



Cottonwood Municipal Airport

MASTER PLAN UPDATE

December 2022

TABLE OF CONTENTS

Chapter 1: Inventory of Existing Conditions.....	1-1
1.1. Chapter Introduction	1-1
1.2. Background and Local Setting.....	1-1
1.2.1. Ownership and Management.....	1-3
1.2.2. Airport History	1-3
1.2.3. Capital Improvements and Grant History.....	1-4
1.2.4. Regional Socioeconomic Data	1-4
1.3. Airport Role	1-6
1.3.1. National Plan of Integrated Airport Systems (NPIAS).....	1-6
1.3.2. Arizona State Aviation System Plan (SASP).....	1-7
1.4. Current Aviation Activity	1-7
1.4.1. Aircraft Operations	1-7
1.4.2. Based Aircraft.....	1-8
1.5. Airside Facilities	1-8
1.5.1. Airport Design Standards.....	1-10
1.5.2. Runway 14-32.....	1-11
1.5.3. Taxiways.....	1-14
1.5.4. Helicopter Operating Area.....	1-15
1.5.5. Nonstandard Conditions	1-15
1.5.6. Aircraft Hangars and Parking.....	1-16
1.5.7. Apron Areas.....	1-16
1.5.8. Airfield Pavement.....	1-18
1.5.9. Airfield Lighting	1-21
1.5.10. Navigational Aids	1-21
1.5.11. Meteorological Conditions	1-22
1.6. Airspace	1-26
1.6.1. Airspace Classifications	1-26
1.6.2. Standard Operating Procedures	1-30
1.6.3. Instrument Flight Procedures.....	1-30
1.7.1. Noise Abatement	1-31
1.8. Landside Facilities	1-31
1.8.1. Terminal Building.....	1-31
1.8.2. Flight Instruction	1-31
1.8.3. Cottonwood Airpark.....	1-32

1.9. Support Facilities	1-32
1.9.1. Fuel Facilities	1-32
1.9.2. Wash Rack	1-33
1.9.3. Airport Maintenance	1-33
1.9.4. Aircraft Rescue and Firefighting.....	1-33
1.9.5. Airport Emergency Plan.....	1-33
1.9.6. Airport Fencing and Security.....	1-33
1.9.7. Utility Infrastructure	1-34
1.10. Land Use and Zoning.....	1-34
1.10.1. Existing Land Use.....	1-34
1.10.2. Zoning.....	1-37
1.10.3. Land Use Planning.....	1-39
1.11. Surface Transportation	1-39
1.11.1. Major and Regional Roadways	1-41
1.11.2. Local and Airport Access Roadways	1-41
1.11.3. Transportation Planning	1-42
1.11.4. Airfield Circulation and Automobile Parking	1-44
1.12. Environmental Overview	1-44
1.12.1. Air Quality.....	1-44
1.12.2. Endangered and Threatened Species	1-45
1.12.3. Water Resources	1-47
1.12.4. Noise Exposure.....	1-50
1.12.5. Department of Transportation Act, Section 4(f).....	1-52
1.12.6. Hazardous Materials.....	1-52
1.12.7. Historic, Cultural, and Archeological Resources.....	1-54
Chapter 2: Aviation Forecast.....	2-1
2.1. COVID-19 Preface	2-1
2.1.1. General Aviation Demand	2-1
2.1.2. Expired Pilot Licenses and Certificates.....	2-2
2.1.3. Business Jet Aircraft	2-2
2.1.4. CARES Act	2-2
2.1.5. Future Outbreaks	2-3
2.2. Chapter Introduction	2-4
2.3. Trends and Factors that Impact Aviation Demand	2-4
2.4. Historical Activity.....	2-6
2.5. Forecasting Assumptions.....	2-8

2.6. Socioeconomic Forecasts	2-8
2.7. Based Aircraft Forecasts	2-9
2.7.1. Based Aircraft – Socioeconomic Variable Forecast	2-9
2.7.2. Based Aircraft – Regional Market Share Forecast.....	2-10
2.7.3. Based Aircraft – Recommended Forecast.....	2-12
2.7.4. Based Aircraft – Fleet Mix Forecast.....	2-14
2.8. General Aviation Operations Forecasts.....	2-15
2.8.1. GA Operations – Socioeconomic Variable Forecast.....	2-15
2.8.2. GA Operations – Regional Market Share Forecast	2-16
2.8.3. GA Operations – FAA Aerospace Forecast Fleet Mix.....	2-17
2.8.4. GA Operations – Operations per Based Aircraft Forecast.....	2-19
2.8.5. GA Operations – Recommended Forecast.....	2-20
2.9. Operations Types Forecasts.....	2-22
2.9.1. Military Operations Forecast.....	2-22
2.9.2. Local/Itinerant Operations Forecast.....	2-22
2.9.3. Daytime/Evening Operations Forecast	2-23
2.9.4. Instrument Operations Forecast	2-23
2.9.5. Touch-and-Go Operations Forecast	2-24
2.10. Peak Operations Forecasts.....	2-25
2.11. Critical Aircraft	2-26
2.11.1. Existing ARC and Critical Aircraft	2-27
2.11.2. Future ARC and Critical Aircraft	2-27
2.12. Forecast Summary.....	2-29
2.13. FAA Forecast Review and Approval.....	2-30
Chapter 3: Facility Requirements.....	3-1
3.1. Chapter Introduction	3-1
3.2. Airfield Demand and Capacity.....	3-2
3.2.1. Airfield Capacity	3-2
3.2.2. Airfield Capacity Analysis	3-5
3.2.3. Aircraft Delay.....	3-7
3.2.4. Airfield Demand-Capacity Summary	3-8
3.3. FAA Design Standards.....	3-8
3.3.1. Airport Reference Code.....	3-8
3.3.2. Runway Design Code and Design Standards.....	3-9
3.3.3. Taxiway Design Group and Design Standards	3-12
3.4. Airside Facilities	3-12

3.4.1. Runway Requirements.....	3-12
3.4.2. Taxiway Requirements.....	3-21
3.4.3. Lighting and NAVAID Requirements.....	3-24
3.4.4. Helicopter Operating Areas.....	3-25
3.4.5. Airfield Pavement.....	3-25
3.4.6. Airfield Drainage.....	3-25
3.5. Airspace Requirements.....	3-26
3.5.1. Part 77 Requirements.....	3-26
3.5.2. Terminal Instrument Procedures	3-30
3.6. Landside Requirements.....	3-34
3.6.1. Aircraft Storage Hangar and Parking Apron Requirements	3-34
3.6.2. Surface Transportation	3-38
3.7. Support Facilities	3-39
3.7.1. FBO Facilities	3-39
3.7.2. Aircraft Fueling Facilities.....	3-39
3.7.3. Airport Maintenance	3-40
3.7.4. Utility Infrastructure	3-40
3.7.5. Airfield Fencing and Security.....	3-40
3.7.6. Terminal/Administration Building.....	3-40
3.8. Summary of Facility Requirements.....	3-41
Chapter 4: Alternatives.....	4-1
4.1. Chapter Introduction	4-1
4.2. Summary of Facility Requirements.....	4-1
4.3. Evaluation Criteria.....	4-3
4.4. No-Development Alternatives	4-4
4.4.1. No-Build Alternative	4-4
4.4.2. Relocation or Transfer of Aviation Activities.....	4-4
4.4.3. Construction of New Airport.....	4-4
4.5. No-Analysis Alternatives.....	4-6
4.6. Runway 14-32 Alternatives.....	4-7
4.7. Aircraft Apron and Support Facilities Alternatives	4-21
4.7.1. Apron Configuration	4-21
4.7.2. Fuel Tanks.....	4-24
4.7.3. Helicopter Parking Area	4-29
4.7.4. T-Shade.....	4-32
4.8. Hangar Development Alternatives	4-37

4.9. Recommended Development Plan	4-48
4.10. On-Airport Land Use.....	4-50
Chapter 5: Implementation Plan and Financial Analysis.....	5-1
5.1. Chapter Introduction	5-1
5.2. Recommended Development Plan	5-1
5.2.1. Near Term Projects (0 - 5 Years).....	5-1
5.2.2. Mid Term Projects (6 – 10 Years)	5-2
5.2.3. Long Term Projects (11 – 20 Years)	5-2
5.3. Environmental Considerations.....	5-3
5.4. Funding Plan	5-4
5.4.1. Assumptions	5-4
5.4.2. Funding Sources	5-5
5.4.3. Capital Improvement Program.....	5-7
5.5. Financial Feasibility Analysis.....	5-10
5.5.1. Airport Revenues.....	5-10
5.5.2. Airport Expenditures.....	5-10
5.5.3. Cash Flow Analysis.....	5-11
5.5.4. Recommendations.....	5-16

LIST OF FIGURES

Figure 1.1 - Map of Airport Vicinity	1-2
Figure 1.2 - Existing Airport Facilities (2020)	1-9
Figure 1.3 - Airport Aprons, Tie-Downs, and Hangar Facilities	1-17
Figure 1.4 - Pavement Condition Index (2017)	1-19
Figure 1.5 - Forecast Pavement Condition Index (2020)	1-20
Figure 1.6 - Wind Roses (10.5-knot wind coverage; True runway headings of 155°, 335°)	1-25
Figure 1.7 - Classifications of Airspace	1-26
Figure 1.8 - VFR Sectional Aeronautical Chart	1-29
Figure 1.9 - Existing Land Use Map	1-36
Figure 1.10 - Zoning Map (City of Cottonwood, Town of Clarkdale, Unincorporated Yavapai County)	1-38
Figure 1.11 - Regional and Local Roadways	1-40
Figure 1.12 - Federal Wetlands near the Airport	1-49
Figure 1.13 - 2019 Noise Contour Map	1-51
Figure 2.1 - Based Aircraft – Forecast Summary and Recommended Forecast	2-13
Figure 2.2 - GA Operations – Forecast Summary and Recommended Forecast	2-21
Figure 3.1 - Runway 32 RNAV (GPS) Approach	3-10
Figure 3.2 - Runway Length Analysis	3-14
Figure 3.3 - Part 77 Imaginary Surfaces Diagram	3-28
Figure 3.4 - Part 77 Imaginary Surfaces and Obstructions	3-29
Figure 3.5 - Departure Obstacle Clearance Surfaces and Obstructions	3-31
Figure 3.6 - Obstacle Clearance Surfaces and Obstructions	3-33
Figure 4.1 - Runway Alternative 1: Base Alternative	4-9
Figure 4.2 - Runway Alternative 2: Northern Extension	4-11
Figure 4.3 - Runway Alternative 3: Southern Extension	4-13
Figure 4.4 - Runway Alternative 4: Southern Extension with Declared Distances	4-16
Figure 4.5 - Runway Alternative 5: Maximum Build-Out with No Impacts to Mingus Avenue or Wash	4-19
Figure 4.6 - Aircraft Parking Apron Existing Configuration	4-22
Figure 4.7 - Aircraft Parking Apron Base Configuration	4-23
Figure 4.8 - Fuel Tank Alternative 1a	4-25
Figure 4.9 - Fuel Tank Alternative 1b	4-26
Figure 4.10 - Fuel Tank Alternative 2	4-27
Figure 4.11 - Helicopter Parking Area Alternative 1	4-30
Figure 4.12 - Helicopter Parking Area Alternative 2	4-31
Figure 4.13 - T-Shade Alternative 1	4-34

Figure 4.14 - T-Shade Alternative 2.....	4-35
Figure 4.15 - Hangar Development Alternative 1.....	4-39
Figure 4.16 - Hangar Development Alternative 2.....	4-41
Figure 4.17 - Hangar Development Alternative 3.....	4-43
Figure 4.18 - Hangar Development Alternative 4.....	4-45
Figure 4.19 - Hangar Development Alternative 5.....	4-47
Figure 4.20 - Recommended Development Plan	4-49
Figure 4.21 - Future On-Airport Land Use.....	4-51

LIST OF TABLES

Table 1.1 - Airport Grant History.....	1-4
Table 1.2 - Historical and Forecast Socioeconomic Data	1-5
Table 1.3 - Aircraft Approach Categories.....	1-10
Table 1.4 - Airplane Design Groups.....	1-10
Table 1.5 - Runway Visual Range	1-11
Table 1.6 - Summary of Existing Runway Characteristics and Design Standards (2020)	1-13
Table 1.7 - Airport Taxiways.....	1-14
Table 1.8 - Taxiway Design Standards (2020)	1-15
Table 1.9 - Summary of Nonstandard Conditions	1-16
Table 1.10 - 2019-2024 Unlimited Budget APPP at Cottonwood Municipal Airport.....	1-21
Table 1.11 - Crosswind Components	1-23
Table 1.12 - Runway 14-32 Crosswind Coverage	1-24
Table 1.13 - Classifications of Airspace	1-27
Table 1.14 - Main Apron Fuel Facility Sales	1-32
Table 1.15 - Verde Valley Master Transportation Plan Projects near Cottonwood Municipal Airport	1-43
Table 1.16 - Endangered, Threatened, and Birds of Concern Species within the Airport's Environs	1-46
Table 1.17 - City of Cottonwood Properties and Districts Listed on the National Register of Hist. Places...1-54	
Table 2.1 - Historical Based Aircraft.....	2-7
Table 2.2 - Historical General Aviation Operations.....	2-7
Table 2.3 - Based Aircraft: Socioeconomic Variable Forecast.....	2-10
Table 2.4 - Based Aircraft: Historical Market Share	2-11
Table 2.5 - Based Aircraft: Regional Market Share Forecast	2-12
Table 2.6 - Based Aircraft: Fleet Mix Forecast.....	2-14
Table 2.7 - GA Operations: Socioeconomic Variable Forecast	2-15
Table 2.8 - GA Operations: Historical Market Share.....	2-16
Table 2.9 - GA Operations: Regional Market Share Forecast.....	2-17
Table 2.10 - GA Operations: FAA Aerospace Fleet Mix	2-19
Table 2.11 - GA Operations: Operations per Based Aircraft Forecast	2-19
Table 2.12 - Local/Itinerant Operations Forecast	2-22
Table 2.13 - Daytime/Evening Operations Forecast	2-23
Table 2.14 - Instrument Operations Forecast	2-24
Table 2.15 - Touch-and-Go Operations Forecast.....	2-24
Table 2.16 - Peak Operations Forecast.....	2-25
Table 2.17 - Aircraft Approach Categories	2-26

Table 2.18 - Airplane Design Groups.....	2-26
Table 2.19 - Critical Aircraft: Operations by Aircraft Approach Category / Airplane Design Group	2-28
Table 2.20 - Critical Aircraft: Operations by Aircraft Type.....	2-28
Table 2.21 - Critical Aircraft: Future Critical Aircraft Characteristics.....	2-29
Table 2.22 - Aviation Activity Forecast Summary	2-29
Table 2.23 - FAA Template for Comparing Airport Planning and TAF Forecasts	2-31
Table 2.24 - Template for Summarizing and Documenting Airport Planning Forecasts	2-32
Table 3.1 - Forecast Summary	3-1
Table 3.2 - Aircraft Fleet Mix Demand-Capacity Analysis	3-5
Table 3.3 - Airfield Capacity Summary	3-6
Table 3.4 - Annual Service Volume and Aircraft Delay	3-7
Table 3.5 - Annual Service Volume, Capacity, and Annual Aircraft Delay	3-7
Table 3.6 - Runway Visual Range	3-9
Table 3.7 - FAA Runway Design and Separation Standards.....	3-11
Table 3.8 - Runway 14-32 Wind Analysis (10.5-knot Crosswind Component).....	3-17
Table 3.9 - RPZ Land Use Compatibility	3-20
Table 3.10 - Storage Space Requirements by Aircraft Type (Square Feet).....	3-34
Table 3.11 - Number of Based and Itinerant Aircraft Requiring Storage	3-35
Table 3.12 - Based and Itinerant Aircraft Storage Requirements.....	3-37
Table 3.13 - Vehicle Parking Requirements.....	3-39
Table 3.14 - Facility Requirements Summary	3-41
Table 4.1 - Summary of Facility Requirements	4-2
Table 4.2 - Runway Alternative 4 Declared Distances	4-14
Table 4.3 - Runway Alternative 5 Declared Distances	4-17
Table 4.4 - Evaluation of Runway Alternatives.....	4-20
Table 4.5 - Evaluation of Fuel Tank Alternatives.....	4-28
Table 4.6 - Evaluation of Helicopter Parking Area Alternatives.....	4-32
Table 4.7 - Evaluation of T-Shade Alternatives.....	4-36
Table 4.8 - Evaluation of Hangar Development Alternatives.....	4-48
Table 4.9 - Airport Land Use Categories.....	4-50
Table 5.1 - Project NEPA Documentation Requirements	5-4
Table 5.2 - 10-Year Airport Capital Improvement Program	5-8
Table 5.3 - Cash Flow Analysis Assumptions.....	5-12
Table 5.4 - 10-Year Airport Cash Flow Analysis.....	5-14
Table 5.5 - 10-Year Airport Cash Flow Analysis with Local Grant Requirements	5-15