

---

---

# **2007 Airport Master Plan Update**

**Prepared for:**

**The City of Chandler**

**December 2006**

Prepared by:

**Wilbur Smith Associates, Inc.**

“The preparation of this document was financed in part through a planning grant from the State of Arizona as approved by the State Transportation Board. The contents of this report reflect the views of the Consultant, which is responsible for the facts and the accuracy of the data depicted herein, and do not necessarily reflect the official views or policy of the State of Arizona. Acceptance of this report by the State of Arizona does not in any way constitute a commitment on the part of the State of Arizona to participate in any development depicted therein, nor does it indicate that the proposed development is environmentally acceptable in accordance with applicable public laws.”

---

**TABLE OF CONTENTS**

**CHAPTER ONE: INVENTORY**

INTRODUCTION.....1-1  
GOALS AND OBJECTIVES .....1-2  
AIRPORT HISTORY .....1-3  
AIRPORT LOCATION AND ACCESS.....1-3  
AIRPORT ROLE .....1-8  
AIRPORT ACTIVITY .....1-9  
    Aircraft Operations.....1-9  
    Based Aircraft.....1-10  
EXISTING AIRPORT FACILITIES.....1-10  
    Airport Property .....1-11  
    Airfield Facilities.....1-11  
    Landside Facilities .....1-16  
    Support Facilities and Equipment.....1-22  
    Utilities.....1-22  
    Surface Access and Parking System.....1-22  
    Airport Fencing and Security .....1-23  
    Pavement Condition .....1-24  
AIRSPACE AND APPROACHES.....1-24  
    Airport Traffic Pattern and Procedures .....1-25  
    Air Traffic Control Facilities and Procedures.....1-25  
    Aeronautical Radio Communications.....1-26  
    Instrument Approaches and Equipment .....1-27  
    Regional Airspace Considerations.....1-28  
    Avoidance of Noise Sensitive Areas.....1-32  
CLIMATIC AND METEOROLOGICAL CONDITIONS .....1-32  
AREA LAND USE PATTERNS AND ZONING .....1-34  
AREA SOCIOECONOMIC DATA.....1-37  
OTHER AREA AIRPORTS.....1-39  
SUMMARY .....1-40

**CHAPTER TWO: PROJECTIONS OF AVIATION DEMAND**

INTRODUCTION .....2-1  
REGIONAL DEMOGRAPHICS .....2-2  
HISTORIC AVIATION ACTIVITY .....2-5  
NATIONAL AVIATION TRENDS.....2-7  
    General Aviation Overview .....2-8  
    General Aviation Industry .....2-8  
    Business Use of General Aviation .....2-9  
FAA ACTIVITY FORECASTS .....2-11  
    Active Pilots.....2-12

# ***Chandler Municipal Airport/2007 Airport Master Plan Update***

Active Aircraft Fleet .....	2-12
Active Hours Flown.....	2-13
Summary of FAA Forecasts.....	2-14
PROJECTIONS OF AVIATION DEMAND.....	2-15
Based Aircraft Projections .....	2-15
FAA Projected Growth Rate Methodology .....	2-16
Regression Methodology .....	2-16
Trendline Methodology .....	2-17
Comparison of Based Aircraft Projections .....	2-18
Projected Fleet Mix .....	2-21
Aircraft Operations Projections .....	2-22
Operations Per Based Aircraft Methodology.....	2-23
Market Share of FAA Hours Flown Methodology.....	2-24
Population Growth Methodology.....	2-25
Comparison of Aircraft Operations Projections.....	2-25
Projected Local/Itinerant Split .....	2-28
CRITICAL AIRCRAFT .....	2-29
PEAKING ANALYSIS.....	2-30
INSTRUMENT APPROACH FORECASTS.....	2-31
SUMMARY .....	2-33

## **CHAPTER THREE: CAPACITY ANALYSIS AND FACILITY REQUIREMENTS**

INTRODUCTION.....	3-1
AIRFIELD CAPACITY .....	3-1
Factors Affecting Airfield Capacity.....	3-2
Peak Hour Capacity Analysis .....	3-3
Annual Service Volume .....	3-5
AIRSIDE REQUIREMENTS .....	3-6
Runway Orientation .....	3-6
Runway Length.....	3-7
Runway Width .....	3-10
Runway Strength .....	3-10
Taxiways.....	3-11
Navigational Aids (NAVAIDs) .....	3-11
Airport Design Standards .....	3-14
LANDSIDE REQUIREMENTS .....	3-19
Hangars .....	3-19
Aprons and Tie-down Areas .....	3-20
Total Storage Demand .....	3-20
Terminal Building.....	3-22
Automobile Parking .....	3-22
Access Roadways .....	3-23
Fuel Storage.....	3-24
SUMMARY .....	3-25

# Chandler Municipal Airport/2007 Airport Master Plan Update

## CHAPTER FOUR: DEVELOPMENT ALTERNATIVES

INTRODUCTION.....	4-1
SUMMARY OF AIRPORT REQUIREMENTS .....	4-1
ABILITY OF EXISTING FACILITIES TO ACCOMMODATE IMPROVEMENTS.....	4-2
Airfield .....	4-2
Landside .....	4-3
IDENTIFICATION OF DEVELOPMENT ALTERNATIVES .....	4-5
No Action Alternative .....	4-5
Transfer of Aviation Services .....	4-6
Airside Alternative .....	4-7
Taxiways .....	4-9
NAVAIDs.....	4-12
Apron Expansion.....	4-14
Construct Additional Hangars .....	4-17
EVALUATION OF ALTERNATIVES.....	4-17
Runways .....	4-17
Taxiways .....	4-24
NAVAIDs.....	4-25
Apron Expansion.....	4-25
Additional Hangars.....	4-26
SUMMARY .....	4-27

## CHAPTER FIVE: ENVIRONMENTAL OVERVIEW

INTRODUCTION.....	5-1
NOISE .....	5-3
Noise Exposure Impacts.....	5-3
COMPATABLE LAND USE.....	5-6
SOCIAL IMPACTS .....	5-7
INDUCED SOCIOECONOMIC IMPACTS/CUMULATIVE IMPACTS .....	5-8
ENVIRONMENTAL JUSTICE IMPACTS.....	5-8
AIR QUALITY.....	5-9
WATER QUALITY .....	5-10
DEPARTMENT OF TRANSPORTATION ACT, SECTION 4(f) .....	5-11
HISTORIC, ARCHITECTURAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES .....	5-12
BIOTIC COMMUNITIES/THREATENED AND ENDANGERED SPECIES .....	5-12
WETLANDS .....	5-13
FLOODPLAINS .....	5-13
COASTAL ZONE MANAGEMENT PROGRAM AND COASTAL BARRIERS .....	5-14
WILD AND SCENIC RIVERS.....	5-14
PRIME AND UNIQUE FARMLANDS .....	5-14
ENERGY SUPPLY AND NATURAL RESOURCES .....	5-14
LIGHT EMISSIONS.....	5-15

# ***Chandler Municipal Airport/2007 Airport Master Plan Update***

SOLID WASTE IMPACTS .....	5-15
CONSTRUCTION IMPACTS .....	5-17
SUMMARY .....	5-17

## **CHAPTER SIX: AIRPORT DEVELOPMENT SCHEDULE AND FINANCIAL ANALYSIS**

INTRODUCTION.....	6-1
PHASING OF PROPOSED DEVELOPMENT .....	6-1
Phase I: Short-Term Development (0-5 Years) .....	6-2
Phase II: Mid-Term Development (5-10 Years) .....	6-4
Phase III: Long-Term Development (10-20 Years) .....	6-5
COST ESTIMATES.....	6-5
CAPITAL FUNDING SOURCES .....	6-7
FAA Funding.....	6-7
State Funding .....	6-8
Sponsor Funding .....	6-10
Airport Operating Revenues and Expenses.....	6-10
Projected Operating Revenues and Expenses .....	6-11
Other Funding.....	6-13
SUMMARY .....	6-14

## **APPENDIX A: AIRSPACE CONFLICTS ANALYSIS**

INTRODUCTION.....	A-1
GENERAL AIRSPACE OVERVIEW .....	A-1
Controlled Airspace .....	A-2
Special Use Airspace .....	A-10
Available VFR Airspace .....	A-10
AIR TRAFFIC CONTROL.....	A-12
Air Traffic Control Facilities.....	A-12
Published Instrument Approaches.....	A-13
CURRENT AIRSPACE ISSUES .....	A-17
Stellar Airpark.....	A-17
Memorial Airfield.....	A-21
Stellar Airpark – Memorial Airfield .....	A-24
Williams Gateway Airport.....	A-27
FUTURE POTENTIAL AIRSPACE ISSUES.....	A-30
Memorial Airfield.....	A-30
Class B Airspace Redesign .....	A-32
SUMMARY .....	A-34

# *Chandler Municipal Airport/2007 Airport Master Plan Update*

## **APPENDIX B: ECONOMIC IMPACT OF AIRPORT INFRASTRUCTURE DEVELOPMENT**

INTRODUCTION.....	B-1
BACKGROUND .....	B-1
RELEVANT MASTER PLAN FINDINGS .....	B-2
ECONOMIC IMPACT ANALYSIS.....	B-4
Economic Impact at Comparable Airports .....	B-4
Economic Impact of Jet Aircraft Operations.....	B-5
Economic Impact of Corporate Flight Departments .....	B-7
Benefits.....	B-8
SUMMARY .....	B-9

## **APPENDIX C: AIRPORT LAYOUT PLAN DRAWINGS**

**LIST OF TABLES**

**CHAPTER ONE: INVENTORY**

Table 1.1 – HISTORIC AIRCRAFT ACTIVITY .....1-9  
Table 1.2 – HISTORIC BASED AIRCRAFT ..... 1-10  
Table 1.3 – EXISTING RUNWAY FACILITIES..... 1-13  
Table 1.4 – EXISTING AIRFIELD LIGHTING AND NAVAIDS ..... 1-15  
Table 1.5 – AIRCRAFT HANGAR STORAGE..... 1-18  
Table 1.6 – CURRENT INSTRUMENT APPROACHES..... 1-28  
Table 1.7 – HISTORIC REGIONAL POPULATION DATA ..... 1-37  
Table 1.8 – HISTORIC EMPLOYMENT DATA..... 1-38  
Table 1.9 – EMPLOYMENT BY INDUSTRY (2000) CHANDLER  
MUNICIPAL AIRPORT MARKET AREA ..... 1-38  
Table 1.10 – EMPLOYMENT BY INDUSTRY (1970-2000) MARICOPA  
COUNTY..... 1-39  
Table 1.11 – OTHER AREA AIRPORTS..... 1-40

**CHAPTER TWO: PROJECTIONS OF AVIATION DEMAND**

Table 2.1 – HISTORICAL POPULATION EMPLOYMENT AND  
EARNINGS DATA .....2-3  
Table 2.2 – TOP EMPLOYERS IN THE CITY OF CHANDLER .....2-4  
Table 2.3 – PROJECTED POPULATION EMPLOYMENT AND  
EARNINGS DATA .....2-5  
Table 2.4 – HISTORIC BASED AIRCRAFT .....2-6  
Table 2.5 – HISTORIC AIRCRAFT OPERATIONS.....2-7  
Table 2.6 – HISTORIC AND PROJECTED U.S. ACTIVE PILOTS BY  
TYPE OF CERTIFICATE..... 2-12  
Table 2.7 – HISTORIC AND PROJECTED U.S. ACTIVE GENERAL  
AVIATION FLEET MIX .....2-13  
Table 2.8 – ACTIVE GENERAL AVIATION AND AIR TAXI HOURS  
FLOWN .....2-14  
Table 2.9 – BASED AIRCRAFT PROJECTION FAA PROJECTED  
GROWTH IN ACTIVE GA AIRCRAFT METHODOLOGY .....2-16  
Table 2.10 – BASED AIRCRAFT PROJECTION REGRESSION  
METHODOLOGY .....2-17  
Table 2.11 – BASED AIRCRAFT PROJECTION TRENDLINE  
METHODOLOGY..... 2-18  
Table 2.12 – COMPARISON OF BASED AIRCRAFT PROJECTIONS.....2-19  
Table 2.13 – PROJECTED CHANGE IN U.S. ACTIVE GENERAL  
AVIATION FLEET MIX .....2-21  
Table 2.14 – PREFERRED BASED AIRCRAFT FLEET MIX PROJECTION.....2-22  
Table 2.15 – AVERAGE OPBA .....2-23

# ***Chandler Municipal Airport/2007 Airport Master Plan Update***

Table 2.16 – AIRCRAFT OPERATIONS PROJECTION OPBA METHODOLOGY .....	2-23
Table 2.17 – PROJECTED AIRCRAFT OPERATIONS MARKET SHARE OF FAA HOURS FLOWN METHODOLOGY .....	2-24
Table 2.18 – AIRCRAFT OPERATIONS PROJECTION PROPULATION GROWTH METHODOLOGY .....	2-25
Table 2.19 – COMPAIRSON OF AIRCRAFT OPERATIONS PROJECTIONS.....	2-26
Table 2.20 – HISTORIC LOCAL AND ITINERANT OPERATIONS.....	2-28
Table 2.21 – LOCAL AND ITINERANT OPERATION PROJECTIONS.....	2-29
Table 2.22 – AIRCRAFT CATEGORIES AND DESIGN GROUPS .....	2-29
Table 2.23 – PEAK ACTIVITY FORECAST .....	2-31
Table 2.24 – INSTRUMENT OPERATIONS FORECAST .....	2-33
Table 2.25 – SUMMARY OF PROJECTIONS.....	2-34

## **CHAPTER THREE: CAPACITY ANALYSIS AND FACILITY REQUIREMENTS**

Table 3.1 – AVIATION DEMAND CAPACITY ANALYSIS.....	3-5
Table 3.2 – AIRFIELD DELAY ANALYSIS .....	3-6
Table 3.3 – WIND COVERAGE .....	3-7
Table 3.4 – RUNWAY LENGTH REQUIREMENTS FOR AIRPORT DESIGN .....	3-9
Table 3.5 – PAVEMENT STRENGTHS.....	3-11
Table 3.6 – FAA DESIGN CRITERIA .....	3-15
Table 3.7 – EXISTING RUNWAY PROTECTION ZONES.....	3-17
Table 3.8 – AIRCRAFT HANGAR STORAGE REQUIREMENTS.....	3-21
Table 3.9 – GENERAL AVIATION TERMINAL BUILDING REQUIREMENTS.....	3-22
Table 3.10 – AUTOMOBILE PARKING REQUIREMENTS .....	3-23
Table 3.11 – FUEL STORAGE REQUIREMENTS.....	3-25

## **CHAPTER FOUR: DEVELOPMENT ALTERNATIVES**

Table 4.1 – COMMON SOUND LEVELS .....	4-20
Table 4.2 – RUNWAY UTILZATIONS .....	4-21

## **CHAPTER SIX: AIRPORT DEVELOPMENT SCHEDULE AND FINANCIAL ANALYSIS**

Table 6.1 – SUMMARY TABLE.....	6-6
Table 6.2 – PHASE I (0-5 Years) .....	6-7
Table 6.3 – PHASE II (6-10 Years) .....	6-7
Table 6.4 – PHASE III (11-20 Years) .....	6-7
Table 6.5 – ON-AIRPORT OPERATING REVENUES AND EXPENSES .....	6-12
Table 6.6 – PROJECTED ON-AIRPORT OPERATING REVENUES AND EXPENSES .....	6-13



# ***Chandler Municipal Airport/2007 Airport Master Plan Update***

## **APPENDIX A: AIRSPACE CONFLICTS ANALYSIS**

Table A.1 – INSTRUMENT APPROACH PROCEDURES .....	A-15
--	------

## **APPENDIX B: ECONOMIC IMPACT OF AIRPORT INFRASTRUCTURE DEVELOPMENT**

Table B.1 – CONSTRAINED JET OPERATIONS FORECAST.....	B-3
Table B.2 – AIRPLANES THAT MAKE UP 75% OF FLEET .....	B-3
Table B.3 – ECONOMIC IMPACT AND FACILITIES AT COMPARABLE AIRPORTS.....	B-5
Table B.4 – ECONOMIC IMPACT OF JET AIRCRAFT OPERATIONS .....	B-6
Table B.5 – 5,700-FOOT RUNWAY EXTENSION CHD CORPORATE FLIGHT DEPARTMENT ECONOMIC IMPACT .....	B-7
Table B.6 – TOTAL ANNUAL ECONOMIC IMPACT OF A 5,700-FOOT RUNWAY EXTENSION AND CHD CORPORATE FLIGHT DEPARTMENT.....	B-8

**LIST OF EXHIBITS**

**CHAPTER ONE: INVENTORY**

EXHIBIT 1.1 – National & Regional Location .....1-6  
EXHIBIT 1.2 – Airport Area .....1-7  
EXHIBIT 1.3 – Existing Airport Diagram.....1-12  
EXHIBIT 1.4 – Chandler Municipal Wind Coverage .....1-14  
EXHIBIT 1.5 – Regional Airspace .....1-29  
EXHIBIT 1.6 – U.S. Airspace Classifications.....1-33  
EXHIBIT 1.7 – Chandler Land Use Map.....1-35  
EXHIBIT 1.8 – Other Area Airports .....1-41

**CHAPTER TWO: PROJECTIONS OF AVIATION DEMAND**

EXHIBIT 2.1 – Business Use of General Aviation Turbine  
Aircraft .....2-10  
EXHIBIT 2.2 – Based Aircraft Projections .....2-20  
EXHIBIT 2.3 – Aircraft Operations Projections.....2-27  
EXHIBIT 2.4 – Aircraft Categories & Design Groups .....2-32

**CHAPTER THREE: CAPACITY ANALYSIS AND FACILITY REQUIREMENTS**

EXHIBIT 3.1 – Chandler Municipal Wind Coverage .....3-8  
EXHIBIT 3.2 – FAA Runway Protection Zones Design Standards .....3-18

**CHAPTER FOUR: DEVELOPMENT ALTERNATIVES**

EXHIBIT 4.1 – Runway Extension.....4-8  
EXHIBIT 4.2 – Taxiway Extension Full.....4-10  
EXHIBIT 4.3 – Taxiway Extension Partial .....4-11  
EXHIBIT 4.4 – MALSR System .....4-13  
EXHIBIT 4.5 – Apron Expansion .....4-15  
EXHIBIT 4.6 – Apron Expansion .....4-16  
EXHIBIT 4.7 – 2005 DNL Noise Contours.....4-22  
EXHIBIT 4.8 – 2025 DNL Noise Contours.....4-23  
EXHIBIT 4.9 – Recommended Landside Alternative.....4-28  
EXHIBIT 4.10 – Recommended Airside Alternative .....4-29

**CHAPTER FIVE: ENVIRONMENTAL OVERVIEW**

EXHIBIT 5.1 – 2025 DNL Noise Contours.....5-5

# ***Chandler Municipal Airport/2007 Airport Master Plan Update***

## **APPENDIX A: AIRSPACE CONFLICTS ANALYSIS**

EXHIBIT A.1 – Phoenix Area High IFR Routes .....	A-3
EXHIBIT A.2 – Regional Airspace .....	A-5
EXHIBIT A.3 – Chandler Municipal Airport Class D Airspace .....	A-7
EXHIBIT A.4 – Phoenix Area Low Altitude Routes.....	A-8
EXHIBIT A.5 – Class D and Class E Airspace .....	A-9
EXHIBIT A.6 – Phoenix Area Military Training Routes .....	A-11
EXHIBIT A.7 – Non-Precision Instrument Approach Procedure Chandler Municipal Airport .....	A-14
EXHIBIT A.8 – Instrument Approach Procedures .....	A-16
EXHIBIT A.9 – Traffic Pattern Airspace.....	A-18
EXHIBIT A.10 – Existing Potential Airspace Conflicts (CHD and P19) .....	A-19
EXHIBIT A.11 – Existing Potential Airspace Conflicts (CHD and P19) .....	A-20
EXHIBIT A.12 – Existing Potential Airspace Conflicts (CHD and 34AZ) .....	A-22
EXHIBIT A.13 – Existing Potential Airspace Conflicts (CHD and 34AZ) .....	A-23
EXHIBIT A.14 – Existing Potential Airspace Conflicts (34AZ and P19).....	A-25
EXHIBIT A.15 – Existing Potential Airspace Conflicts (34AZ and P19).....	A-26
EXHIBIT A.16 – Existing Potential Airspace Conflicts (CHD and IWA) .....	A-28
EXHIBIT A.17 – Existing Potential Airspace Conflicts (CHD and IWA) .....	A-29
EXHIBIT A.18 – Future Potential Airspace Conflicts (CHD and 34AZ).....	A-31
EXHIBIT A.19 – Proposed Phoenix Class B Airspace.....	A-33