



Chapter

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**CONCLUSIONS AND  
RECOMMENDATIONS**

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# CONCLUSIONS AND RECOMMENDATIONS

*for Airport Master Plan  
at Grand Canyon West Airport*

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## 1.0 INTRODUCTION

The Hualapai Indian Tribe, as the Airport Sponsor, is continuing its effort to plan for future development of the Grand Canyon West Airport. This development is designed to enhance air and ground operations, improve safety, provide better airport services, and stimulate economic development through increased tourism at the Grand Canyon West site.

## 1.1 PURPOSE AND NEED

The Airport Master Plan is the culmination of a decision making process in which the Airport Sponsor, with input from the community, Local, State, and Federal agencies, and the consultant, determines the needs and priorities for the long term development of the airport. The Master Plan provides a conceptual picture of the airport development through the use of the Airport Layout Plan drawing set. Airport Master Plans are prepared to support modernization of existing airports, regardless of size, complexity, or role.

This airport planning document for the Grand Canyon West Airport was developed with this purpose in mind. The Grand Canyon West Airport is a general aviation facility serving as a destination point for tourists visiting the South Rim of the Grand Canyon, and is an important revenue source for the Hualapai Tribe. The demands being placed on the airport are creating a need for a safer and more efficient facility for its users. The most pressing need for the airport is to pave the existing runway surface and eliminate potential damage to aircraft operating at the airport. The second most pressing need is to develop a facility, either at the existing location or an alternate location, that meets FAA Safety and Design Standards and with sufficient runway length to accommodate the forecasted fleet mix of aircraft. A future runway length of 6,700 feet and an ultimate runway length of 10,000 feet at either the existing site or an alternate site would be required to meet this need.

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The airport does not currently have any based aircraft. Aircraft operations at Grand Canyon West Airport consist primarily of single and multi-engine piston and turboprop aircraft weighing less than 12,500 pounds. Examples of these aircraft include the Cessna 206, Cessna 207, Cessna 208, and DeHavilland DHC-6 Twin Otter. Helicopter operations include the AS 350 BA.

The existing runway surface is an unimproved dirt airstrip which consists of hard packed dirt intermixed with loose dime to quarter sized stones and gravel. The runway surface presents a damage risk to all but the most rugged aircraft. The poor runway condition has resulted in damage to aircraft; including propeller nicks, dings, and scratches to aircraft fuselages; and excessive wear to aerodynamic leading edges. As a result, several air tour operators have discontinued service to the Grand Canyon West Airport. Upon the paving of the runway and aircraft parking apron, these operators are expected to return along with several new air tour operators, resulting in a significant increase in air traffic.

## 1.2 GOALS AND OBJECTIVES

The overall objective of this airport planning document was to evaluate alternatives for the ultimate development of the airport and to assess the compatibility of such development with the environment and the goals of the Hualapai Tribe. Specific objectives of this study were defined as follows:

- ➔ An inventory of existing air operations and facilities.
- ➔ A forecast of aviation demand based on socioeconomic and population information and available historical air traffic data.
- ➔ Determine current types of aircraft which use the Grand Canyon West Airport and from there, determine whether or not the current facilities are adequate for this traffic.
- ➔ Requirements for new or expanded airport facilities, such as runway extensions, taxiways, aircraft parking aprons, hangars, lighting systems, navigational aids, ground access, and overall land needs to assure airport expansion as needed and future long-term land use compatibility. These facilities were also examined in terms of meeting FAA design criteria.
- ➔ An alternative analysis of new facilities and/or reconfiguration of existing facilities that will be required, and a proposed development schedule, including cost estimates.
- ➔ Preparation of a new Airport Layout Plan Drawing Set.

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### 1.3 FORECASTS

Numerous sources of information including area and regional socioeconomic characteristics, the Grand Canyon West (Resort) Master Plan, and Airport User Surveys led to the development of forecast scenarios which reflect potential aviation growth at the airport. The selected planning forecasts project approximately 55,000 total annual aircraft operations by the year 2015 at the Grand Canyon West Airport based on unconstrained airport development to meet the facility requirements for these aircraft.

Estimates of aircraft fleet mix were also developed to aid in determining the airport's existing and future Airport Reference Code (ARC) and facility requirements. The Airport Reference Code is a system used to relate airport design criteria to the operational and physical characteristics of the aircraft intended to operate at the airport. The ARC has two components. The first component is depicted by a letter and relates to aircraft approach speed. The second component is depicted by a Roman numeral and relates to the aircraft wingspan. The existing ARC is a B-I with aircraft less than 12,500 pounds based on the critical aircraft currently using the airport (Cessna 402). The future design aircraft for an airport to serve the Grand Canyon West area are those aircraft which have an ARC of C-III weighing less than 60,000 pounds, and the ultimate design aircraft are those with an ARC of C-III weighing more than 60,000 pounds. The forecasted ARC is based on unconstrained airport improvements to accommodate larger aircraft. The size of future and ultimate aircraft using Grand Canyon West Airport will actually be determined by the facilities available to support them. The short-term design aircraft are those aircraft with an ARC of A-II weighing less than 12,500 pounds, based on increased operations by Cessna 208 Caravan aircraft pursuant to the paving of the airfield surfaces.

### 1.4 FACILITY REQUIREMENTS

By using FAA criteria and various other airport planning formulas, Armstrong Consultants has developed numerous recommendations to meet the forecasted aviation demand at Grand Canyon West Airport. For example, the existing length of Runway 17/35 is 5,200 feet. This runway length is sufficient for the aircraft that currently use the airport. Future and ultimate recommended runway lengths are 6,700 and 10,000 feet respectively to accommodate the forecasted design aircraft. It should be noted; however, that the sponsor has selected not to expand the airport at its existing location. Development constraints imposed around the existing airport limit the ability to meet the recommended runway length. Proposed improvements to the existing site include the paving of the existing runway and apron surfaces. Other recommendations include relocating a 1,000 foot portion of Buck and Doe Road to meet Runway Safety Area (RSA) criteria, and construction of a turn around taxiway at each runway end to enhance the efficiency of aircraft operations.

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## 1.5 DEVELOPMENT ALTERNATIVES

Alternatives for development of the existing site are presented in Chapter VI, as well as options for minimum short term improvement to the existing site and the study of alternative sites for long term development. These alternatives were discussed in Airport Technical Advisory Committee (ATAC) and Tribal Interdisciplinary Team (IDT) meetings. Based on these discussions, the Tribal Council selected to accomplish the temporary paving (to meet the 5 year demand level) of the existing runway and apron to provide a suitable runway surface for aircraft operations and increase tourism revenues. Concern was raised within the Tribal Committees over the long term development goals of the airport and the proposed resort complex at the existing site. Rather than commit to long term development at the existing site, the Tribe selected to accomplish the minimum paving necessary at the existing location without FAA funding, and to concurrently accomplish a Site Selection Study to evaluate alternative sites for long term airport development.

## 1.6 SUMMARY AND RECOMMENDATIONS

The Airport Master Plan has examined the existing conditions, short term development needs, and long term development needs for an airport to serve the Grand Canyon West area. A detailed Airport Layout Plan drawing set has been prepared depicting the preferred development projects selected by the Airport Sponsor. The improvements depicted in the plan identify projects for implementation which will allow the airport to serve its users both safely and efficiently in its anticipated role.

Several specific recommendations are made throughout the text of the Master Plan which address, in detail, the individual aspects of the airport's development. Equally important, however, are those recommendations which address the operation and management of the facility which is believed to have strong growth potential over the next twenty years. The following recommendations pertain to the more general aspects of the airport's management and development:

- The two most important factors influencing the sponsor's decision to carry out recommendations of the Airport Master Plan are timing and airport activity. Both of these factors can be used as references in plan implementation. While it is necessary for scheduling and budgeting purposes to focus on the timing of airport development, the actual need for facilities is in fact established by levels of activity. Proper Master Plan implementation suggests the use of airport activity rather than time as guidance in development and scheduling.
- It is recommended that the Hualapai Tribe continue to operate and maintain the airport on a day-to-day basis in accordance with federal regulations and standards. Operational maintenance would include but would not necessarily be limited to, periodic inspections of pavement, control of natural growth and obstructions to air navigation, maintenance of pavement markings and surfaces, and implementation and control of a storm water pollution prevention plan.

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- The Hualapai Tribe should review all proposed construction projects near the airport environs to assure that no structures are built which would violate Federal Aviation Regulation Part 77, "Obstructions Affecting Navigable Airspace", and also maintain the area so that no structures, terrain, or vegetation in the area is penetrating these surfaces.
  - The Hualapai Tribe should designate the appropriate airport property boundaries to protect the existing and future Runway Protection Zones, Safety Areas, and Object Free Areas.
  - The Hualapai Tribe should accomplish airport improvement projects which are in accordance with FAA Safety and Design Standards.
  - The Hualapai Tribe should strive to develop an airport facility which meets the ultimate facility recommendations, at either the existing or an alternate site, in order to accommodate the ultimate design aircraft and maximize the potential revenues generated through increased visitors to the Grand Canyon West site.