CHAPTER TWO
PURPOSE AND NEED

This chapter of the Environmental Impact Statement (EIS) describes the purpose and need for the proposed improvements at Gnoss Field Airport (DVO or Airport) and identifies Federal Aviation Administration (FAA) regulations and policies for aviation safety and the potential Federal approvals that would be required for the proposed project to be implemented. FAA Order 5050.4B, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions requires that an EIS fully address and convey the purpose and need for a proposed project. According to the Council on Environmental Quality (CEQ) and their implementing regulations for NEPA, the purpose and need shall briefly specify the underlying purpose and need. In this EIS, the FAA considers the reasonable alternatives that meet the purpose and need of DVO and Marin County. The purpose and need for the proposed improvements serves as the foundation for the identification of reasonable alternatives to the Proposed Project and the comparative evaluation of impacts of development. In order for an alternative to be considered viable and carried forward for detailed evaluation within the NEPA process and this EIS, it must address the needs, as described more fully in the following sections.

The Airport is located in unincorporated Marin County north of the City of Novato, California and serves as an essential regional transportation resource by providing general aviation facilities in the northern portion of the San Francisco Bay area. People choose to use DVO for three primary purposes – flight training, recreation, and business travel. DVO has been defined by the FAA as a reliever airport in the Bay area and served approximately 85,500 arrivals and departures in 2008.\(^1\) A reliever airport is a high-capacity general aviation airport in a major metropolitan area.\(^2\) The FAA defines “capacity” as the “throughput rate” of an airport, i.e., the maximum number of aircraft operations that can take place in an hour.\(^3\)

Reliever airports provide pilots with attractive alternatives to using congested hub airports. They also provide general aviation access to the surrounding area. To be eligible for reliever designation, these airports must be open to the public, have 100 or more based aircraft, or have 25,000 annual itinerant operations. The 268 reliever airports have an average of 184 based aircraft, which in total represents 22 percent of the Nation’s general aviation fleet.

The reliever program, which was established in 1962, has evolved over the years. Currently, many of the airports designated as relievers serve their own economic and operational role. DVO and other general aviation airports in the San Francisco Bay area designated as reliever airports serve to reduce congestion at San

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\(^1\) Appendix C, Aviation Activity Forecast.
\(^3\) FAA Advisory Circular 150/5060-5 Airport Capacity and Delay, September 23, 1983, page 1, paragraph 3.
Francisco International Airport, Oakland International Airport, and San Jose International Airport. Therefore, the FAA has encouraged the development, maintenance, and expansion of general aviation airports in major metropolitan areas.

## 2.1 PURPOSE AND NEED FOR IMPROVEMENTS

The following sections present the Sponsor's and FAA's purpose and need.

### 2.1.1 SPONSOR’S PURPOSE AND NEED

Gnoss Field Airport is designed to accommodate aircraft with a wingspan of 49 feet or less, and an approach speed of 91 to 121 knots (FAA Airport Reference Code B-1). Examples of different sizes of aircraft by Airport Reference Code are shown in Table 2-1.

Marin County has prepared several evaluations of the Airport’s operations and facilities, including the 1989 Airport Master Plan\(^4\), the 1997 Update of the Airport Master Plan\(^5\), the 2002 Preliminary Design Report for the proposed runway extension\(^6\), and the evaluations leading up to the preparation of this EIS\(^7\). These studies identified the limitations regarding the Airport’s ability to accommodate existing aircraft and aviation users for which the Airport was designed. Specifically, the Airport cannot fully accommodate existing aviation activity, as represented by the critical aircraft, the Cessna 525, an Airport Reference Code B-1 business jet\(^8\) that regularly uses the Airport, under hot weather and other adverse weather conditions.\(^9\)

The existing runway at DVO is 3,300 feet long and as a result cannot fully accommodate the operations of the critical aircraft. Therefore, the purpose of the Sponsor's Proposed Project is to:

*allow existing aircraft, as represented by the critical aircraft at DVO, to operate at Maximum Gross Take Off Weight under hot weather and other adverse weather conditions.*

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\(^4\) Airport Master Plan Marin County Airport Gnoss Field, 1989.

\(^5\) Marin County Aviation Commission Resolution No. 97-1: A Resolution Adopting Chapter 6.0 – Airport Development Program Update 1997 – Marin County Airport Master Plan (Gnoss Field) and Recommendation of Approval of Chapter 6.0 1997 Update to the Marin County Board of Supervisors, February 5, 1997.


\(^7\) Landrum & Brown, Gnoss Field Airport Runway Length Analysis, 2008 & 2013. (Appendix D of this EIS).

\(^8\) The critical aircraft for DVO is the Cessna 525 business jet, also known as the Cessna Citation 525 or Citation CJ1+. See Appendix D, Attachment 1, Basis for Determination of the Critical Aircraft for DVO, and the remainder of Chapter Two for details regarding the how the critical aircraft was determined.

\(^9\) For the purpose of this EIS, hot weather is defined as the mean daily maximum temperature of the hottest month at the Airport (FAA A/C 150/5325-4B paragraph 506) and adverse weather conditions include wet runways, icy runways, and crosswinds.
**Table 2-1**
AIRPORT REFERENCE CODES FOR AIRCRAFT TYPICALLY OPERATING AT GNOSS FIELD AIRPORT

<table>
<thead>
<tr>
<th>AIRPORT REFERENCE CODE¹</th>
<th>AIRCRAFT CHARACTERISTICS</th>
<th>EXAMPLE AIRCRAFT TYPE</th>
</tr>
</thead>
</table>
| A-I                     | **Approach Speed:** Less than 91 knots  
                         | **Wingspan:** Less than 49 feet       | Cessna 172              |
| B-I                     | **Approach Speed:** 91 knots or greater, but less than 121 knots  
                         | **Wingspan:** Less than 49 feet       | Cessna 525 (critical aircraft)² |
| B-II                    | **Approach Speed:** 91 knots or greater, but less than 121 knots  
                         | **Wingspan:** 49 feet or greater, but less than 79 feet | Beechcraft Super King Air 200 |

¹ Source: FAA Advisory Circular 150/5300-13A "Airport Design"
² Cessna 525 is the critical aircraft for DVO.

### 2.1.2 FAA PURPOSE AND NEED

The FAA's statutory mission is to ensure the safe and efficient use of navigable airspace in the U.S. as set forth under 49 USC § 47101 (a)(1). The FAA must ensure that the proposed action does not derogate the safety of aircraft and airport operations at DVO. Moreover, it is the policy of the FAA under 49 USC § 47101(a)(6) that airport development projects provide for the protection and enhancement of natural resources and the quality of the environment of the United States.
2.1.3 INSUFFICIENT RUNWAY LENGTH

FAA Order 5090.3C Field Formulation of the National Plan of Integrated Airport Systems (NPIAS)\(^{10}\) identifies that airport dimensional standards such as runway length and width, separation standards (distances) between runways and taxiways, surface gradients, and similar dimensions should be appropriate for the “critical aircraft” that will make “substantial use” of the airport in the planning period for improvements.

An aircraft is called the “critical aircraft” because it is the most “demanding” aircraft in terms of the physical dimensions of the airport such as the length and width of the runways and taxiways, and separation distance between runways and taxiways required for that aircraft to operate at the airport. “Substantial use” of a general aviation airport is defined as 500 or more annual itinerant operations (i.e., 500 arrivals and/or departures from the airport). The FAA uses the requirements of an airport’s critical aircraft as a basis for determining when new aviation development is justified. This type of evaluation is consistently applied across the aviation industry and is the recognized approach for determining the needs of an airport. For DVO, the critical aircraft was determined to be the Cessna 525 business jet. See Appendix D, Attachment 1, Basis for Determination of the Critical Aircraft for DVO, for more information regarding the designation of the Cessna 525 as the critical aircraft for DVO.

The Marin County Aviation Commission Resolution No. 97-1: A Resolution Adopting Chapter 6.0 Airport Development Program Update 1997\(^{11}\) identified a runway extension as a part of DVO’s future development program and a proposed runway length was developed as part of the 2002 Preliminary Design Report\(^{12}\). During the preparation of this EIS FAA Advisory Circular (AC) 150/5325-4B Runway Length Requirements for Airport Design, was used to verify an appropriate length for Runway 13/31 at DVO. FAA AC 150/5325-4B, Paragraph 202, Design Approach, provides the acceptable methods to determine a recommended runway length. For this EIS, the airport planning manual (APM) for the critical aircraft, the Cessna 525, was used to verify the necessary runway length. A summary of the procedure used to verify the necessary runway length for the runway at DVO to accommodate the Cessna 525 under hot weather and other adverse weather conditions is shown in Table 2-2 in this chapter and described in detail in Appendix D, Runway Length Analysis.

Based on the runway length analysis described above, the need at DVO is to address insufficient runway length that precludes the critical aircraft from operating at maximum gross take off weight under hot weather and other adverse weather conditions.

\(^{10}\) FAA Order 5090.3C Field Formulation of the National Plan of Integrated Airport Systems (NPIAS) 3-4 Airport Dimensional Standards. December 4, 2000.

\(^{11}\) Marin County Aviation Commission Resolution No. 97-1: A Resolution Adopting Chapter 6.0 – Airport Development Program Update 1997 – Marin County Airport Master Plan (Gnoss Field) and Recommendation of Approval of Chapter 6.0 1997 Update to the Marin County Board of Supervisors, February 5, 1997.

### Table 2-2
**SUMMARY OF RUNWAY LENGTH DETERMINATION FOR DVO USING AN AIRPORT PLANNING MANUAL (APM) FOR CESSNA 525**

Gnoss Field Airport

<table>
<thead>
<tr>
<th>VARIABLE FACTORS</th>
<th>AIRPLANE PERFORMANCE CHARACTERISTICS TURBOJET (UTILIZING AIRPLANE MANUFACTURER’S AIRPLANE FLIGHT MANUALS (APM)) CHAPTER 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airplane Type</td>
<td>Cessna 525ii</td>
</tr>
<tr>
<td>Flap Setting</td>
<td>15° Flaps for Takeoff performance, “Land” for Landing performance</td>
</tr>
<tr>
<td>Operating Weights</td>
<td>Takeoff</td>
</tr>
<tr>
<td></td>
<td>Landing</td>
</tr>
<tr>
<td>Airport Elevation</td>
<td>Sea Level</td>
</tr>
<tr>
<td>Temperature</td>
<td>Takeoff</td>
</tr>
<tr>
<td></td>
<td>Landing</td>
</tr>
<tr>
<td>Wind</td>
<td>Takeoff</td>
</tr>
<tr>
<td></td>
<td>Landing</td>
</tr>
<tr>
<td>Runway Surface Conditions</td>
<td>Takeoff</td>
</tr>
<tr>
<td></td>
<td>Landing</td>
</tr>
<tr>
<td>Difference in Centerline Elevation</td>
<td>Takeoff</td>
</tr>
<tr>
<td></td>
<td>Landing</td>
</tr>
<tr>
<td>Runway Length for Takeoff</td>
<td>4,400 ft. (rounded from 4,390 ft.)</td>
</tr>
<tr>
<td>Runway Length for Landing</td>
<td>3,100 ft. (rounded from 3,093 ft.)</td>
</tr>
</tbody>
</table>

**Table Notes:**

i. FAA Approved Airplane Flight Manual Citation CJ1+ Model 525, Cessna Aircraft Company, Revision 3 March 27, 2012 was the APM used to obtain the identified values.

ii. Cessna 525 was identified as the critical aircraft based on the number of annual operations estimated to exceed 500 and the runway length requirements of the aircraft exceeding those of the other aircraft operating at DVO.

iii. Maximum Takeoff Weight (MTOW) was selected for this analysis because it is typical to use MTOW for general aviation airports where destinations are not readily available and can change dependent upon the specific requirements of individual passengers. In addition, an analysis of radar data for DVO found that typical destinations for the Cessna 525 and other business jets operating from DVO were at a distance where MTOW would be the selected weight if a payload analysis were conducted.

iv. The mean daily maximum temperature of the hottest month for DVO is 82° F. The Cessna 525 Airplane Flight Manual does not identify a runway length for 82° F. Therefore, the closest/higher temperature available (86° F) was used to ensure that the runway length analysis did not underestimate runway length. This methodology was confirmed through a telephone conversation between Landrum and Brown and a Sr. Customer Support Engineer at Cessna Aircraft Company, on April 12, 2013. Cessna confirmed that it was appropriate to use the higher temperature value to calculate runway length for a mean daily maximum temperature of 82°. Record of telephone conversation is in Administrative File.
2.2 SPONSOR’S PROPOSED PROJECT

Marin County developed the Sponsor’s Proposed Project through the Master Plan for Marin County Airport\textsuperscript{13} the Marin County Aviation Commission Resolution No. 97-1: A Resolution Adopting Chapter 6.0 Airport Development Program Update 1997\textsuperscript{14} and the Preliminary Design Report Runway Extension Gnoss Field.\textsuperscript{15} Exhibit 2-1, Existing Airport Layout, shows the existing Airport location and facilities. The primary elements of the Sponsor’s Proposed Project, which are shown on the 2000 Airport Layout Plan (ALP), and also shown on Exhibit 2-2, Sponsor’s Proposed Project, include the following:

- Extend Runway 13/31 1,100 feet to the northwest from 3,300 feet to a total length of 4,400 feet while maintaining the 75-foot width of the runway;
- Extend the parallel taxiway to the full length of the runway;
- Extend the existing Runway Safety Area (RSA) along the sides of Runway 13/31 to maintain the existing RSA width of 120 feet centered on the runway centerline;
- Extend RSA to 240 feet long beyond each end of Runway 13/31 to meet current FAA B-I airport design standards;
- Corresponding realignment of drainage channels to drain the extended runway and taxiway;
- Corresponding levee extension to protect the extended runway and taxiway from flooding;
- Relocate the navigational aids (PAPI) that pilots use to land at the Airport to reflect the extended runway; and
- Acquire 0.1 acre of land south of the Airport to provide for a 240-foot long RSA on the south end of Runway 13/31.

Marin County intends to keep DVO open during construction of the proposed project. Any modifications to Airport operations necessary to maintain safety during construction would be addressed in a Construction Safety and Phasing Plan prepared in accordance with FAA AC 150/5370-2F, Operational Safety on Airport During Construction, and approved by the FAA.

\textsuperscript{13} Airport Master Plan Marin County Airport Gnoss Field, 1989.
\textsuperscript{14} Marin County Aviation Commission Resolution No. 97-1: A Resolution Adopting Chapter 6.0 – Airport Development Program Update 1997 – Marin County Airport Master Plan (Gnoss Field) and Recommendation of Approval of Chapter 6.0 1997 Update to the Marin County Board of Supervisors, February 5, 1997.
\textsuperscript{15} Cortright & Sebold, Preliminary Design Report, Runway Extension, Gnoss Field, 2002.
Exhibit:

2-1

Existing Airport Layout

Legend

- Existing Runway
- Existing Buildings
- Airport Property Boundary

Filename: P:\DVO-Gnoss Field\GIS\MXD\EIS\EIS_Exhibits\EIS_Document\2-1_Existing Airport Layout.mxd

7/10/2013 Prepared by Landrum & Brown
Environmental Impact Statement
Gnoss Field Airport

Exhibit:

2-1
Exhibit:

Sponsor's Proposed Project

1,100-Foot Runway Extension
Taxiway Extension
Extend Levee and Drainage Ditch
Construct 240-Foot x 120-Foot Safety Area

Acquire 0.1 Acres of Land

101 NW P Railroad
Binford Rd
Black John Slough
Airport Rd

Environmental Impact Statement
Gnoss Field Airport

FINAL 7/10/2013 Prepared by Landrum & Brown
Proponents: P-DOE/Texas Environment

Legend
- Proposed Runway Extension
- Proposed Taxiway and Safety Areas
- Proposed Land Acquisition (0.1 Acres)
- Proposed Drainage Ditch
- Proposed Levee
- Existing Runway
- Existing Buildings
- Airport Property Boundary
2.3 PROPOSED FEDERAL ACTIONS

Several Federal actions are directly or indirectly proposed to occur. Implementation of the Sponsor’s Proposed Project or other build alternatives would require several Federal actions and approvals. These include:

- Unconditional approval of the Airport Layout Plan (ALP) to depict the land acquisition, proposed runway extensions and parallel taxiway extension pursuant to 49 United States Code (USC) §§ 40103(b) and 47107(a)(16);

- Development of air traffic control and airspace management procedures designed to affect the safe and efficient movement of air traffic to and from the proposed runway development. Such actions would include, but are not limited to, the establishment or modification of flight procedures and the installation and/or relocation of Navigational Aids (NAVAIDs) associated with the proposed runway and taxiway extension.

- Determination of eligibility for federal assistance for the proposed projects under the Federal grant-in-aid program authorized by the Airport and Airway Improvement Act of 1982, as amended (49 USC § 47101 et seq.);

- Determinations under 49 USC §§ 47106 and 47107 relating to the eligibility of the Proposed Action for federal funding under the Airport Improvement Program (AIP) to assist with construction of potentially eligible development items shown on the ALP;

- Determination of the effects of the proposed extension of the runway and parallel taxiway and the corresponding increase in size of the associated runway safety area upon the safe and efficient use of navigable airspace pursuant to Title 14 Code of Federal Regulations (CFR) Part 77, Objects Affecting Navigable Airspace. The FAA must determine if the proposed improvements, as proposed by Marin County are consistent with the existing airspace utilization and procedures;

- Determination under 49 USC § 44502(b) that the airport development is reasonably necessary for use in air commerce or in the interests of national defense;

- Approval of further processing of an application for federal assistance for near-term eligible projects using federal funds from the Airport Improvement Program, as shown on the ALP; and

- Approval of a Construction Safety and Phasing Plan to maintain aviation and airfield safety during construction pursuant to FAA Advisory Circular 150/5370-2F Operational Safety on Airports During Construction.

The proposed improvements under consideration in this EIS, and described as Alternatives B and D in Chapter Three, are designed to allow the Airport to accommodate existing aviation traffic and passenger demand.
2.4 COORDINATION WITH OTHER LAWS AND STATUTES

The FAA prepared this EIS, in accordance with the provisions of the CEQ regulation, Title 40 CFR § 1506.2, which directs Federal agencies to cooperate with state and local agencies “to the fullest extent possible” to reduce duplication between the NEPA and comparable state and local requirements. As such, this chapter complies with California State Water Resources Control Board implementation of federal Clean Water Act (CWA) Section 401 Water Quality Certification requirements, per California Code of Regulations (CCR) 23 CCR § 3949.2, demonstrating public need for the project. In addition, this EIS addresses the requirements of the U.S. Army Corp of Engineers, Section 404 process for impacts to waters within the CWA jurisdiction, as well as National Historic Preservation Act, Section 106, consultations for impacts to historic properties, as identified in Title 36 CFR § 800.8, Coordination with the National Environmental Policy Act. This EIS also addresses the requirements of the U.S. Department of Transportation Act of 1966, Section 4(f).¹⁶

2.5 TIME FRAME FOR FEDERAL ACTIONS

The FAA issued a Federal Register Notice on July 11, 2008 (see Appendix A, Agency Scoping and Coordination), announcing its intent to prepare an EIS for the proposed improvements at DVO. In addition, Marin County issued a Notice of Preparation of an Environmental Impact Report (EIR) on July 11, 2008 (see Appendix A). The FAA issued a Notice of Availability and released the Draft EIS for a 60-day public review on December 9, 2011, held a public hearing to receive comments on the Draft EIS on January 10, 2012, and accepted public comments on the EIS through February 6, 2012. Marin County concurrently issued its EIR for this project on December 9, 2011, and accepted comments on its EIR through February 6, 2012. The FAA has reviewed and responded to all comments on the Draft EIS in this Final EIS. Appendix Q, Response to Comments provides responses to all comments received on the Draft EIS. The FAA may issue a Record of Decision (ROD) regarding the Federal actions in this Final EIS 30 days after the release of this Final EIS to the public.

If the FAA issues a ROD to support proceeding with the Sponsor’s Proposed Project, Marin County could then seek Federal funding through the Airport Improvement Program grant program to assist in implementation of the project. Marin County would have to meet Federal, state and local environmental requirements, including complying with the California Environmental Quality Act, in order to proceed with the project.

¹⁶ Section 4(f) of the Department of Transportation Act of 1966 is currently codified as 49 USC § 303(c). Consistent with FAA Order 1050.1E, Appendix A, paragraph 6.1a, Section 303(c) will be referred to as Section 4(f).