



# AIRPORT ALTERNATIVES

In the previous chapter, aviation facilities required to satisfy airside and landside demand through the long-term planning period of the master plan were identified. In addition, various Federal Aviation Administration (FAA) standards were discussed that apply to airfield design. The next step in the planning process is to evaluate reasonable ways these facilities can be provided, and the design standards can be met. The purpose of this chapter is to formulate and examine rational development alternatives that address the short-, intermediate-, and long-term planning horizon levels. Because there are a multitude of possibilities and combinations, it is necessary to focus on those opportunities that have the greatest potential for success. Each alternative provides a differing approach to meet existing and future facility needs, and these layouts are presented for purposes of evaluation and discussion.

Some airports become constrained due to limited availability of space, while others may be constrained due to adjacent land use development. Careful consideration should be given to the layout of future facilities and impacts to potential airfield improvements at Chandler Municipal Airport (CHD). Proper planning at this time can ensure the long-term viability of the airport for aviation and economic growth.



The primary goal of this planning process is to develop a feasible plan for meeting the needs resulting from the projected market demand over the next 20 years. The plan of action should be developed in a manner that is consistent with the future goals and objectives of the City of Chandler, airport users, the local community, and the surrounding region, all of whom have a vested interest in the development and operation of CHD.

The goal is to develop an underlying rationale which supports the final recommended concept. Through this process, an evaluation of the highest and best uses of airport property will be made, while also weighing local development goals, efficiency, physical and environmental factors, capacity, and appropriate safety design standards.

The alternatives presented in this chapter have been formulated as potential means to meet the overall program objectives for the airport in a balanced manner. Through coordination with the City of Chandler, CHD management, the Planning Advisory Committee (PAC), and the public, an alternative (or combination thereof) will be refined and modified as necessary into a recommended development concept. Therefore, the planning considerations and alternatives presented in this chapter can be considered a beginning point in the evolution of a recommended concept for the future of CHD.

## ***PLANNING OBJECTIVES***

A set of basic planning objectives has been established to guide the alternatives development process. It is the goal of this master planning effort to produce a development plan for the airport that addresses forecast aviation demand and meets FAA design standards to the greatest degree possible. As owner and operator, the City of Chandler provides the overall guidance for the operation and development of the airport. It is of primary concern that CHD is marketed, developed, and operated for the betterment of the community and its users. The following basic planning principles and objectives will be utilized as general guidelines during this planning effort:

- To develop a safe, attractive, and efficient aviation facility in accordance with applicable federal, state, and local regulations;
- To preserve and protect public and private investments in existing airport facilities;
- To provide a means for the airport to grow as dictated by demand;
- To put into place a plan to ensure the long-term viability of the airport as well as to promote compatible land uses surrounding the airport;
- To develop a facility that is readily responsive to the changing needs of all aviation users;
- To be reflective and supportive of the long-term planning efforts currently applicable to the region;
- To develop a facility with a focus on self-sufficiency in both operational and developmental cost recovery; and,
- To ensure that future development is environmentally compatible.

## ***REVIEW OF PREVIOUS AIRPORT PLANS***

The previous master plan for CHD was completed in 2007. More recently, the Airport Layout Plan (ALP) was updated in 2016.

The existing Airport Layout Drawing is shown on **Exhibit 4A**. The Airport Layout Drawing graphically depicts airside and landside recommendations based upon previous airport planning that include:

- Extending Runway 4R-22L by 681 feet to the northeast for a full length of 5,550 feet.
- Taxiway improvements, including the extension of Taxiway B to the Runway 4L threshold, and geometry improvements to eliminate direct-access points from the apron to the runway and high-energy area crossings.
- Taxiway fillet improvements to meet current FAA design standards.
- Additional landside development in the form of T-hangars and shade hangars.

The analysis presented in this chapter will revisit the recommendations presented on the Airport Layout Drawing as well as in the previous Master Plan. Since completion of the last plan, the FAA has made significant modifications to design standards as outlined in the previous chapter. As such, some of the previous plan's elements may be carried over to this master plan and others may be changed and/or removed from further consideration.

### ***NO ACTION/NON-DEVELOPMENT ALTERNATIVES***

The City of Chandler is charged with managing the airport for the economic betterment of the community and region. In some cases, alternatives may include a no action option; however, for CHD, this would effectively reduce the quality of services being provided to the general public, affect the aviation facility's ability to meet FAA design standards, and affect the region's ability to support aviation needs. The ramifications of a no action alternative extend into impacts on the economic well-being of the region. **An analysis of the economic benefit of the airport completed in 2016 found that CHD generates \$109.06 million dollars in revenue and almost 800 jobs.** If facilities are not maintained and improved so that the airport provides a pleasant experience for the visitor or business traveler, or if delays become unacceptable, then activity and business may shift elsewhere. The no action alternative is also inconsistent with the long-term goals of the FAA and Arizona Department of Transportation (ADOT) – Aeronautics Group, which is to enhance local and interstate commerce. Therefore, a no action alternative is not considered further in this master plan.

Likewise, this study will not consider the relocation of services to another airport or development of a new airport site. The development of a new facility such as CHD is a very complex and expensive option. A new site will require greater land area, duplication of investment in facilities, installation of supporting infrastructure that is already available at the existing site, and greater potential for negative impacts to natural, biological, and cultural resources.

The purpose of this master plan is to examine aviation needs at CHD over the course of the next 20 years. Therefore, this master plan will examine the needs of the existing airport and will present a program of needed capital improvement projects to cover the scope of the plan. The airport is a lucrative business, transportation utility, and economic asset for the region. It can accommodate existing and future demand and should be developed accordingly to support the interests of local residents and businesses which rely upon it. Ultimately, the final decision with regards to pursuing development rests with the City of Chandler and the FAA on an individual project basis. The analysis to follow considers airside and

landside development alternatives that take into account an array of facility demands, including safety, capacity, access, and efficiency.

## **AIRFIELD ALTERNATIVES**

The development alternatives are categorized into two functional areas: airfield and landside. The airfield relates to runways, taxiways, navigational aids, lighting and marking aids, etc., which require the greatest commitment of land area to meet the physical layout of an airport, as well as the required airfield safety standards. The design of the airfield also defines minimum set-back distances from the runway and object clearance standards. These criteria are defined first to ensure that the fundamental needs of CHD are met. The landside includes terminal services, hangars, aircraft parking aprons, as well as utilization of remaining property to provide revenue support for the airport and to benefit the economic development and well-being of the regional area. This section focuses on airfield facilities.

Each functional area interrelates and affects the development potential of the others. Therefore, all areas must be examined individually, and then coordinated as a whole, to ensure the final plan is functional, efficient, and cost-effective. The total impact of all these factors must be evaluated to determine if the investment in CHD will meet the needs of the surrounding area, both during and beyond the planning period of this study.

As part of this alternatives analysis, Coffman Associates' subconsultant (Dibble Engineering) has prepared preliminary build-out cost estimates for each of the airfield and landside alternatives. Dibble Engineering is providing engineering support for the master plan and is familiar with CHD. A cost breakdown is provided at the end of each alternative description that outlines individual proposed projects so that a financial comparison can be made. These costs are planning-level estimates only that will need to be refined during the project design phase.

## **AIRFIELD CONSIDERATIONS**

**Table 4A** presents a summary of the primary airfield planning considerations for the alternatives analysis. Landside planning considerations are outlined later in the chapter. These considerations are the result of the findings of the aviation demand forecasts and facility requirements evaluations, as well as input from the PAC, CHD management, and the public. In addition to these considerations, both runways should continue to meet applicable runway design code (RDC) standards<sup>1</sup>. Runway 4R-22L is planned to meet RDC B-II-5000 standards and Runway 4L-22R is planned to meet RDC B-II-VIS (small airplane) design standards.

---

<sup>1</sup> Applicable RDC standards are detailed in the Facility Requirements chapter.

**TAXIWAY DESIGN GROUPS**

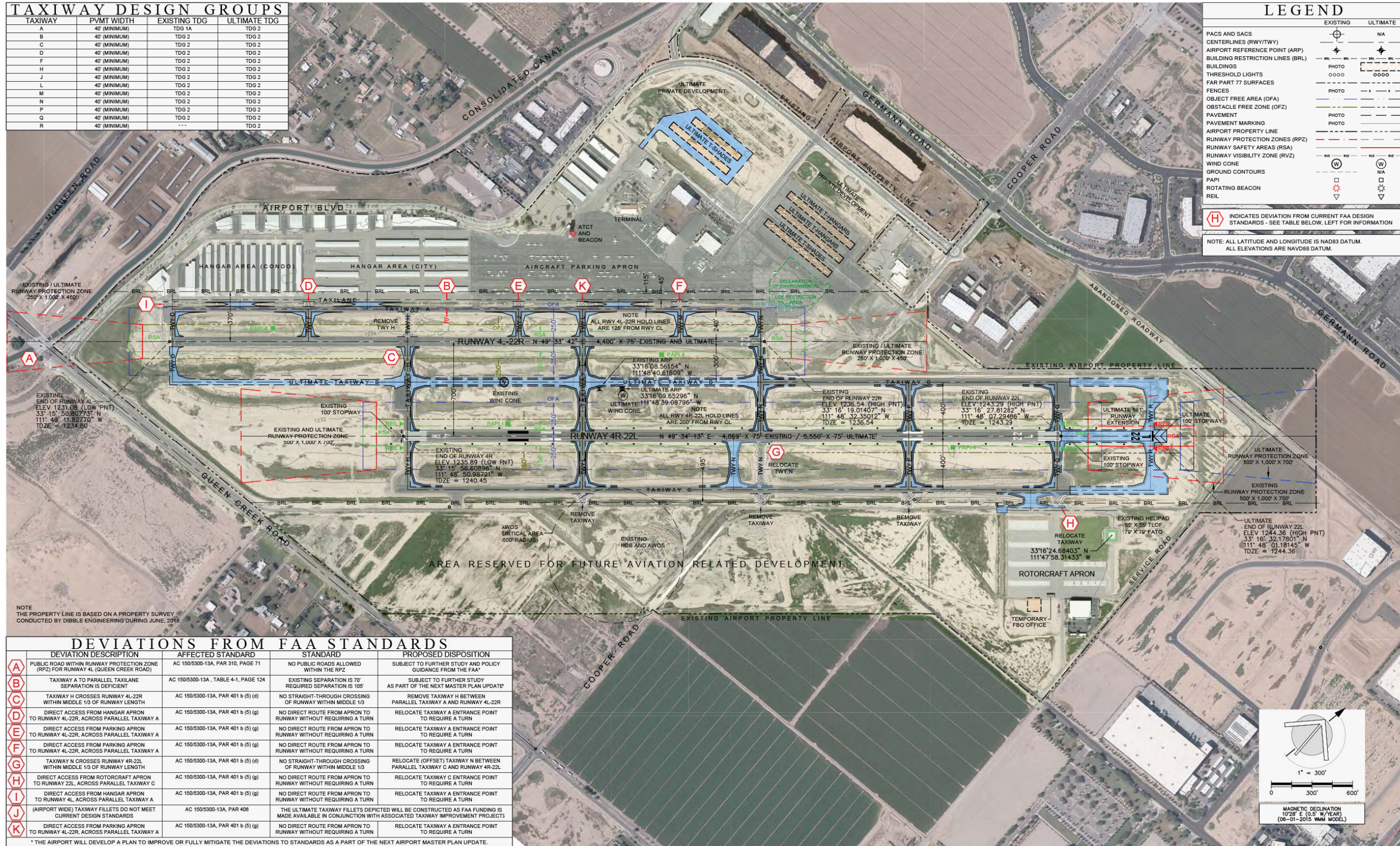
TAXIWAY	PVMT WIDTH	EXISTING TDG	ULTIMATE TDG
A	40' (MINIMUM)	TDG 1A	TDG 2
B	40' (MINIMUM)	TDG 2	TDG 2
C	40' (MINIMUM)	TDG 2	TDG 2
D	40' (MINIMUM)	TDG 2	TDG 2
F	40' (MINIMUM)	TDG 2	TDG 2
H	40' (MINIMUM)	TDG 2	TDG 2
L	40' (MINIMUM)	TDG 2	TDG 2
M	40' (MINIMUM)	TDG 2	TDG 2
N	40' (MINIMUM)	TDG 2	TDG 2
P	40' (MINIMUM)	TDG 2	TDG 2
Q	40' (MINIMUM)	TDG 2	TDG 2
R	40' (MINIMUM)	---	TDG 2

**LEGEND**

	EXISTING	ULTIMATE
PACED AND SACS		NA
CENTERLINES (RWY/TWY)		NA
AIRPORT REFERENCE POINT (ARP)		NA
BUILDING RESTRICTION LINES (BRL)		
BUILDINGS		
THRESHOLD LIGHTS		
FAR PART 77 SURFACES		
FENCES		
OBJECT FREE AREA (OFA)		
OBSTACLE FREE ZONE (OFZ)		
PAVEMENT		
PAVEMENT MARKING		
AIRPORT PROPERTY LINE		
RUNWAY PROTECTION ZONES (RPZ)		
RUNWAY SAFETY AREAS (RSA)		
RUNWAY VISIBILITY ZONE (RVZ)		
WIND CONE		
GROUND CONTOURS		
PAPI		
ROTATING BEACON		
REIL		

INDICATES DEVIATION FROM CURRENT FAA DESIGN STANDARDS - SEE TABLE BELOW, LEFT FOR INFORMATION

NOTE: ALL LATITUDE AND LONGITUDE IS NAD83 DATUM. ALL ELEVATIONS ARE NAVD83 DATUM.



**DEVIATIONS FROM FAA STANDARDS**

DEVIATION	AFFECTED STANDARD	STANDARD	PROPOSED DISPOSITION	
A	PUBLIC ROAD WITHIN RUNWAY PROTECTION ZONE (RPZ) FOR RUNWAY 4L (QUEEN CREEK ROAD)	AC 150/5300-13A, PAR 310, PAGE 71	NO PUBLIC ROADS ALLOWED WITHIN THE RPZ	SUBJECT TO FURTHER STUDY AND POLICY GUIDANCE FROM THE FAA*
B	TAXIWAY A TO PARALLEL TAXIWAY SEPARATION IS DEFICIENT	AC 150/5300-13A, TABLE 4-1, PAGE 124	EXISTING SEPARATION IS 70' REQUIRED SEPARATION IS 105'	SUBJECT TO FURTHER STUDY AS PART OF THE NEXT MASTER PLAN UPDATE*
C	TAXIWAY H CROSSES RUNWAY 4L-22R WITHIN MIDDLE 1/3 OF RUNWAY LENGTH	AC 150/5300-13A, PAR 401 b (5) (d)	NO STRAIGHT-THROUGH CROSSING OF RUNWAY WITHIN MIDDLE 1/3	REMOVE TAXIWAY H BETWEEN PARALLEL TAXIWAY A AND RUNWAY 4L-22R
D	DIRECT ACCESS FROM HANGAR APRON TO RUNWAY 4L-22R, ACROSS PARALLEL TAXIWAY A	AC 150/5300-13A, PAR 401 b (5) (g)	NO DIRECT ROUTE FROM APRON TO RUNWAY WITHOUT REQUIRING A TURN	RELOCATE TAXIWAY A ENTRANCE POINT TO REQUIRE A TURN
E	DIRECT ACCESS FROM PARKING APRON TO RUNWAY 4L-22R, ACROSS PARALLEL TAXIWAY A	AC 150/5300-13A, PAR 401 b (5) (g)	NO DIRECT ROUTE FROM APRON TO RUNWAY WITHOUT REQUIRING A TURN	RELOCATE TAXIWAY A ENTRANCE POINT TO REQUIRE A TURN
F	DIRECT ACCESS FROM PARKING APRON TO RUNWAY 4R-22L, ACROSS PARALLEL TAXIWAY A	AC 150/5300-13A, PAR 401 b (5) (g)	NO DIRECT ROUTE FROM APRON TO RUNWAY WITHOUT REQUIRING A TURN	RELOCATE TAXIWAY A ENTRANCE POINT TO REQUIRE A TURN
G	TAXIWAY N CROSSES RUNWAY 4R-22L WITHIN MIDDLE 1/3 OF RUNWAY LENGTH	AC 150/5300-13A, PAR 401 b (5) (d)	NO STRAIGHT-THROUGH CROSSING OF RUNWAY WITHIN MIDDLE 1/3	RELOCATE (OFFSET) TAXIWAY N BETWEEN PARALLEL TAXIWAY C AND RUNWAY 4R-22L
H	DIRECT ACCESS FROM ROTORCRAFT APRON TO RUNWAY 22L, ACROSS PARALLEL TAXIWAY C	AC 150/5300-13A, PAR 401 b (5) (g)	NO DIRECT ROUTE FROM APRON TO RUNWAY WITHOUT REQUIRING A TURN	RELOCATE TAXIWAY C ENTRANCE POINT TO REQUIRE A TURN
I	DIRECT ACCESS FROM HANGAR APRON TO RUNWAY 4L, ACROSS PARALLEL TAXIWAY A	AC 150/5300-13A, PAR 401 b (5) (g)	NO DIRECT ROUTE FROM APRON TO RUNWAY WITHOUT REQUIRING A TURN	RELOCATE TAXIWAY A ENTRANCE POINT TO REQUIRE A TURN
J	(AIRPORT WIDE) TAXIWAY FILLETS DO NOT MEET CURRENT DESIGN STANDARDS	AC 150/5300-13A, PAR 406	THE ULTIMATE TAXIWAY FILLETS DEPICTED WILL BE CONSTRUCTED AS FAA FUNDING IS MADE AVAILABLE IN CONJUNCTION WITH ASSOCIATED TAXIWAY IMPROVEMENT PROJECTS	
K	DIRECT ACCESS FROM PARKING APRON TO RUNWAY 4L-22R, ACROSS PARALLEL TAXIWAY A	AC 150/5300-13A, PAR 401 b (5) (g)	NO DIRECT ROUTE FROM APRON TO RUNWAY WITHOUT REQUIRING A TURN	RELOCATE TAXIWAY A ENTRANCE POINT TO REQUIRE A TURN

\* THE AIRPORT WILL DEVELOP A PLAN TO IMPROVE OR FULLY MITIGATE THE DEVIATIONS TO STANDARDS AS A PART OF THE NEXT AIRPORT MASTER PLAN UPDATE. THE ACTIONS DESCRIBED IN THIS TABLE (AND ON THE PLAN) REPRESENT THE RESULTS OF PRELIMINARY ASSESSMENTS OF POTENTIAL MITIGATION ACTIONS THAT MAY BE TAKEN.

CHANDLER MUNICIPAL AIRPORT (CHD)  
Chandler, Arizona

REVISION	DESCRIPTION	DATE

**AIRPORT LAYOUT DRAWING**  
CHANDLER MUNICIPAL AIRPORT (CHD)  
CHANDLER, ARIZONA

Planning:	NJP	Sheet No.	2
Drawn:	NJP		of
Checked:	DE		11
Date:	11/22/2016		

This page intentionally left blank

**TABLE 4A**  
**Airfield Planning Considerations**  
**Chandler Municipal Airport**

#	Non-Standard/Deficient Condition	Applicable Design Standard	Proposed Action(s) to be Evaluated
1	Runway 4R-22L, at 4,870 feet long, is deficient in length to safely serve most business jet aircraft.	FAA AC 150/5325-4B, <i>Runway Length Requirements for Airfield Design</i> , Paragraph 306.	Extend Runway 4R-22L.
2	Runway 4L-22R should be equipped with runway end identifier lights (REILS) to improve pilot situational awareness.	FAA AC 150/5300-13A, Change 1, <i>Airport Design</i> , Paragraph 317.a.(4).	Add REILs to both ends of Runway 4L-22R.
3	Taxiways F, M, and Q provide direct access from apron areas to the runways, which can result in a runway incursion.	FAA AC 150/5300-13A, Change 1, <i>Airport Design</i> , Paragraph 401.b.(5).(g).	Offset connecting taxiways to force pilots to make a turn prior to entering a runway.
4	Taxiways H and N create high-energy area runway intersections with a runway.	FAA AC 150/5300-13A, Change 1, <i>Airport Design</i> , Paragraph 401.b.(5).(d).	Move crossings to areas outside the high-energy area (middle 1/3 <sup>rd</sup> of the runway).
5	Existing holding aprons are non-standard design.	FAA AC 150/5300-13A, Change 1, <i>Airport Design</i> , Paragraph 412.b.	Construct new holding bays that meet design standard.
6	Hot Spot #1 – Runway 22R may be used as an alternate taxi route due to run-up area and taxiway congestion.	FAA AC 150/5300-13A, Change 1, <i>Airport Design</i> , Paragraph 401.	Extend Taxiway B and redesign holding bay to mitigate congestion.
7	Existing blast pads at the ends of Runway 4R-22L do not meet design standards.	FAA AC 150/5300-13A, Change 1, <i>Airport Design</i> , Paragraph 304.d.	Upgrade blast pads at both ends of Runway 4R-22L.
8	Runway 4L-22R basic markings do not meet design standard for a non-precision approach runway.	FAA AC 150/5300-13A, Change 1, <i>Airport Design</i> , Paragraph 205.b.(2)	If non-precision approaches are established to the runway, the markings should be upgraded to include threshold markings.

*Source: Coffman Associates analysis.*

### Consideration #1 – Runway Length

The primary runway at CHD, Runway 4R-22L, is currently 4,870 feet long and 75 feet wide. The existing width meets RDC B-II-5000 design standards; however, the length is insufficient to safely accommodate most turbine powered aircraft, particularly during hot weather conditions and when aircraft operate with heavier loads. The current Airport Layout Plan (ALP) for CHD includes a 680-foot extension of the runway to the northeast for a full length of 5,550 feet. Constraints in the form of E. Queen Creek Road to the southwest and the development of the SOLLiD Cabinetry facility along Germann Road to the

northeast prohibit any further extension of the runway beyond the currently planned 680-foot extension. For this reason, the 680-foot northeast extension is the only extension alternative considered.

### **Consideration #2 – Visual Aids**

Both runways are equipped with precision approach path indicator (PAPI) systems and the primary runway is equipped with runway end identifier lights (REILs). Parallel Runway 4L-22R is not equipped with REILs, which help pilots locate and identify the end of the runway, particularly when an airport is located within a developed area with many light sources. As a result, REILs are recommended for both ends of Runway 4L-22R. The alternative exhibits to follow each reflect adding REILs to the parallel runway.

### **Consideration #3 – Direct-Access Points**

FAA taxiway geometry design standards recommend offsetting taxiway connections between aprons and runways to mitigate the potential of pilots unfamiliar with the airport layout unintentionally taxiing directly onto a runway resulting in a runway incursion. Taxiways F, M, and Q provide for direct access to the runway and are, therefore, non-standard design. The airfield alternatives present options for eliminating the direct-access points and forcing pilots to make turns, which increases a pilot's situational awareness.

### **Consideration #4 – High Energy Intersections**

FAA taxiway geometry design standards recommend avoiding runway/taxiway intersections in the middle third of a runway where a pilot can least maneuver. High energy intersections include Taxiway H and Runway 4L-22R, and Taxiway N and Runway 4R-22L. The airfield alternatives present options for eliminating the high energy area intersections.

### **Consideration #5 – Holding Bays**

The airport has six existing holding bays: two of which are located at the end of Runway 4L-22R (north side) and four located near the end of Runway 4R-22L (north and south sides). These holding aprons are a traditional design consisting of a wide pavement area that allows aircraft to pull aside and perform pre-flight engine checks. The traditional design for these holding aprons is now considered non-standard since the wide expansive pavement area makes signage and lighting more difficult for pilots to see, which can lead to pilot confusion, particularly near the entrance of a runway. In 2014, the FAA changed the holding bay design standard to incorporate clearly marked entrance/exits with independent parking areas separated by islands that allow aircraft to safely bypass each other, while also decreasing the amount of pavement. The airfield alternatives consider closing the traditional holding bays and propose options for constructing new holding bays that meet current design standards.



### Consideration #6 – Hot Spot Mitigation

Hot spot #1 at CHD has resulted from pilots using Runway 22R as an alternate route due to run-up area and taxiway congestion. Previous planning has included extending Taxiway B to the southwest to expand taxiway circulation routes, which would alleviate congestion at the end of Runway 22R. The alternatives analysis will examine this and other taxiway layouts to mitigate the hot spot. Furthermore, redesigning the holding bay at the Runway 22R end will also contribute to mitigating the hot spot issues.

### Consideration #7 – Blast Pads

Runway 4R-22L is planned to accommodate more frequent operations by jet aircraft. Jet blast can cause soil erosion and sends dust and debris into the air. The existing blast pads on Runway 4R-22L, which also function as stopways, are 90 feet long and 90 feet wide. The RDC B-II-5000 blast pad design standard is 95 feet wide and 150 feet long. The airfield alternatives depict adding new blast pads to both ends of the runway that meet these dimensions.

### Consideration #8 – Runway 4L-22R Markings

Runway 4L-22R does not currently have published instrument approach capabilities. It is recommended that the airport consider establishing non-precision approaches to both ends of the runway with visibility minimums of one mile or greater. Implementing a non-precision approach to the runway would not change the dimensions of the safety areas, including the Runway Protection Zones (RPZs), nor would it require the installation of new on-site equipment; however, the runway markings would need to be upgraded to include threshold markings. Each of the airfield alternatives reflect the upgraded non-precision markings on Runway 4L-22R.

## AIRFIELD ALTERNATIVE 1

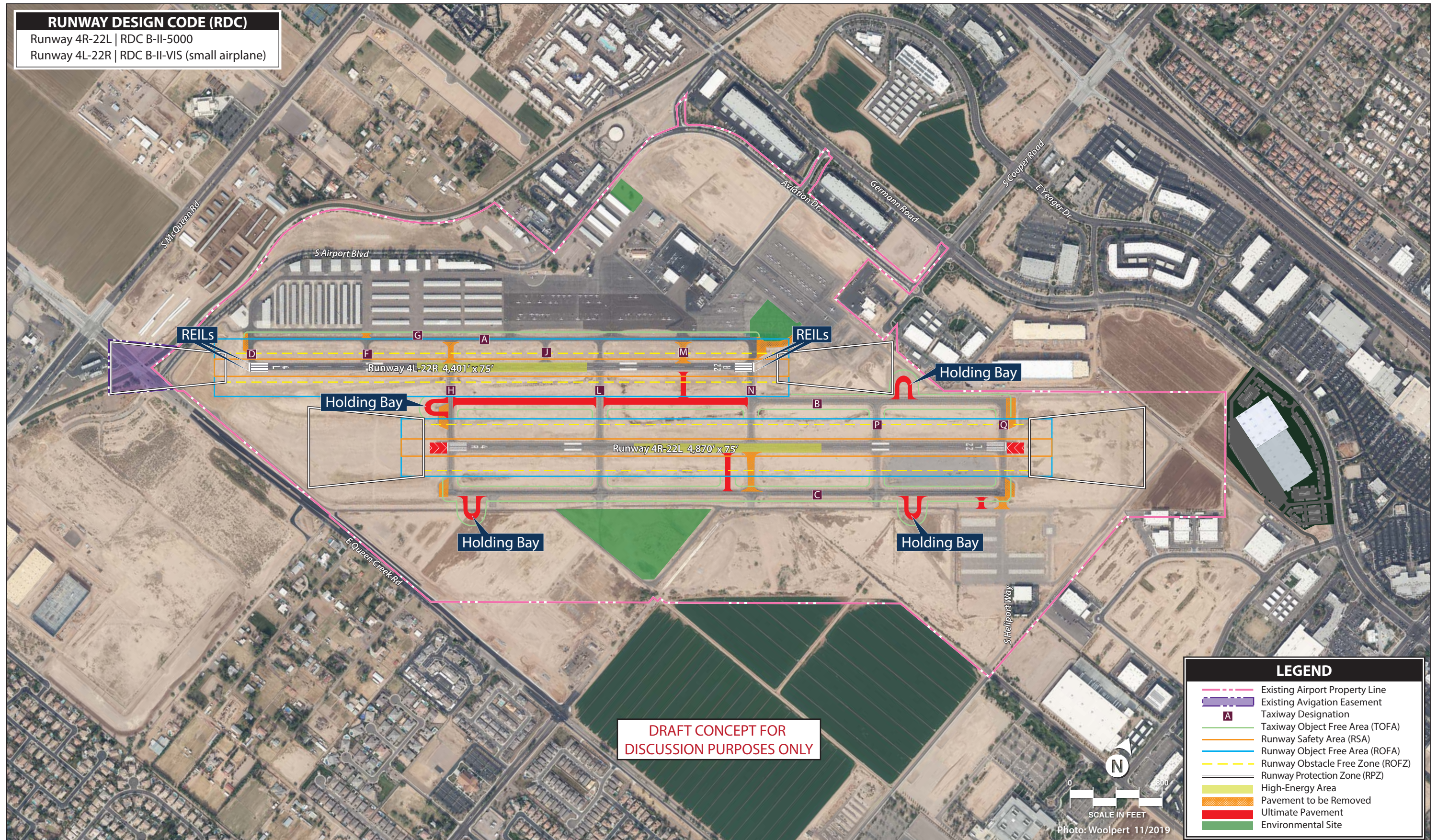
Depicted on **Exhibit 4B**, Airfield Alternative 1 presents a scenario focused on correcting non-standard airfield geometry and maintaining the primary runway at its current length of 4,870 feet. This is an important scenario to consider since an extension to Runway 4R-22L is not a foregone conclusion. **A runway extension still requires justification with the FAA to be eligible for funding through the Airport Improvement Program (AIP). Justification typically involves documentation of at least 500 annual operations by operators and aircraft expressing a need for the additional runway. An environmental assessment (EA) process would also need to be completed, along with extensive public outreach. If justification for a runway extension is not achieved for several years or ever, a contingency airfield plan should be available.**

The features of Airfield Alternative 1 include:

1. REILs are added to both ends of Runway 4L-22R.
2. Taxiway B is extended south to Taxiway H to improve taxiway circulation and mitigate hot spot #1 by providing additional access points to Taxiway B via Taxiway L.
3. The portion of Taxiway F north of Taxiway A is closed and the pavement removed to prevent direct access to the runway.
4. The portion of Taxiway H between Taxiway A and Runway 4L-22R is closed and the pavement removed to eliminate the high energy runway crossing point.
5. The portion of Taxiway M between Taxiway A and Runway 4L-22R is closed and the pavement removed to prevent direct access to the runway.
6. The holding bay at the Runway 22R end and the taxilane extending to the north along the edge of the environmental site is closed and the pavement removed. The holding bay and taxilane create a wide expansive pavement area that is non-standard.
7. The existing holding bays throughout the airfield are closed and the pavement removed. New single lane holding bays are added along Taxiway B east of the Runway 22R RPZ, west of Taxiway H, and south of Taxiway C near the ends of the runway.
8. The portion of Taxiway N between Runway 4R-22L and Taxiway C is closed, and the pavement removed to eliminate the high energy runway crossing point. A new connecting taxiway is added approximately 200 feet west of the section to be closed.
9. The portion of Taxiway Q south of Taxiway C connecting to the heliport apron is closed and the pavement removed to prevent direct access to the runway. A new connecting taxiway to Taxiway C is added, approximately 100 feet west of the section to be closed.
10. Blast pads at the ends of Runway 4R-22L are expanded to meet design standards.
11. Upgraded Runway 4L-22R to non-precision markings by adding threshold markings.

**RUNWAY DESIGN CODE (RDC)**

Runway 4R-22L | RDC B-II-5000  
Runway 4L-22R | RDC B-II-VIS (small airplane)



This page intentionally left blank

*Airfield Alternative 1 Estimated Construction Cost*

Item No.	Proposed Projects	Estimated Cost
	<b>Runway 4R-22L</b>	
1	Construct Blast Pads at both runway ends	\$470,000
	<b>Runway 4L-22R</b>	
2	Install REILS at both runway ends	\$110,000
	<b>Parallel Taxiway A (and projects along Taxiway A)</b>	
3	Remove Run-up near TWY A/D intersection	\$110,000
4	Remove Run-up near TWY A/N intersection	\$210,000
5	Remove Connector TWY H between TWY A and RWY 4L-22R	\$120,000
6	Remove Connector TWY M between TWY A and RWY 4L-22R	\$120,000
	<b>Parallel Taxiway B (and projects along Taxiway B)</b>	
7	Extend TWY B between TWY L and TWY N	\$1,600,000
8	Extend TWY B between TWY N and TWY H	\$1,600,000
9	Remove Run-up on TWY H between RW 4R-22L & RW 4L 22R	\$140,000
10	Remove Run-up near TWY B/Q intersection	\$180,000
11	Construct Holding Bay near TWY B/H intersection (1 aircraft)	\$470,000
12	Construct Holding Bay near TWY B/P intersection (1 aircraft)	\$450,000
13	Construct Connector TWY M between TWY B and RWY 4L-22R	\$420,000
	<b>Parallel Taxiway C (and projects along Taxiway C)</b>	
14	Remove Run-up near TWY C/H intersection	\$130,000
15	Remove Run-up near TWY C/Q intersection	\$140,000
16	Construct Holding Bay near TWY C/H intersection (1 aircraft)	\$510,000
17	Construct Holding Bay near TWY C/P intersection (1 aircraft)	\$510,000
18	Relocate TWY N between TWY C and RWY 4R-22L	\$630,000
19	Relocate TWY Q between TWY C and hangar area	\$510,000
	<b>TOTAL</b>	<b>\$8,430,000</b>

*Source: Dibble Engineering*

## AIRFIELD ALTERNATIVE 2

Depicted on **Exhibit 4C**, Airfield Alternative 2 incorporates a 680-foot extension to Runway 4R-22L for a full length of 5,550 feet. This added length will make the airport more accessible to jet aircraft, particularly during hot weather conditions.

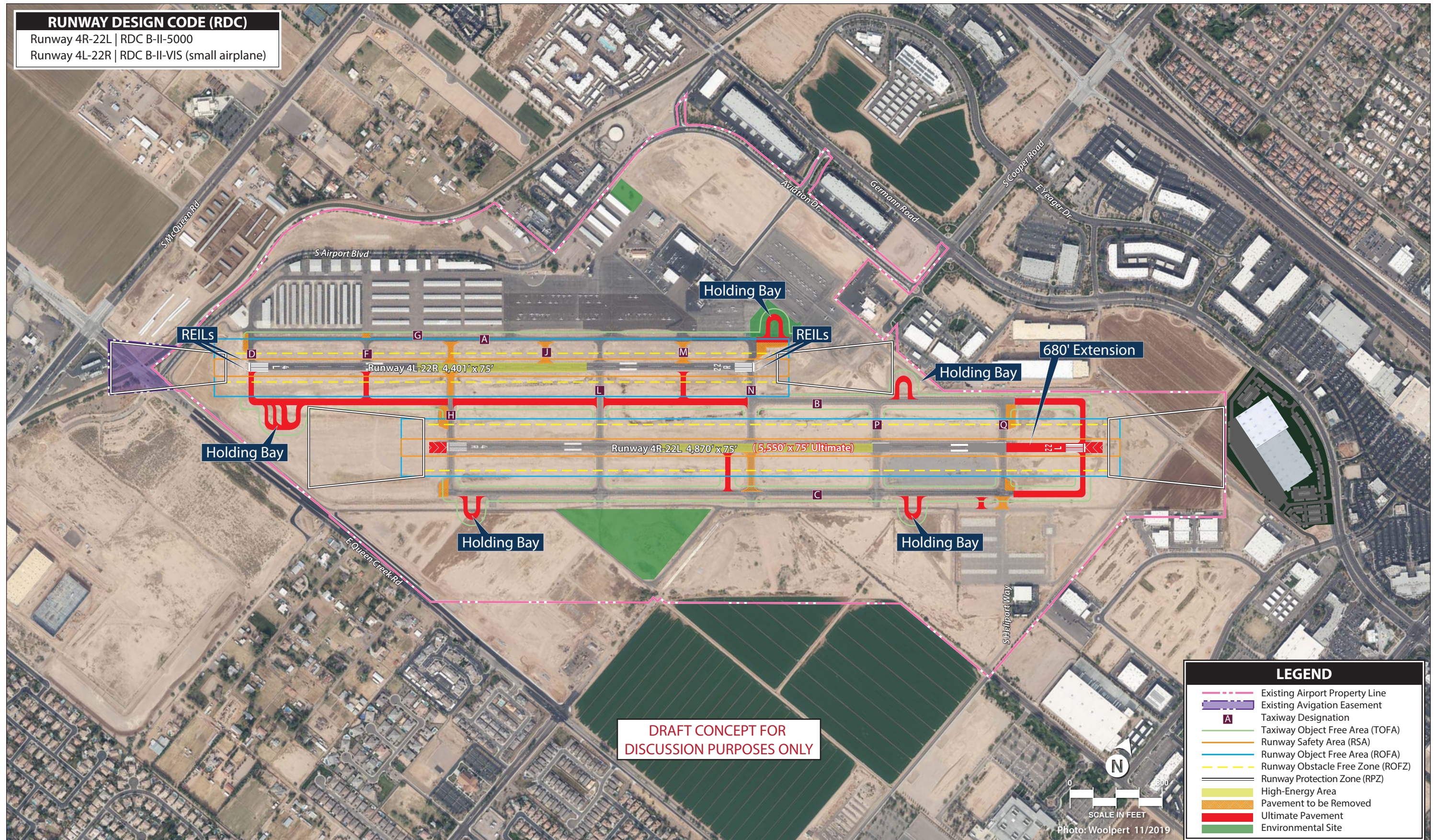
The features of Airfield Alternative 2 include:

1. Runway 4R-22L is extended by 680 feet to the northeast for a full length of 5,550 feet. The associated RDC B-II-5000 safety areas are extended for the same distance but remain entirely on airport property.
2. Taxiways B and C are extended to the new Runway 22L threshold.

3. Runway 4L-22R is maintained at its current length of 4,401 feet and fully meets RDC B-II-VIS (small airplane) design standards.
4. REILs are added to both ends of Runway 4L-22R.
5. Taxiway B is extended south to the Runway 4L threshold to improve taxiway circulation and mitigate hot spot #1 by providing additional access points to Taxiway B via Taxiway L and F.
6. The portion of Taxiway F north of Taxiway A is closed and the pavement removed to prevent direct access to the runway.
7. Taxiway J is closed, and the pavement removed. Taxiway J is located approximately 475 feet from Taxiway L. Taxiway exits should be spaced 750 feet or greater to have an effect on capacity. Since Taxiway J does not meet this spacing recommendation, it can be considered for removal.
8. The portion of Taxiway H between Taxiway A and Taxiway B (excluding the runway pavement) is closed and the pavement removed to eliminate the high energy runway crossing point. An alternate route is created by extending Taxiway F from Runway 4L-22R to Taxiway B.
9. The portion of Taxiway M between Taxiway A and Runway 4L-22R is closed and the pavement removed to prevent direct access to the runway.
10. The holding bay at the Runway 22R end and the taxilane extending to the north along the edge of the environmental site is closed and the pavement removed. The holding bay and taxilane create a wide expansive pavement area that is non-standard.
11. The existing holding bays throughout the airfield are closed and the pavement removed. New single lane holding bays are added on the environmental site near the Runway 22R threshold, east of the Runway 22R RPZ and south of Taxiway C.
12. A multi-lane holding bay is located near the Runway 4L threshold along Taxiway B. A multi-lane holding bay can accommodate multiple aircraft at once, ideally suited for areas that can become congested.
13. The portion of Taxiway N between Runway 4R-22L and Taxiway C is closed and the pavement removed to eliminate the high energy runway crossing point. A new connecting taxiway is added approximately 200 feet west of the section to be closed.
14. The portion of Taxiway Q south of Taxiway C connecting to the heliport apron is closed and the pavement removed to prevent direct access to the runway. A new connecting taxiway to Taxiway C is added approximately 100 feet west of the section to be closed.
15. Blast pads at the ends of Runway 4R-22L are expanded to meet design standards.
16. Upgrade Runway 4L-22R to non-precision markings by adding threshold markings.

**RUNWAY DESIGN CODE (RDC)**

Runway 4R-22L | RDC B-II-5000  
Runway 4L-22R | RDC B-II-VIS (small airplane)



**DRAFT CONCEPT FOR DISCUSSION PURPOSES ONLY**

LEGEND	
	Existing Airport Property Line
	Existing Avigation Easement
	Taxiway Designation
	Taxiway Object Free Area (TOFA)
	Runway Safety Area (RSA)
	Runway Object Free Area (ROFA)
	Runway Obstacle Free Zone (ROFZ)
	Runway Protection Zone (RPZ)
	High-Energy Area
	Pavement to be Removed
	Ultimate Pavement
	Environmental Site

This page intentionally left blank



*Airfield Alternative 2 Estimated Construction Cost*

Item No.	Proposed Projects	Estimated Cost
	<b>Runway 4R-22L</b>	
1	Runway Extension (680') + TW B & TW C Extensions	\$2,930,000
2	Construct Blast Pads at both runway ends	\$470,000
	<b>Runway 4L-22R</b>	
3	Install REILS at both runway ends	\$110,000
	<b>Parallel Taxiway A (and projects along Taxiway A)</b>	
4	Remove Run-up near TWY A/D intersection	\$110,000
5	Remove Run-up near TWY A/N intersection	\$210,000
6	Construct Holding Bay near TWY A/N intersection (1 aircraft)	\$670,000
7	Remove Connector TWY H between TWY A and RWY 4L-22R	\$120,000
8	Remove Connector TWY J between TWY A and RWY 4L-22R	\$130,000
9	Remove Connector TWY M between TWY A and RWY 4L-22R	\$120,000
	<b>Parallel Taxiway B (and projects along Taxiway B)</b>	
10	Extend TWY B between TWY L and TWY N	\$1,600,000
11	Extend TWY B between TWY N and TWY H	\$1,600,000
12	Extend TWY B between TWY H and TWY D, with new RWY End Connector	\$2,050,000
13	Remove Run-up on TWY H between RW 4R-22L & RW 4L 22R	\$140,000
14	Remove Run-up near TWY B/Q intersection	\$180,000
15	Construct Holding Bay near TWY B/D intersection (3 aircraft)	\$800,000
16	Construct Holding Bay near TWY B/P intersection (1 aircraft)	\$450,000
17	Construct Connector TWY F between TWY B and RWY 4L-22R	\$430,000
18	Construct Connector TWY M between TWY B and RWY 4L-22R	\$430,000
	<b>Parallel Taxiway C (and projects along Taxiway C)</b>	
19	Remove Run-up near TWY C/H intersection	\$130,000
20	Remove Run-up near TWY C/Q intersection	\$140,000
21	Construct Holding Bay near TWY C/H intersection (1 aircraft)	\$510,000
22	Construct Holding Bay near TWY C/P intersection (1 aircraft)	\$510,000
23	Relocate TWY N between TWY C and RWY 4R-22L	\$630,000
24	Relocate TWY Q between TWY C and hangar area	\$510,000
	<b>TOTAL</b>	<b>\$14,980,000</b>

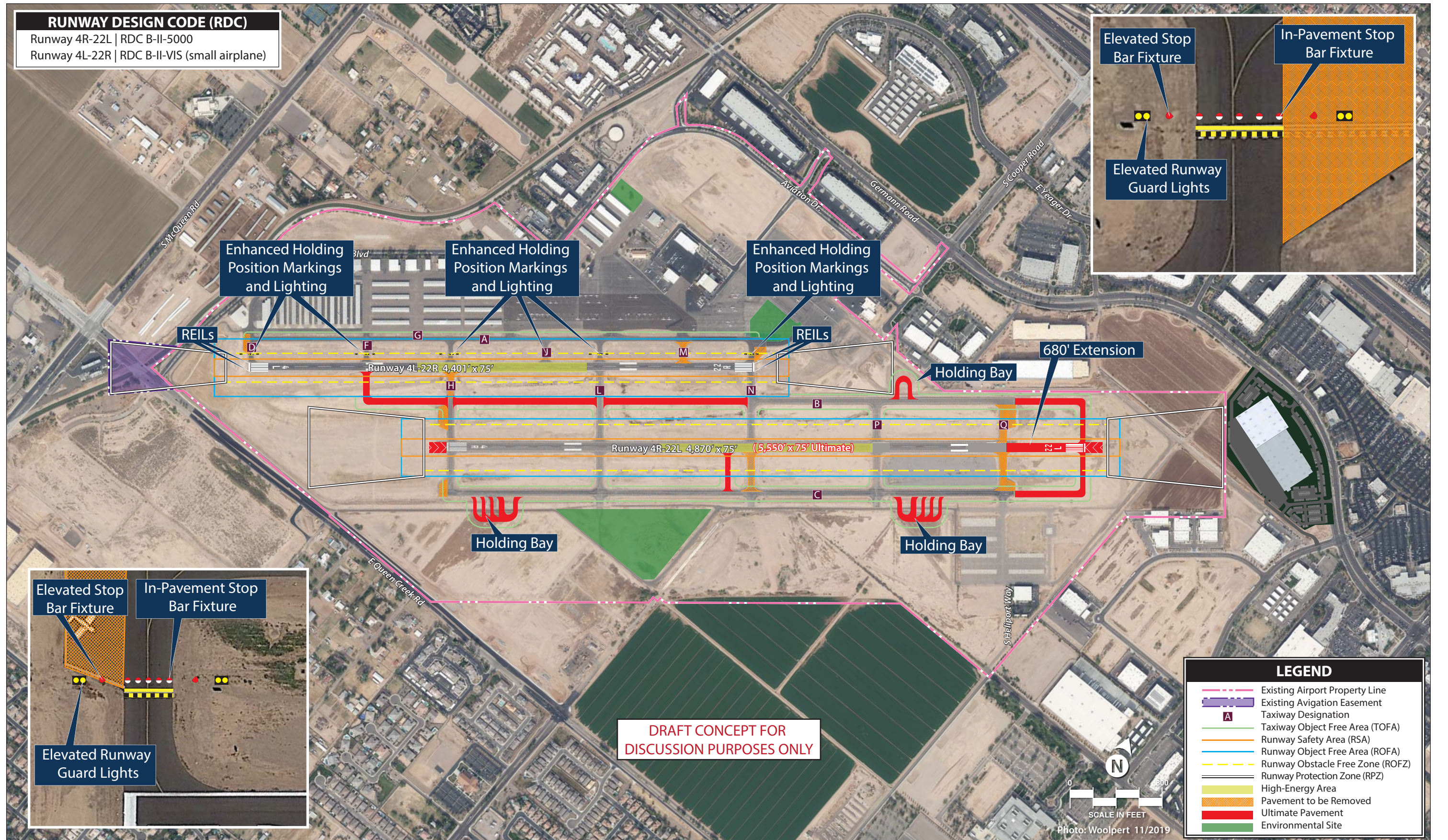
*Source: Dibble Engineering*

### AIRFIELD ALTERNATIVE 3

Depicted on **Exhibit 4D**, Airfield Alternative 3 also includes a 680-foot extension to Runway 4R-22L for a full length of 5,550 feet. The primary difference between Alternative 3 and the others is that it limits the number of taxiways being closed in favor of incorporating enhanced lighting and marking to mitigate direct access points.

The features of Airfield Alternative 3 include:

1. Runway 4R-22L is extended by 680 feet to the northeast for a full length of 5,550 feet. The associated RDC B-II-5000 safety areas are extended for the same distance but remain entirely on airport property.
2. Taxiways B and C are extended to the new Runway 22L threshold.
3. Runway 4L-22R is maintained at its current length of 4,401 feet and fully meets RDC B-II-VIS (small airplane) design standards.
4. REILs are added to both ends of Runway 4L-22R.
5. Taxiway B is extended west to Taxiway F to improve taxiway circulation and mitigate hot spot #1 by providing additional access points to Taxiway B via Taxiway L and F.
6. All holding position markings on the north side of Runway 4L-22R would be equipped with enhanced holding position markings, elevated guard lights, and in-pavement stop bar fixtures for the purpose of raising pilot situational awareness to prevent runway incursions. These systems could eliminate the need to remove pavement to mitigate direct access points.
7. The portion of Taxiway H between Runway 4L-22R and Taxiway B is closed and the pavement removed to eliminate the high energy runway crossing point. An alternate route is created by extending Taxiway F from Runway 4L-22R to Taxiway B.
8. The portion of Taxiway M between Taxiway A and Runway 4L-22R is closed and the pavement removed to prevent direct access to the runway. Taxiway M is a highly trafficked direct access point for the fixed base operator (FBO). This alternative maintains its removal rather than utilizing enhanced holding position markings and lighting to ensure operational safety.
9. The holding bay at the Runway 22R end and the taxilane extending to the north along the edge of the environmental site is closed and the pavement removed. The holding bay and taxilane create a wide expansive pavement area that is non-standard.
10. The existing holding bays throughout the airfield are closed and the pavement removed. A new single lane holding bay is added east of the Runway 22R RPZ.
11. Two multi-lane holding bays are located south of Taxiway C. As development occurs on the south side, it may become necessary to expand the holding bay capacity with multiple lanes to mitigate congestion.
12. The portion of Taxiway N between Runway 4R-22L and Taxiway C is closed and the pavement removed to eliminate the high energy runway crossing point. A new connecting taxiway is added approximately 200 feet west of the section to be closed.
13. Taxiway Q is closed, and the pavement removed to prevent direct access to the runway from heliport apron.
14. Blast pads at the ends of Runway 4R-22L are expanded to meet design standards.
15. Upgrade Runway 4L-22R to non-precision markings by adding threshold markings.



This page intentionally left blank

*Airfield Alternative 3 Estimated Construction Cost*

Item No.	Proposed Projects	Estimated Cost
	<b>Runway 4R-22L</b>	
1	Runway Extension (680') + TW B & TW C Extensions	\$2,930,000
2	Construct Blast Pads at both runway ends	\$470,000
	<b>Runway 4L-22R</b>	
3	Install REILS at both runway ends	\$110,000
4	Install Enhanced Holding Position Markings and Lighting, (at 6 locations - Connectors D, F, H, J, L & N, between RWY 4L-22R and TWY A)	\$650,000
	<b>Parallel Taxiway A (and projects along Taxiway A)</b>	
5	Remove Run-up near TWY A/D intersection	\$110,000
6	Remove Run-up near TWY A/N intersection	\$210,000
7	Remove Connector TWY M between TWY A and RWY 4L-22R	\$120,000
	<b>Parallel Taxiway B (and projects along Taxiway B)</b>	
8	Extend TWY B between TWY L and TWY N	\$1,600,000
9	Extend TWY B between TWY N and TWY H	\$1,600,000
10	Extend TWY B between TWY H and TWY F, with new connector	\$1,280,000
11	Remove Run-up on TWY H between RW 4R-22L & RW 4L 22R	\$140,000
12	Remove Run-up near TWY B/Q intersection	\$180,000
13	Construct Holding Bay near TWY B/P intersection (1 aircraft)	\$450,000
14	Remove Existing Connector TWY Q between TWY B and RWY 4R-22L (Relocated with Extension of TWY B)	\$180,000
15	Remove Connector TWY H between TWY B and RWY 4L-22R	\$130,000
	<b>Parallel Taxiway C (and projects along Taxiway C)</b>	
16	Remove Run-up near TWY C/H intersection	\$130,000
17	Remove Run-up near TWY C/Q intersection	\$140,000
18	Construct Holding Bay near TWY C/H intersection (3 aircraft)	\$960,000
19	Construct Holding Bay near TWY C/P intersection (3 aircraft)	\$960,000
20	Relocate TWY N between TWY C and RWY 4R-22L	\$630,000
21	Remove Existing Connector TWY Q between TWY C and RWY 4L-22R (Relocated with Extension of TWY C)	\$180,000
	<b>TOTAL</b>	<b>\$13,160,000</b>

*Source: Dibble Engineering*

## AIRFIELD SUMMARY

The sections above outlined seven planning considerations for the airfield at CHD. The primary issue at play on the airfield is addressing non-standard airfield geometry. While it may be simple enough to move forward with an alternative to close taxiway pavement that might correct the issue, it is equally important to consider any unintended consequences of those actions. If circulation is impacted, alternate routes need to be provided to ensure new bottlenecks are not created. For this reason, it is vitally

important that the PAC, airport/city management, and the public offer their feedback so that the best course of action is selected.

## **LANDSIDE ALTERNATIVES**

Generally, landside issues are related to those facilities necessary or desired for the safe and efficient parking and storage of aircraft, movement of pilots and passengers to and from aircraft, airport support facilities, and overall revenue support functions. To maximize airport efficiency, it is important to locate facilities together that are intended to serve similar functions. The best approach to landside facility planning is to consider the development to be like that of a community where land use planning is the guide. For airports, the land use guide in the terminal area should generally be dictated by aviation activity levels. Consideration will also be given to non-aviation uses that can provide additional revenue support to the airport and support economic development for the region.

## **LANDSIDE CONSIDERATIONS**

Landside planning considerations, summarized in **Table 4B**, will focus on strategies following a philosophy of separating activity levels. Landside facility development at CHD is focused primarily on the north side, including a terminal building, aprons, a variety of hangar facilities, and fixed base operator (FBO) or specialty aviation service operator (SASO) related facilities. Helicopter-related facilities are currently the only development on the south side. Of the airport's 532.478 acres, approximately 68 percent has been developed, leaving approximately 170 acres available for new development.

### **Consideration #1 – Terminal Services**

Operations at CHD are projected to continue to increase over the course of the next 20 years. As operations grow, so will the need for more terminal service space, which includes passenger and pilot lounges, flight planning equipment, concessions, airport management offices, and storage space. The existing terminal building (constructed in 1996), combined with the available FBO spaces dedicated to these uses, will become undersized and outdated over time. For the airport to attract new high-end clientele, consideration should be given to developing a new, modern terminal building with all appropriate amenities to compete with other Phoenix area reliever airports. The airport and its terminal services are a very important link to the entire region, whether it is for business or pleasure. Consideration to aesthetics should be given high priority in all public areas, as the terminal will serve as the first impression a visitor may have of the community.

**TABLE 4B**  
**Landside Planning Considerations**  
**Chandler Municipal Airport**

#	Landside Component	Existing Capacity/ Condition	Consideration
1	Terminal Services	Existing 5,500 sf terminal on north side; 2,000 sf provided by FBO; 7,500 sf total	Expand terminal capacity to at least 15,400 sf. With the development on the south side, consider relocating main terminal to south side.
2	Hangars	438,517 sf (T-hangars, T-shades, executive, and conventional hangars)	Increase total capacity by at least 290,000 sf.
3	Aprons	235,854 sy	Increase capacity by at least 43,500 sy.
4	Fuel Storage	12,000 gallons (Jet A) 22,000 gallons (AvGas)	Increase Jet A storage capacity by at least 55,400 gallons. Consider new self-service fueling stations particularly on south side to support future development. Relocate existing underground AvGas storage tank at the airport operations and maintenance facility to the terminal apron.
5	Airport Operations & Maintenance	Utilizes old helipad site north of S. Airport Boulevard	Consider relocation of these facilities to provide better access to the airfield and to be in closer proximity to airport administration offices.
6	Aircraft Wash Rack	Not available	Consider sites for a wash rack to expand available airport amenities.
7	General Aviation Pilot's Lounge	Not available	Consider sites for a general aviation pilot's lounge.
8	Land Development	Approximately 363 acres (68%) of the airport's 532.478 acres is developed predominantly for aviation-related uses.	Consider appropriate aviation and non-aviation-related uses for the future development of undeveloped property and consider redevelopment opportunities for under-utilized areas.

sf – square feet | sy – square yards  
Source: *Coffman Associates analysis.*

### Consideration #2 – Hangars

With a hangar space waiting list of 87 people as of June 2020, there is demand for additional hangar capacity at CHD today. The landside alternatives will consider areas for the development of various hangar styles, including small aircraft facilities, executive hangars, and FBO/SASO hangars. These areas are further defined below.

- **Small aircraft facilities** typically consist of T-hangars/T-shades. These facilities often have lower levels of activity and, as such, can be located away from the primary apron areas in more remote locations of the airport. Limited utility services are needed for these areas.

- **Executive hangars** consist primarily of clear span hangars of less than 10,000 sf, which can accommodate small aviation businesses, one larger aircraft, or multiple smaller aircraft. These hangar areas typically require all utilities and segregated roadway access.
- **FBO/SASOs** are businesses that offer services, including but not limited to, aircraft rental and flight training, flight testing, aircraft manufacturing, aircraft charters, aircraft maintenance, line service, and aircraft fueling. The facilities associated with FBOs/SASOs include large conventional-type hangars that hold several aircraft. High levels of activity often characterize these operations, with a need for apron space for the storage and circulation of aircraft. These facilities are best placed along ample apron frontage with good visibility from the runway system for transient aircraft. Utility services are needed for these types of facilities, as well as vehicle parking areas.

Conceptual/order-of-magnitude costs for a range of hangar sizes is provided below. It is important to note that these costs are not inclusive of significant engineering/site preparations that may be required for unique site conditions and do not include special amenities, such as office space, conference areas, etc.

- 8,000 SF ~ \$450,000
- 20,000 SF ~ \$1,100,000
- 30,000 SF ~ \$1,700,000
- T-Hangars ~ \$45-\$50/SF

### **Consideration #3 – Aprons**

CHD has 235,854 sy of apron space for aircraft parking and circulation. Based on projected growth in based aircraft and transient operations, an additional 43,500 sy of apron capacity is needed over the next 20 years. Since apron space is typically co-located with hangar facilities, the landside alternatives assume areas of hangar development will also include apron space.

### **Consideration #4 – Fuel Storage**

Additional fuel storage capacity for Jet A fuel is needed over the course of the planning period driven by increased activity by turbine aircraft. Since these facilities are typically associated with FBO/SASO operators, the landside alternatives assume new fuel storage facilities will be added in these areas. Additionally, the existing underground 100LL fuel storage tank, located on the north side of S. Airport Boulevard near the airport operations/maintenance facilities, is planned to be relocated to the terminal apron near the existing self-service station.



### **Consideration #5 – Airport Operations & Maintenance**

The existing operations and maintenance facilities are located on the old heliport site between S. Airport Boulevard and the drainage canal. This site is not ideal, with it being separated from the entirety of the airport by a public road. New sites for airport operations and maintenance facilities are considered in the landside alternatives.

### **Consideration #6 – Aircraft Wash Rack**

Wash racks are amenities provided at many airports so that aircraft owners can clean aircraft. A wash rack is typically a paved area with a central drain equipped with an oil/water separator, which prevents cleaning products from entering the stormwater system. Sites for an aircraft wash rack are considered in the landside alternatives.

### **Consideration #7 – General Aviation Pilot’s Lounge**

A general aviation pilot’s lounge is a dedicated facility for pilots to socialize and hold events that might otherwise interfere with the day-to-day functions of the terminal building. They can also house other terminal-related functions, such as flight planning equipment and flight training classrooms. Consideration is given to potential sites for a pilot’s lounge in the landside alternatives.

### **Consideration #8 – Land Development**

The landside alternatives present development and redevelopment areas on the airport for aviation-related and non-aviation related uses, considering highest and best use potential. Aviation-related uses are typically reserved for property with direct access to the airfield. For property that is segregated from the airfield, an airport should consider non-aviation related development. The FAA typically requires airports to receive approval through a land-use release to lease airport-owned land for non-aviation related purposes. The FAA stipulates that all land with reasonable airside access should be used or reserved for aviation purposes. The only portion of airport property that is completely segregated from the airfield is the old heliport site, consisting of approximately 16.2 acres located between S. Airport Boulevard and the drainage canal on the north side. A portion of this site is currently utilized for aircraft operations and maintenance equipment storage. Approximately 11.4 acres of this area is within a floodplain.

Construction within a floodplain is regulated by the Maricopa County Flood Control District. Permits are required for any building or site alterations to ensure maximum protection against flooding is maintained. It should also be noted that any development proposed within a floodplain requires additional analysis and protections for any proposed structures and would likely result in significant off-site drainage improvements to offset the drainage impacts.

## LANDSIDE ALTERNATIVES

The following section describes a series of landside alternatives as they relate to considerations detailed above. The alternatives focus on designating generalized land uses as opposed to proposing specific facility types, sizes, and configurations. This is beneficial in that a generalized land use gives flexibility for the development of a site to meet the needs of clients with no predetermined layout constraints.

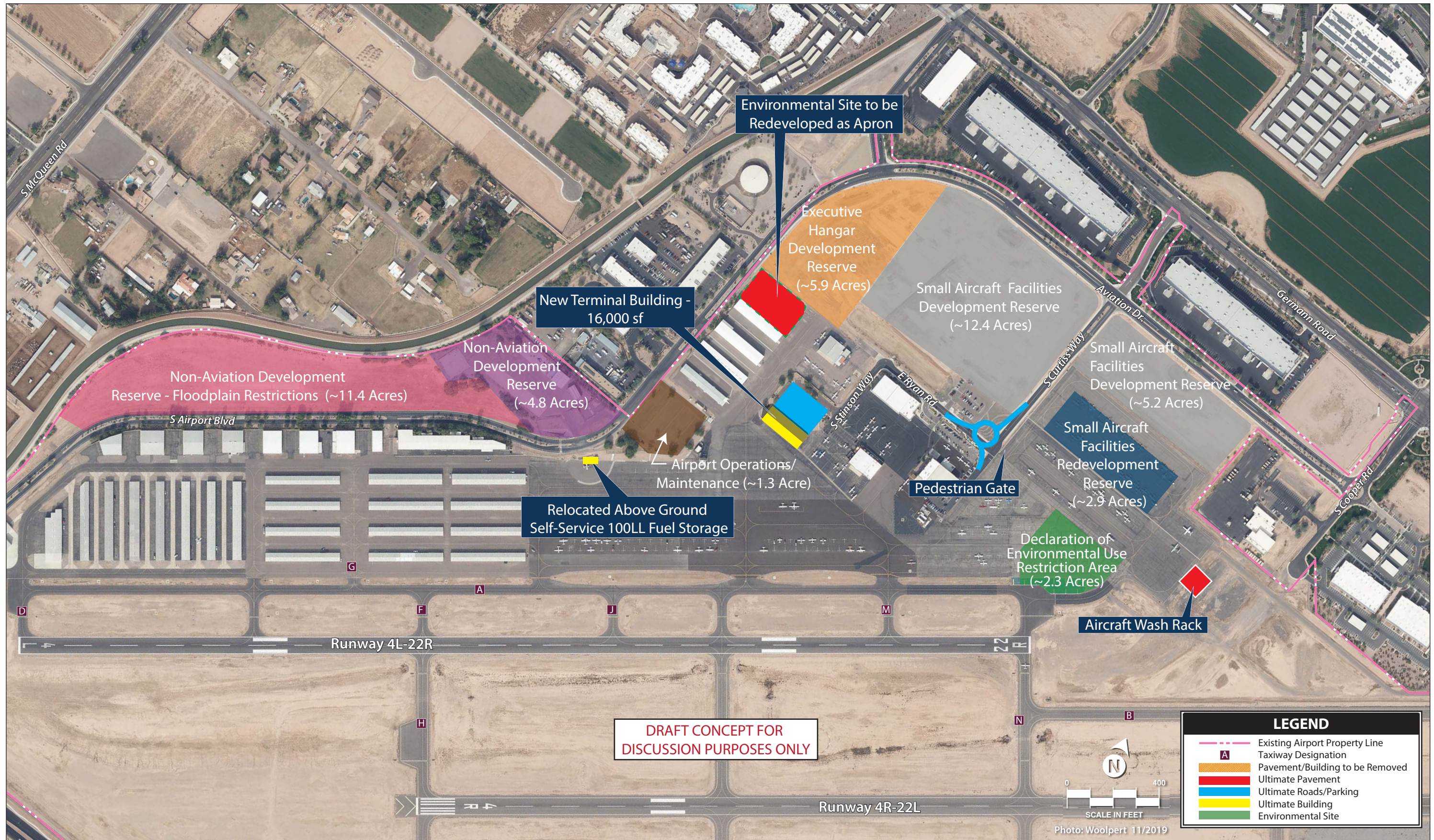
Six alternatives have been prepared, three for the north side and three for the south side. The alternatives provide potential development plans aimed at meeting the needs of general aviation through the long-term planning period and, in some cases, beyond.

**The alternatives to be presented are not the only reasonable options for development. In some cases, a portion of one alternative could be intermixed with another. Also, some development concepts could be replaced with others. The overall intent of this exercise is to outline basic development concepts to spur collaboration for a final recommended plan. The final recommended plan only serves as a guide for the airport, which will aid the City of Chandler in the strategic planning of airport property. Many times, airport operators change their plan to meet the needs of specific users. The goal in analyzing landside development alternatives is to focus future development so that airport property can be maximized, and aviation activity can be protected.**

### NORTH LANDSIDE ALTERNATIVE 1

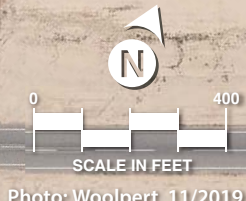
Depicted on **Exhibit 4E**, North Landside Alternative 1 focuses primarily on small aircraft related facilities with the assumption that facilities catering to larger aircraft would be focused on the south side. The features of North Landside Alternative 1 include:

1. Redevelopment of the existing terminal building site with a 16,000-sf terminal with the orientation shifted south to align with the angle of the terminal apron. The vehicle parking lot is also reconfigured and expanded to support the new terminal building.
2. A roundabout is added to replace the intersection of S. Curtis Way and E. Ryan Road, which is a style consistent with the surrounding Chandler Airpark. A secured pedestrian gate would also be added to the perimeter fence providing access to the apron area.
3. The 100LL underground fuel storage tank currently located north of S. Airport Boulevard would be relocated and made an above ground tank in support of the self-service station on the terminal apron.
4. The vehicle parking lot adjacent to the airport traffic control tower (ATCT) would be redeveloped as an airport operations/maintenance site providing better access to airport facilities and the airfield and closer proximity to airport administrative offices.
5. An aircraft wash rack is considered at the east edge of the north apron.



**DRAFT CONCEPT FOR DISCUSSION PURPOSES ONLY**

LEGEND	
	Existing Airport Property Line
	Taxiway Designation
	Pavement/Building to be Removed
	Ultimate Pavement
	Ultimate Roads/Parking
	Ultimate Building
	Environmental Site



This page intentionally left blank

6. Redevelopment of an approximately one-acre environmental site located northwest of the terminal building as apron pavement for aircraft tiedowns. This environmental site was previously used as a dump site for construction debris sometime between 1949 and 1964. The City of Chandler has determined that this site can be capped with asphalt and returned to useable airport property.
7. Reservation of approximately 20.5 acres of property south of Aviation Drive and split by S. Curtiss Way for small aircraft facilities development and redevelopment reserve. This could include new T-hangars, T-shades, apron, and a dedicated GA pilot’s lounge.
8. Reservation of approximately 5.9 acres of property along Aviation Drive/S. Airport Boulevard northwest of the terminal for executive hangar development.
9. Reservation of approximately 11.4 acres of the old heliport site for non-aviation development, including the potential for a solar farm photovoltaic array. This site is subject to floodplain restrictions.
10. Reservation of approximately 4.8 acres of the old heliport site that is currently used for airport operations/maintenance for non-aviation development.

*North Landside Alternative 1 Estimated Construction Cost*

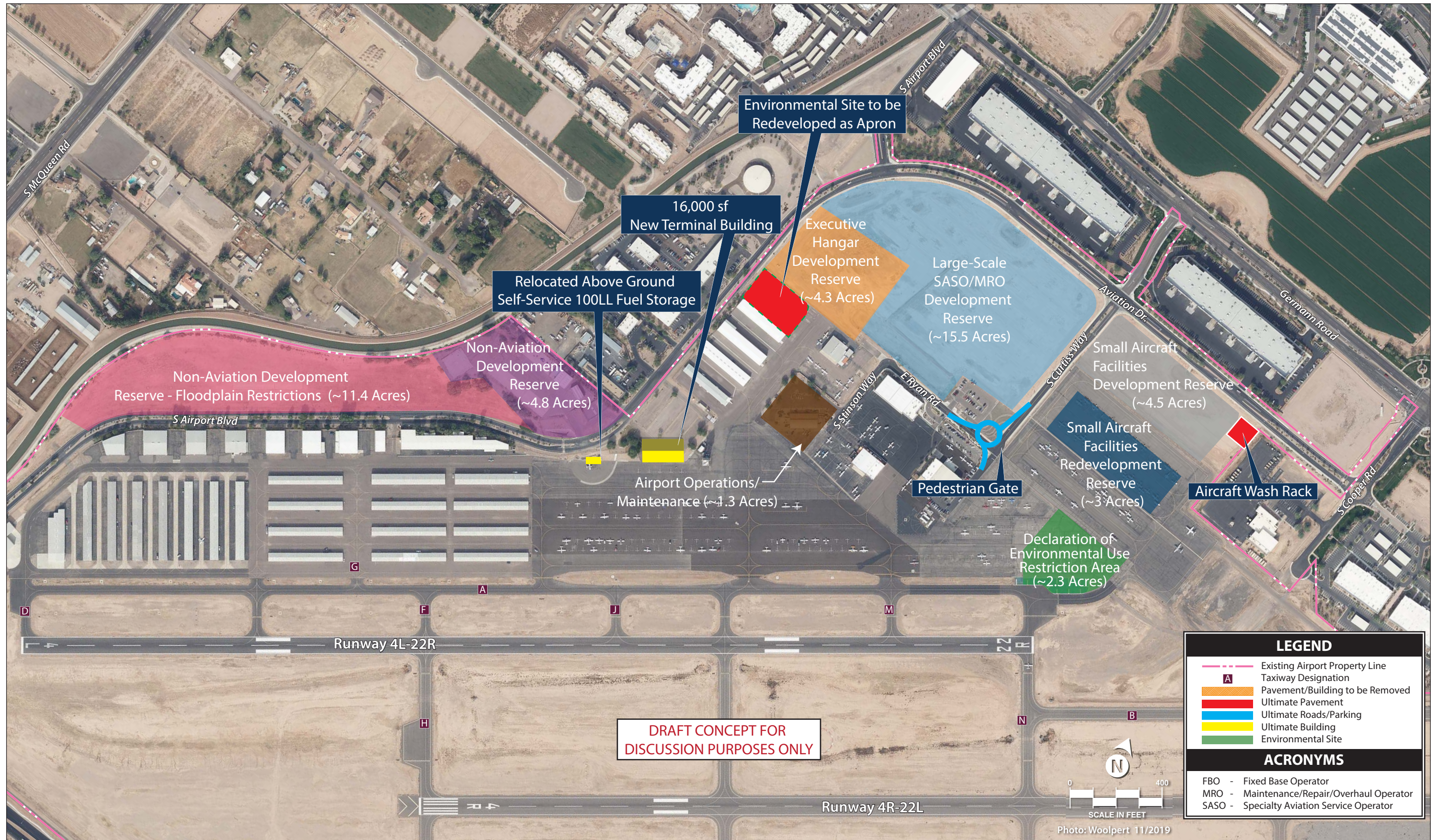
Item No.	Proposed Projects	Estimated Cost
<b>North Landside Developments</b>		
1	New Terminal Building (16,000 FT)	\$8,000,000
2	Relocated Above Ground Self-Service 100LL Fuel Storage	\$800,000
3	Aircraft Wash Rack	\$425,000
4	Shade Structures	\$300,000
5	Parking Lot	\$126,000
6	Pedestrian Gate	\$5,000
<b>Utilities/Sitework</b>		
7	Non-Aviation Development Reserve – Floodplain Restrictions	\$4,470,000
8	Non-Aviation Development Reserve	\$1,890,000
9	Airport Operations/Maintenance	\$510,000
10	Executive Hangar Development Reserve	\$2,320,000
11	Small Aircraft Facilities Development Reserve (12.4 Acres)	\$4,870,000
12	Small Aircraft Facilities Development Reserve (5.2 Acres)	\$2,320,000
13	Small Aircraft Facilities Redevelopment Reserve	\$1,140,000
<b>Roadways</b>		
14	New Roundabout	\$300,000
	<b>TOTAL</b>	<b>\$27,476,000</b>

*Source: Dibble Engineering*

## NORTH LANDSIDE ALTERNATIVE 2

Depicted on **Exhibit 4F**, North Landside Alternative 2 focuses on providing a more diverse range of facilities on the north side, including areas for small aircraft facility development up to large-scale SASO or maintenance/repair/overhaul (MRO) operators. The features of North Landside Alternative 2 include:

1. Development of a new 16,000 sf terminal building adjacent to the ATCT. This site is closer to the runway and would give the terminal better visibility from the airfield. The existing parking lot at the ATCT could also be revamped to support the terminal building.
2. A roundabout is added to replace the intersection of S. Curtis Way and E. Ryan Road, which is a style consistent with the surrounding Chandler Airpark. A secured pedestrian gate would also be added to the perimeter fence providing access to the apron area.
3. The 100LL underground fuel storage tank currently located north of S. Airport Boulevard would be relocated and made an above ground tank in support of the self-service station on the terminal apron.
4. The existing terminal site would be redeveloped for airport operations/maintenance facilities. This site provides better access to airport facilities and is near airport administration offices in the new terminal building.
5. An aircraft wash rack is considered on the north side of the north apron along Aviation Drive.
6. Redevelopment of an approximately one-acre environmental site located northwest of the terminal building as apron pavement for aircraft tiedowns. This environmental site was previously used as a dump site for construction debris sometime between 1949 and 1964. The City of Chandler has determined that this site can be capped with asphalt and returned to useable airport property.
7. Reservation of approximately 7.5 acres of property on and near the north apron for small aircraft facilities development and redevelopment reserve. This could include new T-hangars, T-shades, apron, and a dedicated GA pilot's lounge.
8. Reservation of approximately 4.3 acres of property along Aviation Drive/S. Airport Boulevard northwest of the terminal for executive hangar development.
9. Reservation of approximately 15.5 acres north of the terminal and south of Aviation Drive for a large-scale SASO/MRO complex or an aircraft manufacturer.
10. Reservation of approximately 11.4 acres of the old heliport site for non-aviation development, including the potential for a solar farm photovoltaic array. This site is subject to floodplain restrictions.
11. Reservation of approximately 4.8 acres of the old heliport site that is currently used for airport operations/maintenance for non-aviation development.



This page intentionally left blank



*North Landside Alternative 2 Estimated Construction Cost*

Item No.	Proposed Projects	Estimated Cost
<b>North Landside Developments</b>		
1	New Terminal Building (16,000 FT)	\$8,000,000
2	Relocated Above Ground Self-Service 100LL Fuel Storage	\$800,000
3	Aircraft Wash Rack	\$425,000
4	Shade Structures	\$300,000
5	Pedestrian Gate	\$5,000
<b>Utilities/Sitework</b>		
6	Non-Aviation Development Reserve – Floodplain Restrictions	\$4,470,000
7	Non-Aviation Development Reserve	\$1,890,000
8	Airport Operations/Maintenance	\$510,000
9	Executive Hangar Development Reserve	\$1,690,000
10	Large-Scale SASO/MRO Development Reserve	\$6,080,000
11	Small Aircraft Facilities Development Reserve	\$1,770,000
12	Small Aircraft Facilities Redevelopment Reserve	\$1,180,000
<b>Roadways</b>		
13	New Roundabout	\$300,000
	<b>TOTAL</b>	<b>\$27,420,000</b>

*Source: Dibble Engineering*

### **NORTH LANDSIDE ALTERNATIVE 3**

Depicted on **Exhibit 4G**, North Landside Alternative 3 considers relocating the terminal north of its current location and co-locating future FBO/SASO development. This would give more focus to servicing larger aircraft on the north side as opposed to the south side. The features of North Landside Alternative 3 include:

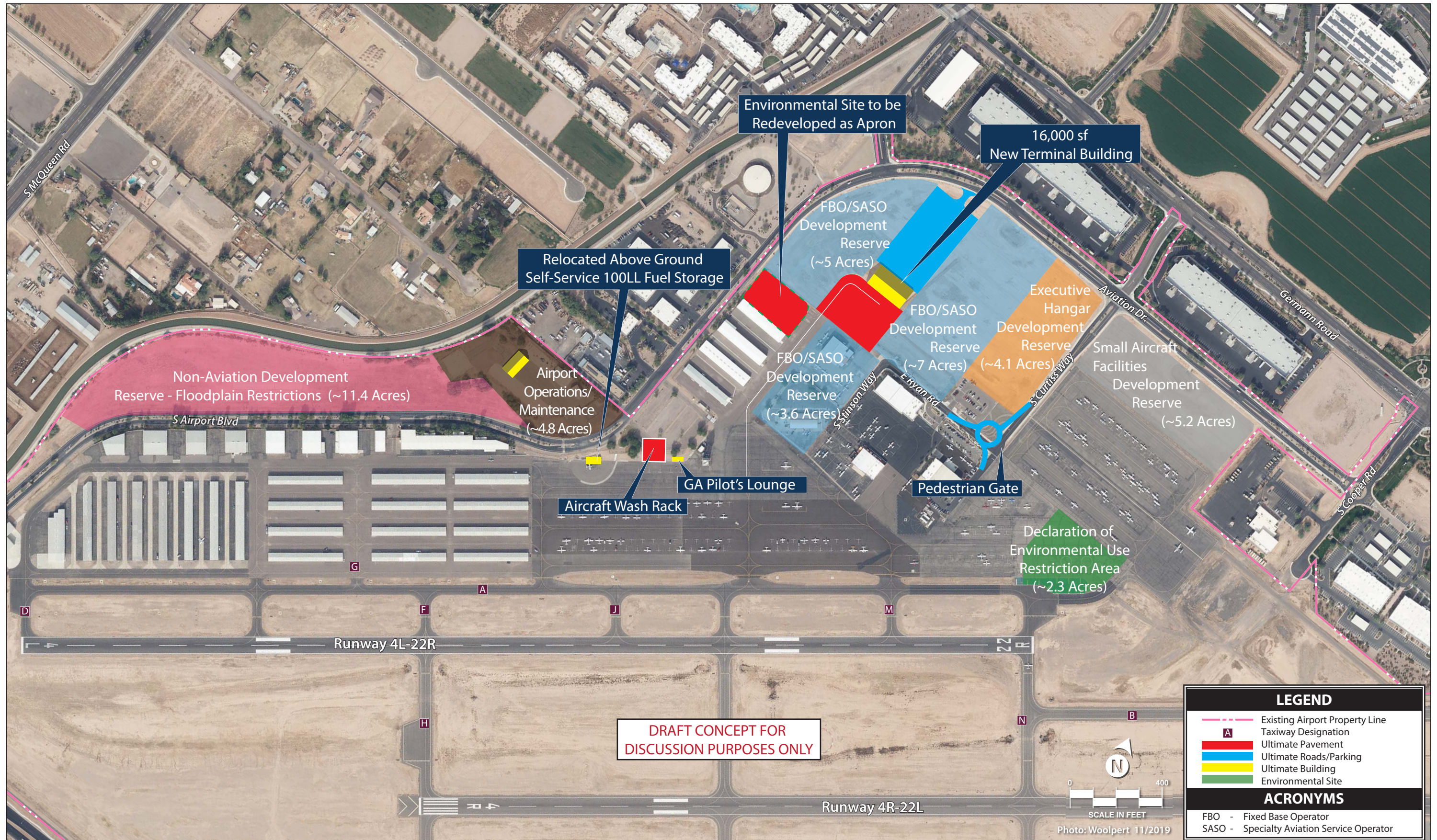
1. Development of a new 16,000 sf terminal building north of the existing location with taxiway access and adjacent apron. An adjacent vehicle parking lot would support the new terminal building as well as the surrounding FBO/SASO development sites. This site is further from the airfield and, based on how the FBO/SASO sites are developed, could make visibility an issue.
2. A roundabout is added to replace the intersection of S. Curtiss Way and E. Ryan Road, which is a style consistent with the surrounding Chandler Airpark. A secured pedestrian gate would also be added to the perimeter fence providing access to the apron area.
3. The 100LL underground fuel storage tank currently located north of S. Airport Boulevard would be relocated and made an above ground tank in support of the self-service station on the terminal apron.
4. An aircraft wash rack is considered adjacent to the ATCT, along with a dedicated GA pilot's lounge.

5. Redevelopment of an approximately one-acre environmental site located northwest of the terminal building as apron pavement for aircraft tiedowns. This environmental site was previously used as a dump site for construction debris sometime between 1949 and 1964. The City of Chandler has determined that this site can be capped with asphalt and returned to useable airport property.
6. Reservation of approximately 5.2 acres of property near the north apron for small aircraft facilities development and redevelopment reserve.
7. Reservation of approximately 4.1 acres of property along S. Curtiss Way for executive hangar development.
8. Reservation of approximately 15.6 acres of property surrounding the new terminal building FBO/SASO development.
9. Reservation of approximately 11.4 acres of the old heliport site for non-aviation development, including the potential for a solar farm photovoltaic array. This site is subject to floodplain restrictions.
10. Reservation of approximately 4.8 acres of airport operations/maintenance facilities, including a new building for equipment storage and office space.

*North Landside Alternative 3 Estimated Construction Cost*

Item No.	Proposed Projects	Estimated Cost
<b>North Landside Developments</b>		
1	New Terminal Building (16,000 FT)	\$8,000,000
2	Relocated Above Ground Self-Service 100LL Fuel Storage	\$800,000
3	Aircraft Wash Rack	\$425,000
4	GA Pilot Lounge	\$150,000
5	Shade Structures	\$300,000
6	Parking Lot	\$470,000
7	Pedestrian Gate	\$5,000
<b>Utilities/Sitework</b>		
8	Non-Aviation Development Reserve – Floodplain Restrictions	\$4,470,000
9	Airport Operations/Maintenance	\$1,890,000
10	FBO/SASO Development Reserve	\$6,120,000
11	Executive Hangar Development Reserve	\$1,610,000
12	Small Aircraft Facilities Development Reserve	\$2,040,000
13	Small Aircraft Facilities Redevelopment Reserve	\$1,180,000
<b>Roadways</b>		
14	New Roundabout	\$300,000
	<b>TOTAL</b>	<b>\$27,760,000</b>

*Source: Dibble Engineering*



This page intentionally left blank

### SOUTH LANDSIDE ALTERNATIVE 1

Depicted on **Exhibit 4H**, South Landside Alternative 1 focuses on providing a mix of general aviation services catering to FBO/SASOs, executive hangars, and small aircraft facilities. This alternative does not include a new terminal facility with the assumption that the terminal would remain on the north side. The features of South Landside Alternative 1 include:

1. Development of a new self-service fuel station equipped with above ground storage tanks for 100LL and Jet A fuels. The station would be accessible to aircraft via a new taxiway from Taxiway C and to supply trucks via new surface roads extending from S. Cooper Road and E. Ryan Road.
2. Reservation of approximately 24.2 acres of property for small aircraft facilities. This includes T-hangars, T-shades, apron, and a dedicated GA pilot’s lounge and wash rack.
3. Reservation of approximately 28.7 acres of property for executive hangar development.
4. Reservation of approximately 19.5 acres for FBO/SASO development.

*South Landside Alternative 1 Estimated Construction Cost*

Item No.	Proposed Projects	Estimated Cost
<b>South Landside Developments</b>		
1	Self-Service Fuel Station	\$800,000
<b>Utilities/Sitework</b>		
2	Executive Hangar Development Reserve	\$11,260,000
3	Small Aircraft Facilities Development Reserve (4.9 Acres)	\$1,930,000
4	Small Aircraft Facilities Development Reserve (19.3 Acres)	\$7,570,000
5	FBO/SASO Development Reserve	\$7,650,000
<b>Roadways</b>		
6	New Roundabout	\$400,000
7	Additional Roadway	\$4,200,000
	<b>TOTAL</b>	<b>\$33,010,000</b>

*Source: Dibble Engineering*

### SOUTH LANDSIDE ALTERNATIVE 2

Depicted on **Exhibit 4J**, South Landside Alternative 2 considers the relocation of the terminal building and focusing on accommodating more transient activity on the south side. The features of South Landside Alternative 2 include:

1. Development of a new 16,000 sf terminal building near the Runway 4R threshold and a co-located self-service fuel station for both Jet A and 100LL fuels. A terminal apron fronts the terminal to the north with a vehicle parking lot to the south.

2. Reservation of approximately 21.1 acres of property for small aircraft facilities. This includes T-hangars, T-shades, apron, and a dedicated GA pilot’s lounge and wash rack.
3. Reservation of approximately 21.1 acres of property for executive hangar development.
4. Reservation of approximately 14.6 acres for FBO/SASO development.
5. Reservation of approximately 8.4 acres for a large-scale SASO operation, such as an MRO or aircraft manufacturer.

*South Landside Alternative 2 Estimated Construction Cost*

Item No.	Proposed Projects	Estimated Cost
	<b>South Landside Developments</b>	
	<b>Utilities/Sitework</b>	
1	FBO/SASO Development Reserve	\$3,610,000
2	GA Terminal/Apron/Fuel Facilities Reserve	\$3,650,000
3	Large-Scale SASO Development Reserve	\$3,300,000
4	Small Aircraft Facilities Development Reserve	\$16,550,000
5	FBO/SASO Development Reserve	\$7,650,000
	<b>Roadways</b>	
6	Additional Roadway	\$4,340,000
	<b>TOTAL</b>	<b>\$39,100,000</b>

*Source: Dibble Engineering*

### **SOUTH LANDSIDE ALTERNATIVE 3**

Depicted on **Exhibit 4K**, South Landside Alternative 3 is like the previous alternative as it also considers relocating the terminal to the south side. This alternative focuses more on dedicating land for FBO/SASO and executive hangar development with less focus on small aircraft facilities. The features of South Landside Alternative 3 include:

1. Development of a new 16,000 sf terminal building near the Runway 4R threshold with apron frontage to the north and vehicle parking to the south. The site would also include a self-service fuel station for Jet A and 100LL fuels.
2. Reservation of approximately 19.9 acres of property for small aircraft facilities. This includes T-hangars, T-shades, apron, and a dedicated GA pilot’s lounge and wash rack.
3. Reservation of approximately 24.6 acres of property for executive hangar development.
4. Reservation of approximately 17.1 acres for FBO/SASO development.

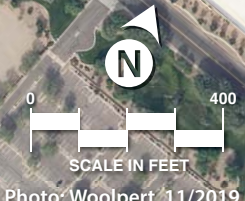


**DRAFT CONCEPT FOR DISCUSSION PURPOSES ONLY**

LEGEND	
	Existing Airport Property Line
	Taxiway Designation
	Ultimate Pavement
	Ultimate Roads/Parking
	Ultimate Building

ABBREVIATIONS	
FBO	- Fixed Base Operator
SASO	- Specialty Aviation Service Operator



This page intentionally left blank





This page intentionally left blank



This page intentionally left blank

*South Landside Alternative 3 Estimated Construction Cost*

Item No.	Proposed Projects	Estimated Cost
	<b>South Landside Developments</b>	
	<b>Utilities/Sitework</b>	
1	FBO/SASO Development Reserve	\$5,730,000
2	GA Terminal/Apron/Fuel Facilities Reserve	\$6,320,000
3	Executive Hangar Development Reserve (28.7 Acres)	\$11,260,000
4	Executive Hangar Development Reserve (15.1 Acres)	\$5,920,000
5	Small Aircraft Facilities Development Reserve	\$7,490,000
	<b>Roadways</b>	
6	New Roundabout	\$400,000
7	Additional Roadway	\$4,900,000
	<b>TOTAL</b>	<b>\$42,020,000</b>

*Source: Dibble Engineering*

## LANDSIDE SUMMARY

The landside alternatives presented look to accommodate an array of aviation activities that either currently occur or could be expected to occur at CHD in the future. There is demand for new facilities at CHD and with a changing fleet mix of aircraft that includes more sophisticated aircraft, airport management will need to determine how to develop its property in an organized and thoughtful way. Each of the development options considers a long-term vision that would, in some cases, extend beyond the 20-year scope of this master plan. Nonetheless, it is beneficial to provide a long-term vision for the airport for future generations.

## SUMMARY

This chapter is intended to present analysis of various options that may be considered for specific airport elements. The need for alternatives is typically spurred by projections of aviation demand growth and/or by the need to resolve non-standard airport elements. FAA design standards are frequently updated with the intent of improving the safety and efficiency of aircraft movements on and around airports, which can lead to certain pavement geometries now being classified as non-standard when previously they qualified to meet standard.

Several development alternatives related to both the airside and the landside have been presented. On the airside, the major considerations involve extending Runway 4R-22L and improving airfield geometry to meet proper taxiway design standards. For the landside, alternatives were presented to consider additional aviation development on the north and south sides of the airport. As the airport's fleet mix transitions to include more jets and turboprops, it will be important to clearly delineate development areas for facilities to accommodate those aircraft. Segregating jet and turboprop traffic from small aircraft operators contributes to operational safety and presents a more organized and efficient airport.

The next step in the master plan development process is to arrive at a recommended development concept. Participation of the PAC and the public will be important considerations. Additional consultation with the FAA may also be required. Once a consolidated development plan is identified, a 20-year capital improvement program, with a list of prioritized projects tied to aviation demand and/or necessity, will be presented. Finally, a financial analysis will be presented to identify potential funding sources and to show airport management what local funds will be necessary to implement the plan.