alternative	4-17
Exhibit 4-4: Detail of Dwelling Units Temporarily Exposed to CNEL 65 dB Noise Levels, Future (2016 Construction) Proposed Action Alternative and Refinement #1 Alternative	4-19
Exhibit 4-5: CNEL 1.5 dBA or Greater Increase During Construction Period	4-21
Exhibit 4-6: Future (2016) No Action Alternative CNEL Contours and Land Use.....	4-25
Exhibit 4-7: Future (2021) No Action Alternative CNEL Contours and Land Use.....	4-27
Exhibit 4-8: Future (2016) Proposed Action Alternative and Refinement #1 Alternative CNEL Contours and Land Use	4-31
Exhibit 4-9: Future (2016) Proposed Action Alternative and Refinement #1 Alternative CNEL 1.5 dBA or Greater Increase.....	4-33
Exhibit 4-10: Future (2021) Proposed Action Alternative and Refinement #1 Alternative CNEL Contour and Land Use	4-35
Exhibit 4-11: Future (2021) Proposed Action Alternative and Refinement #1 Alternative CNEL 1.5 dBA or Greater Increase.....	4-37
Exhibit 4-12: Dwelling Units Newly Exposed to CNEL 65 dB Noise Levels, Future (2016) Proposed Action Alternative and Refinement #1 Alternative	4-41
Exhibit 4-13: Dwelling Units Newly Exposed to CNEL 65 dB Noise Levels, Future (2021) Proposed Action Alternative and Refinement #1 Alternative	4-43
Exhibit 4-14: Future (2016) Refinement #7 Alternative CNEL Contours and Land Use.....	4-47
Exhibit 4-15: Future (2016) Refinement #7 Alternative CNEL 1.5 dBA or Greater Increase.....	4-49
Exhibit 4-16: Future (2021) Refinement #7 Alternative CNEL Contours and Land Use.....	4-51
Exhibit 4-17: Future (2021) Refinement #7 Alternative CNEL 1.5 dBA or Greater Increase.....	4-53
Exhibit 4-18: Existing and Proposed Runway 6R MALS Light Station Locations.....	4-93