CHAPTER 1
PURPOSE AND NEED

1.1 INTRODUCTION

The Federal Aviation Administration (FAA) issued a *Federal Register* Notice on August 19, 2016, announcing its intent to prepare an Environmental Impact Statement (EIS) for the Proposed Airfield Safety Enhancement Project (ASEP) including real property transactions at Tucson International Airport (TUS or Airport) in Pima County, Arizona (the Proposed Action).

The ASEP is series of recommended projects that, if implemented, would improve safety at TUS. These improvements include the relocation of Runway 11R/29L (proposed to be 10,996 feet long by 150 feet wide); the demolition of the existing Runway 11R/29L; the construction of a new center parallel and connecting taxiway system; acquisition of land for the runway object-free area, runway safety area, and the runway protection zone from Air Force Plant 44 (AFP 44); relocation of navigational aids and development and/or modification of associated arrival and departure procedures for the relocated runway; demolition of 12 Earth Covered Magazines (ECMs) on AFP 44 and their replacement elsewhere on AFP 44.

Implementing the ASEP improvements would improve safety by reducing the number of airfield incursions, or occurrences involving the incorrect presence of an aircraft, vehicle, or person on the area designated for landing and take-off of aircraft.

In addition to the ASEP improvements, the Proposed Action being considered in this EIS also includes both connected and similar land transfer actions from the Tucson Airport Authority (TAA) ultimately to the United States Air Force (USAF) for land at AFP 44, and another parcel of airport land on behalf of the National Guard Bureau (NGB) for construction of a Munitions Storage Area (MSA) to include EMCs and an access road for the Arizona Air National Guard (AANG) 162nd Wing at the Tuscon Air National Guard Base.

The FAA is the lead federal agency for preparation of the EIS and will do so in compliance with National Environmental Policy Act of 1969, as Amended (NEPA) and Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations (C.F.R.) Parts 1500-1508), as well as FAA's policies and procedures for complying with NEPA found in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures* and FAA Order 5050.4B, *NEPA Implementing Instructions for Airport Actions*.

The FAA has invited the USAF and the NGB to participate as cooperating agencies as described under 40 CFR § 1501.6(a)(1). The Deputy Assistant Secretary of the Air Force for Installations has accepted and is acting as the Cooperating Agency for both the USAF and the NGB. In reference to the NGB's proposed MSA, projects of this size and scope are typically funded through the USAF under the Military Construction Program. The environmental impacts of the alternatives have also been evaluated per the USAF's Title 32 C.F.R. § Part 989, *Environmental Impact Analysis Process.*

An EIS describes and discusses the environmental impacts that would be caused by the Proposed Action, the reasonable alternatives to the Proposed Action, and the No Action Alternative. As the lead federal agency, the FAA is responsible for preparing the EIS. The FAA selected a third-party contractor to assist in preparing the EIS. The USAF and the NGB assisted the FAA in preparing the EIS. The TAA, as the Airport Sponsor, assisted the FAA with acquiring data and with the public involvement and outreach components of the EIS. The City of Tucson and Pima County also provided information in connection with the EIS.

1.2 BACKGROUND INFORMATION

1.2.1 DESCRIPTION OF EXISTING AIRPORT

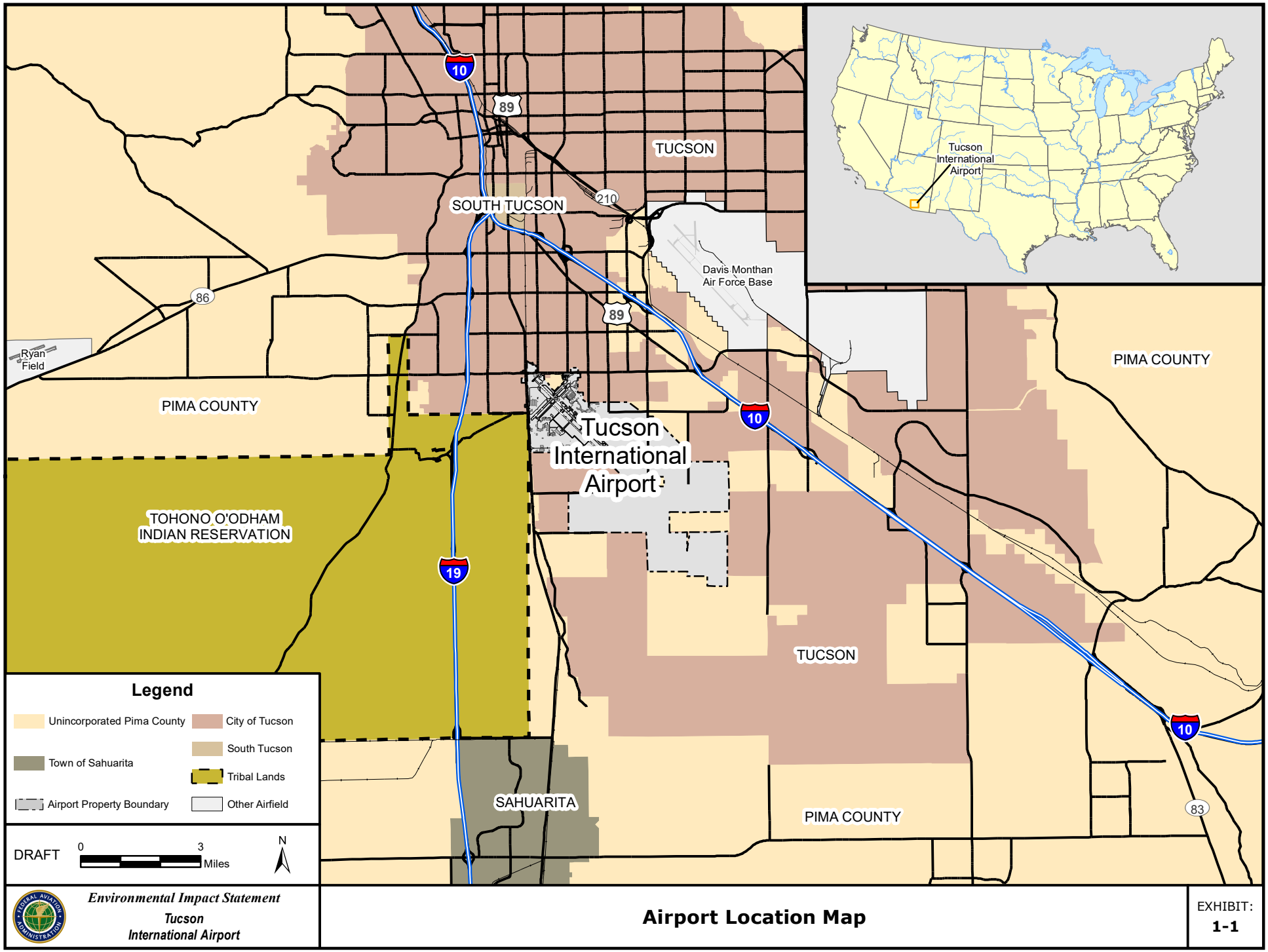
The TAA is the owner and operator of TUS. TAA developed a set of improvements to TUS, which includes the ASEP as depicted on the ALP for TUS. TUS is located on 8,343 acres in Tucson, Arizona in Pima County south of the City of Tucson central business district. The Airport is near both Interstate 10 and Interstate 19 as shown on **Exhibit 1-1**. The USAF owned land, known as AFP 44, is located along the southwest border of the Airport.

The passenger facilities at TUS are comprised of a terminal building with two concourses, referred to as Concourse A and Concourse B. International flights are processed through the Federal Inspection Service (FIS) Facility located in Concourse A. Tucson Air National Guard Base, which hosts the AANG 162nd Fighter Wing, occupies 94 acres on the north side of the Airport along Valencia Road. The AANG has trained tactical fighter pilots since 1958. Today, the facility is used to train F-16 Fighting Falcon pilots. Davis-Monthan Air Force Base (DMA) is located in Pima County approximately four miles northeast of TUS. DMA is a military installation that is not open to civilian aviation use. Special permissions are needed prior to landing non-military aircraft at the base.

1.2.2 EXISTING RUNWAYS AND TAXIWAYS

1.2.2.1 Existing Runways

As shown on **Exhibit 1-2**, the TUS airfield is comprised of three runways; one set of close parallel runways separated by a distance of 706 feet (oriented in a northwest/southeast direction) and one crosswind runway (oriented in a northeast/southwest direction).



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Tucson International Airport

Airport Location Map

EXHIBIT: **1-1**

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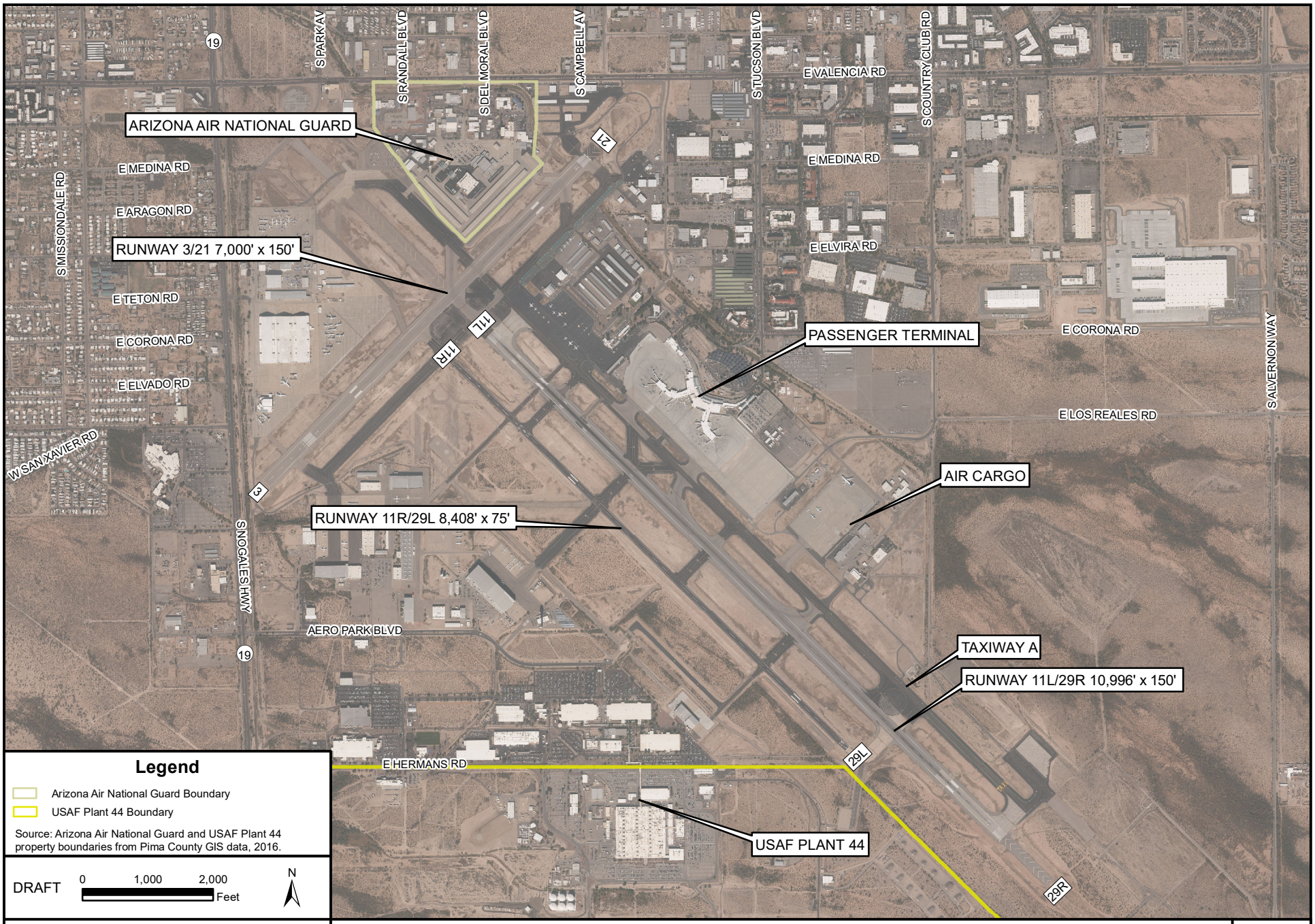

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Existing Airfield

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Parallel Runways 11L/29R and 11R/29L measure 10,996 feet long by 150 feet wide and 8,408-feet long by 75-feet wide, respectively. The crosswind runway, Runway 3/21, measures 7,000 feet long by 150-feet wide.[1] Runway threshold 11R is displaced 1,410 feet; this results in an available landing length of 6,998 feet. Runway threshold 3 is displaced 850 feet, resulting in an available landing length of 6,150 feet.

Runway 11L/29R is the primary runway at TUS and is the runway generally used by air carrier and military aircraft. During adverse wind conditions, air carrier and military aircraft occasionally use crosswind Runway 3/21. The crosswind runway is also used for convenience by General Aviation (GA) aircraft when conditions allow. Runway 11R/29L, originally built as a taxiway, has been converted to a runway primarily used by GA aircraft, due to its length and width.

The Airport has a Category I Instrument Landing System (ILS) available for precision approaches to Runway 11L. To supplement the ILS approach, Runway 11L is also equipped with a Medium-intensity Approach Light System with Runway alignment indicator lights (MALSR). All runways have Area Navigation Global Positioning System.

The Airport's runway ends are also equipped with the following landing aids:

- Runway 11L – ILS, MALSR, Precision Approach Path Indicator (PAPI), and military aircraft arresting system
- Runway 29R – PAPI, Runway End Identifier Lights (REILs), and military aircraft arresting system
- Runway 11R – PAPI
- Runway 29L – REILs
- Runway 21 – PAPI and REILs

Photos of an existing PAPI, REILs, and localizer at TUS are shown in **Exhibit 1-3**.

1.2.2.2 Taxiways

The taxiway system provides aircraft access between the runways and the passenger terminal complex, general and corporate aviation areas, military facilities, airfreight terminals, and other aircraft parking areas.

Runway 11L/29R has a full-length parallel taxiway, identified as Taxiway A. Taxiway A is 75-feet wide and is located to the northeast of Runway 11L/29R at a separation of 537 feet from the runway centerline to the taxiway centerline. Runway 11L/29R is connected to Taxiway A at the thresholds, as well as at multiple intermediate points between the thresholds via 45-degree, 60-degree, and 90-degree connector taxiways.

[1] Runway end 3 has a Takeoff Distance Available (TODA) of 7,000 feet, Takeoff Run Available (TORA) of 7,000 feet, Landing Distance Available (LDA) of 6,150 feet, and Accelerate Stop Distance Available (ASDA) of 7,000 feet.

Runway 3/21 has a parallel taxiway, identified as Taxiway D. Taxiway D is 75-feet wide and is located to the southeast of Runway 3/21 at a separation of 537.5 feet from the centerline of the runway to the centerline of the taxiway.

Runway 11R/29L does not have a parallel taxiway. Aircraft taxiing from Runway 11R/29L to the terminal and cargo areas must cross Runway 11L/29R. There is a separation of 706 feet from the Runway 11R/29L centerline to the Runway 11L/29R centerline. Runway 11R/29L is connected to Runway 11L/29R at the thresholds, as well as at five intermediate points between the thresholds via 90-degree connector taxiways.

1.2.3 AVIATION ACTIVITY

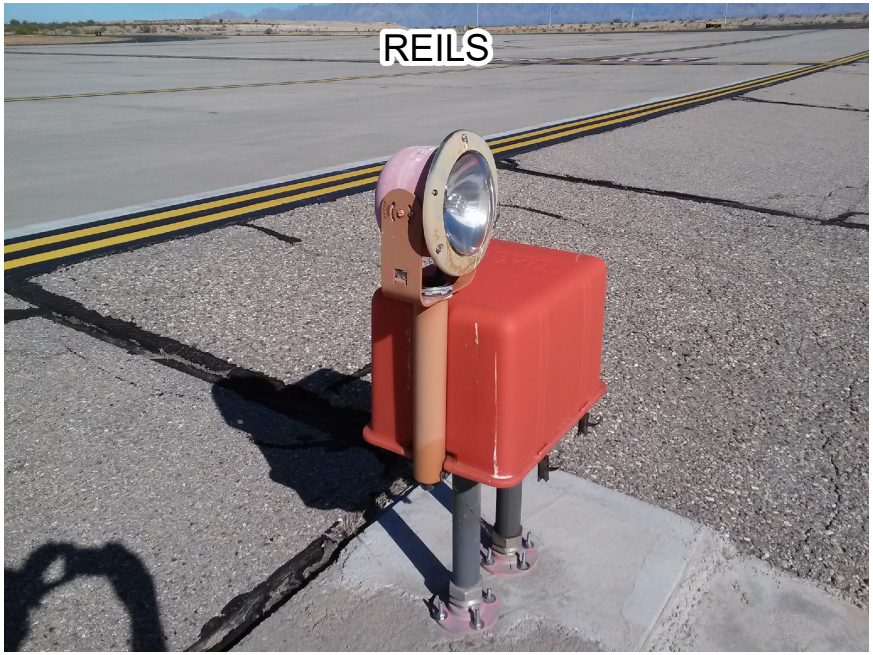
The FAA publishes its forecast annually for each United States airport, including TUS. The Terminal Area Forecast (TAF) is "*prepared to assist the FAA in meeting its planning, budgeting, and staffing requirements. In addition, state aviation authorities and other aviation planners use the TAF as a basis for planning airport improvements.*"[2] The most recent release is the 2016 TAF, which was issued in January 2017. All data in the TAF is provided on a United States Government fiscal year (FY) basis (October 1st through September 30th).

The 2016 TAF includes historical information on aircraft operations from FY1990 through FY2015 and forecasts for FY2016[3] to FY2040. At airports with FAA Airport Traffic Control Towers (ATCT) like TUS, FAA air traffic controllers provide historical aircraft operations data for the TAF, which count landings and takeoffs. These aircraft operations are recorded as either air carrier, commuter & air taxi, GA, or military. Air carrier is defined as an aircraft with seating capacity of more than 60 seats or a maximum payload capacity of more than 18,000 pounds carrying passengers or cargo for hire or compensation. Commuter and air taxi aircraft are designed to have a maximum seating capacity of 60 seats or a maximum payload capacity of 18,000 pounds carrying passengers or cargo for hire or compensation.

According to the 2016 TAF, aircraft operations at TUS have declined from 257,527 in FY2007 to 139,555 in FY2016, representing an average annual rate of decline of 6.6 percent. The national economic downturn of 2008 to 2013/2014 is believed to be the primary cause for the decline in commercial and GA aircraft operations at TUS during this period. For further discussion of the FAA TAF, *see* **Appendix B**, Aviation Activity Forecasts.

Exhibit 1-4 graphically depicts the historical and forecast aircraft operations from the 2016 TAF as well as the historical values provided by the Airport records. The 2016 TAF projects that aircraft operations at TUS will increase from 139,555 in FY2016 to 148,465 in FY2027, representing an average annual growth rate of 0.4 percent.

[2] FAA, January 2016, TAF Summary: Fiscal Years 2015-2040.
[3] Operations data for 2016 are actual.



Source: Photos courtesy of Tucson Airport Authority, 2016

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Landing Aids

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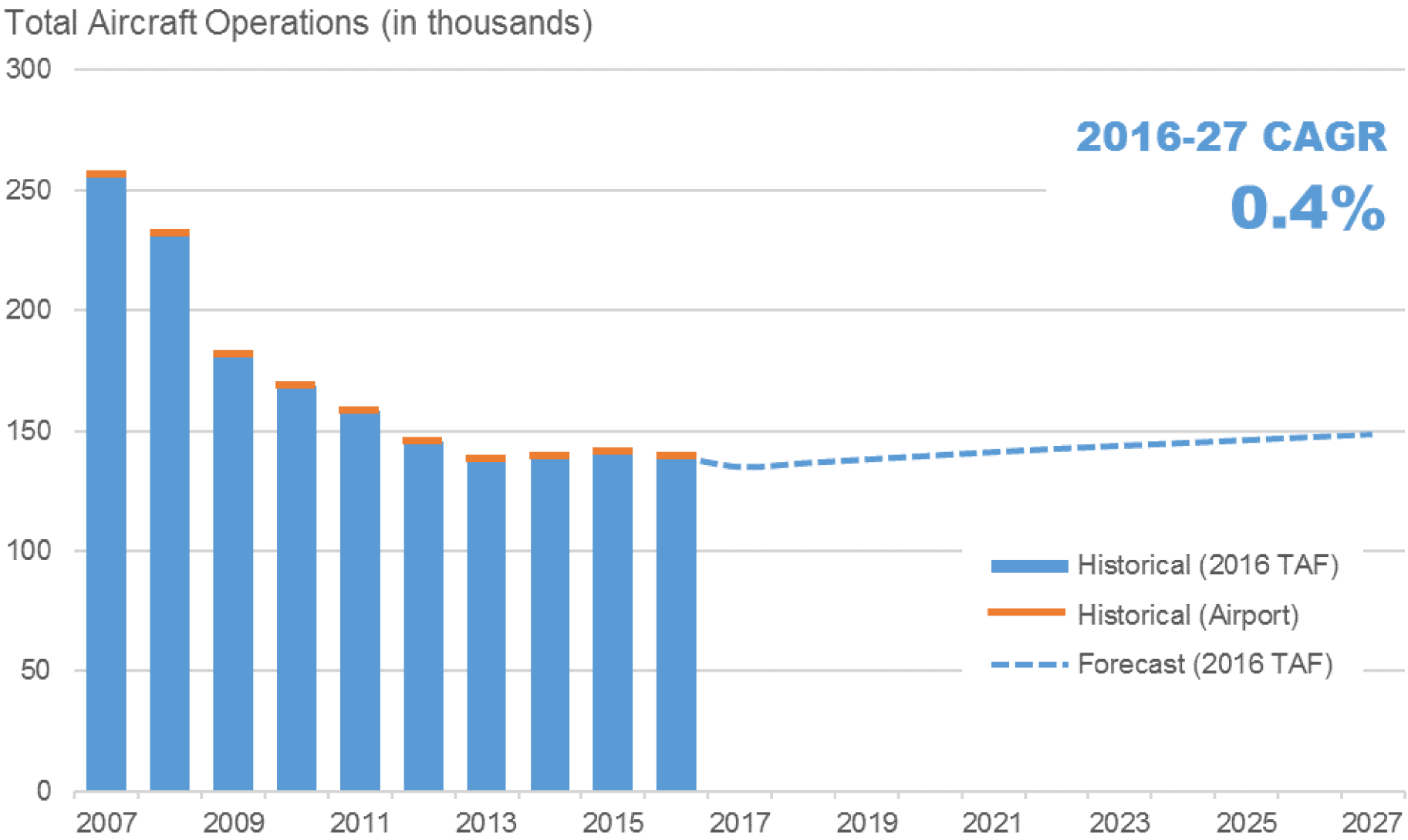

Source: Tucson Airport Authority, Monthly Activity Overview; Federal Aviation Administration, Terminal Area Forecast: Fiscal Years 2016-2045, January 2017.

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FAA 2015 TAF Aircraft Operations Forecast

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The enplanement information in the 2016 TAF includes historical values from FY1976 through FY2015, estimated enplanement figures for FY2016, and forecasts from FY2017 to FY2040. Historical enplanement data is obtained through the United States Department of Transportation (USDOT) T-100 Reports.

According to the 2016 TAF, enplanements at TUS have declined from a high of 2.16 million in FY2007 to an estimated 1.57 million in FY2016, representing an average annual rate of decline of 3.5 percent. The Proposed Action is not intended to address capacity and is meant to enhance the safety of the airfield at TUS. The need for a pair of parallel runways, which are the same length, still exists today. The proposed replacement runway would provide continued use of the airport when Runway 11L/29R is closed for any reason. During this span, enplanements provided in the 2016 TAF have on average been within 2.6 percent of the Airport's records. A difference is common when comparing the TAF to airport records because the enplanements provided in the TAF exclude non-revenue passengers and military charter passengers. In FY2016, the Airport reported 1.62 million enplanements which is 3.1 percent higher than the 1.57 million estimated for FY2016 in the 2016 TAF. The 2016 TAF projects that enplanements will increase from an estimated 1.57 million in FY2016 to 1.97 million in FY2027, representing an average annual growth rate of 1.5 percent. **Exhibit 1-5** graphically depicts the historical and forecast enplanements from the 2016 TAF as well as the historical values provided by the Airport records.

1.3 PROJECT PURPOSE AND NEED

FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, states that the purpose and need of an EIS "*briefly describes the underlying purpose and need for the Federal action. It presents the problem being addressed and describes what the FAA is trying to achieve with the Proposed Action. It provides the parameters for defining a reasonable range of alternatives to be considered. The purpose and need for the Proposed Action must be clearly explained and stated in terms that are understandable to individuals who are not familiar with aviation or commercial aerospace activities. Where appropriate, the responsible FAA official should initiate early coordination with cooperating agencies in developing purpose and need.*"

Here, the purpose and need for the Proposed Action serves as the foundation for identifying reasonable alternatives to the Proposed Action and comparing the impacts of developing the various alternatives. In order for a potential alternative to be considered viable and carried forward for detailed evaluation within the NEPA process and the EIS, that alternative must address the purpose and need. The Deputy Assistant Secretary of the Air Force for Installations represents the entire USAF, including both AFP 44 and the NGB, as the cooperating agency on this EIS and on all high level NEPA actions involving the USAF. In reference to the NGB's proposed MSA, projects of this size and scope are typically funded through the Air Force under the Military Construction Program. The next paragraphs of this section describe the purpose and need of the FAA, USAF (representing AFP 44 and the NGB), and TAA.

In October 2007, the FAA changed its accepted definition of the term "*runway incursion*" to adopt the International Civil Aviation Organization (ICAO) definition of runway incursions.[4] Since that time, FAA has defined runway incursion as "*any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and takeoff of an aircraft,*" which is a more expansive definition than FAA's pre-2007 definition.[5]

Under the current definition, there are four categories of runway incursions based on the severity of the incident:

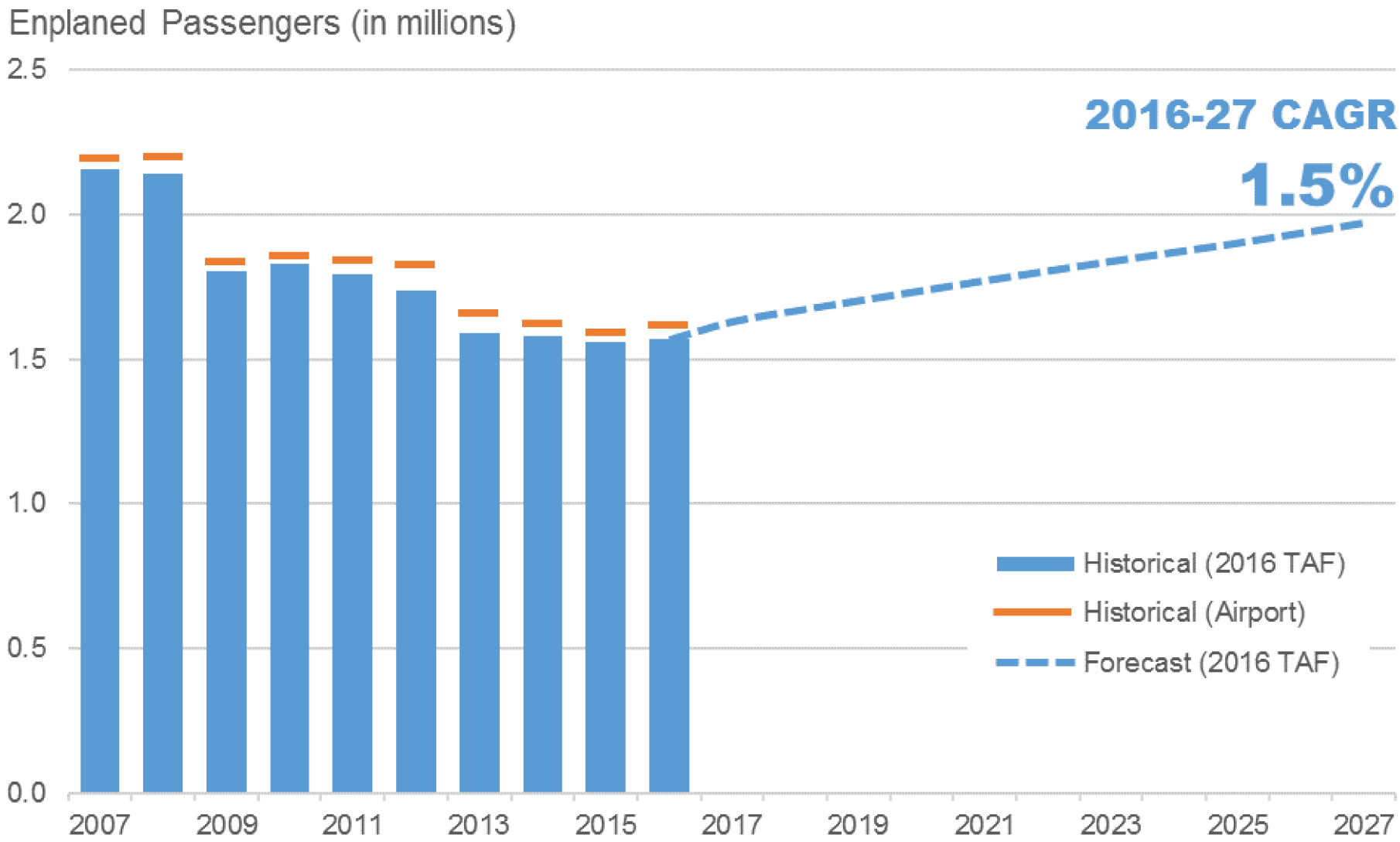
- **Category A**: a serious incident in which a collision was narrowly avoided
- **Category B**: an incident in which separation decreases and there is a significant potential for collision, which may result in a time critical corrective/evasive response to avoid a collision.
- **Category C**: an incident characterized by ample time and/or distance to avoid a collision.
- **Category D**: an incident that meets the definition of runway incursion such as incorrect presence of a single vehicle/person/aircraft on the protected area of a surface designated for the landing and take-off of aircraft but with no immediate safety consequences.

Under these standards, runway incursion severity is measured by the available reaction time, the opportunity for evasive corrective action, environmental conditions, the speed of the aircraft and/or vehicle, and the proximity of aircraft and/or vehicle. The severity of a runway incursion increases from a Category D to a Category A classification.

The 2007 change in definitions caused a greater number of reported surface incidents to become classified as a Category C or D runway incursion. This resulted in a dramatic increase of runway incursions at TUS, as shown in **Exhibit 1-6** and **Table 1-1**. TUS reported a total of 22 runway incursions during the years 2001 to 2007—approximately 3 incursions per year. After the runway incursion definition changed, TUS reported a total of 124 runway incursions during the years 2008 to 2017—over 12 per year.

[4] ICAO, 2007, *Manual on the Prevention of Runway Incursions*. ICAO defines "runway incursion" as "Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and take-off of aircraft."

[5] FAA, April 2015, Runway Incursions. https://www.faa.gov/airports/runway_safety/news/runway_incursions



Tucson Airport Authority, 10 Year Passenger Statistics;
Federal Aviation Administration, Terminal Area Forecast:
Fiscal Years 2016-2045, January 2017.

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FAA 2015 TAF Enplaned Passengers Forecast

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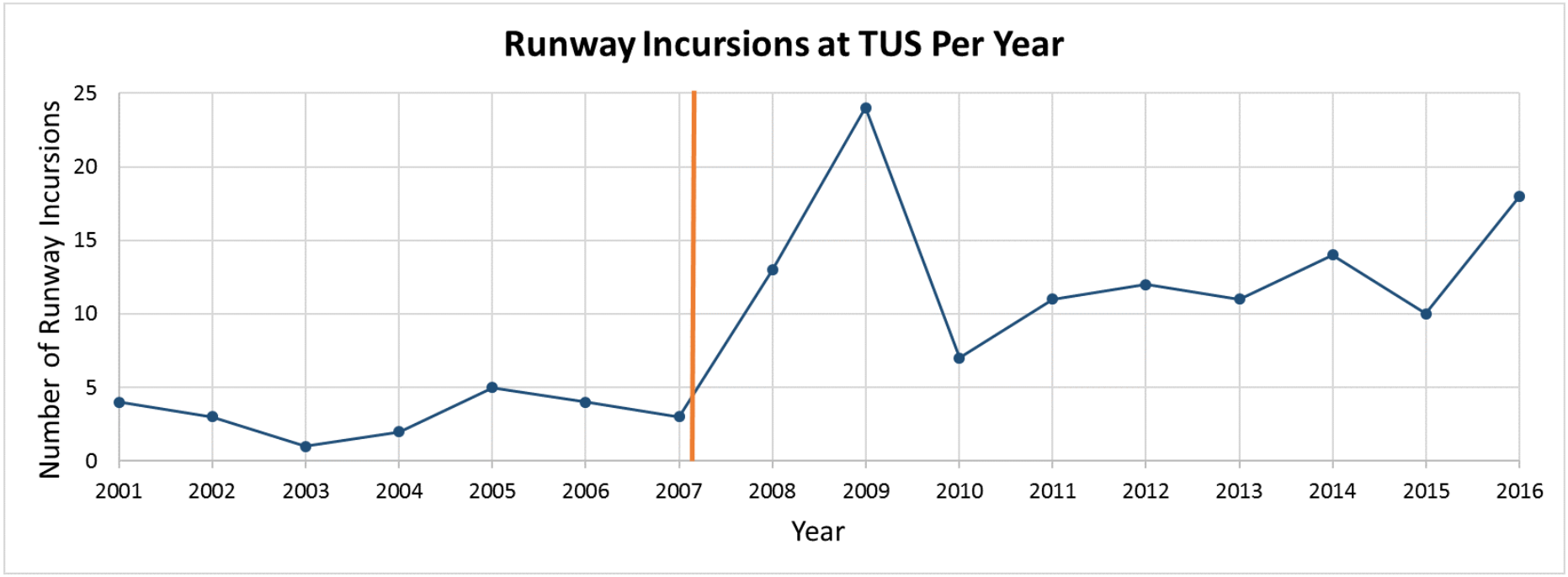

Source: FAA Aviation Safety Information Analysis and Sharing (ASIAS) Database, 2017.

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Environmental Impact Statement
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Runway Incursions at TUS per Year

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Table 1-1
RUNWAY INCURSIONS BY CATEGORY

CATEGORY	2001-2007	2008-2017
Category A	1	0
Category B	0	0
Category C	3	34
Category D	6	73
N/A	12	17
TOTAL	**22**	**124**

Source: FAA ASIAS Database, March 2017.

Since 2007, no Category A or B incursions have occurred at TUS.[6] However, the number of Category C and Category D incursions per year have increased significantly, as shown in **Exhibit 1-7**. Category C and Category D incursions include use of the wrong runway and maneuvering to the wrong runway caused by pilot confusion. These incursions are shown in **Table 1-2**.

Table 1-2
2008-2017 RUNWAY INCURSIONS BY CATEGORY AND INCIDENT

2008-2017 RUNWAY INCURSIONS	NUMBER OF INCURSIONS
Category C	**34**
Arrival/departure on wrong runway	2
Category D	**73**
Arrival/departure on wrong runway	8
Maneuvered to wrong runway	3
N/A	**17**
TOTAL	**124**

Source: FAA ASIAS Database, March 2017.

As a result of the increase in the number of incursions, the TAA conducted various planning studies. TAA initially completed an Airfield Safety Enhancement Study in 2011 to analyze, categorize, and recommend mitigations to enhance safety. Several of these recommendations were implemented. In 2014, TAA completed the most recent Airport Master Plan Update, which further analyzed enhancements recommended in the Airfield Safety Enhancement Study. This set of improvements included the Proposed ASEP, which recommended relocation of Runway 11R/29L, and construction of a center parallel taxiway, as well as additional safety elements.

[6] This data covers through May 2017.

The TAA depicted the ASEP on the Airport Layout Plan (ALP) for TUS. On June 24, 2014, the FAA accepted TAA's Airport Master Plan Update and approved the ALP depicting the proposed ASEP conditional on TAA obtaining FAA environmental approval for the proposed projects depicted on the ALP. In 2015, TAA prepared an update to the Airfield Safety Enhancement Study, which refined the improvements while maintaining the goal of reducing airfield incursions and improving overall safety with the relocation of Runway 11R/29L and construction of a center parallel taxiway.

As a result of these TAA's planning studies, various airfield safety issues were identified at the Airport that may affect its ability to efficiently maintain critical transportation function, now and in the near future. The refined improvements is the ASEP, which is part of the Proposed Action. Pursuant to 49 United States Code (U.S.C.) § 47107(a)(16), FAA must approve the Proposed Action as depicted on the ALP. FAA approval of the ALP is a federal action that must comply with NEPA.

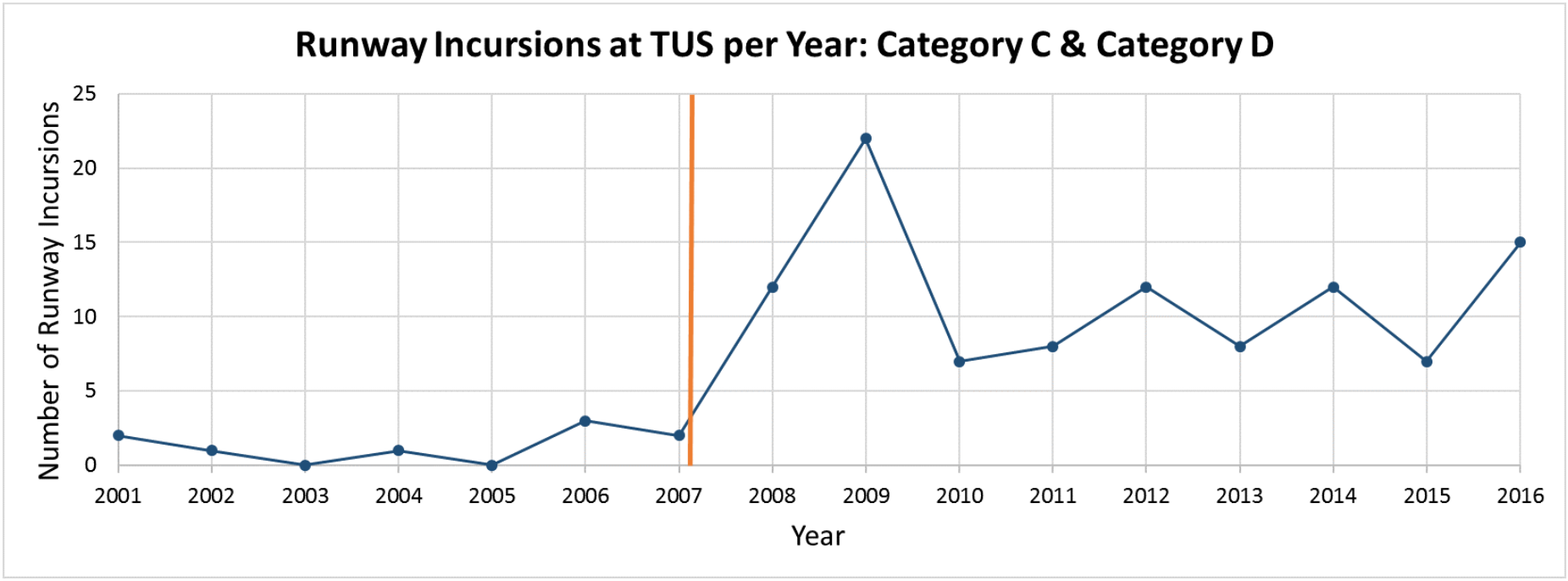
1.3.1 FAA PURPOSE AND NEED

The purpose of the Proposed Action is to fulfill FAA's statutory mission to ensure the safe and efficient use of navigable airspace in the United States as set forth under 49 U.S.C. § 47101 (a)(1). The FAA must ensure that the Proposed Action does not derogate the safety of aircraft and airport operations at TUS. Moreover, it is the policy of the FAA under 49 U.S.C. § 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.

Additionally, the purpose of the Proposed Action in connection with TAA's request to modify the existing ALP is to ensure the proposed improvements to the airport do not adversely affect the safety, utility and efficiency of the airport. Pursuant to 49 U.S.C. § 47107(a)(16), the FAA Administrator (under authority delegated from the Secretary of Transportation) must approve any revision or modification to an ALP before the revision or modification takes effect.

The Administrator's approval reflects a determination that the proposed alterations to the airport, reflected in the ALP revision or modification, do not adversely affect the safety, utility, or efficiency of the airport.

The need for the Proposed Action is to ensure that TUS operates in the safest manner possible pursuant to 49 U.S.C. § 47101(a)(1) and to reduce the potential risk of runway incursions to the extent practicable. The following sections present the FAA's specific needs.



Source: FAA Aviation Safety Information Analysis and Sharing (ASIAS) Database, 2017.

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Environmental Impact Statement
Tucson International Airport

Category C and Category D Runway Incursions at TUS per Year

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THE NEED TO ENHANCE THE SAFETY OF THE AIRFIELD AND ELIMINATE EXISTING "HOT SPOTS".

The FAA defines a "hot spot" as a location on an airport movement area with a history of potential risk of collision or runway incursion, and where heightened attention by pilots and drivers is necessary.[7] Typically, hot spots are located in areas with complex or confusing airfield geometry or in areas that have a history of incursions or the potential for incursions. A confusing condition may be compounded by a miscommunication between ATCT and a pilot, and may cause an aircraft separation standard to be compromised.[8] The FAA has identified two existing hot spots at the Airport, labeled as Hot Spot-1 (HS-1) and Hot Spot-2 (HS-2) on **Exhibit 1-8**.

HS-1, an aerial view of which is shown on **Exhibit 1-9**, is located at the end of Runway 29L. HS-1 has been a historical point of confusion between Runways 29L and 29R and Runway 29R and Taxiway A. On several occasions pilots on approach from the south have mistaken Runway 29R for Runway 29L and Taxiway A for Runway 29R, landing on the wrong runway or on Taxiway A.

HS-2, an aerial view of which is shown on **Exhibit 1-10**, is located along Taxiway D between Runway 11L/29R and Runway 11R/29L. At this location, pilots taxiing along Taxiway D have crossed the approach path for Runway 11L/29R or Runway 11R/29L without proper clearance.

The construction of a full-length parallel runway would eliminate HS-1 because it would clearly differentiate Runway 29L, Runway 29R, and Taxiway A. The proposed relocated Runway 11R/29L would have its threshold aligned with Runway 11L/29R and have the same width, which would clearly differentiate it from a parallel taxiway. Having the length, width, and threshold locations of Runway 11R/29L and Runway 11L/29R the same, would increase safety and pilot situational awareness. Pilots on approach from the south would be better able to visually acquire the end of the runways if they have non-staggered landing thresholds. This would eliminate the potential to mistake Runway 29R for Runway 29L and Taxiway A for Runway 29R.

Displacing the Runway 11L arrivals threshold to match the new Runway 11R arrivals threshold would eliminate HS-2 by enabling aircraft classified as B-II or smaller to be out of the runway safety areas, thereby decreasing the risk of a runway incursion. The hold short lines on Taxiway D near the Runway 11L approach area would remain.

[7] FAA, May 2016, Runway Safety – Hot Spots List, https://www.faa.gov/airports/runway_safety/hotspots/hotspots_list/

[8] FAA Air Traffic Organization Office of Runway Safety, August 2017, Focus on Hotspots- Prevent Runway Incursions Brochure.

THE NEED TO PREVENT AIRCRAFT FROM CROSSING DIRECTLY BETWEEN TWO PARALLEL RUNWAYS[9].

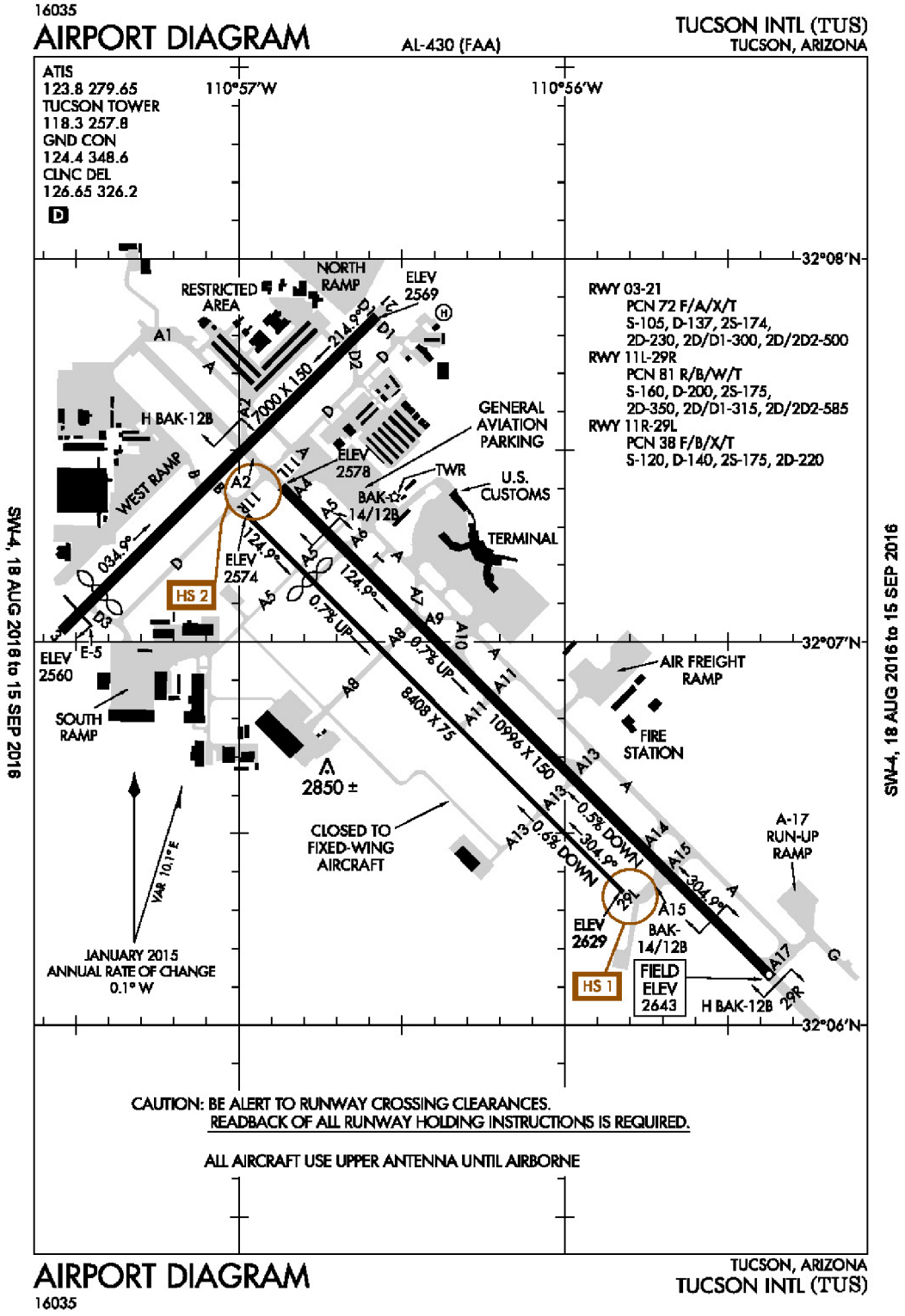
The FAA recommends Airport Sponsors find ways to reduce the probability of potential runway incursions. One way to do that is preventing direct runway to runway crossings. A so-called "centerline" parallel taxiway between parallel runways minimizes the potential for pilots to cross an active runway by forcing them to first turn onto the centerline taxiway and wait for ATCT clearance to cross the other runway. A centerline parallel taxiway increases the margin of safety by providing opportunity to move aircraft runway crossings to lower risk areas and also provides space for aircraft to queue prior to crossing runways.

THE NEED TO MAINTAIN OPERATIONAL CAPABILITIES WHEN THERE IS A TEMPORARY CLOSURE OF RUNWAY 11L/29R.

TUS is a primary commercial airport, and any closure to Runway 11L/29R would have an adverse effect on the National Airspace System. In the past, the Airport has experienced maintenance, disabled aircraft and military aircraft operations that have caused Runway 11L/29R to be closed to commercial service. The use of Runway 3/21 or existing 11R/29L reduces the takeoff runway length available to aircraft, which effectively limits the airport's capabilities to serve commercial aircraft.

Therefore, one purpose of the Proposed Action is to maintain airport operational capabilities during times when Runway 11L/29R is not available by providing additional runway capabilities that can handle the diverse aircraft operating at TUS. The Proposed Action would result in the Airport having two runways at 10,996 feet in length. Military and commercial aircraft operations would be able to continue if Runway 11L/29R were closed for any reason.

[9] FAA, November 19, 2007, Engineering Brief 75, *Incorporation of Runway Incursion Prevention into Taxiway and Apron Design.*



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Source: Federal Aviation Administration, 2017. Available at: http://aeronav.faa.gov/d-tpp/1701/00430ad.pdf#search=KTUS

Environmental Impact Statement *Tucson International Airport*	**Hot Spots**	EXHIBIT: **1-8**

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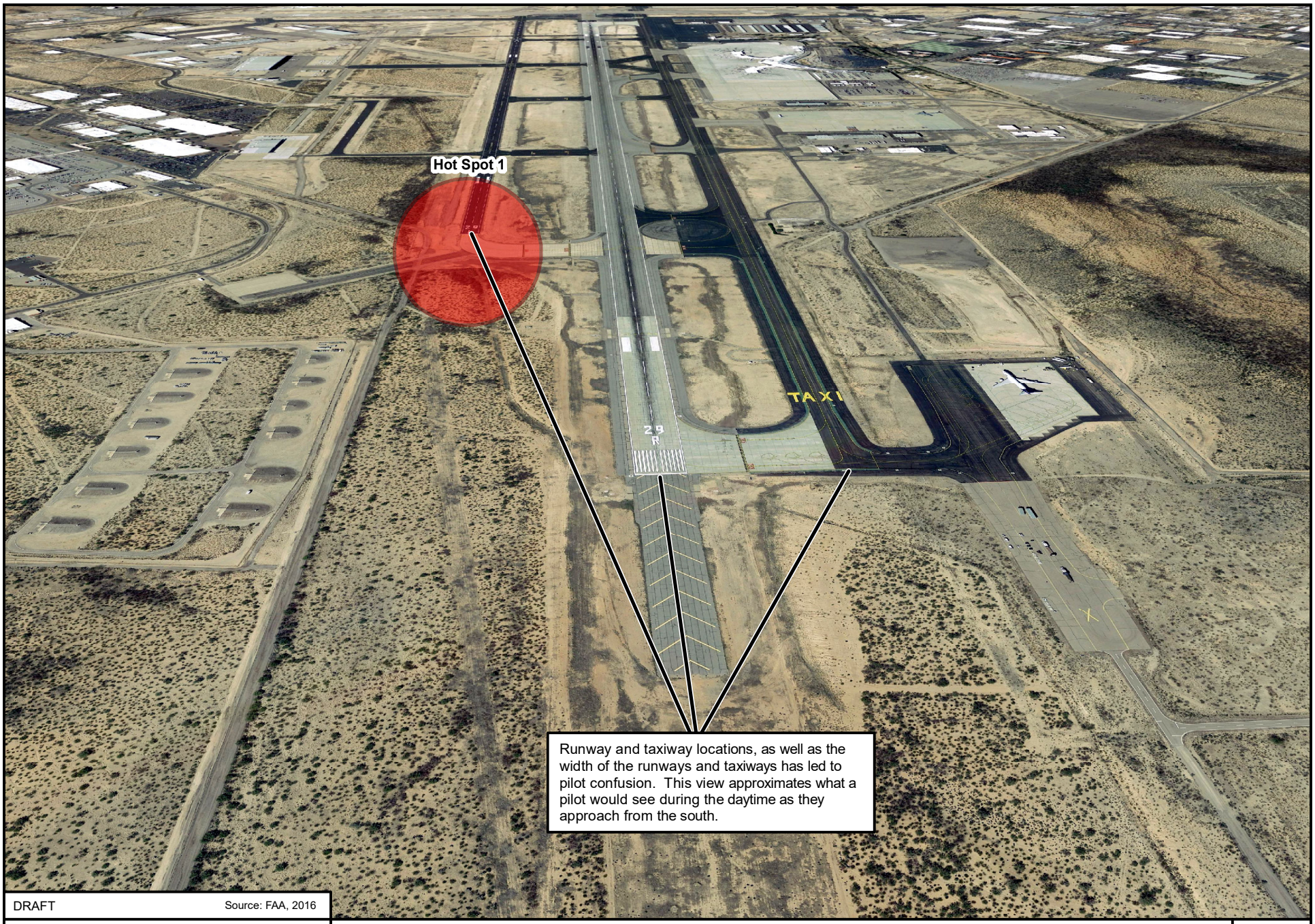

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Source: FAA, 2016

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Tucson International Airport

Runway 29L Hot Spot

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Source: Photos courtesy of Tucson Airport Authority, 2016.

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Tucson International Airport

Taxiway D Hot Spot

EXHIBIT: **1-10**

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1.3.2 USAF PURPOSE AND NEED

THE NEED TO MAINTAIN EQUIVALENT AIR FORCE PLANT 44 OPERATIONAL CAPABILITIES.

The USAF owns and operates multiple installations in southern Arizona, including DMA, located about four miles northeast of TUS. None of these facilities and their respective missions duplicate any other USAF facilities in southern Arizona. Thus, each USAF facility performs a different mission.

The USAF owns land, known as AFP 44, adjacent to the Airport. The USAF currently leases this land to Raytheon Missile Systems, which operates AFP 44 for the manufacture of various missile and other military defense systems. The boundaries of AFP 44 have not changed since 1986 when the USAF deeded about 940 acres of land east/northeast of the current plant to the City of Tucson. In addition to the manufacturing of various missile and other military defense systems, the operations at AFP 44 include the safe storage of explosives/munitions, providing overall plant security, and providing safety areas to make sure the public is not in close proximity to any munitions. AFP 44 does not have any runways or helipads and does not record any landings and takeoffs, but it does maintain a cargo pad, which provides access to the runways at TUS.

Under the Proposed Action, 12 ECMs) located on AFP 44 would have to be demolished to prevent munitions storage safety arcs from extending onto the TUS airfield after relocation of Runway 11R/29L and to remove the ECMs from the relocated runway's safety area. An ECM is a specific structure that is used to store munitions. Land identified as Parcel "F" would be transferred from AFP 44 to TAA in order to provide TUS with sufficient land to maintain the necessary FAA required safety areas associated with the relocated runway. TAA would also transfer a parcel of land identified as Parcel "G" to the USAF for AFP 44. TAA would make available a parcel of land identified as Parcel "H" to the USAF for AFP 44 as needed. These parcels would incorporate the various USAF safety arcs onto USAF property. Incorporation of USAF safety arcs onto USAF property would help to ensure continued operational capabilities of AFP 44 while accommodating the proposed safety enhancement project at TUS. Therefore, the purpose of the Proposed Action is to maintain equivalent AFP 44 operational capabilities while removing 6 ECMs from Parcel "F" and 6 ECMs directly adjacent to Parcel "F". The TAA, as the Project Sponsor, would apply for Federal assistance to provide fair market value of the ECMs in accordance with FAA regulations and eligibility guidelines for reimbursable project expenses.

1.3.3 NGB PURPOSE AND NEED

THE NEED TO MAINTAIN NGB SAFETY STANDARDS AND OPERATIONAL CAPABILITIES.

Since its activation, the AANG has fulfilled a Federal and state mission. The dual mission, a provision of the United States Constitution, results in each Guardsman holding membership in the National Guard of Arizona and in the National Guard of the United States. Specifically, the AANG serves the United States and allied nations by providing fighter aircraft training programs while partnering with the USAF in overseas contingencies and Aerospace Control Alert.

The AANG's Federal mission is to maintain well-trained, well-equipped units available for prompt mobilization during war and provide assistance during national emergencies such as natural disasters or civil disturbances. Currently, the AANG deploys its members as part of the Air and Space Expeditionary Force to provide combat forces in support of Operations in Southwest Asia.

When Guardsmen are not mobilized or under Federal control, they report to the Governor of Arizona and are led by the adjutant general of the state. Under state law, the wing provides protection of life, property and preserves peace, order and public safety. These missions are accomplished through emergency relief support during natural disasters such as floods, earthquakes and forest fires; search and rescue operations; support to civil defense authorities; maintenance of vital public services and counterdrug operations.

The AANG currently maintains MSAs as part of their operational capability. Munitions storage areas may include ECMs but also includes other facilities to support munitions-related operations such as inspection areas, secured roadways, loading docks, and maintenance areas. Not all the munitions used by the AANG can be stored at the existing facilities. Some munitions must be stored at DMA. The AANG needs additional areas to maintain the safe storage of munitions and provide safety areas consistent with USAF standards to ensure the public is not in close proximity to any munitions in the event of a mishap.

TUS is home to the AZ ZANG F-16 fighter pilot training unit. It is the largest AANG fighter wing in the country and resides on 94 acres as Tucson Air National Guard Base. The AANG has its own security, fire suppression equipment and personnel. Approximately 1,450 people work at the Tucson Air National Guard Base. About 900 are full-time employees and the balance are drill status Guardsmen providing forces in support of wartime operations.

The NGB's purpose and need is to maintain NGB safety standards and operational capabilities at the Tucson Air National Guard Base. More specifically, NGB needs to meet required separation distances for its MSA. The existing MSA at the Tucson Air National Guard Base does not meet the USAF separation distances required for explosive operations and exposes non-munitions personnel to explosive hazards. Relocating the MSA would accommodate the required Quantity-Distance clear zone arcs that are required in accordance with USAF Manual 91-201, *Explosives Safety Standards*.

1.3.4 TAA PURPOSE AND NEED

THE NEED TO ENHANCE THE SAFETY OF THE AIRFIELD

TAA has conducted various planning studies with the goal of reducing airfield incursions and improving overall airfield safety. The Proposed ASEP, which is the subject of this EIS, was developed by TAA to meet this goal and to ensure that TUS operates in the safest manner possible. The ASEP includes the relocation of Runway 11R/29L and construction of a center parallel taxiway.

THE NEED TO ENSURE LAND USE COMPATIBILITY AMONG USERS OF TUS AND TO PROTECT FOR POTENTIAL FUTURE AIRPORT DEVELOPMENT.

TUS is an essential transportation resource for the Tucson metropolitan area, Pima County, and southern Arizona. The primary objective of the TAA is the promotion and development of the safest most effective and efficient airport system to meet the needs of users and encourage economic growth in Tucson and southern Arizona. One of TAA's goals is to promote compatible land uses to preserve and grow major employment centers and leverage reasonable revenue enhancement opportunities. TAA does not receive any local tax dollars.

The Proposed Action would require relocation of the ECMs currently on AFP 44 property. The removal of 6 ECMs from Parcel "F" and 6 ECMs directly adjacent to Parcel "F" is necessary to establish the relocated runway object free area, taxiway object free area, runway safety area, and runway protection zone. TAA would need to acquire land from the USAF for this purpose. The location of the replacement magazines and operations at AFP 44 requires land currently owned by TAA for safety area buffer in case of incident. The purpose of a land exchange would be to provide the safety buffer, to ensure compatibility of adjacent land uses, and to offer USAF the ability to control neighboring uses to ensure compatibility with current and future uses at AFP 44. The exchange of land parcels would provide for future economic growth and safety area protections for one of the region's major employers, and would help to ensure continued operational capabilities and safety buffers for AFP 44.

ALPs are drawings used to graphically depict current and planned development for an airport. They serve as a critical planning tool for an airport. The TAA prepared an ALP for TUS in June 2014. On June 24, 2014, the FAA accepted TAA's Airport Master Plan Update, and conditionally approved the ALP depicting the proposed ASEP. The condition requires TAA obtain FAA environmental approval for the proposed projects depicted on the ALP. The ALP also depicted other potential future development and future land use efforts on airport property. TAA has identified the need to protect for potential future airport development and for future development to be compatible with long-term plans for the Airport.

1.4 DESCRIPTION OF PROPOSED ACTION

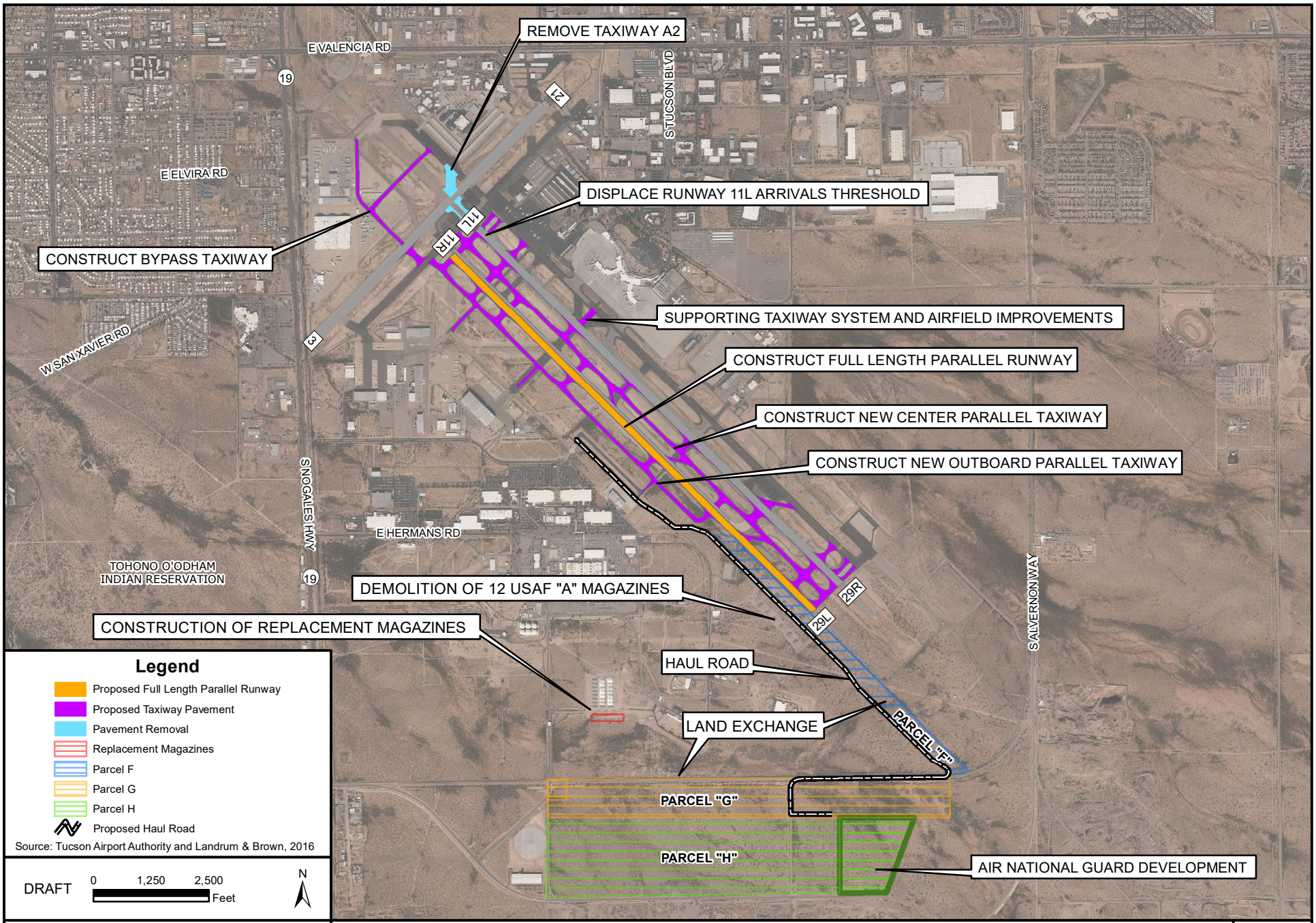
The Proposed Action as shown on **Exhibit 1-11** includes the following elements:

Construct Full Length Parallel Runway: This element includes the relocation and reconstruction of Runway 11R/29L as a 10,996-foot long, 150-foot wide runway. The replacement runway would provide continued use of the airport when Runway 11L/29R is closed for any reason. Currently the narrow width and shorter length of Runway 11R/29L causes some pilots to confuse it with a taxiway when approaching from the south.

The relocation of Runway 11R/29L would require development and/or modification of associated arrival and departure procedures. In general, the distribution of aircraft operating in the 11/29 direction is expected to be more evenly distributed between the two runways resulting in an increased use of Runway 11R/29L by large jet and military operations, and a corresponding decrease in use of Runway 11L/29R. It is also expected that a greater number of westbound turning departures would occur and a greater number of touch-and-go operations would occur on Runway 11R/29L operating in a circuit pattern to the southwest of TUS. The relocated 11R/29L would require updated approach and departure procedures. The relocated 11LR/29L would not have any ILS equipment and would remain a visual approach runway. FAA would test, update, and reissue the arrival and departure procedures charts for the following: RNAV (GPS) RWY 11R and RNAV (GPS) RWY 29L. In addition, the following departures charts would have to tested, updated, and reissued by the FAA: Tucson Eight Departure, Burro Four Departure, and WLDKT Three Departure.

Displace Runway 11L Arrivals Threshold: As part of the Runway 11R/29L relocation, the arrival threshold on Runway 11L would be shifted 921 feet to match Runway 11R and allow aircraft to taxi along Taxiway D independent of runway arrival operations. Currently at HS-2, the existing Runway 11L arrival threshold begins at the physical end of the runway near Taxiway D. Occasionally pilots taxiing along Taxiway D have crossed the approach path for Runway 11L/29R or Runway 11R/29L without clearance. With the existing Runway 11L arrival threshold, the potential for runway incursion is high when a pilot taxis across the approach path without clearance while an aircraft is on approach.

This element also includes reconfiguring the Runway 11L MALSR by shifting stations and installing in-pavement approach lights in the displaced threshold. The existing PAPI and glideslope antenna would also be relocated to accommodate the Runway 11L arrival threshold shift. The existing MALSR and glide slope are shown in **Exhibit 1-12**. Due to the MALSR relocation, FAA would test and reissue the arrival procedures charts for the following: ZONNA One, Arrival, RNAV (RNP) Y RWY 11L, RNAV (GPS) Z RWY 11L, and the VOR or TACAN RWY 11L.



Environmental Impact Statement
Tucson International Airport

Proposed Action

EXHIBIT: **1-11**

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Source: Photos courtesy of Tucson Airport Authority, 2016

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Environmental Impact Statement
Tucson International Airport

Existing MALSR and Glide Slope Antenna

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Demolish Existing Runway 11R/29L: This element proposes demolition of the Existing Runway 11R/29L and associated taxiways. TAA plans to recycle and reuse existing pavement materials (i.e., "old pavement") for subgrade and base course for the Proposed Action to the maximum extent allowed by FAA standards.

Construct New Centerline Parallel Taxiway: This element proposes construction of a full-length parallel taxiway between Runway 11L/29R and Runway11R/29L.

Construct New Outboard Parallel Taxiway: This element includes the construction of a parallel taxiway 400 feet southwest of the new relocated Runway 11R/29L. This parallel taxiway would provide additional access to Runway 11R/29L.

Construct Supporting Connector Taxiways: This element includes construction of connector taxiways between Runway 11R/29L and both outboard and centerline parallel taxiway. It also includes construction of connector taxiways between Runway 11L/29R and the centerline parallel taxiway and connector taxiways between Runway 11L/29R and Taxiway A accommodate the new displaced threshold.

Construct Bypass Taxiway: This element includes construction of a new bypass taxiway northwest of the Runway Protection Zones for Runways 11L and 11R. The displaced arrivals thresholds would allow unrestricted taxiing of aircraft (regardless of size) accessing Runway 11R. This element would include removal of the existing concrete apron from the surrounding area and demolition of four existing buildings/hangars within the area. The Triple hangars would not be impacted as part of this element.

Close Taxiway A2: This element includes the closure of Taxiway A2 segment between Taxiway A and Runway 3/21 and the Taxiway A2 segments between Runway 3/21 and Taxiway D.

Construct/Maintain AANG Extended Blast Pad: This element would construct/maintain the AANG blast pads for Runways 11L/29R and 11R/29L and paint/mark as non-runway/taxiway pavement.

Associated Drainage Improvements: This element provides for additional drainage detention areas to provide for the additional impervious pavement areas.

AANG Aircraft Arresting System/Runway Improvements: This element provides for the removal of two AANG arresting systems on Runway 11L and construction of a new overrun barrier on Runway 11L. In addition, three new systems would be installed on the new parallel runway to include one overrun barrier and one new system would be installed on Runway 3/21. This element also includes the extension of the 11L and new parallel runway to meet arresting system requirements.

1.4.1 CONNECTED AND SIMILAR ACTIONS

Land Transactions/Conveyance of Parcel "F" (approximately 58 acres) from AFP 44 to TAA, Parcel "G" (160 acres) from TAA to USAF, and Conveyance of Parcel "H" (up to 290 acres) from TAA to be made available to USAF as needed: This element of the Proposed Action includes the TAA acquiring land from AFP 44 from USAF known as Parcel "F." This land is needed by TAA to establish the relocated runway object free area, taxiway object free area, runway safety area, and runway protection zone. This Parcel "F" area is currently used by USAF to store explosives in ECMs.

In exchange for Parcel "F," this element also includes FAA releasing TAA from its Federal obligations for the Airport land located between the former East Hughes Access Road and the new Aerospace Parkway, south of AFP 44 from TAA to USAF, and the release of that land from Federal obligations. The eastern 55-acre portion of Parcel "H" has been proposed for construction of a Munitions Storage Area, to include ECMs, and access road, for the AANG at the Tucson Air National Guard Base located adjacent to TUS.

Demolition of 12 USAF ECMs identified at AFP 44 as "A" Magazines: This element includes the demolition of the 12 ECMs on Parcel "F" and adjacent to Parcel "F" to maintain the necessary FAA required safety areas for the relocated runway. An ECM is depicted in **Exhibit 1-13.**

Construction of replacement magazines elsewhere on AFP 44: In order to maintain the existing munitions storage capacity of AFP 44, replacement storage facilities would be constructed elsewhere on AFP 44 that would provide the same munitions storage capacity currently allowed to be stored in the "A" Magazines. These new ECMs would replace the 12 "A" Magazines to be demolished on Parcel "F" and adjacent to Parcel "F".

Construction of Munitions Storage Area for the AANG: This element of the Proposed Action includes the ultimate transfer of land from Parcel "H" to the USAF as needed on behalf of the NGB for construction of a MSA and access road to support the AANG at Tucson Air National Guard Base. A conceptual layout of the MSA is shown on **Exhibit 1-14**.

Earth Covered Magazines

Source: Photos courtesy of USAF and Raytheon Missile Systems, 2016

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Environmental Impact Statement

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Earth Covered Magazines

EXHIBIT: **1-13**

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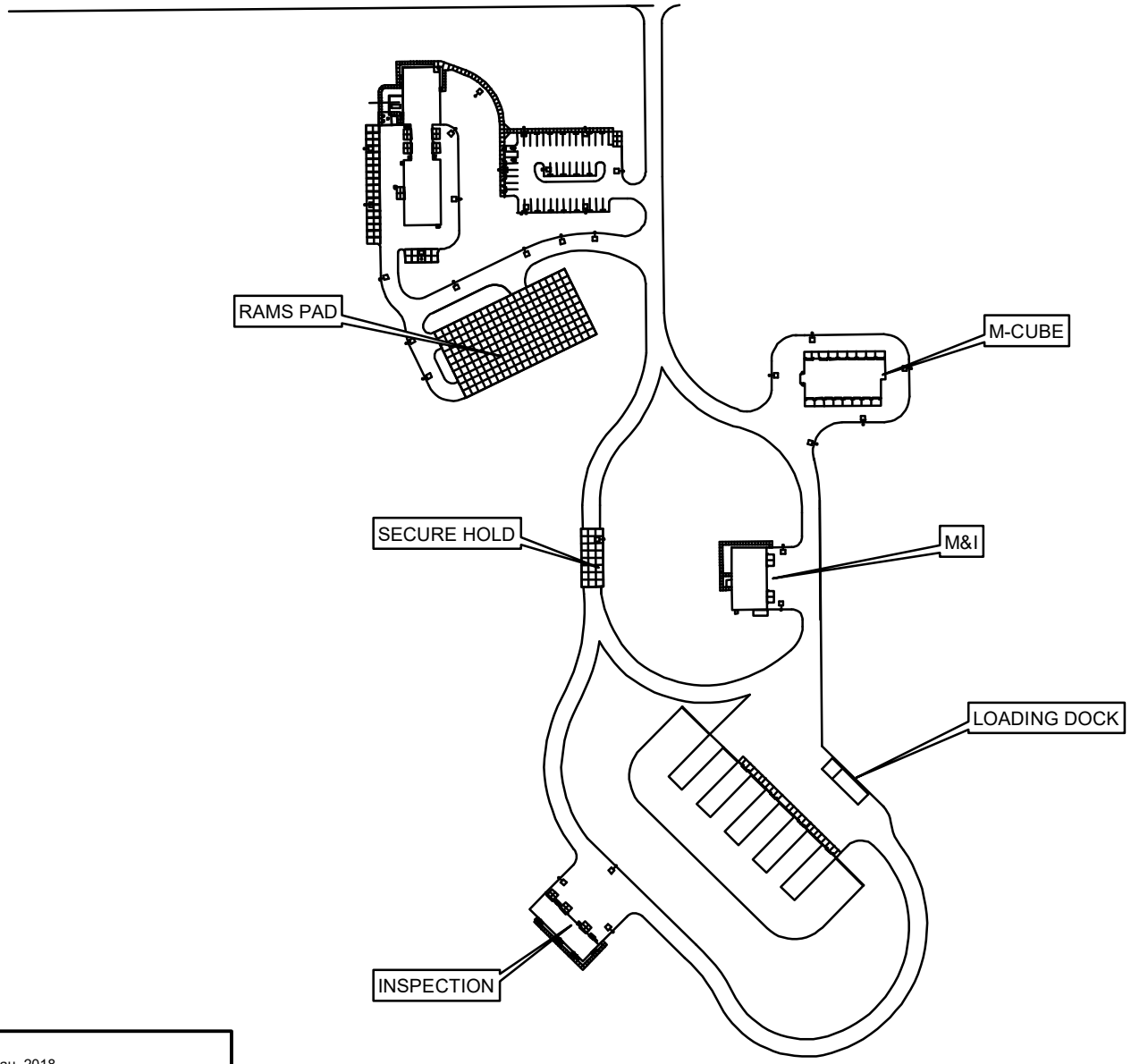

Source: National Guard Bureau, 2018

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Environmental Impact Statement
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General Layout of Proposed Munitions Storage Area

EXHIBIT:
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1.5 REQUESTED FEDERAL ACTIONS

This section summarizes the Federal actions and approvals the Federal Government must give before the Sponsor can implement the Proposed Action, described in Section 1.4.

Federal Actions by the FAA:

- Unconditional approval of the ALP to depict the proposed improvements pursuant to 49 U.S.C. §§ 40103(b) and 47107(a)(16); 14 C.F.R. Part 77, *Objects Affecting Navigable Airspace*; and 14 C.F.R. Part 157, *Notice of Construction, Alteration, Activation, and Deactivation of Airports*.
- Determination under 49 U.S.C. § 44502(b) that the airport development is reasonably necessary for use in air commerce or in the interests of national defense.
- Determination under 49 U.S.C. § 47106(a)(1) that the Selected Alternative is Reasonably Consistent with Existing Plans of Public Agencies Responsible for Development in the Area.
- Approval of a Construction Safety and Phasing Plan to maintain aviation and airfield safety during construction pursuant to FAA Advisory Circular (AC) 150/5370ac-2F, *Operational Safety on Airports During Construction*, [14 C.F.R. Part 139 (49 U.S.C. § 44706)].
- Approval of construction, installation, relocation of FAA-owned navigational and visual aids, including but not limited to the PAPI, Runway End Identifier Lights, taxiway edge lighting, signage, and associated utility lines. The FAA is responsible for the navigational aid equipment necessary to ensure the safety of air navigation for aircraft operations at the Airport. The FAA would make a determination regarding the installation and relocation of navigational aids associated with the Proposed Action. The Proposed Action includes the relocation of the MALSR, localizer array, glide slope equipment, PAPI, and runway end identifier lights on 11L/29R. The relocated 11R/29L would remain a visual approach runway and therefore would include the
- The Proposed Action would displace the threshold for 11L/29R. This would require the relocation of the MALSR/ILS equipment. Due to the relocation, FAA would test and reissue the arrival procedures charts for the following: ZONNA One, Arrival, RNAV (RNP) Y RWY 11L, RNAV (GPS) Z RWY 11L, and the VOR or TACAN RWY 11L.

- The relocated 11R/29L would require updated approach and departure procedures.
    - Approaches: The relocated 11LR/29L would not have any ILS equipment and would remain a visual approach runway. FAA would test, update, and reissue the arrival and departure procedures charts for the following: RNAV (GPS) RWY 11R and RNAV (GPS) RWY 29L.
    - Departures: The following charts would have to tested, updated, and reissued: Tucson Eight Departure, Burro Four Departure, and WLDKT Three Departure.
- The FAA would need to identify, test, and issue any potential revised and temporary air traffic control procedures to be used during construction. During construction, various runway closures could introduce additional aircraft overflights to areas around the Airport. Runway 11R/29L (the existing General Aviation Runway) is anticipated to be closed up to 12 months. After the relocation and approval of use of 11R/29L, Runway 11L/29R would be closed for approximately five months to complete the Proposed Action construction. The FAA would need to develop air traffic control and airspace management procedures designed to affect the safe and efficient movement of air traffic to and from the Proposed Action during construction and determine if the proposed temporary procedures are consistent with this EIS.
- Approval of the TAA's request for release of Federal obligations on land owned by the Airport Authority for ultimate transfer to the USAF for AFP 44.
- Approval of changes to the airport certification manual pursuant to 14 C.F.R. Part 139.
- Determinations under 49 U.S.C §§ 47106 and 47107 relating to project grant application approval conditioned on satisfaction of project requirements, and project grant application approval conditioned on assurances about airport operations the proposed project for Federal funding assistance under the Airport Improvement Plan (AIP) for the proposed project as shown on the ALP.
- Determination of eligibility for Federal assistance for the near-term development projects under the Federal grant-in-aid program authorized by the Airport and Airway Improvement Act of 1982, as amended (49 U.S.C. § 47101 et seq.).
- Appropriate amendments to air carrier operations specifications pursuant to 49 U.S.C. § 44705.
- FAA opinion of the Proposed Action's effects on the safe and efficient use of navigable airspace.

Federal Actions by the USAF:

- Approval of disposal of Parcel "F" and associated recorded deed restrictions for AFP 44.
- Approval of acquisition of Parcel "G" from TAA for use by the USAF at AFP 44.
- Approval of the ultimate transfer of Parcel "H" from TAA to the USAF, a portion of which would be designated for use by the NGB.
- Approval of construction of replacement ECMs on AFP 44.
- Approval of deactivation and subsequent demolition of 12 ECMs (also known as "A" Magazines) located on and adjacent to Parcel "F".
- Approval of construction of a replacement AFP 44 perimeter fence along the western boundary of Parcel "F".

Federal Actions by the NGB:

- Approval of appropriate agreements between the USAF and NGB for use of land in Parcel "H" for construction of a Munitions Storage Area.
- Approval of funds for design/construction of a MSA to support the AANG at Tucson Air National Guard Base on Parcel "H".

1.6 ENVIRONMENTAL REVIEW PROCESS AND TIMEFRAME OF THE PROPOSED ACTION

FAA's environmental review is done in compliance with environmental requirements and policies including NEPA, the CEQ Regulations for Implementing the Procedural Provisions of NEPA (40 C.F.R. § 1506.6), and FAA Orders 1050.1F and 5050.4B. Throughout this process, FAA is directed to "[m]ake diligent efforts to involve the public in preparing and implementing [its] NEPA procedures."[10]

Scoping for the development of the EIS began with the publication of the Notice of Intent to prepare the EIS in the *Federal Register* on August 19, 2016. A notice of the scoping meeting was published in the *Arizona Daily Star*, 30 days in advance of the scheduled meeting.

FAA conducted a governmental agency scoping meeting for all federal, state, and local regulatory agencies which have jurisdiction by law or have special expertise with respect to any potential environmental impacts associated with the Proposed Action was held on September 22, 2016 at Tucson Executive Terminal at the base of the Old Airport Traffic Control Tower building, 7081 South Plumer Avenue, Tucson, Arizona.

[10] 40 C.F.R. 1506.6(a).

FAA also conducted a public scoping meeting on September 22, 2016 at the same location during the evening. The public scoping meeting was conducted in an open house format designed to inform the public about the Proposed Action and NEPA process, and allow the public to speak with FAA, USAF, NGB, and Airport Sponsor representatives on issues and concerns they would like to see addressed in the EIS. During the scoping meeting, FAA staff gave a presentation on the proposed ASEP project and the objectives of the Proposed Action. Following the presentation, the public was provided the opportunity to comment on the project. A total of 22 individuals not including FAA, USAF, NGB, and Airport Sponsor representatives signed in at the meeting.

A total of 18 public comments were received during the scoping period from August 19, 2016 to October 3, 2016. Thirteen people provided comments in support of the proposed project. Five comments were received concerning the possibility of additional military flights including the F-35 Lighting II fighter aircraft being based at DMA or Tucson ANB Base. **However, the need for the Proposed Action at TUS does <u>not</u> involve, in any way, the new F-35 fighter aircraft**. Deployment of the F-35 to various installations around the United States and abroad is a decision made by the USAF. In August 2012, the USAF approved a Record of Decision to station the F-35A at Luke Air Force Base, west of Phoenix, Arizona. At this time, there is no proposal before the USAF or NGB that has identified Tucson Air National Guard Base for placement of the F-35. There will be no analysis of potential F-35 deployment at TUS in the EIS.

Depending on the number and type of comments received on this Draft EIS, the Final EIS is anticipated to be released in the fall of 2018. At that time, the FAA will make a determination on the next steps in the NEPA process. Construction of the Proposed Action is expected to take approximately three years if approved. Under this timeline, if the FAA decides to proceed with the project following environmental review, the Proposed Action could be completed and operational by 2022. Permits, mitigation requirements, and the final design of the Proposed Action, are likely to extend beyond that timeframe.

1.7 EIS DOCUMENT ORGANIZATION

The EIS was prepared in the FAA's standard EIS format, which follows the format prescribed in CEQ Regulations (see 40 C.F.R. § 1502.10). In addition to the cover page, the EIS contains the following content:

Table of Contents: The table of contents lists the chapters, exhibits, and tables presented throughout the EIS. It also lists the appendices, and the acronym list, and glossary of terms/index.

Summary: This summary, as required by 40 C.F.R. § 1502.10[11], describes the purpose and need for the FAA, USAF, NGB, and the TAA. The summary also identifies the alternatives considered, potential environmental consequences, and mitigation measures.

Chapter 1 – Purpose and Need: This chapter briefly describes the underlying purpose and need for the Federal action. It presents the problem being addressed and describes what the FAA is trying to achieve with the proposed action. It provides the parameters for defining a reasonable range of alternatives to be considered.

Chapter 2 –Alternatives: This chapter provides a comparative analysis of the no action alternative, the proposed action, and other reasonable alternatives to fulfill the purpose and need for the action, to sharply define the issues, and provide a clear basis for choice among options by the approving official. This chapter provides a description of the Proposed Action and an overview of the identification and screening of alternatives considered, the process used to screen and evaluate reasonable alternatives, the alternatives carried forward for detailed environmental evaluation, and brief description of those alternatives considered but dismissed.

Chapter 3 – Affected Environment: This chapter describes the environmental conditions of the potentially affected geographic area or areas. This chapter also describes the existing environmental conditions within the project Study Areas, including a definition and description of the resource, regulatory setting, and region of influence.

Chapter 4 – Environmental Consequences and Mitigation Measures: This chapter forms the scientific and analytical basis for comparing the proposed action, the no action alternative, and other alternatives retained for detailed analysis. This chapter describes the potential conditions that must be implemented by the FAA or appropriate authority to minimize harm from the Proposed Action. This chapter also includes cumulative impacts of the Proposed Action and alternatives when added to the impacts of past, present, and reasonably foreseeable future projects in the vicinity of TUS. Lastly, this chapter includes Unavoidable Adverse Impacts, Relationship between Short-term and Long-term Impacts, and Irreversible and Irretrievable Commitment of Resources.

[11] 40 C.F.R. § 1502.10 Recommended Format

Chapter 5 – Coordination and Public Involvement: This chapter discusses coordination and public involvement associated with the EIS process. This chapter also presents a list of federal, state, and local agencies and other interested parties that have been involved in the EIS, coordination efforts, and lists the agencies and persons to whom the EIS has been distributed.

Chapter 6 – List of Preparers: This chapter includes the names, and qualifications (e.g., expertise experience, professional disciplines) of the FAA staff that were primarily responsible for preparing the EIS or significant background material, and contractors who assisted in preparing the EIS or associated environmental studies.

Chapter 7 – References: This chapter includes all the various documents used to prepare the EIS.

Appendices: The appendices of the EIS consists of material that substantiates any analysis that is fundamental to the EIS. The appendices contain information about formal and informal consultation conducted, and related agreement documents prepared, pursuant to other special purpose laws and requirements. The appendices contain detailed information about the agency and public coordination conducted for the EIS. Appendices also contain a variety of technical reports that support the analysis of anticipated impacts.