



BOULDER CITY
MUNICIPAL AIRPORT

CHAPTER FIVE

Recommended Master Plan Concept

BOULDER CITY MUNICIPAL AIRPORT



CHAPTER FIVE RECOMMENDED MASTER PLAN CONCEPT

The preparation of the Airport Master Plan has included technical efforts in the previous chapters intended to establish the role of Boulder City Municipal Airport (BVU or Airport), forecast potential aviation demand, establish airside and landside facility needs, and evaluate options for improving the Airport to meet those facility needs. The planning process has included the development of draft working papers that have been presented to the Planning Advisory Committee (PAC). The PAC is comprised of stakeholders/constituents with an investment or interest in the Airport and surrounding area. This diverse group has provided extremely valuable input into the Master Plan. Additionally, a series of Public Information Workshops have been conducted as part of this planning process, providing the public an opportunity to be involved and educated about the study.

The alternatives that outlined future growth and development scenarios in Chapter Four have been refined into a recommended development concept for the Master Plan, which is included for presentation in this chapter. An overview of environmental conditions that need to be considered when development projects are undertaken is provided later in this chapter.

One of the objectives of the Master Plan is to allow decision-makers the ability to either accelerate or slow development goals based on actual demand. If demand slows, development of the Airport beyond routine safety and maintenance projects could be minimized. If aviation demand accelerates, develop-



ment could be expedited. Any plan can account for limited development, but the lack of a plan for accelerated growth can sometimes be challenging. Therefore, to ensure flexibility in planning and development to respond to unforeseen needs, the Master Plan Concept considers the full and balanced development potential for BVU.

MASTER PLAN CONCEPT

BVU is classified as a nonhub, primary commercial service airport within the FAA's National Plan of Integrated Airport Systems (NPIAS). Most of the Airport's enplanements can be attributed to air tour activities occurring at the Airport. NPIAS airports are considered important to the national aviation system and are eligible for development grant funding from the FAA. At the state level, the Nevada Department of Transportation – Aviation Planning Section (NDOT) also classifies BVU as a primary commercial service airport. It is anticipated that the Airport's classifications will not change because of the recommendations in this Master Plan.

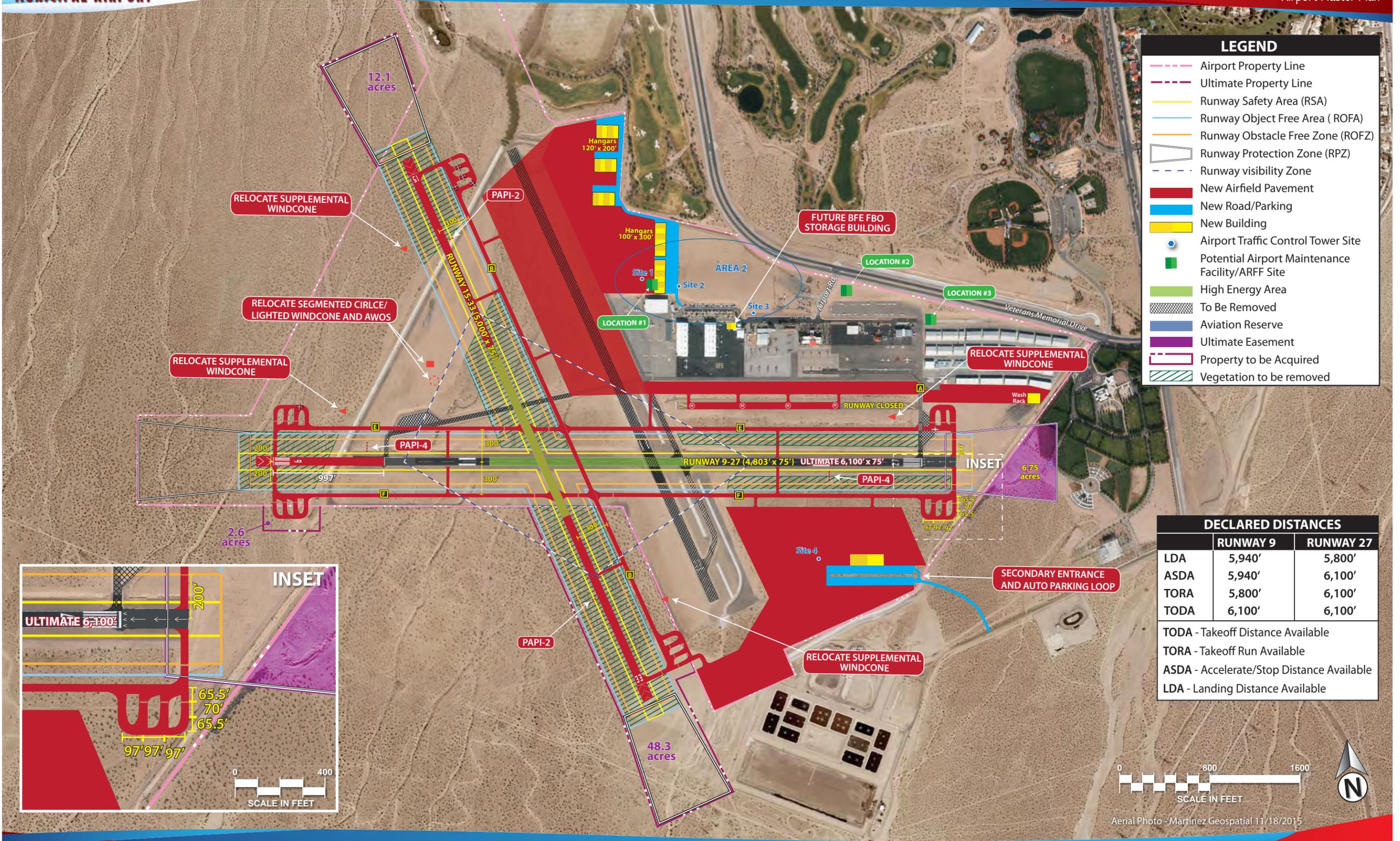
The Master Plan Concept, as shown on **Exhibit 5A**, presents the recommended configuration for BVU, which preserves and enhances the role of the facility while meeting FAA design and safety standards to the extent practicable. It is important to note that the concept provides for anticipated facility needs over the next 20 years, as well as establishing a vision and direction for meeting facility needs beyond the 20-year planning period of this study. A phased program to achieve the recommended Master Plan Concept is presented in Chapter Six. When assessing development needs, this chapter has separated the Airport into airside and landside functional areas. The following sections describe the recommended Master Plan Concept in detail.

AIRSIDE DEVELOPMENT CONCEPT

The airside plan generally considers those improvements related to the runway and taxiway system and often requires the greatest commitment of land area to meet the physical layout of an airport. Operational activity at BVU is anticipated to grow through the 20-year planning horizon of this Master Plan, and the Airport is projected to continue to serve the full range of general aviation aircraft operations, in addition to commercial air tour activities.

The major airside issues addressed in the Master Plan Concept include the following:

- Adhere to ultimate Runway Design Code (RDC) B-II standards on Runways 9-27 and 15-33.
- Consider runway extension options for Runways 9-27 and 15-33 to better accommodate business jet aircraft operations utilizing the Airport, pending further justification and coordination with the FAA.



LEGEND

- Airport Property Line
- Ultimate Property Line
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Obstacle Free Zone (ROFZ)
- Runway Protection Zone (RPZ)
- Runway visibility Zone
- New Airfield Pavement
- New Road/Parking
- New Building
- Airport Traffic Control Tower Site
- Potential Airport Maintenance Facility/ARFF Site
- High Energy Area
- To Be Removed
- Aviation Reserve
- Ultimate Easement
- Property to be Acquired
- Vegetation to be removed

DECLARED DISTANCES

	RUNWAY 9	RUNWAY 27
LDA	5,940'	5,800'
ASDA	5,940'	6,100'
TORA	5,800'	6,100'
TODA	6,100'	6,100'

TODA - Takeoff Distance Available
 TORA - Takeoff Run Available
 ASDA - Accelerate/Stop Distance Available
 LDA - Landing Distance Available

INSET

ULTIMATE 6,100'

200'

97' 97' 97'

65.5' 70' 65.5'

0 400

SCALE IN FEET

0 800 1600

SCALE IN FEET

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Aerial Photo - Martinez Geospatial 11/18/2015

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- Analyze the relocation of Runway 15-33 1,000 feet to the west to account for runway extension options and provide increased future development area contiguous to existing development.
- Consider a pavement strength rating of up to 30,000 pounds single wheel loading (SWL) on Runway 9-27 and 15,000 pounds SWL on Runway 15-33.
- Evaluate improved helipad and taxiway design to better segregate helicopter and fixed-wing traffic.
- Improve safety area deficiencies that currently exist on Runways 9-27 and 15-33.
- Realign non-standard taxiways to meet FAA airfield geometry standards.
- Per FAA standards, locate hold position markings on all taxiways associated with Runways 9-27 and 15-33 to be a minimum of 200 feet from the runway centerline and parallel with the runway centerline.
- Provide non-precision instrument approach capabilities serving Runway 27 with visibility minimums down to one mile.
- Analyze property beyond the existing Airport property line that is needed to accommodate a potential runway extension and protection of the associated safety areas for Runways 9-27 and 15-33.
- Enhance visual approach aids on the runway system with the installation of precision approach path indicator (PAPI) systems.

RUNWAY DIMENSIONAL STANDARDS

The FAA has established design criteria to define the physical dimensions of the runways and taxiways, as well as the imaginary surfaces surrounding them which protect the safe operation of aircraft at airports. These design standards also define the criteria for the placement of landside facilities.

As discussed in previous chapters, the design criteria primarily center on an airport's critical design aircraft. The critical design aircraft is the most demanding aircraft or family of aircraft which currently, or are projected to, conduct 500 or more operations (takeoffs or landings) per year at an airport. Factors included in airport design are an aircraft's wingspan, approach speed, tail height, and, in some cases, the instrument approach visibility minimums for each runway. The FAA has established the RDC to relate these design aircraft factors to airfield design standards. The most restrictive RDC is also considered the overall Airport Reference Code (ARC) for an airport.

Analysis in Chapters Three and Four concluded that the existing and ultimate RDC for primary Runway 9-27 falls in RDC B-II. This runway, with a length of 4,803 feet, can accommodate most general aviation activity, including small and mid-sized business jet activity. Future planning considers numerous upgrades to the runway (to be discussed) while maintaining an ultimate RDC of B-II for Runway 9-27.

Runway 15-33, with a length of 3,852 feet, can accommodate a large majority of the aircraft mix utilizing the Airport, including turboprop and limited business jet operations. This runway also serves an important role in accommodating operations when primary Runway 9-27 is closed for maintenance and when strong crosswinds dictate its use by smaller aircraft. Its current RDC is A-I, and ultimate planning considers an RDC of B-II.

Table 5A provides a summary of the RDCs for each runway based upon the Master Plan Concept. In addition to the physical and operational components of an aircraft, the RDC also considers the instrument approach capabilities for each runway expressed in runway visual range (RVR) values. For Runway 9-27, the ultimate RVR value of 5,000 indicates approach visibility minimums not lower than 1-mile, which correspond to the planned GPS approach to Runway 27 (to be discussed). For Runway 15-33, the RVR value VIS indicates that it will remain a visual approach only runway through the long term planning horizon.

TABLE 5A
Ultimate Runway Design Codes
Boulder City Municipal Airport

Runway	Existing Runway Design Code	Planned Runway Design Code*
9-27	B-II-VIS	B-II-5000
15-33	A-I-VIS	B-II-VIS

* The existing and ultimate ARC for Boulder City Municipal Airport is B-II based upon the most demanding RDC associated with Runway 9-27.

RUNWAY 9-27

BVU is currently served by a two-runway system. Primary Runway 9-27 is 4,803 feet long, 75 feet wide, and oriented in an east-west manner. The runway is capable of handling 100 percent of the small aircraft fleet and 100 percent of small airplanes with 10 or more passenger seats and is currently a visual approach only runway.

Given the results of the runway analysis presented in Chapter Three, the length and width of Runway 9-27 is sufficient to accommodate the majority of aircraft operating at the Airport. However, additional runway length could benefit larger and faster business jet aircraft by making the Airport more accessible during hot summer months. Additional runway length would also provide the opportunity for aircraft to take on more fuel, allowing for longer stage lengths. As such, a 997-foot runway extension to the west is proposed. Moreover, runway extension of 997 feet will keep the runway and its associated runway

protection zone (RPZ) on existing Airport property, and therefore, no property acquisition is required for this project.

Taxiway A currently provides direct access between the apron area and Runway 27, which does not meet FAA taxiway design standards. As such, a project is proposed to relocate the taxiway connector serving Runway 27 approximately 300 feet east, re-designate the existing 300-foot long blast pad as usable runway, and implement a 300-foot displaced threshold. This project, coupled with the 997-foot runway extension, ultimately increases the usable runway length for departures on Runway 27 to 6,100 feet. At 6,100 feet, the runway is capable of accommodating 75 percent of the business jet fleet at 60 percent useful load. The existing pavement strength of Runway 9-27 is 12,500 pounds SWL. This should be increased to 30,000 pounds SWL to better accommodate larger aircraft such as business jets in the future.

It should be noted that the runway safety area (RSA) and runway object free area (ROFA) will extend 140 feet beyond the physical end of Runway 27, as opposed to the 300-foot FAA standard for RDC B-II runways, using declared distances. Declared distances are a tool that may be utilized to obtain additional RSA and/or ROFA and limit or increase runway length. In this case, declared distances serving the ultimate Runway 9-27 will ensure that the RSA and ROFA will remain on Airport property and clear of the existing Airport service road. The implementation of declared distances will also ensure that the ultimate approach RPZ serving Runway 27 and the departure RPZ serving Runway 9 remain in their existing location. Ultimate declared distances imposed on Runway 9-27 are presented on **Exhibit 5A** and in **Table 5B**. The RSA and ROFA will extend the standard 300 feet beyond the end of Runway 9.

Declared distances represent the maximum distances available and suitable for meeting takeoff, rejected takeoff, and landing distance performance requirements for turbine powered aircraft. Declared distances include takeoff run available (TORA) and takeoff distance available (TODA), which apply to takeoff; accelerate stop distance available (ASDA), which applies to a rejected takeoff; and landing distance available (LDA), which applies to landing. Each declared distance can be defined as follows:

- TORA: the distance to accelerate from brake release to lift-off, plus safety factors.
- TODA: the distance to accelerate from brake release past lift-off to takeoff climb, plus safety factors.
- ASDA: the distance to accelerate from brake release to takeoff decision speed and then decelerate to a stop, plus safety factors.
- LDA: the distance from the threshold to complete the approach, touchdown, and decelerate to a stop, plus safety factors.

TABLE 5B
Runway 9-27 Declared Distances
Boulder City Municipal Airport

Category	Runway 9	Runway 27
LDA	5,940'	5,800'
ASDA	5,940'	6,100'
TORA	5,800'	6,100'
TODA	6,100'	6,100'

LDA: Landing Distance Available
 ASDA: Accelerate Stop Distance Available
 TORA: Takeoff Run Available
 TODA: Takeoff Distance Available
 Source: Coffman Associates' analysis.

While the existing Runway 9-27 has no RSA incompatibilities, multiple incompatibilities would be introduced with the construction of the western runway extension. The ultimate RSA would extend across an existing drainageway and would be penetrated by vegetation beginning approximately 500 feet west of the existing Runway 9 threshold. All vegetation within the ultimate RSA should be cleared and the drainageway either rerouted or culverted underground. The ultimate orientation of the drainageway will be determined during the engineering design phase of the runway extension project.

Currently, the ROFA and runway obstacle free zone (ROFZ) serving Runway 9-27 are obstructed by supplemental windcones serving Runways 9 and 27, each located approximately 150 feet from the runway centerline, as well as vegetation along the north and southeast sides of the runway. Under ultimate conditions, the ROFA and ROFZ serving the extended Runway 9-27 will be obstructed by vegetation on the western end of the runway. It is recommended that the ROFA and ROFZ be cleared of all obstructing vegetation and the windcones be relocated out of the ROFA and ROFZ at the same time of the proposed RSA improvements. All ROFA and ROFZ design and clearing standards should also be maintained upon the construction of the 997-foot western Runway 9-27 extension.

Exhibit 5A presents the proposed 6,100-foot ultimate Runway 9-27 and the RPZs associated with each end of the runway. The RPZ serving the extended Runway 9 remains within the Airport property boundary, while the existing and ultimate RPZ serving Runway 27 extends beyond Airport property encompassing approximately 6.75 acres of land owned by the Veterans Memorial Cemetery. As such, it is recommended that the Airport acquire an aviation easement over the uncontrolled property. An aviation easement should be sufficient to control airspace obstructions, but may not be adequate to ensure that on-the-ground improvements are not made. The RPZ cannot contain any improvements that will attract people, including residences, commercial/industrial uses, roads, etc. As long as the area remains free of these types of incompatible uses, the easement should be sufficient, and the land would not need to be acquired fee simple.

RUNWAY 15-33

As the crosswind runway, Runway 15-33 should be designed to accommodate the smaller aircraft that utilize BVU as high crosswind conditions impact them more. Runway 15-33 is 3,852 feet long and 75 feet wide, oriented in a northwest-southeast manner, with visual-only approach capabilities, and has a pavement strength rating of 12,500 pounds SWL. At its existing length, Runway 15-33 does not meet FAA requirements to accommodate 95 percent of the small general aviation aircraft fleet, which is 4,200 feet. The runway currently exceeds the 2.0 percent maximum longitudinal gradient standard by approximately 0.7 percent. Developments including a golf course and a water treatment facility located northwest and southeast of the runway respectively, as well as significant gradient issues and rising terrain to the north, have precluded extensions to Runway 15-33 in its current location.

To better meet the FAA's runway design standards, alternatives presented in Chapter Four analyzed runway extension options to the northwest, southwest, and a combination thereof. Given the previously mentioned conflicting land use constraints beyond the Airport property boundary, an extension to Runway 15-33 in its present orientation is not practical. Thus, the Master Plan Concept shifts Runway 15-33 approximately 1,000 feet west and extends the runway to 5,000 feet. The runway should be built to a strength rating of 15,000 pounds SWL to accommodate a wider array of category B-II aircraft. The runway relocation project will have significant cost associated with site preparation and grading to ensure the runway meets FAA gradient standards. The project will also include the removal and relocation of Taxiway B 1,000 feet to the west serving the relocated Runway 15-33.

Under ultimate conditions, Runway 15-33 will be upgraded to RDC B-II design standards requiring an RSA 150 feet wide and extending 300 feet beyond each runway end. Given that Runway 15-33 will ultimately be shifted 1,000 feet west and extended to 5,000 feet long, all B-II RSA clearing and grading requirements should be addressed upon the ultimate runway construction.

The existing ROFA and ROFZ serving Runway 15-33 are obstructed by the Airport service road as well as a supplemental windcone serving Runway 33 located approximately 140 feet from the runway centerline. ROFA and ROFZ obstructions previously identified in Chapter Four, including overgrown vegetation and the supplemental windcone serving Runway 15, have since been removed. Under ultimate B-II conditions, the ROFA serving Runway 15-33 will be 500 feet wide and extend 300 feet beyond each end of the runway. Given the ultimate Runway 15-33 relocation, it is recommended that all obstructing vegetation be cleared, and the supplemental windcones and Airport perimeter service road be located outside of the ultimate ROFA and ROFZ.

As presented on **Exhibit 5A**, the RPZ serving the ultimate Runway 15 extends off of Airport property to the north, encompassing approximately 12.1 acres of unowned property. Furthermore, the ultimate Runway 33 RSA, ROFZ, ROFA, and RPZ extend off of Airport property to the south, encompassing approximately 48.3 acres of uncontrolled property. Prior to relocating and extending Runway 15-33, it is recommended that the Airport acquire all property that would otherwise be unowned or uncontrolled.

In any event, Airport officials and the City of Boulder City should continue to monitor activity within the existing and proposed safety areas and RPZs serving all runways at the Airport and maintain them free of incompatible land uses to the extent practicable. Continued coordination with the FAA and NDOT officials will be important when implementing projects that could require changes to the existing RPZs at the Airport.

RUNWAY CONFIGURATION

For the operational safety and efficiency of an airport, it is desirable for the primary runway to be oriented as close as possible to the direction of the prevailing wind. This reduces the impact of wind components perpendicular to the direction of travel of an aircraft that is landing or taking off.

As detailed in Chapter Three, no single runway serving BVU provides sufficient wind coverage; therefore, FAA standards justify a two-runway system. Based solely upon wind coverage, Runway 15-33 is orientated in a manner that would be better justified as the primary runway serving BVU. However, when taking into consideration existing development including the golf course and water treatment facility, significant gradient issues, and rising terrain immediately to the north and northwest, Runway 15-33 will continue to be planned as the secondary or crosswind runway serving the Airport. Given that Runway 9-27 is currently and will remain the longest runway, can accommodate most aircraft currently utilizing and forecast to use the Airport, and has the greatest potential for expansion, it will remain as the primary runway in the ultimate design of the airfield system.

INSTRUMENT APPROACHES

As detailed earlier, BVU is not currently served by instrument approach capabilities; however, the Airport is seeking approval for a GPS-based localizer performance with vertical guidance (LPV) approach serving Runway 27. Thus, the Master Plan Concept considers implementing not lower than 1-mile visibility minimums serving Runway 27. The Airport is also served by four standard terminal arrival (STAR) procedures. STARs are typically used by air traffic control (ATC) to provide a seamless transition from the en route airspace structure to an instrument approach serving a specific airport. However, STARs can serve multiple airports as they typically end at a specified fix or navigational aid. If an airport has published and approved instrument approach procedures, the approach will generally begin where the STAR ends. Otherwise, aircraft utilizing the STAR can continue to their desired destination after departing the STAR. It is recommended that STARs serving BVU be maintained throughout the planning horizon.

Instrument approach procedures for the other runway ends are not planned; therefore, Runways 9, 15, and 33 will remain visual flight rule (VFR) runways.

VISUAL APPROACH AIDS

Future planning considers various enhancements to visual approach aids serving the runway system at BVU, as depicted on **Exhibit 5A**. Currently, each end of Runway 9-27 and Runway 33 is served by a two-box precision approach path indicator (PAPI-2) and all runway ends are served by runway end identifier lights (REILs).

Ultimately, four box PAPI-4s are planned to serve Runway 9-27 to further enhance the use of the runway as well as overall airfield safety. This system will provide pilots with improved visual approach guidance information during landings to the runway. A PAPI-2 is also recommended serving Runway 15, while the existing PAPI-2 serving Runway 33 should be maintained. The REILs serving Runways 9-27 and 15-33 should be maintained throughout the long term planning horizon.

HELIPAD LOCATION

At BVU, commercial air tour passenger operations are a significant portion of daily Airport activity. Most tour service providers conduct their operations via helicopters. Currently, the helipads are centrally located on the aircraft parking apron immediately north of Taxiway D. The majority of typical helicopter arrival and departure operations must cross Taxiway D as well as primary Runway 9-27 as the operations generally depart to and arrive from the south. This exercise becomes problematic due to the operational volume occurring at the Airport paired with the amount of coordination needed to safely operate fixed-wing and rotorcraft aircraft simultaneously on Taxiway D. Taxiway D is a highly traveled taxiway serving fixed-wing, rotorcraft, as well as ground-based vehicles. This mix of traffic causes increased congestion and potentially increases the chances of an accident.

Given the significant traffic volume that occurs in the central portion of the aircraft apron and along Taxiway D, it is recommended that Taxiway E be constructed to the south, serving Runway 9-27 as a full length parallel taxiway with 300 feet separation from runway centerline to taxiway centerline. The Master Plan Concept also includes a 125-foot extension of the apron area along the southern perimeter of the existing apron area. The safety and operational efficiency value of constructing Taxiway E and extending the apron area to the south is maximized by relocating the helipads to what is essentially an elongated helipad on the closed Runway 9L-27R. The proposed helipad is raised to meet gradient requirements for hover taxi operations on pier taxiways linking the apron area and the helipad pavement. This configuration will ultimately maximize the use of the extended apron while increasing operational safety by providing added safety margins for helicopter operators.

TAXIWAY DESIGN AND GEOMETRY ENHANCEMENTS

While no significant airfield capacity improvements should be necessary during the course of the planning period, the Master Plan Concept considers improving airfield efficiency through the implementation of relocated and additional taxiways. The taxiway system is planned to meet Taxiway Design Group (TDG) 2 standards, which calls for a taxiway width of 35 feet. The existing taxiway system already meets this design standard and all planned taxiway construction should also meet TDG 2 standards.

As mentioned in the previous section, ultimate Taxiway E is proposed south of the apron area, serving Runway 9-27 as a full length parallel taxiway located 300 feet from runway centerline. Ultimately, this will help relieve apron area congestion. An extension and displaced threshold serving Runway 9-27 would also necessitate the need for ultimate parallel Taxiway E to be extended east, eliminating direct access provided via Taxiway A, and west, to serve the runway's ultimate configuration. Furthermore, full length parallel Taxiway F is proposed on the southern side of Runway 9-27 with 300 feet centerline to centerline separation. Ultimately, Taxiway F will provide access to the southern aviation development area (to be discussed). Two entrance/exit taxiways are also proposed serving Runway 9-27 approximately 1,500 feet from each runway end.

FAA taxiway geometry standards maintain that the taxiway connector and holding position serving a runway threshold must be parallel to the corresponding runway centerline. The planned construction of a full length parallel Taxiway E will allow both the taxiway connector serving Runway 9 to be angled at 90 degrees perpendicular to Runway 9-27 and the holding position marking to be parallel with the runway centerline with a minimum of 200 feet runway centerline separation.

Under ultimate Runway 15-33 conditions, it is recommended that Taxiway B be relocated to the west and extended to serve the ultimate Runway 15-33 as a full length parallel taxiway providing 300 feet centerline to centerline separation. Similar to the taxiway system serving Runway 9-27, two additional entrance/exit taxiways are proposed serving Runway 15-33 approximately 1,250 feet from each end of the runway. Furthermore, it is recommended that when Runway 15-33 and Taxiway B are relocated and extended, that all taxiway connectors serving Runway 15-33 be oriented at 90 degrees perpendicular to the runway and holding position markings be placed parallel with the runway centerline with a minimum of 200 feet runway centerline separation.

Previously discussed in Chapters Three and Four, FAA taxiway design standards present the concept of the “high energy area.” The high energy area is defined as the middle third of a runway and is typically the location where aircraft are moving rapidly for takeoff or landing. Within this area, aircraft are more vulnerable to accidents with aircraft crossing through as they cannot readily slow or stop to avoid impacts. Current FAA guidance highly discourages the location of taxiways routing aircraft across a runway through the high energy area. Currently, full length parallel Taxiways D and B serving Runways 9-27 and 15-33 cross through the high energy areas of each respective runway due to the nature of the intersecting runway configuration. Given the efficiency and functionality provided by full length parallel taxiways, it would be highly inefficient in terms of airfield capacity and cost for the Airport to route all taxiways around the high energy areas of the intersecting runway configuration. Thus, it has been determined that high energy area crossings provided by existing Taxiways B and D and ultimate full length parallel Taxiways B, E, and F are justified and shall remain.

HOLDING BAYS

Taxiway holding bays improve taxiway circulation efficiency by providing a location for aircraft to perform engine run-up procedures and allow aircraft to bypass each other if necessary. Currently, holding bays are located near the ends of Runways 9-27 and 33. The existing holding bays serving Runways 27 and 15 extend beyond the corresponding runway threshold, which is a non-standard condition according to the FAA taxiway geometry guidelines. Moreover, all existing holding bays provide a wide expanse of pavement which is now considered non-standard design. As such, hold bays serving the extended Runway 9-27 are proposed on ultimate Taxiways E and F, while additional hold bays are proposed serving the relocated Runway 15-33 on Taxiway B. The hold bays depicted on **Exhibit 5A** reflect FAA’s design standards for holding bays and are sized to accommodate small and mid-sized business jet aircraft.

LANDSIDE DEVELOPMENT CONCEPT

The primary goal of landside facility planning is to provide adequate space to meet reasonably anticipated aviation needs, while also optimizing operational efficiency and land use. Achieving these goals yields a development scheme which segregates functional uses, while maximizing the Airport's revenue potential. Chapter Three identified several opportunities to improve the existing landside facilities to better accommodate future aviation demand. This section will specify the recommended improvements pertaining to landside facilities. Landside facilities can include terminal buildings, hangars, aircraft parking aprons, and aviation support services, as well as the utilization of remaining airport property to provide revenue support and to benefit the economic well-being of the regional area. Also important is identifying the overall land use classification of airport property to preserve the aviation purpose of the facility well into the future. **Exhibit 5A** presents the planned landside development for BVU.

As a nonhub primary commercial service airport, BVU is unique in that virtually all passenger enplanements occurring at the Airport are associated with air tour commercial operators. As such, the Airport does not conform to the typical commercial passenger service airports which offer national or regional passenger airlines with market-to-market transportation services. With that, the clear majority of landside development presented in the Master Plan Concept will accommodate the needs of air tour commercial operators as well as the general aviation operators present on the airfield.

It should be clearly stated and understood from the outset that the air tour operators based at BVU utilize privately owned terminal facilities and that the proposed Master Plan Concept presented is not intended to direct their development, but merely serve for advisory and planning purposes.

At present, air tour commercial and general aviation landside facilities are located on the north side of the airfield and include 49 separate hangar facilities providing approximately 378,250 square feet (sf) of hangar capacity, as well as aircraft apron space totaling approximately 79,600 square yards (sy).

Multiple layouts of potential landside facilities were presented in Chapter Four that included hangar development, aircraft apron layouts, and the placement of aviation support services. The Master Plan Concept provides a compilation of proposed landside facilities which attempts to maximize potential aviation development space on the airfield. Primarily, new development is planned near existing facilities in order to take advantage of existing infrastructure availability and reduce future development costs.

The major landside issues addressed in the Master Plan Concept include the following:

- Analyze the potential for additional infrastructure associated with air tour commercial operators and general aviation terminal facilities to meet future needs.
- Designate areas that can accommodate aviation development potential on the northwest, east, and southeast sides of the Airport to include aircraft storage hangars and aircraft apron space.

- Provide potential sites for a future aircraft rescue and firefighting (ARFF) building that could be coupled with a designated airport maintenance facility.
- Designate sites for a future potential airport traffic control tower (ATCT).
- Construct additional automobile parking and new Airport entrance road serving the southeast side of the airfield that extends from Quail Drive.

TERMINAL FACILITIES

As previously mentioned, passenger enplanements occurring at BVU are very unique in that they are primarily focused on air tourism. Analysis in Chapter Three examined air tour terminal space requirements based upon current and forecast passenger enplanement counts. Given that air tour service providers differ significantly from traditional air carriers, recommendations provided on the Master Plan Concept are for advisory purposes only. Furthermore, current air tour service providers operating at BVU conduct their operations primarily out of separate private facilities. Thus, the analysis provided in Chapter Three indicated terminal space requirements for a single facility based upon FAA guidance, which is geared toward more traditional air carrier terminal space requirements. Ultimately, the analysis indicated a need of approximately 5,350 sf of additional terminal space over the long term planning horizon. It should be noted that each air tour operator will determine their space allotments based on individualized business models and on an as-needed basis. Based upon this analysis, a suitable location for additional air tour terminal space could be positioned in the northwest or southeast development areas to be discussed later in this section.

Also examined in Chapter Three was the potential need for general aviation terminal facilities. Currently, general aviation terminal facilities at BVU are provided by FBOs in two locations. With the opening of the Boulder City Aviation Services FBO, there is now 6,650 sf of general aviation terminal space available. By the long term planning horizon, an additional 5,850 sf is needed. In the future, it is recommended that additional general aviation terminal facility space be provided on an as-needed basis. Similar to air tour terminal facilities, options for additional general aviation terminal space could be located within the northwest or southeast aviation development areas presented on the Master Plan Concept.

AIRCRAFT STORAGE HANGARS AND FUTURE AVIATION DEVELOPMENT

Analysis in Chapter Three indicated that an additional 101,150 sf of aircraft storage hangar capacity may be needed through the long term planning period in order to meet potential aviation demand. Recommended hangar development is proposed exclusively in the form of executive box and large conventional hangars. Again, future demand will dictate the size and type of hangar facilities that could be built.

As presented on **Exhibit 5A**, the Master Plan Concept shows 12 additional executive box hangars housed within five separate facilities on the northwestern side of the existing landside development. Hangar facilities are composed of three 120 x 200-foot hangars and two 100 x 300-foot hangars. The ultimate relocation of Runway 15-33 to the west allows for significant apron expansion in the proposed northwest development area. As such, an additional 250,450 sy of apron area is planned to serve the northwestern portion of the landside development area. Furthermore, the Master Plan Concept also proposes an apron extension along the southern edge of the current aircraft apron and Taxiway D. This proposed apron extension would add approximately 27,000 sy. Coupled with the previously discussed construction of Taxiway E and helipads, the usage of this apron extension could be maximized.

The Master Plan Concept also includes the proposed BFE FBO storage building located on the east side of the existing BFE FBO. The proposed facility will ultimately provide an estimated 4,560 sf of storage capacity.

On the eastern side of the airfield, an additional 12,300 sy of apron area is proposed. This apron will allow for additional aircraft operation and movement area near the existing general aviation hangars, self-service fueling facility, as well as allow space for an aircraft wash facility (to be discussed). Finally, additional landside development is proposed on the southeastern side of the airfield. The proposed southeast development area includes approximately 179,400 sy of apron area as well as a 100 x 300 foot, clearspan conventional hangar. Access to the runway system from the southeast apron will be via the proposed Taxiways B and F.

SUPPORT FACILITIES

As mentioned in Chapters Three and Four, support facilities are integral to the operation of the airport; however, the facilities are not categorized as airside or landside facilities. The facility requirements analysis identified several improvements that will ultimately contribute to the Airport's ability to accommodate the forecast aviation activity levels.

Airport Maintenance and Aircraft Rescue and Firefighting Facility

The Airport does not currently have a designated airport maintenance facility. At this time, Airport equipment is stored adjacent to the east and west sides of the Airport Administration building that houses the Boulder City Aviation Services FBO. Given that this area only provides for the outside storage of Airport equipment, two potential airport maintenance storage facility locations are identified on the Master Plan Concept.

Moreover, there is a great amount of tenant and Airport interest in the development of an ARFF facility on Airport property due to the level of operations currently occurring at BVU. As mentioned in Chapters

Three and Four, the FAA does not require the Airport to staff and maintain an ARFF facility as BVU is not currently certificated under 14 Code of Federal Regulations (CFR) Part 139 Certification of Airports. Given BVU's uncertificated status, an ARFF facility is not an FAA requirement, nor is federal funding available to the Airport for ARFF equipment and facilities. To become eligible for federal ARFF funding, the Airport could pursue the option of becoming a Part 139 certificated airport. However, this may not be desirable to the Airport from a staffing or financial standpoint. Other options for ARFF funding could include private operation of the ARFF facility through Airport user fees, establishing a joint-use facility for BVU and the City of Boulder City, or a combination of the two options. If justification for an ARFF facility exists, the ARFF facility and equipment could potentially be housed within the proposed Airport maintenance facility. Thus, the Master Plan Concept presents three locations for a facility that could accommodate Airport maintenance and ARFF needs. One location is identified immediately north of the existing Scenic/Grand Canyon Airlines hangar in the northwest development area, and a second location is identified immediately north of the existing based aircraft tiedown area on the eastern side of Airport Road. Finally, a third location is located immediately north of the existing general aviation aircraft storage hangars east of Taxiway A.

Airport Traffic Control Tower

Currently, BVU does not have an ATCT. However, as mentioned in Chapter Four, a 2011 Benefit/Cost (B/C) analysis study (an analysis used by the FAA to justify federal contract ATCTs) was completed by Quadrex Aviation—Airport Development Services. The study was conducted in accordance with FAA Report APO 90-7, "Establishment and Discontinuance Criteria for Air Traffic Control Towers," the guiding document outlining procedures for conducting the B/C analysis. The study concluded that BVU could potentially participate in the federal contract tower (FTC) program. Taking into consideration the results of the B/C analysis, Quadrex Aviation also conducted a preliminary site selection for the ATCT in June of 2015. The preliminary site selection study is included in **Appendix D**. Based upon the B/C and preliminary site selection completed by Quadrex Aviation, the Master Plan Concept presents the three most favorable future potential ATCT sites, with a fourth future potential site located in the southwest aviation development area on the south side of Runway 9-27. In the future, further planning and analysis may be required when justifying and selecting the most effective location for an ATCT.

Aircraft Wash Facility

The addition of an aircraft wash facility will provide for the collection of used aircraft oil and other hazardous materials, as well as provide a covered area for aircraft washing and light maintenance. The recommended location of the aircraft wash facility is on the east side of the airfield and directly south of the existing general aviation hangars.

Airport Utilities

At this time, any significant landside development, particularly on the southeastern side of the airfield, could be limited by the lack of existing utility infrastructure. Minimum water flow requirements (for sprinkler and firefighting purposes) may vary depending upon the type of hangars and facilities built, requiring more or less water storage and pumping capabilities. All future Airport development should consider enhancements to utility infrastructure that could include increased water storage and pumping capacity, sewer, and improved electrical and natural gas capabilities.

Airport Entrance Road and Automobile Parking

In addition to the existing Airport entrance, the Master Plan Concept considers a second entrance road serving the southeastern side of the Airport. The proposed second entry location extends from Quail Drive, continuing north and west providing vehicle parking and access to the proposed southeast development area.

ENVIRONMENTAL OVERVIEW

Analysis of the potential environmental impacts of recommended airport development projects, as discussed in this chapter and depicted on **Exhibit 5A**, is a key component of the Airport Master Plan process. The primary purpose of this Environmental Overview is to identify significance thresholds for the various resource categories contained in the FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, Exhibit 4-1 and FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementation Instructions for Airport Actions*, Table 7.1. The Environmental Overview then evaluates the development program to determine whether proposed actions could individually or collectively significantly affect the quality of the environment.

The construction of any improvements depicted on the recommended development concept plan would require compliance with NEPA to receive federal financial assistance or to obtain a federal approval (i.e., a federal action). For projects not “categorically excluded” under FAA Order 1050.1F, compliance with NEPA is generally satisfied through the preparation of an Environmental Assessment (EA). An EA is prepared when the initial review of the proposed action indicates that it is not categorically excluded, involves at least one extraordinary circumstance, or the action is not one known normally to require an Environmental Impact Statement (EIS). If none of the potential impacts are likely to be significant, then the responsible FAA official prepares a Finding of No Significant Impact (FONSI), which briefly presents, in writing, the reasons why an action, not otherwise categorically excluded, would not have a significant impact on the human environment and the approving official may approve it. Issuance of a FONSI signifies that FAA would not prepare an EIS and has completed the NEPA process for the proposed action.

In instances where significant environmental impacts are expected, an EIS may be required. An EIS is a clear, concise, and appropriately detailed document that provides agency decision-makers and the public with a full and fair discussion of significant environmental impacts of the proposed action and reasonable alternatives and implements the requirement in NEPA §102(2)(C) for a detailed written statement.

Potential Environmental Concerns

Table 5C summarizes potential environmental concerns associated with implementation of the Master Plan Concept. Analysis under NEPA includes direct, indirect, and cumulative impacts. Direct impacts are those caused by the action and occur at the same time and place (see 40 CFR § 1508.8(a)). Examples of direct impacts include:

- Construction of a facility or runway in a wetland which results in the loss of a portion of the wetland;
or
- Noise generated by the proposed action or alternative(s) which adversely affects noise-sensitive land uses.

Indirect impacts are those impacts caused by the action but are later in time or farther removed in distance, but are still reasonably foreseeable (see 40 CFR § 1508.8(b)). Indirect impacts may include growth-inducing impacts and other effects related to induced changes in the pattern of land use, population density or growth rate, and related impacts on air and water and other natural systems, including ecosystems (see 40 CFR § 1508.8(b)). Cumulative impacts are those that take into consideration the environmental impact of past, present, and future actions. Cumulative impacts would vary based on the project type, geographic location, potential to impact resources, and other factors, such as the current condition of potentially affected impact categories.

TABLE 5C
Summary of Potential Environmental Concerns
Boulder City Municipal Airport

Environmental Impact Category	Significance Threshold/ Factors to Consider	Potential Concern
Air Quality	<p>Threshold: The action would cause pollutant concentrations to exceed one or more of the National Ambient Air Quality Standards (NAAQS), as established by the United States (U.S.) Environmental Protection Agency (EPA) under the <i>Clean Air Act</i>, for any of the time periods analyzed, or to increase the frequency or severity of any such existing violations.</p>	<p>Potential Impact. As seen on Exhibit 2J in Chapter Two, annual operations are forecasted to increase through 2036. Additionally, there are capacity increases proposed in the development concept that could have impacts on local air quality, including the extensions to both runways, additional hangars, and parallel taxiways. Both the construction of these improvements, as well as the long term use of the facilities, could impact local air quality.</p> <p>Although the Las Vegas Valley (Hydrographic Area [HA] 212) (approximately 3.0 miles north of the Airport) is a maintenance area for Carbon Monoxide (CO) and Particulate Matter (PM₁₀)¹, Boulder City is in an area classified as attainment for all criteria pollutants regulated by the <i>Clean Air Act</i>. Because Boulder City is separated from the Las Vegas Valley by a mountain range that contains air pollutants within the Las Vegas Valley, activities at the Airport are not anticipated to be subject to regulation by the Clark County Department of Air Quality’s applicable Maintenance Plans. However, given the forecasted operational increases, as well as the planned capacity increasing projects, an emissions inventory under NEPA may be necessary for any proposed action that would result in a foreseeable increase in emissions due to its implementation. For construction emissions, a qualitative or quantitative emissions inventory under NEPA may be necessary, depending on the type of environmental review required for the project.²</p>

¹ Clark County Department of Air Quality, <http://www.clarkcountynv.gov/airquality/planning/Pages/StateImplementationPlans.aspx> (accessed December 4, 2017).

² FAA *Aviation Emissions and Air Quality Handbook*, Figure 4-2 (Determine Need for the Assessment) and Figure 4-3 (Air Quality Assessment Decision Flow Diagram) (January 2015).

<p>Biological Resources (including fish, wildlife, and plants)</p>	<p>Threshold: The U.S. Fish and Wildlife Service (FWS) or the National Marine Fisheries Service (NMFS) determines that the action would be likely to jeopardize the continued existence of a federally listed threatened or endangered species, or would result in the destruction or adverse modification of federally designated critical habitat.</p> <p>FAA has not established a significance threshold for non-listed species. However, factors to consider are if an action would have the potential for:</p> <ul style="list-style-type: none"> • Long term or permanent loss of unlisted plant or wildlife species; • Adverse impacts to special status species or their habitats; • Substantial loss, reduction, degradation, disturbance, or fragmentation of native species' habitats or their populations; or • Adverse impacts on a species' reproductive rates, non-natural mortality, or ability to sustain the minimum population levels required for population maintenance. 	<p><i>For federally-listed species: Potential Impact.</i> There are four species protected by the <i>Endangered Species Act</i> (ESA) with potential to occur near the Airport:</p> <ul style="list-style-type: none"> • Southwestern willow flycatcher (bird, endangered); • Yellow-billed cuckoo (bird, threatened); • Yuma clapper rail (bird, endangered); and • Desert Tortoise (reptile, threatened).³ <p>The southwestern willow flycatcher is typically found in dense riparian tree and shrub communities associated with rivers, swamps, and other wetlands including lakes and reservoirs.⁴ Although this type of habitat is not found on Airport property, this bird is known to occur in and around Boulder City and Clark County.⁵</p> <p>The yellow-billed cuckoo prefers woodlands, thickets, orchards, and streamside groves.⁶ This species is known to occur in Boulder City, Clark County, and the areas surrounding. Given the potential occurrence of both the southwestern willow flycatcher and yellow-billed cuckoo, it is possible that bird surveys and/or biological assessment would be required prior to construction, as well as consultation with the USFWS to determine the impact, if any, that proposed construction at the Airport may have.</p> <p>The Yuma clapper rail is a water bird whose known range occurs approximately 6.50 miles east of the Airport along the Colorado River. Further, the USFWS does not list Clark County as a region of Arizona with known occurrences of the Yuma clapper rail.⁷ This species is therefore not anticipated to be impacted by proposed construction on Airport property.</p>
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³ U.S. Fish and Wildlife Service Information for Planning and Conservation report (accessed December 6, 2017).
⁴ U.S. Fish and Wildlife Service Nevada Fish and Wildlife Office, https://www.fws.gov/nevada/protected_species/birds/species/swwf.html (accessed January 3, 2018).
⁵ U.S. Fish and Wildlife Service Environmental Conservation Online, Species Profile for southwestern willow flycatcher, <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=B094> (accessed January 3, 2018).
⁶ Audubon Bird Guide, Guide to North American Birds, <http://www.audubon.org/field-guide/bird/yellow-billed-cuckoo> (accessed January 3, 2018).
⁷ U.S. Fish and Wildlife Service Environmental Conservation Online, Species Profile for Yuma clapper rail, <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=B00P> (accessed January 3, 2018).

The desert tortoise lives in a variety of habitats from sandy flats to rocky foothills, including alluvial fans, as well as washes and canyons with suitable soils for den construction.⁸ The desert tortoise is known to occur in Boulder City and Clark County.⁹ Further, designated critical habitat for this species is found approximately 1.25 miles south of the Airport. Given the proximity of the critical habitat, as well as the known occurrence throughout the region, it is possible for this species to be encountered during construction. Consultation with the USFWS may be required prior to construction as a result.

*For designated critical habitat: **No Impact.*** There is designated critical habitat located approximately 1.25 miles south of the Airport; however, activities at the Airport would not impact this critical habitat.

*For non-listed species: **Potential Impact.*** Non-listed species of concern include those protected by the *Migratory Bird Treaty Act* and the *Golden and Bald Eagle Protection Act*. There are presently 16 non-listed species of concern that could be impacted by activities at the Airport, including the: Bald eagle, Bendire's thrasher, black-chinned sparrow, burrowing owl, Clark's grebe, Costa's hummingbird, gilded flicker, gray vireo, Lawrence's goldfinch, Le Conte's thrasher, long-billed curlew, marbled godwit, rufous hummingbird, snowy plover, whimbrel, and willet. Several of these birds are known to breed near the Airport. Although Airport property and adjacent areas are primarily barren, desert lands, there are nearby trees and green spaces, including two golf courses to the east, that could provide roosting and/or foraging habitat for the above mentioned migratory birds. Conducting bird surveys prior to development may be required to identify mitigation for potential harm to nests and/or ground-dwelling birds.

⁸ U.S. Fish and Wildlife Service Nevada Fish and Wildlife Office, https://www.fws.gov/nevada/desert_tortoise/dt/dt_life.html (accessed January 3, 2018).

⁹ U.S. Fish and Wildlife Service Environmental Conservation Online, Species Profile for desert tortoise, <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=C04L#crithab> (accessed January 3, 2018).

<p>Climate</p>	<p>FAA has not established a significance threshold for Climate; refer to FAA Order 1050.1F’s Desk Reference and/or the most recent FAA <i>Aviation Emissions and Air Quality Handbook</i> for the most up-to-date methodology for examining impacts associated with climate change.</p>	<p>Potential Impact. An increase in greenhouse gas (GHG) emissions could occur over the 20-year planning horizon of the Airport Master Plan. As operations and based aircraft forecasts are projected to increase, additional storage facilities would be constructed, as demand dictates. Increased operations and facilities at the Airport may result in added Airport users who would require vehicles to get to and from the Airport, with additional potential to increase emissions.</p>
<p>Coastal Resources</p>	<p>FAA has not established a significance threshold for Coastal Resources.</p>	<p>No Impact. The Airport is not located within a designated coastal zone.</p>
<p><i>Department of Transportation (DOT) Act: Section 4(f)</i></p>	<p>Threshold: The action involves more than a minimal physical use of a Section 4(f) resource or constitutes a “constructive use” based on an FAA determination that the aviation project would substantially impair the Section 4(f) resource. Resources that are protected by Section 4(f) are publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance; and publicly or privately-owned land from an historic site of national, state, or local significance. Substantial impairment occurs when the activities, features, or attributes of the resource that contribute to its significance or enjoyment are substantially diminished.</p>	<p>No Impact. There are no wilderness areas, wildlife refuges or properties included in the National Register of Historic Places (NRHP) that would be impacted by proposed development given the distance from the resources to the Airport.</p> <p>The closest public park is Veteran’s Memorial Park, which is less than 0.10 mile east of the Airport (see Exhibit 5B). The closest recreation areas are Boulder Creek Golf Course (0.10 miles east) and Boulder City Municipal Golf Course (0.10 miles southeast), both of which are public golf courses (see Exhibit 5B). The closest historical resource is the Boulder City Historic District, 1.4 miles northeast of the Airport. The Eldorado Wilderness Area is 4.6 miles southeast of the Airport, and the Desert National Wildlife Range Refuge is 26.8 miles northwest of the Airport.</p>
<p>Farmlands</p>	<p>Threshold: The total combined score on Form AD-1006, <i>Farmland Conversion Impact Rating</i>,” ranges between 200 and 260. Form AD-1006 is used by the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) to assess impacts under the <i>Farmland Protection Policy Act</i> (FPPA).</p>	<p>No Impact. Based on the USDA NRCS Web Soil Survey, none of Airport property or adjacent lands are considered prime farmland.¹⁰ Therefore, proposed construction would not impact any farmlands protected by the FPPA.</p>

¹⁰ **Prime farmland** is land having the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimal use of fuel, fertilizer, pesticides, or products (7 CFR § 657.5).



Hazardous Materials, Solid Waste, and Pollution Prevention

FAA has not established a significance threshold for Hazardous Materials, Solid Waste, and Pollution Prevention. However, factors to be considered are if an action would have the potential to:

- Violate applicable federal, state, tribal, or local laws or regulations regarding hazardous materials and/or solid waste management;
- Involve a contaminated site;
- Produce an appreciably different quantity or type of hazardous waste;
- Generate an appreciably different quantity or type of solid waste or use a different method of collection or disposal and/or would exceed local capacity; or
- Adversely affect human health and the environment.

No Impact. There are no documented Superfund¹¹ sites, brownfields,¹² or hazardous waste¹³ facilities on or near Airport property.

The Airport has an aviation fuel farm on the southeast end of the airfield, adjacent to the hangar area and Runway 9 end. There are two 20,000-gallon above ground storage tanks and two 12,000-gallon underground storage tanks. Other than some surface contamination on surrounding pavement, the potential for exposure of aviation fuel to stormwater runoff is low at the Airport. Additionally, the Airport maintains spill response procedures to minimize non-stormwater discharges from contaminating waterways.¹⁴

The recommended development concept does not anticipate land uses that would produce an appreciably different quantity or type of hazardous waste. However, should this type of land use be proposed, further NEPA review and/or permitting would be required.

Construction and demolition waste would be generated because of development proposed in the Master Plan. Construction and demolition waste, along with all other types of non-hazardous solid waste, would be hauled to the Boulder City Landfill, approximately 3.5 miles east of the Airport.¹⁵

¹¹ A **Superfund** site is any land in the U.S. that has been contaminated by hazardous waste and identified by the EPA as a candidate for cleanup as it poses a human health risk and/or the environment (U.S. Department of Health and Human Services).

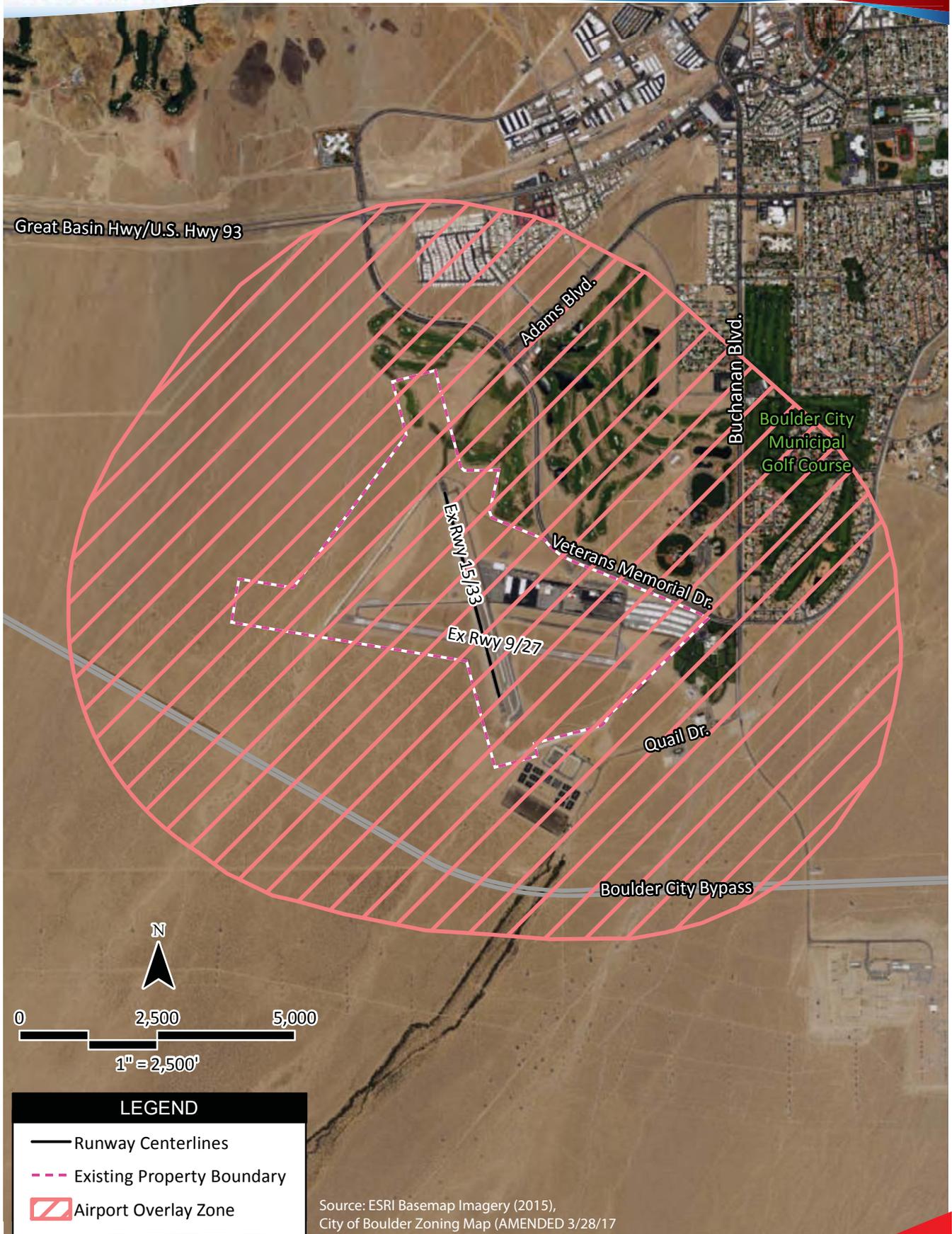
¹² A **brownfield** is a property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutants, or contaminant (U.S. EPA).

¹³ **Hazardous waste** is a type of solid waste that has at least one of four characteristics: ignitability, corrosivity, reactivity, or toxicity (FAA, 40 CFR § 261.3).

¹⁴ *Stormwater Pollution Prevention Plan*, Section 2.1: Non-Stormwater Discharges Documentation (June 2011).

¹⁵ <https://www.bcnv.org/290/Landfill> (accessed December 6, 2017).

<p>Historical, Architectural, Archaeological, and Cultural Resources</p>	<p>FAA has not established a significance threshold for Historical, Architectural, Archaeological, and Cultural Resources. Factors to consider are if an action would result in a finding of “adverse effect” through the Section 106 process. However, an adverse effect finding does not automatically trigger preparation of an EIS (i.e., a significant impact).</p>	<p>Potential Impact. There are two sites listed on the NRHP within two miles of the Airport; however, proposed construction would not impact these historical resources.</p> <p>There are areas of proposed development at the Airport that are previously undisturbed. Specifically, several areas are proposed to be paved that are previously undeveloped, as well as additional roads, parking areas, and buildings that are on undeveloped areas of the Airport. If these undisturbed areas of the Airport should be subject to ground disturbance, a cultural resources survey may be necessary to determine the potential presence of historical or cultural resources.</p> <p>There are no tribal lands that would be impacted by construction as the closest such area is over 20 miles away from the Airport.</p>
<p>Land Use</p>	<p>FAA has not established a significance threshold for Land Use. There are also no specific independent factors to consider. The determination that significant impacts exist is normally dependent on the significance of other impacts.</p>	<p>Direct Impact. Boulder City’s existing land use map was updated in February 2015. The Airport property, as well land to the south, including the wastewater treatment facility and Veterans Memorial Cemetery, are considered public land uses. East of the Airport are primarily parks and recreation uses, including the Boulder Creek Golf Course, Veterans Memorial Park, and Xeriscape Park. There are also some single family residential uses to the southeast. Land is vacant to the north and west of the Airport.</p> <p>Additionally, the Boulder City Bypass is presently being constructed, stretches of which are approximately 0.50 mile south of the Airport. Project completion is slated for 2018. The entire project will construct approximately 15 miles of a four-lane highway between a western boundary at the end of Interstate 515 on U.S. Highway 93/U.S. Highway 95 in Henderson, Nevada, and an eastern boundary on U.S. Highway 93, about 0.75 mile east of the Hacienda Hotel and Casino near the Hoover Dam. Approximately two miles of the Boulder City Bypass is within the Airport Overlay Zone.</p> <p>Boulder City has enacted an Airport Overlay Zone (see Exhibit 5C) that encompasses all existing and proposed future Airport property, as well as the area north up to Great Basin Highway/ U.S. High-</p>



		<p>way 93, south and west along the Boulder City Bypass (not yet complete), and to the edge of Boulder City Municipal Golf Course to the west. This Airport Overlay Zone is created by Chapter 22 of the Boulder City Municipal Code. Within this Zone, there are height limitations and protections against structures that would create electrical or lighting interference with navigational and communication aids.</p> <p>The proposed development concept shows development occurring on existing Airport property, as well as within areas proposed for acquisition. Specifically, there are approximately 63 acres slated for acquisition, including:</p> <ul style="list-style-type: none"> • 48.3 acres south of the Runway 33 end; • 2.6 acres west of the Runway 9 end; and, • 12.1 acres north of the Runway 15 end. <p>The 48.3-acre acquisition is in primarily vacant land; however, part of it is in area reserved for the wastewater treatment plant. This land acquisition should be coordinated with the wastewater treatment plant. The 2.6-acre and 12.1-acre acquisitions are in vacant, undeveloped land. There are no homes or businesses that would require relocation as part of this proposed land acquisition.</p> <p>In addition to traditional property acquisition, there are 6.75 acres of property in the approach and departure RPZ for Runway 27 that are currently not owned by the Airport. To fully protect this RPZ, an aviation easement in this area is proposed.</p>
<p>Natural Resources and Energy Supply</p>	<p>FAA has not established a significance threshold for Natural Resources and Energy Supply. However, factors to consider are if an action would have the potential to cause demand to exceed available or future supplies of these resources.</p>	<p>No Impact. Planned development projects at the Airport could increase demands on energy utilities, water supplies and treatment, and other natural resources during construction; however, impacts are not anticipated to be long-term. Should long-term impacts be a concern, coordination with Boulder City and service providers is recommended. Chapter One describes existing service utility providers for the Airport.</p>

**Noise and Noise-
Compatible Land
Use**

Threshold: The action would increase noise by Day-Night Average Sound Level (DNL) 1.5 decibel (dB) or more for a noise-sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65 dB level due to a DNL 1.5 dB or greater increase, when compared to the no action alternative for the same timeframe.

Another factor to consider is that special consideration needs to be given to the evaluation of the significance of noise impacts on noise-sensitive areas within Section 4(f) properties where the land use compatibility guidelines in Title 14 Code of Federal Regulations (CFR) Part 150 are not relevant to the value, significance, and enjoyment of the area in question.

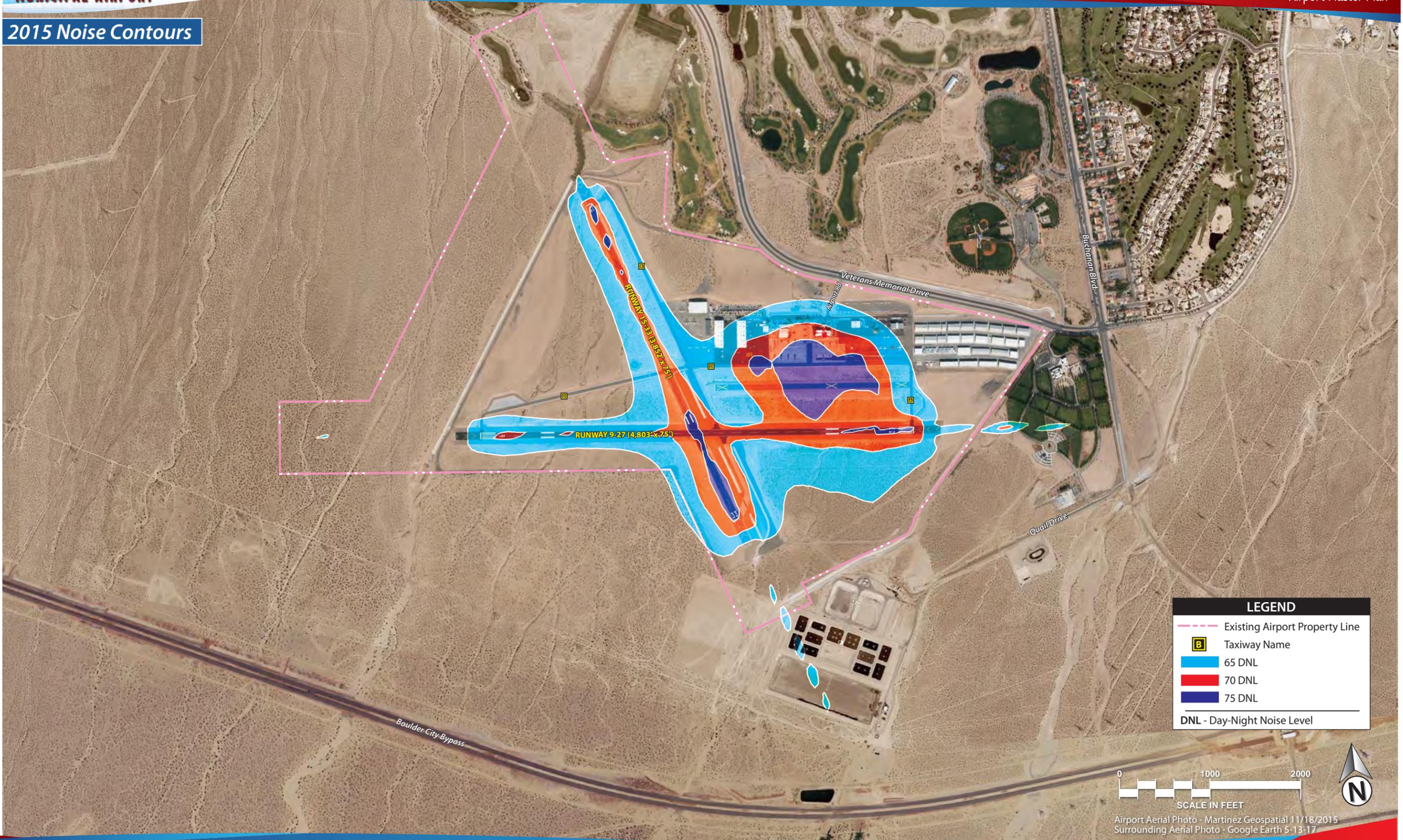
No Impact. The Airport’s existing (2015) and ultimate (2035) DNL noise exposure contours are shown on **Exhibit 5D** and **Exhibit 5E**, respectively. The contours include the 65, 70, and 75 DNL.¹⁶ The FAA’s threshold for compatibility with noise-sensitive land uses is the 65 DNL contour.

The closest noise-sensitive uses near the Airport is the neighborhood just east of Buchanan Boulevard. However, neither the existing and future noise contours extend into this residential area. The current noise contours remain mostly on Airport property, except for south of Runway end 33 over the wastewater treatment facility and east of the Runway 27 end, over the Southern Nevada Veterans Memorial Cemetery. The 65 DNL noise contour extends to the south over the wastewater treatment facility, which is considered a compatible use within this contour. The 65 and 70 DNL contours that extend east over the cemetery are also considered compatible. There are no Section 4(f) properties impacted by the existing noise condition.

In the future noise condition (2035), the noise contours extend off of Airport property to the south and east, similar to the existing condition. Additionally, the 65 DNL noise contour, as well as a small area of the 70 DNL noise contour, extend off Airport property west of the ultimate Runway 33 end. Due to the proposed Runway 15-33 shift to the west, the 65 DNL noise contour that extends to the south no longer encompasses the wastewater treatment facility. Rather, the noise contour now extends over the future Boulder City Bypass, a compatible use. The 65 and 70 DNL noise contour, like the existing condition, extend to the east of the Runway 27 end over the Southern Nevada Veterans Memorial Cemetery, which is considered compatible within these noise contours. There are no Section 4(f) properties implicated in the future noise condition.

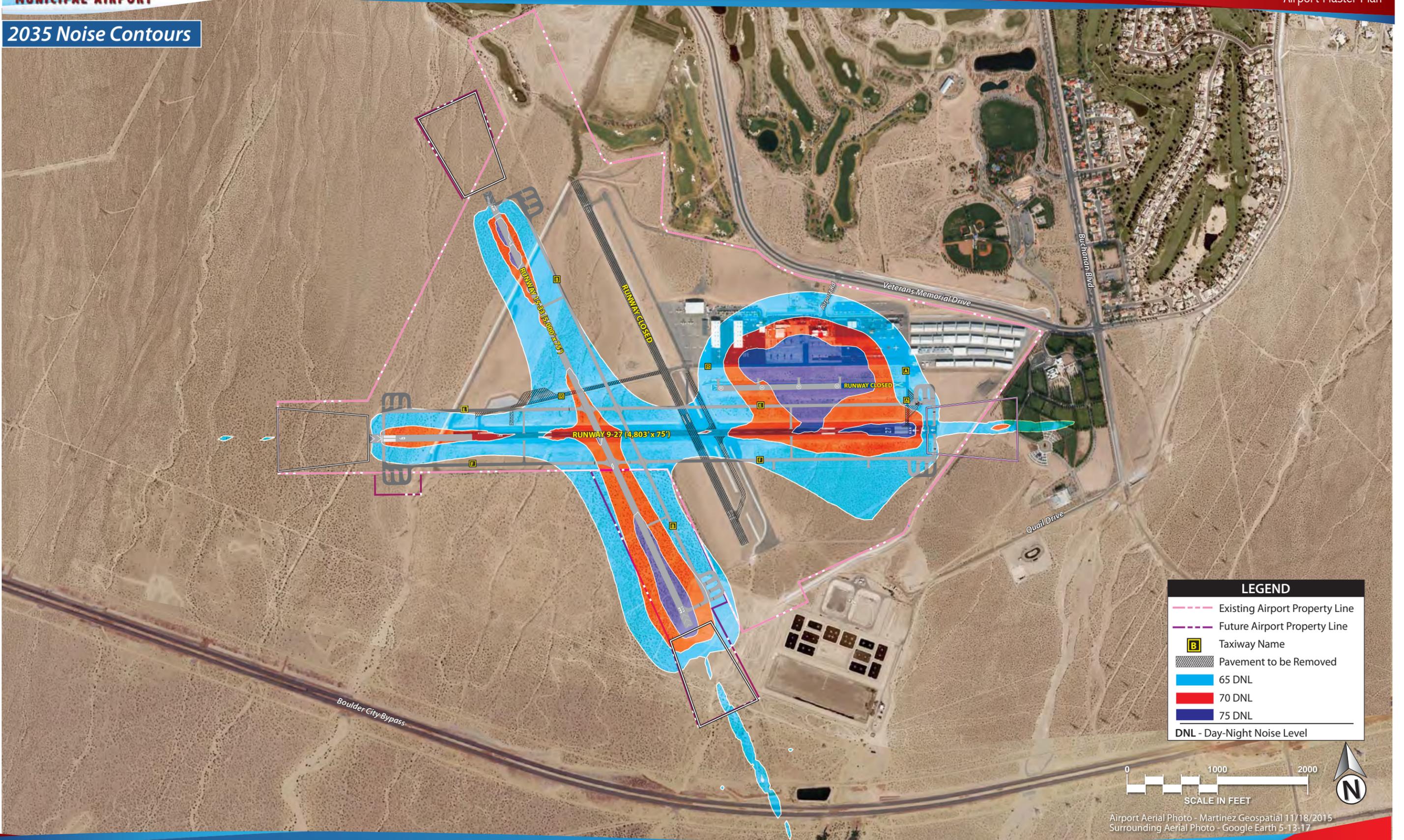
¹⁶ **Day-Night Average Sound Level (DNL):** The 24-hour average sound level, in decibels, for the period from midnight to midnight, obtained after the addition of ten decibels to sound levels for the periods between midnight and 7 a.m., and between 10 p.m., and midnight, local time. The symbol for DNL is Ldn (See 14 CFR § 150.7).

2015 Noise Contours



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2035 Noise Contours



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Socioeconomic Impacts, Environmental Justice, and Children’s Environmental Health and Safety Risks

Socioeconomic Impacts

FAA has not established a significance threshold for socioeconomic impacts. However, factors to consider are if an action would have the potential to:

- Induce substantial economic growth in an area, either directly or indirectly (e.g., through establishing projects in an undeveloped area);
- Disrupt or divide the physical arrangement of an established community;
- Cause extensive relocation when sufficient replacement housing is unavailable;
- Cause extensive relocation of community businesses that would cause severe economic hardship for affected communities;
- Disrupt local traffic patterns and substantially reduce the levels of service of roads serving the Airport and its surrounding communities; or
- Produce a substantial change in the community tax base.

No Impact. Proposed development projects would occur primarily on existing Airport property, except for the Runway 15-33 extension and Taxiway F holding bay for Runway 9. Projects proposed in areas presently not owned by the Airport are concentrated on the west side of the airfield, which would not impact any residential areas.

The proposed projects could result in temporary disruption of local traffic patterns during the construction phase. Specifically, construction on the east side of the Airport may result in additional construction vehicles entering and exiting Veterans Memorial Drive to and from Airport property. Additionally, the proposed roadway extension from the Airport to Quail Drive could impact traffic to and from the wastewater treatment plant. However, these projects are anticipated to be temporary in nature and would not result in long term impacts to the surrounding community.

As mentioned previously, there are several areas of land slated for acquisition. None of these areas contain homes or businesses that would require relocation. Additionally, there is potential for increased economic activity given the capacity-increasing components of the development concept, specifically the additional hangar space and runway extensions. Should substantial impacts to the community’s tax base be anticipated, further evaluation as proposed projects progress would be recommended.

<p>Environmental Justice</p>	<p>FAA has not established a significance threshold for Environmental Justice. However, factors to consider are if an action would have the potential to lead to a disproportionately high and adverse impact to an environmental justice population (i.e., a low-income or minority population) due to:</p> <ul style="list-style-type: none"> • Significant impacts in other environmental impact categories; or • Impacts on the physical or natural environment that affect an environmental justice population in a way that FAA determines is unique to the environmental justice population and significant to that population. 	<p>No Impact. The Airport is in census tract¹⁷ 55.01, in which poverty status has been determined for 3,850 people. Within this census tract, approximately 45 percent (ages 18 to 64) of the population is considered below the poverty level and almost nine percent are considered a minority.¹⁸</p> <p>The closest residences are approximately 0.10 mile from the Airport, just east of Buchanan Boulevard. However, per the EPA’s Environmental Justice Screening and Mapping Tool, these nearby residences are not considered subsidized or public housing. The closest public housing development is approximately 1.3 miles northeast of the Airport. Therefore, it is not expected that construction would result in disproportionately high and/or adverse impacts to environmental justice populations in Boulder City.</p>
<p>Children’s Environmental Health and Safety Risks</p>	<p>FAA has not established a significance threshold for Children’s Environmental Health and Safety Risks. However, factors to consider are if an action would have the potential to lead to a disproportionate health or safety risk to children.</p>	<p>No Impact. The nearest education facility is Mitchell Elementary School, which is approximately 1.5 miles east of the Airport. Veterans Memorial Park is the closest public park, approximately 0.10 east of the Airport. Disproportionate health or safety risks to children are not anticipated.</p>
<p>Visual Effects</p>		
<p>Light Emissions</p>	<p>FAA has not established a significance threshold for Light Emissions. However, a factor to consider is the degree to which an action would have the potential to:</p> <ul style="list-style-type: none"> • Create annoyance or interfere with normal activities from light emissions; and • Affect the visual character of the area due to the light emissions, including the importance, uniqueness, and aesthetic value of the affected visual resources. 	<p>No Impact. The primary recommendations related to lighting include upgrading the MIRL on the ultimate Runway 9-27 from PAPI-2s to PAPI-4s. As the runways are extended, additional MIRL would be added to accommodate the new pavement. The REILs for each runway would also be relocated as they are extended, and in the case of Runway 15-33, shifted west 1,000 feet. Additionally, the ultimate Runway 15 end will be outfitted with PAPI-2s. Existing taxiways have MITL, which would be incorporated to all ultimate taxiways at each runway turnoff. Lastly, all airfield and land-side lighting would be transitioned to LED technology.</p> <p>Further, the addition of lighting to proposed buildings, like additional hangars and parking areas, would increase the amount of light emissions</p>

¹⁷ **Census Tracts** are small, relatively permanent statistical subdivisions of a county that contain between 1,200 and 8,000 persons, averaging around 4,000 inhabitants (U.S. Census Bureau).

¹⁸ Minorities include Black or Africa American, American Indian, Asian, Native Hawaiian and other Pacific Islander, some other race, and two or more races (American Community Survey 2012-2016, Table S1701: Poverty Status in the Past 12 Months).

		<p>on Airport property. This additional lighting is not anticipated to cause impacts to nearby residences as there are elements on and off Airport property that would block light emanating from the Airport. Specifically, the Boulder Creek Golf Club, Veterans Memorial Highway, and Veterans Memorial Park serve as buffers along the eastern side of the Airport which would reduce the amount of light exposure to residences farther east.</p> <p>Light-sensitive species that hunt, migrate, or mate at night near the Airport are likely already acclimated to Airport lights. The change in lighting due to the recommended Master Plan Concept is not anticipated to cause undue stress.</p>
<p>Visual Resources/Visual Character</p>	<p>FAA has not established a significance threshold for Visual Resources/Visual Character. However, a factor to consider is the extent an action would have the potential to:</p> <ul style="list-style-type: none"> • Affect the nature of the visual character of the area, including the importance, uniqueness, and aesthetic value of the affected visual resources; • Contrast with the visual resources and/or visual character in the study area; and • Block or obstruct the views of the visual resources, including whether these resources would still be viewable from other locations. 	<p>No Impact. Full buildout of the proposed development concept would change the visual character of the Airport. However, although the Airport Overlay Zone states that the Planning Commission should consider the location of facilities on Airport property and the impact on the viewshed of nearby residential areas, a negative impact on the viewshed should not be the determining factor in a denial of application, but rather apply mitigation measures if possible.¹⁹ The Boulder City Municipal Code thus sets the standard that the Airport be allowed to erect facilities pertinent to the safe and efficient operation of the Airport, but should mitigate negative visual impacts, if any.</p>

¹⁹ Boulder City Municipal Code, Chapter 22: Airport Zone, Section 11-22-3, subsection 2.

Water Resources (including Wetlands, Floodplains, Surface Waters, Groundwater, and Wild and Scenic Rivers)		
Wetlands	<p>Threshold: The action would:</p> <ol style="list-style-type: none"> 1. Adversely affect a wetland’s function to protect the quality or quantity of municipal water supplies, including surface waters and sole source and other aquifers; 2. Substantially alter the hydrology needed to sustain the affected wetland system’s values and functions or those of a wetland to which it is connected; 3. Substantially reduce the affected wetland’s ability to retain floodwaters or storm runoff, thereby threatening public health, safety or welfare (the term welfare includes cultural, recreational, and scientific resources or property important to the public); 4. Adversely affect the maintenance of natural systems supporting wildlife and fish habitat or economically important timber, food, or fiber resources of the affected or surrounding wetlands. 5. Promote development of secondary activities or services that would cause the circumstances listed above to occur; or 6. Be inconsistent with applicable state wetland strategies. 	<p>No Impact. Per the USFWS National Wetlands Inventory, there are no wetlands on or near Airport property.²⁰</p>
Floodplains	<p>Threshold: The action would cause notable adverse impacts on natural and beneficial floodplain values. Natural and beneficial floodplain values are defined in Paragraph 4.k of DOT Order 5650.2, <i>Floodplain Management and Protection</i>.</p>	<p>No Impact. There is a 100-year floodplain approximately 0.25 mile to the south and east of the Airport along Georgia Avenue Wash (see Exhibit 5B), which is contained in a channel. There is another floodplain 0.5 mile to the north of the Airport. Given the distance from proposed projects and these floodplains, no impact is anticipated.</p>

²⁰ Note that USFWS National Wetlands Inventory aerial image data is from the 1980s.

Surface Waters

Threshold: The action would:

- 1. Exceed water quality standards established by federal, state, local, and tribal regulatory agencies; or**
- 2. Contaminate public drinking water supply such that public health may be adversely affected.**

Factors to consider are when a project would have the potential to:

- Adversely affect natural and beneficial water resource values to a degree that substantially diminishes or destroys such values;
- Adversely affect surface water such that the beneficial uses and values of such waters are appreciably diminished or can no longer be maintained and such impairment cannot be avoided or satisfactorily mitigated; or
- Present difficulties based on water quality impacts when obtaining a permit or authorization.

No Impact. There are no surface waters on Airport property. There are two riverines off Airport property, one south of the Airport and one to north; however, these appear to be seasonally dry and would not be impacted by proposed construction.

In addition to surface waters, there is a drainage system on and off Airport property (see **Exhibit 5B**). Per the Airport's *Stormwater Pollution Prevention Plan* (June 2011), the Airport is bounded on the west by a Clark County Regional Flood Control District (CCRFCD) concrete channel and on the east by a CCRFCD soil cement channel. On the northwest border of the Airport there is a berm which directs runoff to the concrete channel on the west side of the Airport. Because the Airport is surrounded by these manmade physical features, the watershed is contained entirely within the limits of the Airport.

Additionally, the Airport maintains stormwater control measures to eliminate any unauthorized non-stormwater discharge. Should a spill occur, the exposure would be minimized by immediately locating the discharge and containing it prior to it flowing to or discharging into any outfall or off any impervious surface with spill response equipment. Should any of the contaminants come into contact with pervious surfaces on Airport, the contaminated material would be discarded. If the spill is too large for the Airport to handle on its own, a HazMat company would be contacted for further clean up.²¹

²¹ *Stormwater Pollution Prevention Plan for Boulder City Municipal Airport*, June 2011.

Groundwater	<p>Threshold: The action would:</p> <ol style="list-style-type: none"> 1. Exceed groundwater quality standards established by federal, state, local, and tribal regulatory agencies; or 2. Contaminate an aquifer used for public water supply such that public health may be adversely affected. <p>Factors to consider are when a project would have the potential to:</p> <ul style="list-style-type: none"> • Adversely affect natural and beneficial groundwater values to a degree that substantially diminishes or destroys such values; • Adversely affect groundwater quantities such that the beneficial uses and values of such groundwater are appreciably diminished or can no longer be maintained and such impairment cannot be avoided or satisfactorily mitigated; or • Present difficulties based on water quality impacts when obtaining a permit or authorization. 	<p>Indirect Impact. Airport projects, such as additional hangars, buildings, taxiways, runway pavement, and other impervious surfaces, would increase the amount of runoff from the Airport and potentially compromise the quantity of groundwater available. However, groundwater is not the primary source of potable water in Boulder City. Rather, the City’s source of water supply is from Lake Mead on the Colorado River, provided via three independent transmission systems. The Lake Mead supply is obtained from the U.S. Bureau of Reclamation Water System for untreated use, and the Southern Nevada Water System for potable and untreated water.²²</p>
Wild and Scenic Rivers	FAA has not established a significance threshold for Wild and Scenic Rivers.	No Impact. There are no federally designated Wild and Scenic Rivers near the Airport.

RECYCLING PLAN

The *FAA Modernization and Reform Act of 2012 (FMRA)*, which amended Title 49, United States Code (USC), included several changes to the Airport Improvement Program (AIP). Two of these changes are related to recycling, reuse, and waste reduction at airports.

- Section 132 (b) of the FMRA expanded the definition of airport planning to include “developing a plan for recycling and minimizing the generation of airport solid waste, consistent with applicable State and local recycling laws, including the cost of a waste audit.”
- Section 133 of the FMRA added a provision requiring airports that have or plan to prepare a master plan, and that receive AIP funding for an eligible project, to ensure that the new or updated master plan addresses issues relating to solid waste recycling at the airport, including:
 - The feasibility of solid waste recycling at the airport;
 - Minimizing the generation of solid waste at the airport;
 - Operation and maintenance requirements;
 - A review of waste management contracts; and,
 - The potential for cost savings or the generation of revenue.

²² *Boulder City Master Plan*, updated February 2015.

WASTE STREAM INPUTS

Understanding Boulder City Municipal Airport's waste stream requires consideration of the types of waste typically generated at airports. Generally, waste from airports can be divided into eight categories, with additional types of municipal solid waste (MSW).²³

- **Municipal Solid Waste**, more commonly known as trash or garbage, consists of everyday items that are used and then discarded, like product packaging. The following subcategories are either combined with MSW or sorted separately depending on the airport.
 - **Construction and Demolition Waste (C&D)** is considered non-hazardous trash resulting from land clearing, excavation, demolition, renovation or repair of structures, roads and utilities, including concrete, wood, metals, drywall, carpet, plastic, pipe, cardboard, and salvaged building components.
 - **Green Waste** is yard waste consisting of tree, shrub and grass clippings, leaves, weeds, small branches, seeds, and pods.
 - **Food Waste** includes unconsumed food products or waste generated and discarded during food preparation.
 - **Deplaned Waste** is waste removed from passenger aircrafts. Deplaned waste includes bottles, cans, newspaper, mixed paper (newspaper, napkins, paper towels), plastic cups, service ware, food waste, and food soiled paper/packaging.
- **Lavatory Waste** is a special waste that is emptied through a hose and pumped into a lavatory service vehicle. The waste is then transported to a triturator²⁴ facility for pretreatment prior to discharge in the sanitary sewage system.
- **Spill Clean and Remediation Wastes** are also special wastes that are generated during cleanup of spills and/or the remediation of contamination.
- **Hazardous Wastes** are governed by the *Resource Conservation and Recovery Act*, as well as the regulations in 40 CFR Subtitle C, Parts 260 to 270. The EPA developed less stringent regulations for certain hazardous waste, known as universal waste, described in 40 CFR Part 237 – The Universal Waste Rule. Common sources of aviation hazardous waste are included in the sidebar.

Common sources of aviation hazardous waste:

- Solvents
- Caustic parts washes
- Heavy metal paint waste & paint chips
- Wastewater sludges from metal etching & electroplating
- Unused epoxies & monomers
- Waste fuels & other ignitable products
- Unusable water conditioning chemicals
- Contaminated sludge
- Nickel cadmium batteries
- Waste pesticides

²³ Recycling, Reuse and Waste Reduction at Airports, FAA (April 24, 2013)

²⁴ A triturator facility turns lavatory waste into fine particulates for further processing.

As seen on **Exhibit 5F**, there are seven potential areas of an airport contributing to the waste stream. Creating a comprehensive waste reduction and recycling plan for an airport requires the consideration of all potential inputs.

WASTE ASSESSMENTS

The implementation of an effective program requires accurate data of current waste and recycling rates. There are several ways an airport can gain insight into their waste stream. Waste assessments should be based on the size of the airport, specific knowledge of airport operations, and include a detailed analysis of the waste stream, program goals, and available resources, both at the airport and locally. Primary approaches to understanding the generation and flow of waste at an airport is a waste audit, which includes an examination of records, facility walk-through and waste assessment. **Exhibit 5G** illustrates how to plan and prepare for a waste audit, as well as what to do during and after the assessment to maximize the benefits.

SOLID WASTE AND RECYCLING

Since 2014, the Airport has contracted with Boulder City Disposal for solid waste services. **Table 5D** summarizes the Airport’s annual solid waste expenses. Trash is picked up two times per week from the Airport’s dumpster, which is a 2-yard container. Waste is hauled to the Boulder City Landfill, owned by the City of Boulder City. At the time of this study, Airport administration does not participate in recycling services.

TABLE 5D
Airport Administration Solid Waste Expense

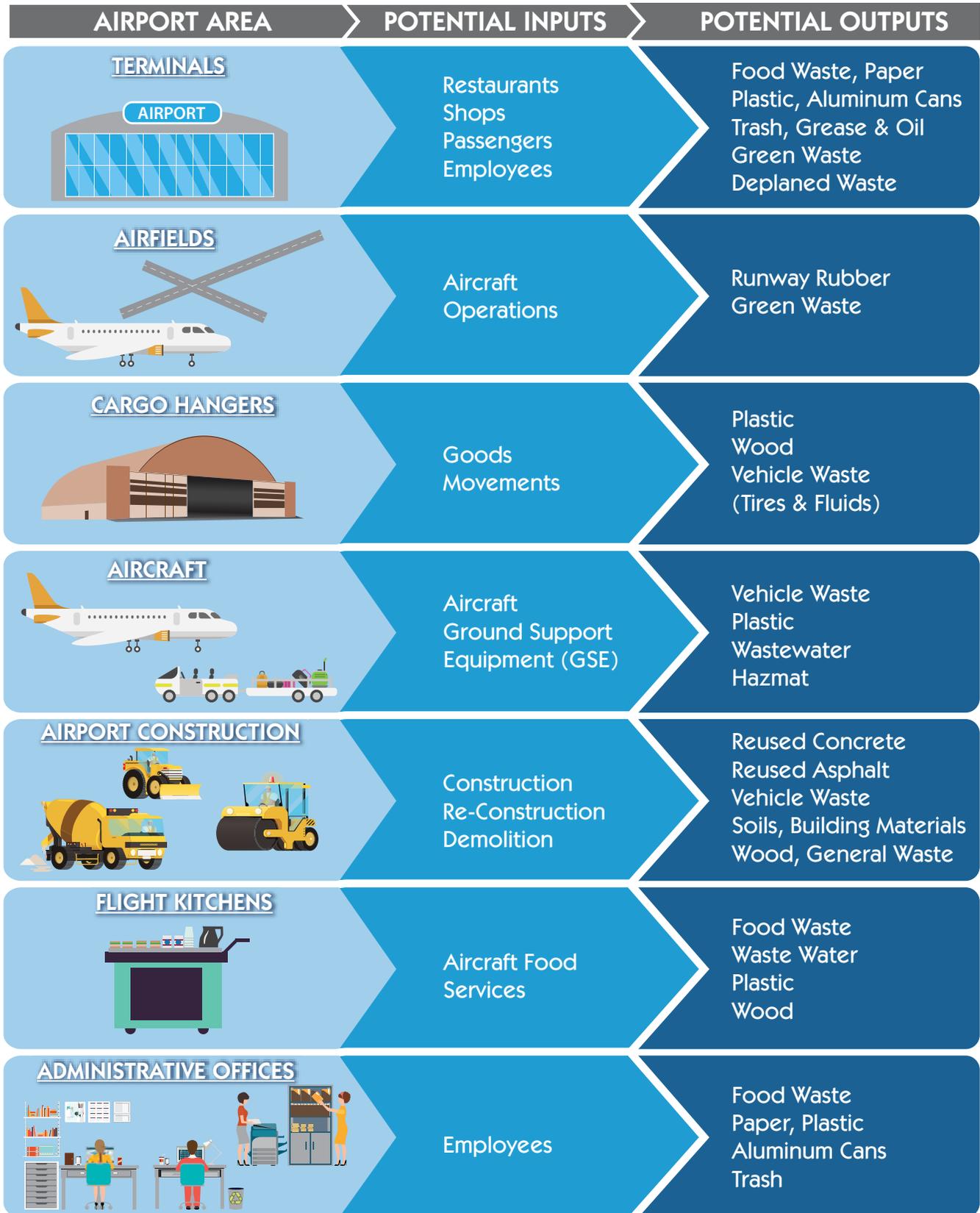
Fiscal Year	Annual Cost
2014	\$2,250.00
2015	\$2,245.00
2016	\$2,278.80
2017	\$2,505.80
Projected 2018	\$2,505.80

Source: Airport administration

Tenants at the Airport, including Papillon and BFE, also contract with Boulder City Disposal for solid waste services. Papillon has three 3-yard dumpster containers for landfill items that are emptied six times weekly. For recycling, Papillon has two 3-yard containers that are picked up once per week, as well as five 64-gallon recycling containers that are also picked up once a week. BFE has one 3-yard container for solid waste that is hauled three times weekly. For recycling, BFE has six 64-gallon containers that are emptied one time weekly.

Boulder City Disposal offers single stream recycling services, which means all recyclables can be placed in the same container to be sorted later at a sorting facility. **Exhibit 5H** shows what can be placed in recycling bins, and what products must be thrown in the trash.

AIRPORT WASTE STREAMS



Source: Recycling, Reuse, and Waste Reduction at Airports, FAA (April 24, 2013)

WASTE AUDIT PROCESS

Before You Start

1 Plan

Determine waste assessment goals.

Decide on materials to include (e.g., all waste collected in flight by attendants).

Identify number of samples needed based on goals and desired level of accuracy.

Plan schedule to capture representative waste samples.

Determine materials to observe and/or sort.

Assign responsibilities for capturing and assessing waste.

Determine whether to engage third party to assist.

2 Prepare

Coordinate with appropriate partners to set aside materials for assessment.

Gather the following supplies:

Pencils/pens; Large tarp; Latex/nitrile gloves; Garden gloves with good protection; Box cutter(s); Camera; Tape measure; Forms for recording; Scales (if approach involves hand sorting and weighing)

Conducting the Assessment

3 Set out waste Place the selected waste on the open tarp.

4 Measure volume of waste Record the average length, width, and height of the pile, in inches.

9 Estimate or weigh the amount of each material. If you have a scale, weigh each material and record the weight. If you are conducting a visual assessment, begin with the most commonly present material and visually estimate its percentage by volume.

7 Photograph the waste Take multiple photographs of the waste, including, if any, materials of particular note (e.g., significant numbers of aluminum cans or large amounts of newspaper).

8 Note all materials present Make a note of every material you see in the waste. Note what material type each material is (e.g., paper, plastic, metal, organic, hazardous waste, other/"unknown").

5 Note days of collection period Note the number of days over which the waste was collected.

6 Open the bags Use the box cutter to split open the bags of waste and place waste on tarp.

After the Assessment

10 Analyze assessment results. Compile waste assessment results. Analyze information to meet waste assessment goals (such as current recycling levels and amount of waste that could be recycled through existing programs). Perform a quality check to minimize data errors. Summarize results into easy to understand graphs or tables.

11 Report results to key participants and program partners. Send waste assessment results to those involved in the assessment. Report results to recycling participants (employees, contractors). Share results, lessons learned, and best practices to others in industry.

Source: Recycling Best Practice - A Guidebook for Advancing Recycling from Aircraft Cabins, ACRP (2014)



B.C. WASTE FREE

No-Sort Recycling Guide

You can now place ALL recyclables in one bin!



Junk Mail & greeting cards



Paper Egg Cartons



Paperboard Boxes



#1-7 Plastic tubs & screw-top jars



#1-7 Plastic bottles & jugs



Folders



Glass bottles & jars



Cans



Plastic bags



White or pastel office paper



Magazines, brochures & catalogs



Newspapers & inserts



Loose metal jar lids & steel bottle caps



Clothes



Phone Books



shredded



Waxed Coated Cups



Yard Waste



Flatten

Corrugated cardboard & paper bags



Paper milk/ juice cartons



Styrofoam boxes & cups



Food



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Questions?
Call or visit:

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For Questions
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Easy and Convenient
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RECOMMENDATIONS AND GOALS

The Airport should ensure that the waste and recycling containers and dumpsters are appropriately sized to the existing operation, as well as on a collection schedule that picks up only when the containers are full. Currently, there are solid waste and recycling trucks driving to and from the Airport multiple days of the week. The number of trips could be reduced by increasing the size of the solid waste and recycling dumpsters or reducing the number of pickups per week if the dumpsters are not reaching capacity daily. Additionally, waste and recycling hauling could be streamlined by tenants and Airport administration sharing dumpsters versus operating individually. The Airport could also consider providing training, education, and support to Airport personnel, tenants, and others who conduct business at the Airport to ensure that all materials are being recycled or disposed of properly to reduce garbage contamination in recycling bins. In-person meetings with Airport tenants could be held to create mutual understanding of the Airport’s solid waste and recycling goals and how tenants play a vital role in the overall success of reducing landfill waste.

As previously mentioned, the Airport does not currently recycle; however, **Table 5E** outlines objectives that could help reduce waste generation and increase recycling efforts should the Airport implement a recycling program. To increase the effectiveness of tracking progress, a baseline state of all suggested metrics should be established to provide a comparison over time.

TABLE 5E
Waste Management and Recycling Goals
Boulder City Municipal Airport

Goals	Objectives to Meet Goals	Metrics
Reduce amount of solid waste generated	Use online bill pay to eliminate monthly paper bills	No longer receiving monthly paper bills
	Conduct a waste audit to identify most common types of waste	Identification of most common solid waste
	Eliminate purchase of items that are not recyclable (i.e., Styrofoam, plastic bags)	Number of items purchased that are not recyclable
Increase amount of material recycled	Improve recycling tracking and data management	Monthly data reports
	Increase the number of recycling bins in public areas	Number of recycling bins available to the public
	Incorporate recycling requirements and/or recommendations into tenant lease agreements	Number of tenant contracts with recycling requirements and /or recommendations
	Place signage of what can/cannot be recycled near all recycling bins	Number of recycling signs in public areas
	Require contractors to implement strategies to reduce, reuse & recycle construction & demolition waste	Incorporation of waste reduction, reuse & recycling language into construction contracts

SUMMARY

This chapter has been prepared to help the City of Boulder City in making decisions on the future growth and development of BVU by describing narratively and graphically the Master Plan Concept. The plan represents an airfield facility that fulfills aviation needs for the Airport, while conforming to safety and design standards to the extent practicable. It also provides a guide for a landside complex that can be developed as demand dictates.

Flexibility will be very important to future development at the Airport, as activity may not occur as predicted. The Master Plan Concept provides Airport stakeholders with a general guide that, if followed, can maintain the Airport's long term viability and allow the Airport to continue to provide air tour and general aviation services for the region. The next chapter of this Master Plan will consider strategies for funding the recommended improvements and will provide a reasonable schedule for undertaking the projects based on safety and demand over the next 20 years.



BOULDER CITY
MUNICIPAL AIRPORT

CHAPTER SIX

Capital Improvements

BOULDER CITY MUNICIPAL AIRPORT



CHAPTER SIX CAPITAL PROGRAM

The analyses completed in previous chapters evaluated development needs at Boulder City Municipal Airport (BVU or Airport) over the next 20 years based on forecast activity, facility requirements, safety standards, and operational efficiency. Now that the recommended Master Plan Concept has been developed and specific needs and improvements for the Airport have been established, the next step is to determine a realistic schedule for project implementation as well as the associated costs for the plan. This chapter will provide a description and overall cost for each project identified in the capital improvement program (CIP) and development schedule. The program has been evaluated from a variety of perspectives and represents a comparative analysis of basic budget factors, demand, and priority assignments.

The presentation of the capital program has been organized into three sections. First, the Airport's capital program needs are identified by various categories ranging from meeting safety and design standards to satisfying demand. Second, the Airport development schedule and CIP cost estimates are presented in narrative and graphic form. The CIP has been developed following Federal Aviation Administration (FAA) guidelines for Master Plans and identifies those projects that are likely eligible for FAA and Nevada Department of Transportation – Aviation Planning Section (NDOT) grant funding. Third, capital improvement funding sources on the federal and local levels are identified and discussed.



AIRPORT DEVELOPMENT NEEDS

In an effort to identify capital needs at the Airport, this section provides analysis regarding the associated development needs of those projects included in the CIP. While some projects will be demand-based, others will be dictated by design standards, safety, or rehabilitation needs. Each development need is categorized according to this schedule. The applicable category (or categories) included are presented on **Exhibit 6A**. The proposed projects can be categorized as follows:

- 1) **Safety/Security (SS)** – these are capital needs considered necessary for operational safety and protection of aircraft and/or people and property on the ground near the Airport.
- 2) **Environmental (EN)** – these are capital needs which are identified to enable the Airport to operate in an environmentally acceptable manner or meet needs identified in the Environmental Overview outlined in Chapter Five.
- 3) **Maintenance (MN)** – these are capital needs required to maintain the existing infrastructure at the Airport.
- 4) **Efficiency (EF)** – these are capital needs intended to optimize aircraft ground operations or passengers' use of the terminal building.
- 5) **Demand (DM)** – these are capital needs required to accommodate levels of aviation demand. The implementation of these projects should only occur when demand for these needs is verified.
- 6) **Opportunities (OP)** – these are capital needs intended to take advantage of opportunities afforded by the Airport setting. Typically, this will involve improvements to property intended for lease to aviation or non-aviation related development.

AIRPORT DEVELOPMENT SCHEDULE AND COST SUMMARIES

Now that the specific needs and improvements for BVU have been established, the next step is to determine a realistic schedule and the associated costs for implementing the recommended Master Plan Concept. The capital program considers the interrelationships among the projects in order to determine an appropriate sequence of projects while remaining within reasonable fiscal constraints.

This section will examine the overall cost of each item in the capital program. The CIP, programmed by years, has been developed to cover the first five years of the plan. The remaining projects are grouped into intermediate (years 6-10) and long (years 11-20) term planning horizons. More detailed information is provided for the five-year horizon, with less detail provided for the longer planning periods. By utilizing

PROJECT DESCRIPTION	PROJECT CATEGORY	FEDERAL FUNDING	AIRPORT/LOCAL SHARE	TOTAL PROJECT COST ESTIMATE
SHORT TERM PROJECT DESCRIPTION				
<i>Planning Year 2018</i>				
1 Design and Construct Taxiway A realignment (Including LED Lights and Signs). Redesignate Blast Pad as Displaced Threshold and Extend Runway 300 Feet. Reconstruct Airfield Vault Building.	SS	\$2,381,250	\$158,750	\$2,540,000
2 Design Taxiway E (Including LED Lights and Signs) Serving Runway 9-27 as Full Length Parallel Taxiway.	SS/EF	\$468,750	\$31,250	\$500,000
2018 Total		\$2,850,000	\$190,000	\$3,040,000
<i>Planning Year 2019</i>				
3 Construct Taxiway E (Including LED Lights and Signs) Serving Runway 9-27 as Full Length Parallel Taxiway.	SS/EF	\$3,468,750	\$231,250	\$3,700,000
4 Design Southeast Apron Area - Entire Area	EN	\$937,500	\$62,500	\$1,000,000
2019 Total		\$4,406,250	\$293,750	\$4,700,000
<i>Planning Year 2020</i>				
5 Construct Southeast Apron Area - Phase 1	DM/OP	\$2,695,313	\$179,688	\$2,875,000
2020 Total		\$2,695,313	\$179,688	\$2,875,000
<i>Planning Year 2021</i>				
6 Construct Conventional Hangar (Including Automobile Parking and Secondary Airport Access) Serving the Southeast Development Area.	DM/OP	\$-	\$3,290,000	\$3,290,000
2021 Total		\$-	\$3,290,000	\$3,290,000
<i>Planning Year 2022</i>				
7 Construct Southeast Apron Area - Phase 2	DM/OP	\$5,390,625	\$359,375	\$5,750,000
2022 Total		\$5,390,625	\$359,375	\$5,750,000
<i>Planning Year 2023</i>				
8 Construct Southeast Apron Area - Phase 3	DM/OP	\$5,390,625	\$359,375	\$5,750,000
2023 Total		\$5,390,625	\$359,375	\$5,750,000
TOTAL SHORT TERM PROGRAM		\$20,732,813	\$4,672,188	\$25,405,000
INTERMEDIATE TERM PROJECT DESCRIPTION				
9 Rehabilitate Runway 15-33 (Including LED Lights and Signs).	MN/SS	\$557,813	\$37,188	\$595,000
10 Design and Construct Rehabilitation of Taxiway B and Taxiway E (Including LED Lights and Signs).	MN/SS	\$3,040,313	\$202,688	\$3,243,000
11 Acquire Avigation Easement for Uncontrolled 6.75 Acres Located in Runway 27 RPZ.	SS	\$93,750	\$6,250	\$100,000
12 Design and Construct East General Aviation Apron.	DM	\$1,879,688	\$125,313	\$2,005,000
13 Design and Construct Aircraft Washrack.	EN	\$2,250,000	\$150,000	\$2,400,000
14 Construct Northwest Development Area Apron Extension (Phase I).	DM/EF	\$10,429,688	\$695,313	\$11,125,000
15 Construct Northwest Development Area Hangars (Including Automobile Parking and Access).	DM/OP	\$-	\$2,370,000	\$2,370,000
TOTAL INTERMEDIATE TERM PROGRAM		\$18,251,250	\$3,586,750	\$21,838,000

PROJECT DESCRIPTION	PROJECT CATEGORY	FEDERAL FUNDING	AIRPORT/LOCAL SHARE	TOTAL PROJECT COST ESTIMATE
LONG TERM PROJECT DESCRIPTION				
16 Extend Western Portion of Runway 9-27 and Taxiway E 997' to Ultimate Length of 6,100' and Relocate Supplemental Windcones out of ROFA.	SS/EF	\$5,498,438	\$366,563	\$5,865,000
17 Upgrade PAPI-2s Serving Runway 9-27 to PAPI-4s.	DM/SS	\$225,000	\$15,000	\$240,000
18 Construct Apron Extension to the South along Flightline.	SS/EF	\$4,823,438	\$321,563	\$5,145,000
19 Construct Elevated Helipads and Connecting Helicopter Taxiways.	SS/EF	\$2,128,125	\$141,875	\$2,270,000
20 Relocate Segmented Circle, Lighted Windcone, and AWOS.	SS	\$337,500	\$22,500	\$360,000
21 Acquire Approximately 60.4 Acres for Runway 15-33 Relocation and Extension.	SS	\$4,687,500	\$312,500	\$5,000,000
22 Relocate Runway 15-33 and Parallel Taxiway B 1,000' West and Extend to 5,000'.	DM/SS	\$23,062,500	\$1,537,500	\$24,600,000
23 Construct Northwest Development Apron Extension (Phase II) and Construct Two Connectors Serving Relocated Runway 15-33.	DM/OP	\$14,537,813	\$969,188	\$15,507,000
24 Implement PAPI-2 Serving Runway 15.	SS/DM	\$196,875	\$13,125	\$210,000
25 Remove Existing Taxiway B and Construct Connector Taxiway Perpendicular to Ultimate Taxiway E.	SS	\$951,563	\$63,438	\$1,015,000
26 Acquire Approximately 2.6 Acres for Ultimate Parallel Taxiway F.	SS	\$375,000	\$25,000	\$400,000
27 Construct Ultimate Parallel Taxiway F Serving South side of Runway 9-27.	DM/EF	\$4,528,125	\$301,875	\$4,830,000
28 Construct Airport Traffic Control Tower (Including Automobile Parking and Access).	SS/EF	\$4,635,000	\$309,000	\$4,944,000
29 Construct Airport Maintenance Facility that Accommodates ARFF Equipment (including parking and access).	MN/SS	\$-	\$3,125,000	\$3,125,000
Total Long Term Program		\$65,986,875	\$7,524,125	\$73,511,000
Capital Improvement Program Total		\$104,970,938	\$15,783,063	\$120,754,000

Category Legend: SS - Safety/Security EN - Environmental MN - Maintenance EF - Efficiency DM - Demand OP - Opportunity



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planning horizons instead of specific years for intermediate and long term development, the City of Boulder City will have greater flexibility to adjust capital needs as demand dictates. **Table 6A** summarizes the key milestones for each of the three planning horizons.

TABLE 6A
Planning Horizon Activity Levels
Boulder City Municipal Airport

	Base Year	Short Term	Intermediate Term	Long Term
ANNUAL ENPLANEMENTS	211,648	240,000	275,000	350,000
BASED AIRCRAFT				
Single Engine Piston	171	184	194	216
Multi-Engine Piston	8	9	10	10
Turboprop	23	29	32	41
Jet	0	1	3	7
Helicopter	43	47	51	56
TOTAL BASED AIRCRAFT	245	270	290	330
ANNUAL OPERATIONS				
Itinerant				
Air Carrier	0	0	0	0
Air Tour Commercial	57,496	63,158	72,368	84,848
General Aviation	6,570	8,000	10,000	13,500
Other Air Taxi	14,100	15,650	16,350	19,000
Military	496	300	300	300
Total Itinerant	78,662	87,108	99,018	117,648
Local				
General Aviation	20,100	22,000	24,000	27,000
Military	0	0	0	0
Total Local	20,100	22,000	24,000	27,000
TOTAL OPERATIONS	98,762	109,108	123,018	144,648

A key aspect of this planning document is the use of demand-based planning milestones. The short term planning horizon contains items of highest need and/or priority. As short term horizon activity levels are reached, it will then be time to program for the intermediate term based upon the next activity milestones. Similarly, when the intermediate term milestones are reached, it will be time to program for the long term activity milestones.

Many development items included in the recommended concept will need to follow demand indicators which essentially establish triggers for key improvements. For example, the Master Plan Concept includes the development of new aircraft hangars. Growth in based aircraft is the trigger for these projects. If growth slows or does not occur as projected, new hangar development can be delayed. As a result, the capital expenditures will be undertaken as needed, which leads to a responsible use of capital assets. Some development items do not depend on demand, such as pavement maintenance. These

types of projects typically are associated with day-to-day operations and should be monitored and identified by Airport management.

Because of economic realities, few airports are constructing hangars on their own, instead relying on private developers. In some cases, private developers can keep construction costs lower, which in turn lowers the monthly lease rates necessary to amortize a loan. To the greatest extent possible, private development of all hangar types should be supported and promoted by the Airport sponsor.

The Airport sponsor's responsibility related to new hangars can be to provide public access taxiways, typically in conjunction with FAA and/or state development grants. These taxiways are then able to be utilized by hangar tenants for aircraft access to the runway/taxiway system.

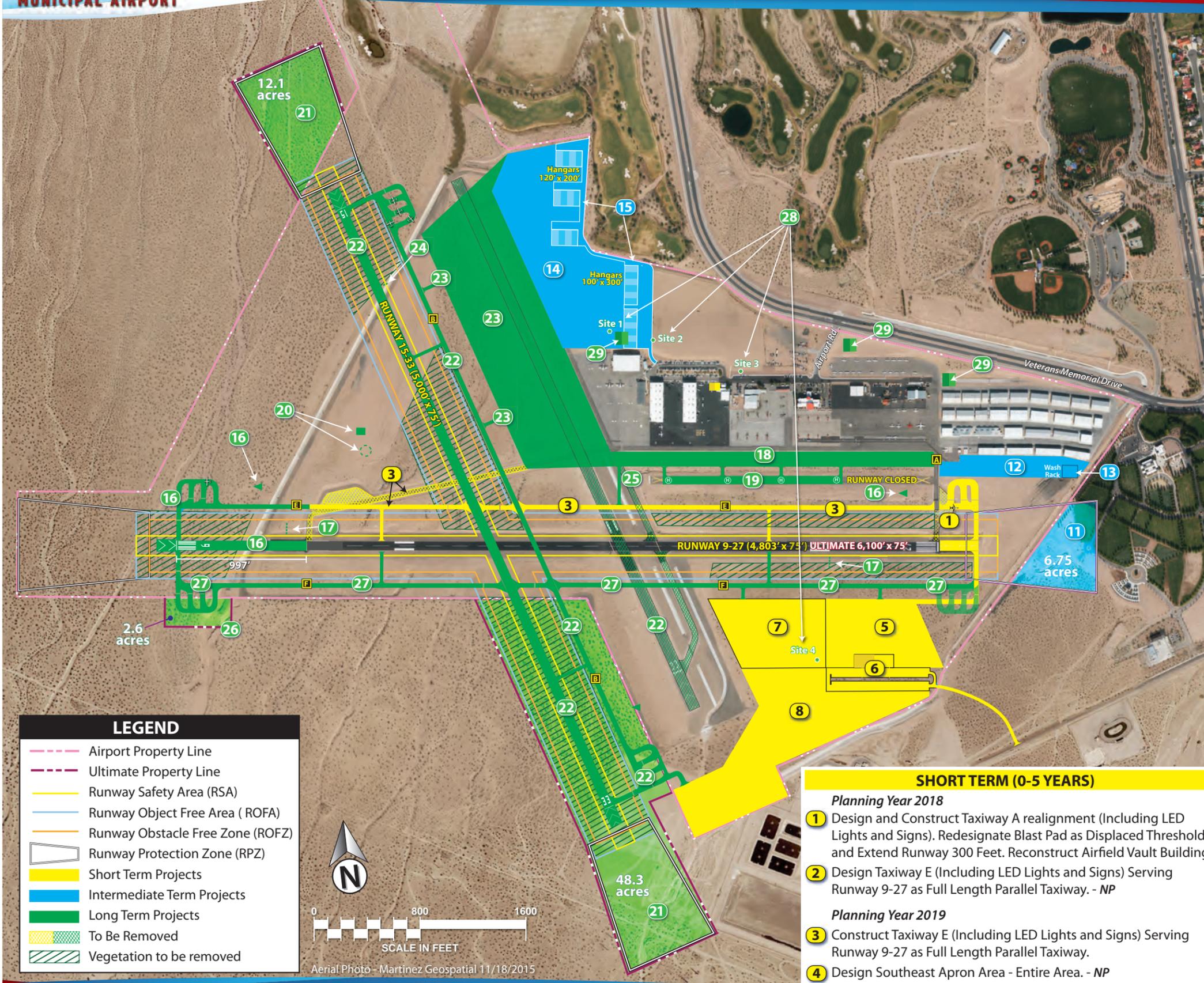
Not all projects identified are necessary to meet projected demand. Other projects are necessary to enhance the safety of the Airport, maintain existing infrastructure, or meet FAA design standards. These projects need to be programmed in a timely manner regardless of changes in demand indicators.

Given that a Master Plan is a conceptual document, implementation of the capital projects should only be undertaken after further refinement of their design and costs through architectural or engineering analyses. Moreover, some projects may require additional infrastructure improvements (i.e., drainage improvements, extension of utilities, etc.) that may increase the estimated cost of the project or increase the timeline for completion.

Once a list of necessary projects was identified and refined, project-specific cost estimates were prepared. The cost estimates also include design, construction administration, and contingencies that may arise on the project. Capital costs presented here should be viewed only as "order-of-magnitude" estimates subject to further refinement during design. Nevertheless, they are considered sufficient for planning purposes. Some projects, particularly those in the short term period, have been taken from the Airport's 5-year Airport Capital Improvement Program (ACIP) currently on file with the FAA. Cost estimates for projects included in the CIP were provided by Kimley-Horn and Associates, Inc. Cost estimates for each of the development projects in the CIP are in current (2018) dollars. Adjustments will need to be applied over time as construction costs or capital equipment costs change.

Exhibit 6A presents the proposed 20-year CIP for BVU. An estimate of FAA funding eligibility has been included, although actual funding is not guaranteed. For those projects that would be eligible for federal funding, Airport Improvement Program (AIP) reauthorization provides for 93.75 percent of the total project cost at the Airport. The remaining amount (6.25 percent) would be funded locally by the City of Boulder City.

As detailed in the CIP, the majority of projects listed are eligible for federal funding. Obviously, demand and justification for these projects must be provided prior to a grant being issued by the FAA. **Exhibit 6B**



- Planning Year 2020**
- 5 Construct Southeast Apron Area - Phase 1
- Planning Year 2021**
- 6 Construct Conventional Hangar (Including Automobile Parking and Secondary Airport Access) Serving the Southeast Development Area.
- Planning Year 2022**
- 7 Construct Southeast Apron Area - Phase 2
- Planning Year 2023**
- 8 Construct Southeast Apron Area - Phase 3

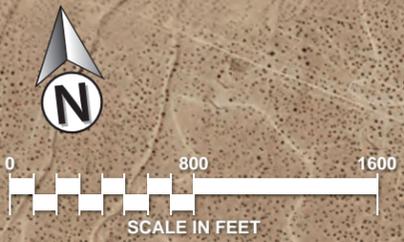
- INTERMEDIATE TERM PROJECT DESCRIPTION**
- 9 Rehabilitate Runway 15-33 (Including LED Lights and Signs). - NP
 - 10 Design and Construct Rehabilitation of Taxiway B and Taxiway E (Including LED Lights and Signs). - NP
 - 11 Acquire Avigation Easement for Uncontrolled 6.75 Acres Located in Runway 27 RPZ.
 - 12 Design and Construct East General Aviation Apron.
 - 13 Design and Construct Aircraft Washrack.
 - 14 Construct Northwest Development Area Apron Extension (Phase I).
 - 15 Construct Northwest Development Area Hangars (Including Automobile Parking and Access).

- LONG TERM PROJECT DESCRIPTION**
- 16 Extend Western Portion of Runway 9-27 and Taxiway E 997' to Ultimate Length of 6,100' and Relocate Supplemental Windcones out of ROFA.
 - 17 Upgrade PAPI-2s Serving Runway 9-27 to PAPI-4s.
 - 18 Construct Apron Extension to the South along Flightline.
 - 19 Construct Elevated Helipads and Connecting Helicopter Taxiways.
 - 20 Relocate Segmented Circle, Lighted Windcone, and AWOS.
 - 21 Acquire Approximately 60.4 Acres for Runway 15-33 Relocation and Extension.
 - 22 Relocate Runway 15-33 and Parallel Taxiway B 1,000' West and Extend to 5,000'.
 - 23 Construct Northwest Development Apron Extension (Phase II) and Construct Two Connectors Serving Relocated Runway 15-33.
 - 24 Implement PAPI-2 Serving Runway 15.
 - 25 Remove Existing Taxiway B and Construct Connector Taxiway Perpendicular to Ultimate Taxiway E.
 - 26 Acquire Approximately 2.6 Acres for Ultimate Parallel Taxiway F.
 - 27 Construct Ultimate Parallel Taxiway F Serving South side of Runway 9-27.
 - 28 Construct Airport Traffic Control Tower (Including Automobile Parking and Access).
 - 29 Construct Airport Maintenance Facility that Accommodates ARFF Equipment (including parking and access).
- NP - Not Pictured

- SHORT TERM (0-5 YEARS)**
- Planning Year 2018**
 - 1 Design and Construct Taxiway A realignment (Including LED Lights and Signs). Redesignate Blast Pad as Displaced Threshold and Extend Runway 300 Feet. Reconstruct Airfield Vault Building.
 - 2 Design Taxiway E (Including LED Lights and Signs) Serving Runway 9-27 as Full Length Parallel Taxiway. - NP
 - Planning Year 2019**
 - 3 Construct Taxiway E (Including LED Lights and Signs) Serving Runway 9-27 as Full Length Parallel Taxiway.
 - 4 Design Southeast Apron Area - Entire Area. - NP

LEGEND

- Airport Property Line
- Ultimate Property Line
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Obstacle Free Zone (ROFZ)
- Runway Protection Zone (RPZ)
- Short Term Projects
- Intermediate Term Projects
- Long Term Projects
- To Be Removed
- Vegetation to be removed



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graphically depicts the development staging by overlaying each project onto the aerial photograph of the Airport.

The FAA utilizes a national priority rating system to help objectively evaluate potential airport projects. Projects are weighted toward safety, infrastructure preservation, meeting design standards, and capacity enhancement. The FAA will participate in the highest priority projects before considering lower priority projects, even if a lower priority project is considered a more urgent need by the local sponsor. Nonetheless, the project should remain a priority for the airport and funding support should continue to be requested in subsequent years.

Some projects identified in the CIP will require environmental documentation. The level of documentation necessary for each project must be determined in consultation with the FAA and NDOT. There are three major levels of environmental review to be considered under the *National Environmental Policy Act* (NEPA) that include categorical exclusions (CatEx), Environmental Assessments (EA), and Environmental Impact Statements (EIS). Each level requires more time to complete and more detailed information. Guidance on what level of documentation is required for a specific project is provided in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*. The Environmental Overview presented in Chapter Five addresses NEPA and provides an evaluation of various environmental categories for BVU. The level of environmental documentation that could be required for future projects in the short term CIP is further discussed later in this chapter. Projects occurring in the intermediate and long term CIP will need to undergo further analysis to determine the level of environmental documentation that could be required.

The following sections will describe in greater detail the projects identified for the Airport over the next 20 years. The projects are grouped based upon a detailed evaluation of existing and projected demand, safety, rehabilitation needs, and local priority. While the CIP identifies the priority ranking of the projects, the list should be evaluated and revised on a regular basis. It is also important to note that certain projects, while listed separately for purposes of evaluation in this study, could be combined with other projects during time of construction/implementation.

SHORT TERM PROGRAM

The short term projects are those anticipated to be needed in years zero through five of the 20-year CIP. The list of projects is further divided into yearly timeframes and are prioritized based on the needs of BVU. Projects related to safety and preservation generally have the highest priority. The short term program considers eight projects for the planning period as presented on **Exhibit 6A** and depicted on **Exhibit 6B**. The following provides a detailed breakdown of each project.

FY 2018 Projects**Project #1: Design and Construct Taxiway A and Holding Bay Realignment (including LED Lights and Signs). Re-designate Runway 9-27 Blast Pad as Displaced Threshold and Extend Runway 300 Feet. Reconstruct Airfield Vaulting.**

Description: Currently, Taxiway A provides direct access from the apron area to Runway 27. In an effort to mitigate direct access issues, this project will remove and realign the portion of Taxiway A providing direct access to Runway 27. Simultaneously, the existing blast pad serving Runway 27 will be strengthened and converted into usable runway, allowing an additional 300 feet for departures on Runway 27. In addition, this project includes the reconstruction of the airfield electrical vault.

Cost Estimate: \$2,540,000

Funding Eligibility: FAA – 93.75 percent / Local – 6.25 percent.

Project #2: Design Taxiway E (including LED Lights and Signs) Serving Runway 9-27 as Full Length Parallel Taxiway.

Description: As it exists, Taxiway D currently provides direct access from the western side of the aircraft apron to Runway 15-33. Moreover, the location of Taxiway D along the southern edge of the aircraft apron is a large contributor to congestion on the apron area. This project is the design portion for the construction of Taxiway E to create a full length parallel taxiway serving Runway 9-27 at a runway/taxiway centerline separation distance of 300 feet.

Cost Estimate: \$500,000

Funding Eligibility: FAA – 93.75 percent / Local – 6.25 percent.

FY 2019 Projects**Project #3: Construct Taxiway E (including LED Lights and Signs) Serving Runway 9-27 as Full Length Parallel Taxiway.**

Description: As previously mentioned, Taxiway D currently provides direct access from the western side of the aircraft apron to Runway 15-33. Moreover, the location of Taxiway D along the southern edge of the aircraft apron is a large contributor to congestion on the apron area. The construction of Taxiway E to serve Runway 9-27 as a full length parallel taxiway with 300 feet separation from runway to taxiway centerline will ultimately mitigate direct access as well as alleviate apron area congestion. Moreover, the ultimate Taxiway E can be linked to the realigned Taxiway A serving the ultimate Runway 27 threshold.

Cost Estimate: \$3,700,000

Funding Eligibility: FAA – 93.75 percent / Local – 6.25 percent.

Project #4: Design Southeast Apron Area – Entire Area.

Description: Given the forecast aviation demands at BVU, additional apron area is proposed on the southeast side of the airfield, south of Runway 9-27. The proposed apron area will provide an estimated 179,400 sy of additional apron area. This project is the environmental and design of the proposed southeast apron area.

Cost Estimate: \$1,000,000

Funding Eligibility: FAA – 93.75 percent / Local – 6.25 percent.

FY 2020 Projects**Project #5: Construct Southeast Apron Area – Phase 1.**

Description: As previously mentioned, additional apron area is proposed on the southeast side of the airfield, south of Runway 9-27. This project is the first phase of construction of the proposed southeast apron area which includes approximately 41,300 sy of pavement.

Cost Estimate: \$2,875,000

Funding Eligibility: FAA – 93.75 percent / Local – 6.25 percent.

FY 2021 Projects**Project #6: Construct Conventional Hangar (Including Automobile Parking and Secondary Airport Access) Serving the Southeast Development Area.**

Description: Upon the first phase of construction of the southeast apron area, this project proposes the construction of a large 100 x 300-foot clearspan conventional style hangar. Automobile parking and a secondary Airport entrance road serving the proposed facility are also considered in this project.

Cost Estimate: \$3,290,000

Funding Eligibility: FAA – 0 percent / Local – 100 percent.

FY 2022 Projects**Project #7: Construct Southeast Apron Area – Phase 2.**

Description: This project is the second phase of construction of the proposed southeast apron area which includes approximately 45,400 sy of pavement.

Cost Estimate: \$5,750,000

Funding Eligibility: FAA – 93.75 percent / Local – 6.25 percent.

FY 2023 Projects

Project #8: Construct Southeast Apron Area – Phase 3.

Description: This project is the third and final phase of construction of the proposed southeast apron area which includes approximately 92,700 sy of pavement.

Cost Estimate: \$5,750,000

Funding Eligibility: FAA – 93.75 percent / Local – 6.25 percent.

Short Term Program Summary

The short term CIP includes projects that enhance the overall safety, efficiency, and maintenance of the airfield while also implementing landside improvements. The total investment necessary for the short term CIP is approximately \$25.4 million. Of the total short term program detailed on **Exhibit 6A**, approximately \$20.7 million is eligible for federal funding assistance. The remaining \$4.7 million is to be provided through local funding outlets.

INTERMEDIATE TERM PROGRAM

The intermediate term projects are those that are anticipated to be necessary in years six through 10 of the Master Plan. These projects are not tied to specific years for implementation; instead, they have been prioritized so that Airport management has the flexibility to determine when they need to be pursued based on current conditions. It is not unusual for certain projects to be delayed or advanced based on changing conditions, such as funding availability or changes in the aviation industry. This planning horizon includes seven projects for the five-year timeframe as listed on **Exhibit 6A** and depicted on **Exhibit 6B**. The following section includes a description of each project.

Project #9: Rehabilitate Runway 15-33 (including LED Lights and Signs).

Description: Ultimately, this project is aimed at prolonging the life of existing pavement and increasing pilot situational awareness by including LED lights and signage in the rehabilitation effort.

Cost Estimate: \$595,000

Funding Eligibility: FAA – 93.75 percent / Local – 6.25 percent.

Project #10: Design and Construct Rehabilitation of Taxiway B and Taxiway E (including LED Lights and Signs).

Description: The rehabilitation of Taxiways B and E is aimed at renovating the existing pavement as well as increase pilot situational awareness by including LED lights and signage. This project serves as the design and construction of the Taxiway B and E rehabilitation.

Cost Estimate: \$3,243,000

Funding Eligibility: FAA – 93.75 percent / Local – 6.25 percent.

Project #11: Acquire Avigation Easement for Uncontrolled 6.75 Acres Located in Runway 27 RPZ.

Description: It is recommended that the Airport own in-fee or have an easement over unowned property located within the runway protection zones (RPZs) serving the runway system. Currently, the RPZ serving Runway 27 extends beyond Airport property encompassing a total of 6.75 acres of property that is uncontrolled by the Airport. As discussed in Chapter Five, the Airport should pursue acquisition of this property in easement.

Cost Estimate: \$100,000

Funding Eligibility: FAA – 93.75 percent / Local – 6.25 percent.

Project #12: Construct East General Aviation Apron.

Description: This project considers an apron expansion on the eastern side of the airfield, south of the general aviation facilities. In total, the proposed apron area will encompass approximately 12,300 square yards (sy).

Cost Estimate: \$2,005,000

Funding Eligibility: FAA – 93.75 percent / Local – 6.25 percent.

Project #13: Construct Aircraft Wash Facility.

Description: The addition of an aircraft wash facility would provide for the collection of used aircraft oil and other hazardous materials, as well as provide a covered area for aircraft washing and light maintenance.

Cost Estimate: \$2,400,000

Funding Eligibility: FAA – 93.75 percent / Local – 6.25 percent.

Project #14: Construct Northwest Development Area Apron Extension (Phase I).

Description: The construction of an apron area extension to the northwest of the existing landside facilities would ultimately lay the groundwork for future hangar development while increasing aircraft operation and movement area available at the Airport. This project serves as the first phase of development for the northwest aviation development area. The apron area expansion considered in this project phase includes a total of approximately 104,700 sy.

Cost Estimate: \$11,125,000

Funding Eligibility: FAA – 93.75 percent / Local – 6.25 percent.

Project #15: Construct Northwest Development Area Hangars (Including Automobile Parking and Access).

Description: If demand warrants, this project includes the construction of five separate hangar facilities, two buildings being 100 x 300 feet housing three separate hangar facilities each and three buildings being 120 x 200 feet housing two separate hangar facilities each. Automobile parking and access serving the proposed facilities are also considered in this project.

Cost Estimate: \$2,370,000

Funding Eligibility: FAA – 0 percent / Local – 100 percent.

Intermediate Term Program Summary

The total costs associated with the intermediate term program are estimated at \$21.8 million. Of this total, approximately \$18.2 million could be eligible for federal funding, and the local share is projected at \$3.6 million.

LONG TERM PROGRAM

The long term planning horizon considers 14 projects for the 10-year period. The improvements are presented on **Exhibit 6A** and depicted on **Exhibit 6B**.

Project #16: Extend Western Portion of Runway 9-27 and Taxiway E 997' to Ultimate Length of 6,100' and Relocate Supplemental Windcones out of ROFA.

Description: The Airport could better accommodate business jet traffic if primary Runway 9-27 were extended. An ultimate length of at least 5,800 feet will accommodate 75 percent of the business jet fleet at 60 percent useful load. Consideration is given to extending Runway 9-27 997 feet to the west, creating an ultimate runway length of 6,100 feet when coupled with the threshold displacement of Runway 27 that was previously discussed.

Cost Estimate: \$5,865,000

Funding Eligibility: FAA – 93.75 percent / Local – 6.25 percent.

Project #17: Upgrade PAPI-2s Serving Runway 9-27 to PAPI-4s.

Description: The existing two-box precision approach path indicator (PAPI-2) approach aids serving Runway 9-27 should be upgraded to PAPI-4s as PAPI-4 approach aids typically serve and are recommended for runways that serve jet traffic.

Cost Estimate: \$240,000

Funding Eligibility: FAA – 93.75 percent / Local – 6.25 percent.

Project #18: Construct Apron Extension to the South along Flightline.

Description: An apron extension along the southern edge of the current aircraft apron and existing Taxiway D could increase square yardage by approximately 27,000 sy. Coupled with the construction of Taxiway E and relocated helipads, the usage of this apron extension could be maximized.

Cost Estimate: \$5,145,000

Funding Eligibility: FAA – 93.75 percent / Local – 6.25 percent.

Project #19: Construct Elevated Helipads and Connecting Helicopter Taxiways.

Description: Currently, final approach and takeoff (FATO) areas serving BVU are centrally located on the aircraft apron area south of the air tour terminal facility and north of the existing Taxiway D. It is recommended that the FATOs be moved to an elevated helipad south of the apron area on the closed Runway 9L-27R. Ultimately, relocation of the FATOs and Taxiway E (previously mentioned) to the south will alleviate apron area congestion and increase operational safety.

Cost Estimate: \$2,270,000

Funding Eligibility: FAA – 93.75 percent / Local – 6.25 percent.

Project #20: Relocate Segmented Circle, Lighted Windcone, and AWOS.

Description: In anticipation of the ultimate Runway 15-33 relocation 1,000 feet to the west, the segmented circle, lighted windcone, and automated weather observation system (AWOS) serving BVU should also be relocated west to remain clear of ultimate safety areas associated with the relocated Runway 15-33.

Cost Estimate: \$360,000

Funding Eligibility: FAA – 93.75 percent / Local – 6.25 percent.

Project #21: Acquire Approximately 60.4 Acres for Runway 15-33 Relocation and Extension.

Description: Prior to relocating and extending Runway 15-33, it is recommended that the Airport acquire all property that would otherwise be unowned or uncontrolled. The RPZ serving Runway 15 would extend off Airport property to the north encompassing approximately 12.1 acres, while the ultimate runway, Taxiway B, and associated safety areas would extend off of Airport property to the south encompassing approximately 48.3 acres of uncontrolled property. The Airport should acquire the estimated 60.4 acres of uncontrolled property ahead of implementing the Runway 15-33 relocation and extension.

Cost Estimate: \$5,000,000

Funding Eligibility: FAA – 93.75 percent / Local – 6.25 percent.

Project #22: Relocate Runway 15-33 and Parallel Taxiway B 1,000' West and Extend to 5,000'.

Description: To better meet the FAA's design standards pertaining to runway gradient and length, the ultimate Runway 15-33 and parallel Taxiway B are to be shifted approximately 1,000 feet to the west and extended to 5,000 feet in length. When this project occurs, the runway should be built to a strength rating of 15,000 pounds single wheel loading (SWL), which will ultimately accommodate a wider array of category B-II aircraft.

Cost Estimate: \$24,600,000

Funding Eligibility: FAA – 93.75 percent / Local – 6.25 percent.

Project #23: Construct Northwest Development Apron Extension (Phase II) and Construct Two Connectors Serving Relocated Runway 15-33.

Description: Upon the relocation of ultimate Runway 15-33 and Taxiway B, the western side of the existing landside development area can be expanded significantly. This project considers the construction of an estimated 145,750 sy of additional apron area along the western side of the landside development area.

Cost Estimate: \$15,507,000

Funding Eligibility: FAA – 93.75 percent / Local – 6.25 percent.

Project #24: Implement PAPI-2 Serving Runway 15.

Description: Currently, Runway 15 is not served by a PAPI system. As such, it is recommended that the ultimate Runway 15 be equipped with a PAPI-2.

Cost Estimate: \$210,000

Funding Eligibility: FAA – 93.75 percent / Local – 6.25 percent.

Project #25: Remove Existing Taxiway B as it Connects from the Apron Area to Ultimate Taxiway E and Construct a Connector Taxiway at a right angle to Ultimate Taxiway E.

Description: The existing Taxiway B extends from the apron area in an acute-angle. Once Taxiway E is constructed the ultimate Taxiway B is relocated to serve Runway 15-33 as a full length parallel taxiway, it is recommended a taxiway connector be constructed at a perpendicular right angle to the ultimate Taxiway E providing access to the western side apron area.

Cost Estimate: \$1,015,000

Funding Eligibility: FAA – 93.75 percent / Local – 6.25 percent.

Project #26: Acquire Approximately 2.6 Acres for Ultimate Parallel Taxiway E.

Description: Prior to construction of ultimate parallel Taxiway F serving the south side of Runway 9-27, approximately 2.6 acres of land should be acquired in order to ensure that the entirety of the proposed holding bay serving ultimate Runway 9 is located on Airport property.

Cost Estimate: \$400,000

Funding Eligibility: FAA – 93.75 percent / Local – 6.25 percent.

Project #27: Construct Ultimate Parallel Taxiway F Serving South side of Runway 9-27.

Description: This project considers the construction of ultimate parallel Taxiway F that will serve Runway 9-27 as a full length parallel taxiway. Ultimately, this taxiway will link the proposed southeast apron area to the runway system at BVU.

Cost Estimate: \$4,830,000

Funding Eligibility: FAA – 93.75 percent / Local – 6.25 percent.

Project #28: Construct Airport Traffic Control Tower (Including Automobile Parking and Access).

Description: Based upon existing and forecast aviation demands at BVU, the construction of an airport traffic control tower (ATCT) could be justified. This project considers the construction of an ATCT in one of the four potential sites identified on **Exhibit 6B**. Costs associated with this project are high level planning costs only and should be used as such. Further justification and more specific cost estimates will be required prior to the completion of this project.

Cost Estimate: \$4,944,000

Funding Eligibility: FAA – 93.75 percent / Local – 6.25 percent.

Project #29: Construct Airport Maintenance Facility that Accommodates Future Potential ARFF Equipment (including parking and access)

Description: Currently, the Airport stores its maintenance equipment adjacent to the east and west sides of the Airport Administration building. It is recommended that the Airport construct a dedicated Airport maintenance building to better protect valuable equipment. Furthermore, given Airport and tenant interest in the construction of an aircraft rescue and firefighting (ARFF) facility, it is recommended that the Airport construct a maintenance facility that could also house future potential ARFF equipment in one of the three potential sites depicted on **Exhibit 6B**. Costs associated with this project are high level planning costs only and should be used as such. Further justification and more specific cost estimates will be required prior to the completion of this project.

Cost Estimate: \$3,125,000

Funding Eligibility:

- Airport Maintenance Facility: FAA – 0 percent / Local – 100 percent.
- Future Potential ARFF Facility: FAA – 0 percent / Local – 100 percent.

Long Term Program Summary

The total costs associated with the long term program are estimated at \$73.5 million. Of this total, approximately \$66.0 million could be eligible for federal funding. The Airport's matching share is projected at \$7.5 million.

CAPITAL IMPROVEMENT PROGRAM SUMMARY

The list of projects needed to accomplish the vision for BVU has been prioritized and cost estimates have been developed. Projects considered for the short term planning horizon (years 0-5) have been divided into yearly increments. Projects considered for the intermediate (years 6-10) and long term (years 11-20) have been prioritized and grouped together. The grouping of projects is necessary to provide the needed flexibility for the Airport to make adjustments as necessary. In addition, on an annual basis, the Airport and FAA assemble and review a five-year CIP. Therefore, the list of projects and the prioritization of the projects can and likely will change in the future.

The total CIP proposes approximately \$120.7 million in Airport development needs. Of this total, approximately \$104.9 million could be eligible for federal funding assistance. The local funding estimate for the proposed CIP is approximately \$15.8 million. It should be noted that the local funding estimate is, in part, driven by the construction costs of large executive box and conventional hangar types. Costs associated with hangar development could be offset by the Airport in pursuing private developers for hangar construction. Nonetheless, the CIP can serve as a road map of airport improvements to help guide the City of Boulder City and the FAA.

ENVIRONMENTAL OVERVIEW SUMMARY OF SHORT TERM AIRPORT DEVELOPMENT SCHEDULE

As a follow-up to the Environmental Overview provided in Chapter Five, **Table 6B** lists the future development projects previously detailed and the most likely NEPA documentation that might be required by the FAA. Some of the projects are actions normally requiring an EA; however, the proposed improvements, unless involving extraordinary circumstances, could be evaluated in terms of NEPA compliance using one of the CatExes listed in FAA Order 1050.1F.

TABLE 6B
Anticipated Environmental Review for Short Term Development Projects
Boulder City Municipal Airport Master Plan

Recommended Project	Initial NEPA Action
Short Term Program (0-5 years)	
2018	
Design and Construct Taxiway A realignment (Including LED Lights and Signs). Re-designate Blast Pad as Displaced Threshold and Extend Runway 300 Feet. Reconstruct Airfield Vault Building.	CatEx
Design Taxiway E (Including LED Lights and Signs) Serving Runway 9-27 as Full Length Parallel Taxiway.	CatEx
2019	
Construct Taxiway E (Including LED Lights and Signs) Serving Runway 9-27 as Full Length Parallel Taxiway.	CatEx
Design Southeast Apron Area - Entire Area.	CatEx
2020	
Construct Southeast Apron Area - Phase 1.	CatEx
2021	
Construct Conventional Hangar (Including Automobile Parking and Secondary Airport Access) Serving the Southeast Development Area.	CatEx
2022	
Construct Southeast Apron Area - Phase 2.	CatEx
2023	
Construct Southeast Apron Area - Phase 3.	CatEx
NEPA – <i>National Environmental Policy Act</i>	
CatEx – Categorical Exclusion	
LED – Light Emitting Diode	

CAPITAL IMPROVEMENT FUNDING SOURCES

There are generally four sources of funds used to finance airport capital development projects: airport revenues, revenue/general obligation bonds, federal/state/local grants, and passenger facility charges (PFCs), which are reserved for commercial service airports. Access to these sources of financing varies widely among airports, with some large airports maintaining substantial cash reserves and most small commercial service and general aviation airports often requiring subsidies from their sponsors (local and state governments) to fund operating expenses and to finance modest improvements.

Financing capital improvements at BVU will not rely solely on the financial resources of the City of Boulder City. Capital improvement funding is available through various grant-in-aid programs on the federal level. While during some years more federal funding could be available, the CIP for this Master Plan was developed with project phasing to appropriately space projects. The following discussion outlines key sources of funding potentially available for capital improvements at the Airport.

FEDERAL GRANTS

Through federal legislation over the years, various grant-in-aid programs have been established to develop and maintain a system of public use airports across the United States. The purpose of this system and its federally based funding is to maintain national defense and to promote interstate commerce. The most recent legislation affecting federal funding was enacted on February 17, 2012 and is titled, the *FAA Modernization and Reform Act of 2012*. The law authorizes FAA appropriations (AIP) at \$3.35 billion for fiscal years 2012 through 2015. In 2016, Congress passed legislation (H.R. 636, *FAA Extension, Safety, and Security Act of 2016*) amending the law to expire on September 30, 2017. Subsequently, Congress passed a bill (H.R. 3823, *Disaster Tax Relief and Airport and Airway Extension Act of 2017*) authorizing appropriations to the FAA through March 31, 2018.

Several projects identified in the CIP are eligible for FAA funding through the AIP, which provides entitlement funds to airports based, in part, on their annual enplaned passengers and pounds of landed cargo weight. Additional AIP funds, designated as discretionary, may also be used for eligible projects based on the FAA's national priority system. Although the AIP has been reauthorized several times and the funding formulas have been periodically revised to reflect changing national priorities, the program has remained essentially the same. Public use airports that serve civil aviation, like BVU, may receive AIP funding for eligible projects, as described in FAA's *Airport Improvement Program Handbook*. The Airport must fund the remaining project costs using a combination of other funding sources, as discussed further below.

Eligible airports, which include those in the *National Plan of Integrated Airport Systems (NPIAS)*, such as BVU, can apply for airport improvement grants. **Table 6C** presents the approximate distribution of the AIP funds. Currently, the Airport is eligible to apply for grants which may be funded through several categories.

TABLE 6C
Federal AIP Funding Distribution

Funding Category	Percent of Total	Funds*
Apportionment/Entitlement		
Passenger Entitlements	29.19%	\$977,865,000
Cargo Entitlements	3.00%	\$100,500,000
Alaska Supplemental	0.65%	\$21,775,000
State Apportionment for Nonprimary Entitlements	10.35%	\$346,725,000
State Apportionment Based on Area and Population	9.65%	\$323,275,000
Carryover	10.77%	\$360,795,000
Small Airport Fund		
Small Hubs	1.67%	\$55,945,000
Nonhubs	6.68%	\$223,780,000
Nonprimary (GA and Reliever)	3.34%	\$111,890,000
Discretionary		
Capacity/Safety/Security/Noise	11.36%	\$380,560,000
Pure Discretionary	3.79%	\$126,965,000
Set Asides		
Noise	8.40%	\$281,400,000
Military Airports Program	0.99%	\$33,165,000
Reliever	0.16%	\$5,360,000
Totals	100.00%	\$3,350,000,000

* FAA Modernization and Reform Act of 2012

AIP: Airport Improvement Program

Source: FAA Order 5100.38D, Airport Improvement Program Handbook

Funding for AIP-eligible projects is undertaken through a cost-sharing arrangement in which the FAA share varies by airport size and is generally 75 percent for large and medium hub airports and 90 percent for all other airports. Since the early days of federal participation in airport infrastructure projects, Congress has provided a higher federal share for airports located in states with more than five percent of their geographic acreage comprised of public lands and nontaxable Indian lands. For states that qualify, such as Nevada, with approximately 80 percent public/Indian lands, the federal share is increased depending on the airport classification. As a nonhub commercial service airport, the federal share of eligible capital improvement projects for BVU is 93.75 percent. In exchange for this level of funding, the airport sponsor is required to meet various Grant Assurances, including maintaining the improvement for its useful life, usually 20 years.

The source for AIP funds is the Aviation Trust Fund. The Aviation Trust Fund was established in 1970 to provide funding for aviation capital investment programs (aviation development, facilities and equipment, and research and development). The Aviation Trust Fund also finances the operation of the FAA. It is funded by user fees, including taxes on airline tickets, aviation fuel, and various aircraft parts.

Apportionment (Entitlement) Funds

AIP provides funding for eligible projects at airports through an apportionment (entitlement) program. Primary commercial service airports receive a guaranteed minimum level of federal assistance each year,

based on their enplaned passenger levels and Congressional appropriation levels. A primary airport is defined as any commercial service airport enplaning at least 10,000 passengers annually.

An airport enplaning 10,000 or more passengers annually will receive the higher of \$1,000,000 or an amount based upon the entitlement formula. The entitlement formula is \$7.80 per enplaned passenger for the first 50,000 enplanements, and \$5.20 per enplanement for the next 50,000 enplanements. The next 400,000 enplanements provide \$2.60 each, and an airport receives \$0.65 for the next 500,000 enplanements. For each annual enplanement above one million, the airport receives \$0.50.

Under the authorizing statute, individual entitlements are doubled (with a maximum of \$26 million and a minimum of \$1.0 million per airport sponsor) if Congressional AIP funding in a fiscal year is at least \$3.2 billion. The FAA utilizes the official enplanement totals from the Air Carrier Activity Information System (ACAIS) database, which is two years behind the current date for determination of entitlement funds. **Table 6D** provides an estimate of entitlement funding that could be available to the Airport, based upon forecast annual enplanements.

TABLE 6D
Projected Annual AIP Entitlement Funding
Boulder City Municipal Airport

Enplanements		Passenger Enplanements*	First 50,000 Enplanements @ \$7.80	Next 50,000 Enplanements @ \$5.20	Next 400,000 Enplanements @ \$2.60	Raw Total	Calculated Passenger Entitlement
CY	for FY						
2012	2014	211,648	\$390,000	\$260,000	\$290,285	\$940,285	\$1,880,570
2013	2015	216,129	\$390,000	\$260,000	\$301,935	\$951,935	\$1,903,871
2014	2016	220,705	\$390,000	\$260,000	\$313,833	\$963,833	\$1,927,666
2015	2017	225,378	\$390,000	\$260,000	\$325,983	\$975,983	\$1,951,966
2016	2018	230,150	\$390,000	\$260,000	\$338,390	\$988,390	\$1,976,780
2017	2019	235,023	\$390,000	\$260,000	\$351,060	\$1,001,060	\$2,002,120
2018	2020	240,000	\$390,000	\$260,000	\$364,000	\$1,014,000	\$2,028,000
2019	2021	246,624	\$390,000	\$260,000	\$381,222	\$1,031,222	\$2,062,445
2020	2022	253,431	\$390,000	\$260,000	\$398,921	\$1,048,921	\$2,097,841
2021	2023	260,426	\$390,000	\$260,000	\$417,108	\$1,067,108	\$2,134,215
2022	2024	267,614	\$390,000	\$260,000	\$435,796	\$1,085,796	\$2,171,593
2023	2025	275,000	\$390,000	\$260,000	\$455,000	\$1,105,000	\$2,210,000
2024	2026	281,713	\$390,000	\$260,000	\$472,454	\$1,122,454	\$2,244,908
2025	2027	288,589	\$390,000	\$260,000	\$490,331	\$1,140,331	\$2,280,663
2026	2028	295,633	\$390,000	\$260,000	\$508,646	\$1,158,646	\$2,317,292
2027	2029	302,849	\$390,000	\$260,000	\$527,407	\$1,177,407	\$2,354,815
2028	2030	310,241	\$390,000	\$260,000	\$546,627	\$1,196,627	\$2,393,253
2029	2031	317,814	\$390,000	\$260,000	\$566,316	\$1,216,316	\$2,432,633
2030	2032	325,572	\$390,000	\$260,000	\$586,487	\$1,236,487	\$2,472,974
2031	2033	333,519	\$390,000	\$260,000	\$607,149	\$1,257,149	\$2,514,299
2032	2034	341,660	\$390,000	\$260,000	\$628,316	\$1,278,316	\$2,556,632
2033	2035	350,000	\$390,000	\$260,000	\$650,000	\$1,300,000	\$2,600,000

*Passenger enplanement counts are based upon approved Master Plan forecasts and may vary from actual enplanement levels
CY - Calendar Year; FY - Fiscal Year

Small Airport Fund

If a large or medium hub commercial service airport chooses to institute a passenger facility charge (PFC), which is a fee of up to \$4.50 on each airline ticket for funding of capital improvement projects, then their apportionment is reduced. A portion of the reduced apportionment goes to the small airport fund. The small airport fund is reserved for small-hub primary commercial service airports, nonhub commercial service airports, and general aviation airports. As a nonhub commercial service airport, BVU is eligible for funds from this source.

Discretionary Funds

In a number of cases, airports face major projects that will require funds in excess of the airports' annual entitlements. Thus, additional funds from discretionary apportionments under AIP become desirable. The primary feature about discretionary funds is that they are distributed on a priority basis. The priorities are established by the FAA, utilizing a priority code system. Under this system, projects are ranked by their purpose. Projects ensuring airport safety and security are ranked as the most important priorities, followed by maintaining current infrastructure development, mitigating noise and other environmental impacts, meeting standards, and increasing system capacity.

It is important to note that competition for discretionary funding is not limited to airports in the State of Nevada or those within the FAA Western-Pacific Region. The funds are distributed to all airports in the country and, as such, are more difficult to obtain. High priority projects will often fare favorably, while lower priority projects may not receive discretionary grants.

Set-Aside Funds

Portions of AIP funds are set-asides designed to achieve specific funding minimums for noise compatibility planning and implementation, select former military airfields (Military Airports Program), and select reliever airports. It is not anticipated that BVU will be eligible for this funding category.

FAA Facilities and Equipment (F&E) Program

The Airway Facilities Division of the FAA administers the Facilities and Equipment (F&E) Program. This program provides funding for the installation and maintenance of various navigational aids and equipment of the national airspace system. Under the F&E program, funding is provided for FAA ATCTs, en route navigational aids, on-airport navigational aids, and approach lighting systems.

Facilities at BVU that are eligible to receive funding from the F&E program include the future potential ATCT and existing and ultimate navoids.

PASSENGER FACILITY CHARGE (PFC)

The *Aviation Safety and Capacity Expansion Act of 1990* contained a provision for airports to levy a PFC, which is a user fee, for the purposes of preserving, enhancing, or making a significant contribution to airport safety, capacity, security, or to reduce or mitigate noise impacts, improve local air quality, enhance competition, or reduce current or anticipated congestion. PFC revenue may be used on a “pay-as-you-go” basis or leveraged to pay debt service on bonds or other debt used to pay for PFC-eligible projects.

Title 14 CFR, Part 158, of May 29, 1991, establishes the regulations that must be followed by airports choosing to levy PFCs. Passenger facility charges may be imposed by public agencies controlling a commercial service airport with at least 2,500 annual passengers with scheduled service. Authorized agencies were initially allowed to impose a charge of \$1.00, \$2.00, or \$3.00 per enplaned passenger. Legislation (AIR-21) passed in 2000 allowed the cap to increase to \$4.50, which remains the current cap level. Prior approval is required from the Department of Transportation (DOT) before an airport can levy a PFC. The DOT must find that the projected revenues are needed for specific, approved projects. Although FAA is required to approve the collection and use of PFCs, the program permits local collection of PFC revenue through the airlines operating at an airport and provides more flexibility to airport sponsors than AIP funds.

Any AIP-eligible project, whether development or planning related, is eligible for PFC funding. Gates and related areas for the movement of passengers and baggage are eligible, as are on-airport ground access projects. Any project approved must preserve or enhance safety, security, or capacity; reduce/mitigate noise impacts; or enhance competition among carriers.

PFCs may be used only on approved projects. However, PFCs can be utilized to fund 100 percent of a project. They may also be used as matching funds for AIP grants or to augment AIP-funded projects. PFCs can be used for debt service and financing costs of bonds for eligible airport development. These funds may also be commingled with general revenue for bond debt service. Before submitting a PFC application, an airport must give notice and an opportunity for consultation with airlines operating at an airport.

PFCs are treated similar to other airport improvement grants, rather than as airport revenues, and they are administered by the FAA. Airlines retain up to 11 cents per passenger for collecting PFCs. It should also be noted that only revenue passengers pay PFCs. Non-revenue passengers, such as those using frequent flier rewards or airline personnel, are counted as enplanements but do not generate PFCs. It is important to note that the FAA has historically held that BVU is not eligible to impose PFCs as a result of the unscheduled nature of air tour enplanements and private ownership of the air tour terminal building.

However, should PFC funding become available, the Airport could impose a \$4.50 PFC to help fund future projects.

STATE FUNDING PROGRAMS

The NDOT recognizes that airports make a valuable contribution to the state's transportation economy. Therefore, NDOT administers a grant program to fund airport planning, construction, and maintenance projects. The Nevada Fund for Aviation (commonly known as the Aviation Trust Fund) was unanimously passed by the 71st session of the Nevada State Legislature and then signed into law on October 1, 2001. It amended Chapter 494 of the Nevada Revised Statutes (NRS) creating a fund to be used for the improvement of the airport system within Nevada. The Fund for Aviation was reestablished by the 2015 legislature through senate bill (SB) 514 at \$100,000 per year.

At present, the Nevada Fund for Aviation will provide funding assistance to airports included within the NPIAS eligible for FAA AIP funding. State grants are provided to match some or all of the 6.25 percent local match not covered by FAA AIP. However, state match grants are not to exceed \$50,000. It should be mentioned, however, that the Fund for Aviation is intended to assist rural General Aviation Airports and is not be available to Commercial Service Aviation Airports. This provision currently precludes BVU from receiving state funding assistance.

LOCAL FUNDING

The balance of project costs, after consideration has been given to grants, must be funded through local resources. The goal for the operation of the Airport is to generate ample revenues to cover all operating and maintenance costs, as well as the local matching share of capital expenditures. As with many airports, this is not always possible and other financial methods will be needed.

According to **Exhibit 6A**, local funding will be needed in each planning horizon. This includes a total of \$4.7 million in the short term, \$3.6 million in the intermediate term, and \$7.5 million in the long term.

There are several local financing options to consider when funding future development at airports, including airport revenues, issuance of a variety of bond types, and leasehold financing. These strategies could be used to fund the local matching share, or complete a project if grant funding cannot be arranged. Below is a brief description of the most common local funding options:

Leasehold/Third-Party Financing: Leasehold or third-party financing refers to a developer or tenant financing improvements under a long term ground lease. The obvious advantage of such an arrangement is that it relieves the airport of all responsibility for raising the capital funds for improvements. However, the private development of facilities on a ground lease, particularly on property owned by the airport, produces a

unique set of concerns. In particular, it may be more difficult to obtain private financing as only the improvements and the right to continue the lease can be claimed in the event of a default. Ground leases normally provide for the reversion of improvements to the airport at the end of the lease term, which reduces their potential value to a lender taking possession. Also, companies that want to own their property as a matter of financial policy may not locate where land is only available for lease.

Bonding: Bonding is a common method to finance large capital projects at airports. A bond is an instrument of indebtedness of the bond issuer to the bond holders; thus, a bond is a form of loan or IOU. While bond terms are negotiable, typically the bond issuer is obligated to pay the bond holder interest at regular intervals and/or repay the principal at a later date.

General Revenue: The operations of the airport generate revenues, which are secured by federal grant assurances to be utilized at the airport. All receipts, excluding bond proceeds or related grants and interest, are irrevocably pledged to the punctual payment of operating and maintenance expenses, payment of debt service for as long as bonds remain outstanding, or for additions or improvements to airport facilities.

All public use airports should establish standard basis rates for various leases. All lease rates should be set to adjust to a standard index such as the Consumer Price Index to assure that fair and equitable rates continue to be charged into the future. The condition and location of hangar space should also be considered when establishing the lease rates. Standard basis rates should be established for sponsor-owned hangars, terminal building office space, and ground leases. Fuel flowage fees and aircraft tie-down fees should also be uniform.

MASTER PLAN IMPLEMENTATION

To implement the Master Plan recommendations, it is key to recognize that planning is a continuous process and does not end with approval of this document. The Airport should implement measures that allow them to track various demand indicators, such as air tour passenger enplanements, based aircraft, hangar demand, and operations. The issues that this Master Plan is based on will remain valid for a number of years. The primary goal is for BVU to best serve the air transportation needs of the region, while striving toward economic self-sufficiency.

The actual need for facilities is best established by activity levels rather than a specified date. For example, projections have been made as to when additional hangars and apron space may be needed at the Airport. In reality, the timeframe in which the development is needed may be substantially different. Actual demand may be slower to develop than expected. On the other hand, high levels of demand may establish the need to accelerate development. Although every effort has been made in this Master Planning process to conservatively estimate when facility development may be needed, aviation demand will dictate timing of facility improvements.

In addition, numerous projects have been identified that will not depend on increased demand. These include enhancing airfield geometry and regular pavement maintenance.

The value of this study is keeping the issues and objectives at the forefront of managers and decision-makers. In addition to adjustments in aviation demand, when to undertake the improvements recommended in this Master Plan will impact how long the plan remains valid. The format of this plan reduces the need for formal and costly updates by simply adjusting the timing of project implementation. Updating can be done by the Airport manager, thereby improving the plan's effectiveness.

In summary, the planning process requires the City of Boulder City to consistently monitor the progress of the Airport in terms of air tour passenger enplanements, aircraft operations, based aircraft, and peaking characteristics. Analysis of aircraft demand is critical to the timing and need for new Airport facilities. The information obtained from continually monitoring Airport activity will provide the data necessary to determine if the development schedule should be accelerated or decelerated.