Pueblo Memorial Airport Master Plan

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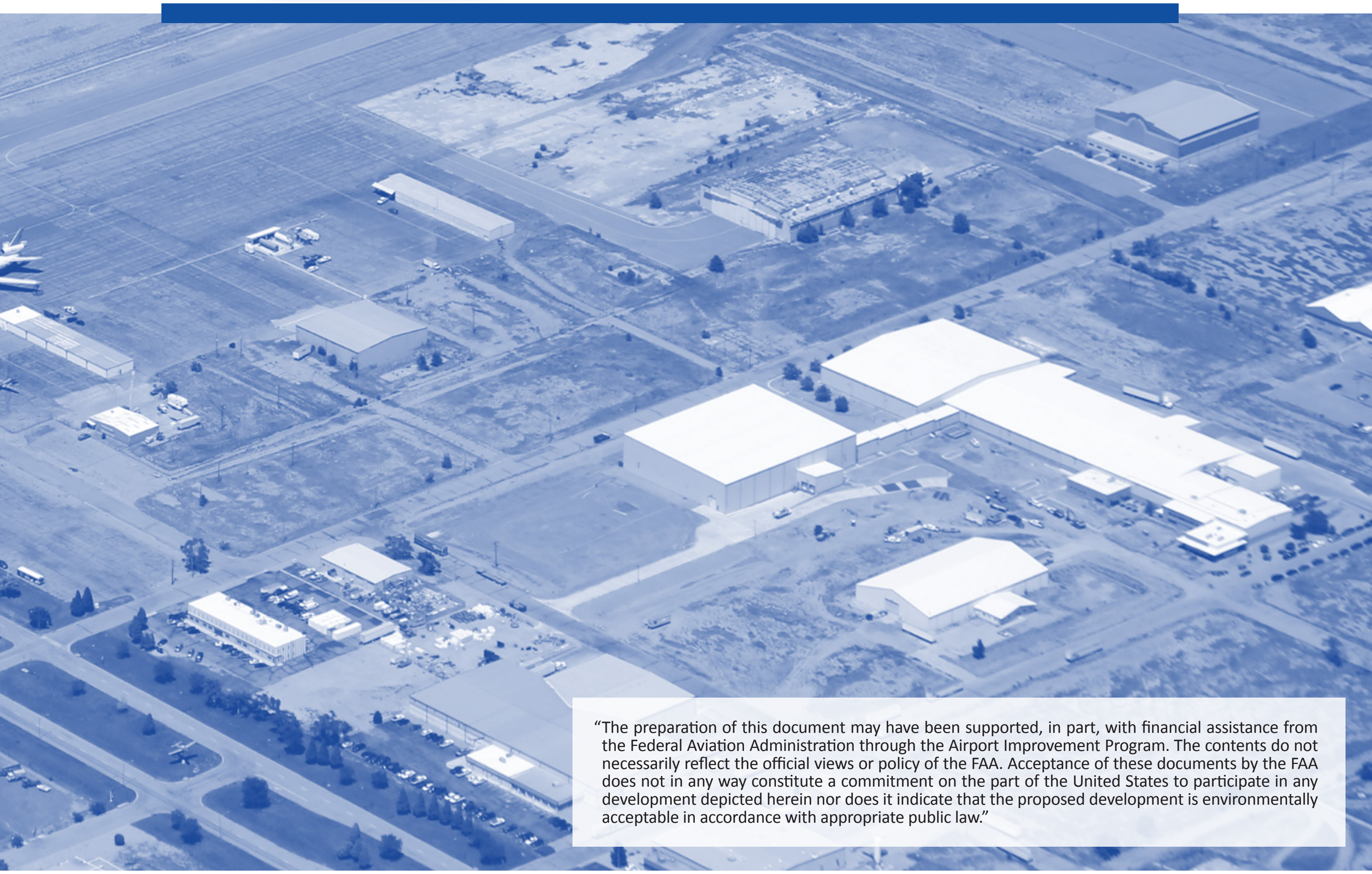
DRAFT REPORT
OCTOBER 2021



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THE Mead & Hunt TEAM

1743 Wazee Street,
Suite 400
Denver, CO 80202
303-825-8844
www.meadhunt.com

Mead & Hunt
Denver, CO

Dibble Engineering
Denver, CO

Quantum Spatial
Sheboygan, WI

NorthStar Engineering and Surveying
Pueblo, CO

Pueblo Airport

Contents

C. Capacity Analysis and Facility Requirements

D. Concepts, Alternatives, and Development Plan

E. Implementation

Appendices

Figures

Tables

Executive Summary

Introduction

Constructed in 1942 as a U.S. Army Air Corps training ground for B-24 Liberator pilots, Pueblo Air Base was renamed to Pueblo Memorial Airport (PUB or Airport) in memory of the pilots who flew during the Second World War. Ownership of PUB transferred to the City of Pueblo in 1953, and PUB continues operation to this day as a commercial service airport serving a large General Aviation (GA) user base. Canadian Aviation Education (CAE)-Doss (formerly L3Harris-Doss), a training facility for pilots in the U.S. Armed Forces, remains the largest user at the Airport.

PUB encompasses approximately 2,551 acres and consists of three runways, numerous taxiways, one main apron, a passenger terminal building, and various hangars and buildings. Runway 8R/26L, the primary runway is 10,498 feet in length and 150 feet in width. Runway 8L/26R, the parallel runway is 4,690 feet in length and 75 feet in width. Runway 17/35, the crosswind runway is 8,310 feet in length and 150 feet in width. Taxiway A is the parallel taxiway serving Runway 8R/26L. Taxiway B is the parallel taxiway serving Runway 8L/26R. Runway 17/35 is not served by a parallel taxiway. The Airport is located less than 50 miles south of the Colorado Springs Airport (COS) and less than 140 miles south of Denver International Airport (DEN). This proximity to other airports in the region provides PUB, and by extension the City and County of Pueblo, the opportunity to grow in its role as a regional airport.

This Master Plan will assist in documenting the current state of the aviation industry at PUB, and ultimately supports the modernization and improvement of existing Airport facilities. In addition, the findings of the Master Plan can serve as the strategic guide for overall economic development opportunities and sustainability recommendations over a 20-year planning horizon, as well as enhance the Airport as a major regional economic and employment center.

Outreach and Communications Plan

The Master Plan includes an Outreach and Communications Plan that defines the proposed communication and community engagement process for the project including overall goals, key community audiences, information needs and messages, and proposed community engagement activities.

Throughout the Master Plan Update, PUB and the project team formed several goals. These goals include:

- **Establishing a process to inform stakeholders and the broader community about the master planning process.**
- **Informing the public on how they can be involved and how their input will be considered.**
- **Collecting substantive and meaningful public input at appropriate milestones.**
- **Conducting a public engagement process that is efficient, effective, and results in informed and engaged stakeholders and community members.**
- **Implementing virtual outreach strategies aligning with COVID-19 health and safety protocols.**

Aviation Activity Forecasts

To provide a defined rationale for necessary improvements needed at PUB as demand increases, aviation activity forecasts were developed using approaches outlined in Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5070-6B, *Airport Master Plans*. The aviation activity forecasts were developed for the 20-year planning period (2019-2040) and based on historic activity, industry trends, local socioeconomic data, and considered the changes that have occurred at PUB since the completion of previous planning studies.

Over the next 20 years, the types of aircraft projected to operate at PUB generally remain the same as those presently operating at the Airport, including small single engine piston aircraft, larger business jet aircraft, and regional jet commercial passenger service aircraft, such as the Canadair CRJ 200. Eventually, the Embraer ERJ 175 is anticipated to replace the CRJ 200, becoming the future critical aircraft. Overall, total aircraft operations, passenger enplanements, and based aircraft at PUB are anticipated to increase over the course of the 20-year planning period, as shown in **TABLE 1**.

TABLE 1 Summary of Aviation Activity Forecasts, 2019-2040

AVIATION ACTIVITY	2019	2025*	2030*	2035*	2040*
ENPLANEMENTS					
Total	**11,571**[1]	**12,067**	**12,942**	**13,881**	**14,888**
OPERATIONS					
Commercial Service	4,157[1]	4,157	4,157	4,157	4,157
Air Taxi	*2,291*	*2,291*	*2,291*	*2,291*	*2,291*
Air Carrier	*1,866*	*1,866*	*1,866*	*1,866*	*1,866*
General Aviation	212,634[1]	415,711	433,072	434,454	435,923
Itinerant	*90,616*	*171,525*	*178,961*	*180,139*	*181,397*
Local	*122,018*	*244,186*	*254,111*	*254,315*	*254,526*
Military	633[1]	633	633	633	633
Total	**217,424**	**420,501**	**437,862**	**439,244**	**440,713**
Total Itinerant	**95,406**	**176,315**	**183,751**	**184,930**	**186,188**
Total Local	**122,018**	**244,186**	**254,111**	**254,314**	**254,525**
BASED AIRCRAFT					
Total	**60**[2]	**66**	**72**	**78**	**84**
Critical Aircraft	**CRJ 200**	**CRJ 200**	**CRJ 200**	**CRJ 200**	**E 175**

SOURCES: [1] FAA TAF.
[2] FAA National Based Aircraft Inventory validated by FAA,2020. Does not include CAE-Doss owned aircraft.
* Projections provided by Mead & Hunt.

Capacity Analysis and Facility Requirements

Capacity Analysis

PUB's operational capacity was analyzed using its Annual Service Volume (ASV). An airport's ASV evaluates, based upon multiple factors, its overall ability to accommodate aviation activities such as takeoffs and landings. The primary drivers of PUB's ASV include:

- **Weather Conditions**
- **Runway Configuration**
- **Exit Taxiways Configuration**
- **Fleet Mix**
- **Peak Hours**
- **Operation Types.**

The ASV analysis found PUB has a potential capacity of 462,108 annual operations. With 217,424 annual operations as of 2019, PUB currently operates at 47 percent of its annual capacity. As operations are forecast to increase to 440,713 by the end of the planning period in 2040, PUB will require additional enhancements to prevent unacceptable delays in airfield operations.

Facility Requirements

Facility requirements examine the landside and airside facilities necessary to meet aviation demand. These estimates are based upon an airport's aviation activity forecasts, but they are also determined via the FAA's design standards. These two elements account for the efficiency and utility of an airport, as well as the efficiency of the airfield environment. Some major development considerations found at PUB include:

- **Remediation of FAA design standard deficiencies.**
- **Pavement rehabilitation.**
- **Terminal building expansion.**
- **Reconstruction of older airfield structures, including hangars and airport maintenance buildings.**

Alternatives and Development Plan

To accommodate the forecasted growth and needed facilities at PUB, a set of alternatives was developed. The alternatives analysis are preceded by several goals intended to guide the Master Plan and inform future development. These goals include:

- **Plan and develop to capably accommodate the future needs of the City of Pueblo, Pueblo County, and the community.**
- **Program the construction of facilities when demand is realized (construction driven by demand, not forecasts).**
- **Plan to accommodate the forecast aircraft fleet safely and efficiently with the facilities needed to accommodate demand.**
- **Provide effective direction for future development through the adopted development program.**
- **Plan and develop to be environmentally compatible with the community.**
- **Integrate the needs of existing tenants with future airport development plans.**
- **Enhance fiscal self-sufficiency.**

Several alternatives addressing needed facilities were examined, including perhaps most notably the provision of a new fourth runway. ASV calculations examining two north-south orientations and three east-west orientations determined that, due to a more centralized location, an east-west oriented runway at the midpoint of Runway 17/35 provided the best outcome. Improvements to the taxiway system, FAA design standards, instrument approach procedures, terminal building, and landside facilities were also addressed. This analysis results in the Conceptual Development Plan (CDP) presented in **FIGURE 1**.

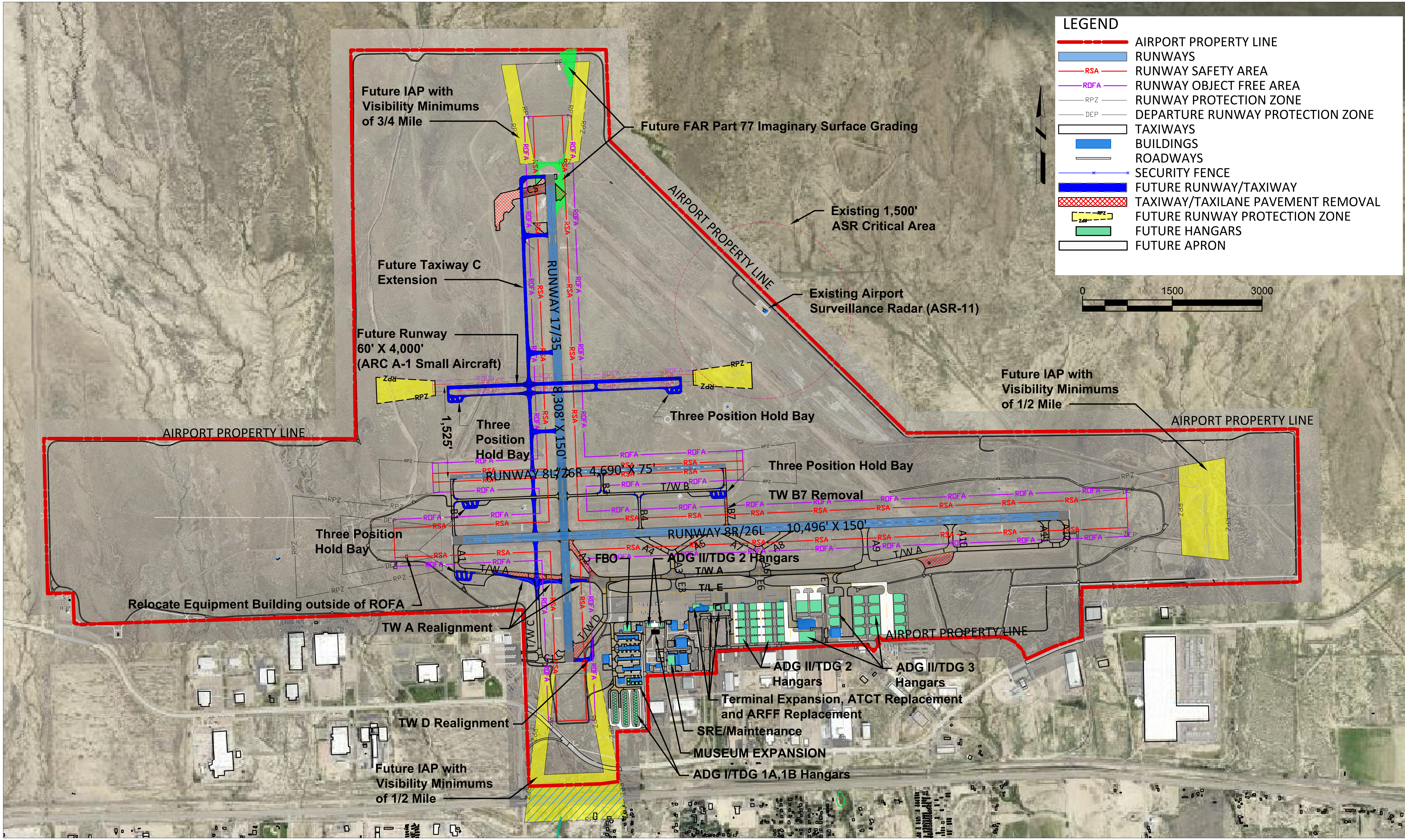


FIGURE 1 **Conceptual Development Plan**

Implementation

The Capital Improvement Program (CIP) for airport development projects outlines the long-term development program for PUB and includes planning level cost estimates for each project. Airport improvement projects are addressed in three phases to best incorporate funding mechanisms over time:

- **Phase I –** Short-Term (0-5 years)
- **Phase II –** Mid-Term (6-10 years)
- **Phase III –** Long-Term (11-20 years).

The primary objective of the Financial Implementation Analysis is to evaluate PUB's capability to fund the development program and to finance airport operations. The analysis includes development of a detailed Financial Implementation Plan that presents the results of the implementation evaluation and provides practical guidelines for matching an appropriate amount and timing of financial sources with the planned use of funds.

Projects are placed in a specific phase based upon priority and available funding. Those projects with lower priorities are placed in later phases, but several projects can and will be phased over multiple years due to their funding needs or length to complete. **TABLE 2**, **TABLE 3**, and **TABLE 4** show the projects in each phase of the development program.

TABLE 2 Phase I (0-5 Years) Development Program Project Costs

PROJECT	PROJECT DESCRIPTION	Cost Estimate (2021)	Cost Estimate (3% Inflation)	OTHER	LOCAL	STATE	AIP Entitlements	AIP Discretionary	Total AIP Funding
Year 1 (2022)									
A.1	Snow Removal Equipment (SRE 22' Plow Truck)	$415,000	$427,500	-	$10,688	$10,688	$406,125	-	$406,125
A.2	Runway 8R/26L Rehabilitation and Taxiway A2 Removal (Design)	$300,000	$309,000	-	$7,725	$7,725	$293,550	-	$293,550
A.3	Construct 10-Unit T-Hangar	$1,307,600	$1,346,800	-	$1,346,800	-	-	-	-
Year 2 (2023)									
A.4	Rehabilitation of Terminal Parking Lot	$376,600	$399,500	-	$399,500	-	-	-	-
A.5	Runway 8R/26L Rehabilitation and Taxiway A2 Removal (Construction)	$8,674,700	$9,203,000	-	$230,075	$230,075	$2,300,000	$6,442,850	$8,742,850
A.6	Future Third Parallel Runway Environmental Assessment and Cost-Benefit Analysis	$400,000	$424,400	$212,200	-	-	-	$212,200	$212,200
A.7	Short-Term Terminal Development Concept for Terminal Building	$1,930,000	$2,047,500	-	$51,188	$51,188	-	$1,945,125	$1,945,125
Year 3 (2024)									
A.8	Future Third Parallel Runway Design	$850,000	$928,800	$464,400	-	-	-	$464,400	$464,400
Year 4 (2025)									
A.9	FAA Part 77 Imaginary Surface Grading	$597,000	$671,900	-	$16,798	$16,798	-	$638,305	$638,305
A.10	Replace ARFF Building	$2,800,000	$3,151,400	-	$78,785	$78,785	$2,000,000	$993,830	$2,993,830
A.11	Future Third Parallel Runway Construction	$8,912,600	$10,031,200	$5,015,600	-	-	-	$5,015,600	$5,015,600
A.12	Apron Rehabilitation (East) (Phase I - Design and Construct)	$2,481,100	$2,792,500	-	$69,813	$69,813	-	$2,652,875	$2,652,875
A.13	Construct One Box Hangar	$1,043,500	$1,174,500	-	$1,174,500	-	-	-	-
Year 5 (2026)									
A.14	Taxiway C Extension (Phase I)	$3,218,700	$3,731,400	-	$93,285	$93,285	-	$3,544,830	$3,544,830
A.15	Taxiway A and Connectors Rehabilitation (Phase I - Design and Construction) (Mill and Overlay Taxiways A, A1, A3, A4, A5. Last Paved Between 1998 and 2014)	$6,571,000	$7,617,600	-	$190,440	$190,440	-	$7,236,720	$7,236,720
SUB-TOTAL PHASE I		**$39,877,800**	**$44,257,000**	**$5,692,200**	**$3,669,595**	**$748,795**	**$4,999,675**	**$29,146,735**	**$34,146,410**

TABLE 3 Phase II (6-10 Years) Development Program Project Costs

PROJECT	PROJECT DESCRIPTION	Cost Estimate (2021)	Cost Estimate (3% Inflation)	LOCAL	STATE	FEDERAL
B.1	Taxiway B7 Removal	$315,400	$376,600	$9,415	$9,415	$357,770
B.2	Relocate Equipment Building Near Runway End 8R Outside of ROFA	$252,500	$301,500	$7,538	$7,538	$286,425
B.3	Replace ATCT	$8,100,000	$9,671,800	$241,795	$241,795	$9,188,210
B.4	Extend Taxiway C (Phase II)	$7,831,500	$9,631,800	$240,795	$240,795	$9,150,210
B.5	Rehabilitate Taxiway B (Design and Construction)	$2,187,300	$2,690,100	$67,253	$67,253	$2,555,595
B.6	Realign Taxiway D	$2,869,500	$3,635,000	$90,875	$90,875	$3,453,250
B.7	Construct Three Position Hold Bays Near Runway Ends 8R, 8L, and 26R	$1,915,800	$2,426,900	$60,673	$60,673	$2,305,555
B.8	Construct Five-Unit T-Hangar	$623,800	$813,900	$623,800	-	-
B.9	Construct Two Box Hangars	$1,196,500	$1,608,000	$1,196,500	-	-
B.10	Construct Wildlife Perimeter Fence Line at Southern Airport Boundary (Design and Construction)	$2,938,500	$3,949,100	$98,728	$98,728	$3,751,645
B.11	Rehabilitate Ramp (Phase V)	$4,000,000	$5,536,900	$138,423	$138,423	$5,260,055
B.12	GA Taxiway and Utilities (Phase II)	$500,000	$692,100	$17,303	$17,303	$657,495
B.13	Acquire SRE (Replace Aging Equipment)	$415,000	$574,500	$14,363	$14,363	$545,775
SUB-TOTAL PHASE II (2027-2032)		**$37,677,900**	**$47,319,800**	**$2,942,748**	**$1,122,448**	**$42,653,005**

TABLE 4 Phase III (11-20 Years) Development Program Project Costs

PROJECT	PROJECT DESCRIPTION	Cost Estimate (2021)	Cost Estimate (3% Inflation)	LOCAL	STATE	FEDERAL
C.1	Rehabilitate Runway 8L/26R (Design and Construction)	$2,919,000	$4,161,800	$104,045	$104,045	$3,953,710
C.2	Construct Snow Removal Equipment (SRE) Building	$2,314,500	$3,398,900	$84,973	$84,973	$3,228,955
C.3	Construct Five-Unit T-Hangar	$694,800	$1,050,900	$1,050,900	-	-
C.4	Construct Three Box Hangars	$1,914,300	$2,982,400	$2,982,400	-	-
C.5	Construct 10-unit T-hangar	$593,500	$952,400	$23,810	$23,810	$904,780
C.6	Realign Taxiway A	$4,327,500	$7,152,700	$178,818	$178,818	$6,795,065
C.7	Purchase ARFF Truck/Equipment	$665,000	$1,166,100	$29,153	$29,153	$1,107,795
C.8	Rehabilitate Apron	$2,242,500	$4,050,200	$101,255	$101,255	$3,847,690
SUB-TOTAL PHASE III (2033-2041)		**$15,671,100**	**$24,915,400**	**$4,555,353**	**$522,053**	**$19,837,995**

A. Inventory of Existing Conditions

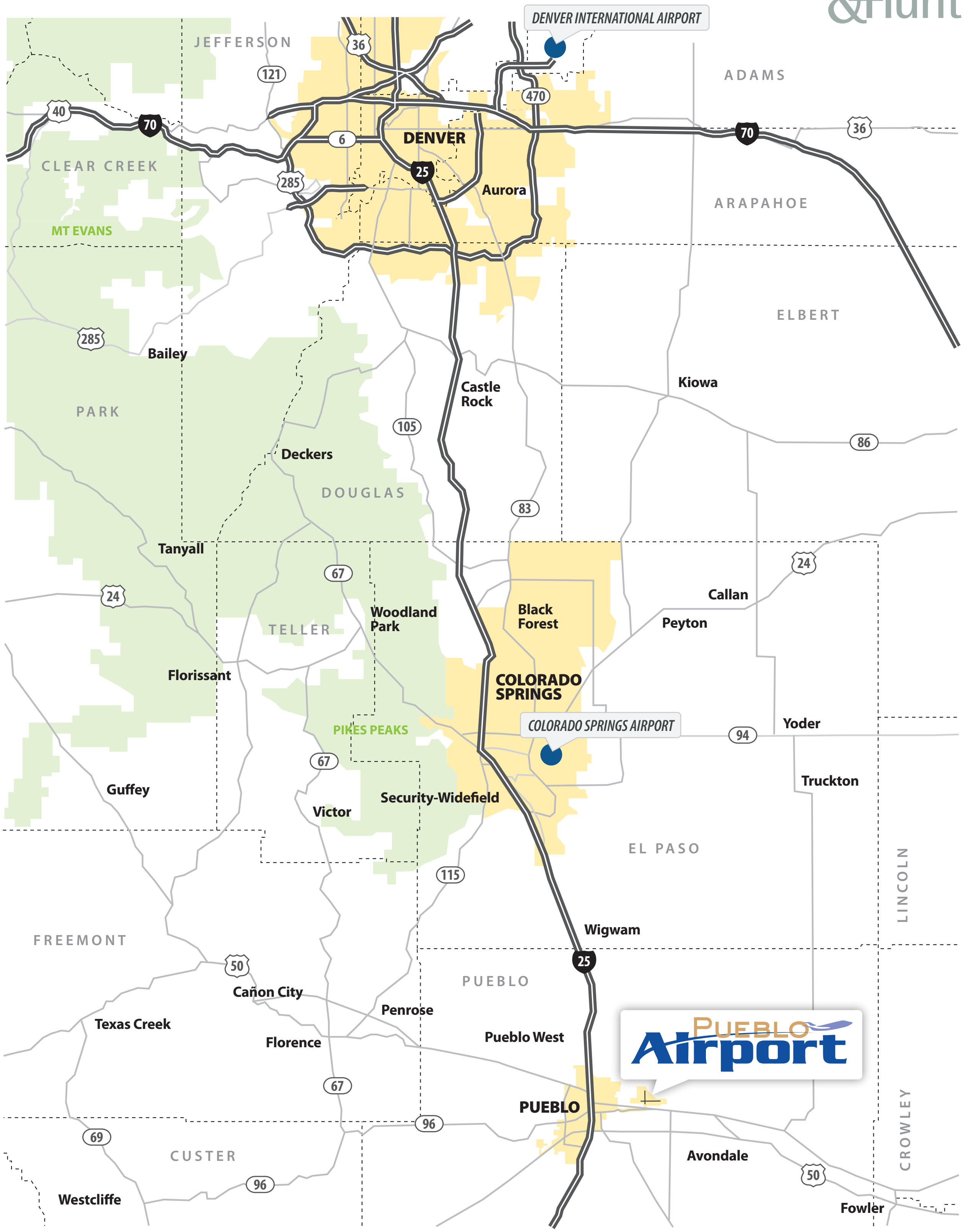
The foundation of any airport master plan begins with a thorough review of an airport's pertinent background data, as well as a physical inventory of its airside and landside components and facilities. Documenting an airport's existing conditions serves as the baseline for subsequent chapters of the master plan, such as the forecast of aviation demand and facility requirements. This chapter is the outcome of the review and inventory of the Pueblo Airport.

Airport History

Pueblo Memorial Airport (the Pueblo Airport, the Airport, or PUB) was originally constructed in 1942 as a training airfield for the U.S. Army Air Corps, where B-24 Liberator pilots and air crew readied themselves for action in World War II. The Airport was named in memoriam for the pilots and crew who trained there. In 1953, the City of Pueblo was granted the airfield from the federal government from the War Surplus Administration. The City of Pueblo has been operating the Airport ever since.

Airport Location and Vicinity

PUB is located in Pueblo County, Colorado, in the south-central part of the state. The County seat is situated in the City of Pueblo. At the time of the 2010 Census, the City of Pueblo was the ninth most populous city in the state. Pueblo is approximately 112 miles south of Denver, the state capitol. The area is considered semi-arid desert, and typically sees less snowfall than other Colorado cities. The relative location of PUB within the state of Colorado is depicted on **FIGURE A1**.



North | Approximate Scale: 1″ = 15 Miles | SOURCE: Google Maps, 2020.

FIGURE A1 **Airport Location Map**

The Airport itself is found six miles east of Pueblo's city-center just north of U.S. Highway 50. PUB property encompasses 2,551 acres and resides at an elevation of 4,729 feet mean seal level (MSL). The adjacent Airport Industrial Park encompasses approximately 1,321 acres but is not considered Airport property. PUB's location relative to the City of Pueblo is depicted on **FIGURE A2**.

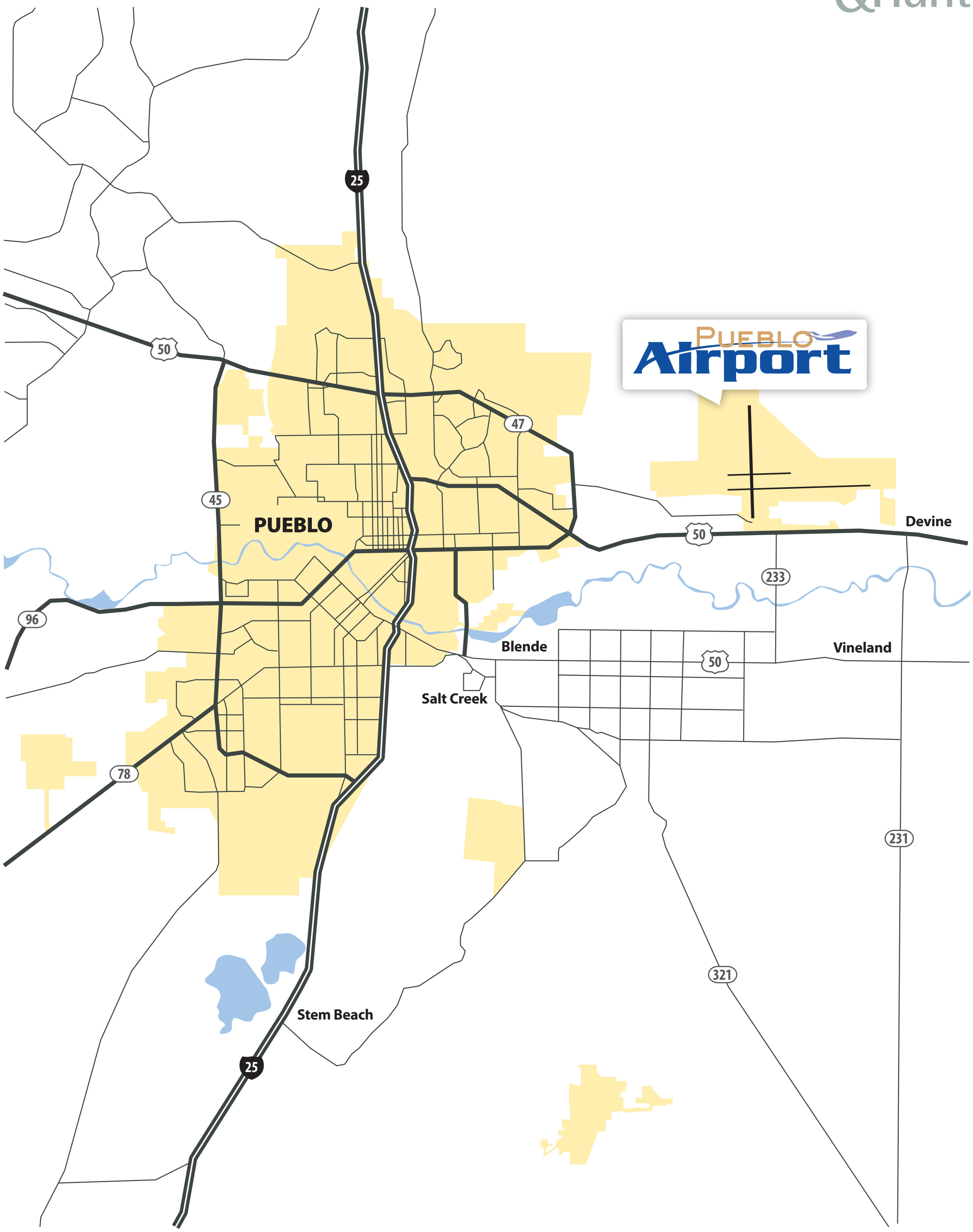
Airport Ownership Structure and Management

PUB is a public-use facility owned and operated by the City of Pueblo. Within the City's government structure, the Airport falls within the Aviation Department. Department positions include:

- **Director of Aviation (1)**
- **Operations and Maintenance Supervisor (1)**
- **Operations and Maintenance Specialists (9)**
- **Operations Technician (1)**
- **Administrative Technician (1)**
- **Seasonal/Temporary Support (3).**

An Airport Advisory Committee was established for PUB in 1999 to act in an advisory capacity to the Pueblo City Council. The committee is made up of 11 members, two of whom are designated by the Pueblo Board of County Commissioners, and one who represents the commercial service operator at the Airport. Committee members serve a three-year term, except for the commercial service representative who serves a one-year term. According to the City of Pueblo website, the functions of the committee are as follows:

- **To create a community awareness program as to the availability and use of air service at Pueblo Memorial Airport**
- **To investigate, evaluate, promote, and recommend programs for commercial airlines and general aviation services at Pueblo Memorial Airport**
- **To make periodic reports with respect to its activities to the City Council and the Board of County Commissioners of Pueblo County, Colorado.**



North | Approximate Scale: 1" = 15 Miles | SOURCE: Google Maps, 2020.

FIGURE A2 **Airport Vicinity Map**

Airport Service Level and Role

Since 1970, the FAA has classified the subset of public-use airports in the United States as being vital to serving the public needs for air transportation, either directly or indirectly, and therefore may be made eligible for federal funding to maintain their facilities. These airports are classified within the National Plan of Integrated Airport Systems (NPIAS), where the airport service level reflects the type of public use the airport provides. The service level also reflects the funding categories established by Congress to assist in airport development. The service level categories listed in the NPIAS include commercial service – either primary or nonprimary, reliever, or general aviation.

According to the NPIAS, 2019-2023, Report to Congress, dated October 2018, there are 3,321 NPIAS airports in the U.S.; Colorado has a total of 49 NPIAS airports. At the time of publication, PUB was classified within the general aviation service level, with a regional role in the state. Although PUB had scheduled commercial service, only approximately 3,800 total enplanements were recorded in calendar year 2017 which kept them classified within the general aviation service level. However, since service began with United Express and their operator SkyWest Airlines, enplanements in calendar years 2018 and 2019 surpassed 10,000 passengers. This milestone enables the Airport to now be classified as a primary commercial service, non-hub airport within the NPIAS and allows the airport to qualify for a one-million-dollar entitlement grant under the FAA Airport Improvement Program (AIP). Nonhub primary airports have more than 10,000 passenger enplanements, but less than 0.05 percent of all total enplanements by primary commercial service airports in the NPIAS.

At the state level, the Colorado Department of Transportation's (CDOT) Division of Aeronautics has long recognized the importance of understanding the interrelationship of its state aviation system airports in order to identify the system's needs. Similar to the FAA's NPIAS, CDOT's Colorado Aviation System Plan (CASP) identifies the state airports' needs and priorities and provides this information to policy makers, such as the Colorado Aeronautical Board (CAB). The most current CASP was published in 2011. However, the CASP Update is currently underway, with an estimated completion date sometime in 2020.

According to the Draft CASP, PUB has been classified as a commercial service airport within Colorado's state aviation system. It is important to note that the current CASP update included revisions to the previous 2011 methodology used to classify airports in the system. As the Draft CASP states, "all airports with existing or committed scheduled commercial services were classified as Commercial Service at the state level regardless of their classification in the NPIAS/ASSET system (August 2019)." Thus, as currently classified, there are 14 commercial service Colorado aviation system.

Federal and State Grant Histories

The City of Pueblo has received several grants from the Federal Aviation Administration (FAA) over the last 10 years through the Airport Improvement Program (AIP) for the development of the Airport. The AIP is funded through the Aviation Trust Fund which was established in 1970 to provide funding for eligible projects as defined in the AIP Handbook.

Likewise, the Colorado Department of Transportation (CDOT) Aeronautics Division has been offering entitlement and discretionary grant funding for state airport since 1991. PUB has also received several state grants in the past 10 years. **TABLE A1** and **TABLE** A2 summarize both the FAA and CDOT grants from 2009 through 2019.

TABLE A1 FAA AIP 10-year Grant History

FISCAL YEAR	GRANT SEQUENCE NO.	FUNDS	PROJECT DESCRIPTION
2009	29	$1,303,177	Rehabilitate Apron
2010	30	$8,510,477	Construct Runway - Plan-1, Wildlife Hazard Assessments
2014	34	$2,310,000	Rehabilitate Taxiway
2017	35	$3,851,643	Rehabilitate Runway - 17/35, Rehabilitate Runway Lighting - 17/35
2018	36	$3,286,159	Rehabilitate Apron
2019	37	$532,741	Conduct Airport Master Plan Study
2019	38	$3,000,000	Install Perimeter Fencing Not Required by 49 CFR 1542

SOURCE: FAA, 2020; Dibble Engineering.
NOTE: The grant data are generated at the end of each fiscal year and will not reflect subsequent grant amendments. This data will not reflect any funding or project amendments.

TABLE A2 CDOT Discretionary Aviation Grant 10-year History

FISCAL YEAR	STATE FUNDS	LOCAL FUNDS	FEDERAL FUNDS	TOTAL	PROJECT DESCRIPTION
2011	$368,925	$91,541	$2,161,004	$2,621,470	Fence & Match on FAA Runway Project
2012	$400,000	$164,912	$5,150,000	$5,714,912	Reconstruct a Portion of the GA Ramp, SRE & Match FAA Runway Project
2013	$285,263	$125,263	$4,000,000	$4,410,526	Participate in Federally Funded ARRF Truck; Construct secondary fuel farm containment structure; Participate in Federally Funded rehabilitation and realignment of TWY A
2014	$262,260	$139,149	$4,808,142	$5,209,551	Fuel Farm Containment System; Participate in Federally Funded AIP 31 & 33; Participate in Federally Funded Taxiway D Rehab, Commercial Apron Rehab, and Ramp Drainage match reimbursement
2015	$8,333	$8,333	$150,000	$166,666	Terminal Improvements
2016	None awarded				
2017	$150,000.00	$165,789.47	$6,000,000.00	$6,315,789.47	Participate in Federally Funded Runway 17/35 Rehabilitation and Airfield Lighting System
2018	$100,512.00	$100,513.00	$3,819,475.00	$4,020,500.00	Participate in Federally Funded Apron Rehabilitation (Construct Islands) and Lighting
2019	None awarded				

SOURCE: CDOT, 2020; Dibble Engineering.
NOTE: The grant data from CDOT was only available through 2011.

Airfield Design Standards

Airport design standards provide basic guidelines for a safe, efficient, and economic airport system. The standards conform to meet the size and performance characteristics of aircraft that are anticipated to use an airport. Various elements of airport infrastructure and their functions are also covered by these standards. This section will summarize the existing safety and other critical areas currently found at PUB based on their current airfield configuration and design aircraft.

Design Aircraft

According to FAA Advisory Circular 150/5300-13A, *Airport Design*, planning a new airport or making improvements to an existing airport requires the selection of one or more "design aircraft." The design aircraft (for the purpose of airport geometric design) can be classified by the parameters:

- **Aircraft Approach Category (AAC)**
- **Airplane Design Group (ADG)**
- **Taxiway Design Group (TDG).**

The AAC relates to aircraft approach speed (operational characteristic) and is represented by the letter A through E. The ADG relates to the aircraft wingspan and tail height (physical characteristic) and is represented by the Roman numeral I through VI. The TDG is based on an aircraft's landing gear, and specifically the main gear width and the length of the cockpit to the main gear. The characteristics of the AAC and ADG are summarized in **TABLE A3**.

TABLE A3 FAA AAC/ADG Characteristics

AIRCRAFT APPROACH CATEGORY	APPROACH SPEED
Category A	Less than 91 knots
Category B	91 to 120 knots
Category C	121 to 140 knots
Category D	141 to 165 knots
Category E	165 knots or more

AIRPLANE DESIGN GROUP	WINGSPAN	TAIL HEIGHT
Group I	< 49 feet	< 20 feet
Group II	49 to 78 feet	20 to 29 feet
Group III	79 to 117 feet	30 to 44 feet
Group IV	118 to 170 feet	45 to 59 feet
Group V	171 to 213 feet	60 to 65 feet
Group VI	214 to 261 feet	66 to 79 feet

SOURCE: FAA Advisory Circular 150/5300-13A, *Airport Design*, 2014; Dibble Engineering.

For the selection of a design aircraft, the FAA requires that the most demanding aircraft, or family of aircraft, which conducts at least 500 operations per year at the airport be selected as the design aircraft. Additionally, when an airport has more than one active runway, a design aircraft is typically selected for each runway. According to the most current approved Airport Layout Plan (ALP) dated April 2019, the existing design aircraft for each runway are as follows:

- **Runway 8L/26R & Runway 17/35:** Gulfstream G-V
- **Runway 8R/26L:** non-specific family of turboprop or small corporate jets categorized as B-II.

Using the AAC/ADG classifications, the Gulfstream G-V is categorized as C-III and falls within TDG 2. Again, as mentioned above, aircraft in the B-II category are typically twin-turboprop or small corporate turbine aircraft. It is not uncommon for a runway to not have a specific aircraft named as their design aircraft, but rather a family of aircraft listed; however, one outcome of this Master Plan effort will be to validate the existing design aircraft for each runway and recommend a specific critical aircraft for Runway 8R/26L using available data.

Runway Design Code

When the AAC, ADG, and approach visibility minimums for a runway are combined, they form the runway design code (RDC). The RDC provides the information needed to determine certain design standards that apply to a runway. The visibility minimums are expressed by runway visual range (RVR) values in feet of 1,200, 1,600, 2,400, 4,000, and 5,000. If a runway is only used for visual approaches, the term “VIS” should appear as the third component. The RDC visibility categories translated to an RVR value are illustrated in **TABLE A4**.

TABLE A4 Runway Design Code Components

RUNWAY VISUAL RANGE (FT)	FLIGHT VISIBILITY CATEGORY (STATUTE MILE)
VIS	Visual approach only
5000	Not lower than 1 mile
4000	Lower than 1 mile but not lower than 3/4 mile
2400	Lower than 3/4 mile but not lower than 1/2 mile (CAT-I PA)
1600	Lower than 1/2 mile but not lower than 1/4 mile (CAT-II PA)
1200	Lower than 1/4 mile (CAT-III PA)

SOURCE: FAA Advisory Circular 150/5300-13A, *Airport Design*, 2014; Dibble Engineering.
NOTE: CAT-I, II, III PA stands for a Category I, II, or II Precision Approach.

Based on the existing critical aircraft and visibility minimums, the RDC for the runways at PUB are as follows:

- **Runway 8R:** C-III/2400
- **Runway 26L:** C-III/4000
- **Runway 8L/26R:** B-II/VIS
- **Runway 17/35:** C-III/5000.

Taxiway Design Group

The taxiway design group (TDG) design standards are based on the overall main gear width (MGW) and the cockpit-to-main gear (CMG) distance of the critical aircraft for the runway(s) at an airport. The TDG is used to determine a minimum width and the fillet standards of taxiways for an airport’s critical aircraft. The existing taxiways at the Airport vary in width from 35 to 75 feet (see **TABLE A7**). Taxiway design standards have been revised by the FAA since the previous Airport Master Plan was prepared; therefore, a TDG was not previously established for taxiways at the Airport, and in some instances the existing taxiway widths exceed the minimum required widths based on the existing critical aircraft. Further analysis on the existing TDG and the recommended TDG will be further discussed in the Facility Requirements chapter.

Airport Reference Code

The ARC is not a design standard, rather it is an airport designation that signifies the airport's highest Runway Design Code (RDC) minus the third (visibility) component. The ARC is used for planning purposes only and does not limit the aircraft that may be able to operate safely on the airport. According to the current ALP, the existing ARC for the Airport is C-III.

Safety Areas

Runway and Taxiway Safety Areas (RSAs and TSAs) are defined as surfaces surrounding the runway and taxiway intended specifically to reduce the risk of damage to aircraft in the event of an undershot, overshot, or excursion from the runway or taxiway. The safety areas must be:

- **Cleared and graded and have no potentially hazardous surface variations**
- **Drained to prevent water accumulation**
- **Capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and firefighting (ARFF) equipment, and the occasional passage of aircraft without causing structural damage to the aircraft**
- **Free of objects, except for objects that need to be in the runway or taxiway safety area because of their function.**

All runway safety areas at PUB are in good condition and meet FAA standards. Likewise, the taxiway and taxilane safety areas were reviewed and no apparent deficiencies were identified. It should be noted that due to the spacing and location of the GA hangars located in the southwest area of the airfield, this area should only accommodate aircraft in ADGs I and II; there is not enough separation to meet taxilane centerline to a fixed or movable object or wingtip clearances for aircraft in ADG III or above.

Obstacle Free Zone, Precision Obstacle Free Zone, and Object Free Area

The obstacle free zone (OFZ) is a three-dimensional volume of airspace which supports the transition of ground to airborne aircraft operations. The clearing standard precludes taxiing and parked airplanes and object penetrations, except for frangible visual navigational aids (NAVAIDs) that need to be in the OFZ because of their function. The OFZ represents the volume of space longitudinally centered on the runway. The runway object free area (ROFA) is a two-dimensional ground area surrounding the runway. The ROFA standard also precludes parked airplanes, agricultural operations and objects, except for those that need to be located in the ROFA for air navigation or aircraft ground maneuvering purposes.

Lastly, for runways equipped with a precision instrument approach, such as an ILS, an additional protection zone is needed. This is the precision obstacle free zone (POFZ). The POFZ is defined as a volume of airspace above an area (200 feet long by 800 feet wide) beginning at the threshold elevation and centered on the extended runway centerline. The POFZ surface is in effect only when certain operational conditions are met, such as an aircraft on final approach within 2 miles of the runway threshold. The dimensional standards for each of these protection areas varies with the type of RDC of a runway, with exception of the POFZ.

The OFZ and ROFA for Runways 8L/26R, 8R/26L, and 17/35, and the POFZ for Runway 8L/26L, at PUB currently meet FAA design standards. See **TABLE A5** for a summary of the safety area dimensional standards as they currently exist at PUB today.

Runway Protection Zone

The runway protection zone (RPZ) is trapezoidal in shape and centered about the extended runway centerline. Like the other safety areas, the RPZ dimension for a runway end is a function of the critical aircraft and approach visibility minimums associated with that runway end (See **TABLE A5**). Additionally, the FAA issued a memorandum on September 27, 2012, regarding land uses within an RPZ. The memorandum outlines interim policy guidance to address what constitutes a compatible land use and how to evaluate proposed land uses that would reside in an RPZ. The land uses currently not recommended by the FAA to be within the RPZ include residences and places of public assembly (churches, schools, hospitals, office buildings, shopping centers, and other uses with similar concentrations of persons typifying places of public assembly). Currently, all RPZs associated with each runway end at PUB are located on existing airport property and the surrounding land uses on adjacent property are compatible with airport operations. The FAA also recommends the Sponsor control the RPZs through fee simple ownership, or avigation easements, thus any future RPZ for PUB runway's that are not on existing property should also be acquired in these manners to comply with the FAA directive.

TABLE A5 PUB Existing Runway Dimensional Standards

DESIGN STANDARD	RUNWAY 8L/26R	RUNWAY 8R/26L	RUNWAY 17/35
RUNWAY DESIGN CODE (RDC)	B-II/VIS	C-III-2400/4000[2]	C-III/5000
Runway Safety Area (RSA) width	150	500	500
RSA length beyond departure end	300	1,000	1,000
Runway Object Free Area (ROFA) width	500	800	800
ROFA length beyond runway end	300	1,000	1,000
Runway Obstacle Free Zone (ROFZ) width	250	400	400
ROFZ length beyond runway end	200	200	200
Precision Obstacle Free Zone (POFZ) width	N/A	800	N/A
POFZ length beyond runway end	N/A	200	N/A
Approach Runway Protection Zone (RPZ)[3] Length x inner width x outer width	1,000 x 500 x 700	2,500 x 1,000 x 1,750	1,700 x 500 x 1,010
Departure RPZ Length x inner width x outer width	Same as Approach RPZ	1,700 x 500 x 1,010	Same as Approach RPZ

SOURCE: Pueblo Memorial Airport Layout Plan, April 2019; FAA Advisory Circular 150/5300-13A, *Airport Design*, 2014; Dibble Engineering.

NOTES: [1] All dimensions are in feet.

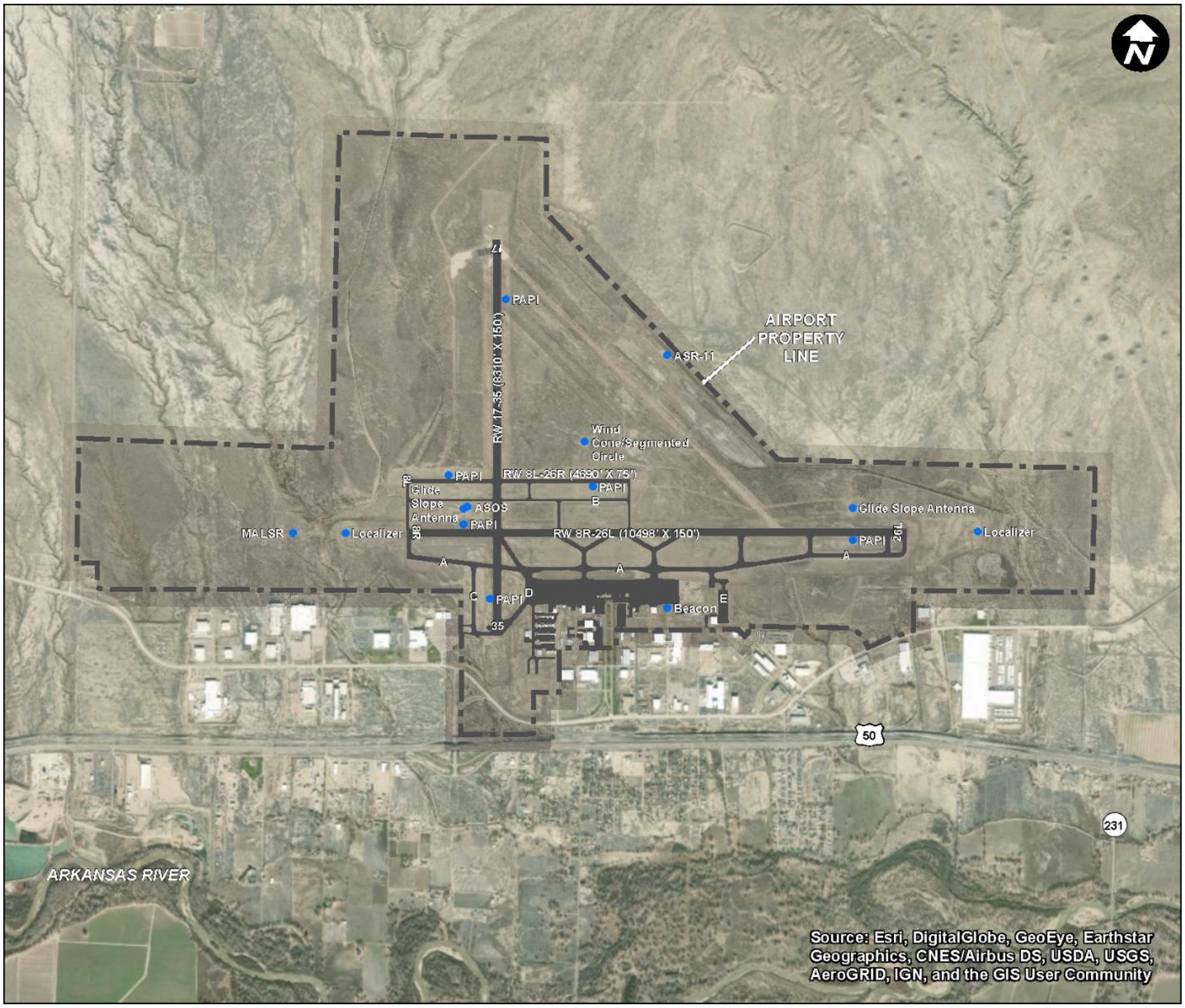
[2] Runway 8R and 26L have different approach minimum, with 8R having the lowest at CAT I standards; for runways with different approach minimums the safety area dimensions for the lowest minimums will apply to the entire runway. In PUB's case this would be those associated with 8R. However, the RPZ dimensions for 26L differ from 8R. Runway 26L RPZ dimensions are: 1,700' x 1,000 x 1,510 (Approach) & 1,700' x 500' x 1,010' (Departure)

[3] The RPZ surface begins 200 feet from the end of a paved runway threshold.

Airside Inventory

The definition of airside is that portion of the airport in which aircraft, support vehicles, and equipment are located, and in which aviation-specific operational activities take place. Typical airside components include airfield pavements, navigational aids and weather equipment, lighting, and signage. The inventory of airside components provides the basis for the airfield demand/capacity analysis and the determination of any facility change requirements that might be identified. The existing airfield layout is illustrated on **FIGURE A3**.

FIGURE A3 Existing Airfield Layout



SOURCE: Dibble Engineering.

Airfield Pavement

Airfield pavements consist of runways and taxiways. These pavements are essentially the skeleton of an airport, supporting and connecting airside activities to non-movement areas and landside facilities. The maintenance and preservation of an airport's system of pavement is essential in order to provide safe and efficient operational capabilities. A general description and condition of the existing airside pavements are described below.

Runways

PUB has three active runways – 8L/26R, 8R/26L, and 17/35. All three are paved in asphalt, grooved[1], and reported to be in good condition according to the current FAA Airport Master Record, Form 5010-1 dated February 27, 2020. **TABLE A6** briefly summarizes the characteristics of each runway.

TABLE A6 PUB Runway System

RUNWAY	CHARACTERISTICS
8L/26R	▪ Dimensions: 4,690 feet x 75 feet ▪ Published strength: 20,000 pounds Single Wheel (SW) gear ▪ Runway category: Greater-than-utility, visual (both) ▪ Runway marking type: Basic (both)
8R/26L	▪ Dimensions: 10,498 feet x 150 feet ▪ Published strength: 75,000 pounds Single Wheel (SW), 170,000 pounds Dual Wheel (DW), 250,000 pounds 2 Dual Wheels in Tandem (2D) gear ▪ Runway category: Greater-than-utility, precision instrument (both) ▪ Runway marking type: Precision (both)
17/35	▪ Dimensions: 8,310 feet x 150 feet ▪ Published strength: 93,000 pounds Single Wheel (SW), 110,000 pounds Dual Wheel (DW), 170,000 pounds 2 Dual Wheels in Tandem (2D) gear ▪ Runway category: Greater-than-utility, non-precision instrument (both) ▪ Runway marking type: Non-precision (both)

SOURCE: FAA, *5010 Airport Master Record – Pueblo Memorial*, 2020; Dibble Engineering.

[1] Some runways are grooved in order to provide an escape route under the aircraft tire for water on the runway to reduce or eliminate dynamic hydroplaning and standing water, assist with drainage to disrupt ice formation, and reduce stopping distances (when dry) through a process called tire tread interlock (Cardinal Grooving, 2020).

Taxiways

The Airport is equipped with two full-length parallel taxiways and a series of connector taxiways, as well as a partial-parallel and an acute-angled taxiway. The pavement widths and the presence of shoulders vary depending on location. **TABLE A7** briefly summarizes each component.

TABLE A7 PUB Taxiway System

TAXIWAY	DESCRIPTION	TDG	WIDTH (FEET)
A	Full length parallel taxiway south of Runway 8R/26L	5/3	75/50[1]
A1	Right-angle connector from parallel Taxiway A to the threshold of Runway 8R	5	75
A2, A4, A5, A7, A8	Acute-angle connector from parallel Taxiway A, A3, and A6 to Runway 8R/26L	5	75
A3, A6, A9, A10	Right-angle connector from parallel Taxiway A to connectors A4/A5, A7/A8, and Runway 8R/26L	5	75
A12	Right-angle connector from parallel Taxiway A to the threshold of Runway 26L	5	75
B	Full length parallel taxiway south of Runway 8L/26R	2	35
B1	Right-angle connector from parallel Taxiway B to the threshold of Runway 8L & 8R	2	35
B3	Right-angle connector from parallel Taxiway B to Runway 8L/26R	2	35
B4	Right-angle connector from parallel Taxiway B to Runway 8R/26L	2	35
B7	Right-angle connector from parallel Taxiway B to the threshold of Runway 26R and to Runway 8R/26L	2	35
C	Partial-parallel taxiway west of Runway 17/35	3	50
C1	Right-angle connector from parallel Taxiway C to the threshold of Runway 35	3	50
C5	Right-angle connector to the threshold of Runway 17	3	50
D	Acute-angle connector to the threshold of Runway 35	5	75
E	Partial-parallel to hangar taxilane on the east apron	3	50
E3	Right-angle connector from apron to Taxiway A	5	75
E6	Right-angle connector from apron to Taxiway A	5	75
E7	Right-angle connector from partial-parallel Taxiway A to Taxiway E	5	75

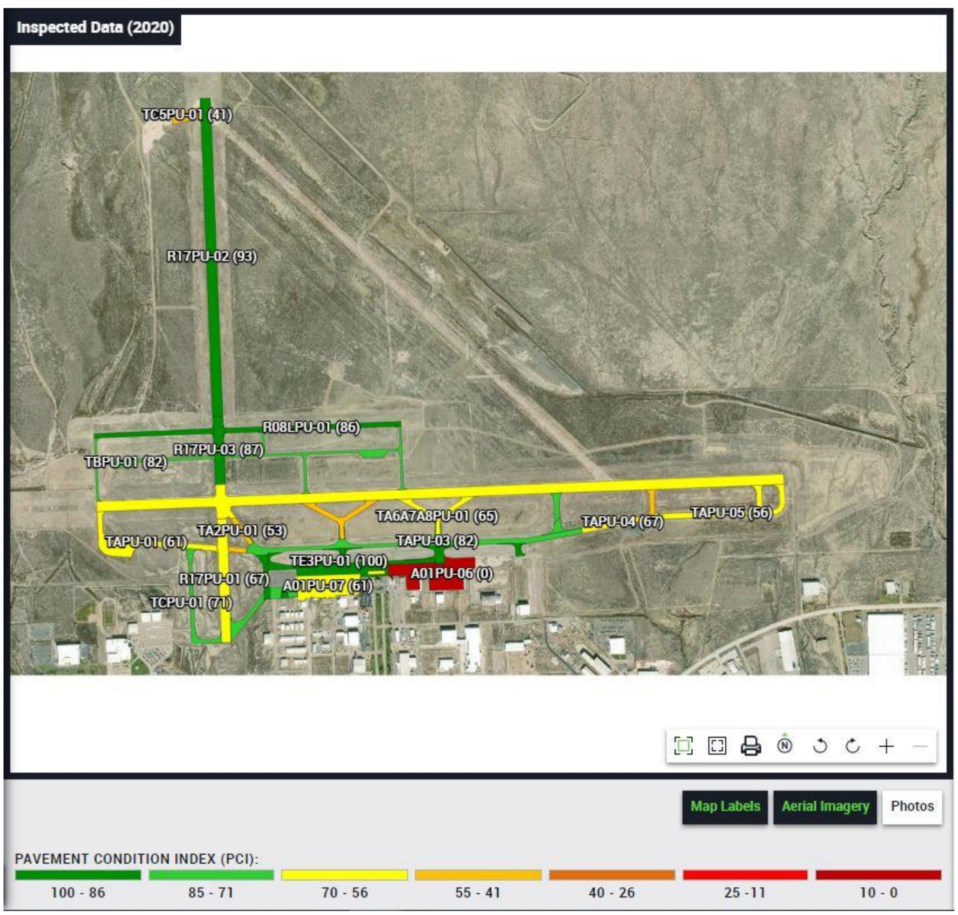
SOURCE: FAA, *PUB Airport Diagram*, 2018; Google Earth imagery, 2020; Dibble Engineering.
NOTE. [1] The width of Taxiway A between Taxiway connector A2 to A6 is 50 feet.

Pavement Condition and Strength

As part of the CDOT Division of Aeronautics Pavement Management Program (PMP), a visual rating system known as the Pavement Condition Index (PCI) is used to evaluate for pavement distress and deterioration. The PCI scale values range from zero (pavement in a failed condition) to 100 (pavement in excellent condition). The CDOT Division of Aeronautics last conducted a major PCI inspection at PUB in 2020. The PCI values from this inspection range from 0 to 100. A depiction of the PCIs for the runways and other airfield pavements are shown on **FIGURE A4**.

Furthermore, to express the bearing strength of pavement, the pavement classification number (PCN) system is used at airports. The PCNs are calculated in terms of a standard single-wheel load. An analysis of the runway and taxiway pavements at PUB was conducted as a part of this Master Plan effort in order to provide the Airport a general idea on the structural condition of the airfield pavement and to help prioritize pavement in need of rehabilitation. The PCN analysis results are found in **Appendix A**.

FIGURE A4 PUB PCI Map



SOURCE: Colorado 2020 IDEA website; Dibble Engineering.

Navigational and Visual Aids

Other key airside components include navigational and visual aids. Navigational aids (NAVAIDs) are electronic aids that assist pilots navigating to the airfield and the runway. Not all NAVAIDs are physically located on the Airport, for example GPS satellites; however, all NAVAIDs associated with PUB will be included here. Visual aids include runway/taxiway edge lighting, pavement marking, signage, and wind cones, amongst others. A summary of the NAVAIDs and visual aids for PUB are listed in **TABLE A8**.

TABLE A8 PUB Navigational and Visual Aids

ITEM		DESCRIPTION
Navigational Aids		▪ Area Navigation (RNAV/Global Positioning System (GPS)) ▪ VHF Omnidirectional Range/Tactical Air Navigation (VORTAC): Pueblo – 3.2 nautical miles east ▪ Instrument Landing System with Localizer (ILS w/ LOC) ▪ ASR-11
Visual Aids	Lighting	▪ High Intensity Runway Lighting (HIRL) - Runway 8R/26L ▪ Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) – Runway 8R ▪ Runway End Identifier Lights (REIL) - Runways 26R/26L, 8L, 17/35 ▪ Medium Intensity Runway Lighting (MIRL) – Runways 8L/26R & 17/35 ▪ 4-Light Precision Approach Path Indicators (PAPIs), three-degree glide path - Runways 8L/26R, 8R/26L, 17/35 ▪ Medium Intensity Taxiway Lighting (MITL) system – all taxiways except Taxiway B and connectors; Taxiway B has retro-reflective markers
	Markings and signage	▪ Precision runway markings - Runway 8R/26L ▪ Non-precision runway markings – Runway 17/35 ▪ Basic runway markings - Runway 8L/26R ▪ Taxiway markings – centerline, standard hold short, surface location/direction, and Land and Hold Short (LAHSO) – Runways 8R/26L and 17/35 ▪ Runway & taxiway guidance signs -instruction, location, direction, destination, and information; distance remaining (8R/26L & 17/35)
	Misc. Aids	▪ Airport Rotating Beacon (green and white) ▪ Segmented Circle / Wind Cone (lighted) – midfield ▪ Wind indicators – all runaway ends (lighted)

SOURCE: FAA, *5010 Airport Master Record – Pueblo Memorial*, 2020; Pueblo Memorial Airport Layout Plan, April 2019; Dibble Engineering.

Weather Monitoring Equipment

Automated airport weather stations are automated sensor suites which are designed to serve aviation and meteorological observing needs for safe and efficient aviation operations, weather forecasting, and climatology. There are several types of automated airport weather reporting stations. These include the Automated Weather Observing System (AWOS), the Automated Surface Observing System (ASOS), and the Automated Weather Sensor System (AWSS).

PUB has an ASOS located on the west end of the airfield, just north of the PAPI for Runway 8R. This system generally reports the following parameters: barometric pressure, altimeter setting, wind speed and direction, temperature and dew point in degrees Celsius, density altitude, visibility, and cloud ceiling, while also having the additional capabilities of reporting temperature and dew point in degrees Fahrenheit, present weather, icing, lightning, sea level pressure and precipitation accumulation. Data is disseminated via an automated VHF air band radio frequency (108-137 MHz) at each airport, broadcasting the automated weather observation. At PUB this occurs via the Automatic Terminal Information Service (ATIS) on 125.25 MHz. The phone number for the ASOS is (719) 948-2803.

Local Climate and Wind Data

Pueblo's geographic location within Colorado falls within the semi-arid climate zone. This zone is hotter and drier than other areas of the state. July is the warmest month where the mean maximum temperature is 92.9 degrees Fahrenheit (°F). Conversely, the coldest moth is January with the lowest average temperature of 14 °F. Rainy season usually begins in late spring through late summer (April through August), with July and August receiving the most precipitation at 2.1 and 2.3 inches of rainfall, respectively. Likewise, the greatest amount of snowfall occurs in December and January with an average of 5.5 inches in December and 6.5 inches in January.

Wind direction and speed are also important meteorological conditions for airports. Wind direction and speed determine the desired alignment and configuration of the runway system. Aircraft land and takeoff into the wind and therefore can tolerate only limited crosswind components (the percentage of wind perpendicular to the runway centerline). FAA Advisory Circular 150/5300-13, *Airport Design*, recommends that a runway should yield 95 percent wind coverage under stipulated crosswind components. If one runway does not meet this 95 percent coverage, then construction of a crosswind runway may be advisable. Due to the wind conditions in the area, PUB does have a designated crosswind runway – Runway 17/35. The allowable crosswind components for each ARC as outlined in AC 150/5300-13A are illustrated in **TABLE A9**.

TABLE A9 FAA Crosswind Components and Corresponding ARCs

ALLOWABLE CROSSWIND	ARC (AAC/ADG)
10.5 knots	A-I & B-I
13 knots	A-II & B-II
16 knots	A-III, B-III, & C-I through D-III
20 knots	A-IV through D-VI, E-I through E-VI

SOURCE: FAA AC 150/5300-13A, *Airport Design*, 2014; Dibble Engineering.

With PUB's ARC and RDC of the primary and crosswind runways designed to meet C-III standards, the allowable crosswind component that the airport must meet is 16 knots. However, most of PUB's operations are performed by training and transient aircraft in A-I/II and B-I/II categories, and therefore the wind coverage was also analyzed for crosswinds at 10.5 knots and 13 knots for each runway. Historical wind data from PUB's ASOS located on the field and the FAA wind analysis tool was used to analyze the runway wind coverage and to create the all-weather and IFR wind roses for the ALP. The allowable crosswind component and corresponding wind coverage percentages for PUB are shown in **TABLE A10**.

TABLE A10 Percentage of Runway Wind Coverage with Crosswind Components

RUNWAY	WEATHER	10.5 KNOTS	13 KNOTS	16 KNOTS
Runway 8/26	VFR	90.34	93.54	96.21
	IFR	89.55	91.93	93.90
	All	90.29	93.43	96.05
Runway 17/35	VFR	87.49	92.09	96.32
	IFR	90.49	94.38	98.10
	All	87.76	92.29	96.48
Combined	VFR	97.82	99.30	99.82
	IFR	98.34	99.33	99.72
	All	97.86	99.30	99.81

SOURCE: NOAA Integrated Surface Database, ASOS Station 724640 - Pueblo Memorial Airport, 2009-2019 data; Dibble Engineering.
NOTE: Runways 8R/L and 26R/L are aligned to the same true bearing, thus wind coverage for both is the same.

Although Runways 8R/26L (and 8L/26R) meet the minimum 95 percent wind coverage for 16-knot crosswind components (C-III standards) in VFR and all-weather conditions, it falls slightly short for 10.5 and 13 knot crosswinds. The same is true on Runway 17/35. However, the combined runway system does meet and exceed the 95 percent coverage in VFR, IFR, and all-weather conditions. Thus, it can be inferred that crosswind Runway 17/35 is still justified and should be maintained.

Airfield Vehicle Service Roads

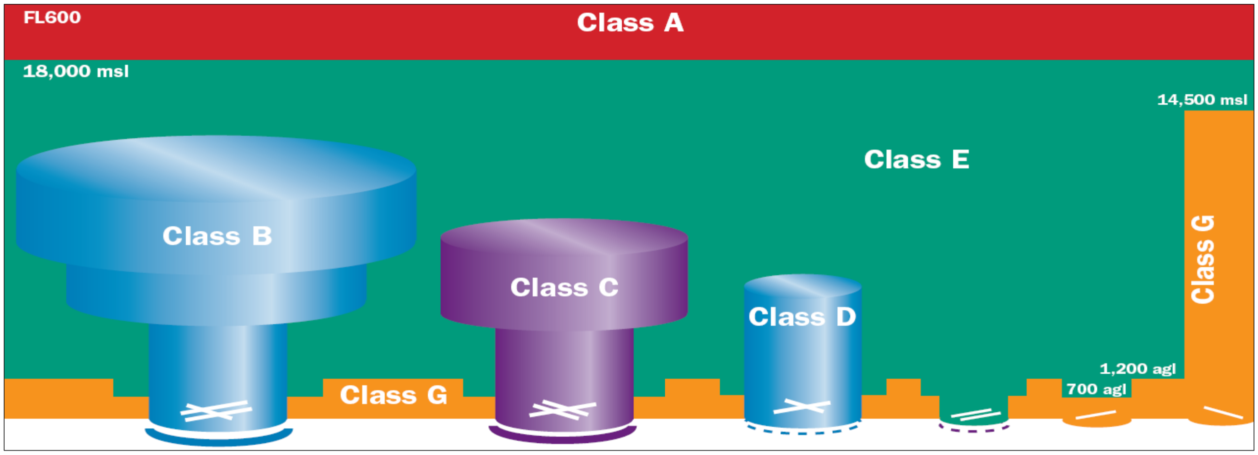
Many airports have vehicle service roads (VSRs) that are either paved, unpaved, or a combination of both, that traverse near the movement and non-movement areas of the airfield in order for airport, emergency, airline, and/or FAA personnel to access these areas by vehicle. PUB has a VSR that encircles the entire airfield. The road is unpaved, but sections exist around the ends of Runways 35 and 26L that have crushed asphalt aggregate, or “roto mill”, that provide more of a hardened surface.

Airspace System

The National Airspace System (NAS) consists of various classifications of airspace that are regulated by the FAA. Airspace is either controlled or uncontrolled. Pilots flying in controlled airspace are subject to Air Traffic Control (ATC) and must follow either Visual Flight Rules (VFR) or Instrument Flight Rules (IFR) requirements. These requirements include combinations of operating rules, aircraft equipment and pilot certification, and vary depending on the Class of airspace. A graphical representation of the different airspace classes is shown in **FIGURE A5**. General definitions of the classes of airspace are provided below:

- **Class A Airspace -** Airspace from 18,000 feet MSL up to and including flight level (FL) 600.
- **Class B Airspace -** Airspace from the surface to 10,000 feet MSL surrounding the nation’s busiest airports in terms of IFR operations or passenger enplanements.
- **Class C Airspace -** Generally, airspace from the surface to 4,000 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower.
- **Class D Airspace -** Airspace from the surface up to 2,500 feet above the airport elevation (charted in MSL) surrounding those airports with an operational control tower.
- **Class E Airspace -** Generally, controlled airspace that is not Class A, Class B, Class C or Class D.
- **Class G Airspace -** Generally, uncontrolled airspace that is not designated Class A, Class B, Class C, Class D, or Class E.
- **Victor Airways -** These airways are low altitude flight paths between ground-based VHF Omni-directional Range receivers (VORs).

FIGURE A5 Classes of Airspace



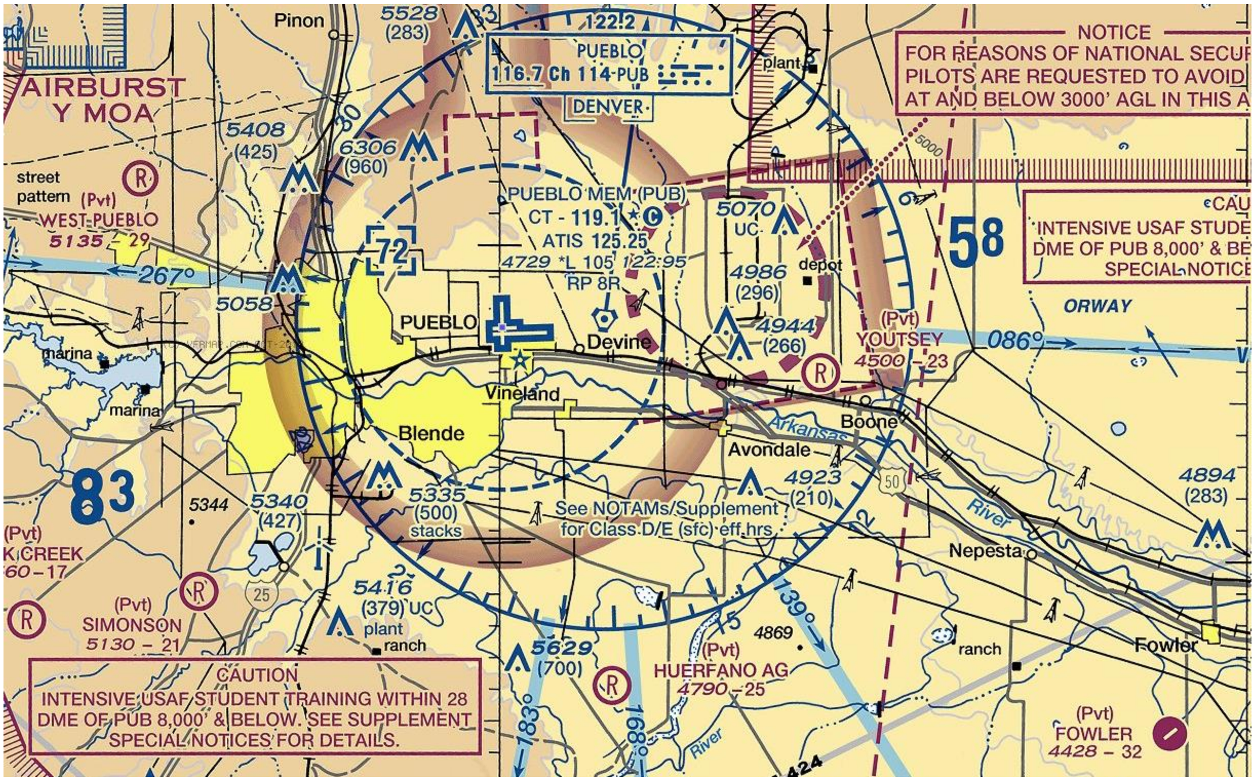
SOURCE: Aircraft Owners and Pilots Association, 2020.

The Airport is situated under Class D airspace during the ATCT's operational hours from 6:00 am until 10 pm Mountain Standard Time (MST). The Class D airspace begins at the surface and extends 2,500 feet above the airport elevation (charted in mean sea level (MSL)). When the ATCT is not operational, the Airport falls under Class E airspace starting at the surface and extends to 18,000 feet MSL, abutting Class A airspace. Class E consists of controlled airspace designed to contain IFR operations near an airport and while aircraft are transitioning between the airport and enroute environments. This transition area is intended to provide protection for aircraft transitioning from enroute flights to the Airport for landing. Several enroute VOR radials are present in or near PUB's airspace leading to the Pueblo VORTAC located approximately 3 miles east of the airfield. A depiction of the airspace and other elements surrounding PUB is found on the VFR sectional chart as shown in **FIGURE A6**.

The traffic patterns at the Airport are standard left traffic for all runways except for 8R, which has a right traffic pattern. Traffic Pattern Altitude (TPA) is the standard 1,000 feet above ground level (AGL). Pilots should also be aware of high levels of Canadian Aviation Education (CAE)-Doss flight training in the traffic pattern and in the designated training areas to the north and southwest of the Airport starting at 500 feet AGL to 8,500 MSL Monday through Friday.

PUB is located within the jurisdiction of the Denver Air Route Traffic Control Center (ARTCC), Denver Terminal Radar Approach Control (TRACON), and the Denver Flight Service Station (FSS). The altitude of radar coverage by the Denver ARTCC may vary as a result of the FAA navigational/radar facilities in operation, weather conditions, and surrounding terrain. The Denver FSS provides additional weather data and other pertinent information to pilots on the ground and enroute.

FIGURE A6 **PUB VFR Sectional Chart**



SOURCE: VFR MAP.

Title 14, Code of Federal Regulations (14 CFR) Part 77 Imaginary Surfaces

The 14 CFR Part 77 *Safe, Efficient Use, and Preservation of Navigable Airspace* establishes several imaginary surfaces that are used as a guide to provide a safe and unobstructed operating environment for aviation. These surfaces, which are typical for civilian airports, are shown in **FIGURE A7**. The primary, approach, transitional, horizontal, and conical surfaces identified in 14 CFR Part 77 are applied to each runway at both existing and new airports on the basis of the type of approach procedure available or planned for that runway and the specific 14 CFR Part 77 runway category criteria. All runways at PUB are classified as larger-than-utility runways, meaning they are designed to accommodate aircraft that weigh more than 12,500 pounds.

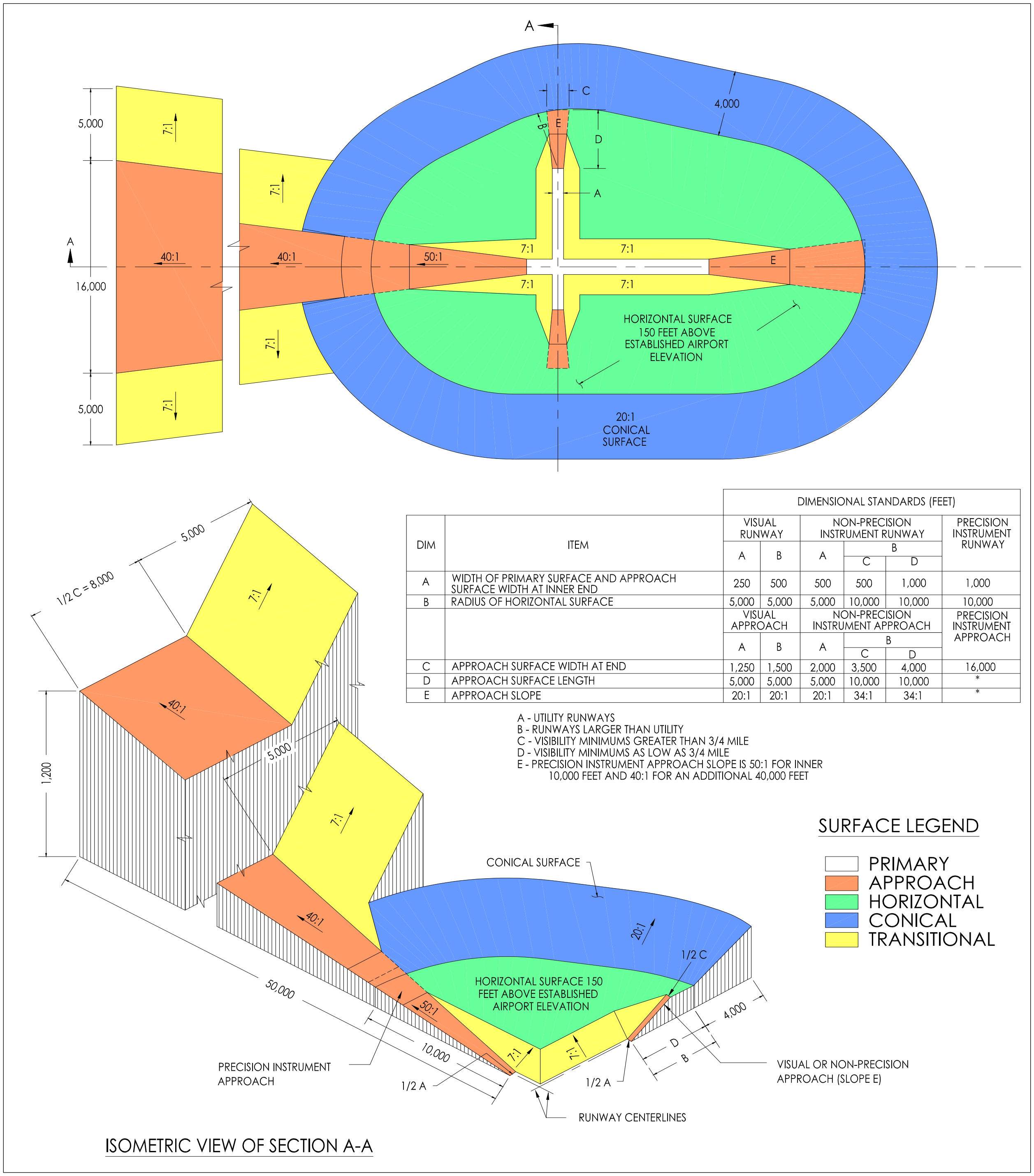
The 14 CFR Part 77 imaginary surfaces depicted in **TABLE A11** represent the existing dimensions for PUB. These surfaces will be used to determine if any existing or potential obstacles exist depending on the planned development at the Airport. Any changes to the existing dimensions based on the selection of a different RDC for the Airport will be noted on the Airport Data Table included on the Airport Layout Plan set. Obstacles will be identified on the Airport Layout Plan and any potential mitigation will also be identified, such as obstruction marking or the recommended removal of an obstacle.

TABLE A11 14 CFR Part 77 Imaginary Surfaces

IMAGINARY SURFACE	RUNWAY 8L/26R	RUNWAY 8R/26L	RUNWAY 17/35
Primary Surface width	500	1,000	500
Primary Surface beyond runway end	200	200	200
Radius of Horizontal Surface	5,000	10,000	10,000
Approach Surface dimensions	500 x 1,500 x 5,000	1,000 x length specified by approach x 16,000	500 x 3,500 x 10,000
Approach Surface slope	20:1	50:1/40:1[1]	34:1
Transitional Surface slope	7:1	7:1	7:1
Conical Surface slope	20:1	20:1	20:1

SOURCE: 14 CFR, Part 77 *Safe, Efficient Use, and Preservation of Navigable Airspace*, 2020; Dibble Engineering.
NOTE: [1] Precision instrument approach slope is 50:1 for inner 10,000 feet and 40:1 for an additional 40,000 feet.

FIGURE A7 **14 CFR Part 77 Imaginary Surfaces**



DIM	ITEM	DIMENSIONAL STANDARDS (FEET)					
		VISUAL RUNWAY		NON-PRECISION INSTRUMENT RUNWAY			PRECISION INSTRUMENT RUNWAY
		A	B	A	B		
					C	D	
A	WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE WIDTH AT INNER END	250	500	500	500	1,000	1,000
B	RADIUS OF HORIZONTAL SURFACE	5,000	5,000	5,000	10,000	10,000	10,000
		VISUAL APPROACH		NON-PRECISION INSTRUMENT APPROACH			PRECISION INSTRUMENT APPROACH
		A	B	A	B		
					C	D	
C	APPROACH SURFACE WIDTH AT END	1,250	1,500	2,000	3,500	4,000	16,000
D	APPROACH SURFACE LENGTH	5,000	5,000	5,000	10,000	10,000	*
E	APPROACH SLOPE	20:1	20:1	20:1	34:1	34:1	*

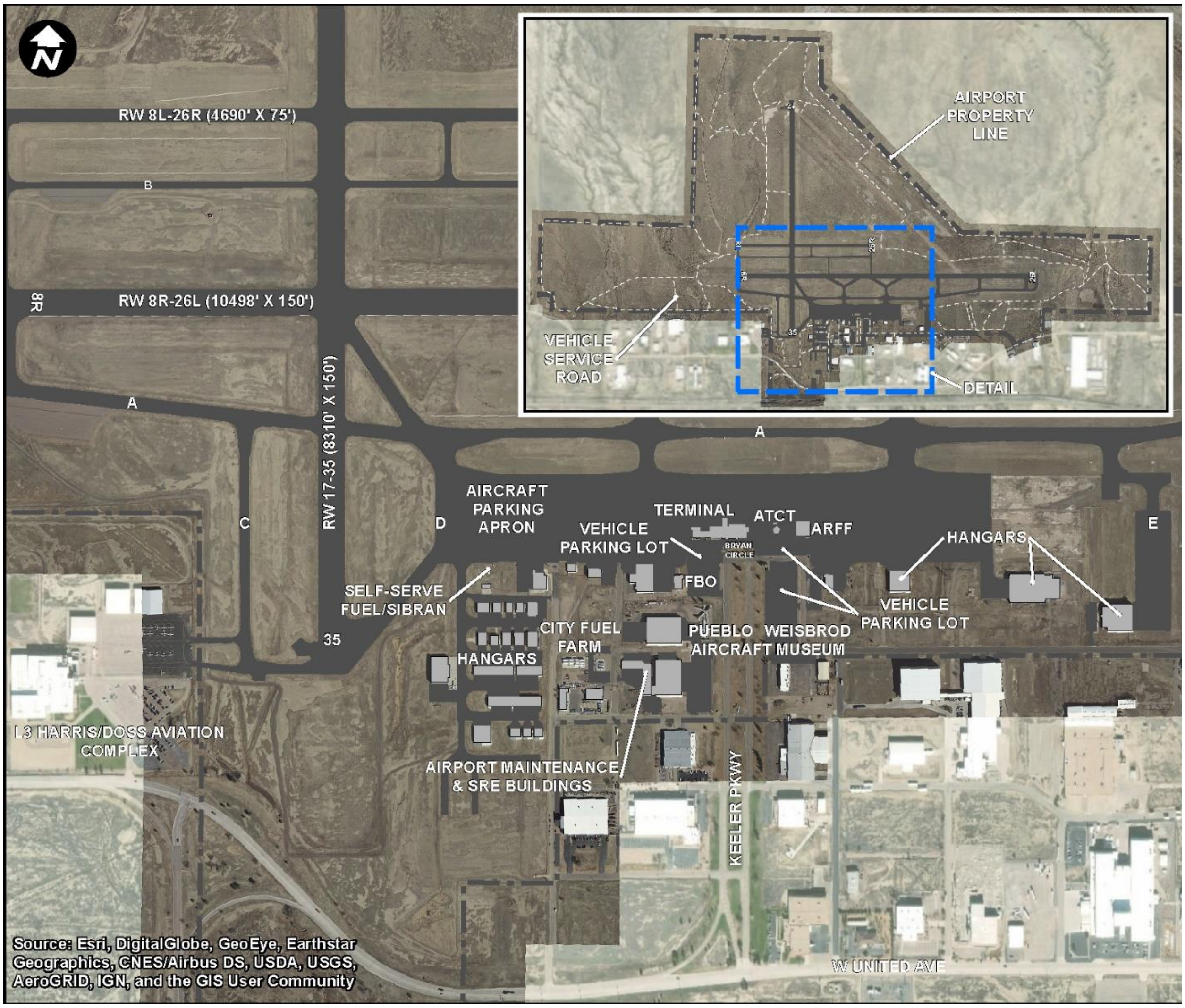
A - UTILITY RUNWAYS
B - RUNWAYS LARGER THAN UTILITY
C - VISIBILITY MINIMUMS GREATER THAN 3/4 MILE
D - VISIBILITY MINIMUMS AS LOW AS 3/4 MILE
E - PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET

SOURCE: Federal Aviation Administration, Order JO 7400.2H, *Procedures for Handling Airspace Matters*, August 2011.

Landside Inventory

For planning purposes, the definition of landside is that portion of the airport designed to serve passengers or other airport users typically located outside of the movement areas; landside facilities include aircraft parking aprons and storage hangars, passenger terminal buildings or other general aviation (GA) facilities, and other buildings where aviation (or non-aviation) related activities are conducted. The various landside facilities are depicted on **FIGURE A8**.

FIGURE A8 Existing Landside Layout



SOURCE: Dibble Engineering.

Aircraft Parking Apron

There is only one main aircraft parking apron at PUB, although it is divided into different sections. According to the CDOT 2020 PMP inventory report, the entire apron encompasses roughly 131,110 square yards of Asphalt concrete (AC) on top of Portland concrete cement pavement (PCCP). The middle portion of the apron is adjacent to the passenger terminal and is used for commercial service aircraft. This area of the apron (approximately 4,200 square yards) is identified as the dedicated commercial service apron area with special pavement markings. Approximately 26,250 square yards of general aviation aircraft parking is available west of the terminal apron. Other portions of the apron are made up of taxilanes that aircraft use to navigate to/from the adjacent taxiways. Approximately 18 tie-down spaces are available for transient aircraft parking on the GA apron near the FBO.

The overall average PCI rating for the apron at PUB according to the 2020 PMP report is 49; however, there are sections that are in better condition than others. The commercial service apron, along with the taxilanes and GA areas to the west are in excellent to good condition with PCI ratings ranging from 100 to 61, respectively. Portions of the commercial service apron and the taxilanes to the east and west were recently rehabilitated in 2018 and inland islands were added south of Taxiway A and north of the apron. New PCI is reported to be 87. The remainder of the apron on the east is in is in failed condition with PCI rating of zero (0) according to the 2020 PMP report.

Passenger Terminal Building

PUB's two-story passenger terminal building is located at the center of the apron (see **FIGURE A8**) and is approximately 24,000 square feet in size. It was originally built in 1954 and has had several additions over the years. A minor remodel was completed in 2017. The terminal serves the commercial service airline and its passengers, and includes a main lobby, ticketing counters, baggage claim, security screening area, post-security hold room, restrooms, and restaurant space. Airport administration and operations, Hertz Rental Car, and the Transportation Security Administration (TSA) are also found in the terminal building. The terminal lies between the commercial service aircraft apron to the north and the Bryan Circle vehicle roadway to the south and has roughly 135 linear feet of passenger drop-off curbside area. The overall condition of the building is fair. Much of the inside and outside are dated and the exterior needs new paint. The flat roof often causes interior ceiling leaks. **TABLE A12** summarizes PUB's key terminal functional areas.

TABLE A12 PUB Terminal Areas

TERMINAL AREA	SIZE
Lobby	1,580 sf
Greeter waiting area	1,025 sf
Ticketing	335 sf
Security screening	600 sf
Baggage claim	1,500 sf
Deplaning outflow	335 sf
Post-security hold room	950 sf
Restrooms	1,000 sf
Passenger drop off/pickup curbside	135 lf

SOURCE: Pueblo Memorial Airport, 2020; Dibble Engineering.
NOTE. All square footage is approximate. Sf = square feet and Lf = linear feet**.**

GA Facilities

GA facilities accommodate the non-commercial service aircraft at airports. Typically, these GA facilities include fixed base operators (FBOs), Specialized Aviation Service Operators (SASOs) and other aviation businesses, and aircraft storage hangars. The GA facilities found at PUB are described below.

FBO

A Fixed Base Operator (FBO) is an aviation-related business that provides services for non-air carrier pilots, aircraft, and passengers. However, some FBOs fuel air carrier aircraft, as well and provide deicing and light maintenance. FBO services range from GA aircraft fueling, ground servicing, aircraft maintenance and repair, in-flight catering, flight training, and aircraft rental.

FBOs often serve as a terminal for GA passengers and include a lobby, restrooms, vending, and rental car services. Pilot lounges, flight planning rooms, and pilot shops are also typical in FBOs. Currently, PUB has one full-service FBO: Rocky Mountain Flower Aviation. Located on the west GA apron, the FBO encompasses roughly 4,200 square feet of terminal space, plus a total of 40,000-square feet of hangar space split between two hangars. Major services offered include:

- **Fueling**
- **Rental cars**
- **Aircraft maintenance**
- **Aircraft charter**
- **Hangar rental**
- **Catering**
- **Gift shop.**

Specialized Aviation Service Operators

Specialized Aviation Service Operators (SASO) are defined by the FAA as single-service providers or special fixed-base operators performing less than full services. Typical SASO services include aircraft sales, flight training, aircraft maintenance, or avionics services, just to name a few. SASOs found at PUB include:

- **CAE-Doss (off-airport property)** – Flight training exclusively for the Department of Defense
- **SoCo Flight Professionals** – Flight training
- **TravelAire Charter Service** – Aircraft charter**.**

Pueblo Weisbrod Aircraft Museum

The Pueblo Weisbrod Aircraft Museum (PWAM) is a non-profit museum owned by the City of Pueblo and managed by the Pueblo Historical Aircraft Society. The museum is located just south and west of the airport terminal building off Keeler Parkway. The museum was founded in 1972 by former City of Pueblo Town Manager Fred Weisbrod. The museum's aircraft collection and other artifacts are housed in two 30,000-square foot hangars built in 2001 and 2010. Likewise, some aircraft and vehicles are stored outside in an adjacent designated area. The PWAM is open daily and operated by an all-volunteer staff.

Aircraft Hangars

There are various types and sizes of aircraft storage hangars found at airports. Most hangars at PUB are large conventional (box) hangars and common-wall, nested T-hangars. T-hangars generally hold one aircraft, while box hangars can hold multiple aircraft. Corporate box hangars typically accommodate larger turbine aircraft and have more amenities such as office space and restrooms.

At PUB there is a combination of large and GA box hangars and T-hangars (see **FIGURE A8** for locations). The City of Pueblo owns two, 10-unit T-hangar structures on the east side apron and currently leases 18 of the spaces. According to the Airport, these T-hangars have been minimally maintained since construction and are in fair condition. Leaking roofs, poor drainage, and poor surrounding apron are some of the major concerns for these structures. There are 16 private box hangars located on the west side apron that are owned by individuals, but who pay a ground lease fee to the Airport. Finally, there are six large box hangars owned by the City but leased to various Airport tenants. These hangars are designated Hangars A-F, although Hangar E (Blitz hangar) is in un-usable condition. There is also one private large executive hangar on the far east side of the apron. A lack of proper identification signage for all hangars (as well as other buildings) is also a concern for the Airport. **TABLE A13** summarizes the hangars found at the airport.

TABLE A13 PUB Hangar Facilities

HANGAR TYPE	QUANTITIY	TOTAL SQ FT
Box, Large/Executive	7[1]	81,600
Box, Small/GA	16	121,150
T-hangar/Open Bay	20[2]	22,000

SOURCE: Pueblo Memorial Airport records and aerial imagery, 2020; Dibble Engineering.
NOTES: All square footage is approximate.
[1] Hangar E (Blitz) is in un-usable condition, although some aircraft are stored within at no cost. This hangar is approximately 35,000 sq ft. One hangar is also privately owned and is approximately 24,000 sq ft.
[2] Only 18 T-hangar units are currently leased for aircraft; one unit is damaged and the other serves as office space.

Support Facilities and Equipment

Several other support functions at PUB have facilities and/or equipment associated with their operations. These include the Airport Traffic Control Tower (ATCT), Aircraft Rescue and Fire Fighting (ARFF), aircraft fueling, snow removal, and other airport maintenance equipment.

Airport Traffic Control Tower

The primary method of controlling the immediate airport environment is visual observation from the Airport Traffic Control Tower (ATCT). The tower is a tall, windowed structure located on airport property. Air traffic controllers are responsible for the separation and efficient movement of aircraft and vehicles operating on the taxiways and runways of the airport itself, and aircraft in the air near the airport, generally 5 to 10 nautical miles depending on the airport procedures. PUB has a FAA staffed ATCT located directly east of the passenger terminal building. The tower is staffed from 6 am until 10 pm daily. There are eight vehicle parking spots directly east of the Tower that are available for FAA personnel.

Aircraft Rescue and Fire Fighting

A special category of firefighting on airports is known as ARFF; ARFF provides response, evacuation, and possible rescue of passengers and crew in an aircraft during and emergency. Since PUB is a 14 CFR Part 139 certificated airport, it is required to provide ARFF services. PUB currently falls within ARFF Index A, which is based on the length of the existing commercial service aircraft providing more than five daily departures at the airport.

The ARFF facility is centrally located on the apron adjacent to the air traffic control tower. The building is approximately 6,350 square feet and in overall good condition. However, in a recent building assessment conducted for the City, the building was found to be roughly 52 years old and at the end of its useful life. A recommendation to build a new station in the next several years based on the building's current age was made within the report. The ARFF vehicles and their corresponding amount of extinguishing agent carried is listed in **TABLE A14**.

TABLE A14 ARFF Response Vehicles

YEAR	MAKE/MODEL	WATER (GAL)	DRY CHEM (LBS)	AFFF[1] (LBS)	CONDITION
2014	**Rosenbauer Panther**	1,500	500	200	Excellent
1991	**E-1 Titan**	3,000	450	400	Good
1980	**Ford FMC**	500	N/A	N/A	Good

SOURCE: Pueblo Memorial Airport, *Airport Certification Manual,* Revision dated November 17, 2017; Dibble Engineering.
NOTE: AFFF (Aqueous Film Forming Foam).

Snow Removal and Airport Maintenance Equipment

Because of Pueblo's climate, periodically the Airport must use snow removal equipment (SRE) to clear the runways, taxiways, and aprons of snow and ice. Additionally, the Airport uses various vehicles and equipment to perform airfield inspections and repairs/maintenance. Both the SRE and other airport maintenance equipment are stored at the maintenance facility and storage yard, located approximately 600 feet south of the main aircraft apron. PUB's SRE are summarized in **TABLE A15**.

TABLE A15 Snow Removal Equipment

EQUIPMENT TYPE	EQUIPMENT DETAILS
Plow	▪ 1987 Chevrolet dump truck, 8-foot Fisher plow ▪ (2) 2006 International 7500 dump truck with 14-foot plow and sander ▪ 1998 Kenworth dump truck, 22-foot Viking plow ▪ 2001/02 John Deere tractor, 9-foot pull behind blade ▪ 2000 CAT grader ▪ 2015 Ford F250, 8-foot Western plow
Rotary Plow	▪ 1994 Steward & Stevenson rotary plow
Multi-Purpose Equipment	▪ 2009 John Deere loader and attachments ▪ 2008 Skid Steer and attachments

SOURCE: Pueblo Memorial Airport, *Snow and Ice Control Plan*, Revision dated August 17, 2018; Dibble Engineering.

Aviation Fueling Facilities

The Airport has its own fuel farm where both Jet A and 100LL fuel is stored. The City of Pueblo owns the fuel farm. It is located south of the aircraft parking apron between Skyway and Bell Streets and just west of the museum hangar. There are five above-ground, 40,000-gallon tanks of Jet A and three, 20,000-gallon tanks of 100LL. The tanks and containment area are in overall good condition. Furthermore, all fueling facilities are inspected on a regular basis according to the Airport Certification Manual (ACM) requirements.

Aircraft fueling at PUB is provided by Rocky Mountain Flower Aviation (FBO), TravelAire Charter Services, or by the self-serve system operated by Sibran. All three lease tanks from the City. Sibran maintains and operates one, 12,000-gallon tank of 100 LL. The self-service fueling apron and fuel tanks are located at the far west end of the apron adjacent to Taxiway D and are in good condition. CAE-Doss aircraft utilize Sibran's self-serve option for fueling.

Airport Access and Circulation Network

PUB's main access road is Keeler Parkway (four lane road with center median) which can be accessed from United Avenue, just north of US Highway 50. Keeler Parkway terminates at Bryan Circle, which will lead to the passenger terminal and vehicle parking lots. Additional surface roads are located throughout the Airport Industrial Park for access to other businesses. Both Keeler Parkway and Bryan Circle are in good condition, with the exception of an approximate 500-foot length section of pavement on the south bound Keeler Parkway from Bryan Circle to the intersection at Walt Basset Avenue; this section is in fair condition with numerous cracks.

Vehicle Parking

One main parking lot provides vehicle parking for both the passenger terminal and the FBO. The lot is located directly south of the terminal and east of the FBO adjacent to southbound Keeler Parkway. There are 104 spaces, and the pavement is in very good condition. Just north of the main lot there are an additional 20 vehicle parking spaces also for the general public. There are five spaces for the rental car company just prior to the passenger drop off area along the terminal curbside. Passenger parking at PUB is currently offered free of charge.

There are two additional parking lots located to the east of the terminal building. One is adjacent to the ATCT and ARFF station and the other is located just south of that. The lot adjacent to the ATCT and ARFF station is used as employee parking for the ARFF, airport, airline, and TSA personnel and contains 50 spaces; this lot is in fair condition. The other large lot just south of the ATCT/ARFF lot is reserved for future passenger parking; the pavement in this lot is in poor condition and needs resurfacing. Other concerns with this lot include limited lighting, no pedestrian sidewalks, no handicap parking spaces, and high maintenance requirements for weed removal in unpaved areas.

Emergency Response

Pueblo Memorial Airport is a FAA Part 139 commercially certificated airport and is required to have an Airport Emergency Plan (AEP) that outlines response expectations to incidents or accidents that may occur on the Airport. The Airport is responsible for the implementation of the emergency plan and coordination with all responding agencies. Initial response to an aircraft incident on the Airport will come from the on-site City of Pueblo Fire Department Station #10 that houses the Airport Rescue Firefighting (ARFF) equipment and personnel. Station #10 also serves the adjacent Airport Industrial Park.

Depending upon the needs of the incident command for response there is a list of organizations and agencies in the Airport Emergency Plan that are relied upon to provide emergency services support. Organizations identified in the emergency plan include City, County, State, and Federal agencies.

Utilities

Utilities at PUB include electricity, natural gas, telephone/internet, and water and sewer services. The service provider for each is listed below:

- **Electricity:** Black Hills Energy
- **Natural Gas:** Xcel Energy
- **Telephone/internet:** Qwest Communications
- **Water:** Pueblo Board of Water Works
- **Sewer:** City of Pueblo Wastewater Department.

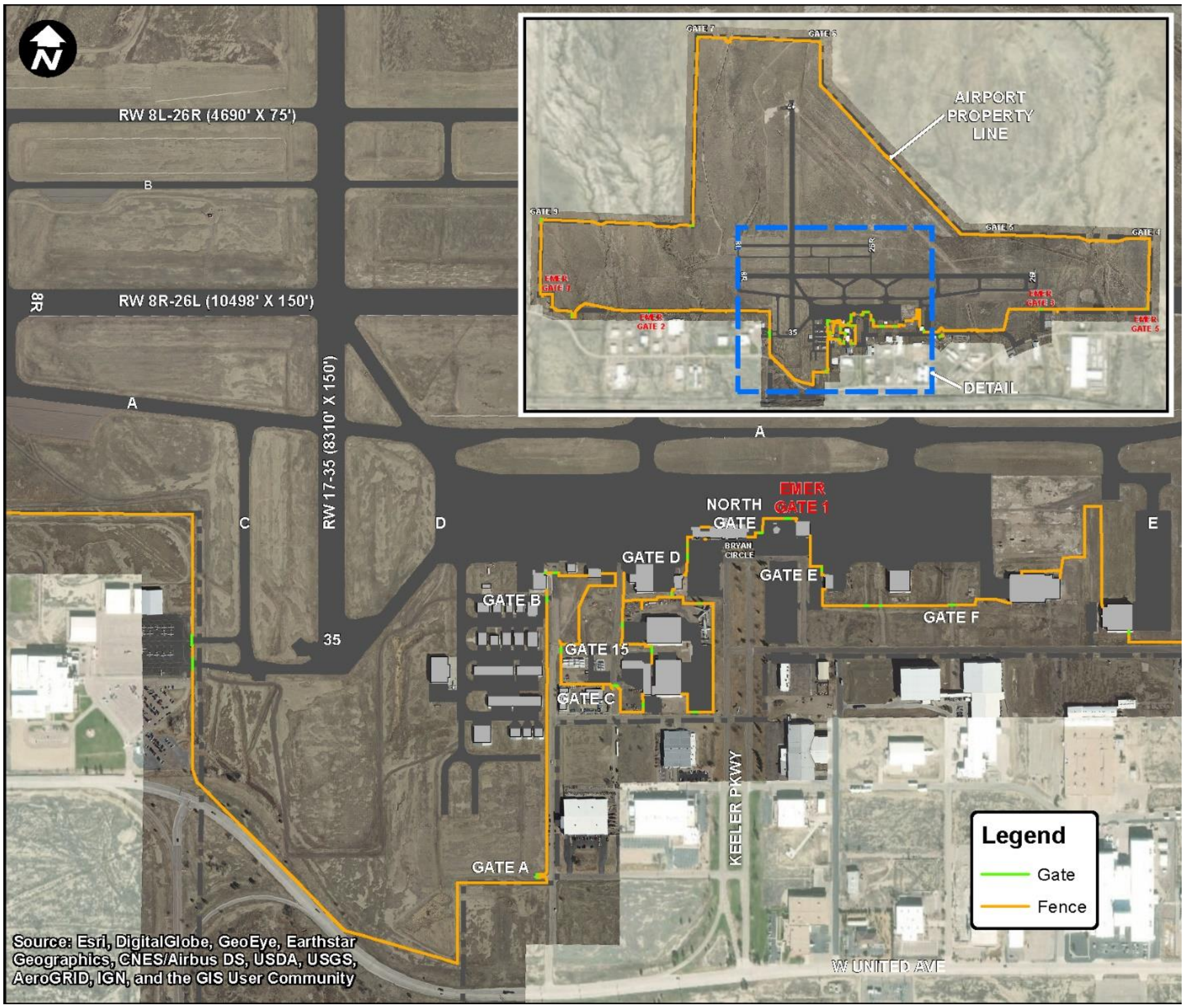
Fencing and Gates

Keeping the aircraft operations area (AOA) clear of unauthorized vehicles and pedestrians is required under Transportation Security Administration (TSA) security regulations for Part 139 certificated airports. Most airports, including GA, use fencing and access control gates to reduce the inadvertent entry of unauthorized people and vehicles, and wildlife as well, onto the airfield.

The terminal area and surrounding buildings are currently enclosed with eight-foot-tall chain link fencing with three strands of barbed wire on top. Based on the findings of PUB's 2018 Wildlife Hazard Assessment and Management Plan, 34,000 linear feet of new perimeter fencing was approved for installation. The new fencing is comprised of 10-foot-tall chain-link fence topped with 3-strand barbed wire. This fencing replaced older four-foot barbed wire fencing on most of the north, west, and east perimeters of the airfield. Phase 1 of the fencing project was completed in April of 2020; Phase 2 is scheduled to begin in June, with anticipated completion scheduled for August 2020.

In the terminal area there are 6 automatic vehicle access gates that provide entry to the airfield. Authorized personnel operate the gates with a magnetic gate card. Two pedestrian gates – one by Rocky Mountain Flower Aviation and one by the ARFF station – are operated via a programmable keypad lock. There are also five emergency vehicle access gates with access to the airfield; one is in the terminal area adjacent to the terminal and ATCT buildings, and two each are located on the southeast and southwest perimeter fence line. The location of the vehicle access gates and others are illustrated in **FIGURE A9**.

FIGURE A9 Existing Fencing and Gates



SOURCE: Dibble Engineering.

Airport Environs

Land Use Planning and Zoning

Designating land use and zoning on, adjacent to, and in the close proximity of an airport is an important task for municipal airport sponsors. Typical land use compatibility considerations include safety, height hazards, and noise exposure, all of which sponsors should address when designating land use and zoning ordinances on and around airports within their jurisdiction. In order to gain a better understanding of the land uses in the vicinity of the Airport, City of Pueblo land use maps were reviewed. As the future development of the Airport is laid out within the airport master planning process, it is essential the City planning efforts as it relates to land use are working in conjunction to prevent incompatible land use in the vicinity of the Airport.

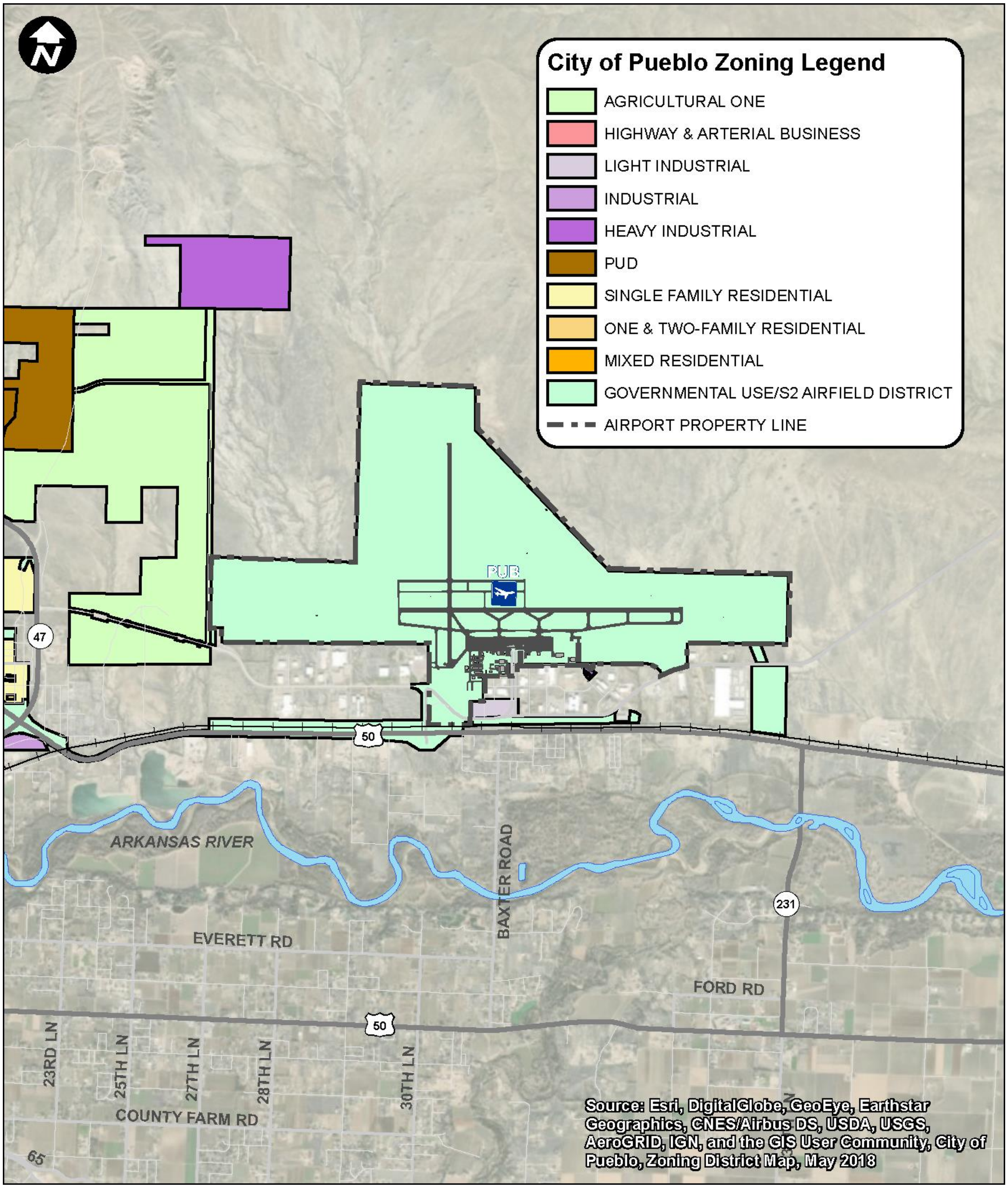
Existing Zoning

According to the City of Pueblo Zoning District Map, PUB and the surrounding industrial park area is zoned as S2 – Airfield District. Furthermore, according to the City of Pueblo Planning and Community Development, this district was designed to give added protection to the population, buildings, structures, and aircraft in close proximity to the airfield and supersede the height standards of the use district over which they may be applied. The height of structures, buildings, trees, or fences within the airfield zone shall not exceed the limits as defined by the 14 CFR Part 77 imaginary surfaces described in a preceding section. This includes the approach, horizontal, conical, and transitional surfaces associated with all three of the airport's runways, as well as their RPZs. The existing zoning in and around the Airport is illustrated in **FIGURE A10**.

Future Land Use

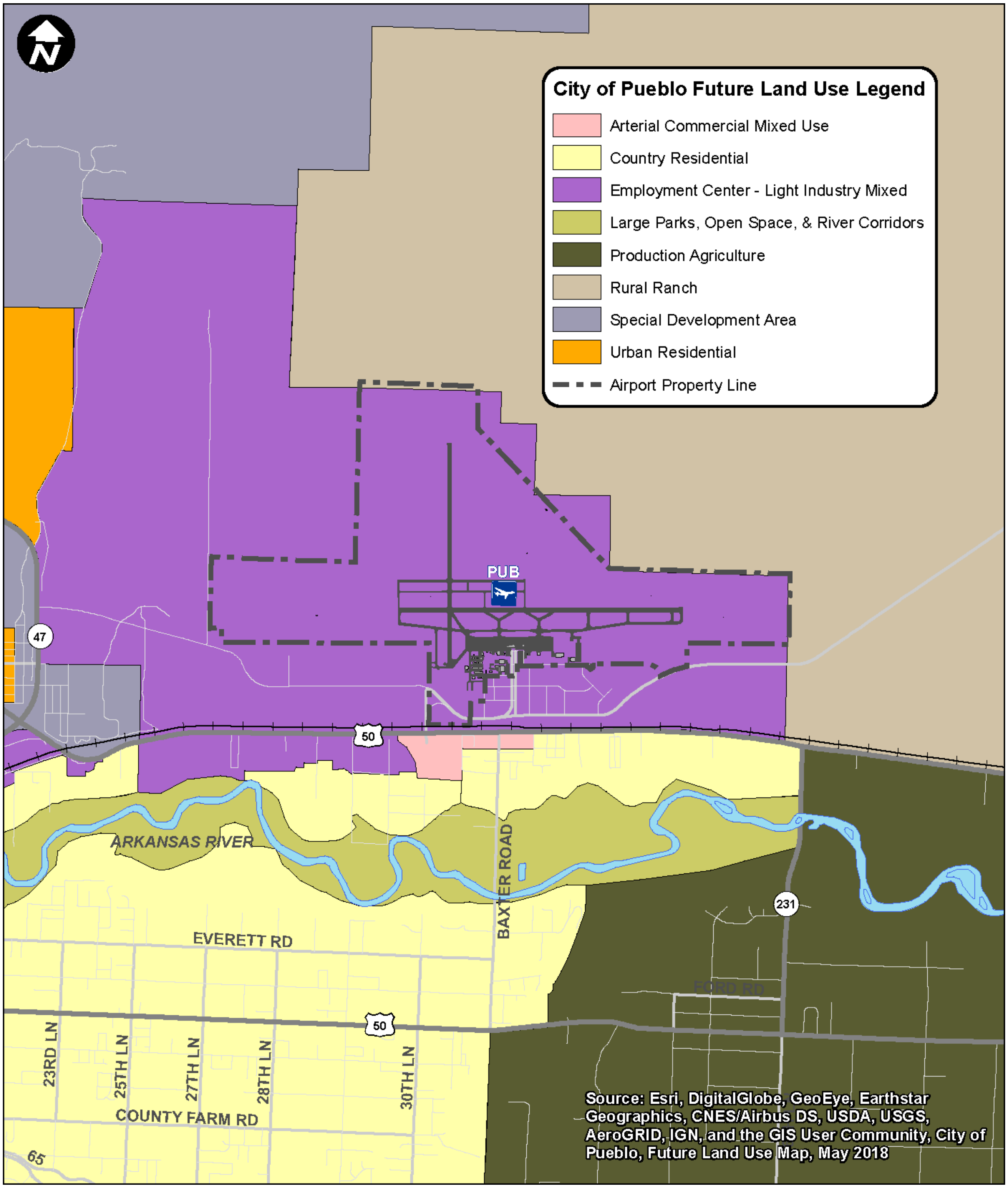
The City of Pueblo published the Pueblo Regional Development Plan Addendum in August 2014 in which the City continued to support compatible land use zoning in and around the airport by classifying the future land use in those areas as Employment Center – Light Industry Mixed Use. Land use in these areas, including the Airport Industrial Park (AIP), will support aeronautical activities, as well as manufacturing, assembly, research and development, and some commercial and office services. These activities will help provide tax revenues and employment for the region and limit the encroachment of residential and other non-compatible airport land uses. The future land use for the City of Pueblo is illustrated in **FIGURE A11**.

FIGURE A10 City of Pueblo Existing Zoning



SOURCE: Dibble Engineering.

FIGURE A11 City of Pueblo Future Land Use



SOURCE: Dibble Engineering.

Environmental Baseline Inventory

This section documents the existing baseline environmental conditions at the Airport and allows for the consideration of potential environmental impacts thorough the planning process including during the development of alternatives and recommendations.

FAA Orders 1050.1E, *Environmental Impacts: Policies and Procedures*, and 5050.4B, *National Environmental Policy Act: Implementation Instruction for Airport Actions*, address specific environmental resource categories to be evaluated in environmental documents in accordance with the National Environmental Policy Act (NEPA). This section summarizes the applicable environmental categories and their existence at PUB. The following environmental categories are not discussed as they are not relevant to PUB and/or they relate to impacts that would occur from a specific project:

- **Climate**
- **Coastal Resources**
- **Natural Resources and Energy Supply**
- **Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks**
- **Cumulative Impacts**
- **Irreversible and irretrievable Commitments of Resources.**

Recommendations will be made to study these categories further under a NEPA analysis as specific projects are implemented.

Air Quality

Air quality analysis for federally funded projects must be prepared in accordance with applicable air quality statutes and regulations, including the Clean Air Act of 1970, the 1977 Clean Air Act Amendments, the 1990 Clean Air Act Amendments, and the National Ambient Air Quality Standards (NAAQS). The air pollutants of concern in the assessment of impacts from airport-related sources include six "criteria pollutants"; carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO2), ozone (O3), particulate matter (PM-10 and PM-2.5), and sulfur dioxide (SO2).

The Airport is located within Pueblo County and is designated by the U.S. Environmental Protection Agency (EPA) as being *in attainment* status for all parts of the County in all other criteria.

Biological Resources

Biological resources include fish, wildlife, plants, and their respective habitats. Requirements have been set forth by The Endangered Species Act (ESA), The Sikes Act, The Fish and Wildlife Coordination Act, The Fish and Wildlife Conservation Act, The Migratory Bird Treaty Act, Executive Order 13751 (Invasive Species), and various state and local regulations for the protection of fish, wildlife, and plants of local and national significance.

There does not appear to be suitable habitat for any of these species within the Airport property limits. A survey would need to be completed prior to any proposed development to determine if any listed threatened or endangered species are present on Airport property.

Species listed as threatened or endangered, or candidates that may be found within the Airport vicinity are depicted in **TABLE A16**.

TABLE A16 Threatened and Endangered Species in Pueblo County

GROUP	SPECIES	SCIENTIFIC NAME	STATUS
Birds	Mexican Spotted Owl	Strix occidentalis lucida	Threatened
Insects	None		
Fish	Greenback Cutthroat Trout	Oncorhynchus clarkii stomias	Threatened
Mammals	Canada Lynx	Lynx canadensis	Threatened
Flowering Plants	None		

SOURCE: U.S. Fish and Wildlife Service, Information for Planning and Consultation (IPaC) Species Report, Pueblo Memorial Airport, 2020.

Department of Transportation Act, Section 4(f)

According to Section 4(f) of the Department of Transportation Act (re-codified as 49 USC, Subtitle I, Section 303), no publicly owned park, recreation area, wildlife or waterfowl refuge, or land of historic site that is of national, state, or local significance shall be used, acquired, or affected by programs or projects requiring federal assistance for implementation unless there is no feasible or prudent alternative.

The closest Section 4(f) property to the Airport is the Walking Stick Golf Course approximately 5 miles west of the Airport; however, no 4(f) properties are located within the Airport property boundary.

Farmlands

The Farmland Protection Policy Act (FPPA) regulates federal actions that may impact or convert farmland to a non-agricultural use. FPPA defines farmland as "prime or unique land as determined by the participating state or unit of local government and considered to be of statewide or local importance".

All Airport property is categorized as "urban and urban build-up land" and the majority of the land within the immediate vicinity surrounding the Airport is categorized as "other". No impacts to farmlands will result from implementation of master plan projects.

Hazardous Materials, Solid Waste and Pollution Prevention

Hazardous materials are defined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA) 42 United States Code (USC) 6901-6992. Hazardous materials include substances that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may present substantial danger to public health or welfare or the environment.

The two statutes of concern to the FAA are the RCRA, as amended by the Federal Facilities Compliance Act, and the CERCLA, as amended by the Superfund Amendments Reauthorization Act (SARA) and by the Community Environmental Response Facilitation Act. RCRA governs the generation, treatment, storage, and disposal of hazardous wastes. CERCLA provides for consultation with natural resources trustees and cleanup of release of a hazardous substance, excluding petroleum, into the environment.

Sites of interest are defined as state cleanup sites, federal superfund cleanup sites, hazardous waste generators, solid waste facilities, underground storage tanks, dairies, and enforcement actions. The United States Environmental Protection Agency (EPA) does not list any sites. However, a search of a regulatory database report conducted for the 2009 EA identified four (4) closed cases concerning hazardous waste. The site is also associated with air emissions. No contamination of soil or groundwater was identified; therefore, any proposed master plan projects should not disturb any areas that contains or have previously contained hazardous materials.

Historical, Architectural, Archeological and Cultural Resources

Historical, architectural, archaeological, and cultural resources encompass a range of sites, properties, and physical resources associated with human activities, society, and cultural institutions. Federal law requires project sponsors who require federal funds or approvals to consider how their proposed projects would affect historic properties. In accordance with NEPA and Section 106 of the National Historic Preservation Act (NHPA), the FAA is the lead agency for identifying the potential impacts of a proposed project on these resources and consulting with federally recognized tribes, the State Historic Preservation Office (SHPO), and other agencies as necessary.

The FAA must also comply with the Archaeological and Historic Preservation Act to ensure the plan "provides the survey, recovery, and preservation of significant scientific, prehistorical, historical, archeological, or paleontological data when such data may be destroyed or irreparably lost due to a federal, federally licensed, or federally funded project."

In the context of an Airport Master Plan, historic, archaeological, and cultural resources are districts, sites, buildings, structures, objects, landscapes, and Native American Traditional Cultural Properties (TCPs) that are on or eligible for listing on the NRHP. PUB does not have historic buildings or structures. The closest historic resource listed on the NRHP is Preston Farm, located over four miles north of Airport.

A Class III cultural resources survey was conducted as part of a previous airport project. The survey identified only one historic property, the Blitz Hangar, which was determined eligible for the NRHP in 1996.

A cultural resource survey would be required prior to any major development to determine if any historic, archaeological, and cultural resources appear on Airport property.

Noise and Noise-Compatible Land Use

According to the FAA Order 1050.1F, Desk Reference, Chapter 11, Noise and Noise-Compatible Land Use, "noise" is defined as unwanted sound that may interrupt activities such as sleep, conversation, or student learning. Aviation noise typically comes from the operation of aircraft during departures, arrivals, overflights, taxiing, and engine run-ups.

Per FAA Order 1050.1F, projects at airports that experience 90,000 annual piston-powered aircraft operations, 700 annual jet-powered aircraft operations, such as siting a new airport, runway relocation, runway strengthening, or a major runway expansion require a noise analysis including noise contour maps. According to the previous master plan (2017) the existing 65 Day-Night Average Sound Level (DNL) noise contour remains well within the Airport's boundary. New noise contours will be generated as part of this study based on updated fleet mix and aviation demand forecast to determine if surrounding land uses would be impacted by aircraft noise.

Visual Effects

FAA Order 1050.1F defines light emissions as light that emanates from a light source into the surrounding environment (i.e. airfield and apron flood lighting, NAVAIDs, terminal lighting, parking lighting, roadway lighting, safety lighting). Visual resources may include structures or objects that obscure or block other landscape features (i.e. buildings, sites, traditional cultural properties, or other manmade landscape features).

The primary sources of light emissions at the Airport are the runway edge lights, approach lights, rotating beacon, PAPIs, and apron and parking lights, which aid in providing a safe environment for aircraft operations and produce an insignificant amount of light on the surrounding area. Light emissions and visual impacts should be considered prior to any future development projects.

Water Resources

Water resources are surface waters and ground water that are vital to society because they provide drinking water as well as support recreation, transportation and commerce, industry, agriculture, and aquatic ecosystems. Surface water, ground water, floodplains, and wetlands do not function as separate and isolated components of the watershed, but rather as a single, integrated natural system. Disruption of any one part of this system can result in consequences to the functioning of the entire system, which need to be considered as part of the planning process along with potential impacts to the quality of water resources.

Wetlands

The Clean Water Act (CWA) defines wetlands as:

> *…areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.*

Federal regulations require that proposed actions avoid, to the greatest extent possible, long-term and short-term impacts to wetlands, including the destruction and altering of the functions and values of wetlands.

The US Fish and Wildlife Service (FWS) is the principal US Federal agency tasked with providing information to the public on the status and trends of our Nation's wetlands. The US FWS National Wetlands Inventory (NWI) is a publicly available resource that provides detailed information on the abundance, characteristics, and distribution of US wetlands.

The USFWS National Wetlands Inventory (NWI) online mapping system was reviewed to identify delineated wetlands on or near the Airport. According to NWI, no wetlands exist at PUB other than a system of riverines which primarily flow from south to north around the perimeter of the Airport property.

A Riverine System includes all wetlands and deepwater habitats contained within a channel, with two exceptions: (1) wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens, and (2) habitats with water containing ocean-derived salts of 0.5 ppt or greater. A channel is an open conduit either naturally or artificially created which periodically or continuously contains moving water, or which forms a connecting link between two bodies of standing water.

Floodplains

A floodplain is generally a flat, low-lying area adjacent to a stream or river that is subject to inundation during high flows. The relative elevation of a floodplain determines its frequency of flooding.

Executive Order 11988 requires federal agencies “to avoid, to the extent possible, the long and short-term adverse impacts associated with the occupancy and modification floodplains and to avoid direct or indirect support of floodplain development whenever there is a practical alternative.”

According to FEMA’s National Flood Hazard Layer (NFHL) Viewer, the Airport has flood zones (Zone A) on the east and west sides of the Airport flowing from south to north. Zone A - areas are subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.

Surface Waters

Surface water is water that occurs above ground such as a wetland, river, stream or lake. There are three unnamed washes flowing into the Airport property from the north. These unnamed washes are tributaries to the Arkansas River. The wash on the western end and eastern end of the Airport property are located in a FEMA jurisdictional washes. The washes are located outside of the Airport runways and traverse the entire Airport property. There are several drainage swales and culverts located within the runway and taxiway area. The main hydrological features in the vicinity of the Airport are the Arkansas River, located approximately 1/2-mile south of the Airport, and Fountain Creek, which is located approximately 3 and ¾-mile west of the Airport.

Groundwater

Groundwater is subsurface water that occupies the space between sand, clay, and rock formations. Aquifers are the geologic layers that store or transmit groundwater to wells, springs and other water sources. The Safe Drinking Water Act and its implementing regulations (40 CFR Parts 141-149) prohibit federal agencies from funding actions that would contaminate an EPA-designated sole source aquifer or its recharge area. State and local agencies may also promulgate regulations to protect sole source aquifers and their recharge areas.

Wild and Scenic Rivers

Wild rivers are free of obstructions such as canals and dams, and normally so remote as to only be accessible by trail. Scenic rivers are free of obstructions and have undeveloped shorelines but may have road access. Wild and scenic rivers are protected by the 1986 Wild and Scenic Rivers Act. Wild and scenic rivers are managed by the Bureau of Land Management, the National Park Service, the USFWS, and the U.S. Forest Service.

According to the National Park Service (NPS) map of the National Wild and Scenic Rivers System, there are no wild and scenic rivers within or around the Airport. The nearest wild and scenic river is the Cache la Poudre Wild and Scenic River, located in northern Colorado.

B. Aviation Activity Forecasts

Introduction

The development of accurate and defensible aviation activity forecasts is a key element in the Master Plan Study process. They are used for determining future airport requirements, analyzing alternative development plans, assessing the possible environmental effects of proposed plans, and determining the economic implications of future growth and development. While forecasting, by nature, is not an exact science, it does establish general estimates for future aviation activity levels and provides a defined rationale for necessary airport facility changes as demands increase.

Airport activity forecasts are principally influenced by local airport factors, aviation industry trends, and overarching regional socioeconomic market conditions. They are developed to meet five main objectives:

- **Provide a realistic and sustainable estimate**
- **Be based on the latest available data**
- **Reflect current conditions at the Airport**
- **Be supported by information in the Master Plan Study**
- **Provide adequate justification for future airport development.**

The aviation activity forecasts presented in this chapter use fiscal year (FY) 2019 as the base year and are developed for the 20-year planning period (2019-2040) to forecast future aviation activity at Pueblo Memorial Airport (PUB or the Airport). Reporting intervals of every five years have been utilized. Each topic is evaluated using multiple forecasting methods and is compared to the 2019 Federal Aviation Administration (FAA) prepared Terminal Area Forecast (TAF), released in January 2020.

Existing Conditions and Assumptions

The forecast data provided in this chapter was created using existing and historical data about the Airport and its surrounding region. Information regarding socioeconomic data, airline industry trends, and PUB-specific activity were all examined to provide context for the forecasting effort.

Regional Statistics

Several regional underlying conditions were evaluated to develop a series of assumptions that serve as a foundation for the forecasts described in this chapter. They represent a variety of operational and socioeconomic considerations which may affect aviation activity at PUB to varying degrees.

One indicator is socioeconomic data; this data will, generally, correlate with aviation activity in its respective region. Population, employment, and income are indicators that typically influence aviation activity. Population figures indicate the general number of persons served by an airport, and therefore influences the potential customer base. Employment levels are a gauge of economic activity and vitality. Income statistics meanwhile reflect the degree to which an airport's customer base has sufficient disposable income to spend on aviation activities such as airline ticket purchases, aircraft ownership, and aircraft charter or rental.

The level and type of aviation activity occurring at an airport is dependent upon many factors, but it is generally reflective of the services available to aircraft operators, the businesses located on the airport or within the community the airport serves, and the general economic conditions prevalent within the surrounding area.

Pueblo is geographically located in the south-central portion of the state of Colorado. The Airport's service area primarily includes the Pueblo Metropolitan Statistical Area (MSA) as well as smaller outlying communities to the south and east.

Regional Socioeconomic Conditions

According to the economic and demographic forecasting firm Woods & Poole, Inc., the Pueblo MSA has seen a steady rise in socioeconomic conditions since the year 2000. **TABLE B1** details historical socioeconomic conditions over the past 10 years, projected conditions 10 years in the future, and their associated Compound Annual Growth Rates (CAGR).

TABLE B1 Socioeconomic Data for the Pueblo MSA, 2010-2029

YEAR	TOTAL POPULATION	GROSS REGIONAL PRODUCT (2009 dollars)	PERSONAL INCOME PER CAPITA (2009 dollars)	TOTAL EMPLOYMENT (Jobs)
HISTORICAL				
2010	159,521	4,073,868,000	28,849	74,559
2011	159,785	4,079,261,000	29,540	75,398
2012	160,397	4,180,834,000	29,822	75,261
2013	160,803	4,145,405,000	29,655	75,284
2014	161,350	4,293,954,000	30,942	76,326
2015	163,117	4,361,252,000	32,267	77,493
2016	165,123	4,418,965,000	32,627	79,009
2017	166,097	4,606,446,000	33,634	80,857
2018	167,195	4,702,228,000	34,216	82,094
2019	168,299	4,776,528,000	34,702	83,032
CAGR	**0.5%**	**1.6%**	**1.9%**	**1.1%**
PROJECTED				
2020	169,405	4,842,782,000	35,159	83,845
2021	170,514	4,908,169,000	35,596	84,710
2022	171,626	4,973,033,000	36,044	85,579
2023	172,739	5,040,743,000	36,495	86,390
2024	173,852	5,107,629,000	36,929	87,210
2029	179,325	5,447,029,000	38,969	91,304
CAGR	**0.6%**	**1.3%**	**1.2%**	**1.0%**

SOURCE: Woods & Poole, Inc.

Community/Airport Location and Potential

South-central Colorado, with its expanding population base, economic growth, numerous recreational facilities, and affordable living, provides a strong and definable market area for all forms of aviation activity. The surrounding communities benefit from the proximity of a high-quality aviation facility and, in turn, provide an economic base serving to attract additional airport users and industrial/business development. PUB's existing instrument approach procedures provide a more efficient aviation environment by increasing the amount of time properly trained pilots may operate during Instrument Meteorological Conditions (IMC).

PUB is located less than 10 miles east of downtown Pueblo. With ample undeveloped property and development potential remaining high, PUB is poised to attract additional aviation and non-aviation development in the future. PUB's largest tenant, Canadian Aviation Education (CAE)-Doss operates the Initial Flight Training (IFT) program for the U.S. Air Force that provides introductory flight training for all U.S. Air Force aviation candidates. At its state-of-the-art facility in the southwest corner of PUB, CAE-Doss provides flight instruction to every U.S. Air Force aviation candidate, be they pilot, combat systems officer, or remotely piloted aircraft pilot. Since 2006 their IFT program has trained more than 17,250 students for the U.S. Air Force.

Community Support

PUB benefits from the support of the City of Pueblo, as well as local industry and the citizens of south-central Colorado. The Airport is recognized as a vital asset that contributes to the stability and future of the region's economy. The overall position of the populace is one of continued growth and development, with special focus on the incentive of a commercial service airport continuing to attract additional economic and industrial development to the area.

Airfares

PUB has realized a net reduction in the cost of airfares in recent years. According to the DOT's Bureau of Transportation Statistics, the average airfares at PUB have decreased from $678.93 in the third quarter of 2016 (adjusted for inflation) to $420.20 in the third quarter of 2019, a total of 61.57 percent.

Airline Seats

The supply of airline seats has also seen a considerable increase in recent years. According to the DOT's Bureau of Transportation Statistics, in the past five years (from 2014-2019) PUB experienced an increase from 40,854 air carrier seats to 98,014 seats. This is a total increase of 139.9 percent in available airline seats with an average annual increase of 19.1 percent.

SkyWest is the only commercial airline currently serving PUB, however Allegiant Airlines also provided commercial service from October 2010 to April 2012. SkyWest currently offers two flights a day between PUB and DEN. With existing service subsidized through the Essential Air Service (EAS) program, it is unlikely that PUB will attract additional service through a legacy air carrier during the planning period.

Potential Challenges

There are few negative factors that have potential to significantly impact future aviation activity at PUB. However, as part of the planning process it is important to consider broad factors that could have a negative or neutralizing impact on PUB. Pueblo's proximity and relative ease of vehicle access to the Denver metropolitan area and Denver International Airport (DEN) make it challenging to retain commercial service passengers and expand air service.

It is thought that many residents will continue to choose the two-hour/130-mile drive to DEN due to a number of factors. These factors include drive time, lower airfares at DEN, and the sheer number of domestic and international destinations available from DEN. Other potential challenges could include the relatively slow growth in general aviation activity nationally for the past 20 years. New general aviation aircraft deliveries and active general aviation aircraft have declined during the past 20 years. According to the General Aviation Manufacturer Association (GAMA) Annual Report 2019, worldwide shipments of all GA aircraft declined by more than 15 percent since 2000. The FAA Aerospace Forecasts 2020-2040 reports active GA aircraft in the United States declined by 2.4 percent during the past 20 years.

Historical and Existing Airport Activity

Aviation activity forecasting commences by utilizing the present time as an initial starting point, supplemented with historical data obtained from various sources, and compared to trends and forecasts. Data from the past 10 years (2010 to 2019) is used for historical trends as it includes periods of economic expansion and contraction that help forecasts account for various economic conditions and gives a perspective on the effects of economic change on aviation activity. **TABLE B2** presents a tabulation of the historical operations data collected and reported at PUB.

TABLE B2 **Historical Aviation Activity, 2010-2019**

		OPERATIONS						
YEAR	COMMERCIAL ENPLANEMENTS	COMMERCIAL	ITINERANT GA	LOCAL GA	ITINERANT MILITARY	LOCAL MILITARY	TOTAL	BASED AIRCRAFT
2010	7,424	5,502	65,291	107,481	2,205	1,651	182,130	129
2011	***22,099***	5,871	70,514	80,013	2,666	2,380	161,444	119
2012	***13,461***	5,617	70,234	81,580	2,665	1,940	162,036	120
2013	6,482	5,334	63,782	75,252	2,753	1,603	148,724	111
2014	5,945	4,156	59,395	71,083	3,351	2,240	140,225	123
2015	5,684	3,793	61,329	90,244	3633	5,771	164,770	128
2016	1,845	3,503	***60,949***	***72,117***	***11,304***	***18,110***	165,983	128
2017	3,564	4,943	***15,063***	***5,977***	***60,619***	***89,246***	175,848	132
2018	8,278	4,298	16,644	6,308	70,233	98,591	196,074	125
2019	11,571	4,157	15,547	5,748	75,702	116,270	**217,424**	**128**
CAGR	**5.1%**	**-3.1%**	**-14.7%**	**-27.8%**	**48.1%**	**60.4%**	**2.0%**	**-0.1%**

SOURCE: FAA TAF; Pueblo Airport.

TABLE B2 displays several important considerations about PUB's activities, which are displayed as the blue bold-faced numbers and warrant further explanation.

Commercial Enplanements

There was a considerable increase in commercial enplanements in the years 2011 and 2012, which was due to the limited presence of Allegiant Airlines as a carrier at PUB. This anomaly causes some issues in forecasting future growth utilizing historical trends. Despite this spike in 2011 and 2012, the CAGR remains the same due to the same start and end value of 2010 and 2019.

Operations

The TAF divides commercial service operations (an operation is defined as either a takeoff or a landing) into two categories: air carrier and air taxi/commuter. Air carrier operations are defined as activity by aircraft of more than 60 seats and air cargo aircraft with more than 18,000 pounds of payload capacity. Air taxi/commuter activity is defined as aircraft with 60 seats or fewer that transport regional passengers on scheduled commercial flights, non-scheduled or for-hire flights, and air cargo flights with 18,000 pounds or less payload. However, for purposes of this Master Plan, commercial aircraft operations have been categorized as air taxi and air carrier operations. The air taxi category includes all air cargo and non-airline operations that involve direct on-demand transactions rather than a regularly scheduled flight. Air carrier operations include all scheduled operations with a commercial component regardless of number of seats, such as operations through SkyWest Airlines CRJ 200, 50-seat aircraft. As shown in **TABLE B2**, commercial aircraft operations have remained relatively stable over the past 10 years with an overall marginal decrease.

Between the years 2016 to 2017, a significant shift occurs in the number of recorded general aviation (GA) and military aircraft operations. CAE-Doss operations were initially recorded by the Airport Traffic Control Tower (ATCT) as GA operations. However, beginning in 2017, the ATCT began to report CAE-Doss operations as military operations. This caused a significant drop in both the recorded itinerant and local GA operations, while the recorded itinerant and local military operations increased. GA operations encompass pleasure flying, flight training, business and corporate activity as well as those operations conducted as unscheduled air taxi operations that are not associated with commercial passenger service.

Aircraft operations are also categorized as local or itinerant operations. The *FAA Advisory Circular (AC) 5070-6B* defines a local operation as any operation performed by an aircraft operating in the local traffic pattern or within sight of the tower, aircraft known to be departing or arriving from flight in local practice areas, or aircraft executing practice instrument approaches at the Airport. Itinerant operations are all other aircraft operations.

Existing Operations by Aircraft Type

TABLE B3 shows the total breakdown of aircraft operations at PUB and their percentage of the total number of operations. The breakdown by type of aircraft for GA and military activity was estimated using data from the FAA Traffic Flow Management System Counts (TFMSC) for PUB during FY 2019. TFMSC data is compiled from Instrument Flights Rules (IFR) filed flight plans to or from an airport and/or when flights are detected by the National Airspace System usually via radar. However, TFMSC data has its limitations. First, it excludes Visual Flight Rules (VFR) operations and may exclude certain flights that do not enter the en route airspace and other low-altitude flights due to limited radar coverage and incomplete messaging. Because of this, it favors larger and/or more sophisticated aircraft operations and undercounts smaller, less sophisticated aircraft operations. Additionally, of the approximately 35,000 location identifiers reported over time, only a few thousand are associated with airports; the remaining are waypoints or references not associated with any airport. Therefore, TFMSC data is not a reliable source of *total* aircraft operations. The data can be used to glean a percentage of aircraft types using an airport. For this Master Plan, a representative from the Fixed Base Operator (FBO) reviewed and confirmed the estimates.

TABLE B3 Existing Operations by Aircraft Type, 2019

AIRCRAFT TYPE	OPERATIONS	PERCENTAGE
Commercial Service	4,157[1]	1.9%
Air Taxi	*2,291[2]*	*55.1%*
Air Carrier	*1,866[2]*	*44.9%*
Regional Jet	*1,830[2]*	*98.1%*
Narrow body Jet	*36[2]*	*1.9%*
General Aviation	21,295[1]	9.8%
Single Engine	*16,945[3]*	*79.6%*
Multi Engine	*1,500[3]*	*7.0%*
Jet	*2,350[3]*	*11.0%*
Helicopter	*500[3]*	*2.4%*
Military	191,972[1]	88.3%
Single Engine (CAE-Doss)	*191,339[4]*	*99.7%*
Standard Military	*633[4]*	*0.3%*
Total	**217,424**	**-**

SOURCE: [1]FAA TAF.
[2]Department of Transportation (DOT) T-100 data.
[3]Mead & Hunt estimates using FAA TFMSC.
[4]FAA TFMSC.

Based Aircraft

The 2019 TAF data indicated total based aircraft is 128. Officially reported counts from PUB, however, indicate that the true number for the year of 2019 was only 114. However, this number included aircraft owned by CAE-Doss. In 2020, the FAA indicated that CAE-Doss owned aircraft should not be included as these aircraft are technically not based on airport property but on Doss owned property and the aircraft access the airport through the fence. The most recent based aircraft count validated by the FAA and reported to the National Based Aircraft Inventory is 60 and thereby considered the most accurate. **TABLE B4** shows a detailed breakdown of PUB's historical and existing based aircraft.

TABLE B4 Summary of Based Aircraft, 2010-2019

YEAR	SINGLE ENGINE	MULTI ENGINE	JET	HELICOPTER	OTHER	TOTAL
2010[1]	113	12	4	0	0	129
2011[1]	101	11	7	0	0	119
2012[1]	101	11	7	0	1	120
2013[1]	96	7	7	0	1	111
2014[1]	105	10	7	0	1	123
2015[1]	110	9	8	1	0	128
2016[1]	109	9	8	1	1	128
2017[1]	117	6	6	2	1	132
2018[1]	112	6	5	1	1	125
2019[2]	51	4	4	1	---	60

SOURCE: [1] FAA TAF.
[2] National Based Aircraft Inventory validated by FAA,2020. Does not include CAE-Doss owned aircraft.

Forecasts of Aviation Activity

The role and importance of PUB will continue to support a wide range of activities including commercial service, CAE-Doss training operations, and GA activity. While there is no guarantee that the Essential Air Service (EAS) program will continue through the planning period, the program has become very important to politicians in Congress who represent small communities who need access to the air transportation system. For this reason, it is assumed that EAS will continue through the planning period. The planning period forecasts aviation activity into the future, from baseline data collected in 2019 to the end of the period in 2040. It is expected that the Airport will see steady growth over the next 20 years, however near-term airport activities have been adversely affected and will likely continue to be adversely affected by the onset of COVID-19.

Forecast projections are developed to provide a range of low to high demand scenarios, each supported by qualitative and quantitative factors that reflect current socioeconomic and aviation activities and trends and provide realistic projections. The forecast scenarios generated for this Master Plan assume, for the most part, straight-line growth. While it is recognized that straight-line (linear) growth never occurs year after year for many years, average annual growth methodologies often serve to illustrate intermediate and long-range planning.

Forecast Documentation Review and Data Sources

To provide context for the development of future activity levels, it is important to not only consider historical aviation activity data, but also existing trends and projections made by other independent organizations. Additionally, a documentation review was also conducted to ascertain and assess available forecast-related data pertinent to the PUB forecasts, including FAA guidance documents, published industry analysis and statistical studies, and other approved state, local, and Airport studies.

The following reports, studies, publications, and associated projections were referenced to provide support and guidance in the development of the aviation activity forecasts presented in this chapter.

2019 State Aviation System Plan

PUB activity projections published in the Colorado Department of Transportation (CDOT) Division of Aeronautics *2019 Colorado Aviation System Plan* (CASP) were referenced for comparison. The forecasts in the CASP use similar methodologies to represent future activity growth. The base year data and projected years do not coincide with the years presented in this Master Plan, and as a result they were not included alongside the forecasting data. While not serving as a direct one to one comparison, the numbers are nevertheless useful in comparing forecasting methodologies within each of the categories.

2007 ALP Update Report

Prior to CAE-Doss operating at PUB, and prior to the design/construction of Runway 8L/26R (often referred to as the trainer runway), PUB completed an ALP Update Report that included a narrative and a chapter with aviation activity forecasts. The report forecast total annual operations to increase from 130,353 in 2006 to over 400,000 by 2026 primarily due to expected operations conducted by CAE-Doss aircraft. This report also forecast annual operations to reach 377,257 by calendar year 2019. Actual operations in 2019 were only 217,414, well short of this projection. According to interviews with CAE-Doss personnel, the reason that operations did not meet projections is due to airfield constraints and a lack of airfield capacity.

FAA Published Data and Guidance

FAA's TAF 2019-2045

The TAF is an FAA developed forecasting tool that is updated annually and used by the FAA to determine budget and staffing needs. Due to limited staff resources, the FAA cannot forecast in as great of detail at smaller regional airports as they can at large airports. However, the TAF provides a guideline for developing forecasts, and is utilized by FAA to compare scenario-driven forecasts with the forecasts developed by the FAA. Aviation activity forecasts are one of the three master plan components that require FAA approval. It is important to note that if a preferred forecast varies more than 10 percent from the TAF in the first five years or 15 percent within the first ten years, it must be supported by an acceptable forecast methodology and analysis.

FAA's Aerospace Forecasts Fiscal Years 2020-2040

The FAA prepares annual updates of this document, which examines the current economic and aviation outlook, as well as macro level forecasts of aviation activity and the aircraft fleet throughout the U.S. The most recent document was published in February 2020 just as the COVID-19 pandemic was spreading from Asia to Europe, but had not yet appeared in the U.S. Only the earliest economic impacts of the virus were being felt on the world's economies and the global aviation industry. It was impossible to foreknow the full outcome of the pandemic and accurately reflect in the forecast. It is now known that the COVID-19 pandemic has had a detrimental impact on both the worldwide and U.S. economies, as well as the commercial aviation industry. Nevertheless, it is important to include the long-term aviation trends contained in the forecasts.

The 2020 FAA forecast called for U.S. carrier passenger growth over the next 20 years to average 2.0 percent annually. It was expected that U.S. carrier profitability would remain steady as solid demand fed by a stable economy offsets rising labor costs. System capacity as measured by available seat miles (ASMs) were forecast to grow in line with the increases in demand. In the long term, it was predicted that the aviation industry would be competitive and profitable, characterized by increasing demand for air travel and airfares growing more slowly than inflation, reflecting over the long term a growing U.S. and global economy.

The long-term outlook for GA was stable to optimistic, as growth of the high-end aircraft fleet offsetting continued retirement of the traditional low-end segment of the fleet. Overall, the forecast projected active GA aircraft to decrease slightly by 0.9 percent between 2020 and 2040 (rounding to an CAGR of 0 percent over the next 20 years). GA hours flown were expected to increase by 16 percent (an CAGR of 0.7 percent) during the same period. Both private and commercial pilot certificates were projected to decrease at an average annual rate of 0.6 and 0.1 percent, respectively.

FAA Advisory Circular 150/5070-6B (Change 2), Airport Master Plans

This AC describes the methodology for preparing airport master plans, including the development of FAA compliant forecasts. For the forecasting component of master planning, it provides key guidance on preparing aviation activity forecasts and it identifies what elements should be forecasted.

Forecasting Aviation Activity by Airport (Prepared for FAA by GRA, Inc.)

GRA, Inc. developed this document for FAA in 2001, which provides guidance for those preparing and reviewing airport activity forecasts. The FAA follows this guidance when developing the TAF.

Industry Reports

Aircraft Manufacturer Marketing Outlooks

Demand for aviation services is generally driven by changes in economic activity. The aviation industry declined with the economy during the 2008 recession and has been slowly recovering ever since. Aircraft manufacturers have increased production to supply commercial airline fleet renewal programs, and general aviation operators have sought more fuel efficient and technologically capable aircraft. Based on figures released by GAMA, recent worldwide shipments of GA aircraft have shown an overall increase. Shipments in 2019 totaled 2,658 aircraft, 8.9 percent more than 2018. Overall piston deliveries increased by 16.4 percent with single-engine deliveries up 16.7 percent and the much smaller multi-engine category up 15.1 percent. In the turbine categories, turbojet deliveries were up 15.1 percent. Turboprop deliveries were down 12.6 percent. Overall, forecasts show the long-term outlook for the aviation industry is one of growth.

Enplanements

PUB enplanements have already begun to see a downturn because of the COVID-19 pandemic. Aviation industry expectations vary wildly on the time frame for recovery, both globally and domestically, but historical events of similar magnitude on the aviation industry (i.e. the terrorist actions of September 11, 2001 and the Great Recession of 2007-2008) typically indicate a two to three-year recovery for passenger enplanements, which would place a recovery in 2022 to re-realize the activity levels of 2019. This trend is portrayed in the forecasting data with reductions in 2020's activity levels by 50 percent from 2019, and 2021 at 25 percent. By the year 2022 a return to the 2019 levels are realized. Each of the enplanement forecast scenarios begin their compound annual growth rates beginning in 2022.

The enplanement forecast scenarios presented in **TABLE B5** And **FIGURE B1** include:

- **2019 TAF.** This projection generated by the FAA's TAF is presented for comparison purposes.
- **Scenario One.** This scenario projects enplanements to increase at a CAGR of 0.5 percent. This is equal to the 2019-2029 projected annual population growth rate of the Pueblo Metropolitan Statistical Area (MSA) provided by Woods & Poole, Inc.
- **Scenario Two.** This scenario projects enplanements to increase at a CAGR of 1.2 percent which is equal to the projected trendline of PUB's historical enplanements with the 2011 and 2012 years of Allegiant Service not included. Without the approximate nine-month anomaly, a more consistent and realistic trend can be established.
- **Scenario Three.** This scenario represents the total market share of PUB's enplanements as they compare to the state of Colorado enplanements during the planning period. Scenario Three projects enplanements to increase at a CAGR of 1.8 percent.
- **Scenario Four.** This scenario is a trend line forecast that applies PUB's historical 10-year enplanements rate of growth (5.1 percent). Enplanements with this scenario increase at a CAGR rate of 4.3 percent.

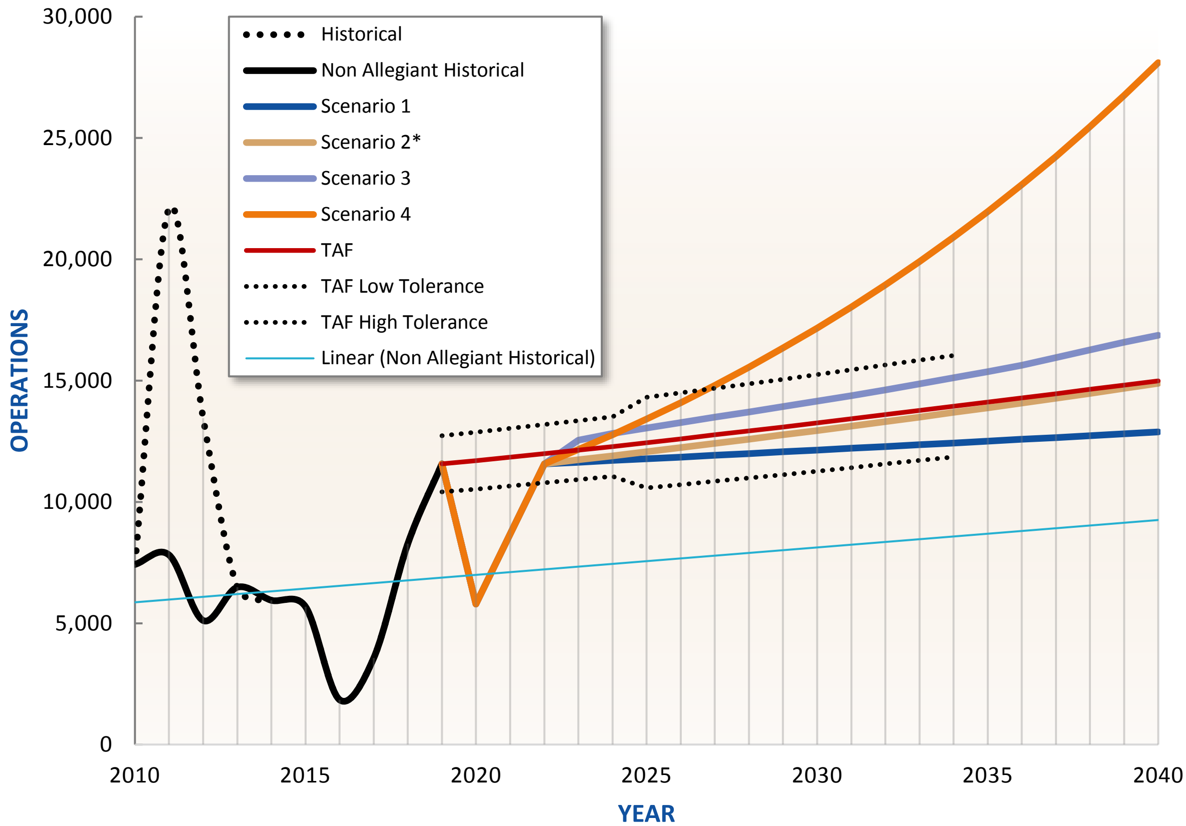
Scenario Two is the selected scenario for passenger enplanements. Its measured growth rate represents a conservative approach for future enplanements while simultaneously coinciding with expectations within the TAF. Scenario Two is also consistent with the passenger demand analysis report prepared separately (**Appendix C**) which defined the enplanement capture area and determined that PUB only captures approximately nine percent of passengers within the catchment area. For reasons specified previously and expanded on in the passenger demand report in **Appendix C**, significant amounts of commercial passengers chose to drive to either DEN or Colorado Springs Airport (COS) rather than initiating their trip at PUB. It is highly likely that this passenger leakage to other airports will continue throughout the planning period.

TABLE B5 Passenger Enplanement Forecast, 2019-2040

YEAR	2019 TAF	SCENARIO 1[3]	SCENARIO 2[4]	SCENARIO 3[5]	SCENARIO 4[6]
2019[1]	11,571	11,571	11,571	11,571	11,571
2020	11,698	5,790	5,790	5,790	5,790
2021	11,843	8,680	8,680	8,680	8,680
2022[2]	11,988	11,571	11,571	11,571	11,571
2023	12,133	11,639	11,733	12,547	12,155
2024	12,278	11,709	11,899	12,821	12,769
2025	12,440	11,780	12,067	13,051	13,415
2030	13,259	12,137	12,942	14,151	17,165
2035	14,114	12,506	13,881	15,371	21,965
2040	14,989	12,885	14,888	16,868	28,106
CAGR	**1.2%**	**0.5%**	**1.2%**	**1.8%**	**4.3%**

SOURCES: FAA TAF; Woods & Poole, Inc.; Pueblo Airport; Mead & Hunt.
NOTES: [1] Base forecasting year, sourced from the FAA TAF.
[2] Predicted COVID recovery year.
[3] Woods & Poole 2019-2029 predicted MSA growth.
[4] 2010-2019 historical trend in enplanements (excluding Allegiant Airlines); Preferred forecast.
[5] 2019-2040 Market share of PUB to CO enplanements.
[6] 2010-2019 total enplanement growth.

FIGURE B1 **Passenger Enplanement Forecast, 2019-2040**



SOURCE: Mead & Hunt.
NOTES: * Preferred forecast.

Enplanement forecasts contained in the CASP utilized the growth rate by service type as the preferred forecast specific to PUB. A base CAGR of 1.6 percent was applied to represent the expected enplanement growth for regional airports. The baseline number was taken from the FAA Air Carrier Activity Information System (ACAIS), which is ATCT reported data. The ACAIS was used over the TAF for all airports where ACAIS data was available, as was the case for PUB. PUB's enplanement numbers forecasted by the CASP were:

- **2018 Baseline:** 10,450.
- **2023 Projection:** 11,310.
- **2028 Projection:** 12,250.
- **2033 Projection:** 13,260.
- **2038 Projection:** 14,360.
- **CAGR:** 1.6 percent.

Aircraft Operations

Operations at PUB represent a varied mix of aircraft activity, with commercial service, GA, and military operations being the largest contributors. Each category of operations entails its own assumptions and forecasting methodologies.

Commercial Service

As previously stated in **Historical Aviation Activity**, SkyWest is the only commercial service operator at PUB and is likely to remain so throughout the planning period. SkyWest currently operates two flights per day between PUB and DEN. These numbers will change due to the COVID-19 pandemic, as the airline will be allowed to reduce its total number of operations by 50 percent. This directly translates to a reduction of one SkyWest flight per day.

The establishment of projected passenger enplanements is required to properly project commercial service operations, as there is usually a direct relationship between passenger enplanements and commercial service operations. If enplanements increase, operations will generally increase to accommodate the demand. However, the relationship can vary significantly, in that enplanements can increase without increasing operations, or even increase following a decrease in operations. Often, this is a result of airlines using larger aircraft with greater seating capacity, or more efficient scheduling with increased passenger Boarding Load Factor (BLF). The BLF is a ratio of the number of actual annual enplanements compared to the total number of annual departure seats (for example, if an aircraft has fifty seats and 25 passengers board, the BLF is 50 percent).

As presented in **TABLE B6**, it is believed that commercial service operations will remain at their 2019 levels even after the expected recovery from the COVID-19 pandemic. This is due to the average BLF at PUB having a maximum of 23.6 percent in 2019. This indicates that less than a quarter of all available departure seats were occupied by passengers in 2019. Using the preferred Scenario Two enplanements forecast, the BLF is projected to reach only 28.3 percent by 2035. Because of age and higher operating expenses, it is expected that the 50-seat regional jets (like the CRJ 200 currently providing service to PUB), will be phased out of airline fleets by the end of the planning period. At PUB, it is anticipated they will be replaced by 76-seat Embraer Regional Jet (ERJ) E-175 aircraft as the currently air carrier is adding this aircraft to its fleet mix and retiring its smaller regional jets. This decreases the BLF to 20.5 percent by 2040, which indicates that future enplanements will be easily accommodated by the current number of commercial service operations.

TABLE B6 Commercial Service Operations Forecast, 2019-2040

YEAR	ENPLANEMENTS	DEPARTURE SEATS	BLF	AIR CARRIER OPERATIONS	AIR TAXI OPERATIONS	TOTAL OPERATIONS
2019[1]	11,571	49,107	23.6%	1,866	2,291	4,157
2025	12,067	49,107	24.6%	1,866	2,291	4,157
2030	12,942	49,107	26.4%	1,866	2,291	4,157
2035	13,881	49,107	28.3%	1,866	2,291	4,157
2040	14,888	72,605	20.5%	1,866	2,291	4,157
CAGR	1.2%	1.9%	-0.7%	-	-	-

SOURCE: Pueblo Airport; Mead & Hunt.
NOTES: [1] Base forecasting year, sourced from the FAA TAF and US DOT T-100 data.

The methodology used by the CASP supports the projections in **TABLE B6**. It predicted that commercial airports with "very small regional carriers utilizing aircraft with lower seating capacities" would not see any significant change in their operations over the 20-year planning period; this included PUB. While statewide commercial enplanements were projected to grow by a 2.0 percent CAGR by 2038, smaller commercial service airports such as PUB would see very little change in commercial activity.

General Aviation Operations

GA activity at PUB have seen a sporadic change in recent years. Also as discussed in **Historical Aviation Activity**, GA operations prior to 2016 were significantly higher when CAE-Doss operations were categorized as GA activity. This created a discrepancy in the analysis of historical activity, as the significant drop recorded from 2010 to 2019 does not provide an accurate understanding of the actual activity. Providing the best possible comparison for predicting future GA operations requires an examination of only the most recent three years of historical data (2017-2019).

The impact of the COVID-19 pandemic on GA operations is expected to be less severe than its impact on enplanements. The forecasting model still predicts 2020 will see a 50 percent reduction from 2019 levels, but it is expected that the pre-pandemic numbers will return by 2021. This impact is assumed based upon the willingness of GA owners to use their private or low-passenger aircraft with minimal fear of infection compared to larger commercial service aircraft with greater numbers of passengers.

Itinerant GA Operations

The forecasts of itinerant GA Operations shown in **TABLE B7** and **FIGURE B2** include the following scenarios:

- **2019 TAF.** This projection is presented for comparison purposes.
- **Scenario One.** This scenario applies the CAGR of 0.6 percent utilized by Woods & Poole, Inc. to project the Pueblo MSA population through 2040. Applying the rate to the adjusted itinerant GA operations starting in 2021 results in a CAGR of 0.6 percent through the forecast time period.
- **Scenario Two.** This scenario uses the three-year historical growth trend in PUB's itinerant GA operations from 2017-2019, which is 1.3 percent. The trend CAGR is then applied the adjusted 2021 itinerant GA operations throughout the forecast time period resulting in a CAGR of 1.2 percent.
- **Scenario Three.** This scenario projects itinerant GA operations to increase at the same CAGR experienced at PUB during the last three years (i.e., 1.6 percent), but applies it to the adjusted 2021 operations and projects it throughout the forecast time period. The result is an overall CAGR of 1.4 percent.

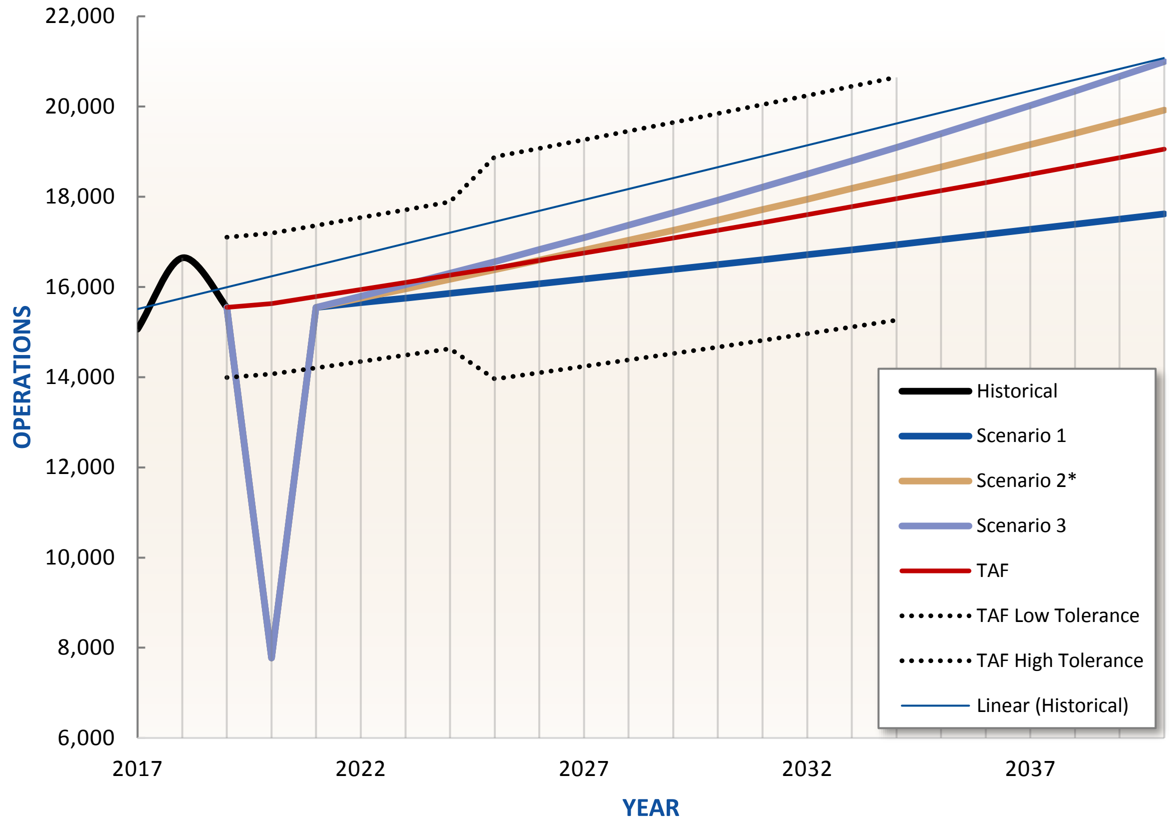
Scenario Two is the preferred forecast for itinerant GA operations due to its moderate growth rate and consistency with the TAF.

TABLE B7 Itinerant GA Operations Forecast, 2019-2040

YEAR	2019 TAF	SCENARIO 1[3]	SCENARIO 2[4]	SCENARIO 3[5]
2019[1]	15,547	15,547	15,547	15,547
2020	15,629	7,770	7,770	7,770
2021[2]	15,784	15,547	15,547	15,547
2022	15,941	15,650	15,751	15,795
2023	16,099	15,753	15,958	16,047
2024	16,259	15,857	16,168	16,302
2025	16,421	15,962	16,380	16,562
2030	17,256	16,496	17,484	17,925
2035	18,135	17,048	18,662	19,400
2040	19,055	17,619	19,920	20,996
CAGR	1.0%	0.6%	1.2%	1.4%

SOURCES: FAA TAF; Woods & Poole, Inc.; Pueblo Airport; Mead & Hunt.
NOTES: [1] Base forecasting year, sourced from the FAA TAF.
[2] Predicted COVID recovery year.
[3] Woods & Poole 2019-2029 predicted MSA growth.
[4] 2017-2019 historical trend in Itn GA growth; Preferred forecast.
[5] 2017-2019 historical Itn GA growth.

FIGURE B2 **Itinerant GA Operations Forecast, 2019-2040**



SOURCES: FAA TAF; Woods & Poole, Inc.; Pueblo Airport; Mead & Hunt.
NOTES: * Preferred forecast.

A comparison between the itinerant GA operations cannot be established between the CASP and the forecasts listed in **TABLE B7** and **FIGURE B2**. The forecasts presented in the CASP do not separate GA operations into categories, but instead projects only the total GA operations for each airport. Therefore, no direct comparison between the CASP and the forecast Itinerant GA operations can be made.

Local GA Operations

Local GA operations are forecasted in **TABLE B8** and **FIGURE B3** and represent the scenarios below:

- **2019 TAF.** The TAF projections are presented for comparison purposes.
- **Scenario One.** This scenario once again uses the Woods & Poole, Inc. supplied Pueblo MSA population growth rate through 2040. The resulting CAGR for this forecast is 0.6 percent.
- **Scenario Two.** This scenario again uses market share of PUB GA operations verses the share of the State's; this equals 0.7 percent CAGR.
- **Scenario Three.** This scenario projects local GA operations to increase at a CAGR of 1.1 percent, which is based on the 2017-2019 growth rate of regional GA operations according to the TAF. The 'region' was defined as the states of AZ, CO, KS, NE, NM, OK, TX, UT, and WY; this scenario utilized the combined data of these states.
- **Scenario Four.** This scenario utilizes the negative growth rate forecasted in the *FAA Aerospace Forecasts Fiscal Years 2020-2040* for the expected nationwide single engine, piston-powered fleet. The three-year historical analysis of the nationwide single engine, piston-powered fleet corresponded well the local GA operations occurring at PUB. The scenario results in a CAGR of -0.9 percent.

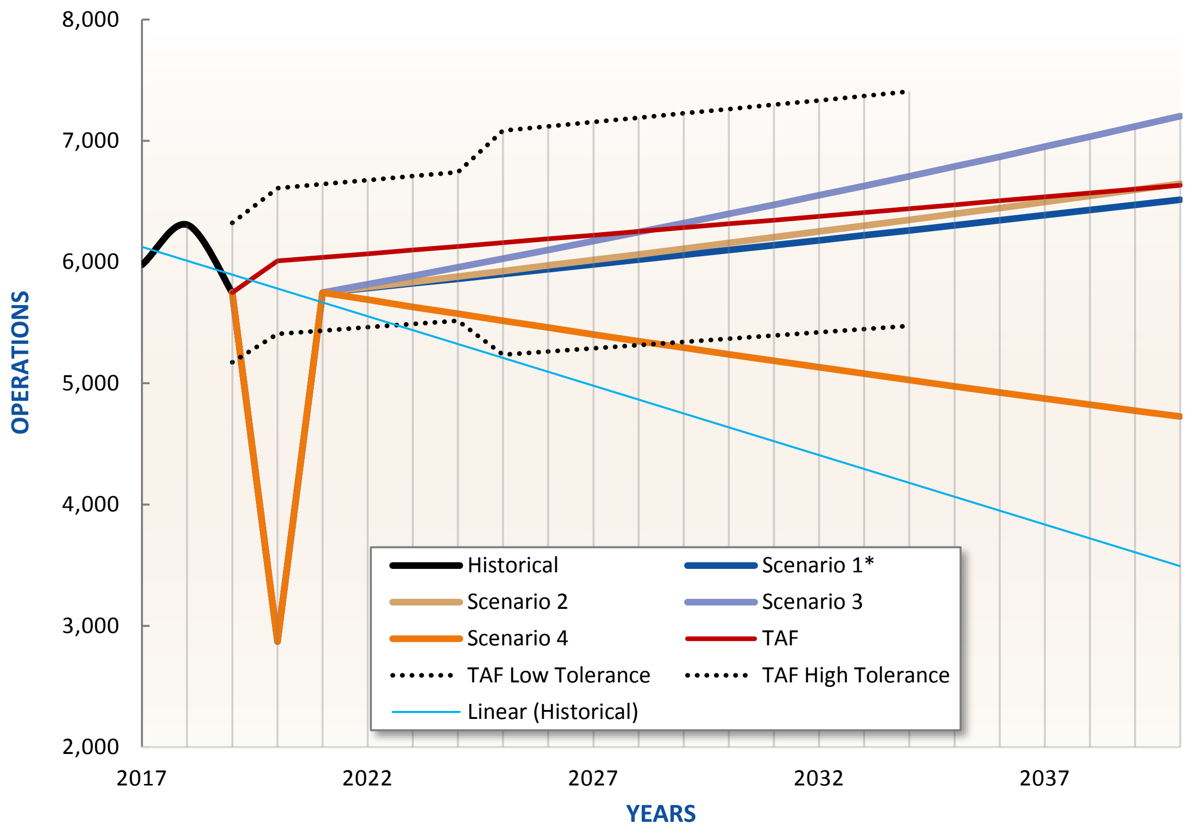
Scenario One appears to be the most appropriate scenario for local GA operations. It represents a steady growth rate and coincides with the median projections of the TAF.

TABLE B8 Local GA Operations Forecast, 2019-2040

YEAR	2019 TAF	SCENARIO 1[3]	SCENARIO 2[4]	SCENARIO 3[5]	SCENARIO 4[6]
2019[1]	5,748	5,748	5,748	5,748	5,748
2020	6,009	2,870	2,870	2,870	2,870
2021[2]	6,039	5,748	5,748	5,748	5,748
2022	6,069	5,786	5,792	5,817	5,689
2023	6,099	5,824	5,836	5,886	5,631
2024	6,129	5,863	5,881	5,957	5,573
2025	6,160	5,901	5,926	6,028	5,516
2030	6,315	6,099	6,157	6,397	5,239
2035	6,473	6,303	6,397	6,788	4,975
2040	6,633	6,514	6,646	7,203	4,725
CAGR	**0.7%**	**0.6%**	**0.7%**	**1.1%**	**-0.9%**

SOURCES: FAA TAF; Woods & Poole, Inc.; Pueblo Airport; Mead & Hunt.
NOTES: [1] Base forecasting year, sourced from the FAA TAF.
[2] Predicted COVID recovery year.
[3] Woods & Poole 2019-2029 predicted MSA growth; Preferred forecast.
[4] 2019-2040 Market share of PUB to CO operations.
[5] 2017-2019 Market regional growth rate.
[6] *FAA Aerospace Forecasts Fiscal Years 2020-2040* growth rate.

FIGURE B3 **Local GA Operations Forecast, 2019-2040**



SOURCE: Mead & Hunt.
NOTES: * Preferred forecast.

As previously stated in **Itinerant GA Operations**, the CASP projects only total GA operations and therefore cannot be compared to the forecasts shown in **TABLE B8** and **FIGURE B3**.

Military Operations

Military operations at PUB have historically represented a large section of its operations. No factors have been identified that would alter the number of non-CAE-Doss military (standard military) operations in the future. Standard military operations at PUB vary widely and range from small F-16 Fighting Falcon type jets to very large Lockheed C-5 Galaxy transport type aircraft.

CAE-Doss represents a separate share of military operations, and as a result have been provided their own projections for anticipated aircraft operations. These projections utilized an unconstrained demand as projected by CAE-Doss (**Appendix B**) that would represent CAE-Doss's total level of operations if they were able to operate at the peak efficiency outlined in their contract with the Department of Defense (DOD). Therefore, the numbers do not account for recent aviation trends such as the COVID-19 pandemic. A summary of the military operations forecasts is shown in **TABLE B9**.

TABLE B9 Military Operations Forecast, 2019-2040

YEAR	2019 TAF (ITN MIL)	2019 TAF (LOCAL MIL)	CAE-DOSS (ITN) [4]	CAE-DOSS (LOC) [4]	STANDARD MILITARY[5]	TOTAL[6]
2019[1]	75,702	116,270	75,069	116,270	633	191,972
2020	75,702	116,270	132,981	204,245	633	337,859
2021[2]	75,702	116,270	142,480	218,834	633	361,947
2025	75,702	116,270	155,145	238,285	633	394,063
2027[3]	75,702	116,270	161,477	248,012	633	410,122
2030	75,702	116,270	161,477	248,012	633	410,122
2035	75,702	116,270	161,477	248,012	633	410,122
2040	75,702	116,270	161,477	248,012	633	410,122
CAGR	-	-	3.7%	3.7%	-	3.7%

SOURCE: FAA TAF, TFMSC; CAE-Doss; Pueblo Airport; Mead & Hunt.
NOTES: [1] Base forecasting year, sourced from the FAA TAF.
[2] Predicted COVID recovery year.
[3] CAE-Doss peak year of unconstrained growth.
[4] Data sourced from CAE-Doss projections.
[5] Data sourced from TFMSC.
[6] Total of CAE-Doss ITN, LOC, and Standard Military.

The CASP projections for military aircraft operations at PUB also predicted flatline growth. However, like GA operations, the CASP does not separate military operations between itinerant and local categories and cannot be used for comparison.

Operations Forecast by Aircraft Type

A further assessment of the forecasts involves the individual and collective use of the Airport by various types of aircraft. Knowing the types of aircraft expected to use the Airport assists in determining the amount and type of facilities needed to meet the aviation demand.

TABLE B10 depicts the approximate level of use by aircraft types that are projected to use PUB. This table reflects a growing percentage of turbine-powered multi-engine aircraft anticipated to operate at the Airport, and a decreasing percentage of both single and multi-engine piston-powered aircraft. This is a national trend in general aviation where smaller piston driven aircraft are being flown less due to several factors including the cost of owning and flying personal aircraft, and the use of turbine-powered aircraft for business purposes increasing as a percentage of total operations. As mentioned previously, there is no expected growth in standard military operations from the base year (2019). The projections for the CAE-Doss operations are expected to be a continuation of the existing piston-powered single engine Diamond DA22 aircraft.

Currently, the FAA ATCT at the Airport estimates that approximately 80 percent of all GA operations are conducted by single engine aircraft, while 7 percent are multi-engine, 11 percent are business jet operations and 2 percent are helicopter. At the end of the forecast period (2040), approximately 74 percent of all general aviation operations are forecast to be single engine, 9 percent multi-engine 5.14 percent business jet, and 4 percent helicopter.

TABLE B10 Summary of Operations Forecast by Aircraft Type, 2019-2040

AIRCRAFT TYPE	2019	2025[2]	2030[2]	2035[2]	2040[2]
Commercial Service	4,157[1]	4,157	4,157	4,157	4,157
Air Taxi	*2,291*[2]	*2,291*	*2,291*	*2,291*	*2,291*
Air Carrier	*1,866*[2]	*1,866*	*1,866*	*1,866*	*1,866*
Regional Jet	*1,830*[2]	*1,830*	*1,830*	*1,830*	*1,830*
Narrow body Jet	*36*[2]	*36*	*36*	*36*	*36*
General Aviation	21,295[1]	22,281	23,583	24,965	26,434
Single Engine	16,945[3]	17,580	18,277	18,849	19,561
Multi Engine	1,500[3]	1,604	1,839	2,122	2,247
Jet	2,350[3]	2,562	2,830	3,246	3,701
Helicopter	500[3]	535	637	749	925
Military	191,972[1]	394,063	410,122	410,122	410,122
Single Engine (CAE-Doss)	*191,339*[4]	*393,430*	*409,489*	*409,489*	*409,489*
Standard Military	*633*[4]	*633*	*633*	*633*	*633*
Total	**217,424**	**420,501**	**437,862**	**439,244**	**440,713**

SOURCE: [1] FAA TAF.
[2] Department of Transportation (DOT) T-100 data.
[3] Mead & Hunt estimate using FAA TFMSC.
[4] FAA TMSC.
[5] Mead & Hunt.

Peak Period Forecast

An additional element in assessing airport use and determining various capacity and demand considerations is to ascertain peak period activities. Data from the FY 2019 TFMSC was used to reach the following assumptions for PUB:

- **October is the peak month for yearly operations**
- **9.6 percent of annual operations occur in the peak month**
- **A 31-day peak month**
- **Existing peak hour operations are 11 percent of the average day of the peak month.**

The peak period operational activities are illustrated in **TABLE B11**.

TABLE B11 Peak Period Aircraft Operations, 2019-2040

YEAR	ANNUAL	PEAK MONTH	AVERAGE DAY OF PEAK MONTH	PEAK HOUR/AVERAGE DAY RATIO	AVERAGE PEAK HOUR
2019	217,424[1]	20,873	673	11%	74
2025	420,501[2]	40,368	1,302	11%	143
2030	437,862[2]	42,035	1,356	11%	149
2035	439,244[2]	42,167	1,360	11%	150
2040	440,713[2]	42,308	1,365	11%	150

SOURCE: [1] FAA TAF.
[2] Mead & Hunt forecast.

Based Aircraft

The number and type of aircraft anticipated to be based at an airport are also vital components in developing a plan for future facilities. GA operators are particularly sensitive to both quality and location of the basing facilities. Many factors affect the decision of aircraft owners to base their aircraft at an airport, including:

- **Airport radio communications**
- **Available facilities and services**
- **Proximity to home and work**
- **Airport accessibility**
- **Basing capacity at adjacent airports.**

Generally, there is a relationship between aviation activity and based aircraft, stated in terms of operations per based aircraft (OPBA). Sometimes, a trend can be established from historical information of operations and based aircraft. The national trend has been changing with more aircraft being used for business purposes and less for pleasure flying. This impacts the OPBA in that business aircraft are usually flown more often than recreational or pleasure aircraft.

The COVID-19 pandemic is predicted to have minimal impact on based aircraft. Aircraft currently based at an airport are likely to remain throughout the duration of the pandemic, and it is expected that the number of operations per based aircraft will increase at PUB as more based aircraft are used for business purposes.

TABLE B12 and **FIGURE B4** list the following based aircraft scenarios:

- **2019 TAF.** The FAA's TAF are presented for comparison purposes.
- **Scenario One.** This scenario applies the CAGR of 0.6 percent used by Woods & Poole, Inc. to project the Pueblo MSA population through 2030.
- **Scenario Two.** This scenario shows the gradual increasing market share ratio of PUB's based aircraft to the entire State of Colorado based aircraft fleet. The base year 2019 market share represents the current number of PUB based aircraft compared to the State, which is a ratio of approximately 1.26 percent. The forecast gradually increases the ratio to approximately 1.48 percent in anticipation of a return to the 10-year historical average market share ratio. This reflects favorable leasing rates and storage options available to aircraft owners at PUB and results in an overall CAGR of 1.6 percent.
- **Scenario Three.** This scenario forecasts based aircraft by applying the existing 2019 OPBA ratio of 354.9 to the selected total GA operations forecasts at PUB. This results in a CAGR of 1.0 percent.

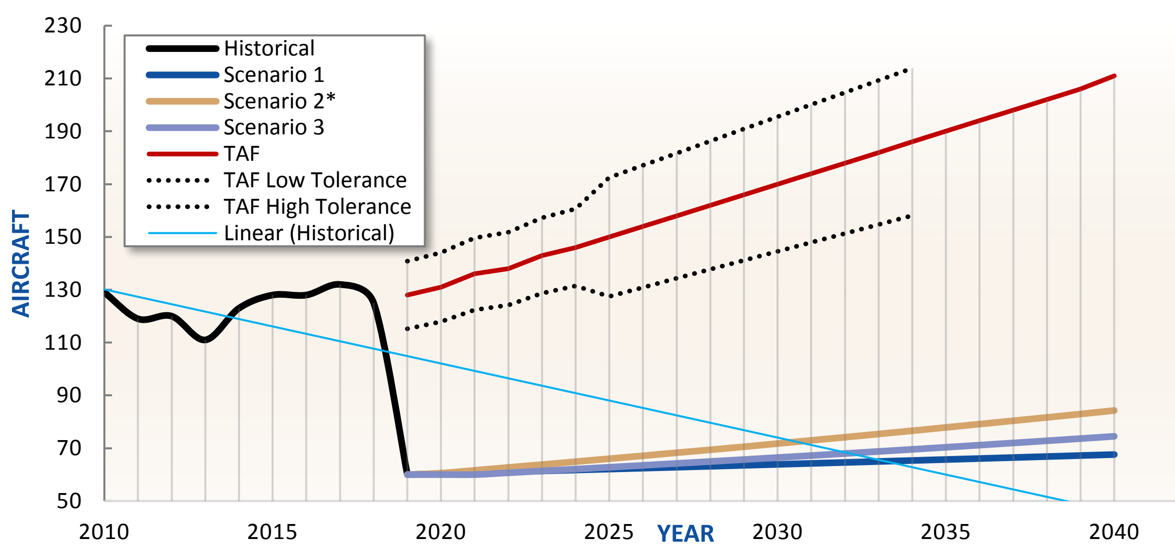
Scenario Two represents the preferred based aircraft forecast. Due to the discrepancy between the starting numbers of the TAF and the base forecasting year, each of the scenarios will not coincide with the TAF's limits. Despite this, the second scenario represents the closest capture of the TAF's values.

TABLE B12 Based Aircraft Forecast, 2019-2040

YEAR	2019 TAF	SCENARIO 1[4]	SCENARIO 2[5]	SCENARIO 3[6]
2019[1]	128[2]	60[3]	60	60
2020	131	60	61	60
2021	136	61	62	60
2022	138	61	63	61
2023	143	61	64	61
2024	146	62	65	62
2025	150	62	66	63
2030	170	64	72	66
2035	190	66	78	70
2040	211	68	84	74
CAGR	**2.4%**	**0.6%**	**1.6%**	**1.0%**

SOURCES: FAA TAF; Woods & Poole, Inc.; Pueblo Airport; Mead & Hunt.
NOTES: [1] Base forecasting year.
[2] Sourced from the FAA TAF.
[3] Sourced from FAA National Based Aircraft Inventory.
[4] Woods & Poole 2019-2029 predicted MSA growth.
[5] 2019 Market share of PUB to CO based aircraft; Preferred forecast.
[6] 2019 OPBA ratio applied to total GA operations.

FIGURE B4 Based Aircraft Forecast, 2019-2040



SOURCE: Mead & Hunt.
NOTES: * Preferred forecast.

CASP's 2018 baseline used the National Based Aircraft Registry for non-primary commercial service airports like PUB. The CASP's preferred forecast used the current based aircraft fleet mix of each airport to determine the future growth rate of total based aircraft. PUB's based aircraft numbers forecasted by the CASP were:

- **2018 Baseline:** 124.
- **2023 Projection:** 130.
- **2028 Projection:** 137.
- **2033 Projection:** 144.
- **2038 Projection:** 151.
- **CAGR:** 1.0 percent.

The mix of based aircraft for incremental periods throughout the planning period is presented in **TABLE B13**. In line with historical based aircraft growth, the percentages of based aircraft type are expected to remain relatively constant.

TABLE B13 General Aviation Based Aircraft Fleet Mix, 2019-2040

AIRCRAFT TYPE	2019	2025	2030	2035	2040
Single Engine	51 *(85.0%)*	56 *(84.8%)*	59 (82.2%)	63 (80.9%)	68 (80.7%)
Multi Engine	4 *(6.7%)*	5 (7.69%)	6 (8.4%)	6 (7.7%)	7 (8.3%)
Jet	4 *(6.7%)*	4 (6.1%)	5 (7.0%)	5 (6.4%)	6 (7.1%)
Helicopter	1 *(1.7%)*	1 (1.5%)	2 (2.8%)	3 (3.9%)	3 (3.6%)
TOTAL	**60 *(100%)***	**66 *(100%)***	**72 *(100%)***	**78 *(100%)***	**84 *(100%)***

SOURCE: Mead & Hunt.
NOTE: Percentages may be off slightly due to rounding.

Runway Design Code (RDC)/Critical Aircraft Analysis

FAA AC 5000-17, *Critical Aircraft and Regular Use* provides guidance on defining critical aircraft for the purposes of airport planning and states that aircraft owned by private companies, but operated under contracts with the federal government or Department of Defense, are to be classified as civil aircraft, not military aircraft and should count toward the critical aircraft and regular use determinations.

The types of aircraft presently using PUB and those projected to in the future are important considerations for airport planning. Critical Aircraft is defined as the most demanding aircraft type, or grouping of aircraft with similar characteristics, that make regular use of a runway or an airport. Similar characteristics refers to grouping of aircraft by comparable characteristics as determined by the Runway Design Code (RDC) described in AC 150/5300-13A *Airport Design.* The RDC is a coding system used to relate and compare the operational performance and physical characteristics of aircraft to airport design criteria. The RDC has two components. The first component, depicted by a letter (i.e., A, B, C, D, or E), is the Aircraft Approach Category (AAC), and relates to aircraft approach speed (operational performance characteristic). The second component, depicted by a roman numeral (i.e., I, II, III, IV, or V), is the Airplane Design Group (ADG) and relates to aircraft wingspan (physical characteristic). Generally, aircraft approach speed applies to runways and runway-related facilities, while aircraft wingspan is related to separation criteria associated with taxiways and taxilanes. **TABLE B14** details this summary of operations by RDC at PUB.

Based on an examination of the current operational information as contained in the TFMSC and data provide by CAE-Doss, most of the existing aircraft operations at PUB are within the A-I through B-II RDCs categories. Aircraft within the RDC C-I and C-II categories accounted for approximately 4,240 operations. The Bombardier CRJ 200 has an RDC of C-II and accounted for 1,830 of the existing operations. Therefore, it is the designated the existing Critical Aircraft for PUB. This aircraft is expected to be phased out of the SkyWest fleet by 2040. Consequently, the E-175 (with an RDC of C-III) is expected to be the future Critical Aircraft for PUB. Since SkyWest currently includes both Runway 8R/26L and Runway 17/35 in their operations specifications, and because SkyWest often utilizes Runway 35 for departures to Denver, the CRJ 200 and E-175 are the existing and future critical aircraft for both runways. For Runway 8L/26R, the existing critical aircraft is the Diamond DA20 Katana operated by CAE-Doss. CAE-Doss has also had discussions with the DOD about operating the single-engine turboprop Beechcraft T-6A Texan II in the future so this aircraft is considered the future critical aircraft for the trainer runway.

TABLE B14 Summary of Operations Forecasts by RDC, 2019-2040

RDC	2019	2025	2030	2035	2040
A-I, A-II, B-I, B-II	211,686	413,028	430,032	431,128	432,326
C-I, C-II	4,240	5,887	6,130	6,290	4,549
D-I, D-II	222	228	250	252	252
B-III, C-III, D-III	142	160	180	192	2,028
TOTAL	**216,291**	**419,333**	**436,592**	**437,862**	**439,155**

SOURCE: Mead & Hunt.
NOTE: Military and helicopter aircraft operations not included in total.

Critical Aircraft Determination by Runway at PUB

- **Runway 8R/26L.** Existing – Bombardier CRJ 200, Future – Embraer E-175
- **Runway 17/35.** Existing – Bombardier CRJ 200, Future – Embraer E-175
- **Runway 8L/26R (Trainer).** Existing – Diamond DA20 Katana, Future – Beechcraft T-6A Texan II.

Aviation Forecasts Summary

A summary of the aviation forecasts is presented in **TABLE B15**. This information is used as a background to develop the remaining portions of the report (analyze facility requirements, to aid development of alternatives and to guide the preparation of the plan and program of future airport facilities). In other words, the aviation activity forecasts are the foundation from which plans will be developed and implementation decisions will be made. In 2020, the FAA indicated that CAE-Doss aircraft operations should not be counted as military and instead should be included as GA since this company operates as a 14 CFR 141 flight school. **TABLE B15** reallocates the military and GA operations accordingly.

TABLE B15 **Summary of Aviation Activity Forecasts, 2019-2040**

AVIATION ACTIVITY	2019	2025*	2030*	2035*	2040*
ENPLANEMENTS					
Total	**11,571**[1]	**12,067**	**12,942**	**13,881**	**14,888**
OPERATIONS					
Commercial Service	4,157[2]	4,157	4,157	4,157	4,157
Air Taxi	*2,291*	*2,291*	*2,291*	*2,291*	*2,291*
Air Carrier	*1,866*	*1,866*	*1,866*	*1,866*	*1,866*
General Aviation	212,634[3]	415,711	433,072	434,454	435,923
Itinerant	*90,616*	*171,525*	*178,961*	*180,139*	*181,397*
Local	*122,018*	*244,186*	*254,111*	*254,315*	*254,526*
Military	633[4]	633	633	633	633
Total	**217,424**	**420,501**	**437,862**	**439,244**	**440,713**
Total Itinerant	**95,406**	**176,315**	**183,751**	**184,930**	**186,188**
Total Local	**122,018**	**244,186**	**254,111**	**254,314**	**254,525**
BASED AIRCRAFT					
Total	**60**[5]	**66**	**72**	**78**	**84**
Critical Aircraft	**CRJ 200**	**CRJ 200**	**CRJ 200**	**CRJ 200**	**E 175**

SOURCES: [1] FAA TAF.
[2] FAA TAF.
[3] FAA TAF. CAE-Doss aircraft operations reallocated as GA operations
[4] FAA TAF. CAE-Doss aircraft operations reallocated as GA operations.
[5] FAA National Based Aircraft Inventory validated by FAA, 2020. Does not include CAE-Doss owned aircraft.
* Projections provided by Mead & Hunt.

In addition, a comparison of the selected forecasts for passenger enplanements, commercial operations, and total operations with the FAA TAF is summarized in **TABLE B16**. This comparison will be used to determine the consistency of the airport forecasts with the TAF. As a rule, forecasted activities are considered consistent with the TAF if the forecasts differ by less than 10% in the 5-year forecast period (2025), and 15% in the 10 and 15-year forecast periods (2030 and 2035).

TABLE B16 **Preferred Forecasts/TAF Forecast Comparison, 2019-2035**

AVIATION ACTIVITY	PREFERRED FORECASTS	2019 TAF	AF/TAF % DIFFERENCE
Enplanements			
Base Year (2019)	11,571	11,571	0.0%
2025	12,440	12,067	3.1%
2030	13,259	12,942	2.4%
2035	14,114	13,881	1.7%
Commercial Operations			
Base Year (2019)	4,157	4,157	0.0%
2025	4,157	4,324	-3.9%
2030	4,157	4,464	-6.9%
2035	4,157	4,638	-10.4%
Total Operations			
Base Year (2019)	217,424	217,424	0.0%
2025	420,501	218,877	92.1%
2030	437,862	220,007	99.0%
2035	439,244	221,188	98.6%
Based Aircraft			
Base Year (2019)	60	128	-53.1%
2025	66	150	-56.0%
2030	72	170	-57.6%
2035	78	190	-58.9%

SOURCES: FAA TAF; Pueblo Airport; Mead & Hunt.

Passenger enplanements and commercial operations are consistent with the TAF, while total operations and based aircraft are not. The discrepancy for total operations lies in the future projections (2025-2035) using CAE-Doss's forecast of unconstrained demand. Alternatively, the discrepancy for based aircraft is due to the use of PUB's FAA validated aircraft count for 2019, which immediately causes inconsistencies between the forecasts and the TAF.

C. Capacity Analysis and Facility Requirements

Introduction

In efforts to quantify an airport's future facility needs, it is necessary to translate the forecasted aviation activity into specific physical development requirements. This chapter analyzes the actual types and quantities of facilities and/or the required improvements to existing facilities needed to accommodate the projected demand in a safe and efficient manner. For those components determined to be deficient, the type, size, or amount of facilities required to meet the demand is identified and explained in the section conclusion. Two separate analyses are included: those requirements related to airside facilities, and those requirements related to landside facilities.

This analysis uses the forecasts presented in the preceding chapter for establishing future development at Pueblo Memorial Airport (PUB). This is not intended to dismiss the possibility that either accelerated growth or consistently higher or lower levels of activity may occur. Aviation activity levels should be monitored for consistency with the forecasts. Since the facility improvements are identified to resolve existing deficiencies, accommodate projected growth, and satisfy airport development goals, the resulting recommendations respond to demand rather than being planned for a specific year.

Airfield Capacity

Airfield capacity is primarily a function of the amount and configuration of the major aircraft operating surfaces (i.e., runways and taxiways). It is defined in terms of potential excesses and deficiencies. Capacity refers to the number of aircraft operations that a particular runway and taxiway configuration can accommodate either on an hourly or annual basis without incurring excessive delays.

This section estimates PUB's annual operational capacity, compares it to forecasted growth, and determines whether capacity improvements are needed to accommodate forecasted growth.

Airfield Capacity Methodology

Long-term planning requires an airport to assess its ability to meet forecasted demand. One metric used to analyze airfield capacity is Annual Service Volume (ASV). ASV is described in Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5060-5, *Airport Capacity and Delay*, as a method of evaluating an airfield's annual operational capacity with acceptable delays. It is used as a metric for planning future improvement projects at an airport and is influenced by several variables. The primary drivers of ASV at PUB include:

- **Weather Conditions.** Weather conditions affect when Visual Flight Rules (VFR) or Instrument Flight Rules (IFR) are required for approach and landing. More frequent occurrences of IFR weather, or more typically more inclement weather conditions, reduces capacity as greater aircraft spacing is required. PUB regularly has clear skies and seldom experiences IFR conditions.
- **Runway Configuration.** The overall placement and use of location of runways at an airport greatly impact its capacity. Parallel runways are more efficient and increase overall capacity than runways that intersect, as they allow for simultaneous use the airfield configuration without delay. PUB's parallel runways, Runway 8L/26R and 8R/26L are both suitable for use by Canadian Aviation Education (CAE)-Doss training aircraft, and both runways may be used with minimal crossings of Runway 17/35.
- **Exit Taxiways Configuration.** Exit taxiways provide opportunities for pilots to exit a runway in a timely fashion, making the runway available for other aircraft operations. The numerous taxiways serving Runway 8R/26L allow for multiple exit points, while the overall length of the runway enables midfield departures (with Airport Traffic Control Tower (ATCT) coordination).
- **Fleet Mix.** Fleet Mix represents the categories of aircraft (A-D) currently using an airport. The categories are based on a combination of maximum takeoff weight, number of engines, and wake turbulence classification (air turbulence trails behind aircraft caused by movement through the air). Larger and heavier aircraft, which tend to create more significant and hazardous wake turbulence require additional spacing between aircraft, and interactions between aircraft of different sizes and approach speeds can also reduce capacity. At PUB, larger commercial service and business jet aircraft maintain a significant presence. However, most operations are conducted by small, homogenous aircraft.
- **Time of Day and Peak Hour.** The number of operations occurring throughout the day or at peak times can affect an airport's overall capacity. Operating under VFR for Runways 8R/26L and 8L/26R yielded the best results for PUB's peak hour period.

- **Percent of Arrivals and Touch-and-Go Operations.** Percent arrivals is the ratio of landing aircraft to all aircraft operations. Aircraft on final approach to a runway are given priority over departures, which increases percentage of arrivals especially during peak periods. Touch-and-go operations also affect the arrival ratio and are factored into the capacity calculation. PUB's touch-and-go percentage was estimated at 25 percent, with the overall arrival percentage approximately 50 percent.

A more detailed description of the ASV and full analysis for this Master Plan is included in **Appendix E**.

Airfield Capacity Conclusion

ASV calculation considers three variables: weighted hourly capacity (C_w), Daily Demand Ratio (D); and Hourly Demand Ratio. C_w blends the different airfield use configurations, touch-and-go factors, exit taxiways, and fleet mix index using charts and formulas contained in FAA AC 150/5060-5. D is the ratio of annual demand to average daily demand during the peak month. H is the ratio of average daily demand to average peak hour demand during the peak month.

Calculation of the existing ASV for PUB is 462,108 annual operations. Comparing this to PUB's total 2019 operations of 217,424 identified in **Chapter B – Aviation Activity Forecasts**, PUB is currently operating at 47 percent of its annual capacity. With the annual operations forecast to exceed 420,500 by 2025, and exceed 440,700 by 2040, and assuming the ASV remains constant, the airfield will be operating at over 90 percent during the planning period. However, as operations increase over time, the ASV will decrease as the peak hour activity levels increase. This indicates PUB's ASV might actually be less than the 2019 calculation.

Current guidelines from the FAA National Plan of Integrated Airport Systems (NPIAS) directs airport sponsors to consider airfield capacity improvements when activity reaches 60 to 75 percent of an airport's ASV. If airfield capacity enhancements are not made, and with the expected increase in annual operations, the level of delay and impact to aircraft operators at PUB is expected to be significant. Therefore, planning for additional airfield capacity improvement alternatives should be evaluated in the Master Plan, and planning and programming improvement decisions should be anticipated during the 20-year planning period. This guidance is considered conservative and allows adequate lead time for environmental reviews, land acquisition, and other necessary actions that can take years to complete.

Airside Facility Requirements

The analysis of airside facility requirements focuses on the determination of needed facilities and spatial considerations related to the actual operation of aircraft at an airport. The FAA is responsible for the overall safety of civil aviation in the United States. Therefore, FAA design standards and policy focus first and foremost on safety, with secondary emphasis on efficiency and utility. The evaluation contained in this section includes the application of appropriate design standards to the aircraft operating surfaces (i.e., runways and taxiways), the desired Instrument Approach Procedure (IAP) improvements, the sufficiency of approach areas, and the resulting navigation and lighting needs.

Overall airside facilities design is based on the specified Runway Design Code (RDC) standards as specified in FAA AC 150/5300-13A, *Airport Design* that was introduced in the previous two chapters. Although the RDC is based on the Critical Aircraft defined in FAA AC 150/5000-17, *Critical Aircraft and Regular Use Determination,* and is used for planning and design, it does not limit the type or size of aircraft that may operate safely at an airport. Critical Aircraft can take the form of one aircraft type or a composite aircraft representing a collection of aircraft with similar characteristics.

A third component of the full expression of the RDC is related to the lowest Instrument Approach Procedure (IAP) visibility minimums. An IAP is a series of predetermined maneuvers designed to transition aircraft under instrument flight conditions from the en route portion of the flight to a point where a landing can be made visually. Runways provide maximum utility when they can be used in less-than-ideal weather conditions. This translates to visibility minimums in terms of the distance to see and identify prominent unlighted objects by day and lighted objects by night. Pilots must be able to see the runway or associated lighting at a certain distance from and height above the runway to land during periods of limited visibility. Ultimate runway development should be designed for one of the following visibility categories:

- **Visual.** Runways that support Visual Flight Rules (VFR) operations only, except circle-to-land approaches.
- **Non-Precision Approach (NPA).** Runways designed to accommodate straight-in approaches with only lateral guidance provided. NPA runways will only support IFR approach operations with visibility minimums of ¾ mile or greater.
- **Approach Procedure with Vertical Guidance (APV).** Runways designed to accommodate approaches where the navigation system provides vertical guidance down to 250 feet above the threshold and visibility minimums of ¾ mile or greater.
- **Precision Approach (PA).** Runways designed to accommodate approaches where the navigation system provides vertical guidance lower than 250 feet above the threshold and visibility minimums lower than ¾ mile.

FAA AC 5300-13A allows for the application of different RDCs to individual runways based on the Critical Aircraft operating or expected to operate on each runway. The previous chapter (and FAA Forecast approval letter in **Appendix D**) identified the existing Critical Aircraft for Runways 8R/26L and 17/35 as the Bombardier CRJ 200, which has a RDC of C-II. The future Critical Aircraft was identified as the Embraer E-175, which has a RDC of C-III. Since Runway 8R is equipped with an Instrument Landing System (ILS) precision approach with visibility minimums as low as ½ mile, the full Runway 8R/26L RDC is expressed as C-III-2400.

Runway 35 is equipped with an Area Navigation (RNAV) Global Positioning System (GPS) non-precision approach with visibility minimums as low as one mile. Therefore, the full Runway 17/35 RDC is expressed as C-III-5000. Should the evaluation of desired instrument approach procedure improvements prove feasible, and the resulting improvements result in lower visibility minimums, the future RDC for Runway 17/35 could change accordingly.

The previous chapter identified the existing Critical Aircraft for Runway 8L/26R as the Diamond DA20 Katana, which has a RDC of A-I. The future Critical Aircraft was identified as the Beechcraft T-6A Texan II, which has a RDC of B-I. However, the current Airport Layout Plan (ALP) indicates the RDC for Runway 8L/26R is B-II. Since the runway was designed and constructed to accommodate aircraft within RDC B-II, and the runway is not equipped with any approach procedures, the continued use of B-II-VIS as the appropriate existing and future RDC is preferred.

Runway Design Standards

Runway design standards are established to assure that runway facilities are designed, constructed, and operated in a safe and efficient manner and represent the minimum standard to be achieved. Runway design standards are determined by applying the dimensional criteria associated with the various RDC design standards.

Runway 8R/26L

TABLE C1 presents the existing dimensions and applicable design standards for Runway 8R/26L. As contained in the table, there are two identified non-standard conditions. First, an FAA-owned equipment building is located within the Runway Object Free Area (ROFA) southwest of the Runway 8R threshold, approximately 260 feet south of the runway centerline. Thus, the ROFA width is deficient by 140 feet, providing only a total width of 660 feet. Second, except for Taxiway A2, all holding position lines marked on each taxiway serving Runway 8R/26L are deficient by 22 feet, with 275-foot separations rather than the defined standard of 297 feet. As noted, the 297-foot standard is calculated on the RDC C-III-2400 standard of 250 feet plus an additional 1-foot for each 100 feet the airport elevation above sea level. Additionally, Taxiway A is not a true parallel taxiway although it does provide access to both runway ends and multiple exit taxiways along the length of Runway 8R/26L. The dogleg between Taxiways A9 and A10 results in varying separation distances from the runway centerline, but the standard separation distance of 400 feet is exceeded.

TABLE C1 Runway 8R/26L Design Standards

ITEM	DESIGN STANDARD (C-III-2400)	EXISTING DIMENSIONS	
		RUNWAY 8R	RUNWAY 26L
Runway Design			
Runway Width	150’	150’	
Shoulder Width	25’	N/A[1]	
Blast Pad Width	200’	N/A[1]	N/A[1]
Blast Pad Length	200’	N/A[1]	N/A[1]
Runway Safety Area (RSA)			
Length Beyond Departure End	1,000’	1,000’	1,000’
Length Prior to Threshold	600’	600’	600’
Width	500’	500’	
Runway Object Free Area (ROFA)			
Length Beyond Departure End	1,000’	1,000’	1,000’
Length Prior to Threshold	600’	600’	600’
Width	800’	**660’**	
Runway Obstacle Free Zone (ROFZ)			
Length	200’	200’	200’
Width	400’	400’	
Precision Obstacle Free Zone (POFZ)			
Length	200’	200’	200’
Width	800’	800’	800’
Runway Separation			
Runway Centerline to:			
Parallel Runway Centerline	700’	1,075’	
Holding Position	297’[2]	**275’**	
Parallel Taxiway/Taxilane Centerline	400’	775’, 500’	
Aircraft Parking Area	500’	1,080’ +	

SOURCE: Mead and Hunt analysis using FAA AC 150/5300-13A, Change 1, *Airport Design*.
NOTES: [1] Runway shoulders and blast pads are recommended, but not required for runways accommodating ADG-III aircraft.
[2] Standard based upon 250 feet plus one foot for each 100 feet above sea level (PUB elevation is 4,729 feet).
N/A = Not Applicable.
Bold = Non-standard conditions that require alteration.

FIGURE C1 provides a graphic depiction of the FAA design standards at PUB.

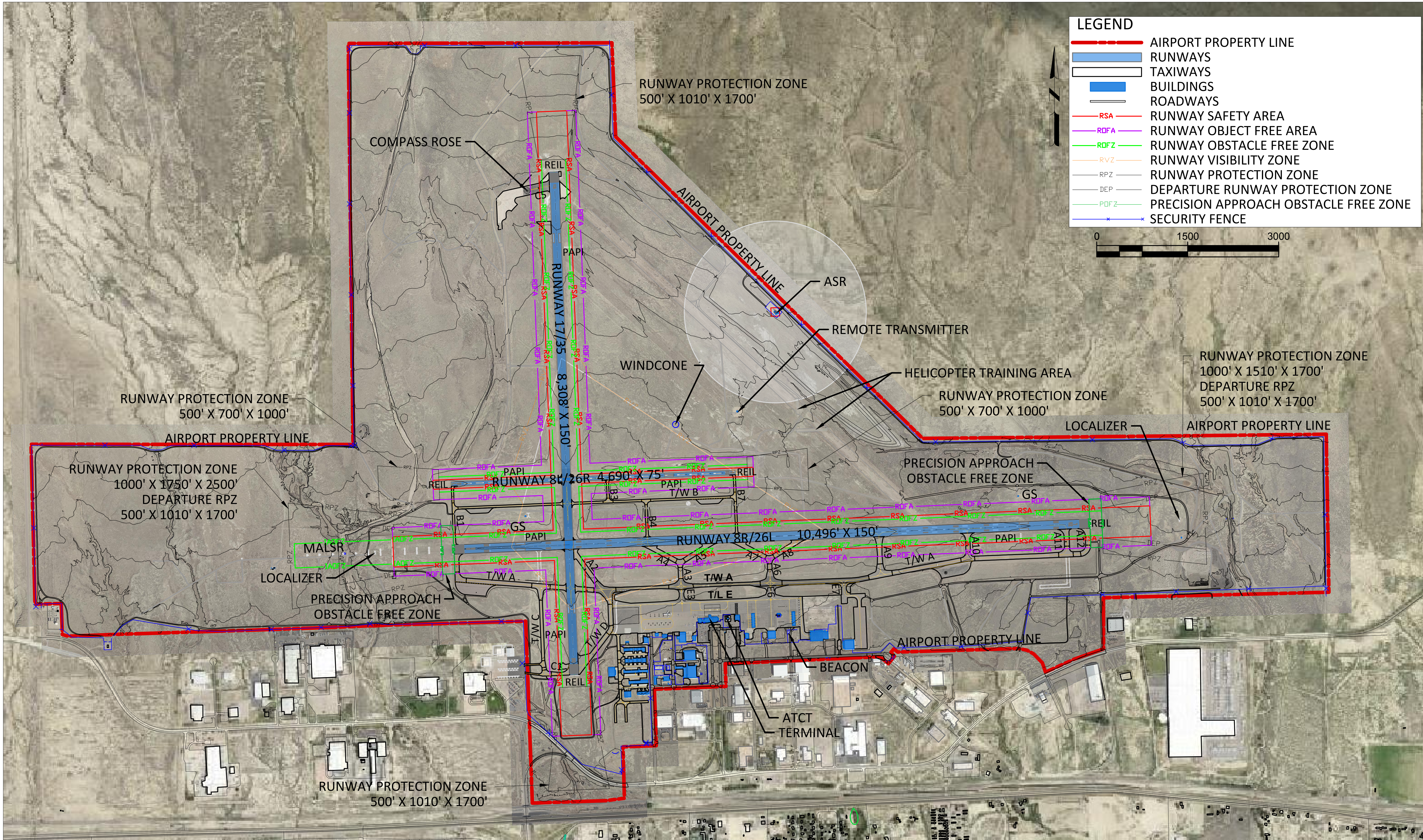


FIGURE C1 **FAA Design Standards**

Runway 17/35

TABLE C2 presents the existing dimensions and applicable design standards for Runway 17/35. Similar to Runway 8R/26L, many of the Runway 17/35 connector taxiways do not meet the 297-foot standard required for holding position lines. Excluding Taxiways D and A, the remaining taxiways' holding position lines are marked at a maximum separation distance of 250 feet, a deficiency of 47 feet. The Taxiway A holding position line located east of Runway 17/35 measures 257 feet from the runway centerline, a 40-foot deficiency. The Taxiway A holding position line located west of Runway 17/35 measures 350 feet from the runway centerline; the Taxiway D holding position line measures 311 feet. Both dimensions exceed the design standard.

TABLE C2 Runway 17/35 Design Standards

ITEM	DESIGN STANDARD (C-III-5000)	EXISTING DIMENSIONS RUNWAY 17	EXISTING DIMENSIONS RUNWAY 35
Runway Design			
Runway Width	150'	150'	
Shoulder Width	25'	N/A[1]	
Blast Pad Width	200'	N/A[1]	N/A[1]
Blast Pad Length	200'	N/A[1]	N/A[1]
Runway Safety Area (RSA)			
Length Beyond Departure End	1,000'	1,000'	1,000'
Length Prior to Threshold	600'	600'	600'
Width	500'	500'	
Runway Object Free Area (ROFA)			
Length Beyond Departure End	1,000'	1,000'	1,000'
Length Prior to Threshold	600'	600'	600'
Width	800'	800'	
Runway Obstacle Free Zone (ROFZ)			
Length	200'	200'	200'
Width	400'	400'	
Precision Obstacle Free Zone (POFZ)			
Length	200'	N/A	N/A
Width	800'	N/A	
Runway Separation			
Runway Centerline to:			
Parallel Runway Centerline	N/A	N/A	
Holding Position	297'[2]	**250', 257'**, 311', 350'	
Parallel Taxiway/Taxilane Centerline	400'	500', 650'	
Aircraft Parking Area	500'	750' +	

SOURCE: Mead and Hunt analysis using FAA AC 150/5300-13A, Change 1, *Airport Design*.
NOTES: [1] Runway shoulders and blast pads are recommended, but not required for runways accommodating ADG-III aircraft.
[2] Standard based upon 250 feet plus one foot for each 100 feet above sea level (PUB elevation is 4,700 feet).
N/A = Not Applicable.
Bold = Non-standard conditions that require alteration.

Runway 8L/26R

TABLE C3 presents the existing dimensions and applicable design standards for Runway 8L/26R. As noted, this runway meets all standard dimensional criteria for RDC B-II-VIS.

TABLE C3 Runway 8R/26L Design Standards

ITEM	DESIGN STANDARD (B-II-VIS)	EXISTING DIMENSIONS	
		RUNWAY 8L	RUNWAY 26R
Runway Design			
Runway Width	75'	75'	
Shoulder Width	10'	N/A[1]	
Blast Pad Width	95'	N/A[1]	N/A[1]
Blast Pad Length	150'	N/A[1]	N/A[1]
Runway Safety Area (RSA)			
Length Beyond Departure End	300'	300'	300'
Length Prior to Threshold	300'	300'	300'
Width	150'	150'	
Runway Object Free Area (ROFA)			
Length Beyond Departure End	300'	300'	300'
Length Prior to Threshold	300'	300'	300'
Width	500'	500'	
Runway Obstacle Free Zone (ROFZ)			
Length	200'	200'	200'
Width	250'	250'	
Runway Separation			
Runway Centerline to:			
Parallel Runway Centerline	700'	1,075'	
Holding Position	200'	200'	
Parallel Taxiway/Taxilane Centerline	240'	400'	
Aircraft Parking Area	250'	2,160' +	

SOURCE: Mead and Hunt analysis using FAA AC 150/5300-13A, Change 1, *Airport Design*.
NOTES: [1] Runway shoulders and blast pads are recommended, but not required for runways accommodating ADG-III aircraft.
N/A = Not Applicable.

Runway Design Standards Conclusion

Most of the runway design standards for each of PUB's three runways are met. However, deficiencies in the Runway 8R/26L ROFA width and in the holding positions of taxiways serving Runways 8R/26L and 17/35 were noted. It is recommended that future capital projects be considered that remark the holding position lines on taxiways serving Runways 8R/26L and 17/35. Additionally, alternatives addressing the Runway 8R/26L ROFA width deficiency will be considered in the next chapter.

Runway Line of Sight

Line of sight standards exist to allow pilots to observe runway and taxiway surfaces for assurance that they are clear of aircraft, vehicle, wildlife, and other hazardous objects. According to the longitudinal (i.e., along the length of the runway) line of sight standards contained in FAA AC 150/5300-13A, any two points located five feet above the runway centerline must be mutually visible for the entire length of the runway. However, if the runway is served by a full-length parallel taxiway, the requirement is reduced to one half the runway length.

The longitudinal profile evaluation from each end of Runway 8R/26L and 8L/26R to the individual runway midpoint at five feet above the runway surface indicates a clear line of sight is achieved. The longitudinal profile evaluation from each end of Runway 17/35 indicates a clear line of sight. However, as noted on the ALP, Runway 17/35 exceeds the 0.8 percent longitudinal gradient standard allowed for runways designed to accommodate aircraft in approach categories C, D, and E within the last 25 percent of runway length at both runway ends. Runway 17/35 has an overall longitudinal gradient of approximately 1.0 percent.

When airfield geometry includes intersecting runways, line of sight standards indicate that there must be an unobstructed view from any point five feet above the runway centerline to any other point five feet above the intersecting runway within the Runway Visibility Zone (RVZ). At PUB, the RVZ is defined as an area formed by the imaginary lines connecting the two runways' line of sight points. Because the runway ends are more than 1,500 feet from the runway intersection, the line of sight points are established one-half the distance from the intersecting runway centerline to the runway ends. An analysis was conducted using PUB's GIS survey data collected in 2016 and no obstructions to the RVZ line of sight were found.

Runway Line of Sight Conclusion

While there were no identified line of sight deficiencies, the overall Runway 17/35 gradient of 1.0 percent exceeds the allowable 0.8 percent standard within the last 25 percent of runway length for runways designed to accommodate aircraft in approach categories C, D, and E. It is recommended that consideration be given to addressing this deficiency during the next pavement maintenance or pavement reconstruction project for this runway.

Runway Length

The runway length analysis recommends the length necessary to meet existing and future aircraft demands. The analysis considers aircraft design characteristics and annual activity levels. The determination of runway recommendations for airport planning purposes uses FAA AC 150/5325-4B, *Runway Length Requirements*. This AC states the design objective for primary runways is to provide a runway length for all aircraft that will regularly use the runway without causing operational weight restrictions. AC 150/5000-17, *Critical Aircraft and Regular Use Determination* defines regular use as 500 annual operations, excluding touch-and-go operations.

There are five steps established by the FAA in AC 5325-4B for determining recommended runway lengths. The information from these steps are to be used for airport design and not for flight operations. The five steps are:

- **Identify potential design aircraft**
- **Identify the most demanding aircraft**
- **Determine appropriate methodology**
- **Select the recommended runway length**
- **Apply necessary adjustments as needed.**

Runway Length Design Aircraft

Runways 8R/26L and 17/35 serve air carrier, general aviation, and military aircraft. Runway 8L/26R is the training runway serving smaller general aviation aircraft exclusively. The existing design aircraft (and most demanding aircraft) for Runways 8R/26L and 17/35 is the Bombardier CRJ 200; the future design aircraft (and most demanding aircraft) is the Embraer E-175.

In additional to the selected design aircraft presented above, PUB is used by a variety of aircraft types whose operations are not sufficient for consideration as the design aircraft but do warrant mentioning because of their growing presence and importance to PUB, the City of Pueblo, and the region. United Launch Alliance operates an engineering and propulsion testing center in Pueblo that utilizes several GA aircraft types. The US Forest Service operates at PUB seasonally (i.e., usually two weeks every summer during the fire season). Colorado experienced the worst forest fire season in history during the summer of 2020 and the USFS operated Boeing DC-10-30 Very Large Airtanker (VLAT)at PUB to combat the fires. The Supermax federal prison designated United States Penitentiary, Administrative Maximum Facility (USP Florence ADMAX) located in Florence, CO uses a Boeing B-757 for prisoner transfers, accounting for approximately 50 annual aircraft operations. Military aircraft frequently using PUB include the Boeing C-17A Globemaster and the C-130 Lockheed Hercules aircraft for transporting cargo. Larger GA business jets utilizing PUB include the Gulfstream G500, the Cessna Citation X, the Dassault Falcon 900, and the British Aerospace Hawker 800.

Determine Appropriate Methodology

Following guidance provided in AC 150/5325-4B, individual airport planning manuals (produced and published by the aircraft manufacturers) for the CRJ 200 and E-175 will be used to determine recommended runway lengths for Runway 8R/26L and 17/35. The family grouping of small aircraft will be used to determine a recommended runway length for Runway 8L/26R.

The performance requirements of the design aircraft determine recommended runway length. Factors that affect aircraft performance capabilities include the airport elevation, air temperature, aircraft payload, fuel load, and wind conditions. These factors are explained below.

Elevation

Aircraft performance declines at higher altitudes because the air is less dense. Higher elevations negatively impact thrust produced by the aircraft on takeoff and the aerodynamic performance of the aircraft. PUB has six runway ends, ranging in elevation from 4648 feet above mean sea level (AMSL) to 4,729 feet AMSL. The elevation of 4,729 feet AMSL is used for this analysis.

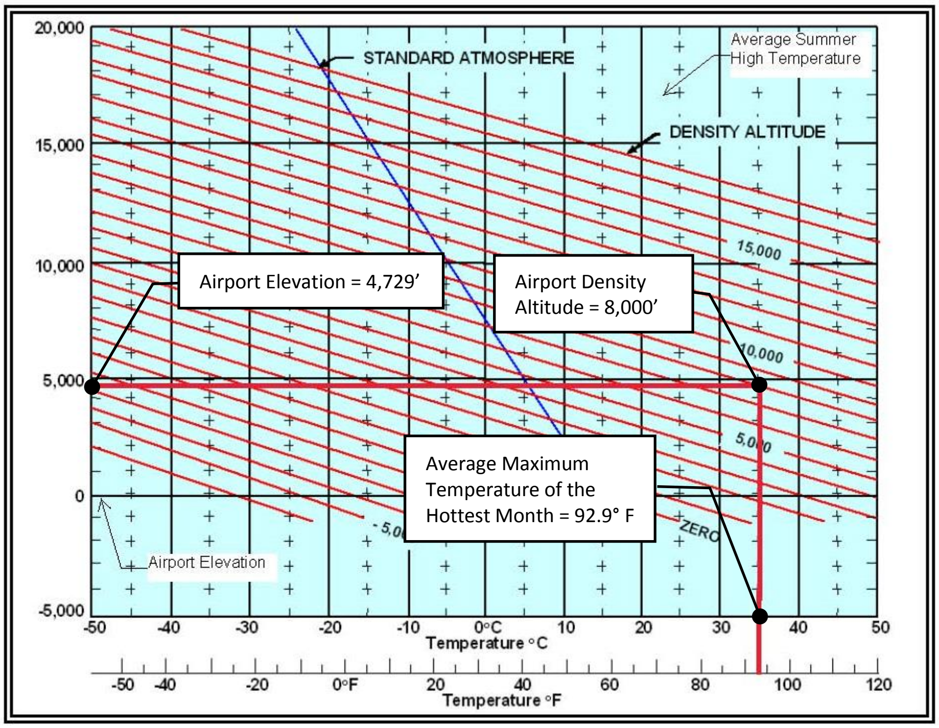
International Standard Atmosphere (ISA)

International Standard Atmosphere (ISA) is a mathematical model that describes how the earth's atmosphere, or air pressure and density, changes relative to altitude. The atmosphere is less dense at higher elevations. ISA is frequently used in aircraft performance calculations because conditions that deviate from ISA will affect aircraft performance. ISA at sea level occurs when the temperature is 59 degrees Fahrenheit. According to the 1976 Standard Atmosphere Calculator, the ISA at PUB's 4,729 feet AMSL occurs when the temperature is 41 degrees Fahrenheit.

Density Altitude (DA)

Density Altitude (DA) compares air density to ISA at a point in time and specific location and is also a critical component of aircraft performance calculations. DA is used to describe how aircraft performance differs from the performance that would be expected under ISA. DA is primarily influenced by elevation and air temperature. **FIGURE C2** illustrates how DA is impacted when factoring in the average maximum temperature of the hottest month. The PUB DA during the hottest month, when the ambient air temperature is 92.9 degrees F, is 8,000 feet AMSL. As a measure of high temperature impacts on aircraft performance, this DA is used in aircraft performance assessment.

FIGURE C2 Density Altitude for PUB



Takeoff Weight

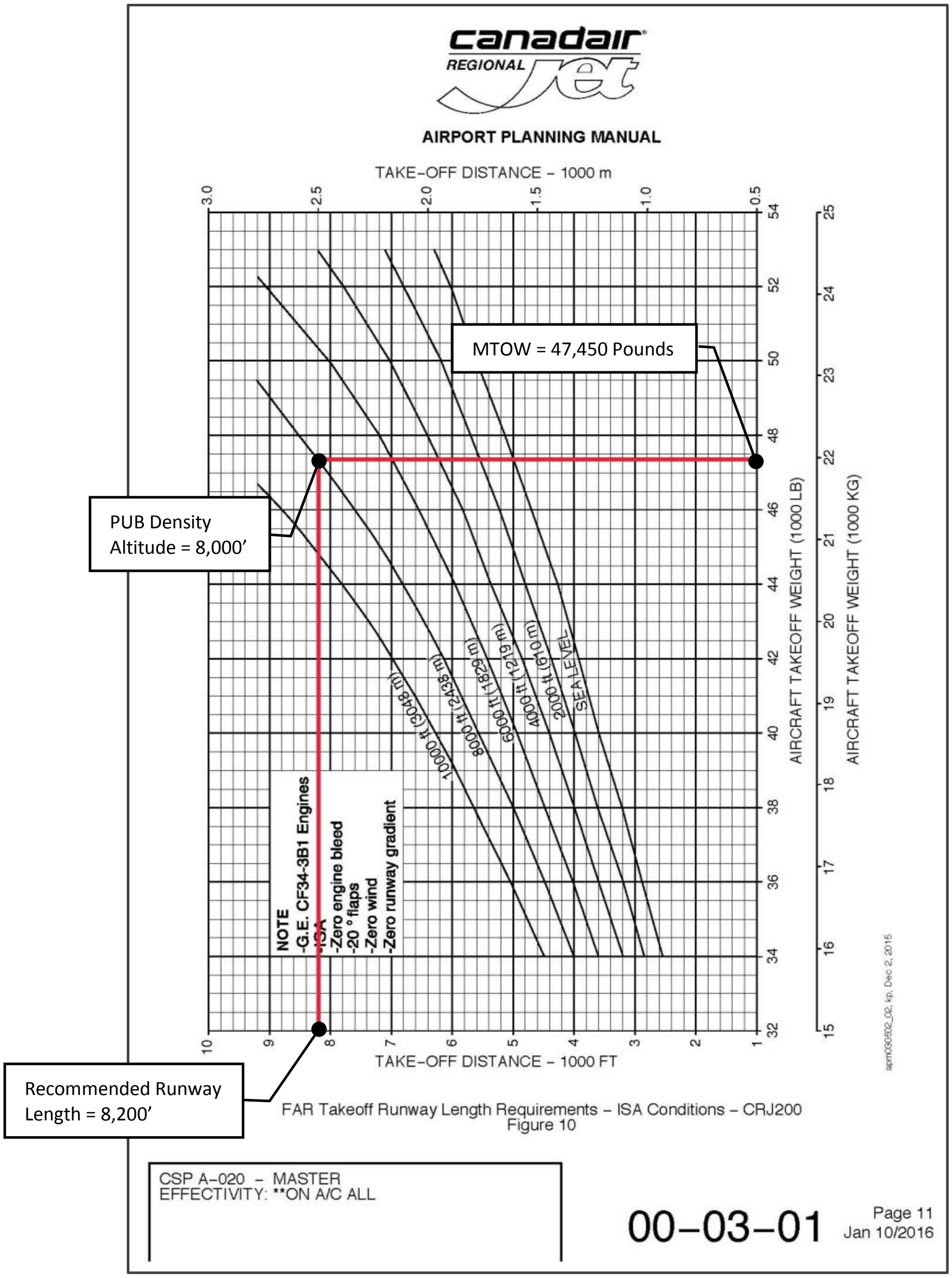
Aircraft takeoff weight is directly related to the distance of the flight and the load that the aircraft is carrying. For shorter distances, aircraft may be able to depart with a full passenger load and less than full fuel tanks. In those instances, the aircraft will typically be departing below Maximum Takeoff Weight (MTOW) and will not require as long of a runway. Aircraft require more fuel for longer trips, and the longest trips may require restrictions on the passengers and cargo that can be carried.

Recommended Runway Length

Runways 8R/26L and 17/35

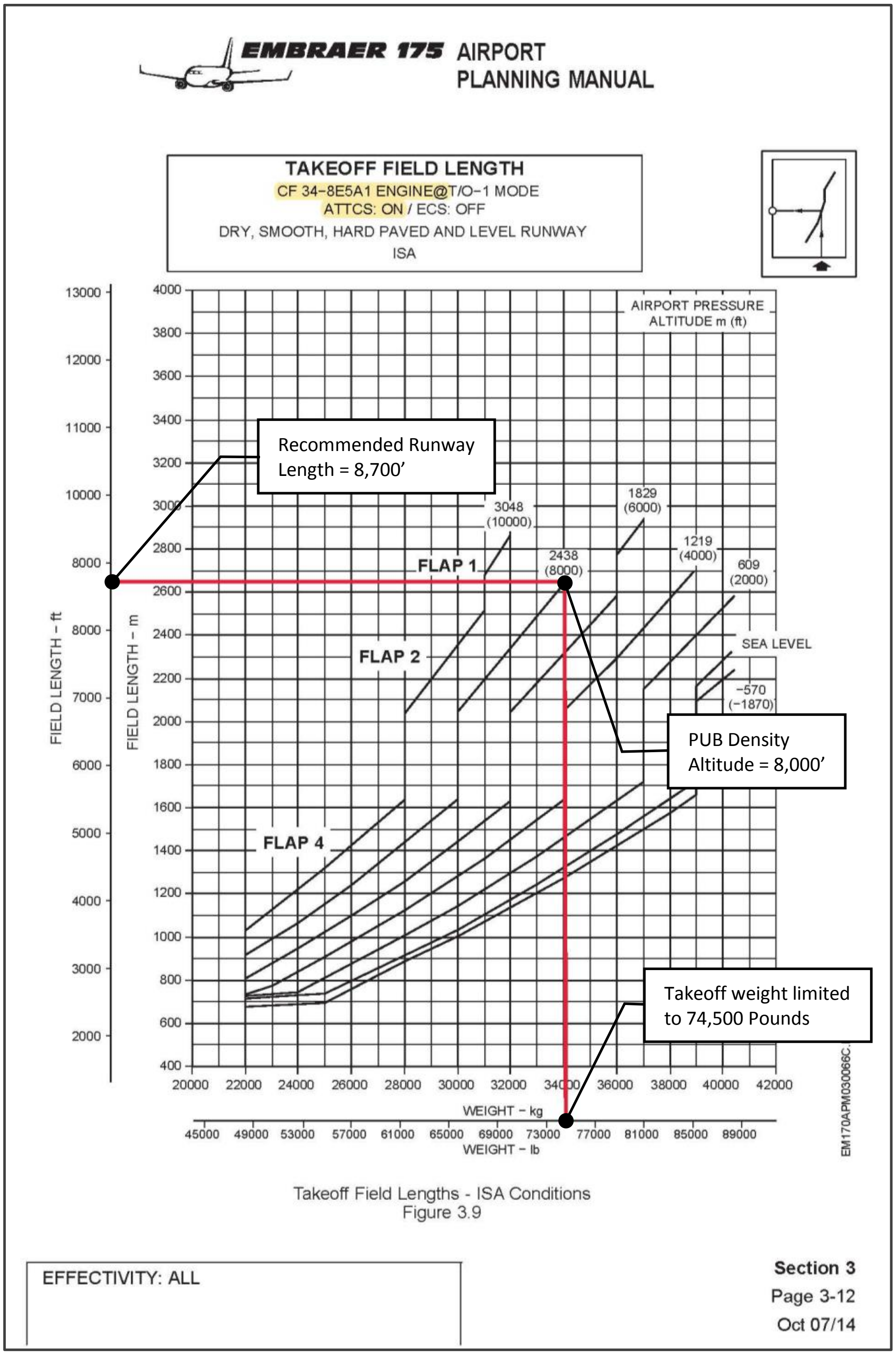
The length assessment for Runways 8R/26L and 17/35 uses the payload and range tables and the takeoff performance charts contained in individual airport planning manuals produced by the aircraft manufacturers. The existing design aircraft (CRJ 200) performance chart presented in **FIGURE C7** indicates that the CRJ 200 requires 8,200 feet of runway length for takeoff at PUB operating at its MTOW of 47,450 pounds. It is understood that the CRJ 200s departing from PUB currently only travel to Denver International Airport (DEN), do not need full fuel capacity, and are not routinely carrying full passenger loads. In other words, the CRJ 200s are not required to operate at MTOW from PUB. Therefore, the runway length requirement would be less than 8,200 feet.

FIGURE C3 **CRJ 200 Takeoff Length Requirements**



The future design aircraft (E-175) performance chart shown in **FIGURE C4** indicates that the E-175 requires 8,700 feet of runway length to takeoff from PUB at a takeoff weight of 74,500 pounds and the Automatic Takeoff-Thrust Control System (ATTCS) turned on. At a DA of 8,000 feet AMSL, the E-175 is limited to a takeoff weight of 74,500 pounds (MTOW is 82,673 pounds). However, as with the CRJ 200, it is not expected that E-175s departing from PUB will be required to operate at MTOW due to the stage length to Denver.

FIGURE C4 **E-175 Takeoff Length Requirements**



Takeoff Field Lengths - ISA Conditions
Figure 3.9

EFFECTIVITY: ALL

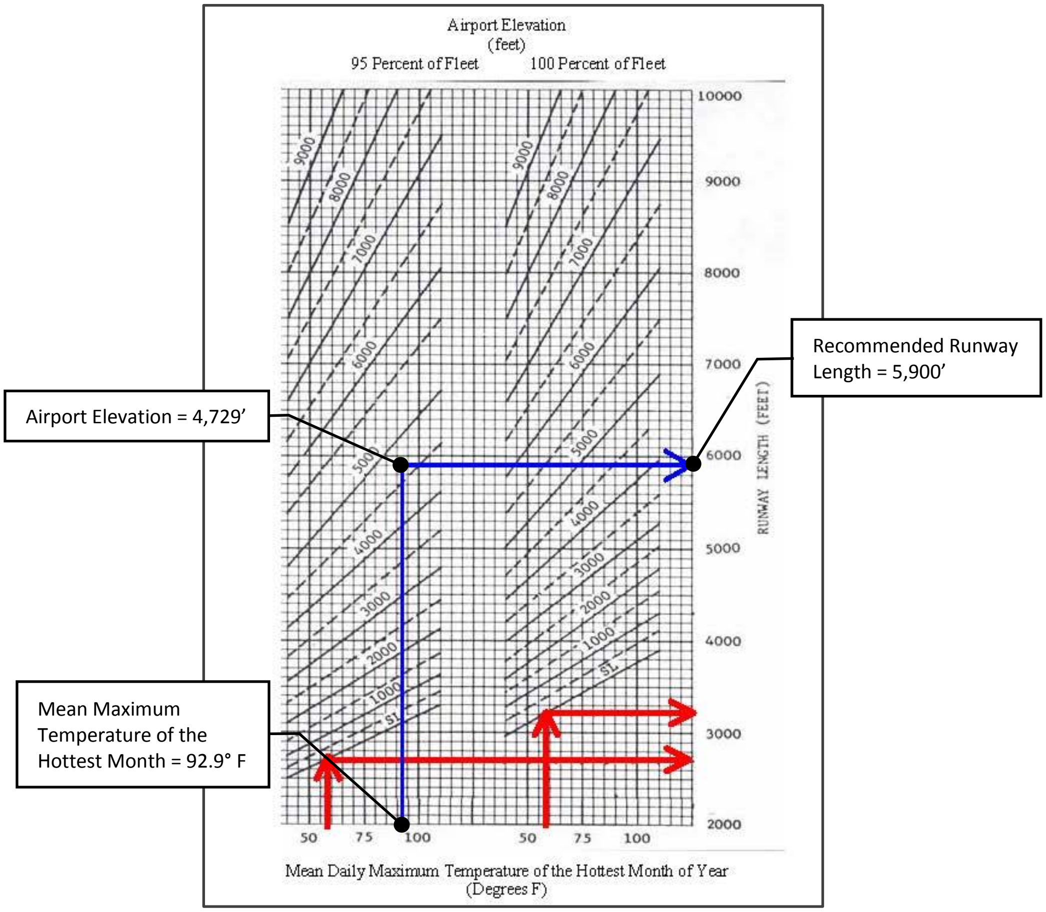
Section 3
Page 3-12
Oct 07/14

Runway 8L/26R

Using the guidance for small aircraft (i.e., aircraft with MTOW equal to or less than 12,500 pounds) contained in AC 150/5325-4B, runway length assessment methodology is based on family groupings of aircraft based on approach speed and number of passenger seats. Most aircraft using Runway 8L/26R have approach speeds greater than 50 knots and less than 10 passenger seats excluding crew (i.e., pilot and copilot). This family grouping of small aircraft with less than 10 passenger seats is further dividing according to percentage of the fleet: 1) 95 percent and 2) 100 percent. The differences between the two percentage categories are based on the airport's location and amount of existing or planned aviation activities. The 95 percent of the fleet category is intended to serve medium size population communities with a diversity of usage and a greater potential for increased aviation activities. It also includes those airports that are primarily intended to service low-activity locations, small population communities, and remote recreational areas. The 100 percent of the fleet category is intended to serve communities located on the fringe of a metropolitan area or a relatively large population remote from a metropolitan area. Pueblo and aircraft activity at PUB are best represented by the 95 percent category.

The runway length chart presented in **FIGURE C5** indicates that a runway length of 5,900 feet is recommended for Runway 8L/26R, as shown by the blue lines in the graphic.

FIGURE C5 Small Aircraft with Less Than 10 Passenger Seats Takeoff Length Requirements



Apply Necessary Adjustments

AC 150/5325-4B allows for the adjustment of runway lengths for non-zero effective runway gradients (i.e., runways having a difference in centerline elevation that is not equal to zero). The adjustment increases the takeoff length by 10 feet for every 1-foot of maximum elevation difference of the runway centerline. For Runway 8R/26L an adjustment of 240 feet is added since the maximum centerline elevation difference is 24 feet. For Runway 17/35 an adjustment of 810 feet is provided since the maximum centerline elevation difference is 81 feet. Runway 8L/26 is afforded a 40-foot adjustment since the maximum centerline elevation difference is 4 feet. This translates to the final recommended runway lengths provided in **TABLE C4**.

TABLE C4 **Runway Length Summary**

RUNWAY	RECOMMENDED RUNWAY LENGTH	MAXIMUM CENTERLINE ELEVATION DIFFERENCE	ADJUSTMENT	FINAL RECOMMENDED RUNWAY LENGTH
Runway 8R/26L				**10,498' (Existing)**
Existing Design Aircraft (CRJ 200)	8,200'	24'	240'	**8,440'**
Future Design Aircraft (E-175)	8,700'	24'	240'	**8,940'**
Runway 17/35				**8,310' (Existing)**
Existing Design Aircraft (CRJ 200)	8,200'	81'	810'	**9,010'**
Future Design Aircraft (E-175)	8,700'	81'	810'	**9,510'**
Runway 8L/26R				**4,690' (Existing)**
Existing and Future Design Aircraft (Diamond DA20)	5,900'	4'	40'	**5,940'**

SOURCE: Mead and Hunt analysis using airport planning manuals and FAA AC 150/5325-4B methodology.

Runway Length Conclusion

The runway length analysis indicates that Runway 8R/26L, with a total length of 10,498 feet is sufficient to accommodate both the existing and future design aircraft and the majority of airport users during most weather conditions. No additional runway length is recommended for this runway.

Runway 17/35, with a total length of 8,310 feet is slightly deficient according to the final recommended runway length provided for both the existing and future design aircraft. However, since this is the crosswind runway, commercial service aircraft normally use it when winds are out of the north during winter months and temperatures are not near the mean maximum temperature used in the runway length calculations. Therefore, it too accommodates the majority of PUB airport users during most weather conditions and no additional runway length is recommended for this runway.

Runway 8L/26R, with a total length of 4,690 feet is also slightly deficient of the final recommended runway length of 5,940 feet. However, since this is the training runway that is most often used by CAE-Doss flight training, the existing length is considered sufficient. No additional runway length is recommended for this runway.

Pavement Condition

The CDOT Division of Aeronautics last conducted a major Pavement Condition Index (PCI) inspection at PUB in July of 2020. According to this 2020 report, the values of airport pavement condition range from 0 to 100. A depiction of the PCIs for the runways and other airfield pavements is included in **Chapter A – Inventory of Existing Conditions.**

The PCI for Runways 8R/26L, 8L/26R, and 17/35 are reported as 64, 86, and 93 respectively. The runway 8L/26R complex was rehabilitated in the 2020 crack seal and sealcoat project, which would indicate a better condition than the reported PCI rating of 86. In general, the existing runway pavement conditions of 8L/26R and 17/35 are adequate and do not suggest a significant state of deterioration. RW 8R-26L is in fair condition with a PCI of 64 and is scheduled to be rehabilitated (Mill and Overlay) in 2023.

Due to deterioration occurring over time, several other areas in the airfield pavement system will likely require rehabilitation to regain and maintain pavement condition in the near future. Pavement with PCI ratings of 40-60 are recommended to be rehabilitated, and pavement with PCI ratings under 40 are advised to incorporate a full pavement reconstruction. Strategic pavement improvements should be considered to the following sections with the lowest PCI ratings:

- **Apron.** With an overall PCI rating of 49, much of the apron pavement was built upon the original World War II era apron, with some areas receiving more recent rehabilitations or reconstructions. Portions of the apron on its easternmost side have been identified with a PCI rating of 0, indicating a need for full reconstruction. This area is largely used by CAE-Doss aircraft for parking and runup to Taxiway A6 and serves as an access point for several hangar spaces. A future Taxiway E is also proposed to branch from this portion of apron and connect with future hangar spaces. Due to low use, some areas of the apron could be marked as non-movement areas and thus do not require full reconstruction. The westernmost sections of the apron pavement around the FBO and terminal remain in reasonable condition.
- **Taxiways A10 and A11.** With a PCI rating of 40 and 64 respectively, Taxiways A10 and A11 are the taxiway connectors between Runway 8R/26L and Taxiway A at the east end of the runway. These connectors may be in better condition currently, as sealcoat applications were applied after the 2020 report. As presented in a later section, Taxiway A11 will be reevaluated according to its importance to PUB due to its low traffic usage and may be removed as a result.
- **Taxiway C5.** With a PCI rating of 41, Taxiway C5 is the back-taxi area for planes landing on Runway 35. The proposed construction of a future bypass taxiway serving Runway 17/35 would require the demolition of Taxiway C5 and subsequent reconstruction as part of two bypass connectors.

Pavement Condition Conclusion

It is recommended that a sizeable portion of the easternmost apron be reconstructed to rectify the 0 PCI rating and improve overall airfield quality. Areas not required for aircraft parking or movement areas will be identified and marked accordingly. The pavement conditions of Taxiways A10, A11, and C5 will be continuously monitored and evaluated, with the recommended scheduling of improvements made according to airport needs and overall taxiway recommendations.

Pavement Strength

FAA pavement design considers the pavement strength needed to accommodate the aircraft fleet expected to frequently use the pavement. No single critical aircraft is designated for pavement strength. Pavement design strength does not necessarily prohibit airport use by heavier aircraft. However, if routine use by an aircraft heavier than the pavement strength is anticipated, then it would be recommended that pavement strength be increased.

Pavement strength ratings are presented for multiple main landing gear configurations by its pavement classification number (PCN). Aircraft with more tires distribute their weight differently than aircraft with fewer tires, and a section of pavement will have a higher strength rating for aircraft with multiple tires than for aircraft with single tires. A full PCN analysis of the airfield pavements at PUB was conducted to identify any areas with understrength pavement, the results of which can be found in **Appendix A**.

Pavement Strength Conclusion

The PCN analysis for PUB did not note any airport pavement of insufficient strength. The analysis concluded that the pavement strength of the runways and their connectors remain suitably fitted to the PUB fleet mix. The published pavement strength should also be updated where necessary in the FAA 5010 and the ALP to the standards currently outlined in PCN analysis.

Runway Protection Zones

Runway Protection Zones (RPZs) are trapezoidal areas beginning 200 feet beyond the threshold of a runway; their dimensions are determined by function (i.e., approach or departure RPZ), Critical Aircraft size, the appropriate AAC, and the lowest instrument approach procedure visibility minimums to each runway end. Their purpose is to enhance the protection of people and property on the ground. This is achieved through airport control of the RPZ areas, preferably exercised through fee simple ownership by the airport sponsor. It is desirable to clear all above ground objects from within RPZs. Where this is impractical, airport sponsors should work with property owners to maintain the RPZ clear of all facilities supporting incompatible activities.

As presented in the Inventory of Existing Conditions chapter, FAA Memorandum entitled *Interim Guidance on Land Uses Within a Runway Protection Zone* outlines interim policy on identifying land uses that may be considered incompatible within RPZs and the measures for protecting, removing, or mitigating incompatible land uses.

The guidance requires Airport Regional Offices (RO) and Airport District Offices (ADO) staff to consult with the National Airport Planning and Environmental Division (APP-400) when defined land uses would enter the limits of an RPZ as a result of the following actions:

- **Airfield improvements (e.g., runway extensions or shifts)**
- **Change in design aircraft increasing the RPZ dimensions**
- **New or revised IAP increasing the RPZ size**
- **Local development proposals in the RPZ.**

Land uses defined in the memorandum that require consultation include:

- **Buildings and structures (e.g., residences, schools, churches, hospitals or other medical care facilities, commercial/industrial)**
- **Recreational land uses (e.g., golf courses, sports fields, amusement parks, other places of public assembly)**
- **Transportation facilities (e.g., rail facilities, public roads and highways, vehicular parking facilities)**
- **Fuel storage facilities (above and below ground)**
- **Hazardous material storage facilities (above and below ground)**
- **Wastewater treatment facilities**
- **Above ground utility infrastructure (i.e., electrical substations), including any type of solar panel installation.**

In consideration of the existing IAP visibility minimums and aircraft type the runways are designed to accommodate, **TABLE C5** provides a comparison of the existing RPZ dimensions at PUB and the FAA's specified RPZ dimensional requirements. The existing approach and departure RPZs associated with each runway end are located on existing airport property and underlying land uses are compatible with FAA guidance. **FIGURE C6** through **FIGURE C8** provides a graphic depiction of the existing and potential future approach and departure RPZs for each runway at PUB.

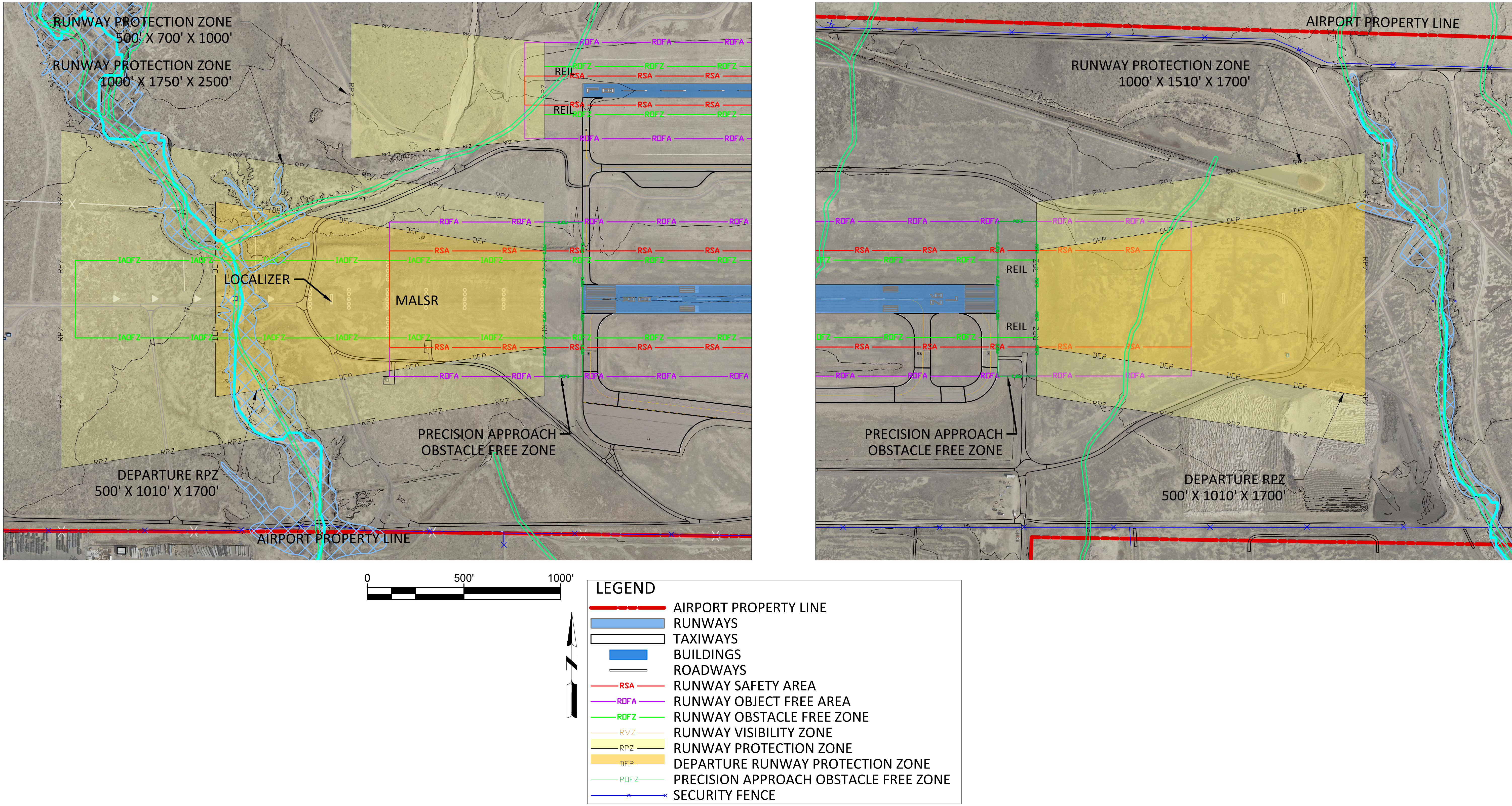
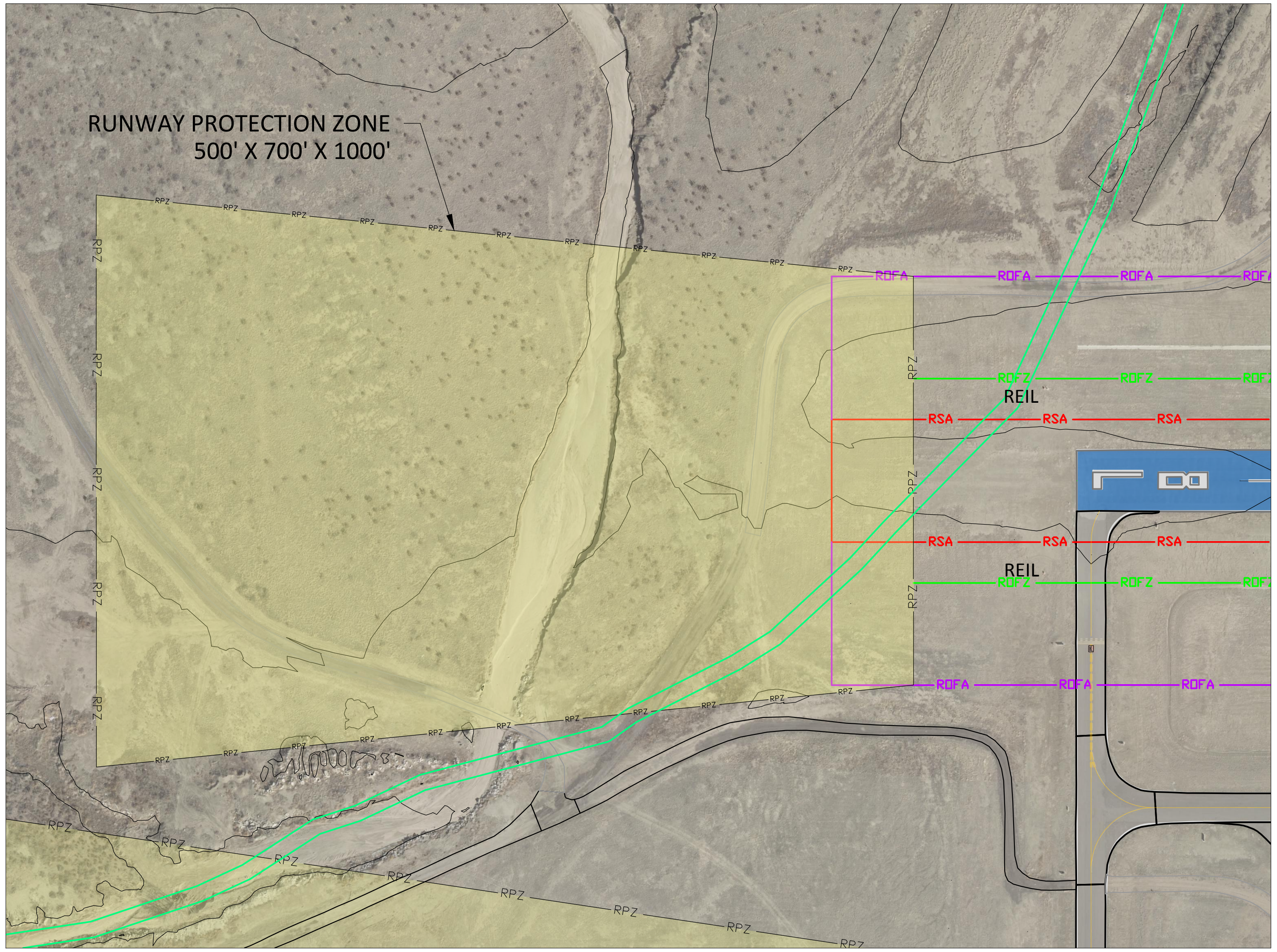
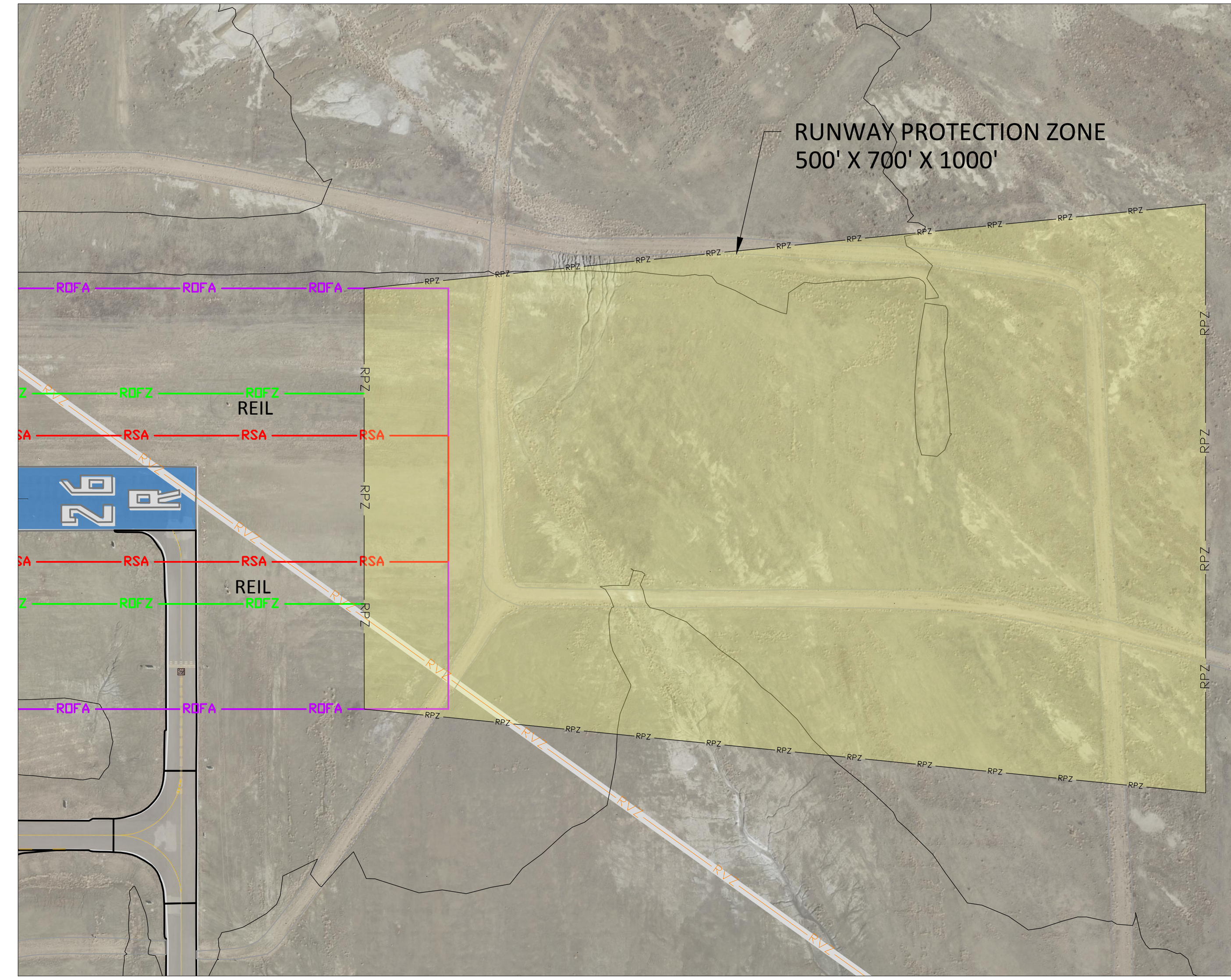


FIGURE C6 Runway 8R/26L
Runway Protection Zones





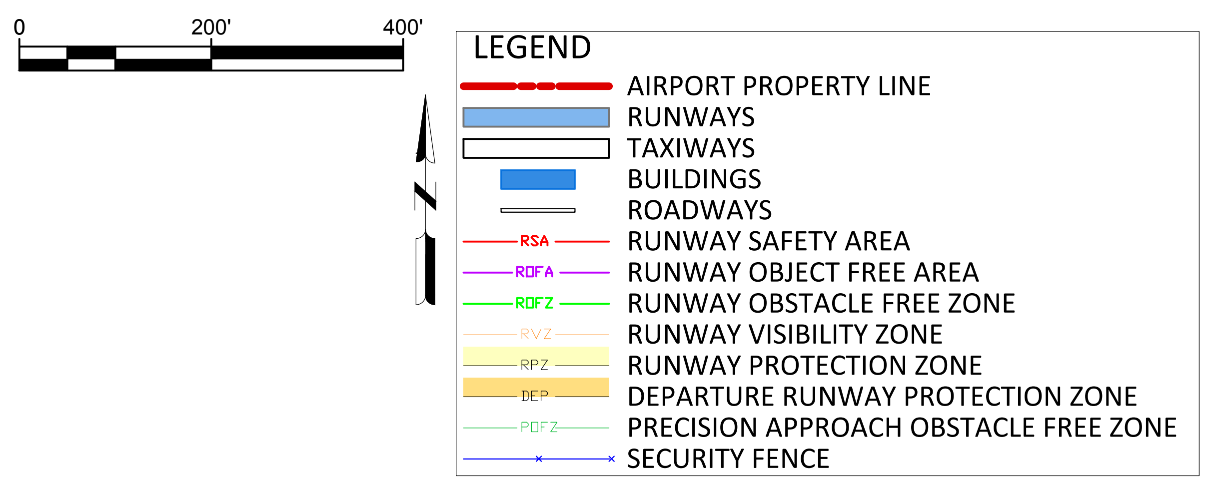
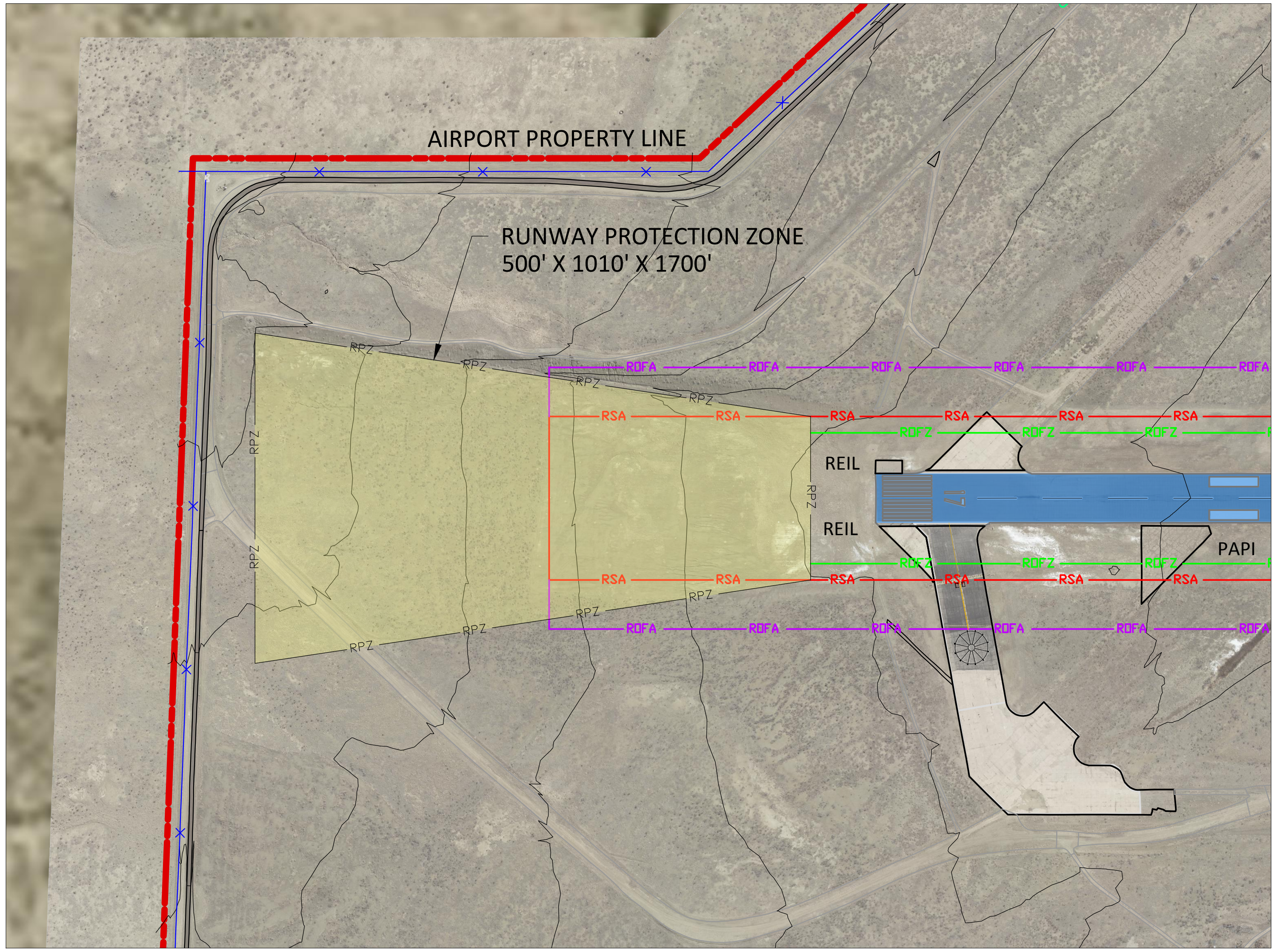
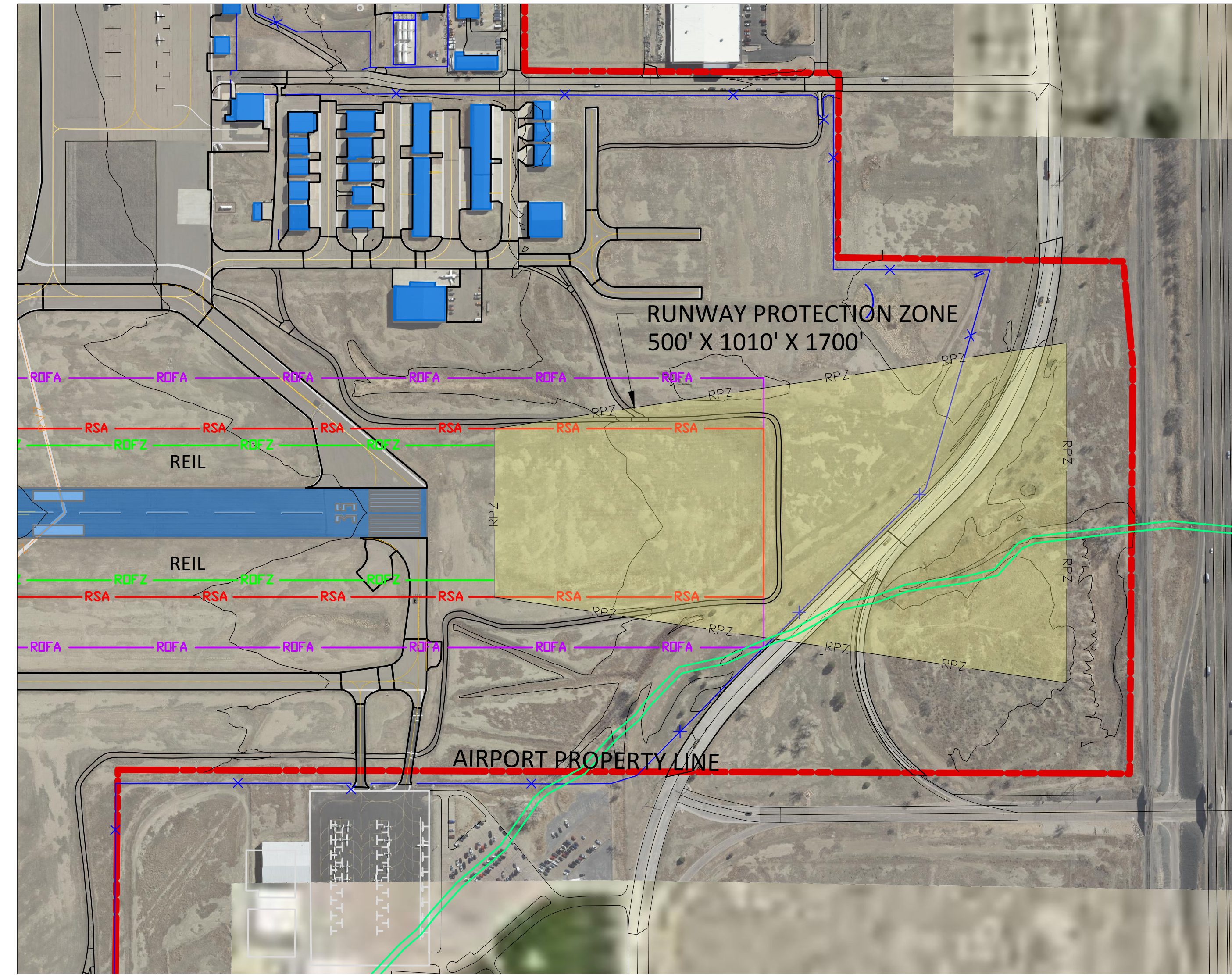


FIGURE C7 Runway 8L/26R
Runway Protection Zones





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LEGEND

- AIRPORT PROPERTY LINE
- RUNWAYS
- TAXIWAYS
- BUILDINGS
- ROADWAYS
- RSA — RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA
- ROFZ — RUNWAY OBSTACLE FREE ZONE
- RVZ — RUNWAY VISIBILITY ZONE
- RPZ — RUNWAY PROTECTION ZONE
- DEP — DEPARTURE RUNWAY PROTECTION ZONE
- POFZ — PRECISION APPROACH OBSTACLE FREE ZONE
- SECURITY FENCE

TABLE C5 Runway Protection Zone Dimension Criteria

ITEM	INNER WIDTH	LENGTH	OUTER WIDTH	AIRPORT CONTROLS ENTIRE RPZ
Existing RPZ Dimensional Requirements				
Runway 8R/26L				
Runway 8R (Approach)	*1,000’*	*2,500’*	*1,750’*	*Yes*
Runway 8R (Departure)	*500’*	*1,700’*	*1,010’*	*Yes*
Runway 26L (Approach)	*1,000’*	*1,700’*	*1,510’*	*Yes*
Runway 26L (Departure)	*500’*	*1,700’*	*1,010’*	*Yes*
Runway 17/35				
Runway 17 (Approach)	*500’*	*1,700’*	*1,010’*	*Yes*
Runway 17 (Departure)	*500’*	*1,700’*	*1,010’*	*Yes*
Runway 35 (Approach)	*500’*	*1,700’*	*1,010’*	*Yes*
Runway 35 (Departure)	*500’*	*1,700’*	*1,010’*	*Yes*
Runway 8L/26R				
Runway 8L (Approach)	*500’*	*1,000’*	*700’*	*Yes*
Runway 8L (Departure)	*500’*	*1,000’*	*700’*	*Yes*
Runway 26R (Approach)	*500’*	*1,000’*	*700’*	*Yes*
Runway 26R (Departure)	*500’*	*1,000’*	*700’*	*Yes*
Standard Approach RPZ Dimensions for Various Visibility Minimums				
Visual and Not Lower Than 1-Mile, Small Aircraft Only	250’	1,000’	450’	
Visual and Not Lower Than 1-Mile, AACs A and B	500’	1,000’	700’	
Visual and Not Lower Than 1-Mile, AACs C and D	500’	1,700’	1,010’	
Not Lower Than ¾-Mile, All Aircraft	1,000’	1,700’	1,510’	
Lower Than ¾-Mile, All Aircraft	1,000’	2,500’	1,750’	
Standard Departure RPZ Dimensions				
Small Aircraft Only, AACs A and B	250’	1,000’	450’	
Large Aircraft, AACs A and B	500’	1,000’	700’	
Large Aircraft, AACs C, D, and E	500’	1,700’	1,010’	

SOURCE: FAA AC 150/5300-13/A, Change 1, *Airport Design*.

Runway Protection Zones Conclusion

PUB currently owns the entirety of property within every existing RPZ. However, with the possible consideration of improved IAPs that reduce visibility minimums to Runway 35, the alternatives evaluation should include an analysis for the portion of the RPZ that extends beyond airport property and encompasses U.S. Highway 96 and any other incompatible land uses.

Runway End Siting Surfaces

Criteria contained in FAA AC 150/5300-13A, provides guidance for the proper siting of runway ends and thresholds. The criteria are in the form of imaginary evaluation surfaces that are typically trapezoidal shaped and extend away from the runway ends along the centerline at specific slopes, expressed in horizontal feet by vertical feet (e.g., a 20:1 slope rises one foot vertically for every 20 feet horizontally). The specific size, slope, and starting point of the trapezoid depends upon the visibility minimums and the type of IAP associated with the runway end.

Threshold Siting Surfaces

Thresholds are located to provide property clearance over obstacles for landing aircraft on approach to a runway end. When an object obstructs this imaginary surface required for aircraft to land at the beginning of the runway, and it is beyond the airport sponsor's ability to remove, relocate, or lower, the landing threshold may require a location other than the end of the pavement (i.e., a displaced threshold). The existing criteria and analysis prepared for PUB are presented in **TABLE C6**. According to analysis of the AGIS data, there are no obstructions to the threshold siting surfaces.

TABLE C6 Threshold Siting Surface Dimensions

RUNWAY END	DISTANCE FOM RUNWAY END	INNER WIDTH	LENGTH	OUTER WIDTH	SLOPE	EXISTING OBSTRUCTION
8R	200'	800'	10,000'	3,400'	34:1	None
26L	200'	400'	10,000'	3,400'	20:1	None
17	200'	400'	10,000'	3,400'	20:1	None
35	200'	400'	10,000'	3,400'	20:1	None
8L	0'	400'	10,000'	1,000'	20:1	None
26R	0'	400'	10,000'	1,000'	20:1	None

SOURCE: Mead and Hunt analysis using FAA Engineering Brief No. 99A, Changes to Tables 3-2 and 3-4 of Advisory Circular 150/5300-13A, *Airport Design*.

IAPs With Vertical Guidance Surfaces

Runway ends equipped with IAPs providing vertical guidance require an additional level of approach surface analysis. When objects penetrate this imaginary surface that cannot be mitigated, then an approach with vertical guidance is not authorized. The size, shape, slope, and criteria for these surfaces, and the analysis conducted for Runways 8R and 26L are presented in **TABLE C7**. Runways 8R and 26L are the only runway ends currently equipped with IAPs providing vertical guidance. There are no objects that penetrate these surfaces; therefore, no threshold relocations or displacements are recommended.

TABLE C7 IAPs With Vertical Guidance Threshold Siting Surface Dimensions

RUNWAY END	DISTANCE FOM RUNWAY END	INNER WIDTH	LENGTH	OUTER WIDTH	SLOPE	EXISTING OBSTRUCTION
8R	0’	350’	10,000’	1,520’	30:1	None
26L	0’	350’	10,000’	1,520’	30:1	None

SOURCE: Mead and Hunt analysis using FAA Engineering Brief No. 99A, Changes to Tables 3-2 and 3-4 of Advisory Circular 150/5300-13A, *Airport Design*.

Departure Runway End Surfaces

Departure ends of runways normally mark the end of the full-strength runway pavement available and suitable for departures. Departure surfaces, when clear of obstacles, allow pilots to follow standard departure procedures. If obstacles penetrate the departure surface, then the obstacles must be evaluated through the Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) process. After the OE/AAA process, departure procedure amendments such as non-standard climb rates, non-standard (higher) departure minimums, or a reduction in the length of takeoff distance available may be required. The size, shape, slope, and criteria of the departure surfaces, as well as the analysis conducted for Runways 8R, 26L, 17, and 35 are presented in **TABLE C8**. Obstructions were observed north of Runway 17 (i.e., the Runway 35 departure surface). Terrain penetrates the departure surface between 1,000 and 2,000 feet from the departure runway end. Two electrical transmission towers penetrate the surface roughly 6,800 feet from the departure runway end.

TABLE C8 Departure Runway Surface Dimensions

RUNWAY END	DISTANCE FOM DEPARTURE RUNWAY END	INNER WIDTH SECTION ONE	INNER WIDTH SECTION TWO	LENGTH	OUTER WIDTH	SLOPE	EXISTING OBSTRUCTION
8R	0’	150’	1,000’	12,152’	7,512’	40:1	None
26L	0’	150’	1,000’	12,152’	7,512’	40:1	None
17	0’	150’	1,000’	12,152’	7,512’	40:1	None
35	0’	150’	1,000’	12,152’	7,512’	40:1	Terrain, Electrical Transmission Towers

SOURCE: Mead and Hunt analysis using FAA Engineering Brief No. 99A, Changes to Tables 3-2 and 3-4 of Advisory Circular 150/5300-13A, *Airport Design*.

Runway End Siting Conclusion

There were no obstructions identified in the threshold siting or IAP evaluation surfaces. Three obstructions, existing terrain and a pair of electrical transmission towers, penetrate the Runway 35 departure surface. Alternatives that improve visibility minimums or change runway ends in any fashion will incorporate runway end siting analysis in the alternatives evaluation. Alternatives that evaluate the departure surface obstructions will be considered in the following chapter.

Instrument Approach Procedures, Navigational Aids, and Visual Landing Aids

Instrument Approach Procedures

Increased airport access can be improved by reducing the ceiling and visibility minimums associated with IAPs. PUB currently has seven published IAPs as presented in **TABLE C9**.

TABLE C9 Existing Instrument Approach Procedures

RUNWAY END	PROCEDURE	PROCEDURE TYPE	AIRCRAFT CATEGORIES	MINIMUM DESCENT ALTITUDE (FEET AGL)	VISIBILITY MINIMUMS (STATUTE MILE)
8R	ILS or LOC	PA	A, B, C, D, E	4,871’ (200’)	1/2
8R	RNAV (GPS)	PA	A, B, C, D	4,871’ (200’)	1/2
26L	ILS or LOC	APV	A, B, C, D	4,859’ (200’)	3/4
26L	RNAV (GPS)	APV	A, B, C, D	4,850’ (200’)	3/4
26L	VOR	NPA	A, B, C, D	5,120’ (461’)	1
17	RNAV (GPS)	NPA	A, B, C, D	5,640’ (911’)	1-1/4
35	RNAV (GPS)	NPA	A, B, C, D	4,980’ (303’)	1

SOURCE: Mead and Hunt analysis using FAA AC 150/5300-13/A, Change 1, *Airport Design*.
NOTES: PA = Precision Approach. APV = Approach Procedure with Vertical Guidance, NPA = Non-Precision Approach.

Based upon an analysis of PUB’s existing climatological conditions presented in **Chapter A – Inventory of Existing Conditions**, the existing IAPs provide adequate IFR accessibility. As presented in **TABLE C10**, the Instrument Flight Rules (IFR) wind analysis indicates that Runway 8, followed by Runway 35 provide the best wind coverage during IFR weather conditions. The existing ALP indicates IAPs with visibility minimums as low as ½-mile are planned for implementation on Runways 26L and 35. Implementation of an IAP with visibilities not lower than ¾-mile is planned for Runway 17. Runway 8L/26R is intended to remain a visual runway with no planned IAPs. PUB would benefit from an IAP providing reduced visibility minimums to Runway 17/35.

TABLE C10 IFR Wind Coverage by Runway End

RUNWAY	10.5 KNOTS	13 KNOTS	16 KNOTS
8/26	**89.55%**	**91.93%**	**93.90%**
8	85.40%	87.47%	89.15%
26	57.98%	58.92%	59.28%
17/35	**90.49%**	**94.38%**	**98.10%**
17	75.99%	78.76%	81.69%
35	84.44%	87.88%	91.11%
Combined	**98.34%**	**99.33%**	**99.72%**

SOURCE: NOAA Integrated Surface Database, ASOS Station 724640 - Pueblo Memorial Airport, 2009-2019 data.
NOTE: Runways 8R/L and 26R/L are aligned to the same true bearing, thus wind coverage for both is the same.

Navigational Aids

FAA AC 150/5070-6B defines Navigational Aids (NAVAIDS) as aids to navigation that provide pilots with information that assist in locating an airport and to provide horizontal and/or positional guidance during landing. The type, mission, and volume of aeronautical activity, in association with airspace, meteorological conditions, and capacity data determine the need and eligibility for NAVAIDS. NAVAID requirements are based on guidelines contained in FAA Handbook 7031.2C, *Airway Planning Standard Number One* and FAA AC 150/5300-13A, Change 1.

As presented above, Runways 8R and 26L are equipped with Instrument Landing System (ILS) IAPs. Two antennae comprise the ILS and work in tandem to provide both vertical and horizontal guidance. The localizer antenna provides the horizontal guidance, and the glide slope antenna provides the vertical guidance. The localizer antenna east of Runway 26L is located approximately 1,470 feet from the threshold and the localizer antenna west of Runway 8R is located approximately 1,300 feet from the threshold. The Runway 8R glide slope antenna is located approximately 1,175 feet east of the threshold and 500 feet north of the centerline. The Runway 26L glide slope antenna is located approximately 1,135 feet west of the threshold and 500 feet north of the centerline.

A Very High Frequency Omni-Directional Range/Tactical Air Navigation (VORTAC) station is located approximately 3.2 miles east of PUB that is utilized for en route navigation for airways as well as the non-precision IAP to Runway 26L. An Airport Surveillance Radar (ASR-11) is located approximately 2,700 feet north-northeast of Runway 26R.

For many years, the FAA has been transitioning away from IAPs that use ground-based NAVAIDS to those that utilize the satellite-based Global Positioning System (GPS). As presented above, PUB has GPS IPAs that have no associated ground-based facilities or equipment. It is anticipated that any future IAP improvements will be implemented using GPS technology and no ground-based NAVAIDS will be utilized at PUB.

Visual Landing Aids

Currently, PUB is equipped with an excellent variety of visual landing aids, including:

Runway 8R/26L

- **High Intensity Runway Lights (HIRLS)**
- **4-Light Precision Approach Path Indicators (PAPIs) – both runway ends**
- **Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) – Runway 8R**
- **Runway End Identifier Lights (REIL) – Runway 26L**
- **Precision markings – both runway ends.**

Runway 17/35

- **Medium Intensity Runway Lights (MIRLS)**
- **4-Light PAPIs – both runway ends**
- **REIL – both runway ends**
- **Non-precision markings – both runway ends.**

Runway 8L/26R

- **MIRLS**
- **4-Light PAPIs – both runway ends**
- **REIL – each runway end**
- **Basic markings – both runway ends.**

According to FAA AC 150/5300-13A, Change 1, an Approach Lighting System (ALS) is recommended, but not required for IAPs with visibility minimums not less than ¾ mile. Unless the ALS is a requirement to achieve lower visibility minimums based on credit for lighting, they are not normally eligible for FAA Airport Improvement Program (AIP) funding. Future ALS improvements, if any, will be evaluated in conjunction with the IAP alternatives development analysis presented in the next chapter.

Instrument Approach Procedures, Navigational Aids, and Visual Landing Aids Conclusion

The operational capacity for each runway regarding wind coverage, navigational aids, and visual aids is sufficient to enable an unincumbered system to support existing and future airport operations. However, the ability to implement improved future GPS-based IAPs providing reduced visibility minimums to Runway 26L (½ mile), Runway 35 (½ mile) and Runway 17 (¾ mile) would enhance PUB's access during adverse weather conditions. It is recommended that PUB continue to plan and program for these improved IAPs, the implementation of appropriate ALS required in conjunction with the desired IAPs, continue to coordinate with the FAA Flight Procedures office, and provide precision markings to Runway 35.

Taxiway/Taxilane System

Taxiways provide defined movement corridors for aircraft between the runway system and the various functional landside areas on an airport. Some taxiways are necessary simply to provide access between aircraft parking aprons and runways, whereas other taxiways become necessary to provide more efficient and safer use of the airfield. Parallel taxiways eliminate the use of a runway for taxiing, referred to as back taxiing, thus increasing an airport's capacity and protecting the runway under low visibility conditions. Taxiway turns and intersections are designed for safe and efficient taxiing by aircraft while minimizing excess pavement.

Taxilanes are provided for low speed, precise taxiing of aircraft that are usually, but not always, located outside the movement area. They normally provide aircraft access from taxiways to apron parking positions or hangar areas.

Taxiway/Taxilane Design Standards

Taxiways and taxilanes are designed for cockpit over centerline taxiing, with enough pavement width to allow for a certain amount of wander. Potential runway incursions should be minimized by using design criteria contained in FAA AC 150/5300-13A, Change 1. Taxiway and taxilane clearance standards are based on wingspan and wingtip clearance criteria determined by the ADG of the Critical Aircraft. Taxiway and taxilane pavement design standards are based on the landing gear dimension determined by the Taxiway Design Group (TDG).

PUB's existing Critical Aircraft, the Bombardier CRJ 200, has an ADG designation of II and a TDG designation of 1B. However, utilizing data from the FAA's Traffic Flow Management System Counts (TFMSC) at PUB for FY 2019, there are sufficient operations by aircraft in TDG 2 (i.e., more than 500 operations) to apply the design standards to PUB. Furthermore, the future Critical Aircraft (Embraer E-175) has an ADG III and TDG 3 designation, so the design standards associated with ADG III and TDG 3 will be evaluated for taxiways serving Runways 8R/26L and 17/35.

TABLE C11 presents the design criteria, design standards, and existing conditions for taxiways serving Runways 8R/26L and 17/35. **FIGURE C9** provides a graphic depiction of the occurrences of PUB's existing taxiway geometry not meeting current FAA design methodology concepts, which include:

- **Taxiway A2.** The intersection of Taxiway A2 with two runways tends to increase pilot confusion and decrease situational awareness. The taxiway also leads directly from the aircraft parking apron to the runway environment without requiring a turn, which increases potential runway incursions. Finally, the non 90-degree angle intersection with both runways does not maximize pilot visibility to both the left and right of the aircraft.
- **Taxiway A.** Taxiway A intersects Runway 17/35 at a non 90-degree angle, so pilot visibility to both the left and right of the aircraft is not optimized.

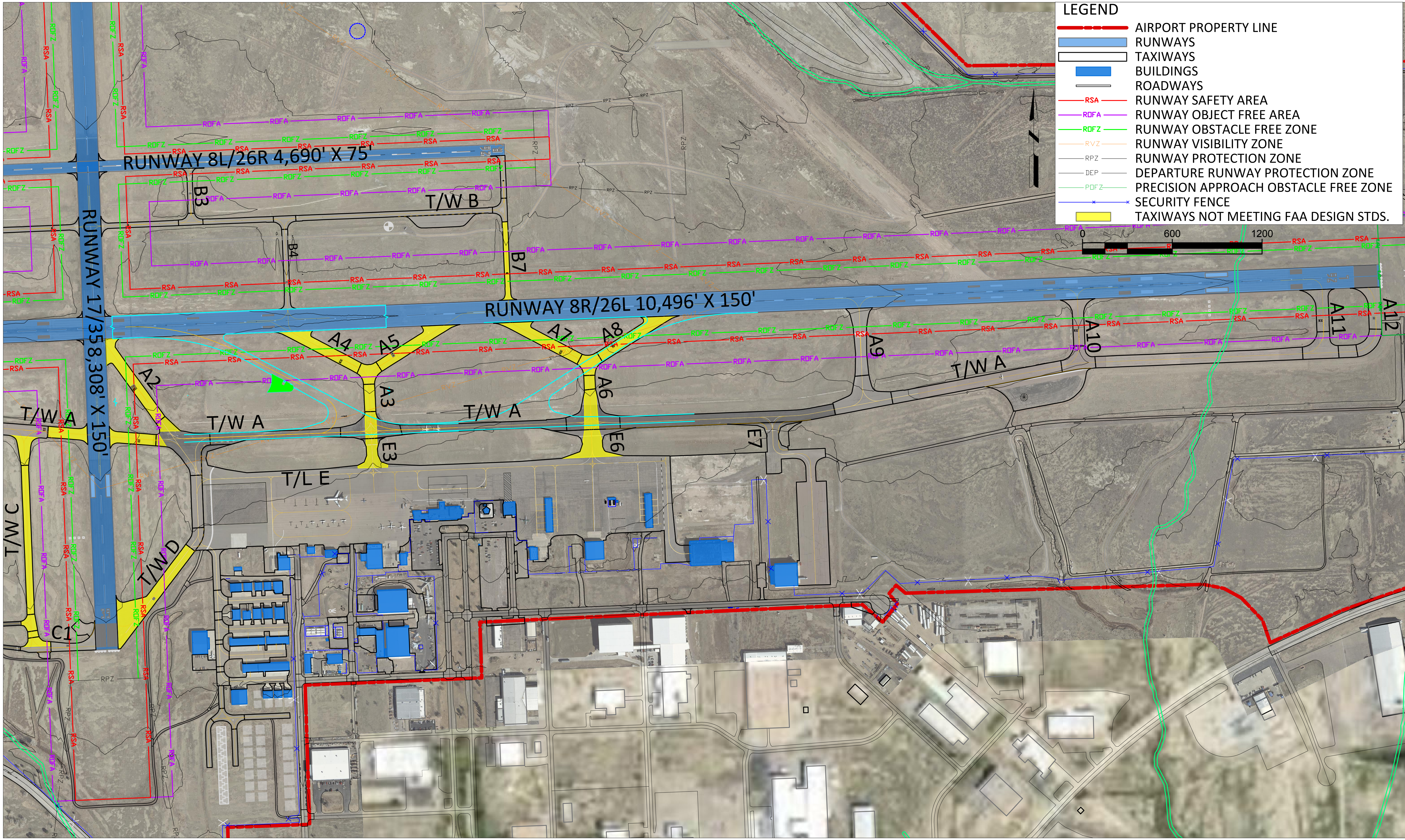


FIGURE C9 **Taxiway Geometry Deficiencies**

- **Taxiways A4, A5, A7, and A8.** The non 90-degree intersections of Taxiways A4, A5, A7, and A8 with Runway 8R/26L do not maximize pilot visibility to both the left and right of the aircraft. However, the difference in elevation between the Runway 8R/26L centerline and Taxiway A centerline at the Taxiway A3 intersection is 16 feet; the difference in elevation between the runway centerline and the Taxiway A centerline at the Taxiway A6 intersection is 20 feet. As stated previously, Taxiway A is located 775 feet from the Runway 8L/26L centerline. Providing 90-degree intersections with the runway by direct extensions of Taxiways A3 and A6 would result in gradients of approximately 2.1 percent and 2.6 percent, respectively. The added length of the “Y” shaped segments of Taxiways A4, A5, A7, and A8 are needed to meet the longitudinal taxiway gradient standard of 1.50 percent for runways accommodating AAC C, D, and E aircraft.
- **Taxiways A7 and B7.** Aircraft crossing Runway 8R/26L at the Taxiway A7 and B7 intersection do so within the middle third of Runway 8R/26L. This “high energy” intersection crosses the runway where aircraft taking off or landing can least maneuver and avoid collisions in the event of a runway incursion. However, since PUB is under ATCT control for 16 hours per day, and the crossing of Runway 8R/26L most often occurs when CAE-Doss aircraft are operational (i.e., from 30 minutes before sunrise to 30 minutes after sunset), this intersection is expected to remain until additional taxiway access is provided to serve Runway 8L/26R.
- **Taxiways A3/E3 and A6/E6.** Taxiways A3/E3 and A6/E6 provide direct access from the aircraft parking apron to Runway 8R/26L without making a turn (notwithstanding the 45-degree turns required of the “Y” shaped segments of Taxiways A4, A5, A7, and A8 presented above).
- **Taxiway C.** Taxiway C is only a partial parallel taxiway serving Runway 17/35 south of Taxiway A. Aircraft accessing Runway 17/35 north of Runway 8L/26R must do so by back taxiing on Runway 17/35. ATCT personnel report underutilizing Runway 17/35 because of the required back taxiing for takeoffs to the south and landings from the south.
- **Taxiway D.** Taxiway D intersects the Runway 35 threshold at an approximate 40-degree angle, which is not at the optimum 90-degree angle providing maximized pilot visibility to both the left and right of the aircraft.
- **Taxiway A11.** Airport personnel report that Taxiway A11 is seldom used. Based on its proximity to the Runway 26L end and entrance Taxiway A12, it could be considered a bypass taxiway. Bypass taxiways provide ATCT personnel flexibility in runway use when bottlenecks occur at busy airports. Bottlenecks happen when aircraft that are not ready for departure block access to the entrance taxiway. The ability to bypass aircraft in this situation and give aircraft that are ready for departure access to the runway increases traffic flow and overall airfield capacity. PUB could close Taxiway A11 if it is not needed for capacity, thus reducing its overall airfield pavement area and lowering future pavement maintenance expenses.

TABLE C11 Taxiway Design Standards for Taxiways Serving Runways 8R/26L and 17/35

DESIGN CRITERIA	DESIGN STANDARD	EXISTING DIMENSIONS			
		TAXIWAY A	TAXIWAYS A1 – A12	TAXIWAY C	TAXIWAYS C1 AND C5
ADG III Design Standard					
Taxiway Safety Area	118’	118’	118’	118’	118’
Taxiway Object Free Area	186’	186’	186’	186’	186’
Taxiway Centerline to:					
Parallel Taxiway/Taxilane Centerline	152’	270’	350’ +	N/A	8,060’
Fixed or Movable Object	93’	93’	93’	93’	93’
TDG 3 Design Standard					
Taxiway Width	50’	75’/50’[1]	75’	50’	50’
Taxiway Shoulder Width[2]	10’	N/A	N/A	N/A	N/A

DESIGN CRITERIA	DESIGN STANDARD	EXISTING DIMENSIONS		
		TAXIWAY D	TAXIWAY E	TAXIWAYS E3, E6, AND E7
ADG III Design Standard				
Taxiway Safety Area	118’	118’	118’	118’
Taxiway Object Free Area	186’	186’	186’	186’
Taxiway Centerline to:				
Parallel Taxiway/Taxilane Centerline	152’	N/A	270’	725’ +
Fixed or Movable Object	93’	93’	93’	93’
TDG 3 Design Standard				
Taxiway Width	50’	75’	50’	75’
Taxiway Shoulder Width[2]	10’	N/A	N/A	N/A

SOURCE: Mead and Hunt analysis using FAA AC 150/5300-13A, Change 1, *Airport Design*.
NOTES: [1] Taxiway A width between Taxiways A2 and A6 is 50 feet.
[2] Taxiway shoulders are recommended, but not required for taxiways accommodating ADG-III aircraft.
N/A = Not Applicable.

The Runway 8L/26R existing Critical Aircraft (Diamond DA20 Katana) and the future Critical Aircraft (Beechcraft T-6A Texan II) are within the ADG I and TDG 1A categories. As presented earlier, the current ALP indicates this runway has an ADG II category. Since the runway was designed and constructed to accommodate aircraft within RDC B-II, and approximately half of the RDC B-II aircraft have a corresponding TDG 2 category, TDG 2 is preferred for taxiways serving Runway 8L/26R. **TABLE C12** presents the design criteria, design standards, and existing conditions for taxiways serving Runway 8L/26R.

TABLE C12 **Taxiway Design Standards for Taxiways Serving Runway 8L/26R**

DESIGN CRITERIA	DESIGN STANDARD	EXISTING DIMENSIONS	
		TAXIWAY B	TAXIWAYS B1, B4, AND B7
ADG II Design Standard			
Taxiway Safety Area	79’	79’	79’
Taxiway Object Free Area	131’	131’	131’
Taxiway Centerline to:			
Parallel Taxiway/Taxilane Centerline	105’	1,450’	2,100’ 2,560’
Fixed or Movable Object	65.5’	65.5’	65.5’
TDG 2 Design Standard			
Taxiway Width	35’	35’	35’
Taxiway Shoulder Width[1]	15’	N/A	N/A

SOURCE: Mead and Hunt analysis using FAA AC 150/5300-13A, Change 1, *Airport Design*.
NOTES: [1] Taxiway shoulders not required for taxiways accommodating ADG I aircraft
N/A = Not Applicable.

Taxiway/Taxilane System Conclusion

The existing taxiway/taxilane system in place at PUB meets most FAA standards. However, the following existing non-standard conditions need to be considered in the alternatives analysis in the next chapter.

- Non 90-degree taxiway to runway intersections at the Taxiway A2 intersection with Runways 8R/26L and 17/35, Taxiway A at the intersection with Runway 17/35, and the Taxiway D intersection at the Runway 35 threshold.
- Direct taxiway access from apron to a runway without turns at Taxiways A3/E3 and A6/E6.
- The “Y” shaped, acute angled exit Taxiways A4, A5, A7, and A8 will be further studied in the next chapter through the development of an alternative concept that compares the feasibility of providing standard airfield geometry (i.e., non 90-degree taxiway and runway intersections and a true parallel Taxiway A) with the ability to provide standard taxiway gradients between Runway 8R/26L and Taxiway A.
- The removal of Taxiway A11 will be considered in the following chapter.

The need for additional exit taxiways and a full- length parallel taxiway serving Runway 17/35 will be considered as part of the alternatives analysis in the following chapter to determine if improvements might be implemented to reduce runway occupancy times for arriving aircraft and increase airfield capacity.

Holding Bays

Holding bays enhance capacity by providing space for aircraft awaiting departure clearance to remain clear of taxiways and allow pilots to perform pre-takeoff checks without impeding other aircraft already cleared for departure to proceed to the runway takeoff position. The most beneficial location is adjacent to the taxiways serving the runway ends and as near the runway ends as possible.

PUB is equipped with three existing holding bays: one at the west end of Taxiway A serving Runway 8R; one near the west end of Taxiway B, and one near the east end of Taxiway B. The Runway 8R holding bay provides sufficient space capable of accommodating up to four CRJ 200 or E-175-sized aircraft stacked nose to tail. The holding bays adjacent to Taxiway B could accommodate approximately seven Diamond DA20-sized aircraft also stacked nose to tail.

Current FAA preferred holding bay design includes clearly marked entrances and exits that allow independent usage of the parking positions for access directly to the runway. This design allows aircraft to bypass one another and assure taxiway wingtip clearances. There is not sufficient space on the existing holding bays to reconfigure aircraft parking positions to meet this preferred layout.

Holding Bays Conclusion

The adequacy of the existing holding bays and the need for additional bays is dependent on the capacity analysis conducted previously. When the capacity alternatives are evaluated in the next chapter, the need for additional or reconfigured holding bays will also be considered.

Landside Facility Requirements

Landside facilities are those facilities that support the airside facilities but are not actually a part of the aircraft operating surfaces. These consists of such facilities as the passenger terminal building, aircraft parking aprons, corporate and general aviation hangars, Fixed Based Operator (FBO) facilities, Aircraft Rescue and Fire Fighting (ARFF) facilities, fuel storage facilities, utilities, perimeter security, and access roads. Following an analysis of these existing facilities, current deficiencies can be noted in terms of accommodating both existing and future needs.

Terminal Area Requirements

Components of the terminal area include the passenger terminal building, gate/aircraft parking positions, and the apron area. FAA AC 150/5360-13A, *Airport Terminal Planning* provides general guidance for sizing terminal area facilities.

Passenger Terminal Building

The passenger terminal building is the face of PUB to the community and the front door for many visitors to Pueblo. Available amenities encourage visitors and the local community to use PUB, add value to the passenger experience, and improve the perception of PUB. Façade and aesthetic improvements to both the exterior of the terminal as well as the interior are recommended during the planning period to property maintain this gateway to the community.

The objective of noting facility requirements for the passenger terminal building is to identify the type, quality, and quantity of the facilities that are required for the terminal to operate safely and efficiently through the planning period. While some of the recommendations made for PUB intend to address specific shortfalls, others are to improve general performance. This section analyzes the existing state of the passenger terminal building and considers the future needs based on forecasted activity levels.

Given the relatively low level of future enplanements presented in the previous chapter (less than 15,000 by 2040), the passenger terminal building is generally sufficient. Therefore, the passenger terminal building requirements analysis consists of a limited evaluation based on known issues. Airport management have noted three select areas to be considered:

- **Security Check Point**
- **Restrooms**
- **Gate hold-room areas.**

Airport staff have also noted a desire to update the interior spaces to fit a more modern aesthetic. An interior renovation of the passenger terminal building is thereby also recommended. **FIGURE C10** provides a floorplan of the existing passenger terminal building.

Security Screening Check Point

The Security Screening Check Point (SSCP) at PUB is undersized to adequately accommodate passenger enplanements during the planning period. The existing checkpoint is atypical, as the present layout, configuration, and length of the SSCP does not meet Transportation Security Administration (TSA) standards for a standard checkpoint layout. The existing SSCP is approximately 680 square feet.

Guidance in the *Program for Applied Research in Airport Security (PARAS) 0002 – Companion Design Guide to US Customs and Border Protection's Airport Technical Design Standards* recommends an average of 13.2 square feet per peak hour passenger for a security checkpoint. Given the 50 passenger commercial aircraft that currently serve PUB, the check point is adequately, but additional space should be planned for the change is critical aircraft to the 76 passenger E-175 which would require closer to 1,000 square feet.

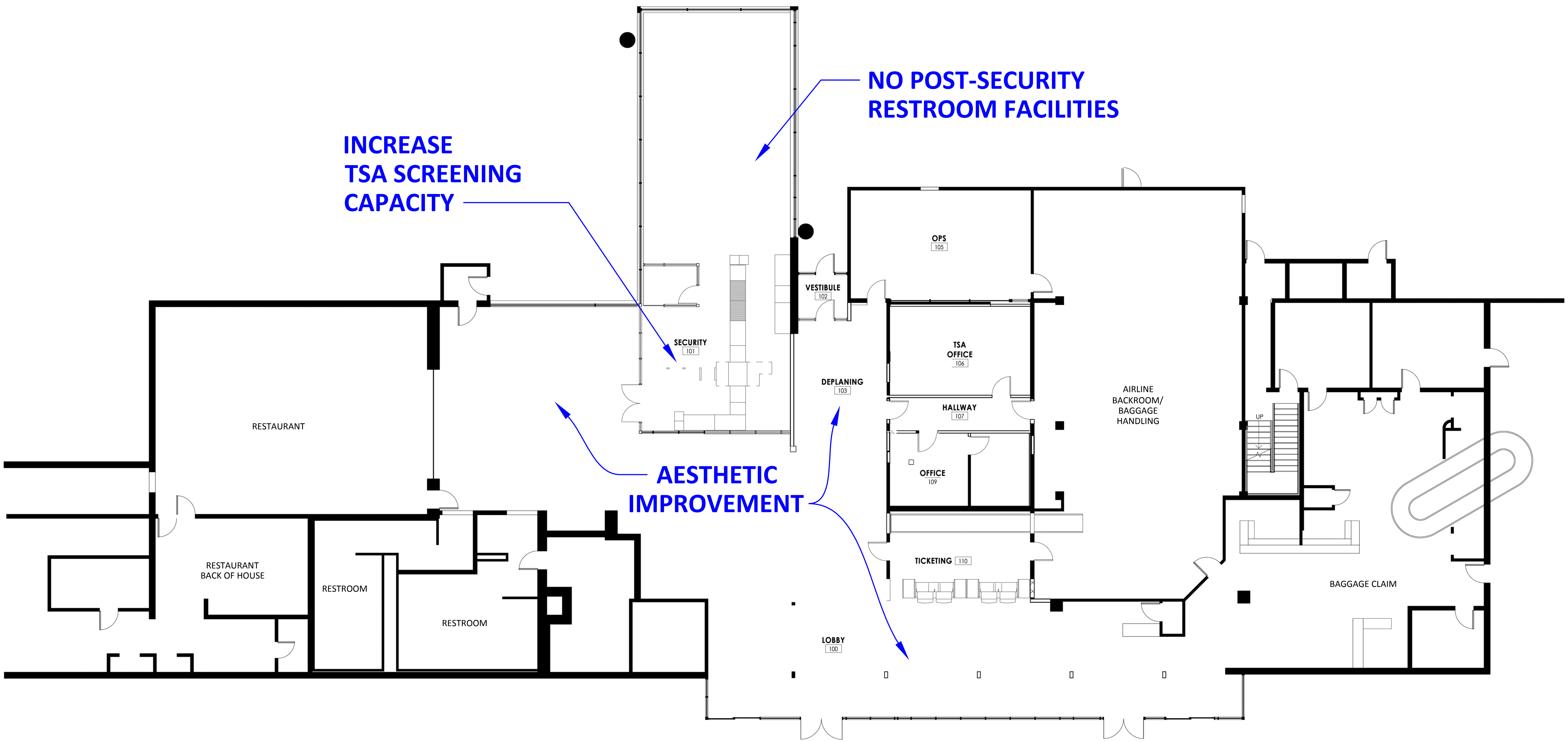


FIGURE C10 Terminal Floorplan

Restrooms

The existing public access restroom facility has one female and one male restroom located adjacent to the pre-security seating area and the restaurant. The existing square footage and fixture counts will serve the pre-security landside area for the next 20 years. Possible additions to each restroom facility would be a mother's room and a flip down step to facilitate children's handwashing, or a family/unisex facility. Additional considerations should be made for the inclusion of a post-security restroom facility of similar size and function as the pre-security area. There are currently no restroom facilities in the terminal gate hold room area, and users are required to leave the secured portion of the terminal to use the pre-security restroom facilities.

Gate Hold-Room Areas

Except for the lack of restroom facilities, the existing gate hold-room areas are sufficient to accommodate the peak hour with the current commercial aircraft type. However, additional square footage will be needed when the critical commercial aircraft changes. Additional square feet would also be beneficial during larger aircraft charter flights that occasionally utilize the terminal.

Aircraft Gates

Given the anticipated commercial operations at PUB throughout the planning period, no additional changes are required to the aircraft gates.

Vehicle parking

The existing vehicle parking area provides free parking to PUB passengers. The vehicle parking is adequate; however, the parking area pavement needs rehabilitation within the short-term planning period.

Passenger Terminal Apron

PUB currently has four commercial daily flights to and from Denver International Airport (DEN): two arriving flights and two departing flights. The passenger terminal apron has one aircraft parking space accommodating the CRJ 200 aircraft (ADG II) located north of the passenger terminal building and accessed via a ground-loaded gate system. Guidance under AC 150/5360-13A recommends rightsizing the terminal apron to accommodate peak hour commercial service aircraft operations. The forecasts do not anticipate any change in the total commercial service aircraft operations during the planning period, nor are any significant changes to peak hour enplanements expected. However, the aircraft providing the commercial service operations is anticipated to change to an E-175 (ADG III) during the planning period. The existing passenger terminal apron provides sufficient space for accommodating larger wingspan aircraft in the future but remarking and relocating the aircraft parking position and taxilane centerline will be required.

Terminal Area Conclusion

The terminal area will not require major changes to meet forecast demand, but instead needs only minor changes intended to facilitate a more effective, efficient, and modern terminal layout, as well as enhance the overall passenger experience well into the future. Recommended changes to the terminal area include additional restrooms in the sterile portion of the passenger terminal building, additional SSCP and hold-room square footage, and aesthetic renovations of the exterior and the interior public areas. Remarking and relocation of the terminal apron aircraft parking area and taxilanes may also be required to accommodate any potential change of commercial service aircraft to ADG III aircraft.

General Aviation and Support Facilities

General aviation (GA) facilities at PUB support the based and transient aircraft fleet. Support facilities serve various functions in support of aircraft operations.

Fixed Based Operators

FBOs are businesses providing aircraft services such as fuel sales, aircraft maintenance, flight training, and aircraft storage that cater to GA aircraft owners and pilots primarily. Currently, Rocky Mountain Flower Aviation is the sole FBO at PUB. Multiple FBOs tend to keep prices consistent with other airports, which benefits aircraft owners and pilots. The facility requirements for FBOs depend on staffing and equipment needs to keep up with an anticipated increase in demand. New or expanded FBO buildings might be necessary as existing facility reach capacity.

Aircraft Hangar Storage

Based on the high investment cost of owning and operating aircraft, hangars are generally the most desired option for both short- and long-term aircraft storage. Aircraft hangar storage at PUB consists of 20 T-hangar spaces, seven large executive box hangars, and 16 smaller GA box hangars. T-hangar spaces house one aircraft, while box hangars generally can hold multiple aircraft. Most of the hangars are located adjacent to the apron, with two 10-unit T-hangar structures located on the east side apron and 16 box hangars located on the west side apron. **FIGURE C11** provides the location of these hangars.

There are 0.72 hangar spaces available for every based aircraft at PUB, confirming that box hangars are storing multiple aircraft since PUB personnel indicate no based aircraft utilize apron tiedown storage. This ratio is used to estimate future storage recommendations, as it is expected that future storage facilities will reflect many of the existing characteristics of the current storage patterns. **TABLE C13** presents the estimated aircraft hangar storage demand throughout the planning period.

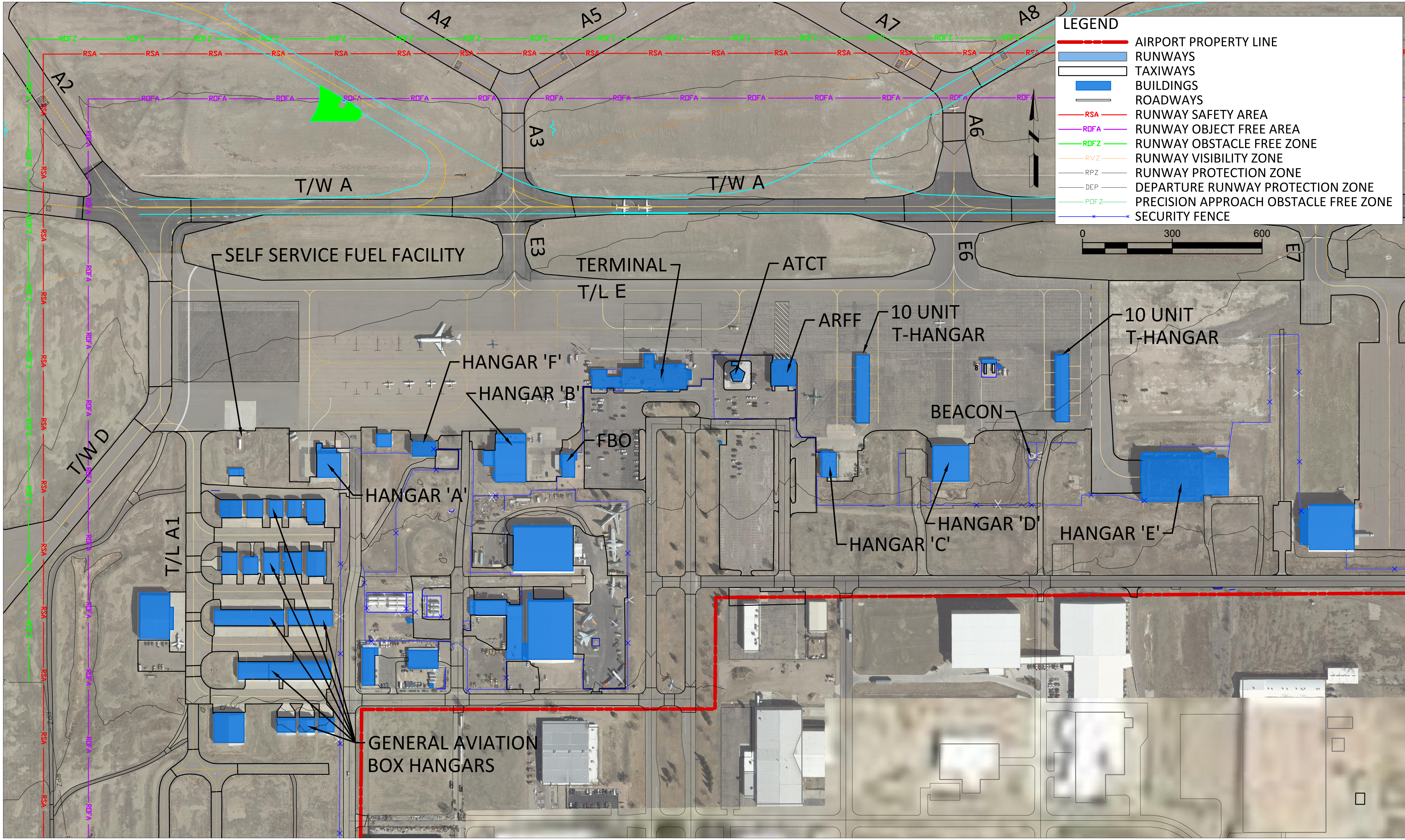


FIGURE C11 **Storage Hangar Locations**

TABLE C13 Hangar Storage Requirements, 2019-2040

YEAR	BASED AIRCRAFT	T-HANGAR UNITS	BOX HANGARS
2019	60	20	23
2025	66	23	24
2030	72	27	25
2035	77	29	26
2040	84	33	27

SOURCE: Mead and Hunt analysis using forecast projections.

The based aircraft forecast presented in **Chapter B – Aviation Activity Forecast** projected an increase of 17 single-engine aircraft, three multi-engine aircraft, two jet aircraft, and two helicopters between 2019 and 2040. In consideration of similar storage preference characteristics, it is expected that additional T-hangar units will be needed to correspond with the increase in single-engine aircraft. Box hangars should be added to accommodate any additional single-engine aircraft as well as the other aircraft types. The actual number, size, and location of future hangars will depend on user needs and financial feasibility at the time demand occurs.

Apron Storage

There is one main apron with approximately 18 aircraft tiedowns at PUB. These areas are almost entirely used for transient aircraft visiting PUB. According to PUB staff, these tiedowns are seldom, if ever, used for parking-based aircraft. Due to adverse climate conditions such as hail and the expense involved in owning aircraft, owners of the based aircraft at PUB will almost unilaterally choose to store their aircraft in a hangar.

GA apron storage requirements typically are based on the estimated amount of itinerant and based aircraft using tiedowns or apron storage spaces. Itinerant aircraft typically only require short-term, temporary storage on the apron, while based aircraft typically use tiedowns for a longer term and require more permanent apron storage. Space calculations for based aircraft use 360 square yards of apron for each aircraft tiedown. Calculations for iterant aircraft use 500 square yards of apron for each itinerant aircraft.

There are two reasons for the larger space requirements for itinerant aircraft. First, itinerant aircraft users will not be as familiar with the layout of and circulation patterns at PUB, and additional maneuvering space is essential. Second, whereas typically smaller, single-engine based aircraft use apron storage, various sized itinerant aircraft do and will continue to use temporary apron storage at PUB, and it occasionally accommodates large military aircraft and helicopters on the apron. Therefore, it is necessary to provide additional space to accommodate larger aircraft.

As presented in **TABLE C14**, the amount of anticipated demand for GA apron space is not expected to exceed existing capacity during the planning period.

TABLE C14 Apron Storage Requirements, 2019-2040

AREA	2019	2025	2030	2035	2040
Itinerant GA Apron (square yards)	23,425	24,509	25,941	27,462	29,077
Based GA Apron (square yards)	0[1]	0[1]	0[1]	0[1]	0[1]
Total Apron (square yards)	23,425	24,509	25,941	27,462	29,077
Existing Apron Area (square yards)	39,250[2]	39,250[2]	39,250[2]	39,250[2]	39,250[2]

SOURCE: Mead and Hunt Forecast Projections.
NOTES: [1] No based aircraft currently stored or projected to be stored on the apron.
[2] GA apron area available for aircraft parking.

General Aviation Facilities Conclusion

To accommodate the projected growth in single-engine aircraft, T-hangar structures should be increased by 13 over the planning period. Box hangars should be increased by six to account for the forecasted growth in other based aircraft types and the remaining single-engine aircraft. It is not anticipated that additional GA apron will be required. As indicated earlier, portions of the east apron may be identified for marking as non-movement areas and eliminated from use.

Aircraft Rescue and Fire Fighting Facility

The ARFF facility serving PUB is located on the apron adjacent to the air traffic control tower east of the terminal building. According to Code of Federal Regulations (CFR) Part 139.317, ARFF equipment and staff requirements are based upon the length of the largest air carrier aircraft that serves an airport with an average of five or more daily departures. **TABLE C15** presents the ARFF Index, aircraft length criteria, and representative air carrier aircraft.

TABLE C15 ARFF Support Requirements

ARFF INDEX	AIRCRAFT LENGTH	REPRESENTATIVE AIRCRAFT
A	Less than 90’	ERJ 135; **CRJ 200**[E]
B	Between 90’ and 126’	CRJ 900; A319/A320; **E175**[F]
C	Between 126’ and 159’	ERJ 195; MD-80; 737-800
D	Between 159’ and 200’	B757; B767; A330
E	Greater than 200’	B747; B777

SOURCE: FAA Part 139.315 ARFF Index Determination.
NOTES: **Bold** = PUB Critical Aircraft; [E] – Existing, [F] – Future.

PUB currently holds an ARFF index designation of A. This is due to the average commercial operations of two departures daily of the CRJ 200. As no projected growth in commercial operations is forecasted over the planning period, PUB will retain its A ARFF index. The CRJ 200 and the E175 are the existing and forecasted critical aircrafts at PUB. The existing ARFF facility is centrally located on the apron adjacent to the Airport Traffic Control Tower (ATCT). It provides approximately 6,350 square feet and is in good functioning condition. However, a recent building assessment conducted by the City of Pueblo concluded that the building is nearing the end of its useful life and a recommendation was made to provide a replacement facility in the next several years. PUB's ARFF facility operates three vehicles, which were detailed in **Chapter A – Inventory of Existing Conditions**. The existing equipment can accommodate the necessary requirements for its current ARFF index. However, due to age two response vehicles may require replacement during the planning period.

ARFF Facility Conclusion

As PUB is anticipated to retain its ARFF Index A designation throughout the planning period, no changes to ARFF equipment or staffing will be required. Two of the three ARFF vehicles may require replacement due to their age. Consideration for siting a new ARFF facility will be considered in this Master Plan Study.

Snow Removal Equipment (SRE) and Airport Maintenance Facility

Airport maintenance handles the upkeep, protection, and preservation of airport facilities, and the snow and ice removal from pavements. Currently, an approximate 15,800-square foot building and adjacent storage yard located south of the main aircraft apron houses the snow removal equipment (SRE) and maintenance equipment. FAA AC 150/5220-20A, *Airport Snow and Ice Control Equipment*, provides guidance in the purchase of AIP eligible SRE. FAA AC 150/5220-18A, *Buildings for Storage and Maintenance of Airport Snow and Ice Control Equipment and Materials*, provides siting factors and space allocation calculations for SRE facilities. **Appendix F** contains the detailed analysis for the SRE and maintenance facility requirements.

SRE Requirements

SRE requirements are primarily based on the total square footage of designated Priority 1 paved area, the airport's service classification, and the amount of annual snowfall. Priority 1 paved area is defined as the primary runway, parallel taxiway, terminal ramp, control tower access, and ARFF access identified in an airport's winter storm management plan for removal of snow, ice, and/or slush within 30 minutes (the standard time allowed for commercial service airports with greater than 40,000 annual operations). Runway 8R/26L and the Taxiway A loop have over 2,739,000 square feet of pavement. With an additional 10,000 square feet of area for ARFF access to Taxiway A and an additional 106,000 square feet of terminal apron, the total Priority 1 paved area at PUB equals over 2,855,000 square feet. Thus, PUB is classified as a very large airport, which influences SRE needs, building configuration and size, material storage needs, and personnel requirements.

Commercial service airports with over 40,000 aircraft operations that receive more than 12 inches of annual snowfall have a minimum SRE requirements of one high-speed rotary plow supported by two snowplows of equal snow removal capacity. PUB currently meets this minimum equipment requirement. However, the existing SRE inventory at PUB does not have the capacity to meet the 30-minute snow clearing time as determined by the commercial service airport operations level, amount of Priority 1 paved areas, and annual snowfall amount (according to National Weather Service data, Pueblo receives an average of 31.3 inches of annual snowfall). PUB is eligible for additional AIP fundable equipment available at their discretion. It is recommended that PUB replace or supplement the existing SRE vehicles that do not meet the requirements or that have exceeded the expected useful lifespan (i.e., generally 10 to 15 years). The existing SRE vehicle inventory that does not meet the recommendations could be used to clear secondary and tertiary paved areas such as GA aprons, access roads, taxilanes, hangar areas, and off-airside surfaces. **TABLE C16** provides the SRE recommendations based on the combination of parameters and calculations using guidance from AC 150/5220-20A.

TABLE C16 AIP Eligible SRE Recommendations

EQUIPMENT	EXISTING[1]	AIP-ELIGIBLE RECOMENDATION[2]
Rotary Plows	1994 Steward and Stevenson rotary plow (medium Class II rotary plow)	Two Class V rotary plows (casting distance at least 100'and 4,000 tons of snow per vehicle per hour
Plows	1987 Chevrolet dump truck, 8' plow (small snowplow)	Four very large plow trucks equipped with 25' blades
	Two 2006 International 7500 dump trucks, 14' plow and sander (intermediate snowplows)	
	1998 Kenworth dump trunk, 22' Viking plow (large snowplow)	
	2001/02 John Deere tractor, 9' pull behind blade (small snowplow)	
	2000 CAT grader (intermediate snowplow)	
	2015 Ford F250, 8' Western plow (small snowplow)	
Multi-Purpose Equipment	2009 John Deere loader and attachment	One large swath 25' wide sweeper broom, equipped with airblast system
	2008 Skid Steer and attachments	One solid material spreader with 6-cubic yard hopper capacity with 75' swath

SOURCE: [1] Pueblo Memorial Airport, Snow and Ice Control Plan, Revision dated August 17, 2018.
[2] Mead and Hunt analysis using FAA AC 150/5220-20A.

SRE and Airport Maintenance Facility Requirements

SRE are costly pieces of complex and technologically advanced equipment. To protect and service the equipment and protect local and federal investment, specifically designed maintenance and storage buildings are needed. SRE should be housed in a building capable of maintaining 50 degrees Fahrenheit to prolong the useful life of the equipment and to enable more rapid response to operational needs.

Total space allocation for a SRE facility is based on the total of three individual areas determined necessary to meet different functional purposes: storage area (including equipment parking, snow and ice control materials, and equipment parts); support area (including administrative and equipment maintenance areas); and special equipment area (including heating, ventilation, air conditioning steam generation, emergency power, and machine rooms). Space allocation for each area is determined by local building codes and ordinances, values provided by tables in AC 150/5220-18A, and applying equipment clearance values as determined by using equipment safety zone concepts.

Using the guidance contained in AC 150/5220-18A, a total SRE and airport maintenance facility consisting of approximately 20,000 square feet is required. Thus, the existing facility, with a total area of approximately 15,800 square feet is limited in providing adequate space for the recommended equipment. Additionally, the existing garage doors might not have sufficient width to accommodate the larger recommended SRE. When consideration is given to expanding, remodeling, or replacing the existing facility, consultation with a specialized engineering and architectural firm is needed to design the facility using AC 150/5220-18A design and construction standards.

SRE and Airport Maintenance Facility Conclusion

It is recommended that PUB program for the replacement of the existing SRE vehicles that do not meet the recommendations presented here or have exceeded their useful lifespans with SRE that are eligible for AIP funding. Additionally, when an expansion, remodel, or replacement of the existing facility is required, it is recommended that PUB engage an engineering and architectural firm to right-size the building space and layout that conforms to FAA guidance and local codes and ordinances.

Fuel Storage Facility

PUB has its own fuel storage facility providing both Jet A and 100LL AVGAS, which is owned by the City of Pueblo. According to fuel sales records provided by PUB, the past three years of fuel sales have averaged between 230,000- and 273,000-gallons of Jet A and 1,240,000 and 1,500,000 gallons of 100LL AVGAS per year. Based on the 2019 total aircraft operations, this equates to approximately 177 gallons of Jet A fuel sold per turbine-powered aircraft operation and 13.1 gallons of 100LL AVGAS fuel sold per piston-powered aircraft operation. Typically, as operations increase, fuel storage requirements can be expected to increase proportionately. Increasing the ratio of gallons sold per operation yields an estimate of a two-week supply for future fuel storage needs during the peak month of operations. **TABLE C17** presents the demand for fuel storage compared to the existing capacity.

TABLE C17 **Summary Fuel Storage Requirements, 2019-2040**

FUEL TYPE	2019	2025	2030	2035	2040
Jet A					
Average Day of Peak Month Turbine-Powered Aircraft Operations	26	25	26	28	29
Two Weeks of Operations	368	346	363	386	411
Gallons Per Operation	176.8	177.5	179.0	182.0	185.0
Actual Fuel Storage (gallons)	200,000[1]	200,000[1]	200,000[1]	200,000[1]	200,000[1]
Future Fuel Storage Requirements (gallons)	65,000	61,470	64,935	70,285	76,080
100LL AVGAS					
Average Day of Pek Month Piston-Powered Aircraft Operations	54	59	62	65	67
Two Weeks of Operations	763	827	867	904	943
Gallons Per Operation	13.1	13.1	13.5	14.0	14.5
Actual Fuel Storage (gallons)	60,000[2]	60,000[2]	60,000[2]	60,000[2]	60,000[2]
Future Fuel Storage Requirements (gallons)	9,967	10,835	11,710	12,650	13,770

SOURCE: Mead and Hunt analysis.
NOTES: [1]Existing Jet A fuel storage capacity (80 percent of storage tank capacity is considered full).
[2]Existing 100LL AVGAS fuel storage capacity (80 percent of storage tank capacity is considered full).

Fuel Storage Facility Conclusion

The existing fuel storage capacity appears to be more than sufficient to accommodate the anticipated demand throughout the planning period.

Airport Access and Circulation

The existing access roads provide easy landside access to the passenger terminal building and other use areas at PUB. Located north of and adjacent to US Highway 50 (US-50) and less than 10 miles east of Interstate 25 (I-25), PUB remains easily accessible to airport visitors. United Avenue provides PUB with immediate access to US-50. Keeler Parkway, the main approach to the passenger terminal building, terminates at Bryan Circle and provides access to the vehicle parking areas. At two lanes each direction and 35 feet in width, Keeler Parkway appears suitable to accommodate any future growth. Additional airport roads connect the GA areas with United Avenue and William White Boulevard. This includes Doss Aviation, PUB's largest user, which has its own access point along William White Boulevard. The number, size, and location of access roads appear sufficient to support projected GA development.

Airport Access and Circulation Conclusion

PUB's existing road network appears capable of providing sufficient vehicular access and circulation throughout the planning period.

Airport Perimeter Security

The existing security fence that surrounds the terminal area and surrounding buildings is an eight-foot chain link topped with three strands of barbed wire. In summer 2020, 34,000 linear feet of 10-foot chain link wildlife fence topped with three-strands of barbed wire was installed around most of the north, west, and east perimeters of airport property. In the terminal area there are six automated access gates providing entry to the airfield through magnetic gate card readers. Two pedestrian gates – one by Rocky Mountain Flower Aviation and one by the ARFF facility – are operated via a programmable keypad lock. Five emergency vehicle access gates are also provided through the security fence, one is between the passenger terminal building and the ATCT, and two each located on the southeast and southwest perimeter fence lines. PUB staff indicate the security perimeter fencing and access gates are adequate for existing and future needs.

Airport Perimeter Security Conclusion

PUB's existing security and wildlife perimeter fencing is sufficient to maintain proper operational security measures. Additional gates or fencing may be installed during the planning period as needs arise.

Utilities

Water, sewer, electricity, natural gas, and telephone/internet services are currently available at PUB. Airport buildings, particularly the FBO and terminal building, are fully serviced by the existing utility network. PUB is sufficiently served by each of these utilities and is likely to remain so throughout the planning period.

Utilities Conclusion

No immediate changes are required to PUB's utilities infrastructure. PUB should coordinate with the City of Pueblo for future extensions, expansions, and upgrades in utility services.

Summary

The information provided in this chapter provides the basis for understanding the facility improvements that are needed at PUB to accommodate future aviation demand efficiently and safely. Following are the major improvement considerations that have been identified in this chapter.

Airside Considerations

Airfield Capacity

- Evaluate taxiway, taxilane, apron and holding bay configuration changes to enhance capacity.
- Evaluate additional runway capacity.

Runway Design Standards

- Evaluate the remediation of the deficient Runway 8R/26L ROFA width.
- Plan and program for the relocation of the taxiway holding position lines on taxiways serving Runways 8R/26L and 17/35.

Runway Line of Sight

- Evaluate correcting the Runway 17/35 gradient of 1.0 percent exceeding the allowable 0.8 percent standard.

Pavement Condition

- Reconstruct a sizeable portion of the easternmost apron.
- Future rehabilitation of Taxiways A10, A11, and C5 due to lower PCI ratings.

Runway Protection Zones

- In conjunction with an improved IAP to Runway 35 that reduces visibility minimums, evaluate impacts and potential mitigation measures to the Runway 35 RPZ extending beyond airport property that will encompass any incompatible land uses.

Runway End Siting

- Evaluate alleviating the existing terrain and a pair of electrical transmission towers that penetrate the Runway 35 departure surface.
- Evaluate future runway end siting requirements in conjunction with possible IAP improvements.

Instrument Approach Procedures, Navigational Aids, and Visual Landing Aids

- Evaluate implementing improved GPS-based IAPs providing reduced visibility minimums to Runway 26L (½ mile), Runway 35 (½ mile), and Runway 17 (¾ mile) that enhance PUB's access during adverse weather conditions.
- Evaluate ALS requirements in conjunction with the proposed IAP improvements.

Taxiway/Taxilane System

- Evaluate solutions to non 90-degree taxiway to runway intersections at the Taxiway A2 intersection with Runways 8R/26L and 17/35, Taxiway A at the intersection with Runway 17/35, and the Taxiway D intersection at the Runway 35 threshold.
- Evaluate solutions that alleviate the direct taxiway access from an apron to a runway without turns at Taxiways A3/E3 and A6/E6.
- Evaluate solutions to the "Y" shaped, acute angled exit Taxiways A4, A5, A7, and A8 that include 90-degree runway intersections and provide standard taxiway gradients.
- Evaluate the ability to remove the dogleg of Taxiway A between Taxiways A9 and A10 in conjunction with an alternative evaluating the resolution of the "Y" shaped, acute angled exit Taxiways A4, A5, A7, and A8.
- In conjunction with the capacity enhancement alternatives evaluation, include the evaluation of a full-length parallel taxiway serving Runway 17/35 and additional exit taxiways.

Holding Bays

- Evaluate reconfiguration of the existing holding bays or the provision of additional bays in conjunction with the capacity enhancement alternatives evaluation.

Landside Considerations

Terminal Area

- Plan and program for the modernization of the interior aesthetic of the terminal building.
- Plan and program for additional restrooms in the sterile portion of the passenger terminal building.
- Plan and program for the remarking and relocation of the terminal apron aircraft parking area and taxilanes to accommodate potential change of service to ADG III aircraft.

General Aviation Facilities

- Reserve ample space to accommodate the projected growth in based aircraft through additional T-hangars and box hangars.
- Reserve ample space for potential new or expanded FBO facilities as demand dictates.

ARFF Facility

- Consider replacement of two of the three ARFF vehicles due to their age.
- Evaluate the siting of a replacement ARFF facility.

SRE and Airport Maintenance Facility

- Plan and program for the replacement of existing SRE vehicles that do not meet AIP funding eligibility recommendations or have exceeded their useful lifespans.
- Plan and program for the expansion, remodel, or replacement of the existing SRE facility.

D. Concepts, Alternatives, and Development Plan

Introduction

This chapter presents development alternatives and recommendations for Pueblo Memorial Airport (PUB) in terms of concepts and reasoning and provides a description of the various factors and influences, which will form the basis for PUB's long-term development plan. In concert with the role of PUB, and community input received during the planning process, several basic assumptions have been established that are intended to direct the development of PUB in the future.

Assumption One. PUB will be developed and operated in a manner that is consistent with local ordinances and codes, federal and state statutes, federal grant assurances, and Federal Aviation Administration (FAA) regulations.

Assumption Two. This assumption recognizes the role of PUB, which will continue to serve as a facility that accommodates regional commercial service passenger activity, along with general aviation (private, corporate, and training) activity and a small amount of military aviation activity.

Assumption Three. This assumption focuses on the need to accommodate forecast operations of all aviation types, as expressed by the Annual Service Volume (ASV) capabilities in the previous chapter. Forecasts of operational activity and the analysis of the capacity of PUB's runway layout indicate that additional capacity (both runway and taxiway) is needed to accommodate aircraft landings and takeoffs efficiently, primarily due to the expected increase in flight training activity at PUB.

Assumption Four. This assumption relates to the size and type of aircraft that utilize PUB and the resulting setback and safety criteria used as the basis for the layout of associated airport facilities.

- **Runway 8R/26L (Primary).** This runway is used by both the commercial service aircraft and many of the larger business jet aircraft that operate at PUB. The future Critical Aircraft for this runway is an Airplane Design Group (ADG) III commercial service type aircraft, specifically the Embraer E-175. As such, this runway should continue to be planned and designed using Runway Design Code (RDC) C-III-2400 criteria.
- **Runway 17/35 (Crosswind).** This runway is also used by both the commercial service aircraft and many of the larger business jet type aircraft that operate at PUB. The future Critical Aircraft for this runway is also the E-175. Thus, this runway should continue to be planned and designed using Runway Design Code (RDC) C-III-2400 criteria.
- **Runway 8L/26R (Parallel or Training).** This runway is used primarily by smaller general aviation aircraft. The Critical Aircraft for this runway is the Diamond DA20 Katana. This indicates the runway should continue to be designed using RDC B-II-VIS dimensional criteria.
- **Taxiway Dimensional Criteria.** The majority of taxiways and taxilanes at PUB currently accommodate all sizes of aircraft. However, in accordance with FAA's recently published Taxiway Design Group (TDG) standards, alternatives that correct or improve the deficiencies and non-standard taxiway/taxilane configurations identified in the previous chapter will be evaluated.

Assumption Five. The fifth assumption relates to the need for PUB to accommodate aircraft operations with great reliability and safety. This indicates that PUB's runway system should be developed with instrument approach guidance capabilities that accommodate the forecast operations as safely as possible under most weather conditions.

Assumption Six. The existing length provided by all three runways is adequate to accommodate the needs of the existing and forecast aircraft fleet safely and efficiently.

Assumption Seven. Because the amount of accessible landside development area at any airport is at a premium, this assumption states that the plan for future airport development should strive to make the most efficient use of the available area for aviation-related activities, including general aviation facilities and passenger terminal facilities. Aviation use areas should be developed to be compatible with surrounding land uses.

Assumption Eight. The eighth assumption focuses on the relationship of PUB to off-airport land uses and the compatible and complementary development of each. To the maximum extent possible, future facilities will be designed to enhance the compatibility of the operation of PUB with the environs.

Goals for Development

Accompanying these assumptions are several goals which have been established for purposes of directing the plan and establishing continuity in the future development of PUB. These goals account for several categorical considerations relating to the needs of PUB, both in the short-term and the long-term, including safety, capacity, noise, capital improvements, land use compatibility, financial and economic conditions, public interest and investment, and community recognition and awareness. While all are project oriented, some obviously represent more tangible activities than others; however, all are deemed important and appropriate to the future of PUB.

The following goals are intended to guide the preparation of this Airport Master Plan and direct the future development and expansion of PUB:

- **Plan and develop PUB to be capable of accommodating the future needs of the City of Pueblo, Pueblo County, and the surrounding area.**
- **Program the construction of facilities when demand is realized (construction is demand driven, not forecast driven).**
- **Plan PUB to accommodate the forecast aircraft fleet safely and efficiently with the facilities needed to accommodate demand. The primary potential facilities improvements under consideration include:**
    - ✓ **Taxiway improvements, extensions, and reconfigurations to enhance airfield capacity.**
    - ✓ **A fourth runway to enhance airfield capacity.**
    - ✓ **Improvements to the terminal building to accommodate passenger screening and waiting areas more efficiently.**
    - ✓ **Construction and rehabilitation of apron and taxilanes needed to accommodate and facilitate aircraft parking.**
- **Provide effective direction for the future development through the preparation of a rational plan and adherence to the adopted development program.**
- **Plan and develop PUB to be environmentally compatible with the community. Minimize environmental impacts on both airport property and adjacent property.**
- **Integrate the needs of existing tenants with future airport development plans. Recognize and accommodate the needs of general aviation including corporate and flight training activity.**
- **Enhance the self-sustaining capability of PUB and the financial feasibility of proposed airport development.**

Airside Development Concepts, Alternatives, and Recommendations

Because all other functions relate to, and revolve around, the basic runway/taxiway layout and approaches, airside development alternatives must first be examined and evaluated. The primary objective of the airside alternatives analysis is to examine options that will result in the best and safest possible aircraft operating environment. The analysis has been prepared to provide PUB with a comprehensive outline of each alternative's key components and the advantages and disadvantages associated with each. Specific airside considerations include a fourth runway that increases airfield capacity, airfield dimensional standards and design criteria, taxiway geometry, and instrument approach capabilities.

Airfield Capacity

Initial Fourth Runway Alternatives

The planning and programming for airfield capacity enhancement involves, but is not limited to, an examination of a fourth runway. By adding additional runway capacity, overall airfield capacity is increased in expectation of the increased aviation activity demand. The fourth runway should be designed to Runway Reference Code (RDC) A-I standards since its principal function would be to accommodate increased training activity, which is expected to be dominated by the Diamond DA20 Katana aircraft. Only visual approaches are required.

FIGURE D1 provides an illustration of the five initial fourth runway alternative locations considered. While not illustrated, all runway alternatives would be served by a parallel taxiway, entrance taxiways at each runway end, and one exit taxiway at the mid-point of the runway. After an initial broad examination of the five alternatives using a qualitative analysis categories, two alternatives were carried forward using the RunwaySimulator model to quantify the change in airfield capacity provided. PUB Airport Traffic Control Tower (ATCT) personnel and PUB staff reviewed the runway alternatives and provided input.

East-West Option 1. This east-west oriented alternative is in the far north part of PUB property approximately 955 feet north of the Runway 17 threshold. This location is needed to provide an approximate ½ nautical mile (NM), or 3,000 feet, separation of the training traffic pattern flight track associated with Runway 8L/26R and the centerline of the new runway. By recommendation of ATCT personnel, the west runway end is aligned with the existing Runway ends 8R and 8L.

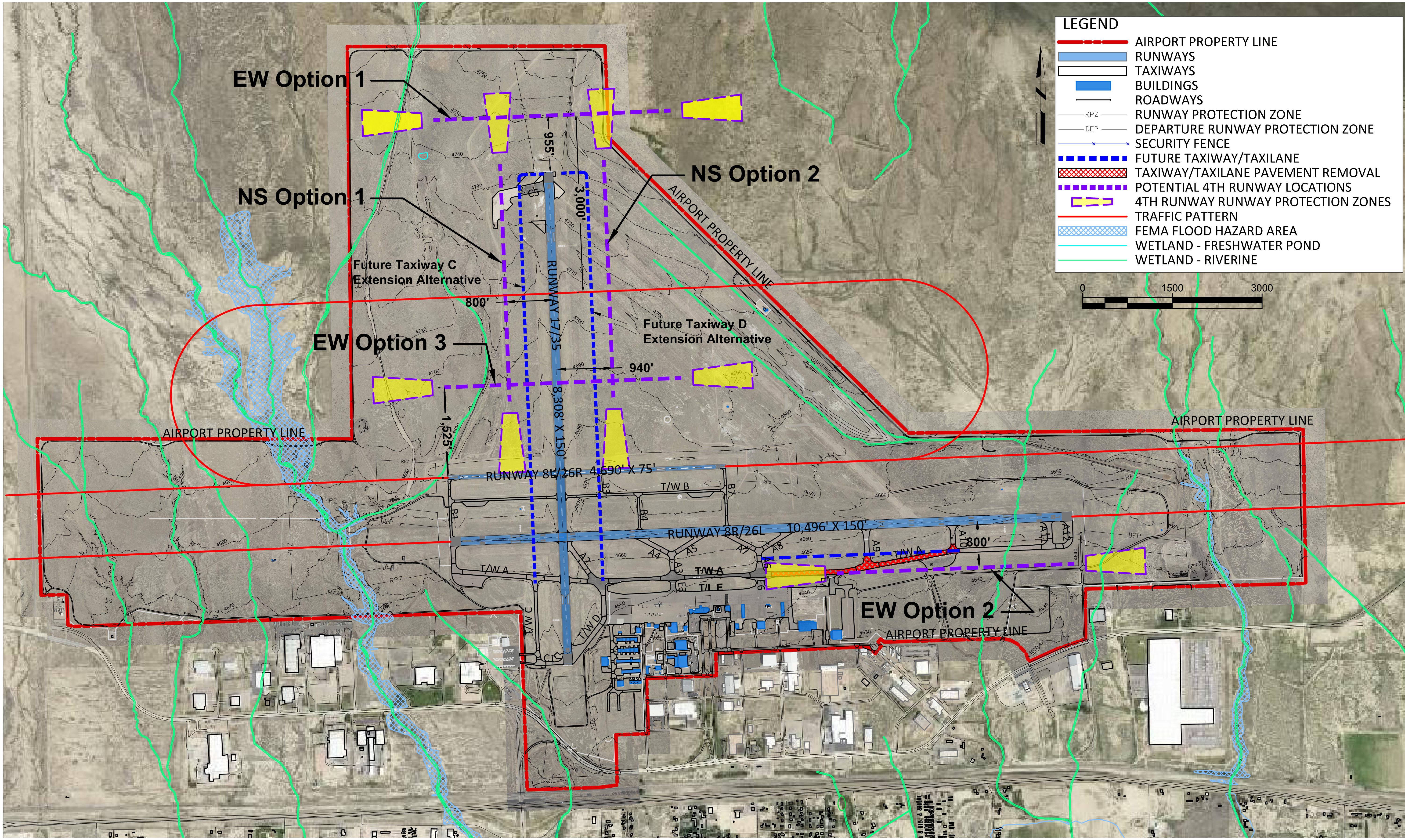


FIGURE D1 **Potential Fourth Runway Location Alternatives**

Advantages:

- **No wake turbulence concerns from large or heavy aircraft utilizing Runway 8R/26L simultaneously.**
- **Provides adequate separation to conduct simultaneous training operations to both this runway and Runway 8L/26R.**
- **Has no impact to drainageways.**

Disadvantages:

- **Potential line of sight (LOS) concerns from existing ATCT cab.**
- **Longest taxi times for training aircraft of the five options.**
- **Requires land acquisition and relocation of 10-foot perimeter fence for implementation.**
- **Terrain variations in the area north of Runway 8L/26R require extensive earthwork.**

East-West Option 2. This east-west oriented alternative is located south of Taxiway A at the east end PUB's airfield. It is located 300 feet south of Taxiway A corresponding to RDC C-III dimensional standards for runway to taxiway centerline separation. In this location it would require the realignment of Taxiway A between Taxiways A6 and A10.

Advantages:

- **Least amount of taxi times for training aircraft of the five options.**
- **No LOS concerns from existing ATCT cab.**

Disadvantages:

- **The 800-foot separation from Runway 8R/26L causes wake turbulence concerns from large or heavy aircraft utilizing the primary runway simultaneously.**
- **Concerns with overflying existing taxiways and buildings at low altitudes on approaches from and departures to the west.**
- **Steep terrain at the runway location would require extensive fill to provide necessary Runway Safety Area (RSA) width.**
- **Impacts a north-south drainageway and riverine wetland at the east end of the runway.**

East-West Option 3. This east-west oriented alternative is located approximately 2,600 feet north of Runway 8R/26L (1,525 feet north of Runway 8L/26R). Sited here, uninterrupted training operations can occur simultaneously with large and heavy itinerant aircraft operations on the primary runway.

Advantages:

- **Reduced taxi times for training aircraft compared to East-West Option 1.**
- **Improved ATCT visibility compared to East-West Option 1.**
- **The 2,600-foot separation from Runway 8R/26L causes no wake turbulence concerns from large or heavy aircraft utilizing the primary runway simultaneously.**

Disadvantages:

- **Limits operations on Runway 8L/26R to itinerant operations only (no training operations because there is not sufficient space for a traffic pattern that does not overlap the other parallel runways).**
- **Impacts a north-south drainageway and riverine wetland at the west end of the runway.**

North-South Option 1. This north-south oriented alternative is in the north part of PUB's airfield located west of Runway 17/35. Its south runway end is sited such that the southern RPZ remains clear of Runway 8L/26R, which extends the north runway end approximately 180 feet north of the Runway 17 threshold. It is located 300 feet west of a future extended Taxiway C (in accordance with RDC C-III dimensional standards for runway to taxiway centerline separation).

Advantages:

- **Would provide a slight airfield capacity enhancement compared to existing conditions. However, since it would only be required in extensive crosswind conditions and not preferred by training pilots during calm wind conditions, the enhancement provided would be less than the East-West options.**

Disadvantages:

- **Minimal capacity enhancement provided due to the small percentage of time that winds favor north/south operations at PUB.**
- **The 800-foot separation from Runway 17/35 causes wake turbulence concerns from large or heavy aircraft utilizing the crosswind runway simultaneously.**
- **Potential LOS concerns from existing ATCT cab, especially to the north runway end.**
- **Slight potential impact to north-south drainageway.**
- **Long taxi times for training aircraft, although less so than East-West Option 1.**

North-South Option 2. This north-south oriented alternative is also in the north part of PUB's airfield but is located east of Runway 17/35. Its south runway end is also sited such that the southern RPZ remains clear of Runway 8L/26R, which extends the north runway end approximately 180 feet north of the Runway 17 threshold. It is located 300 feet east of a future extended Taxiway D (in accordance with RDC C-III dimensional standards for runway to taxiway centerline separation).

Advantages:

- **Would provide a slight airfield capacity enhancement compared to existing conditions (similar to North-South Option 1). However, since it would only be required in extensive crosswind conditions and not preferred by training pilots during calm wind conditions, the enhancement provided would be less than the East-West options.**
- **Has no impact to drainageways.**

Disadvantages:

- **Minimal capacity enhancement provided due to the small percentage of time that winds favor north/south operations at PUB.**
- **The 950-foot separation from Runway 17/35 causes wake turbulence concerns from large or heavy aircraft utilizing the crosswind runway simultaneously, although less so compared to North-South Option 1 and East-West Option 2.**
- **Potential LOS concerns from existing ATCT cab, especially to the north runway end.**
- **Terrain variations along the length of the runway requires extensive earthwork to construct.**
- **Long taxi times for training aircraft, although less so than East-West Option 1.**
- **Requires land acquisition for implementation.**

Refined Fourth Runway Alternatives

Given that prevailing winds at PUB heavily favor east/west operations, this runway orientation is expected to have a significantly greater capacity enhancement than the north/south alternatives. Consequently, the north/south alternatives were eliminated from further consideration. East-West Option 2 was also eliminated due to the safety concerns related to overflying the existing developed areas on the airfield as well as the wake turbulence concerns that would reduce the capacity enhancement provided by a runway in this location.

East-West Options 1 and 3 were carried forward for further evaluation. Specifically, analysis was conducted utilizing RunwaySimulator to quantify the capacity enhancement provided by both alternatives. It is also expected that both alternatives will reduce or eliminate the wake turbulence concerns from simultaneous large or heavy aircraft operations on a parallel runway.

Background

Prior to evaluating and comparing the anticipated capacity enhancements provided by the two east/west runway alternatives using computer modeling, it is necessary to establish an ASV of the existing airfield configuration using computer modeling (Runway Simulator) so that a direct comparison can be made of the improvements. Determining ASV via the computer modeling follows a similar process used in FAA's Advisory Circular (AC) 150/5060-5, *Airport Capacity and Delay*.

The model is used to determine the base hourly capacities of the four existing airfield configurations presented in **Appendix E**. For reference, these four configurations are:

- **VFR Runways 8R/26L and 8L/26R**
- **VFR Runway 17/35**
- **IFR Runways 8R/26L and 8L/26R**
- **IFR Runway 17/35.**

Once the hourly capacity base of each of these configurations is determined through computer modeling, the same methods from AC 150/5060-5 are applied to account for weather conditions, touch and go frequency, taxiway exits, and local demand ratios. The resulting adjusted hour bases for each scenario is shown below:

- **Configuration 1: VFR Runways 8R/26L and 8L/26R**
  - ✓ C* x T x E = 143.5 x 1.2 x 1.0 = 172.2 operations.
- **Configuration 2: VFR Runway 17/35**
  - ✓ C* x T x E = 61 x 1.2 x 0.86 = 63 operations.
- **Configuration 3: IFR Runways 8R/26L and 8L/26R**
  - ✓ C* x T x E = 52.8 x 1.0 x 1.0 = 52.8 operations.
- **Configuration 4: IFR Runway 17/35**
  - ✓ C* x T x E = 45.7 x 1 x 0.86 = 39.3 operations.

These hourly capacities are then used to determine the weighted capacity of 108.29. Finally, this is combined with the local demand factors determined in the previous chapter to calculate the ASV.

$ASV = C_W \times D \times H$
$ASV = 108.29 \times 323.07 \times 9.09$
$ASV = 318{,}162$

By comparison, as presented in the previous chapter using only the methodology from AC 150/5060-5 (i.e., no computer modeling), an ASV of 462,108 operations was determined. While this is a notable difference, the primary reason for this change is the method through which the AC determines the hourly capacity base. Once the appropriate runway configurations and corresponding charts from AC 150/5060-5 are determined, the mix index is the primary influence. The fleet mix, and resulting mix index, at PUB is unique to airports with large training programs. Although commercial service is available at PUB, the strong presence of flight training aircraft means that these more demanding aircraft make up a very small percentage of the total fleet mix. Operations by the CRJ 200 for instance, which is used for air carrier service at PUB, made up only 0.8% of operations in 2019. The resulting fleet mix index of 1.0 results in an VFR hourly capacity base of 200 as opposed to 143.5 presented above in Configuration 1.

Capacity Analysis Results

From an airfield capacity standpoint, both east/west runway alternatives are similar in that they both propose a third parallel runway. The primary difference is that the reduced separation between Runway 8L/26R and the East-West Option 3 would reduce the number of IFR operations slightly due to the increased separation required between aircraft during IFR conditions. The computer derived hourly capacity base (C*), the weighted capacity (C_W), and ASV calculations for each runway alternative are provided below.

East-West Option 1

- **Configuration 1: VFR Runways 8R/26L, 8L/26R and East-West Option 1**
  - ✓ *C* x T x E* = 218.7 x 1.2 x 1.0 = 262.4 operations.
- **Configuration 2: VFR Runway 17/35**
  - ✓ *C* x T x E* = 61 x 1.2 x 0.86 = 63 operations.
- **Configuration 3: IFR Runways 8R/26L, 8L/26R and proposed East-West Option 1**
  - ✓ *C* x T x E* = 100.9 x 1.0 x 1.0 = 100.9 operations.
- **Configuration 4: IFR Runway 17/35**
  - ✓ *C* x T x E* = 45.7 x 1 x 0.86 = 39.3 operations.

$ASV = C_W \times D \times H$
$ASV = 147.69 \times 323.07 \times 9.09$
$ASV = 433{,}930$

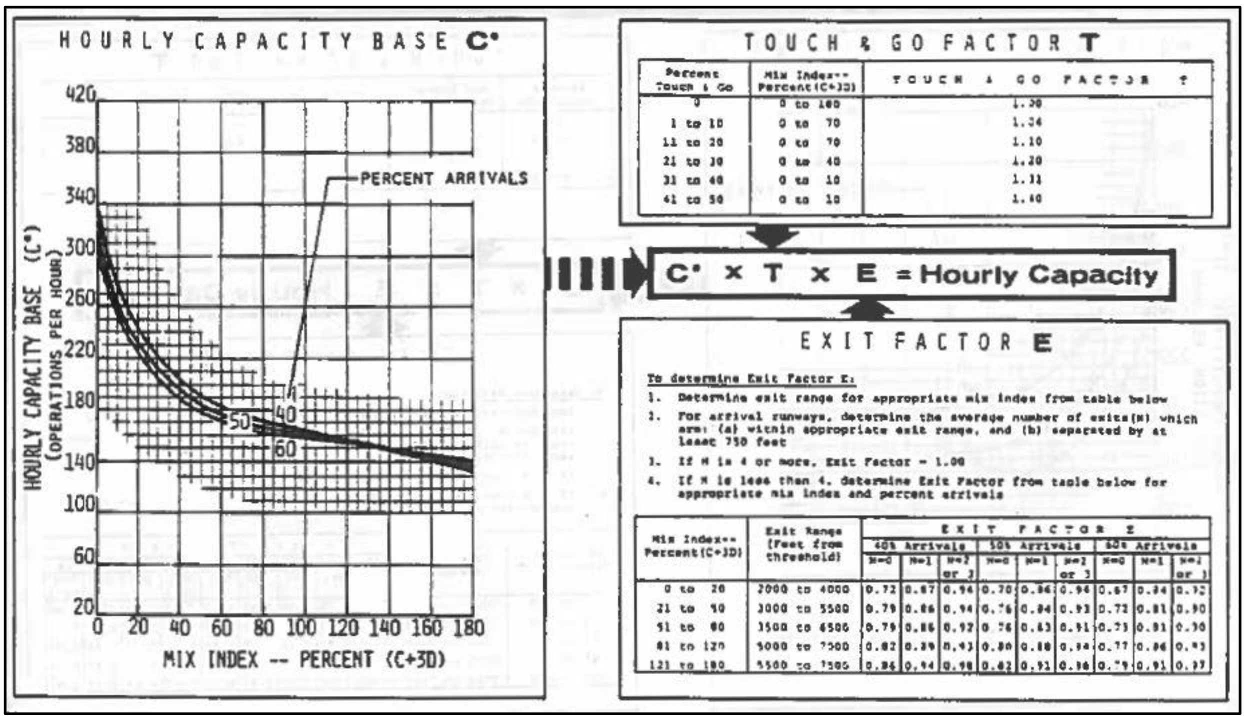
East-West Option 3

- **Configuration 1: VFR Runways 8R/26L, 8L/26R and East-West Option 3**
  - ✓ *C* x T x E* = 218.7 x 1.2 x 1.0 = 262.6 operations.
- **Configuration 2: VFR Runway 17/35**
  - ✓ *C* x T x E* = 61 x 1.2 x 0.86 = 63 operations.
- **Configuration 3: IFR Runways 8R/26L, 8L/26R and proposed East-West Option 3**
  - ✓ *C* x T x E* = 100.9 x 1.0 x 1.0 = 90.1 operations.
- **Configuration 4: IFR Runway 17/35**
  - ✓ *C* x T x E* = 45.7 x 1 x 0.86 = 39.3 operations.

$ASV = C_W \times D \times H$
$ASV = 147.12 \times 323.07 \times 9.09$
$ASV = 432{,}259$

For comparison, the ASV for each runway alternative was determined using only the methodology from AC 150/5060-5. Using the new runway configurations and applying the VFR and IFR performance curves for East-West Option 1, presented in **FIGURE D2** and **FIGURE D3**, respectively, and the VFR and IFR performance curves for East-West Option 3, presented in **FIGURE D4** and **FIGURE D5**, respectively, the methodology for calculating ASV is the same as presented previously. The charts contained on the left provide hourly capacity base (C*) for the appropriate mix index, the tables in the upper right hand corner provide the touch and go factor (T), and the tables in the bottom right hand corner provide the exit factor (E) based on number of exit taxiways. Since the north-south flow conditions of Runway 17/35 would remain the same for both east-west runway alternatives, it is not presented but is considered in the ASV calculations.

FIGURE D2 Configuration 1: VFR Runways 8R/26L, 8L/26R, and Proposed East-West Option 1



TOUCH & GO FACTOR T

Percent Touch & Go	Mix Index-- Percent (C+3D)	TOUCH & GO FACTOR T
0	0 to 180	1.00
1 to 10	0 to 70	1.04
11 to 20	0 to 70	1.10
21 to 30	0 to 40	1.20
31 to 40	0 to 10	1.31
41 to 50	0 to 10	1.40

EXIT FACTOR E

To determine Exit Factor E:

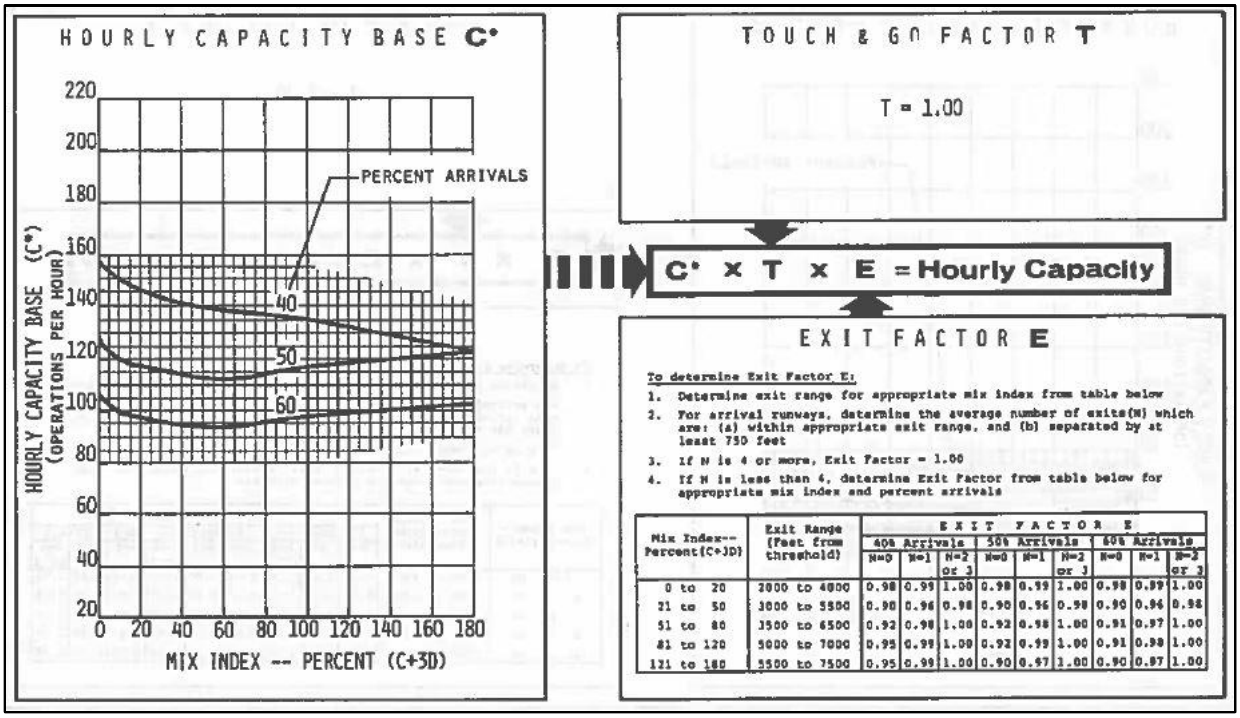
1. Determine exit range for appropriate mix index from table below
2. For arrival runways, determine the average number of exits (N) which are: (a) within appropriate exit range, and (b) separated by at least 750 feet
3. If N is 4 or more, Exit Factor = 1.00
4. If N is less than 4, determine Exit Factor from table below for appropriate mix index and percent arrivals

Mix Index-- Percent (C+3D)	Exit Range (Feet from threshold)	EXIT FACTOR E								
		40% Arrivals			50% Arrivals			60% Arrivals		
		N=0	N=1	N=2 or 3	N=0	N=1	N=2 or 3	N=0	N=1	N=2 or 3
0 to 20	2000 to 4000	0.72	0.87	0.94	0.70	0.86	0.94	0.67	0.84	0.92
21 to 50	3000 to 5500	0.79	0.86	0.94	0.76	0.84	0.93	0.72	0.81	0.90
51 to 80	3500 to 6500	0.79	0.86	0.92	0.76	0.83	0.91	0.73	0.81	0.90
81 to 120	5000 to 7000	0.82	0.89	0.93	0.80	0.88	0.94	0.77	0.86	0.93
121 to 180	5500 to 7500	0.86	0.94	0.98	0.82	0.91	0.96	0.79	0.91	0.97

SOURCE: FAA AC 150/5060-5, *Airport Capacity and Delay*, Figure 3-19.

- **Configuration 1: VFR Runways 8R/26L, 8L/26R, and Proposed East-West Option 1**
  - *C* x T x E* = 305 x 1.2 x 1.0 = 366.0 operations.

FIGURE D3 **Configuration 3: IFR Runways 8R/26L, 8L/26R, and Proposed East-West Option 1**

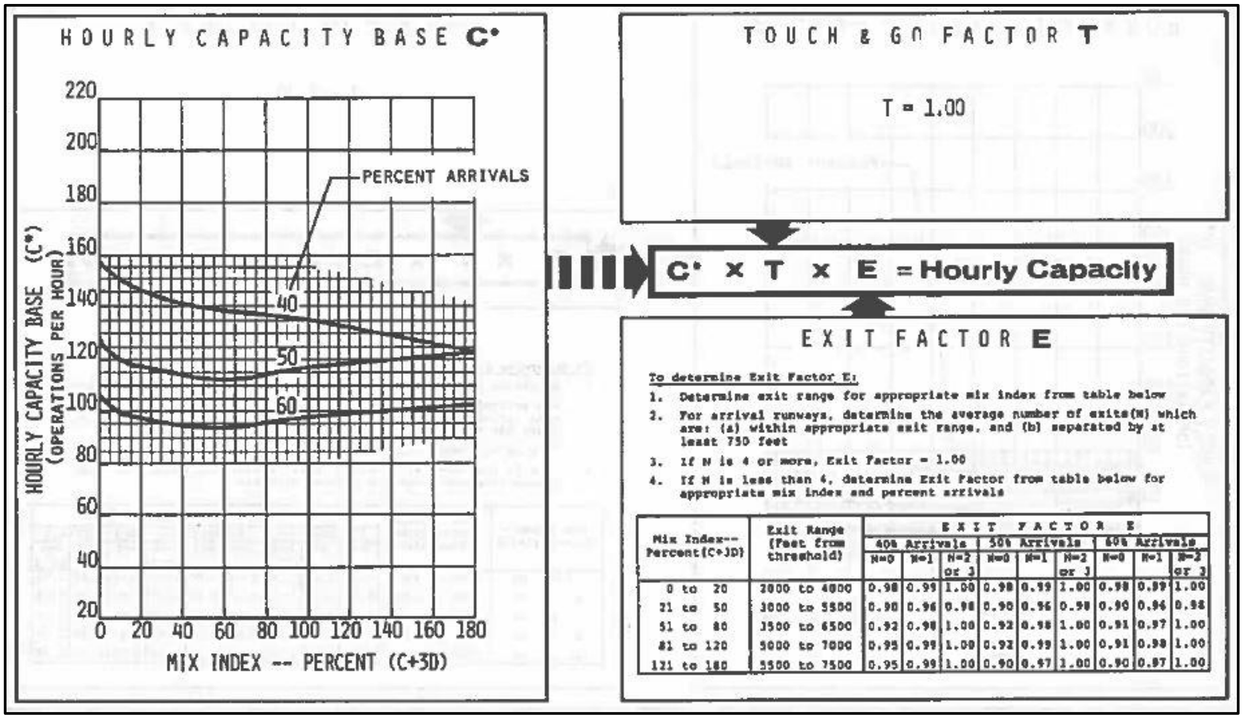


Mix Index--Percent (C+3D)	Exit Range (Feet from threshold)	EXIT FACTOR E 40% Arrivals N=0	N=1	N=2 or 3	50% Arrivals N=0	N=1	N=2 or 3	60% Arrivals N=0	N=1	N=2 or 3
0 to 20	2000 to 4000	0.98	0.99	1.00	0.98	0.99	1.00	0.98	0.99	1.00
21 to 50	3000 to 5500	0.90	0.96	0.98	0.90	0.96	0.98	0.90	0.96	0.98
51 to 80	3500 to 6500	0.92	0.98	1.00	0.92	0.98	1.00	0.91	0.97	1.00
81 to 120	5000 to 7000	0.95	0.99	1.00	0.92	0.99	1.00	0.91	0.98	1.00
121 to 180	5500 to 7500	0.95	0.99	1.00	0.90	0.97	1.00	0.90	0.97	1.00

SOURCE: FAA AC 150/5060-5, *Airport Capacity and Delay*, Figure 3-55.

- **Configuration 3: IFR Runways 8R/26L, 8L/26R, and Proposed East-West Option 1**
  - *C* x T x E* = 126 x 1.0 x 1.0 = 126.0 operations.

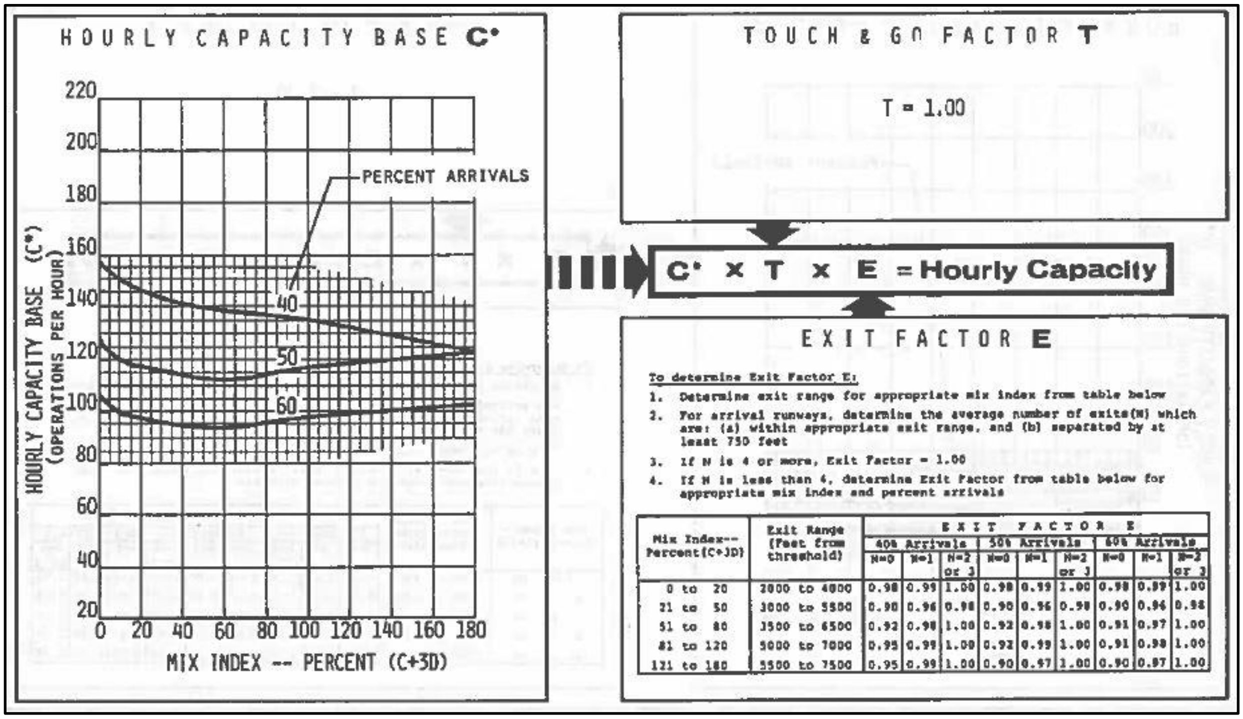
FIGURE D4 **Configuration 1: VFR Runways 8R/26L, 8L/26R, and Proposed East-West Option 3**



SOURCE: FAA AC 150/5060-5, *Airport Capacity and Delay*, Figure 3-18.

- **Configuration 1: VFR Runways 8R/26L, 8L/26R, and Proposed East-West Option 3**
    - *C* x T x E* = 302 x 1.2 x 1.0 = 362.4 operations.

FIGURE D5 **Configuration 1: IFR Runways 8R/26L, 8L/26R, and Proposed East-West Option 3**



SOURCE: FAA AC 150/5060-5, *Airport Capacity and Delay*, Figure 3-49.

- **Configuration 3: IFR Runways 8R/26L, 8L/26R, and Proposed East-West Option 3**
  - *C* x T x E* = 63 x 1.0 x 1.0 = 63.0 operations.

The different configurations and resulting ASV for each alternative are presented in **TABLE D1**. As presented, East-West Runway Options 1 and 3 result in very similar ASV enhancements (an approximate 0.4 percent difference in the computer modeled ASV calculations). By comparison, the ASV calculation derived from using AC 150/5060-5 only also resulted in very similar enhancements (an approximate 2.4 percent difference). From an airfield capacity standpoint enhancement only, East-West Runway Option 1 provides a modest advantage over East-West Runway Option 3 due to its greater runway separation from Runway 8L/26R. This is true for both the computer model and AC methodologies.

TABLE D1 Runway Alternatives Airfield Capacity Enhancement

AIRFIELD CONFIGURATION	COMPUTER MODEL DERIVED ASV	PERCENTAGE CHANGE	ADVISORY CIRCULAR DERIVED ASV	PERCENTAGE CHANGE
Existing Configuration	318,162	-	462,108	-
East-West Option 1	433,930	36.4%	629,717	36.3%
East-West Option 3	432,259	35.9%	614,836	33.1%

SOURCE: Mead & Hunt analysis using RunwaySimulator computer model and FAA AC 150/5060-5, *Airport Capacity and Delay*.

Recommendation. East-West Runway Option 3 is the preferred runway alternative as it provides nearly an identical increase in airfield capacity as East-West Runway Option 1, but the taxi times for training aircraft to access the runway would be less. While East-West Option 3 does impact the north-south drainageway and riverine wetland, it does not require additional property to implement. Finally, East-West Runway Option 3 poses fewer visibility and LOS concerns from the existing ATCT cab than East-West Runway Option 1. Although consideration of a taller ATCT or a relocated ATCT prior to construction of this runway is recommended.

Taxiway Improvements

Other capacity enhancing improvements to the existing airfield configuration were considered and are presented below. They consist of taxiway improvements that either reduce runway occupancy times for landing aircraft or enhance the ATCT personnel abilities to maximize utility of the existing runway system configuration. **FIGURE D6** presents the improvement options.

Taxiway C Extension. Extending Taxiway C to a full parallel taxiway serving Runway 17/35 provides ATCT personnel the ability to use Runway 17/35 for takeoffs to the north of Runway 8L/26R while simultaneously using the parallel runways for departures, landings, or training operations, thus enhancing airfield capacity. It allows aircraft the ability to taxi to and from Runway end 17 without back taxiing on the runway. Additionally, it eliminates the need for aircraft utilizing Runway 26R to cross Runway 8R/26L at the Taxiways A7 and B7 intersection, a “high energy” runway crossing discussed later in this chapter.

Advantages:
- **Eliminates back taxiing on Runway 17/35.**
- **Eliminates the high energy crossing in the middle third of Runway 8R/26L.**

Disadvantages:
- **Potential LOS concerns to north end of taxiway from existing ATCT cab.**
- **Construction costs could outweigh benefits gained.**

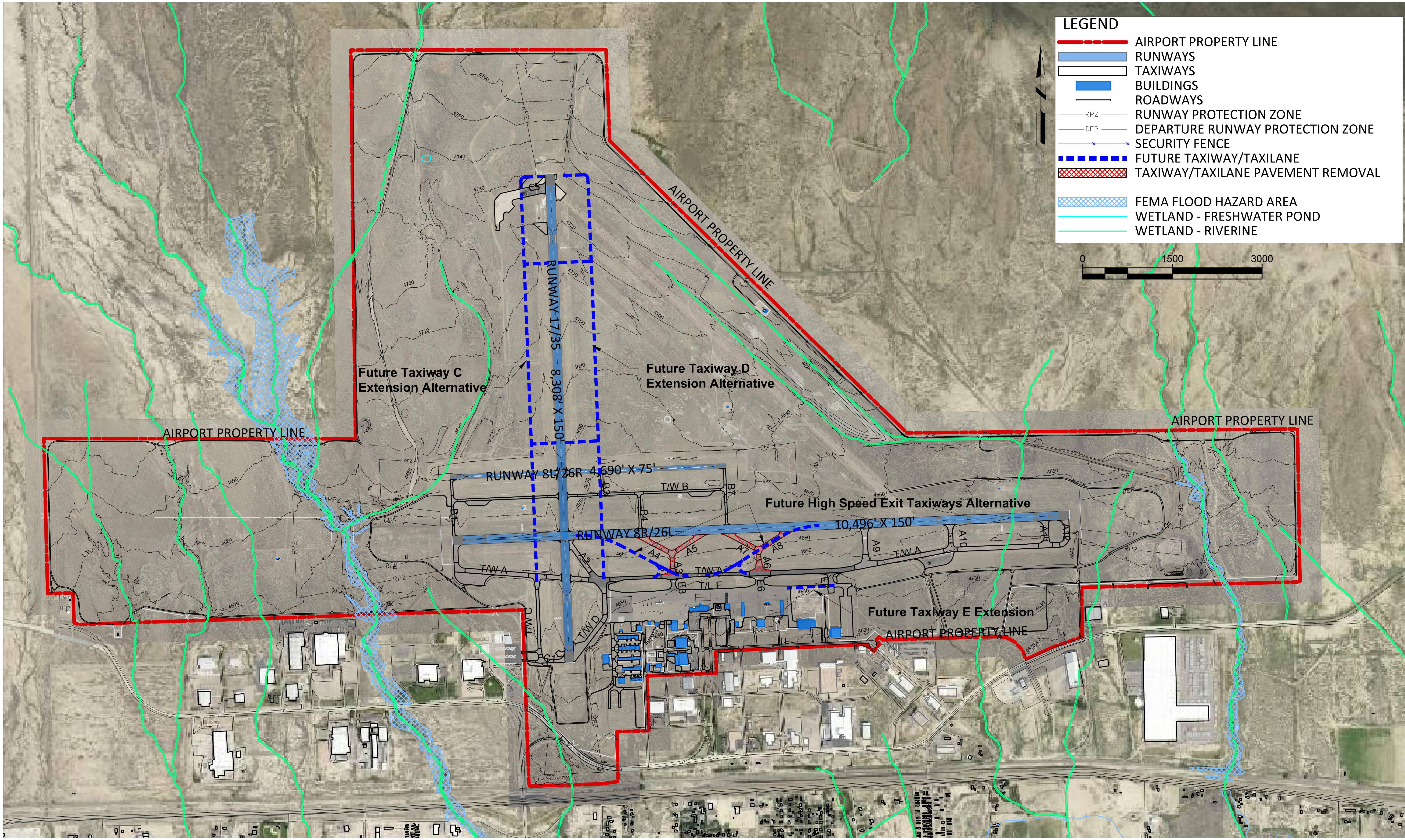


FIGURE D6 **Taxiway Capacity Enhancement Alternatives**

Master Plan Pueblo Airport

Taxiway D Extension. Extending Taxiway D to a full parallel taxiway serving Runway 17/35 also provides ATCT personnel the ability to use Runway 17/35 for takeoffs to the north of Runway 8L/26R while simultaneously using the parallel runways for departures, landings, or training operations, thus enhancing airfield capacity. It also allows aircraft the ability to taxi to and from Runway end 17 without back taxiing on the runway. And finally, it eliminates the need for aircraft utilizing Runway 26R to cross Runway 8R/26L at the Taxiways A7 and B7 intersection, a “high energy” runway crossing, and a crossing that rarely occurs according to PUB staff.

Advantages:

- **Eliminates back taxiing on Runway 17/35.**
- **Eliminates the high energy crossing in the middle third of Runway 8R/26L.**

Disadvantages:

- **Potential LOS concerns to north end of taxiway from existing ATCT cab.**
- **Steep terrain between Taxiway A and Runway 8R/26L (existing grade of approximately 2.0 percent) proves challenging to meet the maximum 1.5 percent longitudinal gradient standard for airports accommodating aircraft with approach categories C, D, and E.**
- **Terrain variations along the length of the taxiway north of Runway 8L/26R requires extensive earthwork to construct.**
- **Construction costs could outweigh benefits gained.**

High Speed Exit Taxiways. Acute-angled, high speed exit taxiways normally increase airfield capacity by reducing runway occupancy times. Replacing the existing Y configured Taxiways A3, A4, A5, A6, A7, and A8 with two high speed exit taxiways has the potential to improve PUB’s airfield capacity. As presented in **FIGURE D6**, by lengthening the segment between the runway and Taxiway A, it appears the maximum 1.5 percent longitudinal gradient standard can be achieved. This provides an additional benefit of rectifying the existing non-standard longitudinal gradients associated with Taxiways A3, A6, A7, and A8.

However, by replacing four mid-runway exit taxiways (Taxiways A4, A5, A7, and A8, which can be used at faster than normal speeds than right angled taxiways) with only two exit taxiways, airfield capacity is in fact not improved. For instance, aircraft landing to Runway 8R not able to reduce speed sufficiently to exit at the future east-flow high speed exit taxiway (located approximately 2,200 feet from the Runway 8R threshold) must continue another approximate 3,500 feet along the runway before encountering the next exit taxiway (the future west-flow high speed exit taxiway, a maneuver requiring an approximate 150-degree turn). Should this exit prove to be problematic, then aircraft must travel an additional 1,300 feet before exiting at Taxiway A9.

Consequently, aircraft landing to Runway 26L not able to reduce speed sufficiently to exit at the future west-flow high speed exit taxiway (located approximately 4,300 feet from the Runway 26L threshold) must continue another approximate 3,600 feet along the runway before encountering the next exit taxiway (the future east-flow high speed exit taxiway, a maneuver requiring an approximate 150-degree turn). Should this exit prove to be problematic, then aircraft must travel an additional 2,500 feet before exiting at Taxiway A1. The increased distance between mid-runway exit taxiways, even if high speed exits, tends to increase runway occupancy times and thus decrease airfield capacity.

Advantages:

- **Corrects the longitudinal gradient standards exceeding the 1.5 percent maximum associated with existing Taxiways A3, A6, A7, and A8.**

Disadvantages:

- **Removes multiple mid-runway exit taxiways potentially useful for smaller aircraft.**
- **Construction costs could outweigh benefits gained.**

Recommendation. Extend Taxiway C to full length parallel taxiway serving Runway 17/35. Provide ample exit taxiways spaced to minimize runway occupancy times of landing aircraft and allow for departures to the north of Runway 8L/26R while simultaneously using the parallel runways for departures, landings, or training operations. It is not recommended to replace Taxiways A3, A4, A5, A6, A7, and A8 with high-speed exit taxiways as is unlikely that the benefits derived would outweigh the costs incurred.

Runway Design Standards

Runway 8R/26L ROFA

As presented in the previous chapter, an FAA-owned equipment building is located within the Runway 8R/26L Runway Object Free Area (ROFA) southwest of the Runway 8R threshold, approximately 260 feet south of the runway centerline. Thus, the ROFA width is deficient by 140 feet, providing only a total width of 660 feet.

Recommendation. Relocate the equipment building a minimum 140 feet to the south outside the ROFA.

Taxiway Holding Position Lines and Signs

As presented in the previous chapter, all holding position lines marked on taxiways serving Runway 8R/26L, except for Taxiway A2, are deficient by 22 feet. Similarly, many of the Runway 17/35 connector taxiways do not meet the 297-foot holding position line standard required at PUB’s elevation.

Recommendation. Plan and program for the relocation of holding position lines and signs on taxiways serving Runways 8R/26L and 17/35 at the next scheduled pavement rehabilitation projects.

Runway 17/35 Gradient

As presented in the previous chapter, the overall Runway 17/35 longitudinal gradient of 1.0 percent exceeds the allowable 0.8 percent standard within the last 25 percent of runway length.

Recommendation. At the next scheduled Runway 17/35 pavement reconstruction project, evaluate the cost of and benefits to achieving the standard 0.8 percent gradient within the last 25 percent of the runway length. If benefits are found to outweigh the cost incurred, then plan and program for the project to include the correction of this deficiency.

Instrument Approach Procedure Improvements

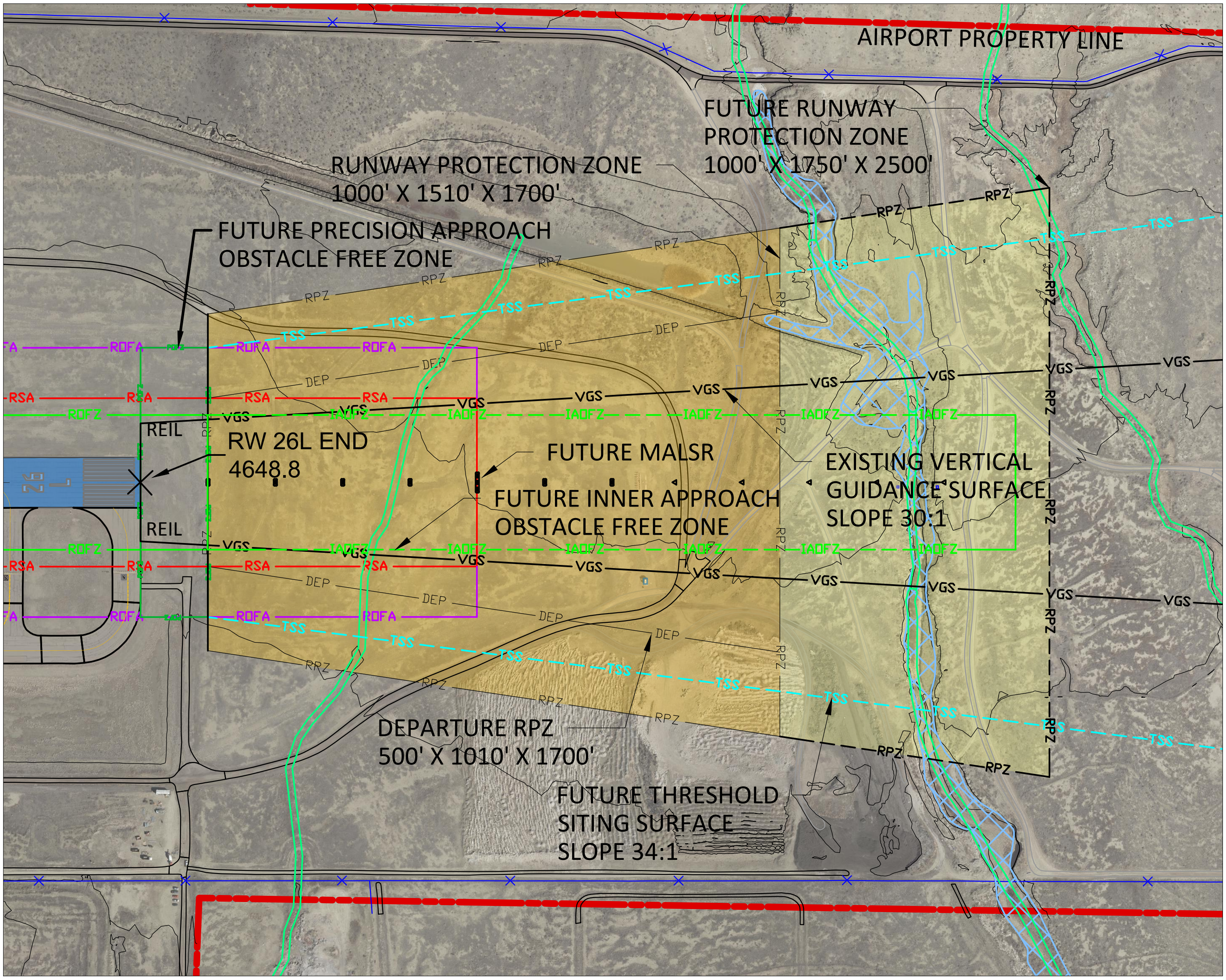
As stated in the previous chapter, an evaluation of implementing improved GPS-based Instrument Approach Procedures (IAP) to Runways 26L, 17, and 35 are warranted to enhance PUB's access during inclement weather conditions.

Runway 26L

Since this runway is already equipped with an Instrument Landing System (ILS) and Area Navigation (RNAV) Global Positioning Satellite (GPS) approaches with visibility minimums as low as ¾-mile, the installation of a Medium Intensity Approach Light System with Runway Alignment Indicator Lights (MALSR) would provide lighting credit enabling a decrease of the visibility minimums to as low as ½-mile. In doing so, the RPZ and threshold siting surface would increase in size accordingly. **FIGURE D7** illustrates the location of the MALSR, increased RPZ, increased threshold siting surface, and existing vertical guidance approach surface associated with this IAP improvement. The future RPZ would remain entirely on PUB property. The outer one or two light units of the MALSR would be located within or close to a riverine wetland and floodplain. There are no known obstructions to either the threshold siting or vertical guidance approach surfaces.

Runway 17

To achieve an IAP with visibility minimums as low as ¾-mile to Runway 17, as designated on the existing Airport Layout Plan (ALP), an enhancement to the existing RNAV (GPS) approach can be implemented. According to FAA Advisory Circular (AC) 150/5300-13A, an Approach Lighting System (ALS) is recommended but not required for this type of IAP. Non-precision markings are required and are currently provided to Runway 17. In implementing this type of IAP, the RPZ and threshold siting surface would increase in size accordingly. It is anticipated that this IAP would provide vertical guidance so a vertical guidance approach surface would be required that is free of any obstructions. **FIGURE D8** illustrates the location of the increased RPZ, larger threshold siting surface, and the vertical guidance approach surface associated with this IAP improvement. The future RPZ would remain entirely on PUB property. There are no known obstructions to either the threshold siting or vertical guidance approach surfaces.



LEGEND

- AIRPORT PROPERTY LINE
- RUNWAYS
- TAXIWAYS
- BUILDINGS
- ROADWAYS
- RSA — RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA
- ROFZ — RUNWAY OBSTACLE FREE ZONE
- RVZ — RUNWAY VISIBILITY ZONE
- RPZ — RUNWAY PROTECTION ZONE
- DEP — DEPARTURE RUNWAY PROTECTION ZONE
- POFZ — PRECISION APPROACH OBSTACLE FREE ZONE
- VGS — EXISTING VERTICAL GUIDANCE SURFACE
- SECURITY FENCE
- RPZ — FUTURE RUNWAY PROTECTION ZONE
- IAOFZ — FUTURE INNER APPROACH OBSTACLE FREE ZONE
- TSS — FUTURE THRESHOLD SITING SURFACE
- FEMA FLOOD HAZARD AREA
- WETLAND - RIVERINE

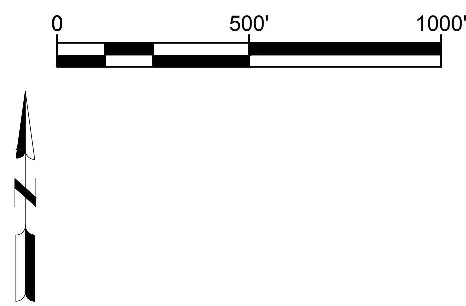
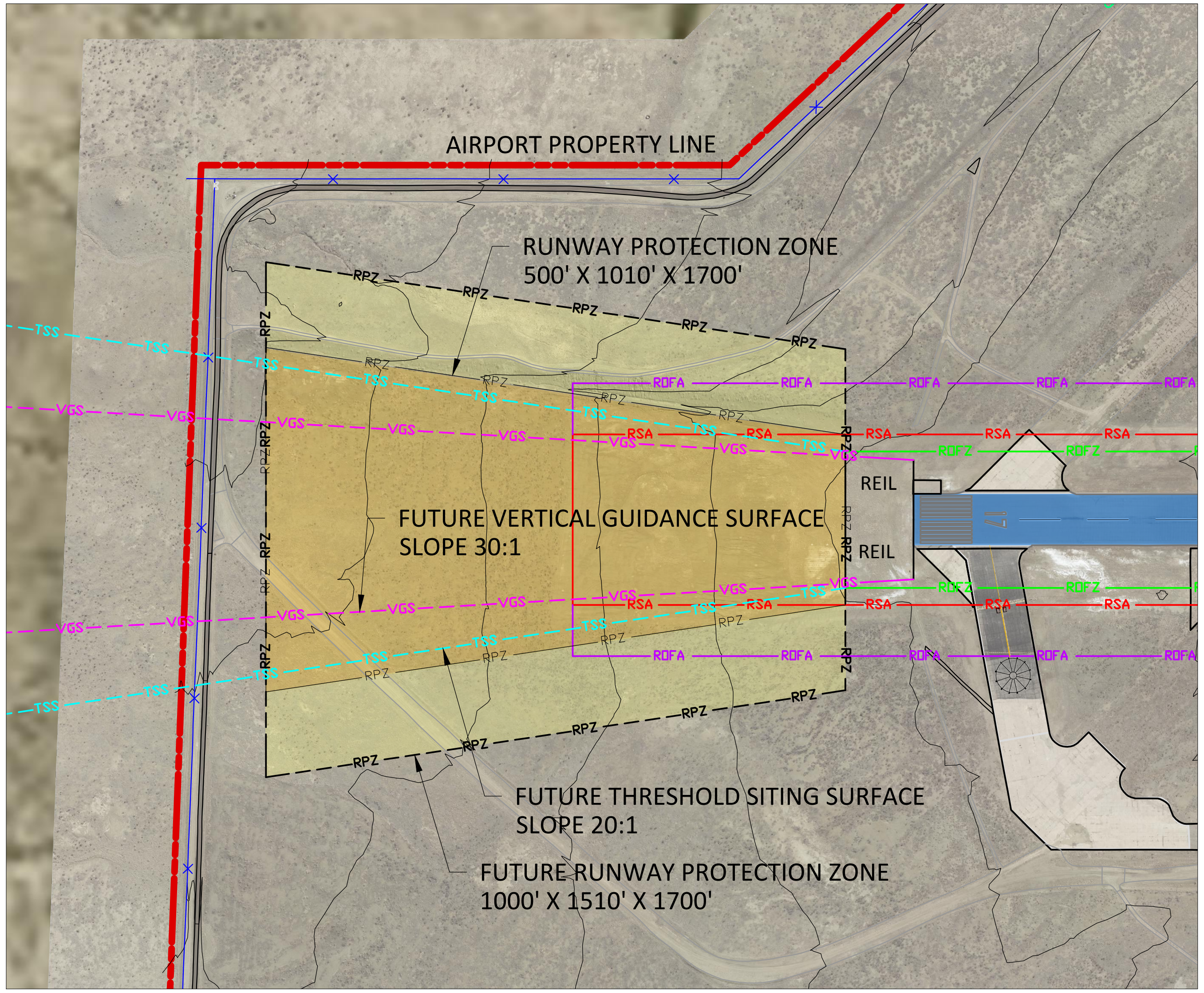
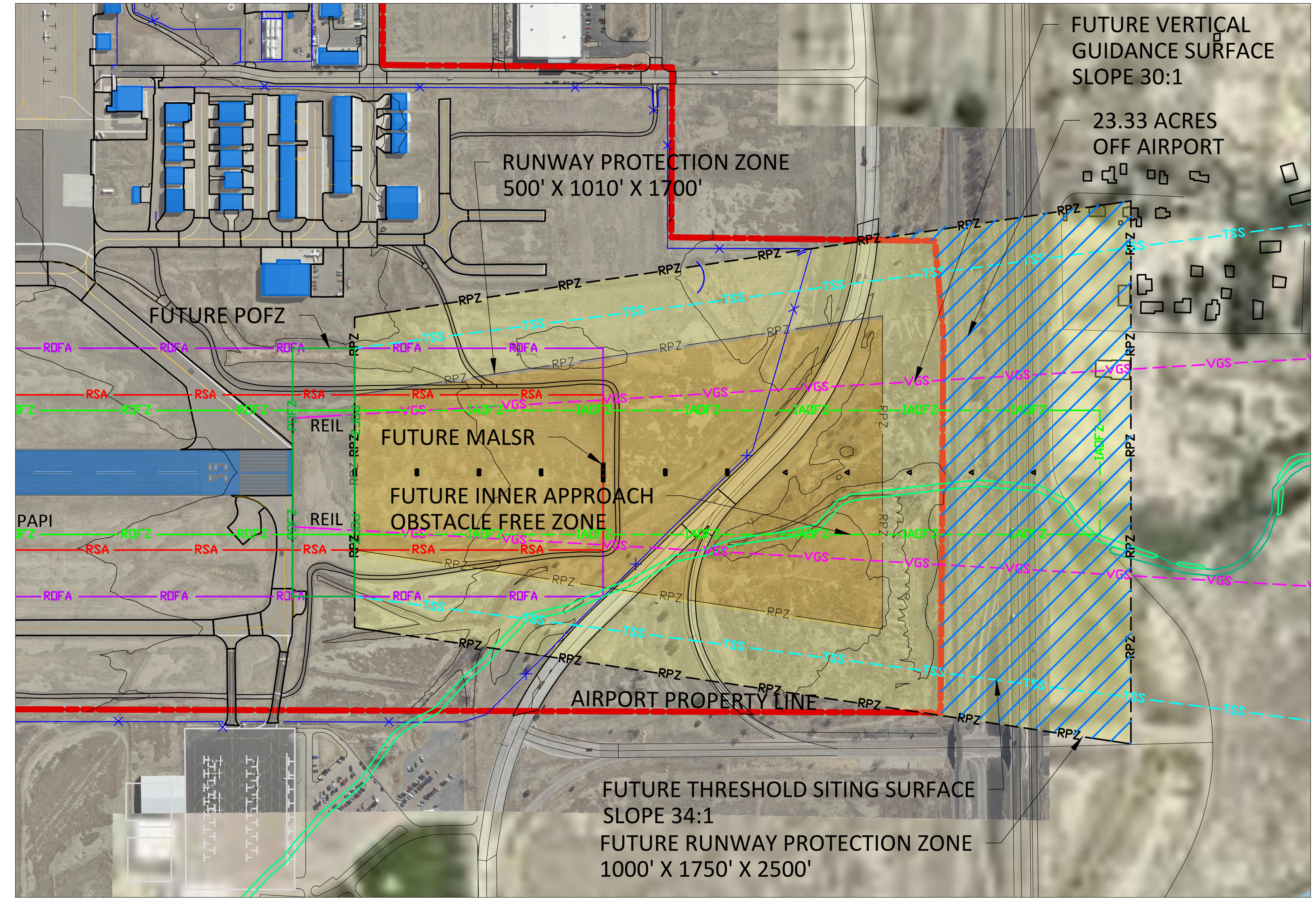
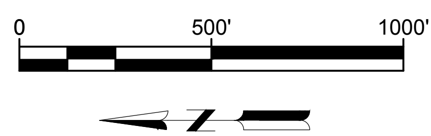


FIGURE D7 **Runway 26L IAP Improvement Requirements**







LEGEND

- AIRPORT PROPERTY LINE
- RUNWAYS
- TAXIWAYS
- BUILDINGS
- ROADWAYS
- RSA — RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA
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- SECURITY FENCE
- VGS — FUTURE VERTICAL GUIDANCE SURFACE
- RPZ — FUTURE RUNWAY PROTECTION ZONE
- IAOFZ — FUTURE INNER APPROACH OBSTACLE FREE ZONE
- TSS — FUTURE THRESHOLD SITING SURFACE
- WETLAND - RIVERINE

FIGURE D8 **Runway 17/35 IAP Improvement Requirements**

Runway 35

As presented in the previous chapter, when considering individual runway ends, Runway 35 provides the best wind coverage for the 13- and 20-knot crosswind components during Instrument Flight Rules (IFR) weather conditions. It is second only to Runway 8R for providing the best wind coverage for the 10.5-knot crosswind component. To achieve an IAP with visibility minimums as low as ½-mile to Runway 35, as designated on the existing ALP, an enhancement of the existing RNAV (GPS) approach to a Localizer Performance with Vertical Guidance (LPV) approach is expected. In doing so, the RPZ and threshold siting surface would increase in size accordingly. The provision of a MALSR and precision markings would be required. Additionally, a vertical guidance approach surface free of any obstacle penetrations would be required for implementation. **FIGURE D8** also illustrates the location of the MALSR, increased RPZ, larger threshold siting surface, and the vertical guidance approach surface associated with the Runway 35 IAP improvement.

The future RPZ would extend beyond PUB property (approximately 23 acres) and encompass State Highway 96. Because public roadways are considered incompatible land uses within an RPZ, coordination with FAA headquarters is required before approval of this improved IAP can be granted. There are no obstructions to either of the threshold siting or vertical guidance approach surfaces.

Recommendation. Continue to include the improved visibility minimum IAPs as shown on the existing ALP. The cost to mitigate the incompatible land uses within the Runway 35 RPZ might outweigh the benefits gained, but preserving the airspace associated with the improved IAPs assures that future implementation is not impeded by obstructions created beyond PUB's boundary.

Taxiway/Taxilane Design Standards

As presented in the previous chapter, there are multiple occurrences of PUB's taxiway geometry and design standards not meeting current FAA guidelines. Each occurrence is reviewed below and a recommendation provided that corrects the deficiency. **FIGURE D9** illustrates the taxiway and taxilane deficiencies and potential corrective measures that will rectify the deficiencies.

A general recommendation for the entire PUB taxiway system is that as pavement conditions warrant reconstruction, design guidelines providing for "cockpit over centerline" and adequate Taxiway Edge Safety Margin (TESM) be used for appropriate fillet design at intersections.

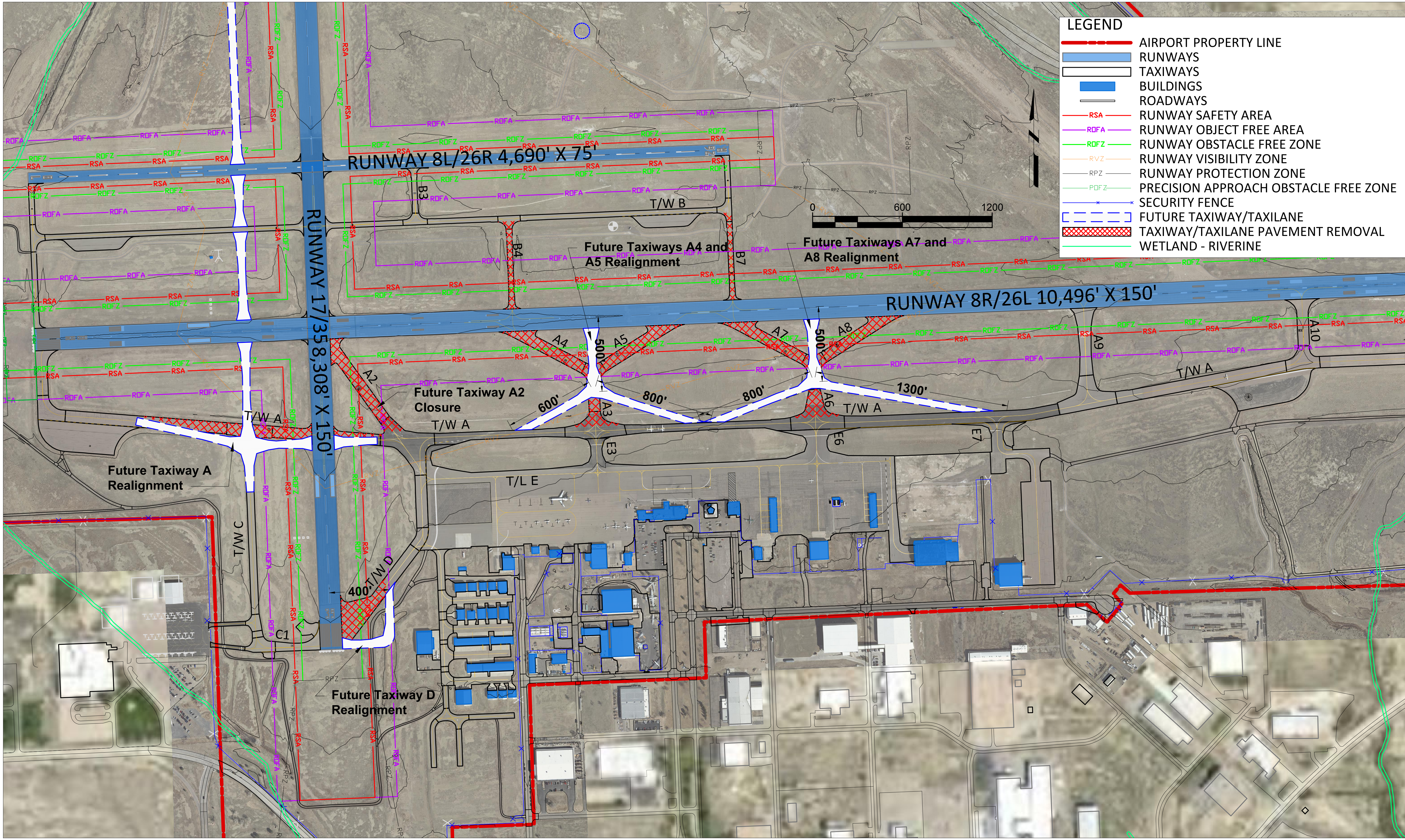

FIGURE D9 Taxiway Standards Alternative Improvements

Taxiway A

Taxiway A intersects Runway 17/35 at a non-90-degree angle, which does not optimize pilot visibility in both directions.

Recommendation. When pavement conditions warrant a reconstruction of the Taxiway A sections between Taxiways C and D, it is recommended to reconfigure the intersections with Runway 17/35 at 90 degrees.

Taxiway A2

Taxiway A2 violates multiple taxiway design standards and geometry, including non-90-degree runway intersections, allowing direct access from an apron to a runway environment without requiring a turn, and exceeding the maximum 1.5 percent longitudinal gradient. Because of its proximity to Runway 8R threshold, only small aircraft can decelerate in time to exit the runway environment when landing to the east. It does provide one of only three exit taxiways for aircraft landing to the south on Runway 17.

Recommendation. Because of the non-90-degree intersections, excessive grade, and limited use, it is recommended to remove Taxiway A2.

Taxiways A4, A5, A7, A8

Taxiways A4, A5, A7, and A8 intersect Runway 8R/26L at non-90-degree angles. As presented in the previous chapter, the added lengths of the “Y” shaped segments are needed to optimize the longitudinal gradient standard of 1.5 percent, although Taxiways A3, A6, A7, and A8 currently exceed this standard. As illustrated on **FIGURE D9**, the inverted “Y” alternative provides sufficient pavement length to intersect Runway 8R/26L at 90 degrees and remain within the maximum 1.5 percent longitudinal gradient between the runway pavement edge and the centerline of existing Taxiway A.

ATCT personnel indicate that Taxiways A4, A5, A7, and A8 are used as “high speed” exit taxiways allowing aircraft to exit Runway 8R/26L at faster-than-normal exiting speeds. This decreases runway occupancy times and improves airfield capacity even though the taxiways’ geometric designs do not meet the standard geometry of true high speed exit taxiways as analyzed and presented earlier in this chapter.

Should the decision be made to not rectify the non-90-degree runway intersections, then PUB should request and be granted a Modification of Standards (MOS) from the FAA that allows the continued use of the non 90-degree standard geometric design of the existing taxiway intersections with Runway 8R/26L, as well as the continuation of the existing longitudinal gradients associated with Taxiways A3, A6, A7, and A8 exceeding the maximum 1.5 percent standard. The MOS should be noted on the ALP.

Recommendation. Retain the existing configuration of Taxiways A4, A5, A7 and A8. Request a MOS from the FAA that allows the continued use of the non-90-degree runway intersections and the longitudinal gradients exceeding the maximum 1.5 percent standard.

Taxiways A7 and B7

Because of the lack of optimized taxiway access to Runway 26R, aircraft can cross Runway 8R/26L at the Taxiways A7 and B7 intersection, which is within the "high energy" middle third of Runway 8R/26L. PUB staff report that this rarely occurs, but it does happen, and the existence of the intersection allows for the possibility of it occurring more frequently. If Taxiway C were extended to at least Taxiway B, then aircraft access to the Runway 26R threshold could be accomplished via Taxiways C, B, and B7.

Recommendation. Extend Taxiway C to Taxiway B and eliminate the Taxiway A7 and B7 intersection crossing of Runway 8R/26L.

Taxiways A3/E3 and A6/E6

Taxiways A3/E3 and A6/E6 provide direct taxiway access from the main apron to the Runway 8R/26L environment without making a turn (notwithstanding the 45-degree turns required of the "Y" shaped segments of Taxiways A4, A5, A7, and A8). If the high-speed exit or the inverted "Y" shaped alternative rectifying the non-90-degree intersections of Taxiways A4, A5, A7, and A8 with Runway 8R/26L presented earlier are selected, the direct runway access is alleviated. If not, PUB has two options:

- **A clarification from the FAA can be provided that the "Y" shaped segments of Taxiways A4, A5, A7, and A8 do constitute a turn and therefore the standard is met. The clarification might require PUB to request and be granted a MOS from the FAA. Either way, the clarification/MOS would be noted on the ALP.**
- **The second option would be to reconfigure the pavement islands separating Taxiway A and Taxilane E that would require a turn onto Taxiway A from the apron prior to accessing Taxiways A3 and A6.**

Recommendation. Request a clarification and MOS that the "Y" shaped segments of Taxiways A4, A5, A7, and A8 do constitute a turn and retain the existing taxiway configuration.

Taxiway A11

As presented in the previous chapter, PUB personnel report that Taxiway A11 is seldom used by aircraft for either aircraft entering or exiting Runway 8R/26L. The closure/removal of Taxiway A11 would slightly reduce overall pavement maintenance costs. However, PUB personnel also indicate this taxiway is used during snow events to pile snow from the surrounding pavements. The airfield capacity analysis indicates that Taxiway A11 provides no benefit as an exit taxiway that increases the ASV calculations, so its existence is of no overall value.

Recommendation. Retain Taxiway A11 for the rare use of aircraft departures and landings, but also as a storage area for snow during snow events and as a potential run-up area if needed.

Taxiway D

Taxiway D intersects the Runway 35 threshold at an approximate 40-degree angle, which does not optimize pilot visibility in both directions.

Recommendation. When pavement condition warrants a reconstruction of this section of Taxiway D, it is recommended to reconfigure the intersection with the Runway 35 threshold at 90 degrees.

Holding Bays

As presented in the previous chapter, PUB's existing holding bays are no longer the FAA's preferred design since the wide amount of pavement makes lighting and signage difficult for pilots to see clearly and easily. Current FAA preferred holding bay design includes clearly marked entrances and exits that allow independent usage of the parking positions separated by islands. This design allows aircraft to bypass one another and assure taxiway wingtip clearances. Since small training aircraft represent most users requiring holding bays, each parking position is designed to accommodate aircraft in Aircraft Reference Code (ARC) A-I, which translates to aircraft having wingspans less than 49 feet and a length 30 feet or less.

Recommendation. When pavement conditions warrant reconstruction, it is recommended that a minimum of three-position holding bays replace the existing holding bays at the west end of Taxiway A and at the west and east ends of Taxiway B. Additionally, a minimum of three-position holding bays are recommended at the west and east ends of the parallel taxiway serving the new training runway.

Landside Development Concepts, Alternatives, and Recommendations

With the framework of PUB's ultimate airside development identified, placement of needed landside facilities can now be analyzed. The overall objectives of the landside plan are the provisions of conceptual development locations for facilities that are conveniently located and accessible to the community, and that accommodate the specific requirements of PUB's users.

Passenger Terminal Facilities

The passenger terminal analysis process began with an observational review and assessment of the functionality and condition of the existing terminal building. The analysis took into consideration the current standard airport terminal building operational characteristics, building and safety codes, and the physical condition of the facility. As discussed in the previous chapter, the terminal at PUB has a dated appearance and needs interior and exterior updates.

Observations, Assessments, and Conclusions

The existing passenger terminal building's functionality, capacity, and operational issues were assessed in **Chapter C – Airport Capacity and Facility Requirements**. The following observations and conclusions were made and are summarized below.

- **Ticketing/Baggage Check-In, Checked Baggage Screening, Outbound Baggage Make-Up, Baggage Claim, and Office Space.** All these areas of the passenger terminal building have adequate space and function well. No improvements to these spaces are recommended.
- **Passenger Security Screening.** The security checkpoint is insufficiently sized for security screening operations and its configuration restricts the amount of baggage lay-down and pick-up space available, inhibiting flow-through. The existing checkpoint is approximately 1,255 square feet and should be 1,725 square feet based on industry standards and 2019 passenger enplanement levels. Additional space for Transportation Security Administration (TSA) security screening is necessary. However, any decisions to expand the area will be made in consultation with the TSA.
- **Secure Passenger Departure Lounge.** The existing secure departure lounge provides approximately 1,000 square feet of space. It is undersized to comfortably accommodate passengers for more than a short wait. There are also no restrooms, water, or concessions/vending machines beyond the security checkpoint. Additional space is required for the provision of restrooms and concessions to meet building codes for passenger waiting areas or improve the level of service provided to passengers.
- **Terminal Parking.** Existing passenger terminal parking is sufficient to meet demand, although resurfacing of the terminal parking area is needed.
- **Terminal Appearance.** The interior and exterior areas of the terminal should be updated to achieve a more modern aesthetic.

Passenger Terminal Building Expansion Concepts

The purpose of these concepts is to explore potential passenger terminal building expansion configurations that can be developed in a phased manner while minimizing the need for temporary facilities. The passenger terminal building concepts presented on the following pages delineate potential terminal footprint options for a future phased terminal expansion and renovation at PUB.

Short-Term Terminal Expansion Concept

This concept would increase the size of the existing security checkpoint and secure departure lounge space by expanding immediately west of the existing departure lounge. The concept also reconfigures the security screening checkpoint and eliminates the 90-degree turn that passengers currently make when proceeding through the checkpoint. Finally, this concept adds restrooms and vending machines or food delivery options to the secure area. This concept is illustrated in **FIGURE D10**.

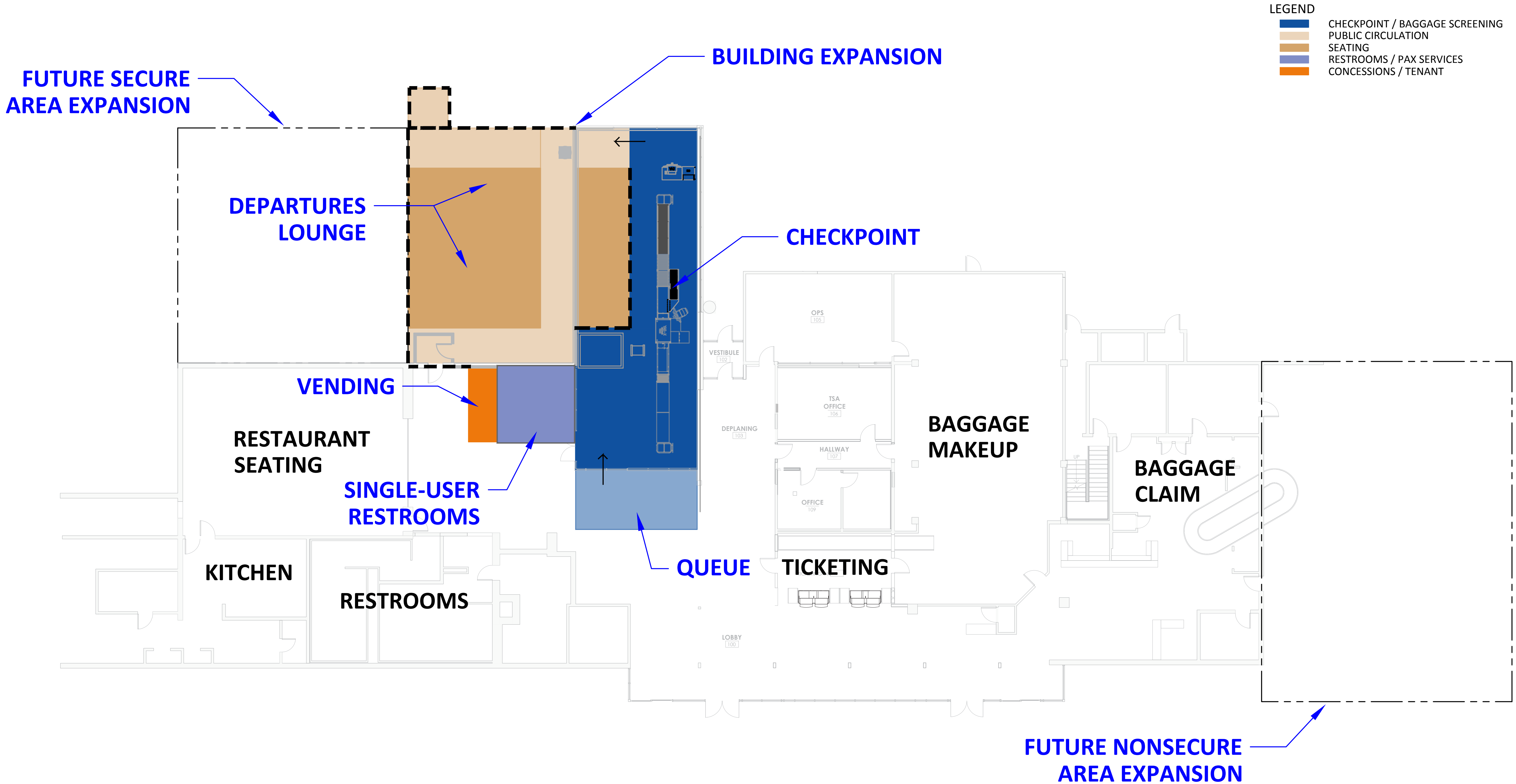

FIGURE D10 Short-Term Terminal Expansion Concept

Advantages:

- **Provides adequate space for security screening and the secure departure lounge.**
- **Provides for post security restrooms, meeting code requirements at PUB.**
- **Provides access to food and water beyond the security checkpoint.**
- **Realigns security screening to a linear layout in accordance with TSA checkpoint guidance.**
- **Plans for aesthetic terminal improvements.**
- **Provides adequate departure lounge area required for existing and planned commercial flights.**

Disadvantages:

- **Requires approximately 1,600 square feet of expansion to the passenger terminal building footprint.**
- **Departure lounge area would be slightly undersized to adequately accommodate narrow body aircraft used for typical casino charter flights.**
- **Does not address ADA access issues to the second floor or other physical upgrades needed throughout the original two-story portion of the passenger terminal building.**

Long-Term Terminal Expansion Concept

This concept would likely only be required if an additional airline like Allegiant Air were to reinitiate service at PUB. This concept further modifies the passenger terminal building by providing additional space to the west of the hold room that was expanded in the previous short-term concept. Additional space is also provided for a second security screening checkpoint lane that would be required if an additional airline served PUB and had overlapping flights during the peak hour.

This long-term concept also provides a reconfiguration of the restaurant seating area, the airlines ticketing and car rental counters and office space, and a terminal expansion to the east to provide an expanded baggage claim and baggage makeup areas. These major renovations and expansions of this concept are illustrated in **FIGURE D11**.

Advantages:

- **Provides adequate passenger terminal building space for an additional airline at PUB.**
- **Provides adequate passenger terminal building space for typical casino charter flights with narrow body aircraft.**
- **Reconfigures spaces in the passenger terminal building such as airline and car rental counters and office space, as well as baggage screening, makeup and baggage claim if determined to be necessary to accommodate future demand.**

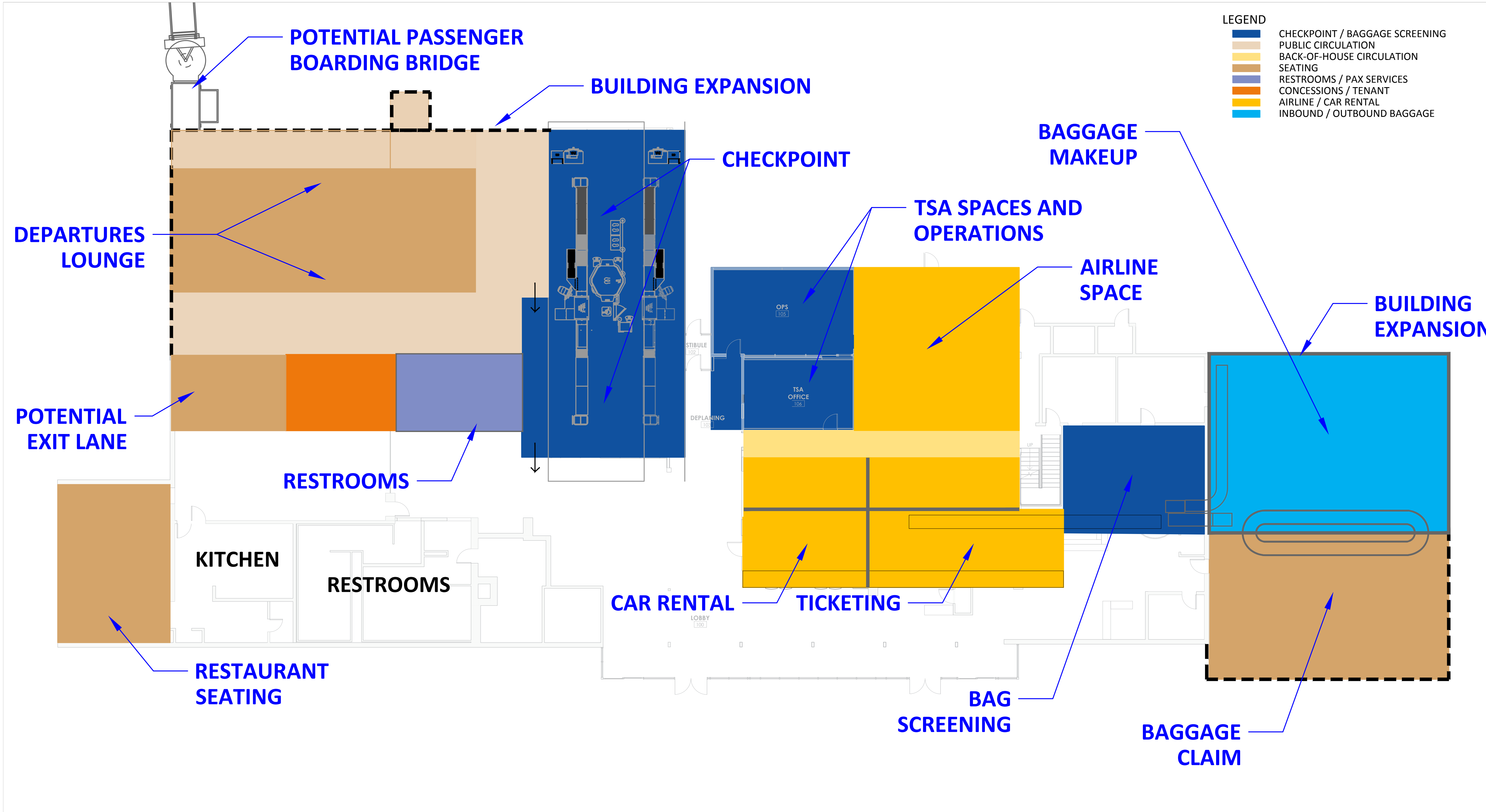

FIGURE D11 Long-Term Terminal Expansion Concept

Disadvantages:

- **Requires a significant increase in the square footage of the passenger terminal building footprint: 5,600 square feet in addition to the 1,600 square feet added in the short-term expansion concept.**
- **Construction would significantly impact current airline, TSA, and concession operations and would likely require phasing and/or temporary facilities to process passengers.**
- **Provides more space than necessary for one airline and should only be considered if demand from a second airline materializes.**

Recommendation. The existing passenger terminal building served PUB and the community well for several years. However, short-term improvements are needed to accommodate current demand and should be programmed in the short-term planning period. These improvements include additional hold room space and the provision of concessions and restrooms, additional security screening checkpoint space, and a resurfacing of the existing vehicle parking area.

Reservation of space for construction of the long-term concept should be illustrated on the Conceptual Development Plan and Airport Layout Plan (ALP) if demand from an additional airline or low-cost carrier like Allegiant Air materializes in the future.

General Aviation Facilities

General aviation (GA) is a very diverse category of aviation uses considering various aircraft sizes, aircraft technology and sophistication, mission of the organization operating the aircraft, and both airside and landside access requirements. It is usually defined as all activity that is not related to commercial passenger operations, large transport air cargo operations, or military operations. It includes private aviation related to recreational flying, flight training, business transportation and storage, corporate aviation related to employee transportation and aircraft storage, and Fixed Base Operators (FBOs) or Specialized Aviation Service Operators (SASOs) providing single or multiple aviation services generally consisting of aircraft maintenance, aircraft charter and rental, aircraft storage, fuel sales, and aircraft manufacturing and/or refurbishment.

The diverse aviation use categories mentioned above will impact the appropriateness of a given location for specific GA uses. However, as in most cases, any given site can accommodate a variety of GA uses. The recommendations provided here attempt to identify the best types of facilities for a specific developable site. Ultimately, PUB must evaluate specific development proposals and make land use determinations based on the proposed site use efficiencies, striving to maximize the utilization of the available property in the most efficient and effective manner (i.e., the highest and best use of each property parcel), and best business practices.

FIGURE D12 graphically illustrates the proposed layout of future GA development at PUB. The overall development scheme focuses on accommodating smaller aircraft types and therefore, smaller storage facilities west of the passenger terminal building area. Smaller aircraft in Airplane Design Groups (ADGs) I and II, with Taxiway Design Groups (TDGs) 1A, 1B, and 2 match this category. Facilities identified in this area consist primarily of nested T-hangars and individual aircraft box/executive hangars. Larger aircraft types and larger storage facilities are accommodated east of the passenger terminal building area. Larger aircraft in ADGs II and III and TDGs 2 and 3 match this category. Facilities identified for this area consist primarily of larger aircraft box/executive hangars, multiple aircraft storage hangars, and SASOs. The lingering effects of the COVID-19 pandemic have had a positive impact on GA activity at PUB. Allocating adequate space for increased based aircraft and transient GA hangars are needed to meet the increased demand.

Airport and Terminal Support Facilities

Airport and terminal support facilities provide those services and functions that are necessary for an airport to operate properly but are not part of the runway/taxiway system and are not related to the passenger terminal building, aircraft storage, or aircraft maintenance. Support facilities in need of consideration at PUB include the Airport Traffic Control Tower (ATCT), the Aircraft Rescue and Fire Fighting (ARFF) facility, and the Snow Removal Equipment (SRE) and airport maintenance facility.

ATCT

ATCT personnel report visibility and detection ability difficulties to the north end of Runway 17/35 from the existing tower cab. A taller tower located in the same general area, or a new tower located northeast of the intersection of Runways 8R/26L and 17/35 would more than likely alleviate these issues. Any replacement of the existing tower would need to be conducted using FAA Order 6480.4B, *Airport Traffic Control Tower Siting Process* as well as coordinated through the Airport Facilities Terminal Integration Laboratory (AFTIL). It is beyond the scope of this Master Plan to provide a detailed ATCT siting analysis.

Aircraft Rescue and Fire Fighting Facility

The existing ARFF is sited to maximize emergency response times to airfield locations at PUB. However, its age warrants the planning and programming of a replacement facility, preferably in the same location. As presented in the previous chapter, two of three existing ARFF vehicles should be replaced due to their age and condition.

SRE and Airport Maintenance Facility

The existing SRE and airport maintenance facility is undersized to accommodate the recommended SRE and materials storage needs at PUB. Expansion, remodeling, or replacing the existing facility in the existing location is recommended.

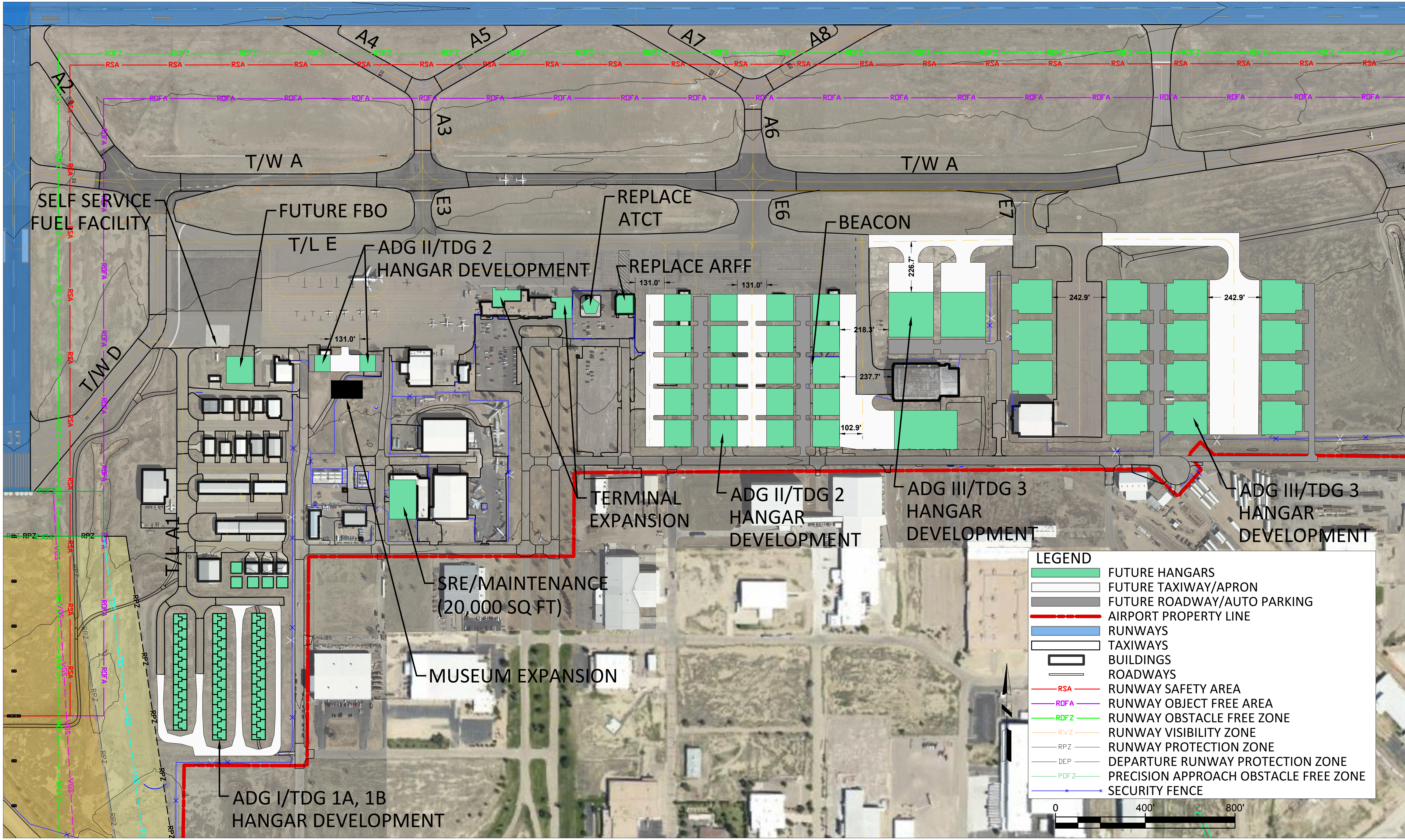

FIGURE D12 General Aviation Development

Master Plan Pueblo Airport

Conceptual Development Plan

Utilizing the recommended components of PUB's airside and landside development areas as presented in this chapter results in the Conceptual Development Plan presented in **FIGURE D13**. The plan presents PUB with a comprehensive development scheme accommodating a wide range of aviation user groups and operational activities. As with any airport planning decision, the ultimate build-out of the various aviation and aviation-compatible development areas will be demand driven, and the depicted development far exceeds that which is projected during the 20-year planning period. The Conceptual Development Plan will be used for the preparation of the ALP set representing the ultimate long-term airport configuration.

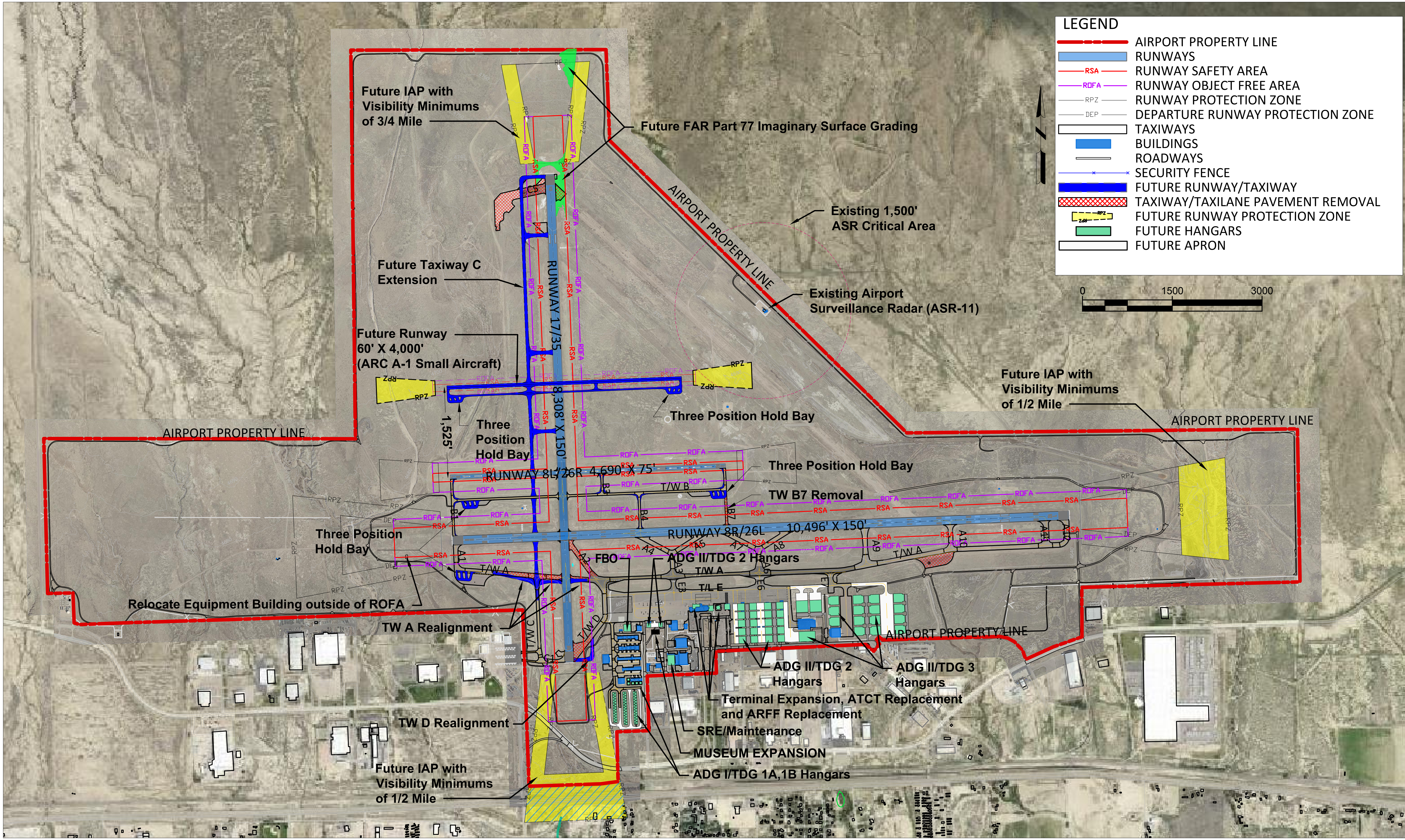

FIGURE D13 Conceptual Development Plan

E. Implementation

Introduction

The long-term development program or Capital Improvement Program (CIP) for Pueblo Memorial Airport (PUB) is intended to establish a strategy to fund airport improvements and maximize the potential to receive federal and state grant funds. It also establishes a financially prudent plan for improvement funding on a local level. This programming effort is a critical component of the Airport Master Plan for the Federal Aviation Administration (FAA), the Colorado Department of Transportation (CDOT) Division of Aeronautics, and the local sponsor (the City of Pueblo). The CIP identifies improvement needs and allows budgeting/financial decisions to be made with a comprehensive understanding of financial implications. Although the CIP will be used for preliminary programming by the FAA and CDOT Division of Aeronautics, this analysis does not guarantee any financial commitment from the federal government, the state, or the sponsor to provide funding for the CIP.

The CIP provides guidance for continued maintenance, upgrade, and expansion of PUB facilities in a fiscally responsible manner and with realistic local financial capabilities. This chapter is prepared using guidance from FAA Order 5100.38D, *AIP Handbook*, and FAA Order 5100.39A, *Airport Improvements Plan*, and contains the following sections:

- **Capital Improvement Approach**
- **Cost Estimates and Project Phasing**
- **Funding Sources**
- **Financial Plan**
- **Summary.**

Capital Improvement Approach

The CIP identifies the overall airport development objectives, individual project costs, and anticipated funding by planning phases: Phase I (1-5 years), Phase II (6-10 years), and Phase III (11-20 years). The CIP projects are based on the needs identified in **Chapter C – Facility Requirements**, the most recent approved CIP, and planning and pavement maintenance projects. The following considerations influenced the project priority approach:

- **Ability to meet user demand**
- **Ability to enhance efficiency and meet FAA design standards**
- **Ability to repair and upgrade facilities reaching the end of useful life.**

Projects also considered PUB preference and ability to facilitate an orderly sequence of improvements while taking into consideration economic and environmental factors. Projects are sequenced with regard to strategic vision, forecast demand triggers, and funding considerations. Phase I projects are sequenced in year-by-year format, Phase II, and Phase III projects are identified in priority order without year distinction.

Most projects identified in the CIP are eligible for FAA funding according to the AIP Handbook and PUB will pursue funding thought eh FAA AIP grant-in-aid program. It is anticipated that these projects will be funded mainly through AIP funds with a match from PUB. However, not all projects identified in the CIP are eligible for AIP funding. They are a necessary contribution to the quality and overall development potential of PUB. They can be funded through multipole sources such as the city, the state, other governmental agencies, public-private partnerships, or private entities. PUB will participate in both AIP eligible and non-eligible projects.

Cost Estimates and Project Phasing

Cost Estimates

Cost estimates, based on current construction unit costs, have been prepared so PUB and the FAA can allocate financial resources for the improvement projects that have been identified as potentially being needed during the 20-year planning period. Professional engineers and architects developed cost estimates for each project based on 2021 dollars. For projects occurring beyond 2021, the costs have been adjusted with an inflation rate of three percent per year. Contingencies are included to account for unknowns at the planning level of design. The contingency amount varies by project but is generally set between 5 and 15 percent depending on the complexity and overall project cost. Costs for planning, environmental review, design, and construction management are included as appropriate. The cost estimates are intended to be used for planning purposes only and should not be construed as construction cost estimates, which can only be compiled following the preparation of detailed engineering design documents.

Project Phasing

Project phasing prioritizes projects through a priority ranking system based on development needs. The FAA's priorities in administering the CIP gives highest priority to projects that currently do not meet FAA standards and must be constructed to meet standards to maintain safety, security, and efficiency. Projects in the higher priority categories are considered to have more urgency and are placed in the beginning phase. Those projects with lower priorities are placed in later phases. Several projects can and will be phased over multiple years. This approach helps distribute capital costs more evenly and allows PUB to implement improvements as demand materializes. Project phasing supports accelerating or delaying project implementation in response to economic conditions and changing airport user needs.

Future demand for airport facilities is difficult to predict accurately, especially during the latter phases of the 20-year planning period. Therefore, emphasis is placed on the initial portion of the planning period. In this phase, projections are more definable, and the magnitude of program accomplishment is more pronounced.

Phase I Projects

TABLE E1 provides the sequencing and cost for each project contained in the first phase (i.e., 0 to 5 years). Phase I major improvement projects include a rehabilitation of Runway 8R/26L., the construction of a future third parallel runway, the first phase extension of Taxiway C to a full-length parallel taxiway serving Runway 17/35, and the rehabilitation of Taxiways A, A1, A3, A4, and A5. Other projects identified are ineligible pavement rehabilitation and hangar construction. Based on the priority and availability of local and federal funds, some projects may be moved to another phase. Ineligible projects will be paid for with local money or through other non-AIP sources. **FIGURE E1** illustrates the location of these projects on the airfield.

TABLE E1 Phase I (0-5 Years) Development Program Project Costs

PROJECT	PROJECT DESCRIPTION	Cost Estimate (2021)	Cost Estimate (3% Inflation)	OTHER	LOCAL	STATE	AIP Entitlements	AIP Discretionary	Total AIP Funding
Year 1 (2022)									
A.1	Snow Removal Equipment (SRE 22' Plow Truck)	$415,000	$427,500	-	$10,688	$10,688	$406,125	-	$406,125
A.2	Runway 8R/26L Rehabilitation and Taxiway A2 Removal (Design)	$300,000	$309,000	-	$7,725	$7,725	$293,550	-	$293,550
A.3	Construct 10-Unit T-Hangar	$1,307,600	$1,346,800	-	$1,346,800	-	-	-	-
Year 2 (2023)									
A.4	Rehabilitation of Terminal Parking Lot	$376,600	$399,500	-	$399,500	-	-	-	-
A.5	Runway 8R/26L Rehabilitation and Taxiway A2 Removal (Construction)	$8,674,700	$9,203,000	-	$230,075	$230,075	$2,300,000	$6,442,850	$8,742,850
A.6	Future Third Parallel Runway Environmental Assessment and Cost-Benefit Analysis	$400,000	$424,400	$212,200	-	-	-	$212,200	$212,200
A.7	Short-Term Terminal Development Concept for Terminal Building	$1,930,000	$2,047,500	-	$51,188	$51,188	-	$1,945,125	$1,945,125
Year 3 (2024)									
A.8	Future Third Parallel Runway Design	$850,000	$928,800	$464,400	-	-	-	$464,400	$464,400
Year 4 (2025)									
A.9	FAA Part 77 Imaginary Surface Grading	$597,000	$671,900	-	$16,798	$16,798	-	$638,305	$638,305
A.10	Replace ARFF Building	$2,800,000	$3,151,400	-	$78,785	$78,785	$2,000,000	$993,830	$2,993,830
A.11	Future Third Parallel Runway Construction	$8,912,600	$10,031,200	$5,015,600	-	-	-	$5,015,600	$5,015,600
A.12	Apron Rehabilitation (East) (Phase I - Design and Construct)	$2,481,100	$2,792,500	-	$69,813	$69,813	-	$2,652,875	$2,652,875
A.13	Construct One Box Hangar	$1,043,500	$1,174,500	-	$1,174,500	-	-	-	-
Year 5 (2026)									
A.14	Taxiway C Extension (Phase I)	$3,218,700	$3,731,400	-	$93,285	$93,285	-	$3,544,830	$3,544,830
A.15	Taxiway A and Connectors Rehabilitation (Phase I - Design and Construction) (Mill and Overlay Taxiways A, A1, A3, A4, A5. Last Paved Between 1998 and 2014)	$6,571,000	$7,617,600	-	$190,440	$190,440	-	$7,236,720	$7,236,720
SUB-TOTAL PHASE I		**$39,877,800**	**$44,257,000**	**$5,692,200**	**$3,669,595**	**$748,795**	**$4,999,675**	**$29,146,735**	**$34,146,410**

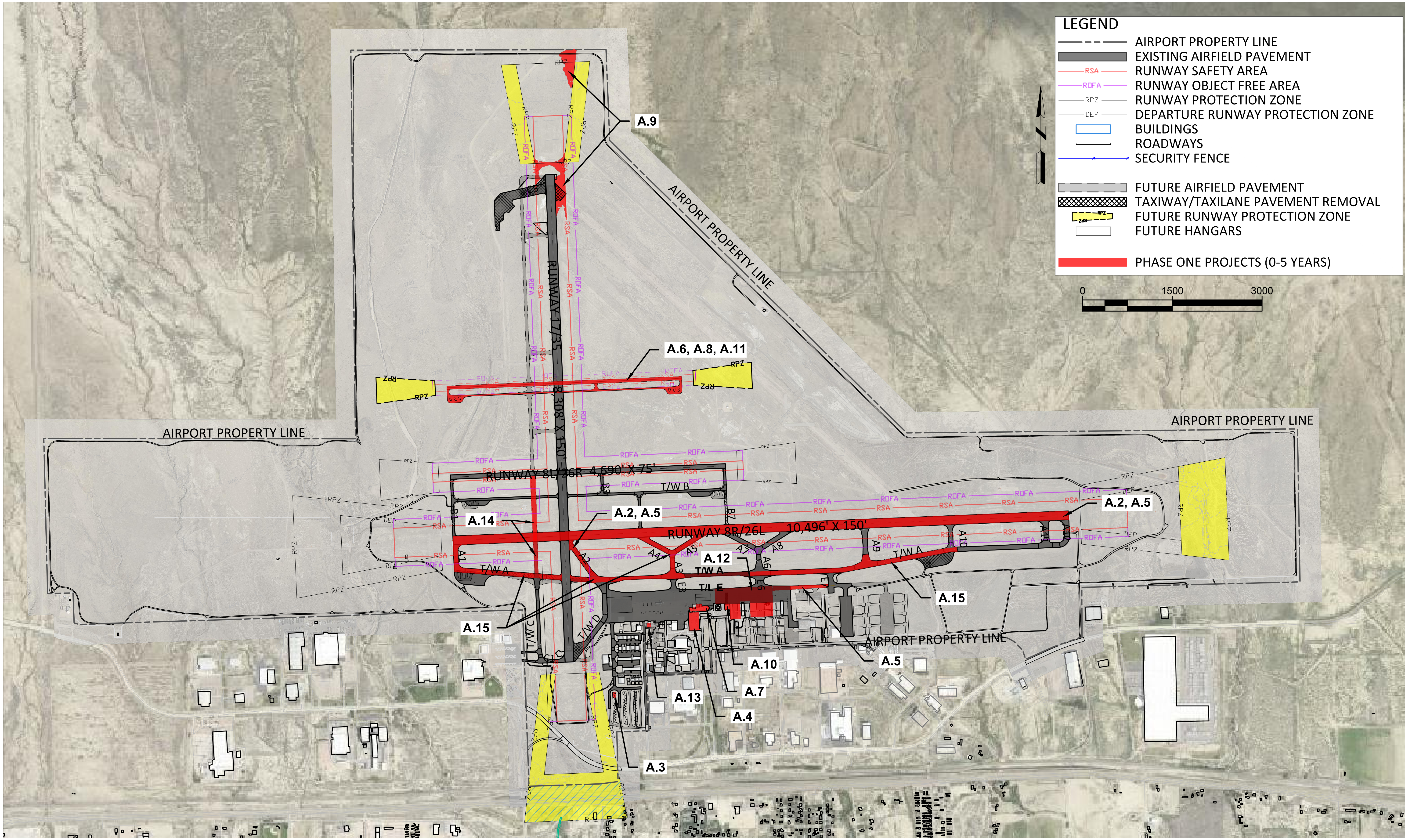

FIGURE E1 **Phase I CIP (2022-2026)**

Phase II Projects

The phase II projects are anticipated to be implemented following the completion of the rehabilitation of Taxiways A, A1, A3, A4, and A5. Major projects include taxiway improvements, the relocation of the equipment building near Runway 8R, and the replacement or relocation of the ATCT. ATCT personnel have reported visibility issues to the north end of Runway 17/35 from the existing cab. PUB will require a separate analysis for the new location of the ATCT. The ramp rehabilitation project is to replace pavement that is 20 years old. The addition of three-position holding bays near Runway Ends 8R, 8L, and 26R are intended to satisfy the FAA' preferred design standards, replacing holding bays that do not meet current preferred standards. **TABLE E2** identifies Phase II projects with cost estimates, and **FIGURE E2** illustrates the location of the projects.

TABLE E2 Phase II (6-10 Years) Development Program Project Costs

PROJECT	PROJECT DESCRIPTION	Cost Estimate (2021)	Cost Estimate (3% Inflation)	LOCAL	STATE	FEDERAL
B.1	Taxiway B7 Removal	$315,400	$376,600	$9,415	$9,415	$357,770
B.2	Relocate Equipment Building Near Runway End 8R Outside of ROFA	$252,500	$301,500	$7,538	$7,538	$286,425
B.3	Replace ATCT	$8,100,000	$9,671,800	$241,795	$241,795	$9,188,210
B.4	Extend Taxiway C (Phase II)	$7,831,500	$9,631,800	$240,795	$240,795	$9,150,210
B.5	Rehabilitate Taxiway B (Design and Construction)	$2,187,300	$2,690,100	$67,253	$67,253	$2,555,595
B.6	Realign Taxiway D	$2,869,500	$3,635,000	$90,875	$90,875	$3,453,250
B.7	Construct Three Position Hold Bays Near Runway Ends 8R, 8L, and 26R	$1,915,800	$2,426,900	$60,673	$60,673	$2,305,555
B.8	Construct Five-Unit T-Hangar	$623,800	$813,900	$623,800	-	-
B.9	Construct Two Box Hangars	$1,196,500	$1,608,000	$1,196,500	-	-
B.10	Construct Wildlife Perimeter Fence Line at Southern Airport Boundary (Design and Construction)	$2,938,500	$3,949,100	$98,728	$98,728	$3,751,645
B.11	Rehabilitate Ramp (Phase V)	$4,000,000	$5,536,900	$138,423	$138,423	$5,260,055
B.12	GA Taxiway and Utilities (Phase II)	$500,000	$692,100	$17,303	$17,303	$657,495
B.13	Acquire SRE (Replace Aging Equipment)	$415,000	$574,500	$14,363	$14,363	$545,775
SUB-TOTAL PHASE II (2027-2032)		**$37,677,900**	**$47,319,800**	**$2,942,748**	**$1,122,448**	**$42,653,005**

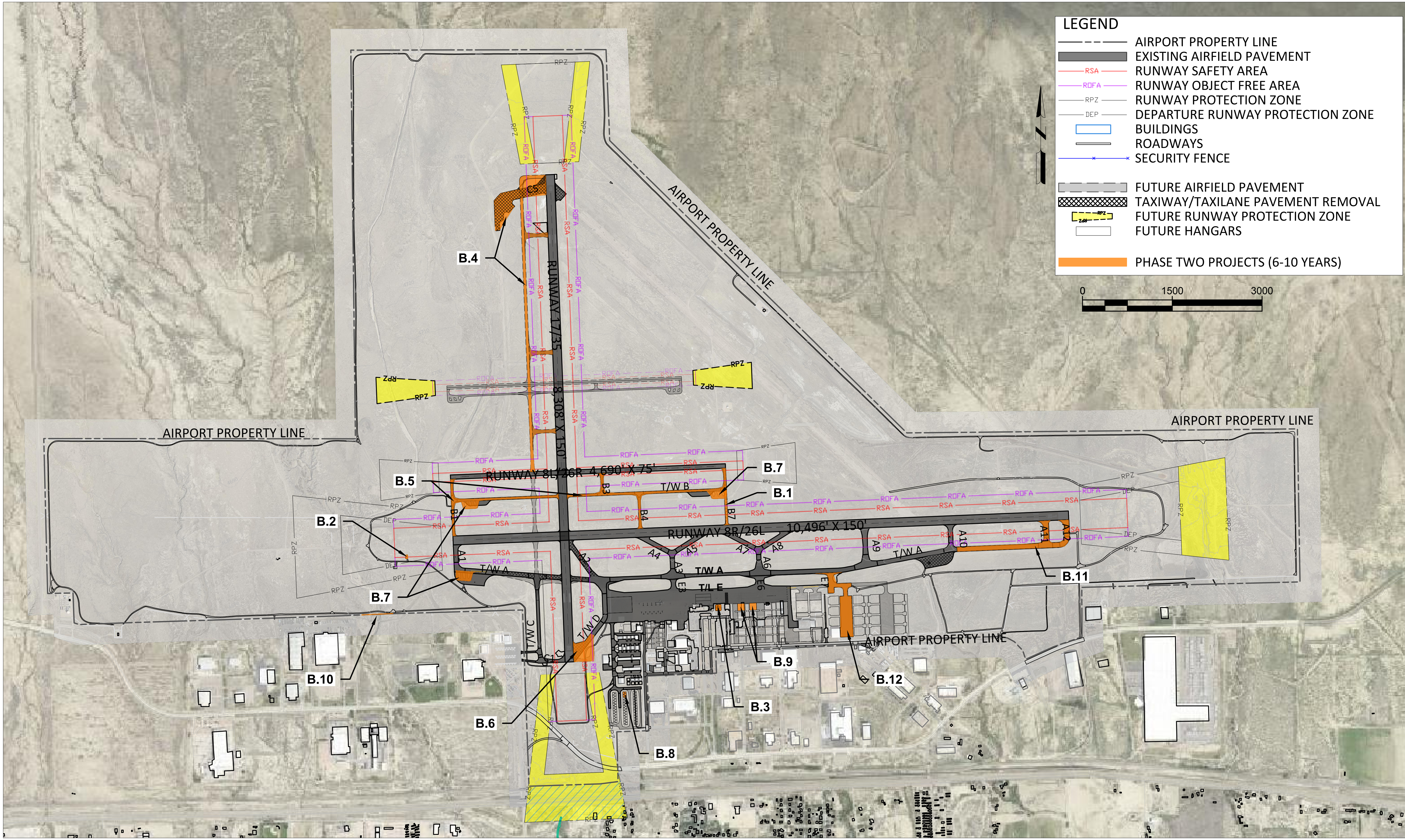

FIGURE E2 **Phase II CIP (2027-2032)**

Phase III Projects

Phase III projects are difficult to predict accurately, but like all CIP projects, they must be included on the Airport Layout Plan (ALP) to be eligible for AIP funding. Major projects include rehabilitation of pavements, construction of the SRE building, and construction of additional hangars to meet the anticipated demand. **TABLE E3** identifies the Phase III projects with cost estimates, and **FIGURE E3** illustrates the location of the projects.

TABLE E3 Phase III (11-20 Years) Development Program Project Costs

PROJECT	PROJECT DESCRIPTION	Cost Estimate (2021)	Cost Estimate (3% Inflation)	LOCAL	STATE	FEDERAL
C.1	Rehabilitate Runway 8L/26R (Design and Construction)	$2,919,000	$4,161,800	$104,045	$104,045	$3,953,710
C.2	Construct Snow Removal Equipment (SRE) Building	$2,314,500	$3,398,900	$84,973	$84,973	$3,228,955
C.3	Construct Five-Unit T-Hangar	$694,800	$1,050,900	$1,050,900	-	-
C.4	Construct Three Box Hangars	$1,914,300	$2,982,400	$2,982,400	-	-
C.5	Construct 10-unit T-hangar	$593,500	$952,400	$23,810	$23,810	$904,780
C.6	Realign Taxiway A	$4,327,500	$7,152,700	$178,818	$178,818	$6,795,065
C.7	Purchase ARFF Truck/Equipment	$665,000	$1,166,100	$29,153	$29,153	$1,107,795
C.8	Rehabilitate Apron	$2,242,500	$4,050,200	$101,255	$101,255	$3,847,690
SUB-TOTAL PHASE III (2033-2041)		**$15,671,100**	**$24,915,400**	**$4,555,353**	**$522,053**	**$19,837,995**

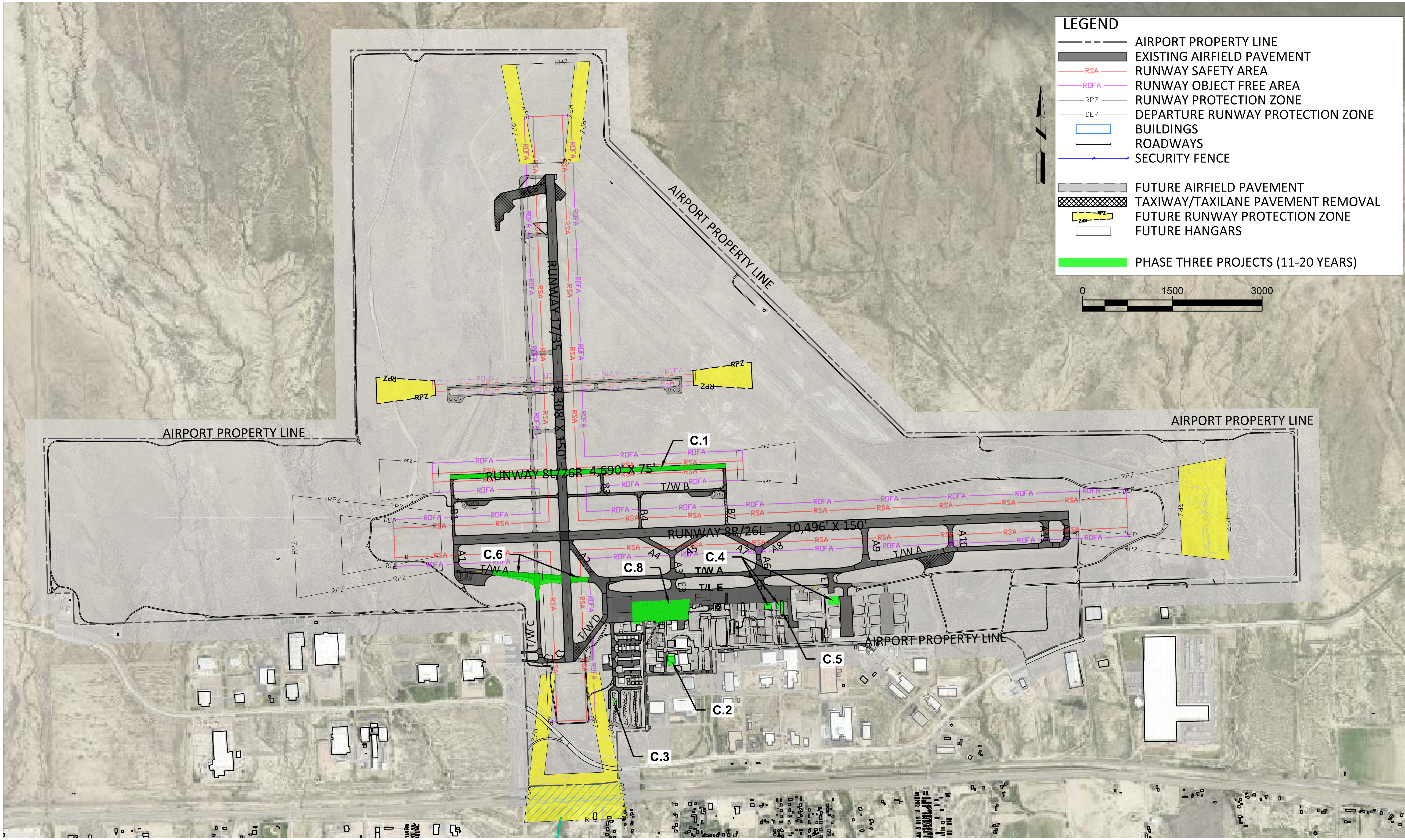

FIGURE E3 **Phase III CIP (2023-2041)**

Phase IV Projects

Phase IV projects, or post planning period projects, are identified as contingent projects that are anticipated for implementation beyond the 20-year planning period. The two projects that are considered in Phase IV include the long-term development concept for the terminal building and improvement to the visibility minimums of the Instrument Approach Procedures (IAPs) for Runway Ends 17, 35, and 8L. No cost estimates are provided for contingent development in the post planning phase.

Project Phasing Summary

The CIP aids PUB with budgeting and programming processes. Phase I typically constitutes the FAA and the CDOT Division of Aeronautics Airport Capital Improvement Program (ACIP) to assist in providing justification and funding strategies for projects under the FAA and CDOT grant-in-aid programs. This will assist PUB in implementing the CIP projects as necessary to meet federal and state grant assurances.

Funding Sources

Funding sources for the CIP depend on many factors, including the AIP project eligibility, the Colorado Discretionary Aviation Grant (CDAG) Program priority rating model for project evaluation, the ultimate type and use of facilities to be developed, PUB's debt capacity, the availability of other financing sources, and the priorities for scheduling project completion. For planning purposes, assumptions were made related to the funding source of each capital improvement. The following funding sources provide background and context when reviewing the financial feasibility of proposed improvements.

- **Federal**
- **State**
- **Local**
- **Other.**

Federal

The FAA provides funding for airport improvements through the Aviation Trust Fund (ATF), which is financed by aviation system user fees and taxes (e.g., airline passenger tax, aircraft parts tax, fuel tax, and aircraft registration fees). The AIP provides the mechanism to reinvest the ATF monies at FAA-eligible airports. The total amount of federal funds is governed by congressional appropriations to the AIP. FAA Order 5100.38D, *Airport Improvement Program Handbook* (AIP Handbook), describes AIP funding eligibility.

Because Colorado contains more than five percent of its geographic acreage comprised of unappropriated and unreserved public lands and nontaxable Indian lands, the AIP program allows for a higher-than-normal federal percentage match for AIP eligible projects. The adjusted formula provides for an FAA contribution of 95 percent compared to the normal contribution of 90 percent. The AIP grants require PUB to contribute a local match of 5 percent.

The FAA's most recent version (2021) of the National Plan of Integrated Airport Systems (NPIAS) classifies PUB as a Nonhub Commercial Service Primary airport. A primary airport is defined by statute as a public use airport receiving scheduled air carrier service with 10,000 or more annual enplaned passengers. Primary airports are divided into four categories based on the percentage of total U.S. passenger enplanements, with non-hub airports accounting for less than 0.05 percent of the total. The NPIAS identifies airports as eligible for AIP funding and estimates the amount of funds needed for projects that will update airports to current FAA standards and increase capacity as needed. FAA AIP funds available for commercial service airports are allocated through entitlement grants and discretionary grants.

AIP Passenger Entitlement Grants

AIP entitlement grants are allocated among airports by an enplanements-driven formula . The percentage of costs shown as eligible for participation by the FAA is subject to change depending upon current funding legislation and policy at the time of implementation. The relationship between local and anticipated federal funding is based on current FAA participation of 95 percent of the total costs and local match of 5 percent.

Based on the current program, PUB is projected to receive entitlement grants of approximately $1 million per year based on its enplanement levels. The five-year estimate of airport improvements that are eligible for federal development grants under the AIP total $12.9 million. Airport categories in the NPIAS do not reflect the changes in airline or passenger demand and activity levels due to the COVID-19 pandemic.

AIP Discretionary Grants

Projects eligible for AIP funding may also receive discretionary grants if the total cost exceeds what can be covered by entitlement funds. The approval of discretionary grant funds is established through a project priority ranking methodology used by the FAA to award grants, at their prerogative, based upon project's importance to the National Airport System (NAS). Discretionary grants are generally provided for projects that have placed high in priority towards enhancing safety, security, capacity and would be difficult to fund otherwise. Dollar amounts vary and can be significant compared to entitlement grants. Discretionary grants are not guaranteed, and the amount dedicated to any one airport is determined by each project's demonstrated and documented need compared to the needs at other airports within the NAS. It is reasonable to assume that PUB will receive additional discretionary grants during the planning period for higher priority, eligible projects such as runway projects.

Like passenger entitle grants, discretionary grants usually have an FAA funding participation of 95 percent and a local cost of 5 percent. However, for the construction of the third parallel runway, an FAA funding participation rate of only 50 percent is used. This is based on an anticipated unfavorable FAA Benefit Cost Analysis (BCA) ratio using the standard 95 percent federal funding levels, and the willingness of the Pueblo Economic Development Corp (PEDCO) to contribute significant funding for this project. Should the BCA indicate an unfavorable ratio even with this amount of local funding participation, PUB and PEDCO will need to re-evaluate the funding levels or reprioritize the project altogether.

State

The CDOT Division of Aeronautics provides grants-in-aid from state funds for construction and development of airport projects to Colorado counties, cities, and towns. Grants are approved for projects including those that are AIP eligible, aviation pavement maintenance projects, and various other aviation projects. For AIP-eligible projects, state grant awards are typically for up to fifty percent of the local match requirement up to a limit of $250,000 per fiscal year per airport. The $250,000 limit does not apply to federal entitlement dollars that airports might save for several years and then receive in a single year. Projects that are not AIP eligible (but are still eligible for state funding) may also receive funding based on various state eligibility percentages. This funding requires a local match component to support the state funding requested. Local match can be provided by cash or in-kind work.

Local

Local funds include, but are not limited to, airport revenues from leases, fuel surcharges, landing fees, Passenger Facility Charges (RFCs). PUB uses local funds to provide the five percent match on AIP- eligible projects. Local funds are also used for projects that are not eligible or do not compete well for AIP funding. In accordance with the current funding policies of CDOT Division of Aeronautics, the state participation is shown as 2.5 percent and the local share is shown as the remaining 2.5 percent.

Cash Reserves/Airport Net Operating Revenue

PUB's cash reserves and future net operating revenues are significant sources of funds for the implementation of the projects included in the CIP. Net operating revenues represent the remaining funds available from the generation of operating revenues less payment of operating expenses as well as any debt service requirements. Any revenues generated on an airport mush be sued for airport-related capital and operational expenses only. As with many airports, including PUB, generating the necessary cash flow to balance the operations and maintenance costs is a constant struggle. Many airports rely upon supplemental funds from a municipal or county government to assist with funding the capital needs of their facilities. However, airports compete with other capital improvement needs for scarce local funding resources.

Passenger Facility Charges

The Aviation Safety and Capacity Expansion Act of 1990 established the authority for commercial service airports to apply to the FAA for imposing and using a Passenger Facility Charge (PFC) of up to $3.00 per eligible enplaned passenger. With the passage of AIR-21 in June 2000, airports could apply for an increase in the PFC collection amount from $3.00 per eligible enplaned passenger to $4.50. The proceeds from PFCs are eligible to be used for AIP eligible projects and for certain additional projects that preserve or enhance capacity, safety, or security, mitigate the effects of aircraft noise; or enhance airline competition. PFCs may also be used to pay debt service on bonds (including principal, interest and issue costs) and other indebtedness incurred to carry out eligible projects. In addition to funding future planned projects, the legislation permits airports to collect PFCs to reimburse the eligible costs of projects that began on or after November 5, 1990. PUB currently collects PFC revenues in an approved open application at the $4.50 collection level.

Customer Facility Charges (CFCs)

Rental car companies collect Customer Facility Charges (CFCs) on behalf of, and for the benefit of, the airports at which they operate. The charge is typically based on a fee per rental car transaction day that is added to rental car contracts. CFCs are required to be used for the financing, designing, constructing, operating, and maintaining of consolidated rental car facilities and common use transportation equipment and facilities that are used to transport the customer between the consolidated car rental facilities and other airport facilities.

PUB does not currently collect a CFC. If PUB so chooses, it can collect a CFC of $3.00 per rental car transaction day to support capital expenditure for improving and expanding its rental car facilities. It is recommended that PUB consider collecting CFCs to assist with improvements and new rental car infrastructure.

Private Third-Party Financing

Many airports use private third-party financing when the planned improvements will be primarily used by a private business or other organization. Such projects are not ordinarily eligible for federal funding. Projects of this kind typically include hangars, FBO facilities, fuel storage and dispensing systems, exclusive aircraft parking aprons, industrial aviation use facilities, and other non-aviation office/commercial/industrial development. Private development proposals are considered on a case-by-case basis. Often, airport funds for the infrastructure, preliminary site work, and site access are required to facilitate privately developed projects on airport property.

Other Unidentified Funding

The traditional funding sources described in previous paragraphs are insufficient to finance a small number of projects programmed for development. Projects requiring other funding, such as revenue bonds, or general obligation bonds are primarily related to the terminal expansion and improvement.

Financial Plan

The financial plan is developed for the five-year CIP to demonstrate PUB's ability to fund project improvements. PUB financial governance, structure, and fiscal authority will be described by the existing financial policy and rates and charges used for assessing funding assumptions, strategies, and suitability. An analysis based on financial statements has been reviewed and historical data tabulated to identify PUB budget trends, income patterns, and operating influence. A proforma analysis of PUB operating revenues and expenses has been conducted to identify PUB net income, carryover, cash flow balances, and capital cost recovery amounts reasonable to fund PUB projects. The financial plan focuses on:

- **Historical Review (revenues and expenses)**
- **Proforma Analysis (future financial projections)**
- **Budget Summary (impact on future finances).**

Historical Review

The City of Pueblo owns PUB and has established the Memorial Airport Fund to operate PUB. The Memorial Airport Fund consists of revenues from four separate funds: the Memorial Airport Fund, the Airport Improvement Trust Fund, Airport Passenger Facility Fund, and the Aviation Grants Fund. Revenues in the Memorial Airport Fund primarily come from fees charged at PUB as well as subsidies from the city's general fund. The Airport Passenger Facility Fund accounts for the collection of PFCs at PUB. The Airport Improvement Trust Fund accounts for the transfer of funds equal to the appraised value of land located at PUB conveyed to private ownership. The Aviation Grants Fund consists of monies received from both federal and state grants, which fund most of the capital improvement projects at PUB.

TABLE E4 provides PUB's historical operating budgets with data provided by the City of Pueblo financial statements.

TABLE E4 Historical Operating Budget Summaries, 2018-2021

	2018 (ACTUAL)	2019 (ACTUAL)	2020 (ESTIMATE)	2021 (ADOPTED)
Revenues				
Memorial Airport Fund	$2,051,062	$1,974,184	$1,334,342	$2,017,170
Airport Improvement Trust Fund	$3,763	$6,273	$4,830	-
Passenger Facility Charge Fund	$47,354	$55,963	$28,517	$47,000
Aviation Grants	$7,101,867	$1,267,975	$4,688,912	-
Total Revenues	**$9,204,046**	**$3,304,395**	**$6,056,601**	**$2,064,170**
Expenditures				
Memorial Airport Fund	$1,917,000	$1,785,500	$1,334,342	$2,017,170
Airport Improvement Trust Fund	-	-	$55,555	-
Passenger Facility Charge Fund	-	$160,000	-	$47,000
Aviation Grants	$6,927,064	$1,007,101	$4,688,912	-
Total Expenditures	**$8,844,064**	**$2,952,601**	**$6,078,809**	**$2,064,170**
Cash at End of Year				
Net Increase (Decrease) in Cash	$359,982	$351,794	($22,208)	-
Cash at Beginning of Year	$400	$400	$400	-
Total	**$360,382**	**$352,194**	**$(21,808)**	**-**

SOURCE: City of Pueblo 2021 Budget, May 2021.
City of Pueblo Statement of Cash Flows for Year End December 31,2018.
City of Pueblo Statement of Cash Flows for Year End December 31,2019.
City of Pueblo Statement of Cash Flows for Year End December 31,2020.

Pro forma Analysis

Pro forma is a scenario- based planning tool that can be used to estimate future revenues and expenses. Because PUB has commercial air carrier service, it is required to file annual financial reports with FAA using the Certification Activity Tracking System (CATS). The system provides public access to the financial reports and the CATS data was used in the pro forma financial forecast. The PUB pro forma analysis is prepared using the passenger enplanements, aircraft operations, and based aircraft projections determined in **Chapter B – Aviation Activity Forecasts**. The PUB Master Plan covers a 20-year planning period (2019-2040) with 2019 as the existing forecast baseline year. The compound annual growth rate (CAGR) is calculated by determining the rate of change over the planning period. The CAGR is used to forecast projections for revenues and expenses.

Forecast activity and CAGR are provided in detail in **Appendix H** determine the rate of change for each budget category. For the revenues and expenses that are not driven by passengers, aircraft operations or based aircraft categories, they are escalated with the CIP inflation rate. The CIP inflation rate of two percent used in this pro forma analysis is the national standard inflation rate by year and corresponds to the cycle of the nation's gross domestic product (GDP). CAGR for all forecast activities are listed in **Appendix H**.

The financial feasibility and project potential cash flows are evaluated in this pro forma analysis. The pro forma projections consider a five-year window beginning in 2022 and continuing through 2026. The budget for 2021 has been adopted already since the analysis is completed mid-year 2021 and was not considered. The proforma analysis is expressed into the following categories.

- **Aeronautical Revenue**
- **Operating Expenses**
- **Capital Expenditures.**

Aeronautical revenues

Passenger-related aeronautical revenues come primarily from airline landing fees, terminal arrival fees which include rents and utilities, and other passenger fees. Additionally, airlines act as airport tenants, paying rent for counter and gate space, training facilities, storage facilities, offices and maintenance facilities.

Non-passenger aeronautical revenues are generated from aeronautical activities. These include hangar rentals, fuel tax and flowage fees, and FBO revenues. These revenues have been escalated at the appropriate rate based on the forecast activity.

Non-Aeronautical Revenues include revenues generated in retail concessions, parking, rental cars, food and beverage, advertising, access fees, taxes, and utilities. Revenue from terminal services and retail is assumed to have decreased due to the COVID -19 related decrease in commercial air service at PUB . Other categories such as taxes on utilities increase each year using the CIP inflation rate.

Operating Expenses

Operating expenses include items such as compensation, benefits, supplies, insurance, maintenance, and contractual services. These expenses are not driven by the future airport activity and have been escalated at the CIP pro-forma rate of two percent.

The non-operating revenue (expenses) and capital expenditures include interest income, grant receipts, capital contributions and other non-operating revenue. and customer facility charges. Interest income is escalated at the CIP inflation of two percent. The grants projections are calculated using the CIP and the anticipated AIP funding participation for each year for the five-year planning period. Each year varies depending on the grant needs for each specific year. Escalation after the year 2021 has already been included in the cost estimates. Passenger Facility Charges (PFCs) are not included in the proforma analysis forecast. PUB PFC funds have been allocated to pay for past FAA approved projects for the previous year(s) until the expiration of the PFC application which will occur in 2036. The Capital Contribution forecast shows the 2.5 percent match that is required by FAA. The match correlates with the capital project needs for each year escalated appropriately. Other non-operating funding has been forecasted as anticipated funding from a third party that has coordinated with PUB to contribute funds based on an agreed upon percentage for their contribution.

Capital Expenditures

The capital expenditures and construction -in-progress CATS category in the analysis is based on the programmed five-year CIP. These account for airfield, terminal, parking, and other capital projects for each year for PUB. Carryover years are years in which PUB is not expected to fund projects with AIP grants but is carrying over their passenger entitlements into the next year that has a programmed project. PUB has the option to carry over passenger entitlements for up to three years for use in the fourth year.

Budget Summary

Using the forecast aviation activity and the escalation factors, a summary of the five-year pro forma projected operating budget has been formed. The analysis of the cash flow provides insight into ways to reduce operating costs or steps to accelerate revenues. **TABLE E5** provides a summary of the total forecasted operating revenues, expenses, and capital contributions. PUB operating income is trending negative, averaging approximately 400,000 dollars each year for the five-year period. This is the result of PUB operating expenses being greater than the operating revenues. The projected amount of capital expenditures anticipated for the five-year period are anticipated to be funded through the request of FAA discretionary. Even with the sizable local funding involvement of the third parallel runway (i.e., 50 percent), PUB will find it difficult to contribute its match for any AIP passenger entitlement grants as the funding mechanisms are structured now. Additionally, PUB is not favorably positioned to maximize discretionary grants or contribute to non-AIP eligible projects. PUB will need to request discretionary funds for many other projects in Phase I, or it may need to shift Phase I projects to Phases II or III as needed to minimize the capital and operating costs. Reprioritizing the projects or increasing the local funding match will be required as each year's projects are evaluated and considered for implementation.

TABLE E5 **Forecast Operating Budget Summary, 2022-2026**

ACCOUNT ACTIVITY	FORECASTED				
	2022	2023	2024	2025	2026
Total Passenger Airline Aeronautical Revenue	$83,000	$85,000	$86,000	$87,000	$88,000
Total Non-Passenger Aeronautical Revenue	$430,000	$436,000	$442,000	$451,000	$458,000
Total Aeronautical Revenue	$513,000	$521,000	$528,000	$538,000	$546,000
Total Non-Aeronautical Revenue	352,000	$359,000	$365,000	$372,000	$379,000
Total Operating Revenue	$865,000	$880,000	$893,000	$910,000	$925,000
Total Operating Expenses	$1,241,000	$1,267,000	$1,291,000	$1,318,000	$1,343,000
Operating Income (Loss)[1]	$(376,000)	$(387,000)	$(398,000)	$(408,000)	$(418,000)
Total Non-Operating Revenue[2]	$2,084,000	$12,075,000	$929,000	17,823,000	$11,350,000
Total Capital Expenditures[3]	**$2,083,000**	**$12,075,000**	**$929,000**	**$17,822,000**	**$11,349,000**

SOURCE: Mead & Hunt analysis.
NOTES: [1] Depreciation expense is not a cash transaction, so it has been removed. Depreciation averaged $1.7 million per year from 2019-2020.
[2] Includes FAA and state grants.
[3] These are capital projects reported on the capital improvement plan. Funding for these projects, including FAA and State grants, is included in Total Non-Operating Revenue.

Summary

The 20-year CIP project costs, including inflation, are expected to total approximately $116.5 million. The pro forma analysis projects that PUB can generate additional revenue by escalating passenger and non-passenger operating revenues with the associated rates that have been forecasted through the planning period of 2040. This analysis indicates that PUB will rely mostly on AIP entitlements and discretionary grants to cover funding for the initial five-year period of 2022 to 2026. PUB may choose to adjust rates as demand changes to help defray increasing costs. It is a worthy and feasible goal that PUB become as financially self-sufficient as possible. In fact, FAA Grant Assurance #24 indicates that airport sponsors should maintain fee and rental structures for facilities and services that make airports as self-sustaining as possible given local circumstances.

The development plan for PUB is aggressive; the monetary commitments are significant. However, it is a solid plan that represents PUB's best opportunity for meeting its current and future obligations. The plan also represents a series of choices and alternatives for the City of Pueblo. The ultimate success of PUB does not rely upon the completion of every single project contained in the development plan. To meet realistic funding expectations, it may be necessary to weigh the projects in a thoughtful and economical manner. In other words, to keep from being short-sighted in its choices, the city may be required to selectively implement the projects. Knowing the full scope of development possibilities enables the city to capitalize on opportunities, respond to financial realities, and select projects that are in harmony with PUB's overall development plan and strategic vision. The project improvements are depicted on the ALP so that PUB can respond to changing demand quickly and illustrate to the FAA that should the need for a particular facility arise earlier than expected, its size and location have been considered in relation to the rest of airport facilities.

If aviation demands continue to indicate that improvements are needed, and if the proposed improvements prove to be environmentally acceptable, the capital improvement financial implications discussed previously are likely to be acceptable for CDOT Division of Aeronautics, and the FAA. However, it must be recognized that this is only a programming analysis and not a commitment on the part of the CDOT Division of Aeronautics, the FAA, or the Airport Sponsor. If the cost of an improvement project is not financially feasible, it will not be instigated.

Appendices

Appendix A. PCN Analysis

Appendix A. PCN Analysis

In accordance with FAA AC 150/5335-5C, *Standard Method of Reporting Pavement Strength-PCN*, a Pavement Classification Number (PCN) analysis was completed using COMFAA software (version 3.0) and the supporting Excel spreadsheet. The PCN analysis was performed on Runways 17/35, 8R/26L and 8L/26R. In addition to the runways, PCN analysis was performed on Taxiway A and all associated connectors (A1-A12), Taxiway B and all associated connectors (B1-B7), and Taxiway C, D, E and E7.

The PCNs calculated are approximate values based on available historical pavement section data. Pavement section data is based on pavement strength surveys, geotechnical reports, and construction drawings from past projects. On pavement areas in which the pavement section data is not available, a PCN value was not calculated. Some older pavement sections such as Taxiway A may have incomplete data available, resulting in lower-than-expected PCN values. More accurate pavement section data can be obtained by conducting a geotechnical investigation of the airfield in conjunction with Falling Weight Deflectometer (FWD) testing.

The proposed aircraft fleet mix for the PCN analysis is identified in **Table 1** below. The aircraft and operations used are based on data provided by the FAA Airport Master Record (5010, dated 6/18/2020), the Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) (dated 3/26/2020), historical data maintained and updated by PUB, and this Airport Master Plan. This representative fleet mix was developed using equivalent traffic calculations in accordance with FAA AC 150/5335-5C, Section A3. The equivalent traffic calculations were performed on military and GA jet traffic utilizing the Gulfstream G-V and C-130 Hercules as representative aircraft.

Aircraft operations data were converted to departures to be analyzed by the COMFAA software. One departure equals 0.5 operations. Aircraft operations were then further broken down by runway. The PUB ATCT provided an approximate breakdown of aircraft operations by runway as shown in **Table 1**. Each runway/taxiway was analyzed using the fleet mix currently using that specific section of runway or taxiway.

In general, the pass to coverage (P/C) used for analysis was 1.0 as specified in FAA AC 150/5335-5C, Section A 2.2, for airports with parallel taxiway scenarios in which aircraft will be obtaining fuel at the airport. For analysis purposes, the P/C ratio and departures may have been increased in order to obtain cumulative damage factor (CDF) resulting in a representative PCN.

TABLE 1 Airport Fleet Mix

AIRCRAFT FLEET MIX	PUEBLO MEMORIAL AIRPORT MASTER PLAN PCN ANALYSIS ANNUAL DEPARTURES					
Aircraft Type	**ARC**	**Max. Take-off Weight (lbs.)**	**Average Projected Departures/YEAR 2020 - 2040**	**Runway 8R - 26L Departures**	**Runway 8L - 26R Departures**	**Runway 17/35 Departures**
Boeing 737-800	D-III	174,700	100	95	0	5
Cessna Skyhawk 172	A-I	2,550	9,479	8,531	474	474
Diamond DA-20	A-I	1,764	186,837	88,748	88,748	9,342
Gulfstream G-V	C-III	90,900	1,315	1,249	0	66
C-130 Hercules	C-IV	155,000	225	214	0	11
CRJ-200	C-II	53,000	2,325	2,209	0	116

SOURCES: FAA Airport Master Record; FAA TFMSC database; PUB airport management and ATCT records; June, 2020; Aviation System Performance Metrics, March 2020.

Using the aircraft fleet mix data displayed in **Table 1**, the PCN of each pavement section was determined. The PCN is comprised of four components representing pavement type, subgrade strength category, allowable tire pressure, and method used to determine PCN. Each component is represented by a code and are defined as follows:

Pavement Codes

Pavement Type	Pavement Code
Flexible	F
Rigid	R

Subgrade Strength Category

Subgrade Strength Category	Subgrade Support CBR-Value	Represents	Code Designation
High	15	CBR ≥ 13	A
Medium	10	8<CBR<13	B
Low	6	4<CBR≤8	C
Ultra-Low	3	CBR≤4	D

Allowable Tire Pressure

Category	Code	Tire Pressure Range
Unlimited	W	No Pressure Limit
High	X	Pressure Limited to 254 psi (1.75 MPa)
Medium	Y	Pressure Limited to 181 psi (1.25 MPa)
Low	Z	Pressure Limited to 73 psi (0.50 MPa)

Method used to determine PCN

Results of technical Study = T
Based on aircraft using pavement = U

Table 2 identifies the runway/taxiway areas under analysis and the fleet mix used to evaluate the pavement area. The PCN results for each runway/taxiway are also illustrated. The COMFAA data sheets detailing the analysis for the runways/taxiways are provided in this Appendix for a more in-depth review. The data sheets include the following:

- **Aircraft operational and maximum gross weights**
- **Typical aircraft weight distribution on the main and nose gear**
- **Main gear type (dual, dual tandem, etc.)**
- **Main gear tire pressure**
- **Maximum allowable gross weight for each aircraft on pavement at equivalent annual departure level**
- **Aircraft Classification Number (ACN) of each aircraft at its maximum allowable gross weight.**

TABLE A2 **Summary of PCN Data for PUB Runways & Taxiways**

PUB MASTER PLAN PCN DATA		
Runway / Taxiway	**Aircraft Fleet Mix**	**PCN**
Runway 8L-26R	8L-26R	7.6 F/D/Z/T
Runway 8R-26L (Keel)	8R-26L	73 F/D/X/T
Runway 8R-26L (Edges)	8R-26L	67 F/D/X/T
Runway 17-35	17-35	57 F/B/X/T
Taxiway A	100% Fleet	36 R/C/X/T
Taxiway A (A1 to A2)	100% Fleet	31 F/C/X/T
Taxiway A (E7 to A10)	8R-26L	73 F/C/X/T
Taxiway A (A10 to A12)	8R-26L	41 F/D/X/T
Taxiway A2	100% Fleet	61 F/C/X/T
Taxiway A3	100% Fleet	28 F/C/X/T
Taxiway A6	8R-26L	63 F/C/X/T
Taxiway A9	8R-26L	13 F/C/X/T
Taxiway B	8L-26R	7.6 F/D/Z/T
Taxiway B1	8L-26R	8.1 F/D/Z/T
Taxiway B3	8L-26R	7.6 F/D/Z/T
Taxiway B4	8L-26R	7.6 F/D/Z/T
Taxiway B7	8L-26R	8.1 F/D/Z/T
Taxiway C	8L-26R	8.1 F/D/Z/T
Taxiway D	17-35	66 F/B/X/T
Taxiway E	8R-26L	61 R/C/X/T
Taxiway E7	8R-26L	35 R/D/X/T

SOURCE: Dibble Engineering, June 2020.

Runway 8L-26R
Pavement Section R11

Library file name = K:\2019\1019046_PUB_MP_Update\Technical Information\PCN\Aircraft Fleet Mix\PUB 8L-26R Fleet.Ext
Units = English

Evaluation pavement type is flexible and design procedure is CBR.
Alpha Values are those approved by the ICAO in 2007.

CBR = 3.00 (Subgrade Category is D(3))
Evaluation pavement thickness = 25.50 in
Pass to Traffic Cycle (PtoTC) Ratio = 10.00 (non-standard)
Maximum number of wheels per gear = 1
Maximum number of gears per aircraft = 1

No aircraft have 4 or more wheels per gear. The FAA recommends a reference section assuming 3 inches of HMA and 6 inches of crushed aggregate for equivalent thickness calculations.

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	Diamond DA-20	1,764	100.00	30.0	887,480	15,881,654	10.25
2	Skyhawk-172	2,558	95.00	50.0	4,740	54,598	7.19

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on D(3)
1	Diamond DA-20	>5,000,000	10.25	10,912	18.20	0.0000	7.6
2	Skyhawk-172	>5,000,000	9.06	20,248	18.20	0.0000	7.6
					Total CDF =	0.0000	

When computing the numbers of coverages to failure, the coverages for none of the aircraft converged at a pavement thickness greater than 99 percent of the evaluation thickness. This means that the life of the pavement is unlimited and the pavement is very strong in relation to the aircraft loading. The relative aircraft load evaluations are also unreliable. Consider reviewing the procedures used to determine the evaluation thickness and the strength of the support. The thicknesses for unlimited operations of each of the aircraft are as follows.

Results Table 2a. Thicknesses for Unlimited Operations

Diamond DA-20	14.64
Skyhawk-172	12.95

Results Table 3. Flexible ACN at Indicated Gross Weight and Strength

No.	Aircraft Name	Gross Weight	% GW on Main Gear	Tire Pressure	ACN Thick	ACN on D(3)
1	Diamond DA-20	1,764	100.00	30.0	7.32	1.2
2	Skyhawk-172	2,558	95.00	50.0	6.47	1.0

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

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Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,Diamond DA-20,1764.000,1.2,8874800,10.25,1.58817E+007,1.01423E+304,10.25,10911.780,7.6,25.5,D,3.00,10.00,F
2,Skyhawk-172,2558.000,1.0,47400,7.19,5.45977E+004,1.01423E+304,9.06,20247.843,7.6,25.5,D,3.00,10.00,F
```

Runway 8R-26L (Keel)

Pavement Section R1

Library file name = K:\2019\1019046_PUB_MP_Update\Technical Information\PCN\Aircraft Fleet Mix\PUB 8R-26L Fleet.Ext
Units = English

Evaluation pavement type is flexible and design procedure is CBR.
Alpha Values are those approved by the ICAO in 2007.

CBR = 4.00 (Subgrade Category is D(3))
Evaluation pavement thickness = 40.80 in
Pass to Traffic Cycle (PtoTC) Ratio = 2.00
Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

No aircraft have 4 or more wheels per gear. The FAA recommends a reference section assuming 3 inches of HMA and 6 inches of crushed aggregate for equivalent thickness calculations.

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	B737-800	174,700	93.56	205.0	100	1,124	34.80
2	RegionalJet-200	53,000	95.00	177.0	2,209	17,072	24.80
3	C-130	155,000	95.00	105.0	214	3,702	31.42
4	Gulfstream-G-V	90,900	95.00	188.0	1,249	11,911	31.45
5	Diamond DA-20	1,764	100.00	30.0	88,748	317,633	7.15
6	Skyhawk-172	2,558	95.00	50.0	8,531	19,653	5.72

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on D(3)
1	B737-800	1,195	35.01	226,190	56.42	0.1430	73.3
2	RegionalJet-200	>5,000,000	37.06	63,987	30.97	0.0000	22.1
3	C-130	67,455	37.57	177,468	43.94	0.0083	44.5
4	Gulfstream-G-V	3,044,985	39.10	98,569	38.04	0.0006	33.3
5	Diamond DA-20	>5,000,000	11.79	21,129	25.32	0.0000	14.8
6	Skyhawk-172	>5,000,000	10.96	35,480	24.09	0.0000	13.4
					Total CDF =	0.1520	

Results Table 3. Flexible ACN at Indicated Gross Weight and Strength

No.	Aircraft Name	Gross Weight	% GW on Main Gear	Tire Pressure	ACN Thick	ACN on D(3)
1	B737-800	174,700	93.56	205.0	48.96	55.2
2	RegionalJet-200	53,000	95.00	177.0	28.09	18.2
3	C-130	155,000	95.00	105.0	40.41	37.6
4	Gulfstream-G-V	90,900	95.00	188.0	36.45	30.6
5	Diamond DA-20	1,764	100.00	30.0	7.32	1.2
6	Skyhawk-172	2,558	95.00	50.0	6.47	1.0

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,B737-800,174700.000,55.2,200,34.80,1.12440E+003,7.86085E+003,35.01,226189.940,73.3,40.8,D,4.00,2.00,F
2,RegionalJet-200,53000.000,18.2,4418,24.80,1.70719E+004,1.01423E+304,37.06,63987.406,22.1,40.8,D,4.00,2.00,F
3,C-130,155000.000,37.6,428,31.42,3.70182E+003,4.43861E+005,37.57,177468.253,44.5,40.8,D,4.00,2.00,F
4,Gulfstream-G-V,90900.000,30.6,2498,31.45,1.19108E+004,2.00364E+007,39.10,98569.016,33.3,40.8,D,4.00,2.00,F
5,Diamond DA-20,1764.000,1.2,177496,7.15,3.17633E+005,1.01423E+304,11.79,21128.666,14.8,40.8,D,4.00,2.00,F
6,Skyhawk-172,2558.000,1.0,17062,5.72,1.96529E+004,1.01423E+304,10.96,35479.552,13.4,40.8,D,4.00,2.00,F

Runway 8R-26L (Edges)

Pavement Section R2

Library file name = K:\2019\1019046_PUB_MP_Update\Technical Information\PCN\Aircraft Fleet Mix\PUB 8R-26L Fleet.Ext
Units = English

Evaluation pavement type is flexible and design procedure is CBR.
Alpha Values are those approved by the ICAO in 2007.

CBR = 4.00 (Subgrade Category is D(3))
Evaluation pavement thickness = 36.80 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00
Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

No aircraft have 4 or more wheels per gear. The FAA recommends a reference section assuming 3 inches of HMA and 6 inches of crushed aggregate for equivalent thickness calculations.

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	B737-800	174,700	93.56	205.0	100	562	32.32
2	RegionalJet-200	53,000	95.00	177.0	2,209	8,536	23.84
3	C-130	155,000	95.00	105.0	214	1,851	29.72
4	Gulfstream-G-V	90,900	95.00	188.0	1,249	5,955	30.12
5	Diamond DA-20	1,764	100.00	30.0	88,748	158,817	6.92
6	Skyhawk-172	2,558	95.00	50.0	8,531	9,826	5.47

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on D(3)
1	B737-800	678	33.01	209,131	54.06	0.2742	67.3
2	RegionalJet-200	>5,000,000	36.77	53,092	28.11	0.0000	18.2
3	C-130	14,849	34.56	172,194	43.09	0.0412	42.8
4	Gulfstream-G-V	129,515	35.32	98,174	37.96	0.0152	33.2
5	Diamond DA-20	>5,000,000	11.79	17,189	22.84	0.0000	12.0
6	Skyhawk-172	>5,000,000	10.96	28,864	21.73	0.0000	10.9
					Total CDF =	0.3306	

Results Table 3. Flexible ACN at Indicated Gross Weight and Strength

No.	Aircraft Name	Gross Weight	% GW on Main Gear	Tire Pressure	ACN Thick	ACN on D(3)
1	B737-800	174,700	93.56	205.0	48.96	55.2
2	RegionalJet-200	53,000	95.00	177.0	28.09	18.2
3	C-130	155,000	95.00	105.0	40.41	37.6
4	Gulfstream-G-V	90,900	95.00	188.0	36.45	30.6
5	Diamond DA-20	1,764	100.00	30.0	7.32	1.2
6	Skyhawk-172	2,558	95.00	50.0	6.47	1.0

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,B737-800,174700.000,55.2,100,32.32,5.62200E+002,2.05041E+003,33.01,209131.035,67.3,36.8,D,4.00,1.00,F
2,RegionalJet-200,53000.000,18.2,2209,23.84,8.53597E+003,4.75968E+019,36.77,53092.127,18.2,36.8,D,4.00,1.00,F
3,C-130,155000.000,37.6,214,29.72,1.85091E+003,4.49159E+004,34.56,172194.222,42.8,36.8,D,4.00,1.00,F
4,Gulfstream-G-V,90900.000,30.6,1249,30.12,5.95539E+003,3.91759E+005,35.32,98174.454,33.2,36.8,D,4.00,1.00,F
5,Diamond DA-20,1764.000,1.2,88748,6.92,1.58817E+005,1.01423E+304,11.79,17188.881,12.0,36.8,D,4.00,1.00,F
6,Skyhawk-172,2558.000,1.0,8531,5.47,9.82644E+003,1.01423E+304,10.96,28863.822,10.9,36.8,D,4.00,1.00,F

Runway 17-35

Pavement Section R8

This file name = PCN Results Flexible 6-23-2020 15;57;18.txt
Library file name = K:\2019\1019046_PUB_MP_Update\Technical Information\PCN\Aircraft Fleet Mix\PUB 17-35 Fleet.Ext
Units = English

Evaluation pavement type is flexible and design procedure is CBR.
Alpha Values are those approved by the ICAO in 2007.

CBR = 10.00 (Subgrade Category is B(10))
Evaluation pavement thickness = 25.60 in
Pass to Traffic Cycle (PtoTC) Ratio = 8.00 (non-standard)
Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

No aircraft have 4 or more wheels per gear. The FAA recommends a reference section assuming 3 inches of HMA and 6 inches of crushed aggregate for equivalent thickness calculations.

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	B737-800	174,700	93.56	205.0	200	8,995	22.81
2	RegionalJet-200	53,000	95.00	177.0	116	3,586	13.28
3	C-130	155,000	95.00	105.0	11	761	15.45
4	Gulfstream-G-V	90,900	95.00	188.0	66	2,518	16.24
5	Diamond DA-20	1,764	100.00	30.0	9,342	133,742	2.91
6	Skyhawk-172	2,558	95.00	50.0	474	4,368	2.54

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on B(10)
1	B737-800	8,996	22.81	209,399	25.79	0.1506	57.0
2	RegionalJet-200	>5,000,000	22.46	67,886	16.40	0.0000	23.1
3	C-130	>5,000,000	24.61	165,535	19.47	0.0000	32.4
4	Gulfstream-G-V	>5,000,000	24.82	96,045	18.65	0.0000	29.8
5	Diamond DA-20	>5,000,000	5.00	46,305	12.80	0.0000	14.0
6	Skyhawk-172	>5,000,000	5.40	57,498	12.80	0.0000	14.0
					Total CDF =	0.1506	

Results Table 3. Flexible ACN at Indicated Gross Weight and Strength

No.	Aircraft Name	Gross Weight	% GW on Main Gear	Tire Pressure	ACN Thick	ACN on B(10)
1	B737-800	174,700	93.56	205.0	22.99	45.3
2	RegionalJet-200	53,000	95.00	177.0	14.26	17.4
3	C-130	155,000	95.00	105.0	18.78	30.2
4	Gulfstream-G-V	90,900	95.00	188.0	18.03	27.9
5	Diamond DA-20	1,764	100.00	30.0	2.50	0.5
6	Skyhawk-172	2,558	95.00	50.0	2.70	0.6

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,B737-800,174700.000,45.3,1600,22.81,8.99520E+003,5.97252E+004,22.81,209398.663,57.0,25.6,B,10.00,8.00,F
2,RegionalJet-200,53000.000,17.4,928,13.28,3.58596E+003,1.01423E+304,22.46,67886.408,23.1,25.6,B,10.00,8.00,F
3,C-130,155000.000,30.2,88,15.45,7.61122E+002,8.98022E+007,24.61,165534.617,32.4,25.6,B,10.00,8.00,F
4,Gulfstream-G-V,90900.000,27.9,528,16.24,2.51757E+003,4.19922E+008,24.82,96044.792,29.8,25.6,B,10.00,8.00,F
5,Diamond DA-20,1764.000,0.5,74736,2.91,1.33742E+005,1.01423E+304,5.00,46304.521,14.0,25.6,B,10.00,8.00,F
6,Skyhawk-172,2558.000,0.6,3792,2.54,4.36782E+003,1.01423E+304,5.40,57497.823,14.0,25.6,B,10.00,8.00,F

Taxiway A (Between Taxiway A1 and A2)

Pavement Section T6

Library file name = K:\2019\1019046_PUB_MP_Update\Technical Information\PCN\Aircraft Fleet Mix\PUB 100% Fleet.Ext
Units = English

Evaluation pavement type is flexible and design procedure is CBR.
Alpha Values are those approved by the ICAO in 2007.

CBR = 4.90 (Subgrade Category is C(6))
Evaluation pavement thickness = 24.90 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00
Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

No aircraft have 4 or more wheels per gear. The FAA recommends a reference section assuming 3 inches of HMA and 6 inches of crushed aggregate for equivalent thickness calculations.

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	B737-800	174,700	93.56	205.0	100	562	28.37
2	RegionalJet-200	53,000	95.00	177.0	2,325	8,984	21.40
3	C-130	155,000	95.00	105.0	225	1,946	26.17
4	Gulfstream-G-V	90,900	95.00	188.0	1,315	6,270	26.95
5	Diamond DA-20	1,764	100.00	30.0	186,837	334,349	6.10
6	Skyhawk-172	2,558	95.00	50.0	9,479	10,918	4.79

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on C(6)
1	B737-800	1,537	31.59	120,031	25.45	2.7230	31.2
2	RegionalJet-200	1,625,197	26.55	46,910	18.00	0.0412	15.6
3	C-130	8,164	29.17	117,772	22.18	1.7745	23.7
4	Gulfstream-G-V	16,065	28.55	71,068	21.45	2.9055	22.2
5	Diamond DA-20	>5,000,000	10.03	10,872	10.43	0.0000	5.2
6	Skyhawk-172	>5,000,000	9.53	17,466	10.78	0.0000	5.6
					Total CDF =	7.4442	

Results Table 3. Flexible ACN at Indicated Gross Weight and Strength

No.	Aircraft Name	Gross Weight	% GW on Main Gear	Tire Pressure	ACN Thick	ACN on C(6)
1	B737-800	174,700	93.56	205.0	32.30	50.3
2	RegionalJet-200	53,000	95.00	177.0	19.24	17.8
3	C-130	155,000	95.00	105.0	25.91	32.3
4	Gulfstream-G-V	90,900	95.00	188.0	24.70	29.4
5	Diamond DA-20	1,764	100.00	30.0	4.20	0.8
6	Skyhawk-172	2,558	95.00	50.0	4.12	0.8

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

```
Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,B737-800,174700.000,50.3,100,28.37,5.62200E+002,2.06461E+002,31.59,120031.447,31.2,24.9,C,4.90,1.00,F
2,RegionalJet-200,53000.000,17.8,2325,21.40,8.98422E+003,2.18317E+005,26.55,46909.780,15.6,24.9,C,4.90,1.00,F
3,C-130,155000.000,32.3,225,26.17,1.94605E+003,1.09668E+003,29.17,117772.044,23.7,24.9,C,4.90,1.00,F
4,Gulfstream-G-V,90900.000,29.4,1315,26.95,6.27009E+003,2.15800E+003,28.55,71067.980,22.2,24.9,C,4.90,1.00,F
5,Diamond DA-20,1764.000,0.8,186837,6.10,3.34349E+005,1.01423E+304,10.03,10872.092,5.2,24.9,C,4.90,1.00,F
6,Skyhawk-172,2558.000,0.8,9479,4.79,1.09184E+004,1.01423E+304,9.53,17465.959,5.6,24.9,C,4.90,1.00,F
```

Taxiway A (Between TWY E7 and A10)

Pavement Section T15

This file name = PCN Results Flexible 6-23-2020 17;41;39.txt
Library file name = K:\2019\1019046_PUB_MP_Update\Technical Information\PCN\Aircraft Fleet Mix\PUB 8R-26L Fleet.Ext
Units = English

Evaluation pavement type is flexible and design procedure is CBR.
Alpha Values are those approved by the ICAO in 2007.

CBR = 6.00 (Subgrade Category is C(6))
Evaluation pavement thickness = 30.50 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00
Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

No aircraft have 4 or more wheels per gear. The FAA recommends a reference section assuming 3 inches of HMA and 6 inches of crushed aggregate for equivalent thickness calculations.

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	B737-800	174,700	93.56	205.0	100	562	24.88
2	RegionalJet-200	53,000	95.00	177.0	2,209	8,536	19.05
3	C-130	155,000	95.00	105.0	214	1,851	22.93
4	Gulfstream-G-V	90,900	95.00	188.0	1,249	5,955	23.86
5	Diamond DA-20	1,764	100.00	30.0	88,748	158,817	4.94
6	Skyhawk-172	2,558	95.00	50.0	8,531	9,826	4.12

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on C(6)
1	B737-800	618	25.15	236,516	38.79	0.1211	72.5
2	RegionalJet-200	>5,000,000	29.84	55,299	19.68	0.0000	18.7
3	C-130	33,271	27.79	181,570	28.43	0.0074	38.9
4	Gulfstream-G-V	171,416	28.47	103,122	26.51	0.0046	33.9
5	Diamond DA-20	>5,000,000	8.40	23,262	15.25	0.0000	11.2
6	Skyhawk-172	>5,000,000	8.25	34,951	15.25	0.0000	11.2
					Total CDF =	0.1332	

Results Table 3. Flexible ACN at Indicated Gross Weight and Strength

No.	Aircraft Name	Gross Weight	% GW on Main Gear	Tire Pressure	ACN Thick	ACN on C(6)
1	B737-800	174,700	93.56	205.0	32.30	50.3
2	RegionalJet-200	53,000	95.00	177.0	19.24	17.8
3	C-130	155,000	95.00	105.0	25.91	32.3
4	Gulfstream-G-V	90,900	95.00	188.0	24.70	29.4
5	Diamond DA-20	1,764	100.00	30.0	4.20	0.8
6	Skyhawk-172	2,558	95.00	50.0	4.12	0.8

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

```
Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,B737-800,174700.000,50.3,100,24.88,5.62200E+002,4.64106E+003,25.15,236515.774,72.5,30.5,C,6.00,1.00,F
2,RegionalJet-200,53000.000,17.8,2209,19.05,8.53597E+003,1.01423E+304,29.84,55299.218,18.7,30.5,C,6.00,1.00,F
3,C-130,155000.000,32.3,214,22.93,1.85091E+003,2.49837E+005,27.79,181569.738,38.9,30.5,C,6.00,1.00,F
4,Gulfstream-G-V,90900.000,29.4,1249,23.86,5.95539E+003,1.28719E+006,28.47,103122.470,33.9,30.5,C,6.00,1.00,F
5,Diamond DA-20,1764.000,0.8,88748,4.94,1.58817E+005,1.01423E+304,8.40,23262.148,11.2,30.5,C,6.00,1.00,F
6,Skyhawk-172,2558.000,0.8,8531,4.12,9.82644E+003,1.01423E+304,8.25,34950.924,11.2,30.5,C,6.00,1.00,F
```

Taxiway A (Between TWY A10 and A12)

Pavement Section T12

Library file name = K:\2019\1019046_PUB_MP_Update\Technical Information\PCN\Aircraft Fleet Mix\PUB 8R-26L Fleet.Ext
Units = English

Evaluation pavement type is flexible and design procedure is CBR.
Alpha Values are those approved by the ICAO in 2007.

CBR = 3.00 (Subgrade Category is D(3))
Evaluation pavement thickness = 35.60 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00
Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

No aircraft have 4 or more wheels per gear. The FAA recommends a reference section assuming 3 inches of HMA and 6 inches of crushed aggregate for equivalent thickness calculations.

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	B737-800	174,700	93.56	205.0	100	562	38.56
2	RegionalJet-200	53,000	95.00	177.0	2,209	8,536	27.82
3	C-130	155,000	95.00	105.0	214	1,851	35.46
4	Gulfstream-G-V	90,900	95.00	188.0	1,249	5,955	35.29
5	Diamond DA-20	1,764	100.00	30.0	88,748	158,817	8.59
6	Skyhawk-172	2,558	95.00	50.0	8,531	9,826	6.46

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on D(3)
1	B737-800	1,089	41.27	136,106	42.52	1.9546	41.6
2	RegionalJet-200	>5,000,000	36.62	50,152	27.29	0.0014	17.2
3	C-130	7,336	39.56	130,217	36.35	0.9549	30.4
4	Gulfstream-G-V	25,798	38.39	78,850	33.78	0.8737	26.3
5	Diamond DA-20	>5,000,000	14.64	10,430	17.79	0.0000	7.3
6	Skyhawk-172	>5,000,000	12.95	19,345	17.79	0.0000	7.3
					Total CDF =	3.7847	

Results Table 3. Flexible ACN at Indicated Gross Weight and Strength

No.	Aircraft Name	Gross Weight	% GW on Main Gear	Tire Pressure	ACN Thick	ACN on D(3)
1	B737-800	174,700	93.56	205.0	48.96	55.2
2	RegionalJet-200	53,000	95.00	177.0	28.09	18.2
3	C-130	155,000	95.00	105.0	40.41	37.6
4	Gulfstream-G-V	90,900	95.00	188.0	36.45	30.6
5	Diamond DA-20	1,764	100.00	30.0	7.32	1.2
6	Skyhawk-172	2,558	95.00	50.0	6.47	1.0

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

```
Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,B737-800,174700.000,55.2,100,38.56,5.62200E+002,2.87628E+002,41.27,136105.903,41.6,35.6,D,3.00,1.00,F
2,RegionalJet-200,53000.000,18.2,2209,27.82,8.53597E+003,5.90228E+006,36.62,50151.518,17.2,35.6,D,3.00,1.00,F
3,C-130,155000.000,37.6,214,35.46,1.85091E+003,1.93823E+003,39.56,130217.342,30.4,35.6,D,3.00,1.00,F
4,Gulfstream-G-V,90900.000,30.6,1249,35.29,5.95539E+003,6.81630E+003,38.39,78850.277,26.3,35.6,D,3.00,1.00,F
5,Diamond DA-20,1764.000,1.2,88748,8.59,1.58817E+005,1.01423E+304,14.64,10430.211,7.3,35.6,D,3.00,1.00,F
6,Skyhawk-172,2558.000,1.0,8531,6.46,9.82644E+003,1.01423E+304,12.95,19345.225,7.3,35.6,D,3.00,1.00,F
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Taxiway A

Pavement Section T19

This file name = PCN Results Rigid 6-23-2020 16;07;55.txt
Library file name = K:\2019\1019046_PUB_MP_Update\Technical Information\PCN\Aircraft Fleet Mix\PUB 100% Fleet.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 116.0 lbs/in^3 (Subgrade Category is C(147))
flexural strength = 650.0 psi
Evaluation pavement thickness = 11.60 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	B737-800	174,700	93.56	205.0	100	562	14.01
2	RegionalJet-200	53,000	95.00	177.0	2,325	8,984	9.55
3	C-130	155,000	95.00	105.0	225	973	10.50
4	Gulfstream-G-V	90,900	95.00	188.0	1,315	6,270	11.76
5	Diamond DA-20	1,764	100.00	30.0	186,837	334,349	2.71
6	Skyhawk-172	2,558	95.00	50.0	9,479	10,918	2.09

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on C(147)
1	B737-800	566	14.02	121,668	11.14	188.6392	35.5
2	RegionalJet-200	>5,000,000	14.87	32,795	6.55	0.0374	11.4
3	C-130	1,958,117	15.53	86,920	8.13	0.0944	18.1
4	Gulfstream-G-V	972,850	15.72	51,538	7.78	1.2245	16.5
5	Diamond DA-20	>5,000,000	12.35	1,528	1.89	0.0000	0.8
6	Skyhawk-172	>5,000,000	12.31	2,247	1.74	0.0000	0.7
					Total CDF =	189.9956	

Results Table 3. Rigid ACN at Indicated Gross Weight and Strength

No.	Aircraft Name	Gross Weight	% GW on Main Gear	Tire Pressure	ACN Thick	ACN on C(147)
1	B737-800	174,700	93.56	205.0	13.56	54.1
2	RegionalJet-200	53,000	95.00	177.0	8.50	19.9
3	C-130	155,000	95.00	105.0	11.05	34.9
4	Gulfstream-G-V	90,900	95.00	188.0	10.59	31.9
5	Diamond DA-20	1,764	100.00	30.0	2.02	0.9
6	Skyhawk-172	2,558	95.00	50.0	1.85	0.8

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,B737-800,174700.000,54.1,100,14.01,5.62200E+002,2.98029E+000,14.02,121668.402,35.5,11.6,C,116.00,1.00,R
2,RegionalJet-200,53000.000,19.9,2325,9.55,8.98422E+003,2.39900E+005,14.87,32795.199,11.4,11.6,C,116.00,1.00,R
3,C-130,155000.000,34.9,225,10.50,9.73026E+002,1.03061E+004,15.53,86919.946,18.1,11.6,C,116.00,1.00,R
4,Gulfstream-G-V,90900.000,31.9,1315,11.76,6.27009E+003,5.12038E+003,15.72,51537.709,16.5,11.6,C,116.00,1.00,R
5,Diamond DA-20,1764.000,0.9,186837,2.71,3.34349E+005,3.56172E+032,12.35,1528.357,0.8,11.6,C,116.00,1.00,R
6,Skyhawk-172,2558.000,0.8,9479,2.09,1.09184E+004,5.37300E+034,12.31,2247.042,0.7,11.6,C,116.00,1.00,R

Taxiway A2

Pavement Section T4

Library file name = K:\2019\1019046_PUB_MP_Update\Technical Information\PCN\Aircraft Fleet Mix\PUB 100% Fleet.Ext
Units = English

Evaluation pavement type is flexible and design procedure is CBR.
Alpha Values are those approved by the ICAO in 2007.

CBR = 6.00 (Subgrade Category is C(6))
Evaluation pavement thickness = 37.40 in
Pass to Traffic Cycle (PtoTC) Ratio = 10.00 (non-standard)
Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

No aircraft have 4 or more wheels per gear. The FAA recommends a reference section assuming 3 inches of HMA and 6 inches of crushed aggregate for equivalent thickness calculations.

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	B737-800	174,700	93.56	205.0	400	22,488	34.01
2	RegionalJet-200	53,000	95.00	177.0	2,325	89,842	21.50
3	C-130	155,000	95.00	105.0	225	19,461	26.97
4	Gulfstream-G-V	90,900	95.00	188.0	1,315	62,701	27.27
5	Diamond DA-20	1,764	100.00	30.0	186,837	3,343,490	5.60
6	Skyhawk-172	2,558	95.00	50.0	9,479	109,184	4.76

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on C(6)
1	B737-800	22,490	34.01	204,391	35.56	0.1564	61.0
2	RegionalJet-200	>5,000,000	29.84	82,191	24.31	0.0000	28.5
3	C-130	>5,000,000	36.33	162,506	26.63	0.0000	34.2
4	Gulfstream-G-V	>5,000,000	37.10	92,308	24.91	0.0000	29.9
5	Diamond DA-20	>5,000,000	8.40	34,978	18.71	0.0000	16.9
6	Skyhawk-172	>5,000,000	8.25	52,554	18.70	0.0000	16.8
					Total CDF =	0.1564	

Results Table 3. Flexible ACN at Indicated Gross Weight and Strength

No.	Aircraft Name	Gross Weight	% GW on Main Gear	Tire Pressure	ACN Thick	ACN on C(6)
1	B737-800	174,700	93.56	205.0	32.30	50.3
2	RegionalJet-200	53,000	95.00	177.0	19.24	17.8
3	C-130	155,000	95.00	105.0	25.91	32.3
4	Gulfstream-G-V	90,900	95.00	188.0	24.70	29.4
5	Diamond DA-20	1,764	100.00	30.0	4.20	0.8
6	Skyhawk-172	2,558	95.00	50.0	4.12	0.8

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,B737-800,174700.000,50.3,4000,34.01,2.24880E+004,1.43830E+005,34.01,204391.296,61.0,37.4,C,6.00,10.00,F
2,RegionalJet-200,53000.000,17.8,23250,21.50,8.98422E+004,1.01423E+304,29.84,82190.893,28.5,37.4,C,6.00,10.00,F
3,C-130,155000.000,32.3,2250,26.97,1.94605E+004,1.16160E+009,36.33,162505.603,34.2,37.4,C,6.00,10.00,F
4,Gulfstream-G-V,90900.000,29.4,13150,27.27,6.27009E+004,2.01144E+013,37.10,92307.787,29.9,37.4,C,6.00,10.00,F
5,Diamond DA-20,1764.000,0.8,1868370,5.60,3.34349E+006,1.01423E+304,8.40,34977.903,16.9,37.4,C,6.00,10.00,F
6,Skyhawk-172,2558.000,0.8,94790,4.76,1.09184E+005,1.01423E+304,8.25,52553.628,16.8,37.4,C,6.00,10.00,F

Taxiway A3

Pavement Section T3

Library file name = K:\2019\1019046_PUB_MP_Update\Technical Information\PCN\Aircraft Fleet Mix\PUB 100% Fleet.Ext
Units = English

Evaluation pavement type is flexible and design procedure is CBR.
Alpha Values are those approved by the ICAO in 2007.

CBR = 6.00 (Subgrade Category is C(6))
Evaluation pavement thickness = 20.90 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00
Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

No aircraft have 4 or more wheels per gear. The FAA recommends a reference section assuming 3 inches of HMA and 6 inches of crushed aggregate for equivalent thickness calculations.

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	B737-800	174,700	93.56	205.0	100	562	24.88
2	RegionalJet-200	53,000	95.00	177.0	2,325	8,984	19.11
3	C-130	155,000	95.00	105.0	225	1,946	23.03
4	Gulfstream-G-V	90,900	95.00	188.0	1,315	6,270	23.94
5	Diamond DA-20	1,764	100.00	30.0	186,837	334,349	5.11
6	Skyhawk-172	2,558	95.00	50.0	9,479	10,918	4.15

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on C(6)
1	B737-800	1,837	28.14	108,309	23.87	3.7684	27.5
2	RegionalJet-200	587,703	23.05	44,153	17.41	0.1883	14.6
3	C-130	8,196	25.57	108,087	21.15	2.9242	21.6
4	Gulfstream-G-V	14,210	25.23	65,484	20.44	5.4339	20.1
5	Diamond DA-20	>5,000,000	8.40	10,923	10.45	0.0000	5.3
6	Skyhawk-172	>5,000,000	8.25	16,412	10.45	0.0000	5.3
					Total CDF =	12.3147	

Results Table 3. Flexible ACN at Indicated Gross Weight and Strength

No.	Aircraft Name	Gross Weight	% GW on Main Gear	Tire Pressure	ACN Thick	ACN on C(6)
1	B737-800	174,700	93.56	205.0	32.30	50.3
2	RegionalJet-200	53,000	95.00	177.0	19.24	17.8
3	C-130	155,000	95.00	105.0	25.91	32.3
4	Gulfstream-G-V	90,900	95.00	188.0	24.70	29.4
5	Diamond DA-20	1,764	100.00	30.0	4.20	0.8
6	Skyhawk-172	2,558	95.00	50.0	4.12	0.8

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,B737-800,174700.000,50.3,100,24.88,5.62200E+002,1.49188E+002,28.14,108308.524,27.5,20.9,C,6.00,1.00,F
2,RegionalJet-200,53000.000,17.8,2325,19.11,8.98422E+003,4.77236E+004,23.05,44153.301,14.6,20.9,C,6.00,1.00,F
3,C-130,155000.000,32.3,225,23.03,1.94605E+003,6.65508E+002,25.57,108086.658,21.6,20.9,C,6.00,1.00,F
4,Gulfstream-G-V,90900.000,29.4,1315,23.94,6.27009E+003,1.15388E+003,25.23,65483.763,20.1,20.9,C,6.00,1.00,F
5,Diamond DA-20,1764.000,0.8,186837,5.11,3.34349E+005,1.01423E+304,8.40,10923.031,5.3,20.9,C,6.00,1.00,F
6,Skyhawk-172,2558.000,0.8,9479,4.15,1.09184E+004,1.01423E+304,8.25,16411.645,5.3,20.9,C,6.00,1.00,F

Taxiway A6

Pavement Section T7

Library file name = K:\2019\1019046_PUB_MP_Update\Technical Information\PCN\Aircraft Fleet Mix\PUB 8R-26L Fleet.Ext
Units = English

Evaluation pavement type is flexible and design procedure is CBR.
Alpha Values are those approved by the ICAO in 2007.

CBR = 6.00 (Subgrade Category is C(6))
Evaluation pavement thickness = 35.60 in
Pass to Traffic Cycle (PtoTC) Ratio = 7.00 (non-standard)
Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

No aircraft have 4 or more wheels per gear. The FAA recommends a reference section assuming 3 inches of HMA and 6 inches of crushed aggregate for equivalent thickness calculations.

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	B737-800	174,700	93.56	205.0	200	7,871	31.76
2	RegionalJet-200	53,000	95.00	177.0	2,209	59,752	21.12
3	C-130	155,000	95.00	105.0	214	12,956	26.32
4	Gulfstream-G-V	90,900	95.00	188.0	1,249	41,688	26.74
5	Diamond DA-20	1,764	100.00	30.0	88,748	1,111,716	5.38
6	Skyhawk-172	2,558	95.00	50.0	8,531	68,785	4.64

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on C(6)
1	B737-800	7,882	31.76	210,323	36.18	0.1541	63.1
2	RegionalJet-200	>5,000,000	29.84	74,648	23.10	0.0000	25.7
3	C-130	>5,000,000	34.16	166,046	26.97	0.0002	35.1
4	Gulfstream-G-V	>5,000,000	34.89	94,410	25.23	0.0000	30.7
5	Diamond DA-20	>5,000,000	8.40	31,692	17.81	0.0000	15.3
6	Skyhawk-172	>5,000,000	8.25	47,617	17.80	0.0000	15.3
					Total CDF =	0.1543	

Results Table 3. Flexible ACN at Indicated Gross Weight and Strength

No.	Aircraft Name	Gross Weight	% GW on Main Gear	Tire Pressure	ACN Thick	ACN on C(6)
1	B737-800	174,700	93.56	205.0	32.30	50.3
2	RegionalJet-200	53,000	95.00	177.0	19.24	17.8
3	C-130	155,000	95.00	105.0	25.91	32.3
4	Gulfstream-G-V	90,900	95.00	188.0	24.70	29.4
5	Diamond DA-20	1,764	100.00	30.0	4.20	0.8
6	Skyhawk-172	2,558	95.00	50.0	4.12	0.8

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

```
Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,B737-800,174700.000,50.3,1400,31.76,7.87080E+003,5.10806E+004,31.76,210323.142,63.1,35.6,C,6.00,7.00,F
2,RegionalJet-200,53000.000,17.8,15463,21.12,5.97518E+004,1.01423E+304,29.84,74648.491,25.7,35.6,C,6.00,7.00,F
3,C-130,155000.000,32.3,1498,26.32,1.29564E+004,5.96609E+007,34.16,166046.365,35.1,35.6,C,6.00,7.00,F
4,Gulfstream-G-V,90900.000,29.4,8743,26.74,4.16877E+004,8.54731E+009,34.89,94410.279,30.7,35.6,C,6.00,7.00,F
5,Diamond DA-20,1764.000,0.8,621236,5.38,1.11172E+006,1.01423E+304,8.40,31691.947,15.3,35.6,C,6.00,7.00,F
6,Skyhawk-172,2558.000,0.8,59717,4.64,6.87851E+004,1.01423E+304,8.25,47616.517,15.3,35.6,C,6.00,7.00,F
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Taxiway A9

Pavement Section T18
Library file name = K:\2019\1019046_PUB_MP_Update\Technical Information\PCN\Aircraft Fleet Mix\PUB 8R-26L Fleet.Ext
Units = English

Evaluation pavement type is flexible and design procedure is CBR.
Alpha Values are those approved by the ICAO in 2007.

CBR = 3.00 (Subgrade Category is D(3))
Evaluation pavement thickness = 22.20 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00
Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

No aircraft have 4 or more wheels per gear. The FAA recommends a reference section assuming 3 inches of HMA and 6 inches of crushed aggregate for equivalent thickness calculations.

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	B737-800	174,700	93.56	205.0	100	562	38.56
2	RegionalJet-200	53,000	95.00	177.0	2,209	8,536	27.82
3	C-130	155,000	95.00	105.0	214	1,851	35.46
4	Gulfstream-G-V	90,900	95.00	188.0	1,249	5,955	35.29
5	Diamond DA-20	1,764	100.00	30.0	88,748	158,817	8.59
6	Skyhawk-172	2,558	95.00	50.0	8,531	9,826	6.46

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on D(3)
1	B737-800	3,652	45.71	53,164	23.91	25.1241	13.2
2	RegionalJet-200	79,303	31.13	27,838	19.98	17.5646	9.2
3	C-130	7,724	39.70	56,741	22.56	39.1014	11.7
4	Gulfstream-G-V	11,940	36.83	36,306	21.95	81.3921	11.1
5	Diamond DA-20	>5,000,000	14.64	4,056	11.09	0.0000	2.8
6	Skyhawk-172	>5,000,000	12.95	7,523	11.09	0.0000	2.8
					Total CDF =	163.1822	

Results Table 3. Flexible ACN at Indicated Gross Weight and Strength

No.	Aircraft Name	Gross Weight	% GW on Main Gear	Tire Pressure	ACN Thick	ACN on D(3)
1	B737-800	174,700	93.56	205.0	48.96	55.2
2	RegionalJet-200	53,000	95.00	177.0	28.09	18.2
3	C-130	155,000	95.00	105.0	40.41	37.6
4	Gulfstream-G-V	90,900	95.00	188.0	36.45	30.6
5	Diamond DA-20	1,764	100.00	30.0	7.32	1.2
6	Skyhawk-172	2,558	95.00	50.0	6.47	1.0

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

```
Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,B737-800,174700.000,55.2,100,38.56,5.62200E+002,2.23769E+001,45.71,53164.043,13.2,22.2,D,3.00,1.00,F
2,RegionalJet-200,53000.000,18.2,2209,27.82,8.53597E+003,4.85976E+002,31.13,27837.722,9.2,22.2,D,3.00,1.00,F
3,C-130,155000.000,37.6,214,35.46,1.85091E+003,4.73362E+001,39.70,56740.607,11.7,22.2,D,3.00,1.00,F
4,Gulfstream-G-V,90900.000,30.6,1249,35.29,5.95539E+003,7.31692E+001,36.83,36305.908,11.1,22.2,D,3.00,1.00,F
5,Diamond DA-20,1764.000,1.2,88748,8.59,1.58817E+005,1.01423E+304,14.64,4056.013,2.8,22.2,D,3.00,1.00,F
6,Skyhawk-172,2558.000,1.0,8531,6.46,9.82644E+003,1.01423E+304,12.95,7522.803,2.8,22.2,D,3.00,1.00,F
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Taxiway B

Pavement Section T17

Library file name = K:\2019\1019046_PUB_MP_Update\Technical Information\PCN\Aircraft Fleet Mix\PUB 8L-26R Fleet.Ext
Units = English

Evaluation pavement type is flexible and design procedure is CBR.
Alpha Values are those approved by the ICAO in 2007.

CBR = 3.00 (Subgrade Category is D(3))
Evaluation pavement thickness = 25.50 in
Pass to Traffic Cycle (PtoTC) Ratio = 10.00 (non-standard)
Maximum number of wheels per gear = 1
Maximum number of gears per aircraft = 1

No aircraft have 4 or more wheels per gear. The FAA recommends a reference section assuming 3 inches of HMA and 6 inches of crushed aggregate for equivalent thickness calculations.

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	Diamond DA-20	1,764	100.00	30.0	887,480	15,881,654	10.25
2	Skyhawk-172	2,558	95.00	50.0	4,740	54,598	7.19

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on D(3)
1	Diamond DA-20	>5,000,000	10.25	10,912	18.20	0.0000	7.6
2	Skyhawk-172	>5,000,000	9.06	20,248	18.20	0.0000	7.6
					Total CDF =	0.0000	

When computing the numbers of coverages to failure, the coverages for none of the aircraft converged at a pavement thickness greater than 99 percent of the evaluation thickness. This means that the life of the pavement is unlimited and the pavement is very strong in relation to the aircraft loading. The relative aircraft load evaluations are also unreliable. Consider reviewing the procedures used to determine the evaluation thickness and the strength of the support. The thicknesses for unlimited operations of each of the aircraft are as follows.

Results Table 2a. Thicknesses for Unlimited Operations

Diamond DA-20	14.64
Skyhawk-172	12.95

Results Table 3. Flexible ACN at Indicated Gross Weight and Strength

No.	Aircraft Name	Gross Weight	% GW on Main Gear	Tire Pressure	ACN Thick	ACN on D(3)
1	Diamond DA-20	1,764	100.00	30.0	7.32	1.2
2	Skyhawk-172	2,558	95.00	50.0	6.47	1.0

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,Diamond DA-20,1764.000,1.2,8874800,10.25,1.58817E+007,1.01423E+304,10.25,10911.780,7.6,25.5,D,3.00,10.00,F
2,Skyhawk-172,2558.000,1.0,47400,7.19,5.45977E+004,1.01423E+304,9.06,20247.843,7.6,25.5,D,3.00,10.00,F

Taxiway B1

Pavement Section T13

Library file name = K:\2019\1019046_PUB_MP_Update\Technical Information\PCN\Aircraft Fleet Mix\PUB 8L-26R Fleet.Ext
Units = English

Evaluation pavement type is flexible and design procedure is CBR.
Alpha Values are those approved by the ICAO in 2007.

CBR = 5.00 (Subgrade Category is C(6))
Evaluation pavement thickness = 20.70 in
Pass to Traffic Cycle (PtoTC) Ratio = 10.00 (non-standard)
Maximum number of wheels per gear = 1
Maximum number of gears per aircraft = 1

No aircraft have 4 or more wheels per gear. The FAA recommends a reference section assuming 3 inches of HMA and 6 inches of crushed aggregate for equivalent thickness calculations.

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	Diamond DA-20	1,764	100.00	30.0	887,480	15,881,654	6.88
2	Skyhawk-172	2,558	95.00	50.0	4,740	54,598	5.23

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on C(6)
1	Diamond DA-20	>5,000,000	6.88	15,962	12.64	0.0000	7.7
2	Skyhawk-172	>5,000,000	6.59	25,228	12.95	0.0000	8.1
					Total CDF =	0.0000	

When computing the numbers of coverages to failure, the coverages for none of the aircraft converged at a pavement thickness greater than 99 percent of the evaluation thickness. This means that the life of the pavement is unlimited and the pavement is very strong in relation to the aircraft loading. The relative aircraft load evaluations are also unreliable. Consider reviewing the procedures used to determine the evaluation thickness and the strength of the support. The thicknesses for unlimited operations of each of the aircraft are as follows.

Results Table 2a. Thicknesses for Unlimited Operations

Diamond DA-20	9.82
Skyhawk-172	9.41

Results Table 3. Flexible ACN at Indicated Gross Weight and Strength

No.	Aircraft Name	Gross Weight	% GW on Main Gear	Tire Pressure	ACN Thick	ACN on C(6)
1	Diamond DA-20	1,764	100.00	30.0	4.20	0.8
2	Skyhawk-172	2,558	95.00	50.0	4.12	0.8

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,Diamond DA-20,1764.000,0.8,8874800,6.88,1.58817E+007,1.01423E+304,6.88,15961.750,7.7,20.7,C,5.00,10.00,F
2,Skyhawk-172,2558.000,0.8,47400,5.23,5.45977E+004,1.01423E+304,6.59,25227.589,8.1,20.7,C,5.00,10.00,F

Taxiway B1

Pavement Section T13A

Library file name = K:\2019\1019046_PUB_MP_Update\Technical Information\PCN\Aircraft Fleet Mix\PUB 8L-26R Fleet.Ext
Units = English

Evaluation pavement type is flexible and design procedure is CBR.
Alpha Values are those approved by the ICAO in 2007.

CBR = 3.00 (Subgrade Category is D(3))
Evaluation pavement thickness = 25.50 in
Pass to Traffic Cycle (PtoTC) Ratio = 10.00 (non-standard)
Maximum number of wheels per gear = 1
Maximum number of gears per aircraft = 1

No aircraft have 4 or more wheels per gear. The FAA recommends a reference section assuming 3 inches of HMA and 6 inches of crushed aggregate for equivalent thickness calculations.

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	Diamond DA-20	1,764	100.00	30.0	887,480	15,881,654	10.25
2	Skyhawk-172	2,558	95.00	50.0	4,740	54,598	7.19

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on D(3)
1	Diamond DA-20	>5,000,000	10.25	10,912	18.20	0.0000	7.6
2	Skyhawk-172	>5,000,000	9.06	20,248	18.20	0.0000	7.6
					Total CDF =	0.0000	

When computing the numbers of coverages to failure, the coverages for none of the aircraft converged at a pavement thickness greater than 99 percent of the evaluation thickness. This means that the life of the pavement is unlimited and the pavement is very strong in relation to the aircraft loading. The relative aircraft load evaluations are also unreliable. Consider reviewing the procedures used to determine the evaluation thickness and the strength of the support. The thicknesses for unlimited operations of each of the aircraft are as follows.

Results Table 2a. Thicknesses for Unlimited Operations

Diamond DA-20	14.64
Skyhawk-172	12.95

Results Table 3. Flexible ACN at Indicated Gross Weight and Strength

No.	Aircraft Name	Gross Weight	% GW on Main Gear	Tire Pressure	ACN Thick	ACN on D(3)
1	Diamond DA-20	1,764	100.00	30.0	7.32	1.2
2	Skyhawk-172	2,558	95.00	50.0	6.47	1.0

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,Diamond DA-20,1764.000,1.2,8874800,10.25,1.58817E+007,1.01423E+304,10.25,10911.780,7.6,25.5,D,3.00,10.00,F
2,Skyhawk-172,2558.000,1.0,47400,7.19,5.45977E+004,1.01423E+304,9.06,20247.843,7.6,25.5,D,3.00,10.00,F

Taxiway B3

Pavement Section T14A

ibrary file name = K:\2019\1019046_PUB_MP_Update\Technical Information\PCN\Aircraft Fleet Mix\PUB 8L-26R Fleet.Ext
Units = English

Evaluation pavement type is flexible and design procedure is CBR.
Alpha Values are those approved by the ICAO in 2007.

CBR = 3.00 (Subgrade Category is D(3))
Evaluation pavement thickness = 25.50 in
Pass to Traffic Cycle (PtoTC) Ratio = 10.00 (non-standard)
Maximum number of wheels per gear = 1
Maximum number of gears per aircraft = 1

No aircraft have 4 or more wheels per gear. The FAA recommends a reference section assuming 3 inches of HMA and 6 inches of crushed aggregate for equivalent thickness calculations.

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	Diamond DA-20	1,764	100.00	30.0	887,480	15,881,654	10.25
2	Skyhawk-172	2,558	95.00	50.0	4,740	54,598	7.19

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on D(3)
1	Diamond DA-20	>5,000,000	10.25	10,912	18.20	0.0000	7.6
2	Skyhawk-172	>5,000,000	9.06	20,248	18.20	0.0000	7.6
					Total CDF =	0.0000	

When computing the numbers of coverages to failure, the coverages for none of the aircraft converged at a pavement thickness greater than 99 percent of the evaluation thickness. This means that the life of the pavement is unlimited and the pavement is very strong in relation to the aircraft loading. The relative aircraft load evaluations are also unreliable. Consider reviewing the procedures used to determine the evaluation thickness and the strength of the support. The thicknesses for unlimited operations of each of the aircraft are as follows.

Results Table 2a. Thicknesses for Unlimited Operations

Diamond DA-20	14.64
Skyhawk-172	12.95

Results Table 3. Flexible ACN at Indicated Gross Weight and Strength

No.	Aircraft Name	Gross Weight	% GW on Main Gear	Tire Pressure	ACN Thick	ACN on D(3)
1	Diamond DA-20	1,764	100.00	30.0	7.32	1.2
2	Skyhawk-172	2,558	95.00	50.0	6.47	1.0

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,Diamond DA-20,1764.000,1.2,8874800,10.25,1.58817E+007,1.01423E+304,10.25,10911.780,7.6,25.5,D,3.00,10.00,F
2,Skyhawk-172,2558.000,1.0,47400,7.19,5.45977E+004,1.01423E+304,9.06,20247.843,7.6,25.5,D,3.00,10.00,F

Taxiway B4

Pavement Section T15

Library file name = K:\2019\1019046_PUB_MP_Update\Technical Information\PCN\Aircraft Fleet Mix\PUB 8L-26R Fleet.Ext
Units = English

Evaluation pavement type is flexible and design procedure is CBR.
Alpha Values are those approved by the ICAO in 2007.

CBR = 3.00 (Subgrade Category is D(3))
Evaluation pavement thickness = 25.50 in
Pass to Traffic Cycle (PtoTC) Ratio = 10.00 (non-standard)
Maximum number of wheels per gear = 1
Maximum number of gears per aircraft = 1

No aircraft have 4 or more wheels per gear. The FAA recommends a reference section assuming 3 inches of HMA and 6 inches of crushed aggregate for equivalent thickness calculations.

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	Diamond DA-20	1,764	100.00	30.0	887,480	15,881,654	10.25
2	Skyhawk-172	2,558	95.00	50.0	4,740	54,598	7.19

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on D(3)
1	Diamond DA-20	>5,000,000	10.25	10,912	18.20	0.0000	7.6
2	Skyhawk-172	>5,000,000	9.06	20,248	18.20	0.0000	7.6
					Total CDF =	0.0000	

When computing the numbers of coverages to failure, the coverages for none of the aircraft converged at a pavement thickness greater than 99 percent of the evaluation thickness. This means that the life of the pavement is unlimited and the pavement is very strong in relation to the aircraft loading. The relative aircraft load evaluations are also unreliable. Consider reviewing the procedures used to determine the evaluation thickness and the strength of the support. The thicknesses for unlimited operations of each of the aircraft are as follows.

Results Table 2a. Thicknesses for Unlimited Operations

Diamond DA-20	14.64
Skyhawk-172	12.95

Results Table 3. Flexible ACN at Indicated Gross Weight and Strength

No.	Aircraft Name	Gross Weight	% GW on Main Gear	Tire Pressure	ACN Thick	ACN on D(3)
1	Diamond DA-20	1,764	100.00	30.0	7.32	1.2
2	Skyhawk-172	2,558	95.00	50.0	6.47	1.0

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

```
Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,Diamond DA-20,1764.000,1.2,8874800,10.25,1.58817E+007,1.01423E+304,10.25,10911.780,7.6,25.5,D,3.00,10.00,F
2,Skyhawk-172,2558.000,1.0,47400,7.19,5.45977E+004,1.01423E+304,9.06,20247.843,7.6,25.5,D,3.00,10.00,F
```

Taxiway B7

Pavement Section T16

Library file name = K:\2019\1019046_PUB_MP_Update\Technical Information\PCN\Aircraft Fleet Mix\PUB 8L-26R Fleet.Ext
Units = English

Evaluation pavement type is flexible and design procedure is CBR.
Alpha Values are those approved by the ICAO in 2007.

CBR = 5.00 (Subgrade Category is C(6))
Evaluation pavement thickness = 20.70 in
Pass to Traffic Cycle (PtoTC) Ratio = 10.00 (non-standard)
Maximum number of wheels per gear = 1
Maximum number of gears per aircraft = 1

No aircraft have 4 or more wheels per gear. The FAA recommends a reference section assuming 3 inches of HMA and 6 inches of crushed aggregate for equivalent thickness calculations.

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	Diamond DA-20	1,764	100.00	30.0	887,480	15,881,654	6.88
2	Skyhawk-172	2,558	95.00	50.0	4,740	54,598	5.23

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on C(6)
1	Diamond DA-20	>5,000,000	6.88	15,962	12.64	0.0000	7.7
2	Skyhawk-172	>5,000,000	6.59	25,228	12.95	0.0000	8.1
					Total CDF =	0.0000	

When computing the numbers of coverages to failure, the coverages for none of the aircraft converged at a pavement thickness greater than 99 percent of the evaluation thickness. This means that the life of the pavement is unlimited and the pavement is very strong in relation to the aircraft loading. The relative aircraft load evaluations are also unreliable. Consider reviewing the procedures used to determine the evaluation thickness and the strength of the support. The thicknesses for unlimited operations of each of the aircraft are as follows.

Results Table 2a. Thicknesses for Unlimited Operations

Diamond DA-20	9.82
Skyhawk-172	9.41

Results Table 3. Flexible ACN at Indicated Gross Weight and Strength

No.	Aircraft Name	Gross Weight	% GW on Main Gear	Tire Pressure	ACN Thick	ACN on C(6)
1	Diamond DA-20	1,764	100.00	30.0	4.20	0.8
2	Skyhawk-172	2,558	95.00	50.0	4.12	0.8

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,Diamond DA-20,1764.000,0.8,8874800,6.88,1.58817E+007,1.01423E+304,6.88,15961.750,7.7,20.7,C,5.00,10.00,F
2,Skyhawk-172,2558.000,0.8,47400,5.23,5.45977E+004,1.01423E+304,6.59,25227.589,8.1,20.7,C,5.00,10.00,F

Taxiway C

Pavement Section T13

his file name = PCN Results Flexible 6-23-2020 17;57;13.txt
Library file name = K:\2019\1019046_PUB_MP_Update\Technical Information\PCN\Aircraft Fleet Mix\PUB 8L-26R Fleet.Ext
Units = English

Evaluation pavement type is flexible and design procedure is CBR.
Alpha Values are those approved by the ICAO in 2007.

CBR = 5.00 (Subgrade Category is C(6))
Evaluation pavement thickness = 20.70 in
Pass to Traffic Cycle (PtoTC) Ratio = 10.00 (non-standard)
Maximum number of wheels per gear = 1
Maximum number of gears per aircraft = 1

No aircraft have 4 or more wheels per gear. The FAA recommends a reference section assuming 3 inches of HMA and 6 inches of crushed aggregate for equivalent thickness calculations.

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	Diamond DA-20	1,764	100.00	30.0	887,480	15,881,654	6.88
2	Skyhawk-172	2,558	95.00	50.0	4,740	54,598	5.23

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on C(6)
1	Diamond DA-20	>5,000,000	6.88	15,962	12.64	0.0000	7.7
2	Skyhawk-172	>5,000,000	6.59	25,228	12.95	0.0000	8.1
					Total CDF =	0.0000	

When computing the numbers of coverages to failure, the coverages for none of the aircraft converged at a pavement thickness greater than 99 percent of the evaluation thickness. This means that the life of the pavement is unlimited and the pavement is very strong in relation to the aircraft loading. The relative aircraft load evaluations are also unreliable. Consider reviewing the procedures used to determine the evaluation thickness and the strength of the support. The thicknesses for unlimited operations of each of the aircraft are as follows.

Results Table 2a. Thicknesses for Unlimited Operations

Diamond DA-20	9.82
Skyhawk-172	9.41

Results Table 3. Flexible ACN at Indicated Gross Weight and Strength

No.	Aircraft Name	Gross Weight	% GW on Main Gear	Tire Pressure	ACN Thick	ACN on C(6)
1	Diamond DA-20	1,764	100.00	30.0	4.20	0.8
2	Skyhawk-172	2,558	95.00	50.0	4.12	0.8

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,Diamond DA-20,1764.000,0.8,8874800,6.88,1.58817E+007,1.01423E+304,6.88,15961.750,7.7,20.7,C,5.00,10.00,F
2,Skyhawk-172,2558.000,0.8,47400,5.23,5.45977E+004,1.01423E+304,6.59,25227.589,8.1,20.7,C,5.00,10.00,F

Taxiway D

Pavement Section T1

Library file name = K:\2019\1019046_PUB_MP_Update\Technical Information\PCN\Aircraft Fleet Mix\PUB 17-35 Fleet.Ext
Units = English

Evaluation pavement type is flexible and design procedure is CBR.
Alpha Values are those approved by the ICAO in 2007.

CBR = 9.00 (Subgrade Category is B(10))
Evaluation pavement thickness = 22.00 in
Pass to Traffic Cycle (PtoTC) Ratio = 10.00 (non-standard)
Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

No aircraft have 4 or more wheels per gear. The FAA recommends a reference section assuming 3 inches of HMA and 6 inches of crushed aggregate for equivalent thickness calculations.

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	B737-800	174,700	93.56	205.0	5	281	17.69
2	RegionalJet-200	53,000	95.00	177.0	116	4,482	14.41
3	C-130	155,000	95.00	105.0	11	951	16.96
4	Gulfstream-G-V	90,900	95.00	188.0	66	3,147	17.74
5	Diamond DA-20	1,764	100.00	30.0	9,342	167,177	3.33
6	Skyhawk-172	2,558	95.00	50.0	474	5,460	2.82

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on B(10)
1	B737-800	387	18.39	234,538	27.74	0.1245	65.9
2	RegionalJet-200	>5,000,000	21.61	54,798	14.52	0.0000	18.1
3	C-130	8,717	19.98	184,024	20.64	0.0187	36.5
4	Gulfstream-G-V	19,147	20.10	105,947	19.80	0.0282	33.6
5	Diamond DA-20	>5,000,000	5.65	26,735	9.72	0.0000	8.1
6	Skyhawk-172	>5,000,000	5.91	35,436	10.05	0.0000	8.6
					Total CDF =	0.1714	

Results Table 3. Flexible ACN at Indicated Gross Weight and Strength

No.	Aircraft Name	Gross Weight	% GW on Main Gear	Tire Pressure	ACN Thick	ACN on B(10)
1	B737-800	174,700	93.56	205.0	22.99	45.3
2	RegionalJet-200	53,000	95.00	177.0	14.26	17.4
3	C-130	155,000	95.00	105.0	18.78	30.2
4	Gulfstream-G-V	90,900	95.00	188.0	18.03	27.9
5	Diamond DA-20	1,764	100.00	30.0	2.50	0.5
6	Skyhawk-172	2,558	95.00	50.0	2.70	0.6

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

```
Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,B737-800,174700.000,45.3,50,17.69,2.81100E+002,2.25716E+003,18.39,234538.398,65.9,22.0,B,9.00,10.00,F
2,RegionalJet-200,53000.000,17.4,1160,14.41,4.48245E+003,1.41588E+010,21.61,54798.036,18.1,22.0,B,9.00,10.00,F
3,C-130,155000.000,30.2,110,16.96,9.51403E+002,5.08491E+004,19.98,184023.519,36.5,22.0,B,9.00,10.00,F
4,Gulfstream-G-V,90900.000,27.9,660,17.74,3.14696E+003,1.11692E+005,20.10,105947.117,33.6,22.0,B,9.00,10.00,F
5,Diamond DA-20,1764.000,0.5,93420,3.33,1.67177E+005,1.01423E+304,5.65,26734.880,8.1,22.0,B,9.00,10.00,F
6,Skyhawk-172,2558.000,0.6,4740,2.82,5.45977E+003,1.01423E+304,5.91,35435.919,8.6,22.0,B,9.00,10.00,F
```

Taxiway E

Pavement Section T8

Library file name = K:\2019\1019046_PUB_MP_Update\Technical Information\PCN\Aircraft Fleet Mix\PUB 8R-26L Fleet.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 200.0 lbs/in^3 (Subgrade Category is C(147))
flexural strength = 650.0 psi
Evaluation pavement thickness = 14.00 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	B737-800	174,700	93.56	205.0	100	562	13.26
2	RegionalJet-200	53,000	95.00	177.0	2,209	8,536	9.12
3	C-130	155,000	95.00	105.0	214	925	9.65
4	Gulfstream-G-V	90,900	95.00	188.0	1,249	5,955	11.09
5	Diamond DA-20	1,764	100.00	30.0	88,748	158,817	2.42
6	Skyhawk-172	2,558	95.00	50.0	8,531	9,826	1.97

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on C(147)
1	B737-800	627	13.30	192,626	14.30	0.1814	60.6
2	RegionalJet-200	>5,000,000	13.05	60,726	9.15	0.0003	23.3
3	C-130	257,900	12.90	182,963	12.09	0.0007	42.3
4	Gulfstream-G-V	60,408	12.81	107,462	11.60	0.0199	38.7
5	Diamond DA-20	>5,000,000	13.79	1,830	2.05	0.0000	1.0
6	Skyhawk-172	>5,000,000	13.80	2,644	1.88	0.0000	0.8
					Total CDF =	0.2024	

Results Table 3. Rigid ACN at Indicated Gross Weight and Strength

No.	Aircraft Name	Gross Weight	% GW on Main Gear	Tire Pressure	ACN Thick	ACN on C(147)
1	B737-800	174,700	93.56	205.0	13.56	54.1
2	RegionalJet-200	53,000	95.00	177.0	8.50	19.9
3	C-130	155,000	95.00	105.0	11.05	34.9
4	Gulfstream-G-V	90,900	95.00	188.0	10.59	31.9
5	Diamond DA-20	1,764	100.00	30.0	2.02	0.9
6	Skyhawk-172	2,558	95.00	50.0	1.85	0.8

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

```
Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,B737-800,174700.000,54.1,100,13.26,5.62200E+002,3.09916E+003,13.30,192625.549,60.6,14.0,C,200.00,1.00,R
2,RegionalJet-200,53000.000,19.9,2209,9.12,8.53597E+003,3.09325E+007,13.05,60725.661,23.3,14.0,C,200.00,1.00,R
3,C-130,155000.000,34.9,214,9.65,9.25456E+002,1.27449E+006,12.90,182963.313,42.3,14.0,C,200.00,1.00,R
4,Gulfstream-G-V,90900.000,31.9,1249,11.09,5.95539E+003,2.98521E+005,12.81,107462.148,38.7,14.0,C,200.00,1.00,R
5,Diamond DA-20,1764.000,0.9,88748,2.42,1.58817E+005,1.20306E+043,13.79,1829.655,1.0,14.0,C,200.00,1.00,R
6,Skyhawk-172,2558.000,0.8,8531,1.97,9.82644E+003,7.77395E+044,13.80,2643.624,0.8,14.0,C,200.00,1.00,R
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Taxiway E7

Pavement Section T20

Library file name = K:\2019\1019046_PUB_MP_Update\Technical Information\PCN\Aircraft Fleet Mix\PUB 8R-26L Fleet.Ext
Units = English

Evaluation pavement type is rigid
Equivalent coverages computed with the AC 150/5320-6C/D edge stress design method.
Maximum gross weight computed with the AC 150/5320-6C/D edge stress design method.

k Value = 85.0 lbs/in^3 (Subgrade Category is D(74))
flexural strength = 650.0 psi
Evaluation pavement thickness = 11.60 in
Pass to Traffic Cycle (PtoTC) Ratio = 1.00

Maximum number of wheels per gear = 2
Maximum number of gears per aircraft = 2

Results Table 1. Input Traffic Data

No.	Aircraft Name	Gross Weight	Percent Gross Wt	Tire Press	Annual Deps	20-yr Coverages	6D Thick
1	B737-800	174,700	93.56	205.0	100	562	14.35
2	RegionalJet-200	53,000	95.00	177.0	2,209	8,536	9.76
3	C-130	155,000	95.00	105.0	214	925	10.93
4	Gulfstream-G-V	90,900	95.00	188.0	1,249	5,955	12.01
5	Diamond DA-20	1,764	100.00	30.0	88,748	158,817	2.70
6	Skyhawk-172	2,558	95.00	50.0	8,531	9,826	2.14

Results Table 2. PCN Values

No.	Aircraft Name	Critical Aircraft Total Equiv. Covs.	Thickness for Total Equiv. Covs.	Maximum Allowable Gross Weight	ACN Thick at Max. Allowable Gross Weight	CDF	PCN on D(74)
1	B737-800	567	14.35	114,943	11.49	341.9248	34.6
2	RegionalJet-200	>5,000,000	15.33	30,854	6.64	0.0563	10.9
3	C-130	1,886,032	16.16	80,616	8.39	0.1691	17.8
4	Gulfstream-G-V	816,702	15.97	49,473	8.03	2.5133	16.2
5	Diamond DA-20	>5,000,000	12.47	1,501	1.76	0.0000	0.7
6	Skyhawk-172	>5,000,000	12.41	2,207	1.51	0.0000	0.5
						Total CDF = 344.6636	

Results Table 3. Rigid ACN at Indicated Gross Weight and Strength

No.	Aircraft Name	Gross Weight	% GW on Main Gear	Tire Pressure	ACN Thick	ACN on D(74)
1	B737-800	174,700	93.56	205.0	14.40	56.1
2	RegionalJet-200	53,000	95.00	177.0	8.91	20.2
3	C-130	155,000	95.00	105.0	11.92	37.5
4	Gulfstream-G-V	90,900	95.00	188.0	11.16	32.6
5	Diamond DA-20	1,764	100.00	30.0	1.93	0.8
6	Skyhawk-172	2,558	95.00	50.0	1.66	0.6

Results Table 4. Summary Output for Copy and Paste Into the Support Spread Sheet

```
Num,Plane,GWin,ACNin,ADout,6Dt,COV20yr,COVtoF,CDFt,GWcdf,PCNcdf,EVALt,SUBcode,KorCBR,PtoTC,FlexOrRig
1,B737-800,174700.000,56.1,100,14.35,5.62200E+002,1.64422E+000,14.35,114943.417,34.6,11.6,D,85.00,1.00,R
2,RegionalJet-200,53000.000,20.2,2209,9.76,8.53597E+003,1.51482E+005,15.33,30854.009,10.9,11.6,D,85.00,1.00,R
3,C-130,155000.000,37.5,214,10.93,9.25456E+002,5.47210E+003,16.16,80615.517,17.8,11.6,D,85.00,1.00,R
4,Gulfstream-G-V,90900.000,32.6,1249,12.01,5.95539E+003,2.36956E+003,15.97,49472.698,16.2,11.6,D,85.00,1.00,R
5,Diamond DA-20,1764.000,0.8,88748,2.70,1.58817E+005,2.05863E+031,12.47,1501.308,0.7,11.6,D,85.00,1.00,R
6,Skyhawk-172,2558.000,0.6,8531,2.14,9.82644E+003,5.08183E+033,12.41,2206.657,0.5,11.6,D,85.00,1.00,R
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Appendices

Appendix B. Canadian Aviation Education (CAE)-Doss Operations Projection Letter

L3HARRIS™

Mr. Paul C. Walker
Director – Flight Training
AVIATION SYSTEMS / L3HARRIS TECHNOLOGIES
1 William White Blvd.
Suite 100
Pueblo, CO 81001
t 719 423-8430 | m 719 252 6727

Mr. Greg Pedroza
Interim Director of Aviation
PUEBLO MEMORIAL AIRPORT
31201 Bryan Circle
Pueblo, CO 81001

11 May 2020

Dear Mr. Greg Pedroza,

L3Harris Doss Aviation Inc. Operations, following a teleconference on 15 April 2020, received a request for information concerning IFT program parameters from Mead & Hunt for the purpose of planning the future of the Pueblo Memorial Airport. Specifically the following information was requested: define terms, like sortie, goes, and syllabus hours, and explain how those relate to your contract and equate to annual operations; reiterate your contact stipulations, restrictions, and constraints; and include a table with forecast annual operations starting in 2020 and going through 2040.

Terms defined and contract stipulations:

Sortie – A designated flying event that consists of a briefing, ground operations, a flight, and a post flight de-brief. Sorties vary in length and operations required depending on the syllabus.

Goes – The flying window is subdivided into sections called "Goes". This is a method of organizing a large number of sorties to mitigate inherent risks involved in scheduling a complex dynamic flight program. The number of "Goes" change based on the available flying window as directed by the Performance Work Statement for IFT. The number of sorties scheduled per "Go" depend on the Syllabus Flight Hour Band and other variables.

Syllabus Flight Hours – Flight hours as directed by each individual syllabus per student. Total annual Syllabus Flight Hours are determined by the US Air Force and can range from 18,000 to 51,000 hours in 3,000 hour increments. From the total annual syllabus flight hours the number of students per syllabus is determined per class. To determine total hours flown by the program add 10% of the syllabus flight hours. In other words 51,000 syllabus flight hours equates to 56,100 total flight hours.

The contract further stipulates, except for designated night sorties as described in the RPA Syllabus, that all sorties will be flown between the beginning of morning civil twilight to the end of evening civil twilight. Normal operating hours are Monday through Friday except as requested and approved by the USAF. The Program takes a two week student flying break in late December and early January. This results in approximately 245 flying training days per year. Due to syllabus constraints night sorties comprised approximately 1% of all sorties flown by the IFT Program in 2019.

L3HARRIS™

Contract renewal periods are five years, three years and two years beginning in 2017 and ending in 2027.

There is a possibility that L3Harris could add up to 10 more aircraft in future years to support increased student throughput.

Annual Operations Unconstrained forecast:

Year	Pub Total	L3Harris Uncnstrnd	L3Harris Syl Hours	Forecast
2019	????	287,772	37,284.5	XXXX
2020	????	337,226	XXXX	42,000
2021	????	361,314	XXXX	45,000
* TBD	????	409,489	XXXX	51,000

* Anticipate 2021 – 2027 throughput to average between the 45,000 to 51,000 level.

Disclaimer: The above numbers are projections based on parameters that could change in the future and are not a commitment by L3Harris Doss Aviation, Inc. as to the number of operations that will be conducted by the IFT Program in the future.

Paul C Walker

Mr. Paul C. Walker

Appendices

Appendix C. PUB Passenger Demand Analysis

PUEBLO MEMORIAL AIRPORT

Passenger Demand Analysis

YEAR ENDED DECEMBER 31, 2019

Mead & Hunt

CONTENTS

TABLE OF CONTENTS

INTRODUCTION & METHODOLOGIES

Achieving air service success requires thoroughly understanding the market and the needs of local stakeholders, airlines, and trends impacting the aviation industry. Air service development efforts are most effective when they follow a plan consistent with industry trends, the air service needs of the community and specific strategies of target airlines for additional air service. This section discusses industry trends that will impact Pueblo Memorial Airport (PUB) as well as the methodologies used in the development of this report.

INDUSTRY TRENDS

The airline industry has had the strongest performance in its history over the past seven years. Airlines routinely produced double-digit profit margins and supported load factors in the 85 percent range. Industry consolidation through mergers and acquisitions over the previous 15 years resulted in the top four airlines controlling over 80 percent of the U.S. domestic market which helped balance supply and demand for airline seat capacity. Airlines replaced smaller regional jets and narrow-body aircraft with larger aircraft with better operating economics. They connected passengers through fewer major hubs while reducing flights in smaller, less lucrative short-haul markets. Airlines also learned to drive substantial new revenue streams through ancillary revenues including squeezing more value out of mileage and credit card affinity programs, charging baggage fees, ticket change fees, and selling more onboard food and beverages. In this environment ultra-low-cost carriers like Allegiant Air, Frontier Airlines and Spirit Airlines grew rapidly, but major airlines were successful in segmenting service offerings to compete effectively or, in some cases avoid competing, with these airlines. As a result, all segments of the industry produced strong financial results to the tune of more than $100 billion in net profits for the U.S. industry since 2013.

Calendar year 2020 appeared to be headed for an equally strong year, but the emergence of the Coronavirus Disease 2019 (COVID-19) pandemic sent devastating effects throughout world economies, and no industry was impacted more visibly than the airlines. By late March 2020, U.S. passenger demand had fallen 95 percent and airlines were rapidly adjusting schedules to mitigate as much of the impact as possible. Overall U.S. seat capacity dropped by over 70 percent.

The U.S. Coronavirus Aid, Relief, and Economic Security Act, also known as the CARES Act, provided up to $58 billion in grants and low interest loans to airlines as well as another $10 billion to airports to shore up some of the damage. Airlines are still evolving their network and planning processes to attempt to manage through the crisis.

Most experts expect the start of some level of recovery to begin by mid-summer with demand and seat capacity slowly ramping back up as confidence in travel rebuilds, but most airline executives are predicting that the entire industry will emerge as a smaller and potentially structurally-different entity at the end of the pandemic. Over the long-term, however, the airline industry has demonstrated exceptional resilience and is expected to see a return to the long-term growth trends that have dominated the industry for the past 50 years. Service levels and seat capacity will eventually rebound, but there is the potential that smaller markets like Pueblo that are dependent on small regional jet operations will undergo another evolution in frequency constraints and risk.

With these trends in mind, the responsibility is on airports to monitor their market and be proactive with their air service development efforts, especially when performance issues are noted. When service improvements or new service is sought, it is important that airports and communities know and understand their market, and the *Passenger Demand Analysis* is a critical tool in helping communities do so. It provides objective air traveler data, compiled from industry accepted sources using standard methodologies.

This study reviews historical trends and catchment area demand as it existed through the fourth quarter of 2019 (the latest available traffic base at the time of this study). Assumptions about the pandemic-affected air travel environment have not been incorporated because there is not currently a clear view to where this evolving situation will lead. While the currently evolving environment will certainly create some temporary setbacks or delay potential expansion plans, the observations and recommendations of this study are still valid and important for long-term air service development.

OBJECTIVES

The objective of the *Passenger Demand Analysis* is to develop information on the travel patterns of airline passengers who reside in the PUB catchment area. The report provides an understanding of the PUB situation and formulates strategies for improvement. This analysis includes an estimate of total airline passengers in the catchment area and related destinations as well as an assessment of the air service situation at PUB.

Although limitations exist, ARC data accurately portrays the airline ticket purchasing habits of a large cross-section of catchment area travelers.

METHODOLOGY

The *Passenger Demand Analysis* combines Airline Reporting Corporation (ARC) ticketed data and U.S. Department of Transportation (DOT) airline data to provide a comprehensive overview of the air travel market. For the purposes of this study, ARC data includes tickets purchased through travel agencies in the PUB catchment area (**Exhibit 3.1**, page 6) as well as tickets purchased via online travel agencies by passengers in the PUB catchment area. It does not capture tickets issued directly by airline web sites (e.g., www.aa.com, www.united.com) or directly through airline reservation offices. The data used include tickets for the zip codes in the catchment area, NOT all tickets. As a result, ARC data represents a sample to measure the air travel habits of catchment area air travelers. Data for travel agencies located within the catchment area is reported by the zip code of the travel agency. Online travel agency data (e.g. Expedia, Orbitz, and Travelocity) is reported by the customer zip code used to purchase the ticket. Although limitations exist, ARC data accurately portrays the airline ticket purchasing habits of a large cross-section of catchment area travelers. A total of 7,979 ARC tickets for the year ended December 31, 2019, were used in this analysis. Adjustments were made for Frontier Airlines, Southwest Airlines and Spirit Airlines since they have limited ARC representation.

EXECUTIVE SUMMARY

DATA SOURCE/ CATCHMENT AREA

The *Passenger Demand Analysis* includes 7,979 ARC tickets from the PUB catchment area for the year ended December 31, 2019. The catchment area has an estimated population of 209,851 in 2019 and 24 zip codes. In addition to ARC data, Diio Mi origin and destination data and schedule data is used throughout the report. Adjustments were made for Frontier Airlines, Southwest Airlines and Spirit Airlines.

DEPARTURES AND AVAILABLE SEATS

For the year ended December 31, 2019, PUB had service by one airline, United Airlines, serving Denver International Airport (DEN) nonstop and Liberal, KS. PUB's service is supported by Essential Air Service (EAS). Overall, there were 938 scheduled departures with 46,900 annual seats on 50-seat regional jet aircraft.

AIRPORT USE

Nine percent of catchment area travelers used PUB, while 60 percent diverted to DEN and 31 percent to Colorado Springs Airport (COS).

TRUE MARKET

PUB's total air service market, called the true market, is estimated at 258,524 annual origin and destination passengers. Domestic travelers accounted for 237,545 of the total true market (92 percent). International travelers made up the remaining 20,980 passengers (8 percent). DEN captured a higher share of international travelers, 89 percent, than domestic, 58 percent. COS served 33 percent of domestic and 7 percent of international passengers.

DESTINATIONS

Sixty-three percent of travelers were destined to the top 25 markets. Los Angeles was the number one destination. PUB retained just 4 percent of passengers to Los Angeles. The next largest markets were Las Vegas, Seattle, Houston-Intercontinental and San Francisco with retention of 5, 8, 5 and 10 percent, respectively. Two of the top 25 markets had retention rates greater than 15 percent while seven markets had retention of less than 5 percent.

REGIONAL DISTRIBUTION

Twenty-nine percent of travelers were destined to the West region and 15 percent to the Southwest region. PUB's highest retention was in the Central region at 22 percent, while the lowest retention was to international destinations at 4 percent. Of the international travelers, the top three international regions were Mexico and Central America, Asia, and Canada.

AIRLINES USED

With service limited to United, nearly 100 percent of passengers traveled on a United ticket to/from PUB, while less than 1 percent of passengers were traveling on codeshare partner tickets.

Diverting passengers were estimated using an approximation of carrier share with ARC data. Carrier shares of diverting PUB catchment area passengers were United with 42 percent, Frontier Airlines with 16 percent, American Airlines with 14 percent, Delta Air Lines with 11 percent, Southwest Airlines with 9 percent and Spirit Airlines with 4 percent. Other various airlines served the remaining 4 percent of diverting passengers.

PASSENGER ACTIVITY

For the year ended December 31, 2010, through the year ended December 31, 2019, PUB's origin and destination passengers (as reported by the airlines to the U.S. DOT) increased at a compounded annual growth rate (CAGR) of 0.6 percent. DEN had the largest CAGR growth at 5.5 percent, while COS's CAGR decreased by 0.5 percent.

DOMESTIC AIRFARES

For the year ended December 31, 2019, the one-way average domestic airfare for PUB was $194. PUB's fare was $57 higher than DEN's average fare and $16 higher than COS. In individual markets, PUB had the highest fare in 12 of the top 25 true markets, with PUB having a lower fare than COS in 13 markets and a higher fare than DEN in all of the top 25 markets. The fare disparity exceeded $100 one-way in two markets, $108 one-way to Washington-National and $101 one-way to San Antonio.

AVERAGE FARE TREND

From the year ended December 31, 2010, through the year ended December 31, 2019, the average domestic airfare for PUB increased at a CAGR of 6.4 percent. Fares at DEN increased at a CAGR of 0.1 percent while the COS average fare increased at a CAGR of 0.3 percent. Since 2012, PUB's fare has averaged $48 to $75 higher than DEN and $3 to $64 higher than COS.

NONSTOP SERVICE

For the year ended December 31, 2019, PUB offered nonstop service to just DEN, which was not in the top 25 destinations. DEN had nonstop service to all 25 of the top 25 destinations with 2,222 weekly frequencies, while COS offered service to 11 of the top 25 markets with 145 weekly frequencies.

AIRLINE COMPARISONS

PUB ranked 187th out of United's 242 U.S. markets in terms of the number of seats offered for the year ended December 31, 2019. PUB ranked 182nd highest in the number of departures. PUB's load factor was 55 percentage points below United's average in the U.S. but improved 5 percentage points year-over-year. While PUB's passengers and revenue increased 15 and 20 percent, respectively, United's system average increased just 4 percent.

On a revenue per available seat mile (RASM) basis, PUB performed below the hub average for United at DEN for all markets under 500 miles in stage length. PUB's RASM was 20.6 cents, which was a 20 percent increase over the previous year's RASM performance.

ESSENTIAL AIR SERVICE

PUB's service is supported with a $2.8 million annual subsidy through November 2022 with SkyWest Airlines operating as United Express. The U.S. DOT continues to enforce statutory requirements for the EAS program including the $200 per passenger subsidy cap and 10 enplanement per service day minimum. With current service levels on SkyWest, there is no near-term risk of PUB not meeting these statutory requirements. There are always risks that changes to the EAS program could jeopardize service at PUB long term.

AIR SERVICE OPPORTUNITIES

PUB's geographic location presents a number of airline-related obstacles, especially in regard to retaining catchment area passengers. PUB is located just 115 miles (less than a two-hour drive) from DEN. This close proximity to DEN makes it especially challenging to retain passengers in PUB and expand PUB's air service offerings.

With existing service subsidized through the EAS program, it is unlikely that any new service on a traditional legacy carrier, either United/SkyWest or a new entrant like Delta or American, would happen without using EAS subsidies. The addition of service to a different hub would almost certainly be at the expense of at least one roundtrip to DEN.

The only additional PUB service is potentially by Allegiant Air. Allegiant left COS in 2018 and service at PUB could potentially use its close proximity to Colorado Springs to draw enough passengers to support Allegiant's low-cost, leisure service.

AIRPORT USE

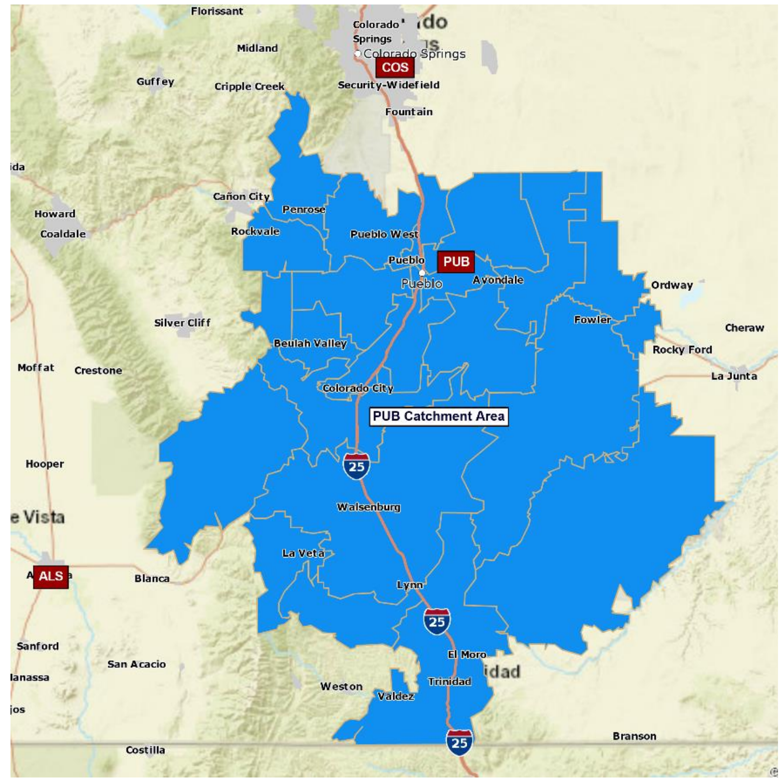
To understand airport use, it is important to understand the relative size of the catchment area, current air service and passenger activity. PUB's use was determined using year ended December 31, 2019, ARC data for the zip codes from the catchment area.

AIRPORT CATCHMENT AREA

An airport catchment area, or service area, is a geographic area surrounding an airport where it can reasonably expect to draw passenger traffic and is representative of the local market. The catchment area contains the population of travelers who should use PUB considering the drive time from the catchment area to competing airports. This population of travelers is PUB's focus market for air service improvements and represents the majority of travelers using the local airport.

Exhibit 3.1 identifies the PUB catchment area. It is comprised of 24 zip codes within the U.S. with a population of approximately 209,851 in 2019 (source: U.S. Census Bureau, Woods & Poole Economics, Inc.).

EXHIBIT 3.1 PUB CATCHMENT AREA



United Airlines was the only carrier serving PUB for the year ended December 31, 2019, with nonstop service to their DEN hub.

AIR SERVICE

Catchment area airport use is affected by a variety of factors including destinations offered, flight frequency, available seats, type of aircraft, airfares and distance to a competing airport. **Table 3.1** provides PUB's departures and seats by month for the year ended December 31, 2019. PUB had service on United Airlines, operating a total of 938 annual departures and 46,900 annual seats. Nonstop service was provided to DEN with an average of two daily nonstop flights. The Liberal service is part of a tag whereby the aircraft originates in Liberal and stops on the way to DEN in PUB.

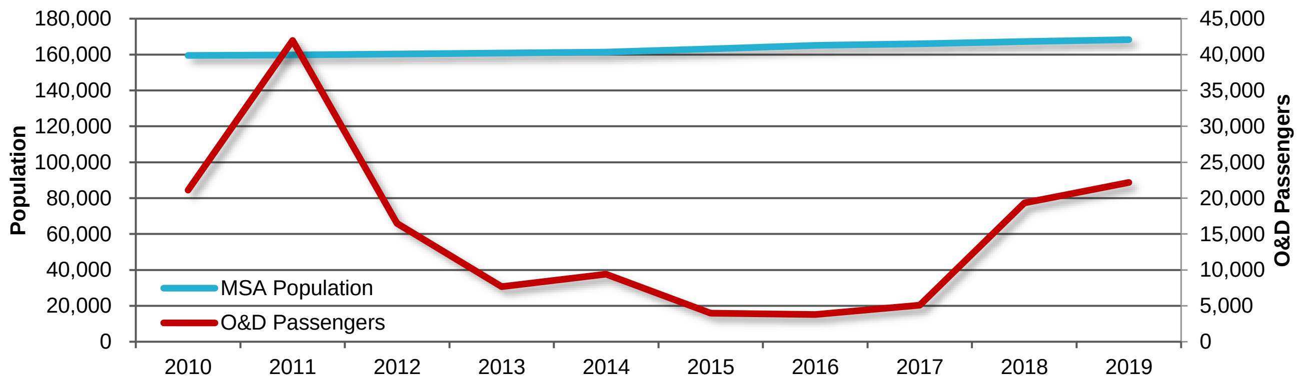
TABLE 3.1 DEPARTURES AND SEATS BY AIRLINE AND DESTINATION

DESTINATION	MARKETING CARRIER	CY 2019											
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Denver, CO	United	53	48	52	52	54	50	54	53	51	54	51	53
Liberal, KS	United	27	24	26	26	27	25	27	26	26	27	25	27
Total Departures		**80**	**72**	**78**	**78**	**81**	**75**	**81**	**79**	**77**	**81**	**76**	**80**
Total Seats		**4,000**	**3,600**	**3,900**	**3,900**	**4,050**	**3,750**	**4,050**	**3,950**	**3,850**	**4,050**	**3,800**	**4,000**

PASSENGER AND POPULATION TRENDS

Exhibit 3.2[1] plots origin and destination passenger trends from 2010 to 2019 compared to population trends at PUB. The Pueblo, CO Metropolitan Statistical Area (MSA) was used as a surrogate for the growth trend of the PUB catchment area population. During the 10-year period, passengers and population increased at a 0.6 percent CAGR; however, origin and destination passengers fluctuated significantly over the 10-year period.

EXHIBIT 3.2 PASSENGERS AND POPULATION TRENDS



[1] *Source: Diio Mi; Woods & Poole Economics, Inc.*

PUB retains 9 percent of its catchment area passengers, with DEN being the largest diversionary airport at 60 percent and COS following at 31 percent.

AIRPORT USE

Exhibit 3.3 shows the airports used by PUB catchment area travelers. An estimated 9 percent of the catchment area's air travelers used PUB for their trips; 60 percent diverted to DEN and 31 percent to COS.

DOMESTIC AND INTERNATIONAL ITINERARIES

Table 3.2 shows passengers by domestic and international itineraries. Nine percent, or 21,455 domestic travelers, and 4 percent, or 725 international travelers, used PUB. DEN is the top diversionary airport for domestic and international passengers, capturing a higher percentage of international travelers, 89 percent, than domestic travelers, 58 percent. COS captured a small share of international traffic at 7 percent compared to domestic travelers at 33 percent. The PUB catchment area had an estimated 258,524 annual origin and destination travelers for the year ended December 31, 2019.

EXHIBIT 3.3 AIRPORT USE

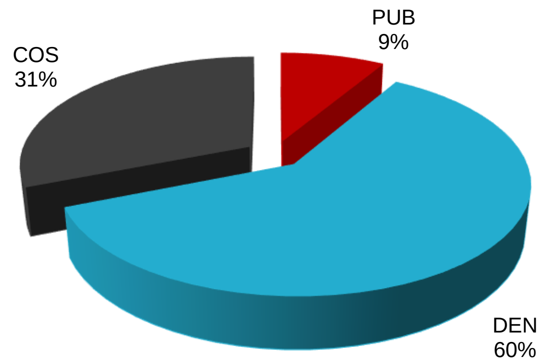


TABLE 3.2 AIRPORT USE - DOMESTIC & INTERNATIONAL COMPARISON

RANK	ORIGINATING AIRPORT	AIRPORT USE	
		PAX	%
Domestic			
1	DEN	137,358	58
2	COS	78,732	33
3	PUB	21,455	9
Subtotal		**237,545**	**100**
International			
1	DEN	18,749	89
2	COS	1,506	7
3	PUB	725	4
Subtotal		**20,980**	**100**
Domestic and International			
1	DEN	156,107	60
2	COS	80,238	31
3	PUB	22,180	9
Total		**258,524**	**100**

AIRPORT USE BY COMMUNITY

Airport retention rates by community are an important aspect to understanding the overall PUB catchment area. **Table 3.3** shows how retention varies among the local communities within it. ARC tickets include local travel agency data which is reported by the agency zip code and online travel agency data which is reported by the passenger zip code.

Overall, the Pueblo community generates the highest number of true market passengers, with nearly 222,000 annual passengers or 86 percent, followed by the Florence, Penrose and Walsenburg communities. Communities with lower than average retention (less than 5 percent) included the Florence, Penrose, Walsenburg and La Veta communities. The highest retention (greater than 15 percent) included the Beulah, Colorado City and Boone communities.

TABLE 3.3 AIRPORT USE BY COMMUNITY

COMMUNITY	% AIRPORT USE			TRUE MARKET PASSENGERS
	DEN	COS	PUB	
Pueblo	61	31	9	221,947
Florence	68	32	0	7,854
Penrose	42	55	4	4,650
Walsenburg	70	27	2	3,822
Beulah	58	25	18	3,586
Rye	58	31	11	3,471
La Veta	73	26	1	3,459
Colorado City	36	47	17	2,965
Fowler	58	29	13	2,229
Boone	66	6	28	1,416
Other	58	32	11	3,125
Total	**60**	**31**	**9**	**258,524**

TRUE MARKET

The true market portion of the *Passenger Demand Analysis* provides the total number of passengers in the catchment area; specifically, it analyzes the portion of passengers diverting from the PUB catchment area. This section investigates destinations associated with travel to and from the catchment area. In addition, destinations are grouped into geographic regions to further understand the regional flows of catchment area air travelers.

TRUE MARKET ESTIMATE

The airport catchment area (**Exhibit 3.1**, page 6) represents the geographic area from which the airport primarily attracts air travelers. Domestic airlines report origin and destination traffic statistics to the U.S. DOT on a quarterly basis. Used by itself, these traffic statistics do not quantify the total size of an air service market. By combining ARC tickets with passenger data contained in the U.S. DOT airline reports, an estimate of the total air travel market by destination was calculated. The total air travel market is also referred to as the “true market”. Passengers are estimated for domestic and international markets on a destination basis. Adjustments were made to account for Frontier Airlines, Southwest Airlines and Spirit Airlines, which are under-represented in ARC data.

The ARC data used in this report includes information on initiated passengers ticketed by local or online travel agencies. This enables the identification of passenger retention and diversion. According to U.S. DOT airline reports for the year ended December 31, 2019, 61 percent of PUB origin and destination passengers initiated air travel from PUB, and the other 39 percent began their trip from another city (e.g. New York, Los Angeles and Phoenix). For the purposes of this analysis, it is assumed that travel patterns for PUB visitors mirror catchment area passengers.

TOP 25 TRUE MARKET DESTINATIONS

The top 25 destinations for PUB (shown in **Table 4.1**) accounted for 63 percent of the travel to/from the PUB catchment area. Los Angeles was the largest market with 16,225 annual passengers (22.2 passengers daily each way [PDEW]) and accounted for 6 percent of all catchment area travel. Las Vegas, Seattle, Houston-Intercontinental and San Francisco made up the remaining top five markets.

TABLE 4.1 TRUE MARKET ESTIMATE - TOP 25 DESTINATIONS

RANK	DESTINATION	PUB REPORTED PAX	DIVERTED PAX	TRUE MARKET	PDEW
1	Los Angeles, CA	692	15,533	16,225	22.2
2	Las Vegas, NV	791	13,868	14,659	20.1
3	Seattle, WA	835	10,005	10,840	14.8
4	Houston, TX (IAH)	463	9,038	9,501	13.0
5	San Francisco, CA	888	7,909	8,796	12.0
6	San Diego, CA	1,290	7,027	8,318	11.4
7	Dallas, TX (DFW)	446	7,710	8,156	11.2
8	San Antonio, TX	190	7,470	7,660	10.5
9	Phoenix, AZ (PHX)	445	7,036	7,481	10.2
10	Orlando, FL (MCO)	412	6,984	7,397	10.1
11	Boston, MA	315	6,315	6,630	9.1
12	Cancun, Mexico	100	6,164	6,263	8.6
13	Minneapolis, MN	384	5,372	5,757	7.9
14	New York, NY (LGA)	528	5,218	5,746	7.9
15	Atlanta, GA	162	5,024	5,186	7.1
16	Washington, DC (DCA)	260	4,723	4,983	6.8
17	Salt Lake City, UT	189	4,306	4,495	6.2
18	Philadelphia, PA	149	3,834	3,983	5.5
19	Tampa, FL	231	3,752	3,983	5.5
20	Orange County, CA	259	2,932	3,190	4.4
21	Chicago, IL (ORD)	337	2,733	3,071	4.2
22	Portland, OR	724	2,272	2,995	4.1
23	Detroit, MI	120	2,633	2,753	3.8
24	Baltimore, MD	121	2,521	2,642	3.6
25	Charlotte-Douglas, NC	70	2,231	2,301	3.2
Top 25 destinations		**10,402**	**152,609**	**163,011**	**223.3**
Total domestic		**21,455**	**216,090**	**237,545**	**325.4**
Total international		**725**	**20,255**	**20,980**	**28.7**
All markets		**22,180**	**236,344**	**258,524**	**354.1**

San Diego and Portland had the highest retention rates, exceeding 15 percent, while seven markets had retention of less than 5 percent.

TOP 25 DOMESTIC DESTINATIONS

Table 4.2 shows the percentage of passengers by market and originating airport for the top 25 domestic destinations. Six percent of passengers used PUB for travel to the top 25 domestic markets. Overall, the highest retention rates by market (greater than 15 percent) included San Diego and Portland. The lowest retention rates (less than 5 percent) included Los Angeles, San Antonio, Atlanta, Salt Lake City, Philadelphia, Detroit and Charlotte.

TABLE 4.2 TOP 25 DOMESTIC DESTINATIONS BY ORIGINATING AIRPORT

RANK	DESTINATION	ORIGIN AIRPORT %			TOTAL PAX
		DEN	COS	PUB	
1	Los Angeles, CA	73	22	4	16,225
2	Las Vegas, NV	53	42	5	14,659
3	Seattle, WA	77	15	8	10,840
4	Houston, TX (IAH)	37	58	5	9,501
5	San Francisco, CA	71	19	10	8,796
6	San Diego, CA	65	20	16	8,318
7	Dallas, TX (DFW)	38	57	5	8,156
8	San Antonio, TX	19	78	2	7,660
9	Phoenix, AZ (PHX)	48	46	6	7,481
10	Orlando, FL (MCO)	53	41	6	7,397
11	Boston, MA	86	9	5	6,630
12	Minneapolis, MN	45	48	7	6,263
13	New York, NY (LGA)	78	13	9	5,757
14	Atlanta, GA	45	52	3	5,746
15	Washington, DC (DCA)	78	17	5	5,186
16	Salt Lake City, UT	58	38	4	4,983
17	Philadelphia, PA	76	20	4	4,495
18	Tampa, FL	58	36	6	3,983
19	Orange County, CA	80	12	8	3,983
20	Chicago, IL (ORD)	48	41	11	3,190
21	Portland, OR	60	16	24	3,071
22	Detroit, MI	59	36	4	2,995
23	Baltimore, MD	52	44	5	2,753
24	Charlotte-Douglas, NC	88	9	3	2,642
25	Raleigh/Durham, NC	71	24	6	2,301
Top 25 Domestic		**60**	**34**	**6**	**163,011**
Total Domestic		**58**	**33**	**9**	**237,545**

Los Angeles, Las Vegas, Orlando-International and Phoenix-Sky Harbor were markets included in the top 10 destinations for both DEN and COS.

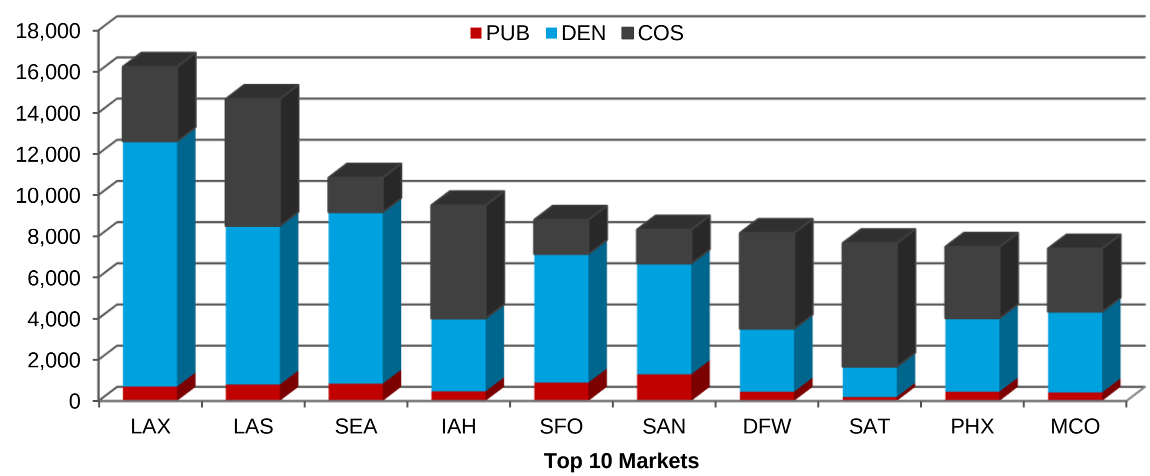
TOP 10 DOMESTIC DESTINATIONS BY ORIGINATING AIRPORT

Table 4.3 shows the top 10 markets when passengers exclusively fly out of PUB as well as the top 10 markets when passengers fly exclusively from DEN and COS. Los Angeles, Las Vegas, Orlando-International and Phoenix-Sky Harbor were markets included in the top 10 destinations for both DEN and COS. **Exhibit 4.1** shows the top 10 markets overall and the share PUB, DEN and COS airports receive by market with a bar graph.

TABLE 4.3 TOP 10 DOMESTIC DESTINATIONS BY ORIGINATING AIRPORT

RANK	DEN		COS		PUB	
	DESTINATION	PAX	DESTINATION	PAX	DESTINATION	PAX
1	Los Angeles, CA	11,918	Las Vegas, NV	6,156	San Diego, CA	1,290
2	Seattle, WA	8,335	San Antonio, TX	5,999	Denver, CO	989
3	Las Vegas, NV	7,712	Houston, TX (IAH)	5,493	San Francisco, CA	888
4	San Francisco, CA	6,252	Dallas, TX (DFW)	4,646	Seattle, WA	835
5	Boston, MA	5,686	Los Angeles, CA	3,615	Las Vegas, NV	791
6	San Diego, CA	5,385	Phoenix, AZ (PHX)	3,463	Portland, OR	724
7	New York, NY (LGA)	4,487	Orlando, FL (MCO)	3,061	Los Angeles, CA	692
8	Orlando, FL (MCO)	3,924	Minneapolis, MN	2,765	Liberal, KS	532
9	Washington, DC (DCA)	3,867	Atlanta, GA	2,672	New York, NY (LGA)	528
10	Phoenix, AZ (PHX)	3,572	Salt Lake City, UT	1,701	Houston, TX (IAH)	463

EXHIBIT 4.1 RETENTION AND DIVERSION FOR THE TOP 10 DESTINATIONS



TOP 15 INTERNATIONAL DESTINATIONS

Table 4.4 shows the percentage of passengers for the top 15 international destinations by originating airport. Only the top 15 international destinations are shown due to the smaller market sizes involved with international itineraries and limited available data. PUB retained 4 percent of the catchment area passengers destined for the top 15 international markets.

Cancun, Mexico, San Jose del Cabo, Mexico, and Vancouver, Canada were the top three international markets. The highest retention was to Melbourne, Australia and Bogota, Colombia while the lowest retention was to Cancun, Mexico.

TABLE 4.4 TOP 15 INTERNATIONAL DESTINATIONS BY ORIGINATING AIRPORT

RANK	DESTINATION	ORIGIN AIRPORT %			PASSENGERS	
		DEN	COS	PUB	TOTAL	PDEW
1	Cancun, Mexico	93	6	2	6,263	8.6
2	San Jose del Cabo, Mexico	89	6	5	1,597	2.2
3	Vancouver, Canada	76	19	5	945	1.3
4	Ottawa, Canada	95	0	5	769	1.1
5	Puerto Vallarta, Mexico	85	9	6	679	0.9
6	Beijing, China	94	0	6	547	0.7
7	Sydney, Australia	94	0	6	512	0.7
8	Tokyo-Haneda, Japan	94	2	4	474	0.6
9	Shanghai, China	94	2	4	474	0.6
10	Hong Kong, Hong Kong	94	0	6	462	0.6
11	Melbourne, Australia	92	0	8	445	0.6
12	Bangkok, Thailand	94	2	4	426	0.6
13	Mexico City, Mexico	94	2	4	426	0.6
14	Edmonton, Canada	94	2	4	426	0.6
15	Bogota, Colombia	91	0	9	418	0.6
Top 15 International		**91**	**5**	**4**	**14,864**	**20.4**
Total International		**89**	**7**	**4**	**20,980**	**28.7**

Most airline hubs are directional and flow passenger traffic to and from geographic regions, not just destinations within the region.

FEDERAL AVIATION ADMINISTRATION (FAA) GEOGRAPHIC REGIONS

It is important to identify and quantify air travel markets, but it is also important to measure air travel by specific geographic regions. Generally, airlines operate route systems that serve geographic areas. Additionally, most airline hubs are directional and flow passenger traffic to and from geographic regions, not just destinations within the region. Therefore, air service analysis exercises consider the regional flow of passenger traffic as well as passenger traffic to a specific city. Accordingly, this section analyzes the regional distribution of air travelers from the airport catchment area. For this exercise, the FAA geographic breakdown of the U.S. is used (**Exhibit 4.2**).

EXHIBIT 4.2 FAA GEOGRAPHIC REGIONS

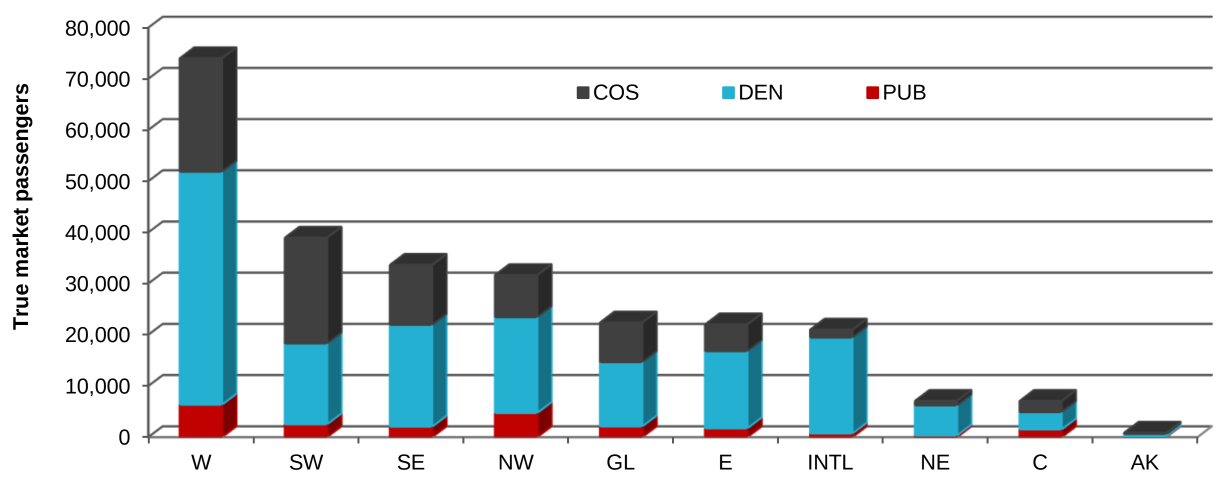
REGIONAL DISTRIBUTION OF TRAVELERS

Table 4.5 and **Exhibit 4.3** divide catchment area travel into the FAA's nine geographic regions and one catch-all international region. The West region was the largest traveled region for PUB catchment area passengers, with 29 percent of passengers. The Southwest region was the second largest with 15 percent of passengers. PUB's retention was highest to the Central region at 22 percent while its lowest retention rate was to international destinations at 4 percent.

TABLE 4.5 REGIONAL DISTRIBUTION OF TRAVEL BY AIRPORT

AIRPORT		REGION										
		W	SW	SE	NW	GL	E	INTL	NE	C	AK	TOTAL
DEN	Pax	45,494	15,776	19,885	18,717	12,553	15,064	18,749	5,891	3,387	590	156,107
	%	29	10	13	12	8	10	12	4	2	0	100
COS	Pax	22,141	20,627	11,694	8,178	7,704	5,194	1,506	837	2,147	210	80,238
	%	28	26	15	10	10	6	2	1	3	0	100
PUB	Pax	6,368	2,530	2,062	4,739	2,113	1,751	725	333	1,517	42	22,180
	%	29	11	9	21	10	8	3	2	7	0	100
Total	**Pax**	**74,003**	**38,933**	**33,641**	**31,635**	**22,371**	**22,009**	**20,980**	**7,061**	**7,051**	**842**	**258,524**
	%	**29**	**15**	**13**	**12**	**9**	**9**	**8**	**3**	**3**	**0**	**100**
PUB Retention %		**9**	**6**	**6**	**15**	**9**	**8**	**4**	**5**	**22**	**5**	**9**

EXHIBIT 4.3 REGIONAL DISTRIBUTION OF TRAVEL



Mexico and Central America was the largest international region, with 49 percent of PUB catchment area international passengers.

DISTRIBUTION OF INTERNATIONAL TRAVEL

Table 4.6 shows international travelers by airport and region. Eight percent of catchment area travelers had international itineraries. Mexico and Central America was the most frequented international region with 49 percent, or 10,373 of the total 20,980 catchment area international travelers, followed by Asia with 18 percent of the total and Canada with 14 percent of the total. Europe was the fourth largest region with 7 percent of international travel. The remaining top international regions were, in order of greatest to least: Australia and Oceania, South America, the Caribbean, Africa, and the Middle East.

TABLE 4.6 REGIONAL DISTRIBUTION OF INTERNATIONAL PASSENGERS

REGION	ORIGINATING AIRPORT			TRUE MARKET	% OF COLUMN	PUB RETENTION %
	DEN	COS	PUB			
Mexico & Central America	9,294	793	286	10,373	49	3
Asia	3,388	255	156	3,800	18	4
Canada	2,343	411	146	2,900	14	5
Europe	1,352	32	31	1,415	7	2
Australia & Oceania	969	1	67	1,038	5	6
South America	587	3	38	628	3	6
Caribbean	600	7	0	607	3	0
Africa	113	2	0	115	1	0
Middle East	102	2	0	103	0	0
Total passengers	**18,749**	**1,506**	**725**	**20,980**	**100**	**4**
% of row	**89**	**7**	**4**	**100**	**-**	**-**

AIRLINES

Information in this section identifies airline use by catchment area air travelers. The information is airport and airline specific. The intent is to determine which airlines are used to travel to specific destinations. The airline market share at PUB is based on U.S. DOT airline reported data. Airline market share at diverting airports is based on ARC data and is an estimation of the carrier's share of diverted passengers.

AIRLINES USED AT PUB

Table 5.1[2] provides the airline share for the top 25 true markets and total share by airline at PUB. With service on just United Airlines, nearly 100 percent of passenger traffic flew with that airline. The less than 1 percent of other traffic was either interline or codeshare connections.

TABLE 5.1 AIRLINES USED AT PUB

RANK	TOP 25 DOMESTIC TRUE MARKETS	AIRLINE %		TOTAL PAX
		UA	OTHER	
1	San Diego, CA	100	0	1,290
2	Denver, CO	100	0	989
3	San Francisco, CA	100	0	888
4	Seattle, WA	99	1	835
5	Las Vegas, NV	100	0	791
6	Portland, OR	100	0	724
7	Los Angeles, CA	100	0	692
8	Liberal, KS	100	0	532
9	New York, NY (LGA)	100	0	528
10	Houston, TX (IAH)	100	0	463
11	Dallas, TX (DFW)	100	0	446
12	Phoenix, AZ (PHX)	100	0	445
13	Orlando, FL (MCO)	100	0	412
14	Minneapolis, MN	100	0	384
15	Boise, ID	100	0	376
16	Chicago, IL (ORD)	100	0	337
17	Sacramento, CA	100	0	334
18	Nashville, TN	100	0	321
19	Boston, MA	100	0	315
20	San Jose, CA	100	0	308
21	Washington, DC (DCA)	100	0	260
22	New Orleans, LA	100	0	260
23	Orange County, CA	100	0	259
24	Spokane, WA	100	0	251
25	Austin, TX	100	0	238
Total Top 25		**100**	**0**	**12,679**
Total All Markets		**100**	**0**	**22,180**

[2] *Source: Diio Mi*

United Airlines had the highest share of catchment area passengers at DEN, carrying 41 percent of diverting passengers.

AIRLINES USED AT DEN

Table 5.2 shows the airlines used and top destinations when travelers from the catchment area used DEN. United Airlines served the highest share of catchment area passengers at DEN, carrying 41 percent of diverting passengers. Southwest Airlines had the second highest share at 13 percent, followed by Frontier Airlines at 13 percent and Delta Air Lines at 12 percent. American Airlines had a 9 percent share of traffic while Spirit Airlines served 6 percent of diverting DEN passengers. All other carriers combined for the remaining 6 percent of passengers.

TABLE 5.2 AIRLINES USED AT DEN

RANK	TOP 25 DOMESTIC TRUE MARKETS	AIRLINE %							TOTAL DEN PAX
		UA	WN	F9	DL	AA	NK	OTHER	
1	Los Angeles, CA	34	7	7	27	17	7	1	11,918
2	Seattle, WA	12	9	9	39	0	0	31	8,335
3	Las Vegas, NV	46	17	17	1	1	17	0	7,712
4	San Francisco, CA	74	11	11	1	3	0	0	6,252
5	Boston, MA	49	6	6	2	5	6	25	5,686
6	San Diego, CA	55	13	13	1	3	13	0	5,385
7	New York, NY (LGA)	43	6	6	37	3	6	0	4,487
8	Orlando, FL (MCO)	38	19	19	2	3	19	0	3,924
9	Washington, DC (DCA)	11	37	37	7	9	0	0	3,867
10	Phoenix, AZ (PHX)	32	12	12	0	45	0	0	3,572
11	Houston, TX (IAH)	69	0	15	0	0	15	0	3,545
12	Dallas, TX (DFW)	30	0	14	0	42	14	0	3,064
13	Philadelphia, PA	14	11	11	4	49	11	0	3,021
14	Minneapolis, MN	24	12	12	28	0	12	13	2,607
15	Salt Lake City, UT	13	17	17	54	0	0	0	2,605
16	Orange County, CA	55	18	18	5	4	0	0	2,544
17	Atlanta, GA	26	10	10	38	6	10	0	2,352
18	Tampa, FL	39	16	16	6	9	16	0	2,301
19	Charlotte-Douglas, NC	4	15	15	0	52	15	0	2,027
20	Portland, OR	47	13	13	12	1	13	0	1,789
21	Detroit, MI	27	7	7	49	2	7	0	1,634
22	Raleigh/Durham, NC	17	17	17	8	25	17	0	1,569
23	Chicago, IL (MDW)	0	100	0	0	0	0	0	1,540
24	San Antonio, TX	64	18	18	0	0	0	0	1,471
25	Chicago, IL (ORD)	47	0	11	0	31	11	0	1,465
Total Top 25		**37**	**13**	**13**	**14**	**10**	**8**	**5**	**94,672**
Total All Markets		**41**	**13**	**13**	**12**	**9**	**6**	**6**	**156,107**

United Airlines had the highest share of catchment area passengers at COS, carrying 44 percent of diverting passengers.

AIRLINES USED AT COS

Table 5.3 shows the airlines used and top destinations when travelers from the catchment area used COS. United had the highest share of diverting passengers at COS, carrying 44 percent of diverting passengers. Frontier had the second highest share at 23 percent while American carried 22 percent of travelers and Delta had a 10 percent share. Other airlines served only 1 percent of diverting COS travelers.

TABLE 5.3 AIRLINES USED AT COS

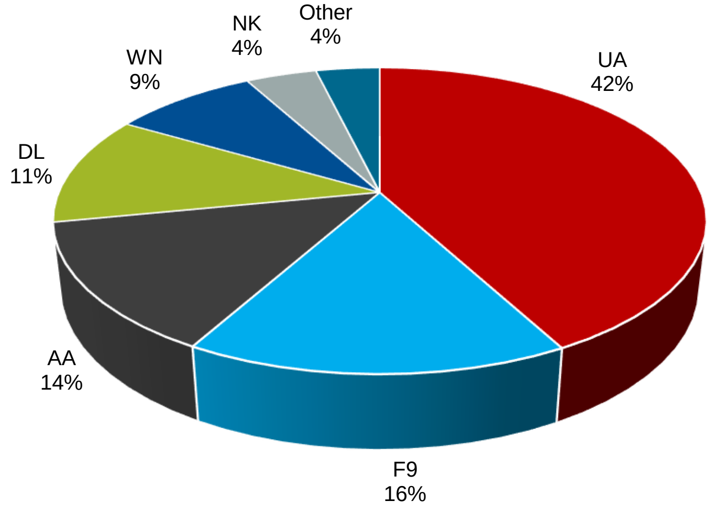
RANK	TOP 25 DOMESTIC TRUE MARKETS	AIRLINE %					TOTAL COS PAX
		UA	F9	AA	DL	OTHER	
1	Las Vegas, NV	6	92	0	2	0	6,156
2	San Antonio, TX	20	55	24	0	0	5,999
3	Houston, TX (IAH)	96	0	4	0	0	5,493
4	Dallas, TX (DFW)	4	0	96	0	0	4,646
5	Los Angeles, CA	97	0	2	1	0	3,615
6	Phoenix, AZ (PHX)	6	91	2	1	0	3,463
7	Orlando, FL (MCO)	19	70	7	4	0	3,061
8	Minneapolis, MN	20	68	6	6	0	2,765
9	Atlanta, GA	7	46	2	45	0	2,672
10	Salt Lake City, UT	11	0	0	87	2	1,701
11	Seattle, WA	34	0	2	56	8	1,670
12	San Francisco, CA	86	0	7	7	0	1,657
13	San Diego, CA	67	0	9	24	0	1,642
14	Tampa, FL	27	0	55	18	0	1,450
15	Chicago, IL (ORD)	67	0	33	0	0	1,269
16	Baltimore, MD	32	0	32	37	0	1,151
17	Detroit, MI	54	0	42	4	0	999
18	Pasco, WA	83	0	0	17	0	919
19	Washington, DC (DCA)	70	0	17	13	0	856
20	Honolulu, HI	94	0	2	4	0	852
21	Philadelphia, PA	48	0	43	9	0	813
22	Austin, TX	50	0	50	0	0	793
23	Oklahoma City, OK	64	0	36	0	0	764
24	Omaha, NE	91	0	9	0	0	749
25	New York, NY (LGA)	44	0	56	0	0	731
Total Top 25		**39**	**31**	**19**	**10**	**1**	**55,887**
Total All Markets		**44**	**23**	**22**	**10**	**1**	**80,238**

When PUB catchment area travelers diverted to alternate airports, the largest percentage used United Airlines, followed by Frontier Airlines, American Airlines and Delta Air Lines.

DIVERTING PASSENGER AIRLINE USE

Exhibit 5.1 shows the airlines used when travelers from the catchment area originated from any other airport besides PUB. Overall, United carried the highest number of diverting passengers, with 42 percent, followed by Frontier with 16 percent, American with 14 percent, Delta with 11 percent, Southwest with 9 percent and Spirit with 4 percent. All other carriers combined for the remaining 4 percent of diverting passengers.

EXHIBIT 5.1 DIVERTING PASSENGER AIRLINE USE



FACTORS AFFECTING AIR SERVICE DEMAND AND RETENTION

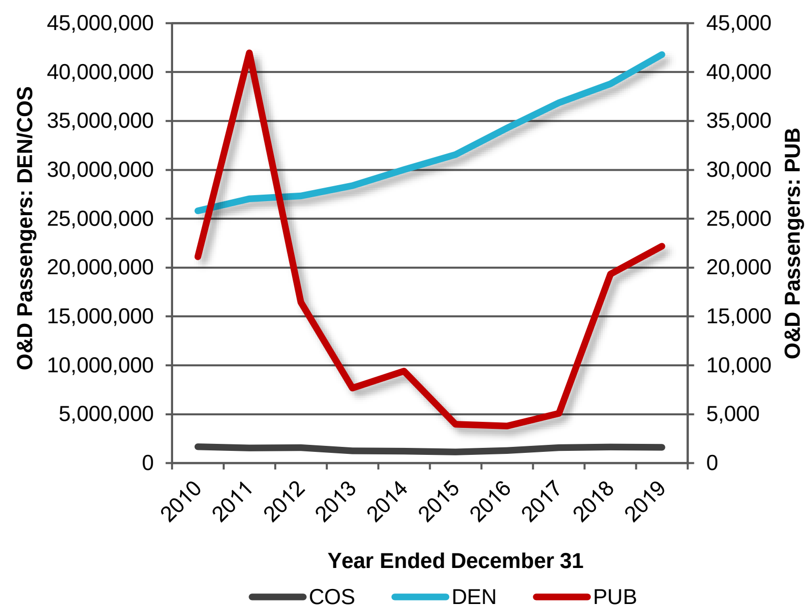
This section examines several factors that have affected and will continue to affect air service demand in the Pueblo area and PUB's ability to retain passengers. The factors affecting PUB's ability to retain passengers included in this section are airfares, nonstop service availability, and the quality and capacity of air service offered at PUB and the competing airports.

PASSENGER ACTIVITY COMPARISON

To better understand the changes in passenger volumes at PUB, DEN and COS, **Exhibit 6.1** provides a depiction of origin and destination passengers over the last 10 years by year ended December 31 passenger totals as reported to the U.S. DOT. During this period:

- PUB's passengers increased at a CAGR of 0.6 percent and ranged from 3,790 in 2016 to 41,968 passengers in 2011.
- DEN's passengers increased at a 5.5 percent CAGR and ranged from 25.8 million in 2010 to 41.8 million in 2019.
- COS's passengers decreased at a 0.5 percent CAGR and ranged from 1.1 million in 2015 to 1.7 million in 2010.

EXHIBIT 6.1 PASSENGER TRENDS



PUB's overall average domestic fare for the year ended December 31, 2019, was $194, which was $57 higher than DEN and $16 higher than COS.

AIRFARES

When a traveler decides which airport to access for travel, airfares play a large role. Airfares affect air service demand and an airport's ability to retain passengers. One-way airfares (excluding taxes and Passenger Facility Charges (PFC)) paid by travelers are used to measure the relative fare competitiveness between PUB, DEN and COS. Fares listed for DEN and COS are for all air travelers using the airport and are not reflective of the average fare paid only by catchment area travelers diverting to those airports.

Table 6.1[3] shows one-way average airfares for the top 25 catchment area domestic destinations. Average airfares are a result of many factors including length of haul, availability of seats, business versus leisure fares and airline competition. PUB's overall average domestic fare for the year ended December 31, 2019, was $194, which was $57 higher than DEN and $16 higher than COS.

In individual markets, PUB had the highest fare in 12 of the top 25 true markets when compared to diverting airports, with PUB having a lower fare than COS in 13 markets and a higher fare than DEN in all of the top 25 markets.

TABLE 6.1 U.S. DOT AVERAGE DOMESTIC ONE-WAY FARES

RANK	DESTINATION	AVERAGE ONE-WAY FARE			MIN DIFF.
		DEN	COS	PUB	
1	Los Angeles, CA	$115	$211	$203	($7)
2	Las Vegas, NV	$92	$49	$156	$63
3	Seattle, WA	$123	$194	$146	($49)
4	Houston, TX (IAH)	$133	$198	$225	$27
5	San Francisco, CA	$139	$211	$174	($37)
6	San Diego, CA	$117	$213	$169	($44)
7	Dallas, TX (DFW)	$119	$186	$180	($5)
8	San Antonio, TX	$112	$90	$213	$101
9	Phoenix, AZ (PHX)	$106	$61	$177	$71
10	Orlando, FL (MCO)	$126	$102	$189	$63
11	Boston, MA	$184	$273	$229	($43)
12	Minneapolis, MN	$99	$77	$166	$67
13	New York, NY (LGA)	$171	$218	$180	($37)
14	Atlanta, GA	$137	$135	$202	$65
15	Washington, DC (DCA)	$136	$243	$351	$108
16	Salt Lake City, UT	$105	$194	$206	$12
17	Philadelphia, PA	$160	$253	$287	$34
18	Tampa, FL	$139	$199	$186	($13)
19	Orange County, CA	$137	$228	$202	($26)
20	Chicago, IL (ORD)	$127	$222	$195	($28)
21	Portland, OR	$129	$227	$190	($36)
22	Detroit, MI	$121	$233	$218	($15)
23	Baltimore, MD	$143	$278	$285	$7
24	Charlotte-Douglas, NC	$157	$256	$276	$19
25	Raleigh/Durham, NC	$141	$237	$210	($27)
Average Domestic Fare		**$137**	**$178**	**$194**	**$16**

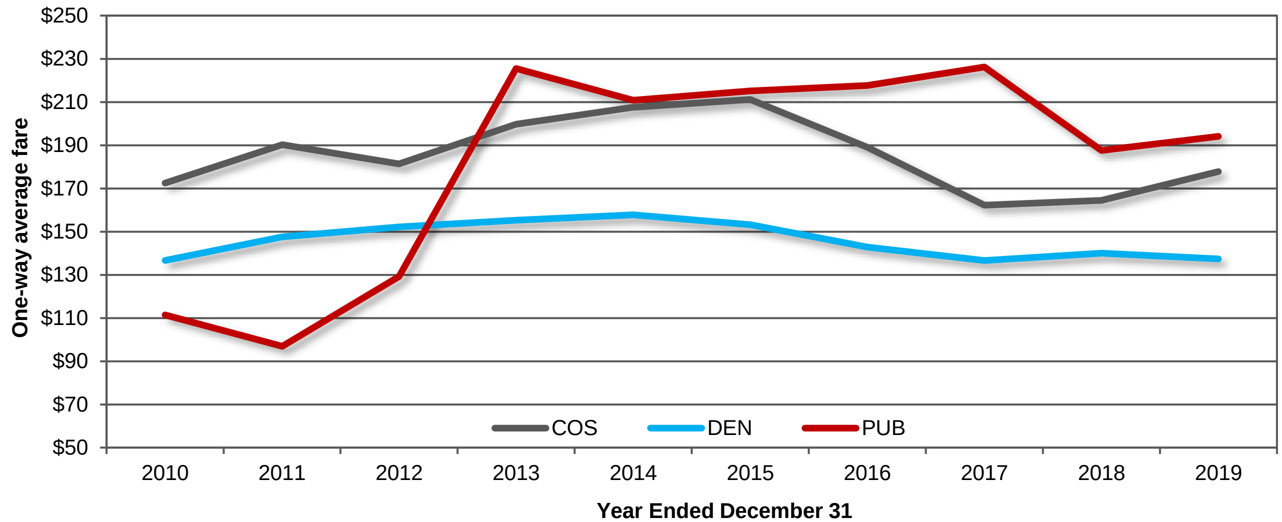
[3] *Source: Diio Mi; Note: Year Ended December 31, 2019; Fares do not include taxes or Passenger Facility Charges*

From 2018 to 2019, the fare differential compared to DEN increased $9 while the fare differential compared to COS decreased $7.

Exhibit 6.2 tracks the average fares at PUB and each diverting airport from the year ended December 31, 2010, through the year ended December 31, 2019. Based on U.S. DOT airline data, average fares at PUB have ranged from $97 (2011) to $226 (2017). The average fare at DEN ranged from $137 (2010) to $158 (2014). Fares at COS have ranged from a low of $162 (2017) to a high of $211 (2015). Overall, average domestic fares over the 10-year period increased at a CAGR of 6.4 percent at PUB, 0.1 percent at DEN and 0.3 percent at COS.

The fare gap between PUB and all diverting markets have fluctuated significantly over the past 10 years. From 2010 to 2012, PUB had a lower average fare than DEN and COS. Since 2012, PUB's fare has averaged $48 to $75 higher than DEN and $3 to $64 higher than COS. From 2018 to 2019, the fare differential compared to DEN increased $9 while the fare differential compared to COS decreased $7.

EXHIBIT 6.2 10-YEAR AVERAGE DOMESTIC ONE-WAY FARE TREND



PUB offered nonstop service to DEN which was not included in the top 25 destinations.

NONSTOP SERVICE AVAILABILITY

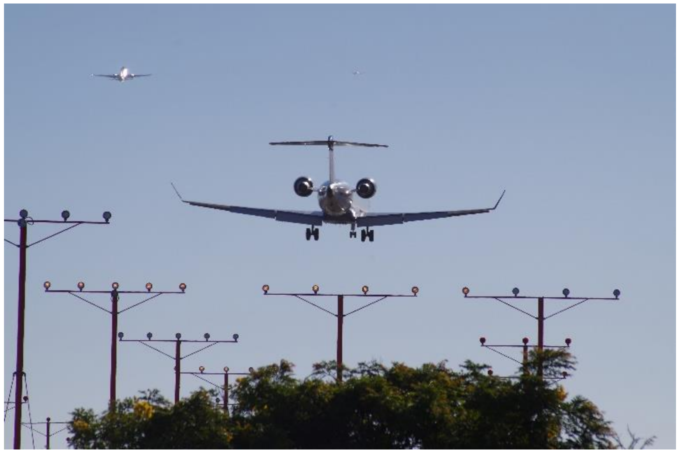
Travelers drive to competing airports to access air service for many reasons, one of which is nonstop service availability. **Table 6.2**[4] compares the level of air service offered at PUB with that offered at DEN and COS.

For the year ended December 31, 2019, PUB had nonstop service to DEN which was not included in the top 25 destinations. PUB also had nonstop service to Liberal, KS; however, the service is provided as an originator in Liberal for one-stop service to DEN, stopping in PUB. There is limited to no use from PUB passengers going to Liberal and, as such, is not considered a secondary nonstop market for PUB travelers. DEN had service to all 25 of the top 25 markets, with 2,222 weekly departures. COS offered nonstop service to 11 of the top 25 markets and 145 weekly roundtrips to those destinations.

TABLE 6.2 NONSTOP SERVICE COMPARISON

RANK	DESTINATION	AVG WEEKLY DEPARTURES		
		DEN	COS	PUB
1	Los Angeles, CA	158	15	0
2	Las Vegas, NV	133	8	0
3	Seattle, WA	132	0	0
4	Houston, TX (IAH)	90	22	0
5	San Francisco, CA	108	0	0
6	San Diego, CA	87	0	0
7	Dallas, TX (DFW)	116	33	0
8	San Antonio, TX	50	2	0
9	Phoenix, AZ (PHX)	150	7	0
10	Orlando, FL (MCO)	71	3	0
11	Boston, MA	64	0	0
12	Minneapolis, MN	119	2	0
13	New York, NY (LGA)	84	0	0
14	Atlanta, GA	119	8	0
15	Washington, DC (DCA)	28	0	0
16	Salt Lake City, UT	144	16	0
17	Philadelphia, PA	56	0	0
18	Tampa, FL	45	0	0
19	Orange County, CA	64	0	0
20	Chicago, IL (ORD)	121	30	0
21	Portland, OR	74	0	0
22	Detroit, MI	61	0	0
23	Baltimore, MD	57	0	0
24	Charlotte-Douglas, NC	57	0	0
25	Raleigh/Durham, NC	34	0	0
Total Top 25 Frequencies		**2,222**	**145**	**0**
Total All Markets		**5,895**	**211**	**12**
Number of Top 25 Served		**25**	**11**	**0**
Total Destinations Served		**214**	**13**	**1**

[4] *Source: Diio Mi; Year Ended December 31, 2019*



QUALITY OF AIR SERVICE AT COMPETING AIRPORTS

The quality of air service offered by an airport is a factor in a traveler's decision when selecting which airport to originate travel from. In general, passengers prefer larger aircraft over smaller aircraft and jet aircraft over turboprop aircraft.

Table 6.3[5] provides PUB's and each diversionary airport's total departures by aircraft type for the year ended December 31, 2019. PUB offered a total of 938 departures and 46,900 seats. All of PUB's departures were on regional jet aircraft. Comparatively, DEN offered 306,530 departures and nearly 40 million seats on a mix of aircraft. COS had 9,932 total departures with 66 percent of departures on regional jet aircraft.

TABLE 6.3 DEPARTURES BY AIRCRAFT TYPE BY ORIGIN

AIRCRAFT TYPE	SEAT RANGE	TOTAL DEPARTURES		
		DEN	COS	PUB
Turboprop	<9	5,628	-	-
	10-19	367	-	-
Regional jet	30-50	61,453	5,086	938
	51-70	16,378	1,152	-
	71-100	18,777	277	-
Narrow body jet	70-125	2,118	-	-
	126-160	66,473	1,562	-
	>160	130,909	1,855	-
Wide body jet	160-240	1,210	-	-
	241-300	349	-	-
	>300	2,868	-	-
Total Departures		**306,530**	**9,932**	**938**
% Turboprop Departures		**2%**	**0%**	**0%**
% Regional Jet Departures		**32%**	**66%**	**100%**
Total Seats		**39,796,681**	**1,008,072**	**46,900**

[5] *Source: Diio Mi; Year Ended December 31, 2019*

An increase in retention of 10 percentage points would create an estimated additional 25,852 annual passengers (35 PDEW) for PUB.

RETENTION RATE SENSITIVITY

Considering the previous factors of airfares, nonstop service and quality of service, a retention rate sensitivity follows in **Table 6.4**. The purpose is to show how small changes in passenger retention can affect passenger volume. Passengers in total and for each of the top 25 markets are calculated using varying degrees of retention. An increase in retention of 10 percentage points would create an estimated additional 25,852 annual passengers (35 PDEW) for PUB.

TABLE 6.4 RETENTION RATE SENSITIVITY

RANK	DESTINATION	REPORTED PAX	RETENTION %	RETENTION IMPROVEMENT		
				5%	10%	15%
1	Los Angeles, CA	692	4	1,503	2,315	3,126
2	Las Vegas, NV	791	5	1,524	2,257	2,990
3	Seattle, WA	835	8	1,377	1,919	2,461
4	Houston, TX (IAH)	463	5	938	1,413	1,888
5	San Francisco, CA	888	10	1,328	1,767	2,207
6	San Diego, CA	1,290	16	1,706	2,122	2,538
7	Dallas, TX (DFW)	446	5	854	1,262	1,669
8	San Antonio, TX	190	2	573	957	1,340
9	Phoenix, AZ (PHX)	445	6	819	1,193	1,567
10	Orlando, FL (MCO)	412	6	782	1,152	1,522
11	Boston, MA	315	5	646	978	1,309
12	Cancun, Mexico	100	2	413	726	1,039
13	Minneapolis, MN	384	7	672	960	1,248
14	New York, NY (LGA)	528	9	815	1,102	1,390
15	Atlanta, GA	162	3	421	681	940
16	Washington, DC (DCA)	260	5	510	759	1,008
17	Salt Lake City, UT	189	4	414	638	863
18	Philadelphia, PA	149	4	348	547	746
19	Tampa, FL	231	6	430	629	828
20	Orange County, CA	259	8	418	578	737
21	Chicago, IL (ORD)	337	11	491	644	798
22	Portland, OR	724	24	873	1,023	1,173
23	Detroit, MI	120	4	258	395	533
24	Baltimore, MD	121	5	253	385	517
25	Charlotte-Douglas, NC	70	3	185	300	415
Total Top 25		**10,402**	**6**	**18,552**	**26,703**	**34,854**
Total Domestic		**21,455**	**9**	**33,332**	**45,210**	**57,087**
Total International		**725**	**4**	**1,774**	**2,823**	**3,872**
Total of All Markets		**22,180**	**9**	**35,106**	**48,032**	**60,959**

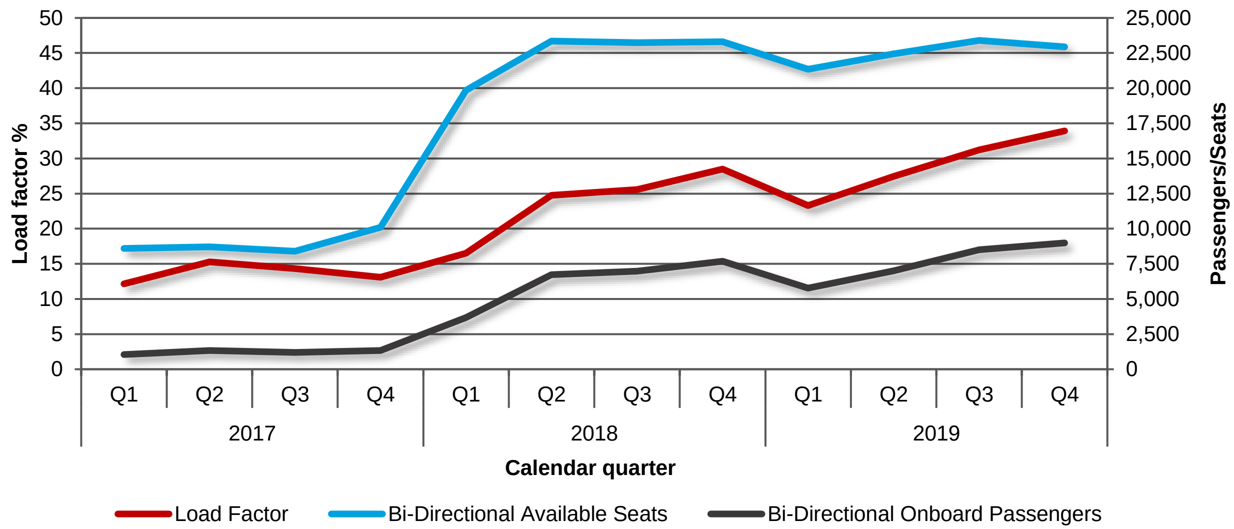
AIRLINE PERFORMANCE COMPARISONS

This section compares PUB's performance with other airports served by PUB's incumbent airline, United Airlines. These comparisons are important from an airline and community standpoint and should be monitored quarterly as an under-performing market may be at risk of service being reduced or cancelled and an over-performing market can be a candidate for expanded service.

LOAD FACTOR, AVAILABLE SEATS AND PASSENGERS

Exhibit 7.1 shows PUB's bi-directional available seats, bi-directional onboard passengers and load factors by quarter from the first quarter 2017 through the fourth quarter 2019. Load factors have improved in all four of the last four quarters with a decrease in seats in two of the four quarters. The lowest load factor during the 12-quarter period was in the first quarter of 2017 at 12 percent, while the high was in the fourth quarter of 2019 at 34 percent. Over the three-year period, available seats were lowest in the third quarter of 2017 and highest in the third quarter of 2019. The low for onboard passengers at PUB was in the first quarter of 2017 and the high was in the fourth quarter of 2019.

EXHIBIT 7.1 LOAD FACTOR, AVAILABLE SEATS AND ONBOARD PASSENGERS



SEATS, DEPARTURES AND LOAD FACTOR COMPARISONS

For the year ended December 31, 2019, United served PUB to DEN nonstop. All service was provided annually on 50-seat regional jet aircraft.

Table 7.1 provides a comparison of United's departures, load factor and seats. PUB had 45,075 seats for the year ended December 31, 2019, and 902 departures, representing the 187th highest service level in terms of seats and 182nd highest number of departures of United's 242 U.S. markets. PUB's seats and departures increased over the prior year by 1 percent. Comparatively, United's system seats decreased by 1 percent and departures decreased by less than 1 percent year-over-year. PUB's load factor was 55 percentage points below United's average; however, PUB's average load factor increased by 5 percentage points over the prior year.

TABLE 7.1 UNITED AIRLINES - COMPARISON OF SEATS, DEPARTURES AND LOAD FACTOR (NON-DIRECTIONAL)

RANK	AIRPORT	YE Q4 2019				CHANGE YOY		
		SEATS	DEPART-URES	SEATS/ DEPT	LOAD FACTOR %	SEATS %	DEPART-URES %	LOAD FACTOR PTS
175	Laredo, TX	49,025	981	50	64	0	(1)	3
176	Lansing, MI	48,307	944	51	76	(14)	(6)	1
177	Killeen, TX	48,150	946	51	72	16	13	(3)
178	Lake Charles, LA	47,975	960	50	63	(3)	(4)	5
179	Westchester County, NY	47,575	952	50	81	3	3	(1)
180	Saginaw, MI	47,500	950	50	76	(4)	(4)	3
181	Hilo/Hawaii, HI	47,265	281	169	67	(11)	(12)	8
182	Evansville, IN	46,625	933	50	69	(5)	(5)	7
183	Jamestown, ND	46,350	927	50	55	(2)	(2)	1
184	Cape Girardeau, MO	45,900	918	50	53	54	54	22
185	Wausau, WI	45,900	918	50	76	11	12	13
186	Springfield, IL	45,545	909	50	64	(7)	(7)	1
187	**Pueblo, CO**	**45,075**	**902**	**50**	**29**	**1**	**1**	**5**
188	Salina, KS	44,925	899	50	51	34	34	5
189	Kalamazoo, MI	44,825	897	50	71	(4)	(4)	5
190	Cody, WY	44,705	890	50	75	26	26	(1)
191	College Station, TX	43,900	878	50	67	(2)	(4)	8
192	Ithaca, NY	43,075	862	50	73	12	12	3
193	Alexandria, LA	42,600	852	50	67	(15)	(16)	9
194	Allentown, PA	42,341	801	53	81	9	8	1
195	Minot, ND	42,225	845	50	83	19	19	0
196	Panama City, FL	42,137	785	54	81	0	0	2
197	Myrtle Beach, SC	40,401	311	130	89	(14)	2	6
198	St. George, UT	40,260	804	50	74	(25)	(25)	(3)
199	Fairbanks, AK	38,180	230	166	69	190	207	(16)
All UA U.S. markets		**93,928,897**	**852,353**	**110**	**84**	**(1)**	**(0)**	**1**

PUB's average fare is 31 percent lower than United's system average, while yield was 38 percent higher than average.

PASSENGERS, REVENUE, FARE AND YIELD COMPARISONS

Table 7.2 shows how PUB ranks based on passengers among United's U.S. markets. PUB ranked 230th out of United's 242 U.S. passenger markets. PUB ranked 229th in revenue. In fare and yield, PUB ranked 216th in average fare and 73rd in yield. PUB's average fare was 31 percent lower than United's U.S. average, and PUB's yield was 38 percent higher than the system average on an average itinerary mile length 50 percent below the system average. Compared to the prior year, PUB's passengers increased 15 percent, while revenue increased 20 percent. The average fare increased 5 percent from the prior year while yield decreased 6 percent. United's U.S. passengers and revenue increased 4 percent and fares and yield essentially remained the same.

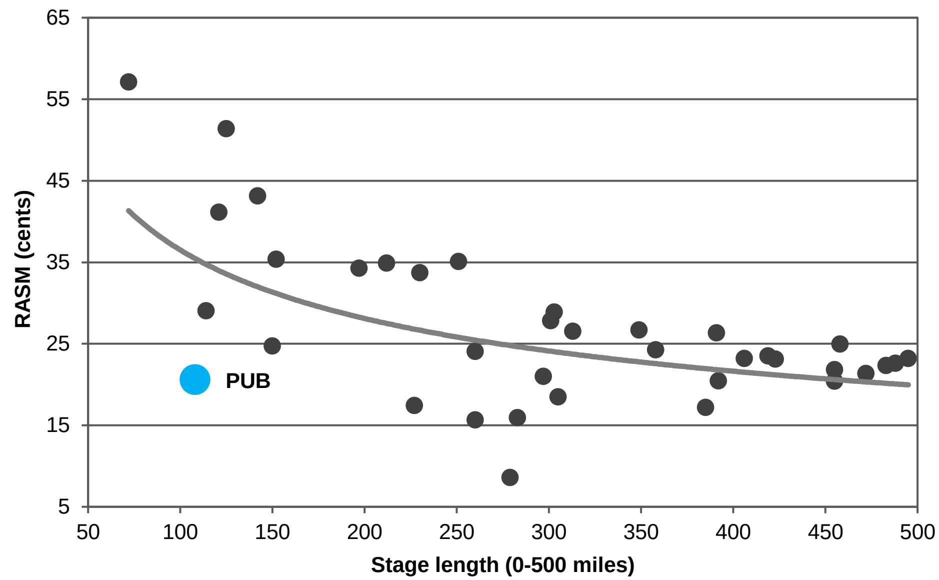
TABLE 7.2 UNITED AIRLINES - COMPARISON OF PASSENGERS, REVENUE, FARE AND YIELD

RANK	AIRPORT	YE Q4 2019					% CHANGE YOY			
		PAX	REV ($000S)	FARE ($)	YIELD (¢)	ITIN MILES	PAX	REV	FARE	YIELD
214	Clarksburg, WV	34,715	7,231	208	23.5	886	15	15	(0)	0
215	Laramie, WY	34,576	7,795	225	21.4	1,053	7	3	(4)	(4)
216	Paducah, KY	34,323	8,229	240	24.3	988	(15)	(11)	5	3
217	Salina, KS	33,956	5,624	166	24.2	685	36	48	9	(3)
218	Moab, UT	32,240	6,147	191	19.2	990	59	76	11	5
219	Hays, KS	32,020	6,459	202	21.7	931	18	8	(8)	(9)
220	Mammoth Lakes, CA	31,918	5,543	174	23.3	747	100+	100+	(13)	5
221	Shenandoah Valley, VA	31,827	5,927	186	21.6	862	47	53	4	9
222	North Platte, NE	30,914	6,652	215	22.8	943	22	27	4	(4)
223	Pierre, SD	29,089	6,209	213	23.0	928	100+	100+	(41)	(32)
224	North Bend, OR	26,177	6,806	260	23.0	1,130	9	7	(2)	(7)
225	Presque Isle, ME	25,878	5,903	228	16.2	1,409	100+	77	(14)	(23)
226	Vernal, UT	25,001	4,938	198	27.8	711	91	92	1	(7)
227	Greenbrier, WV	23,618	4,886	207	23.7	872	42	37	(3)	1
228	Watertown, SD	22,974	4,104	179	20.9	854	100+	100+	(48)	(26)
229	Cape Girardeau, MO	22,636	4,369	193	24.8	777	34	51	13	3
230	**Pueblo, CO**	**22,078**	**4,481**	**203**	**20.9**	**972**	**15**	**20**	**5**	**(6)**
231	Jamestown, ND	21,101	4,479	212	20.5	1,038	(13)	(8)	6	(8)
232	Ogdensburg, NY	20,259	3,913	193	18.2	1,061	100+	100+	(54)	(32)
233	Quincy, IL	19,611	3,848	196	24.0	818	4	19	14	(4)
234	Nantucket, MA	18,411	4,563	248	27.6	898	12	13	2	7
235	Devils Lake, ND	15,671	3,346	214	20.1	1,065	(10)	(1)	10	(13)
236	Liberal, KS	13,522	2,735	202	22.4	903	27	37	8	(11)
237	Stockton, CA	13,257	2,172	164	20.6	794	0	0	0	0
238	Fayetteville, NC	6,646	2,028	305	19.8	1,539	(88)	(84)	31	16
All UA U.S. markets		**115,752,717**	**33,858,888**	**293**	**15.1**	**1,932**	**4**	**4**	**0**	**(0)**

REVENUE PER AVAILABLE SEAT MILE PERFORMANCE

Exhibit 7.2 provides PUB's RASM plotted against other markets served by United at DEN (under 500 miles). On a RASM basis, PUB performed below United's average at DEN for the year ended December 31, 2019. PUB had a RASM of 20.6 cents at a stage length of 108 miles, the second shortest stage length in United's system to DEN. This was a 20 percent increase over the year ended December 31, 2018, when PUB's RASM was 17.2 cents. With an average load factor of 43 percent, PUB's load factor was 44 percentage points lower than United's average at DEN of 87 percent. It is important to note that SkyWest Airlines receives nearly $2.8 million in annual subsidies for service to PUB, and those revenues are not included in this RASM calculation. The EAS subsidy would add an estimated 40.1 cents to the RASM calculation for PUB, putting it well above the hub average.

EXHIBIT 7.2 UNITED AIRLINES DEN RASM PERFORMANCE



SITUATION ANALYSIS

PUB's geographic location presents a number of airline-related obstacles, especially in regard to retaining catchment area passengers. PUB is located just 115 miles (less than a two-hour drive) from DEN, the fifth largest U.S. airport in terms of flights and the second largest airport in terms of passenger traffic. This close proximity to DEN, offering major hub operations for both United Airlines and Southwest Airlines as well as the largest operation for Frontier Airlines, one of the most successful ultra-low-cost carriers, makes it especially challenging to retain passengers in PUB. PUB is also located just 47 miles from COS. While a much smaller airport than DEN, COS still has significantly more service than PUB, affecting passenger retention.

Overall, PUB retains just 9 percent of total passengers, while losing 60 percent to DEN and another 31 percent to COS. With over 200 nonstop destinations offered at DEN and another 13 nonstop markets from COS, combined with significant fare differentials, 91 percent of PUB's catchment area travelers drive to one of those two airports for their travel needs. DEN's low fare and hypercompetitive environment, having 3 different airlines (Frontier, Southwest and United) have "hubs" greatly impacts PUB's ability to retain passengers, with not only cheaper flights but with nonstop service to almost anywhere in the country available.

United Airlines/SkyWest Airlines' service to DEN is supported by $2.8 million in annual EAS. Passenger numbers have improved significantly over prior EAS service, with SkyWest's service generally being more reliable and the jet service being more attractive to passengers than a turboprop. The following subsection discusses the EAS program and how PUB's service is performing. Following the EAS subsection is a discussion of potential airline opportunities including incumbent carrier United and other potential new entrant airlines.

ESSENTIAL AIR SERVICE

In 1978, the Airline Deregulation Act was enacted to preserve service to smaller communities. The program has been adjusted over the years to limit and sometimes eliminate which airports are deemed “Essential.” In 2012, Congress made several major changes to the EAS program:

- The program was capped at airports that were currently in the program. This means that there is no longer a safety net for any airports not currently subsidized.
- A $1,000 subsidy cap per passenger was put in place regardless of the distance to the hub.
- There is a 10 enplanement per service day minimum for airports within 175 miles of a medium or large hub airport.
- Enforcement of the $200 per passenger subsidy cap for airports within 210 miles of a medium or large hub airport.

There is a possibility of a waiver being granted from the Secretary of Transportation for the 10 enplanement and $200 passenger cap; however, there is no possibility of a waiver to be granted for the $1,000 hard cap that applies to all airports. Overall, there have been only a handful of communities eliminated by the $1,000 cap, while the Secretary has issued waivers for the majority of the communities requesting waivers from the $200 cap or 10 enplanement rule. In 2018, further language was added by Congress that granted an automatic waiver if a community has a lower subsidy per passenger than the previous year. The U.S. DOT continues to enforce all of these limitations on a federal fiscal year schedule, and, while they will likely grant waivers to most requests, it is not a guarantee and it is important for communities to work diligently to be in compliance.

PUB’s service to DEN had a load factor of only 43 percent of its seats in 2019 on its 12 weekly flights on 50-seat Canadair Regional Jet aircraft. That load is boosted by carrying additional one-stop traffic from Liberal, KS on to DEN. The presence of the EAS support suggests that PUB should retain its DEN service as long as SkyWest is willing to continue in the program beyond the November 2022 contract expiration, but the relatively low passenger volumes on the DEN flights is a strong indication that additional service offerings will be difficult to attract. Today, PUB is not at risk of losing EAS service, with a subsidy per passenger well under the $200 cap and significantly more than 10 enplanements per service day. There is some relative risk inherent to EAS communities due to the ever-changing political climate towards the EAS program as a whole and potential changes to program eligibility. Reducing eligibility through distance to small hub airports or potentially increasing the mileage for “cost sharing” could impact PUB.

It is possible that with nonstop service stimulation and typical connecting traffic flows, both Houston and Los Angeles could evolve over time into potential nonstop markets, but traffic diversion from United's existing DEN service would be a huge obstacle to overcome.

INCUMBENT AIRLINE OPPORTUNITIES – UNITED AIRLINES

As the only incumbent airline at PUB, United has a vested interest in enhancing its performance at the airport. SkyWest, as United's regional partner, operates 12 trips per week to United's DEN hub supported by EAS subsidy. United operates hubs at Chicago-O'Hare, Houston-Intercontinental, DEN, Newark, San Francisco, Washington-Dulles and Los Angeles.

Table 8.1 shows seat and departure changes at each of United's hubs year-over-year for July 2020. These changes reflect current (as of May 11, 2020) reductions taken due to COVID-related schedule changes for July. Overall, United's seats are scheduled to be down 16 percent and departures down 10 percent year-over-year. All hubs show year-over-year seat and departure decreases with the COVID impacts. The San Francisco and Los Angeles hubs shows the most significant percentage decreases.

TABLE 8.1 UNITED AIRLINES - DEPARTURES AND SEATS BY HUB

HUB/FOCUS MARKET	JULY 2020			% CHANGE YOY		
	AVG DAILY SEATS	AVG DAILY DEPARTURES	AVG SEATS/ DEPARTURE	AVG DAILY SEATS	AVG DAILY DEPARTURES	AVG SEATS/ DEPARTURE
Chicago, IL (ORD)	55,124	548	101	(14)	(9)	(6)
Houston, TX (IAH)	49,544	466	106	(13)	(8)	(5)
Denver, CO	48,642	468	104	(8)	(3)	(4)
Newark, NJ	42,963	348	123	(17)	(16)	(2)
San Francisco, CA	36,994	264	140	(19)	(14)	(6)
Washington, DC (IAD)	23,755	241	99	(16)	(8)	(9)
Los Angeles, CA	18,113	130	139	(17)	(15)	(2)
Total all markets	**487,416**	**4,605**	**106**	**(16)**	**(10)**	**(6)**

Source: Diio Mi; As of 5/11/2020

Los Angeles with 22 PDEW, Houston with 13 PDEW and San Francisco with 12 PDEW are in PUB's top five markets. All three markets are worth watching over time to see if they continue to mature into stronger markets for PUB. While it is highly unlikely that SkyWest or United would choose to operate service to a different hub in addition to service to DEN, it is possible that a service combination with another EAS airport could allow for one-stop service to another hub, either in addition to current DEN service or more likely in place of one roundtrip to DEN.

NEW ENTRANT AIRLINE OPPORTUNITIES

Several potential new entrant airlines are discussed in this section including Allegiant Air, American Airlines, Delta Air Lines, Frontier Airlines and other airlines.

Allegiant Air

Allegiant operates a different business model than the traditional network airlines, focusing on deeply discounted fares to either large leisure destinations or very large business markets. In most new markets, Allegiant will operate two to three nonstop frequencies per week to consolidate leisure travelers on select days of the week. Most of Allegiant's growth in the last five years has been focused on larger markets such as Austin, Cincinnati, Cleveland, Indianapolis, Nashville, Newark, New Orleans and Pittsburgh. Allegiant's smallest aircraft is a 156-seat Airbus A-319, and the airline needs average load factors in the 85 percent range to be profitable, so viable markets must produce at least 130 passengers per flight to succeed.

In general, Allegiant's leisure destination-oriented service is focused primarily on service to Orlando-Sanford, Tampa-St. Petersburg, Las Vegas, Phoenix-Mesa, Cincinnati and Punta Gorda with limited service in select other markets such as Fort Walton Beach and Fort Lauderdale. Service is typically provided through secondary airports (e.g., Sanford, Mesa) and is generally on a less-than-daily basis (two to three times weekly) from cities having limited access to service at larger airports. **Table 8.2** compares Allegiant's average daily departures and seats in July 2020. Overall seats are scheduled to increase 18 percent and departures to increase 17 percent year-over-year.

TABLE 8.2 ALLEGIANT AIR - DEPARTURES AND SEATS BY FOCUS CITY

FOCUS CITY	JULY 2020			% CHANGE YOY		
	AVG DAILY SEATS	AVG DAILY DEPARTURES	AVG SEATS/ DEPARTURE	AVG DAILY SEATS	AVG DAILY DEPARTURES	AVG SEATS/ DEPARTURE
Orlando, FL (SFB)	6,495	39	165	6	6	(0)
St. Petersburg, FL	5,351	29	183	22	13	9
Las Vegas, NV	4,951	31	161	15	12	3
Phoenix, AZ (AZA)	3,104	17	182	9	7	2
Cincinnati, OH	3,072	17	182	32	32	0
Punta Gorda, FL	3,065	17	176	15	20	(4)
Fort Walton Beach, FL	2,860	16	184	15	15	(0)
Fort Lauderdale, FL	2,162	12	178	12	12	0
Total all markets	**76,565**	**444**	**173**	**18**	**17**	**1**

Source: Diio Mi; As of 5/11/2020

The only opportunity that American would explore for PUB is to bid on the EAS contract in 2022 and replace the current service offered by SkyWest/United.

Allegiant's business model has the advantage of driving large amounts of passenger stimulation with extremely low fares and only needing to fill two to three flights per week per nonstop market. However, most airports it serves must be able to support those two to three flights per week to multiple nonstop markets in order to justify opening a new airport station, so PUB would have to be able to generate upwards of 130 passengers per flight for at least two days per week to two or more markets for Allegiant to seriously consider adding service. PUB's two largest true markets, Los Angeles and Las Vegas, would be the most likely markets to support Allegiant service. It is unlikely that PUB's market alone could support service; however, the close proximity to Colorado Springs is a benefit to PUB. Allegiant ceased service to COS in 2018 and further analysis should be undertaken to determine the potential to attract some passengers from the Colorado Springs area with nonstop service at PUB. While Allegiant served PUB from October 2010 until April 2011 to Las Vegas, the market's performance was adequate to revisit service to Las Vegas or another destination in the west.

American Airlines

American Airlines is the largest airline in the world with numerous hubs across the U.S. American has been investing in fortifying their existing hubs, and with a large influx of new aircraft, American is on the path to have the youngest fleet of the legacy airlines. **Table 8.3** compares American's departures and seats in July 2020 with the prior year. Overall, average daily seats show a 17 percent decline driven by the COVID influence on this summer's schedules. American's two largest hubs along with Washington-National show the smallest declines and would most likely be the first hubs to rebuild to pre-COVID service levels. The more internationally dependent hubs like Miami, Philadelphia and Los Angeles all show 20 percent or larger declines for now.

TABLE 8.3 AMERICAN AIRLINES - DEPARTURES AND SEATS BY HUB

HUB/FOCUS CITY	JULY 2020			% CHANGE YOY		
	AVG DAILY SEATS	AVG DAILY DEPARTURES	AVG SEATS/ DEPARTURE	AVG DAILY SEATS	AVG DAILY DEPARTURES	AVG SEATS/ DEPARTURE
Dallas, TX (DFW)	95,267	780	122	(12)	(9)	(3)
Charlotte-Douglas, NC	64,656	593	109	(11)	(11)	(0)
Chicago, IL (ORD)	44,065	437	101	(17)	(15)	(3)
Miami, FL	36,606	268	137	(22)	(20)	(2)
Philadelphia, PA	30,621	309	99	(25)	(21)	(5)
Phoenix, AZ (PHX)	28,256	223	127	(15)	(11)	(4)
Los Angeles, CA	21,714	144	151	(25)	(29)	6
Washington, DC (DCA)	18,843	205	92	(6)	(10)	4
Total all markets	**628,735**	**5,743**	**109**	**(17)**	**(15)**	**(3)**

Source: Diio Mi; As of 5/11/2020

The only opportunity that American would explore for PUB is to bid on the EAS contract in 2022 and replace the current service offered by SkyWest/United. This is highly unlikely due to the proximity to COS, and significant analysis would need to be undertaken by PUB to demonstrate to American that service would not cannibalize their current COS service.

Delta Air Lines

Delta has consistently ranked as one of the top airlines for operational performance and customer service and continues to evolve as an airline focusing on operational and product excellence. They have also been active in route network adjustments with much of the recent growth focused on its Salt Lake City hub and building Seattle and Boston into larger hubs/focus cities. Delta operates the second nearest major hub to PUB at Salt Lake City and has a track record for successfully serving smaller markets from its major hubs.

Delta operates an extensive network with hubs and focus cities at Atlanta, Minneapolis, Detroit, Salt Lake City, New York-Kennedy and LaGuardia, Los Angeles, and Seattle. **Table 8.4** provides frequency and capacity changes at Delta's hubs in July 2020. All hubs except New York-LaGuardia show decreases in seats compared to July 2019. Atlanta continues to be the largest hub in the world for a single airline, with almost 1,000 daily departures. The most significant year-over-year seat decline on a percentage basis is at New York-Kennedy and Atlanta.

TABLE 8.4 DELTA AIR LINES - DEPARTURES AND SEATS BY HUB

HUB	JULY 2020			% CHANGE YOY		
	AVG DAILY SEATS	AVG DAILY DEPARTURES	AVG SEATS/ DEPARTURE	AVG DAILY SEATS	AVG DAILY DEPARTURES	AVG SEATS/ DEPARTURE
Atlanta, GA	133,508	945	141	(7)	(5)	(1)
Minneapolis, MN	47,542	399	119	(3)	(3)	1
Detroit, MI	44,981	401	112	(5)	(5)	(0)
Salt Lake City, UT	31,060	256	121	(2)	(4)	2
New York, NY (JFK)	29,691	212	140	(10)	(8)	(2)
Los Angeles, CA	25,206	158	160	(0)	0	(1)
Seattle, WA	23,720	171	139	(1)	1	(2)
New York, NY (LGA)	23,484	237	99	2	1	1
Total all markets	**685,527**	**5,542**	**124**	**(4)**	**(3)**	**(2)**

Source: Diio Mi; As of 5/11/2020

Like American, the only opportunity that Delta would explore for PUB is to bid on the EAS contract in 2022 and replace the current service offered by SkyWest/United. This is highly unlikely due to the proximity to COS, and significant analysis would need to be undertaken by the airport to demonstrate to Delta that service would not cannibalize their current service at COS. Delta also has been the least likely legacy carrier to add service to smaller airports, especially EAS markets.

Other airlines like Southwest Airlines and JetBlue Airways exclusively serve much larger markets than PUB and do not have the proper aircraft types to consider service to PUB.

Frontier Airlines

Frontier Airlines, similar to Allegiant, is one of the fastest growing ultra-low-cost airlines, driving significant new passenger traffic by offering rock-bottom airfares, typically 60 percent to 70 percent lower than the traditional network airlines. Frontier operates Airbus A-320 and A-321 aircraft seating anywhere from 180 to 230 passengers per flight. Because of its low fares, Frontier usually must average 85 percent or higher load factors to generate target profitability. While most of the largest markets it serves from DEN offer daily service, Frontier offers less-than-daily flights to many of its DEN nonstop markets. There are over 30 DEN nonstop markets where Frontier flies two times per week or less, but even these smaller markets are much larger than PUB's traffic base.

Denver is Frontier's largest operation with 60 flights per day scheduled for July 2020. The next largest Frontier operation is Orlando-International at half DEN's size. While Frontier has been one of the fastest growing airlines over the past five years, July 2020 shows declines in seats and flights in total driven by COVID-related schedule changes (**Table 8.5**). As the industry and the economy recover, Frontier is expected to resume its fast-paced growth in the U.S. market.

TABLE 8.5 FRONTIER AIRLINES - DEPARTURES AND SEATS BY FOCUS CITY

FOCUS CITY/HUB	JULY 2020			% CHANGE YOY		
	AVG DAILY SEATS	AVG DAILY DEPARTURES	AVG SEATS/ DEPARTURE	AVG DAILY SEATS	AVG DAILY DEPARTURES	AVG SEATS/ DEPARTURE
Denver, CO	11,568	60	192	(26)	(29)	3
Orlando, FL (MCO)	6,152	31	198	(18)	(14)	(4)
Las Vegas, NV	5,105	25	201	6	2	4
Philadelphia, PA	3,101	15	213	(19)	(25)	8
Atlanta, GA	2,833	15	187	34	40	(4)
Miami, FL	2,752	14	193	563	611	(7)
Total all markets	**65,771**	**339**	**194**	**(18)**	**(19)**	**1**

Source: Diio Mi; As of 5/11/2020

Frontier's largest operation by far is at DEN, where United offers PUB's only hub service. Because of the available nonstop service to DEN, this market is the largest origin and destination market reported in the U.S. DOT's database with just under 1,000 passengers in the most recent 12 months. Unfortunately, this only amounts to less than two PDEW. With less than a two-hour drive to DEN, this market is not the type of nonstop market that Frontier looks to serve. PUB's two largest true markets, Los Angeles and Las Vegas, are the most likely markets for Frontier consideration, but with the smallest aircraft at 180 seats, neither market could realistically generate enough passengers to support the service. In addition, Frontier offers over 30 flights per week to seven nonstop markets from COS, less than a one-hour drive from PUB.

Other Airlines

Other airlines like Southwest Airlines and JetBlue Airways exclusively serve much larger markets than PUB and do not have the proper aircraft types to consider service to PUB. Alaska Airlines does have regional jet and large turboprop aircraft that would be more suited to a market like PUB, but its hubs in Seattle and Portland would not generate enough potential passenger traffic to sustain nonstop service at this time.

TOP 50 TRUE MARKETS

TABLE A.1 TOP 50 TRUE MARKETS

RANK	DESTINATION	REPORTED PAX	RETENTION %	TRUE MARKET	PDEW	DIVERTING PASSENGERS	
						DEN	COS
1	Los Angeles, CA	692	4	16,225	22.2	11,918	3,615
2	Las Vegas, NV	791	5	14,659	20.1	7,712	6,156
3	Seattle, WA	835	8	10,840	14.8	8,335	1,670
4	Houston, TX (IAH)	463	5	9,501	13.0	3,545	5,493
5	San Francisco, CA	888	10	8,796	12.0	6,252	1,657
6	San Diego, CA	1,290	16	8,318	11.4	5,385	1,642
7	Dallas, TX (DFW)	446	5	8,156	11.2	3,064	4,646
8	San Antonio, TX	190	2	7,660	10.5	1,471	5,999
9	Phoenix, AZ (PHX)	445	6	7,481	10.2	3,572	3,463
10	Orlando, FL (MCO)	412	6	7,397	10.1	3,924	3,061
11	Boston, MA	315	5	6,630	9.1	5,686	630
12	Cancun, Mexico	100	2	6,263	8.6	5,806	358
13	Minneapolis, MN	384	7	5,757	7.9	2,607	2,765
14	New York, NY (LGA)	528	9	5,746	7.9	4,487	731
15	Atlanta, GA	162	3	5,186	7.1	2,352	2,672
16	Washington, DC (DCA)	260	5	4,983	6.8	3,867	856
17	Salt Lake City, UT	189	4	4,495	6.2	2,605	1,701
18	Philadelphia, PA	149	4	3,983	5.5	3,021	813
19	Tampa, FL	231	6	3,983	5.5	2,301	1,450
20	Orange County, CA	259	8	3,190	4.4	2,544	388
21	Chicago, IL (ORD)	337	11	3,071	4.2	1,465	1,269
22	Portland, OR	724	24	2,995	4.1	1,789	482
23	Detroit, MI	120	4	2,753	3.8	1,634	999
24	Baltimore, MD	121	5	2,642	3.6	1,369	1,151
25	Charlotte-Douglas, NC	70	3	2,301	3.2	2,027	204
26	Raleigh/Durham, NC	131	6	2,224	3.0	1,569	524
27	Austin, TX	238	11	2,168	3.0	1,137	793
28	Fort Lauderdale, FL	198	9	2,121	2.9	1,448	475
29	Omaha, NE	226	11	2,069	2.8	1,093	749
30	Boise, ID	376	18	2,039	2.8	1,072	591
31	New Orleans, LA	260	14	1,923	2.6	1,158	505
32	San Jose, CA	308	16	1,874	2.6	1,064	501
33	Ontario, CA	116	7	1,775	2.4	966	694
34	Washington, DC (IAD)	207	12	1,748	2.4	846	694
35	Cincinnati, OH	63	4	1,730	2.4	1,249	418

TABLE A.1 TOP 50 TRUE MARKETS

RANK	DESTINATION	REPORTED PAX	RETENTION %	TRUE MARKET	PDEW	DIVERTING PASSENGERS	
						DEN	COS
36	Nashville, TN	321	19	1,649	2.3	779	550
37	Honolulu, HI	79	5	1,623	2.2	692	852
38	San Jose del Cabo, Mexico	80	5	1,597	2.2	1,415	103
39	Spokane, WA	251	16	1,594	2.2	993	351
40	Chicago, IL (MDW)	0	0	1,540	2.1	1,540	0
41	Oklahoma City, OK	223	16	1,408	1.9	421	764
42	San Luis Obispo, CA	150	11	1,367	1.9	723	495
43	Pasco, WA	153	11	1,340	1.8	268	919
44	Miami, FL	50	4	1,332	1.8	1,037	246
45	Kansas City, MO	216	17	1,288	1.8	795	278
46	Sacramento, CA	334	26	1,278	1.8	514	430
47	Louisville, KY	81	6	1,275		709	485
48	Tucson, AZ	217	18	1,217	1.7	592	408
49	Columbus, OH	162	14	1,196	1.6	549	485
50	Dallas, TX (DAL)	0	0	1,190	1.6	1,190	0
Top 50 Destinations		**14,840**	**7**	**203,578**	**278.9**	**122,559**	**66,180**
Total Domestic		**21,455**	**9**	**237,545**	**325.4**	**137,358**	**78,732**
Total International		**725**	**4**	**20,980**	**28.7**	**18,749**	**1,506**
Total All Markets		**22,180**	**9**	**258,524**	**354.1**	**156,107**	**80,238**

GLOSSARY

AIRLINE CODES

AA	American Airlines
DL	Delta Air Lines
F9	Frontier Airlines
NK	Spirit Airlines
UA	United Airlines
WN	Southwest Airlines

AIRPORT CATCHMENT AREA

The geographic area surrounding an airport from which that airport can reasonably expect to draw passenger traffic. The airport catchment area is sometimes called the service area.

AIRPORT CODES

ALS	Alamosa, CO
AZA	Phoenix-Mesa, AZ
COS	Colorado Springs, CO
DAL	Dallas-Love Field, TX
DCA	Washington-National, DC
DEN	Denver, CO
DFW	Dallas-Fort Worth, TX
IAD	Washington-Dulles, DC
IAH	Houston-Intercontinental, TX
JFK	New York-Kennedy, NY
LAS	Las Vegas, NV
LAX	Los Angeles, CA
LGA	New York-LaGuardia, NY

AIRPORT CODES (CONT.)

MCO	Orlando-International, FL
MDW	Chicago-Midway, IL
ORD	Chicago-O'Hare, IL
PHX	Phoenix-Sky Harbor, AZ
PUB	Pueblo, CO
SAN	San Diego, CA
SAT	San Antonio, TX
SEA	Seattle-Tacoma, WA
SFB	Orlando-Sanford, FL
SFO	San Francisco, CA

ARC

Acronym for Airline Reporting Corporation.

AVERAGE AIRFARE

The average of the airfares reported by the airlines to the U.S. DOT. The average airfare does not include taxes or passenger facility charges and represents one-half of a roundtrip ticket.

CAGR

Abbreviation for compounded annual growth rate, or the average rate of growth per year over a given time period.

DESTINATION AIRPORT

Any airport where the air traveler spends four hours or more. This is the Federal Aviation Administration definition.

DIVERSION

Passengers who do not use the local airport for air travel, but instead use a competing airport to originate the air portion of their trip.

FAA

Acronym for the Federal Aviation Administration.

HUB

An airport used by an airline as a transfer point to get passengers to their intended destination. It is part of a hub and spoke model, where travelers moving between airports not served by direct flights change planes en route to their destination. Also an airport classification system used by the FAA (e.g., non-hub, small hub, medium hub, and large hub.

INITIATED (ORIGIN) PASSENGERS

Origin and destination passengers who began their trip from within the catchment area.

LOAD FACTOR
The percentage of airplane capacity that is used by passengers.

LOCAL MARKET
The number of air travelers who travel between two points via nonstop air service.

MSA
Acronym for Metropolitan Statistical Area. MSAs have at least one urban cluster with a population of at least 50,000 plus adjacent territory that has a high degree of social and economic integration with the core as measured by commuting ties.

NARROW-BODY JET
A jet aircraft with a single aisle designed for seating over 100 passengers.

NONSTOP FLIGHT
Air travel between two points without stopping at an intermediate airport.

ONBOARD PASSENGERS
The number of passengers transported on one flight segment.

ORIGIN AND DESTINATION (O&D) PASSENGERS
Includes all originating and destination passengers. In the context of this report, it describes the passengers arriving and departing an airport.

ORIGINATING AIRPORT
The airport used by an air traveler for the first enplanement of a commercial air flight.

PASSENGER FACILITY CHARGE
Fee imposed by airports of $1 to $4.50 on enplaning passengers. The fees are used by airports to fund FAA approved airport improvement projects.

PAX
Abbreviation for passengers.

PDEW
Abbreviation for passengers daily each way.

POINT-TO-POINT
Nonstop service that does not stop at an airline's hub and whose primary purpose is to carry local traffic rather than connecting traffic.

REFERRED PASSENGERS
Origin and destination passengers who began their trip from outside the catchment area.

REGIONAL JET
A jet aircraft with a single aisle designed for seating fewer than 100 passengers.

RETAINED PASSENGERS
Passengers who use the local airport for air travel instead of using a competing airport to originate the air portion of their trip.

TRUE MARKET
Total number of air travelers, including those who are using a competing airport, in the geographic area served by PUB. The true market estimate includes the size of the total market and for specific destinations.

TURBOPROP AIRCRAFT
A type of engine that uses a jet engine to turn a propeller. Turboprops are often used on regional and business aircraft because of their relative efficiency at speeds slower than, and altitudes lower than, those of a typical jet.

U.S. DOT
Acronym for U.S. Department of Transportation.

WIDE-BODY JET
A jet aircraft with two aisles designed for seating greater than 175 passengers.

FOR MORE INFORMATION, PLEASE CONTACT
MEAD & HUNT, INC | JEFFREY HARTZ | 959 RED CEDAR WAY | COPPELL, TX 75019
360-600-6112 | JEFFREY.HARTZ@MEADHUNT.COM | WWW.MEADHUNT.COM

Mead & Hunt

Appendices

Appendix D. FAA Forecast Approval Letter

Ryan Hayes

From: Yaffa, Christine (FAA) <Christine.Yaffa@faa.gov>
Sent: Tuesday, November 10, 2020 7:19 AM
To: gpedroza
Cc: cdevore@pueblo.us; Ryan Hayes; Kaitlyn.westendorf; john.sweeney
Subject: PUB Forecast Approval AIP 3-08-0046-037-2019
Attachments: PUB Forecasts 11 09 20.docx

U.S. Department
of Transportation
Federal Aviation Administration

Northwest Mountain Region
Colorado · Idaho · Montana · Oregon · Utah
Washington · Wyoming

Denver Airports District Office
26805 E. 68th Ave., Suite
224 Denver, CO 80249

November 10, 2020

Greg Pedroza, Interim Director of Aviation
Pueblo Memorial Airport
31201 Bryan Circle
Pueblo, CO 81001

Pueblo Memorial Airport
Pueblo, Colorado
AIP: 3-08-0046-037-2019
Forecast Approval

Dear Mr. Pedroza:

The Federal Aviation Administration (FAA) reviewed forecast information for the subject airport. The forecast was received November 9, 2020. FAA approves the attached forecast. The FAA also approves the Bombardier CRJ 200 for the existing and the Embraer E-175 for the future critical aircraft. We found the forecast to be supported by reasonable planning assumptions and current data. Your forecast appears to be developed using acceptable forecasting methodologies.

This forecast was prepared at the same time as the evolving impacts of the COVID-19 public health emergency. Forecast approval is based on the methodology, data, and conclusions at the time the document was prepared. However, consideration of the impacts of the COVID-19 public health emergency on aviation activity is warranted to acknowledge the reduced confidence in growth projections using currently-available data.

Accordingly, FAA approval of this forecast does not constitute justification for future projects. Justification for future projects will be made based on activity levels at the time the project is requested for development.

Documentation of actual activity levels meeting planning activity levels will be necessary to justify AIP funding for eligible projects.

The approval of the forecast and critical aircraft does not automatically constitute a commitment on the part of the United States to participate in any development recommended in the master plan or shown on the ALP. All future development will need to be justified by current activity levels at the time of proposed implementation. [*See FAA Order 5100.38D, Airport Improvement Program, Paragraph 3-12, for ADO options.*] Further, the approved forecasts may be subject to additional analysis or the FAA may request a sensitivity analysis if this data is to be used for environmental or Part 150 noise planning purposes.

If you have questions, please call me at 303-342-1280.

Thank you,

Christy Yaffa
Community Planner
FAA Denver Airports District Office

Phone 303-342-1280 **Fax** 303-342-1260
Email christine.yaffa@faa.gov
26805 E. 68th Ave., Ste 224, Denver, CO 80249-6361

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Appendices

Appendix E. Annual Service Volume

Appendix E. Annual Service Volume

Annual Service Volume (ASV) is a metric commonly used to identify deficiencies in airfield capacity. Once the ASV has been calculated and compared to the forecasts of future demand, capital improvement needs, and operational capacity enhancements can be determined.

Airfield capacity is defined in Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5060-5, *Airport Capacity and Delay*, as the maximum number of aircraft operations that a given airport configuration can accommodate during a given time interval of continuous demand. This derived level of capacity is affected by several factors including: weather conditions, number of runways and their configuration, the placement of exit taxiways and their configuration, the number of touch-and-go operations, and the types of aircraft utilizing a facility. This section estimates and evaluates the following airfield capacity metrics:

- **Hourly Capacity of Runways.** The maximum number of aircraft operations that can occur at an airport in an hour, given specified weather conditions.
- **Annual Service Volume.** An estimate of an airport's annual capacity that accounts for runway use, aircraft mix, weather conditions, and other factors that would be encountered over the course of a year. The ASV also assumes an acceptable level of aircraft delay as described in FAA AC 150/5060-5, which is used in this analysis.

Runway Capacity Factors

There are several factors that can affect hourly capacity. These factors are described in the following sections:

- **Weather Conditions (Ceiling and Visibility)**
- **Runway Use Configuration**
- **Aircraft Mix Index**
- **Peak Hour**
- **Percent Arrivals and Percent Touch-and-Go Operations**
- **Exit Taxiway Locations**
- **Peak Hour Airfield Capacity.**

Weather Conditions (Ceiling and Visibility)

Adverse weather conditions impact capacity by increasing the separation distances needed between aircraft on arrival. Aircraft operate under two primary weather categories: Visual Flight Rules (VFR) and Instrument Flight Rules (IFR). VFR conditions exist when the cloud ceiling is 1,000 feet or greater above ground level (AGL) and visibility is at least three statute miles. IFR weather conditions prevail when the cloud ceiling is 500 feet AGL, or greater, but less than 1,000 feet, and visibility is less than three statute miles. In general, any weather conditions below VFR minimums are considered IFR weather conditions. The ability of aircraft to operate during IFR conditions is often solely dependent on the lowest available instrument approach minimums at an airport. The lowest minimums at PUB are a 200-foot AGL cloud ceiling and ½-mile visibility that correspond to the Instrument Landing System (ILS) approach to Runway 8R. During VFR and IFR conditions, the required separation distances between aircraft vary. In general, greater separation is required under IFR than VFR.

Information from PUB was retrieved from the Automated Surface Observing System (ASOS) located on the field. The frequency of adverse weather occurrences is an important consideration as it influences the weighted capacity (C_w) variable used in the final capacity calculation presented near the end of this section. More frequent occurrences of IFR weather reduces capacity as greater aircraft spacing is required. Based on its geographic location, PUB tends to experience clear days and the observed conditions for VFR and IFR conditions from 2015 through 2019 show that IFR conditions occurred an average of only 3.4 percent of the time. This information is presented in **TABLE 1**.

TABLE 1 Occurrences per Year by Percentage

	2015	2016	2017	2018	2019	AVERAGE
IFR OCCURANCE	3.8%	2.1%	3.5%	3.4%	4.0%	3.4%

SOURCE: PUB ASOS, 2015-2019.

Runway Use Configuration

Runway use configuration refers to the number, location, and orientation of runways. It also refers to the type and direction of operations as well as the flight rules in effect at any given time. The number, placement, and orientation of runways at an airport can affect capacity. For example, runways that intersect each other can affect the overall capacity of an airport since simultaneous use of the runways cannot occur. Likewise, parallel runways allow for simultaneous aircraft operations to occur that can increase the overall capacity of an airport. AC 150/5060-5 includes a variety of runway use configuration diagrams. The AC advises selecting the configuration that best represents airport use during the specified hour. PUB has three runways, one of which intersects with the other two. Runway 8R/26L is the longest runway at PUB at 10,498 feet long and parallel to Runway 8L/26R, which is 4,690 feet in length. Finally, Runway 17/35, having a north-south orientation and intersecting the other two runways, is 8,310 feet long.

Aircraft tend to operate in one of two configurations at PUB. Ideally, both parallel runways would be used for continuous operations and are the designated calm wind runways by the PUB Airport Traffic Control Tower (ATCT). However, the Canadian Aviation Education (CAE)-Doss aircraft and other aircraft used for flight training purposes at PUB are small and have limited crosswind tolerances, so Runway 17/35 is used when crosswind conditions necessitate. Coordination with local ATCT personnel indicates that use of Runway 17/35 is not common, and the runway is typically only used approximately five percent of the time. Coordination with the ATCT also indicated that use of all three runways at the same time is not common. Each of these configurations are also used in either VFR or IFR conditions and result in four configurations that are listed below. The configurations are also shown by percent used in **TABLE 2**.

- **VFR Runways 8R/26L and 8L/26R**
- **VFR Runway 17/35**
- **IFR Runways 8R/26L and 8L/26R**
- **IFR Runway 17/35.**

TABLE 2 Runway Configuration Uses by Percentage

RUNWAY USED	VFR	IFR
8R/26L AND 8L/26R	91.8%	3.2%
17/35	4.8%	0.2%

SOURCE: PUB ATCT.

Aircraft Mix Index

The aircraft mix index is based on the percentage of operations conducted by four different categories of aircraft (A, B, C, and D). Aircraft class definitions used to calculate the mix index are based on a combination of maximum certified takeoff weight, number of engines, and wake turbulence classification. Wake turbulence classification is based on aircraft wake vortices, which are the air turbulence trails behind aircraft created by their movement through the air. Heavier and larger aircraft create more significant and potentially more hazardous wake vortices, which are of greater concern for aircraft on arrival. To mitigate the hazards of wake vortices, aircraft are spaced according to differences in approach airspeed as well as weight. In general, aircraft departures are spaced two minutes apart for larger aircraft and at least three minutes for the largest aircraft (AC 90-23G, *Aircraft Wake Turbulence*). Airfield capacity can significantly increase or decrease depending on the approach speeds, aircraft weights, wake turbulence classification, and the separation needed between aircraft to mitigate for wake turbulence.

To better understand the effect aircraft mix has on runway configuration and capacity, FAA AC 150/5060-5 uses different aircraft classifications than FAA AC 150/5300-13A, *Airport Design*. When referring to the aircraft mix index categories, the categories laid out in **TABLE 3** coincide with the criteria used in AC 150/5060-5.

TABLE 3 Aircraft Mix Index

CLASS	MAXIMUM TAKEOFF WEIGHT (POUNDS)	AIRCRAFT TYPE	WAKE TURBULANCE FACTOR
A	12,500 or less	Small Single-Engine	Small
B	12,500 or less	Small Multi-Engine	Small
C	12,500 – 300,000	Large	Large
D	300,000 or more	Heavy	Heavy

SOURCE: FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*.

Baseline 2019 operations data presented in **Chapter B – Aviation Activity Forecasts** is used in the airfield capacity calculations and further examined via the FAA operations data from the Traffic Flow Management System Counts (TFMSC) database. TFMSC collects information for aircraft flying under IFR flight plans and captured by FAA en route computers.

AC 150/5060-5 defines the aircraft mix index as the percent of Class C aircraft plus three times the percent of Class D aircraft, or %(C+3D), and A and B aircraft are not included in this formula. While Class D aircraft use the Airport on occasion, they are not expected to be a significant presence during the twenty-year planning period. However, Class C aircraft are a common presence at PUB, the most frequent of which is the CRJ 200 with 1,830 operations in 2019. While this is a significant amount of operations there were a total of 217,424 total operations and small, single engine training aircraft conducted a total of 191,339 operations in 2019. Therefore, the total number of operations by Class C aircraft, including the CRJ 200, and other air carriers and business jets is approximately one percent of total operations. Therefore, the fleet mix index is set at one percent.

Peak Hour

The number of peak hour operations can affect the total annual capacity of an airport. Due to the separation needed between aircraft, periods of congestion limit the number of aircraft that can land and takeoff on a runway. Based on the information in **Chapter B – Aviation Activity Forecasts**, October is determined to be the peak month with 9.6 percent of the annual operations. As this is a 31-day peak month, the peak month operations can be divided by 31 to determine the average daily operations during October. Finally, 11 percent of the peak month average day operations are believed to occur during the peak hour. This process can be used for both the base year, 2019 and for the end of the master planning period, 2040, to determine the peak hour as shown in **TABLE 4**.

TABLE 4 Peak Period Aircraft Operations, 2019

YEAR	ANNUAL	PEAK MONTH	AVERAGE DAY OF THE PEAK MONTH	PEAK HOUR/AVERAGE DAY RATIO	AVERAGE PEAK HOUR
2019	217,424	20,873	673	11%	74
2040	440,713	42,308	1,365	11%	150

SOURCE: FAA TAF, Mead and Hunt Forecast.

Percent Arrivals and Touch-and-Go Operations

Percent arrivals is the ratio of arrivals to total operations. In general, aircraft on final approach are given priority over departures, which increases percentage of arrivals during peak periods, thus reducing the ASV. Percent arrivals are computed as follows:

$$Percent\ Arrivals = \frac{A + 0.5(T)}{A + D + T}\ x\ 100$$

A = Number of arriving aircraft in the hour
D = Number of departing aircraft in the hour
T = Number of touch-and-go operations in the hour

In the section above, the current peak aircraft operations were determined to be an average of 74 peak hour operations during October during the peak month average day. The TFMSC database does not track touch-and-go operations. Given the strong presence of local flight training at PUB, a large percentage of touch and go operations are known to occur. Therefore, the touch and go operations are considered to represent 25 percent of total operations at PUB. For these 74 peak operations, it is estimated that 28 were arriving aircraft, 28 departing aircraft and 18 aircraft were conducting touch-and-go operations. Arriving and departing aircraft were determined based on the assumption that for every arriving aircraft, there was also a departing aircraft. Based on the formula above, as well as touch-and-go estimates, the percent arrivals during the peak hour is 50 percent.

Exit Taxiway Locations

In some cases, exit taxiway locations providing access to a parallel taxiway can affect capacity. Optimally located exit taxiways provide aircraft multiple options to exit the runway safely as soon as their speed decreases sufficiently. Permitting aircraft to quickly exit the runway via additional exits can reduce runway occupancy times and make the runway available for other aircraft, thus increasing total capacity. While Runway 8R/26L and 8L/26R have numerous taxiway exits relative to their size, Runway 17/35 has limited opportunities for aircraft to exit the runway. Due to the lack a parallel taxiway, the north half of Runway 17/35 only has a turnaround opportunity at the Runway 17 threshold, so aircraft that cannot exit at Taxiways A or B must continue taxiing down the entire length of the runway when landing to Runway 35. This increases runway occupancy time and reduces overall airfield capacity as other aircraft are not able to land efficiently. **TABLE 5** provides the relative location of each runway's exit taxiways.

TABLE 5 **Exit Taxiway Locations**

RUNWAY	TAXIWAY AND DISTANCE FROM LANDING THRESHOLD									
Runway 8R/26L										
Runway End	**A1**	**A2**	**A4/B4**	**A5**	**A7/B7**	**A8**	**A9**	**A10**	**A11**	**A12**
8R	50’	1,950’	3,200’	4,255’	4,700’	5,700’	7,000’	8,450’	10,100’	10,450’
26L	10,450’	8,550’	7,300’	6,245’	5,800’	4,800’	3,500’	2,050’	400’	50’

	TAXIWAY AND DISTANCE FROM LANDING THRESHOLD							
Runway 17/35					**Runway 8L/26R**			
Runway End	**C1**	**A**	**B**	**C5**	**Runway End**	**B1**	**B3**	**B7**
17	8,300’	6,900’	5,100’	200’	8L	0’	2,600’	4,650’
35	0’	1,450’	2,800’	8,100’	26R	4,650’	2,100’	0’

SOURCE: Mead and Hunt.
NOTES: Exit taxiway must be separated by at least 750 feet to count as separate exits for the capacity analysis. Therefore, Taxiways A11 and A12 on Runway 8R/26L are counted as one exit and Taxiway A11 is omitted from the analysis but shown here for reference.

Peak Hour Airfield Capacity

Determining the peak hour airfield capacity provides a method to determine how many aircraft operations an airfield accommodates during the busiest time of day. Peak hour airfield capacity is calculated using the guidelines in AC 150/5060-5 under both VFR and IFR conditions. It is calculated as follows:

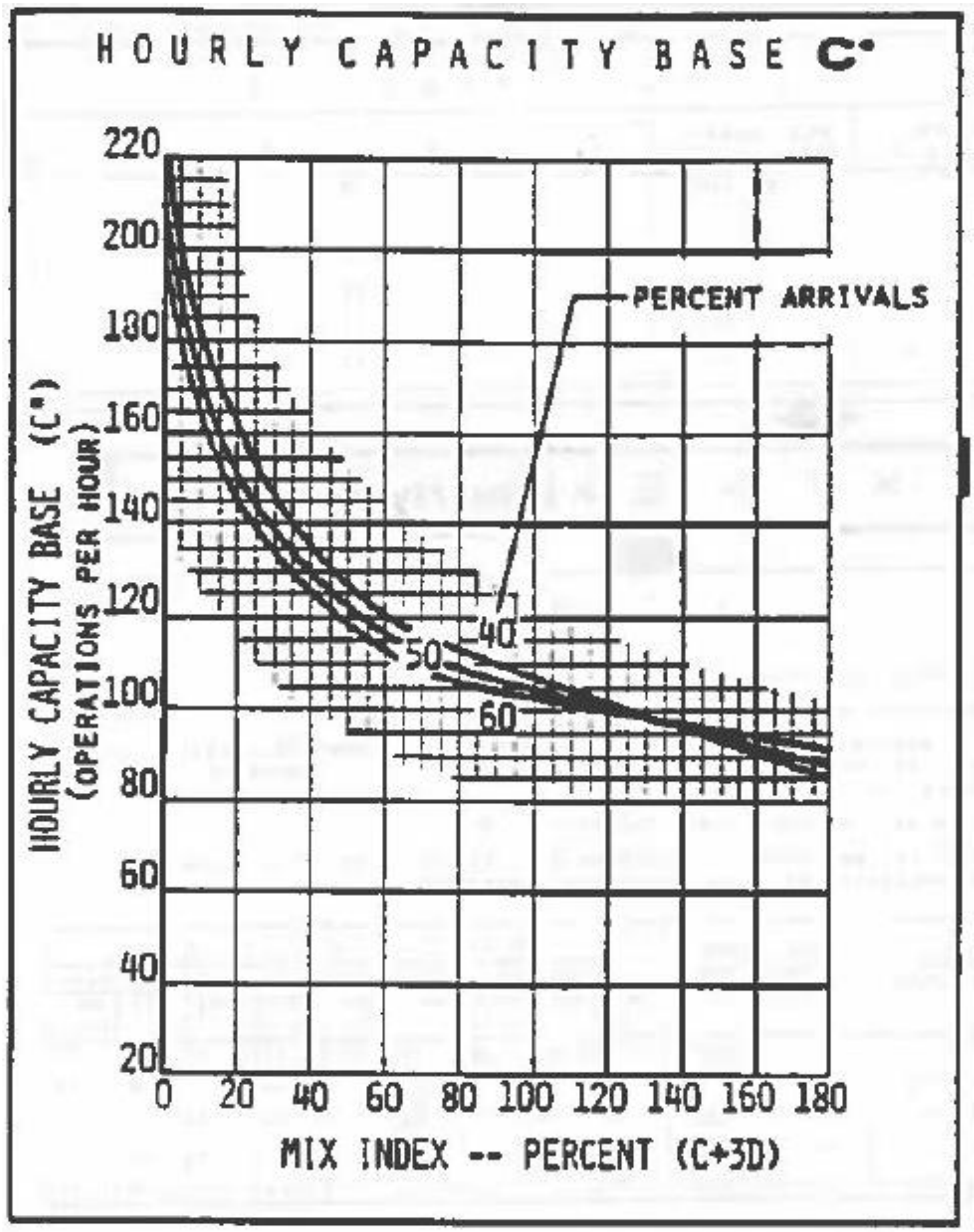
$$Hourly\ Capacity = C^{*} x\ T\ x\ E$$

C = Hourly capacity base*
T = Touch-and-go factor
E = Exit factor

The hourly capacity base (C*) is based on performance curves developed for the specific runway use configuration. As shown in **FIGURE 1** and **FIGURE 2**, C* is calculated by identifying aircraft mix index and percent arrivals, which are one percent and 50 percent, respectively. Using these inputs, C* is shown below for each configuration displayed in **FIGURE 1** through **FIGURE 4**.

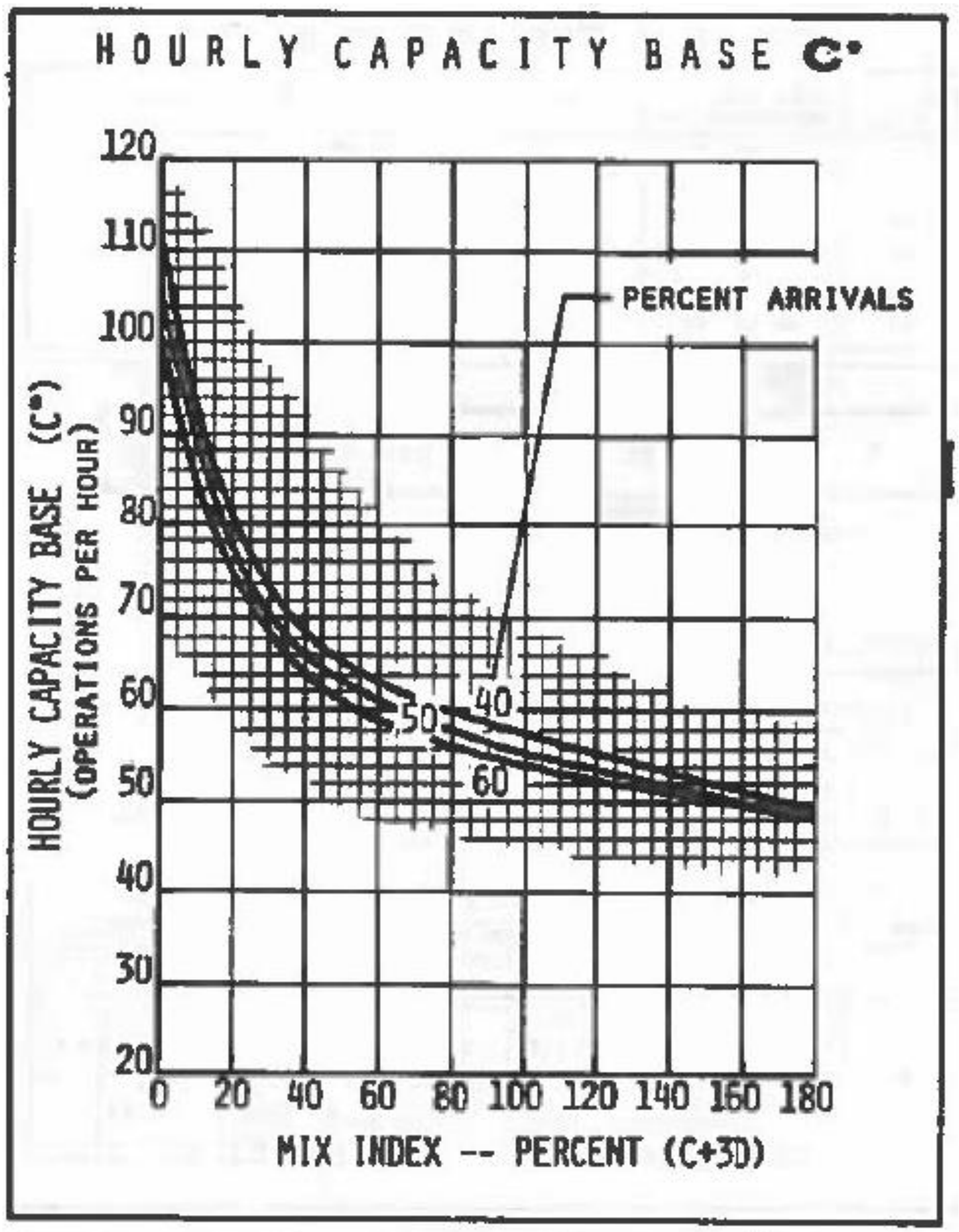
- **Configuration 1:** VFR Runways 8R/26L and 8L/26R = 200
- **Configuration 2:** VFR Runway 17/35 = 102
- **Configuration 3:** IFR Runways 8R/26L and 8L/26R = 60
- **Configuration 4:** IFR Runway 17/35 = 60.

FIGURE 1 **Configuration 1: VFR Runways 8R/26L and 8L/26R**



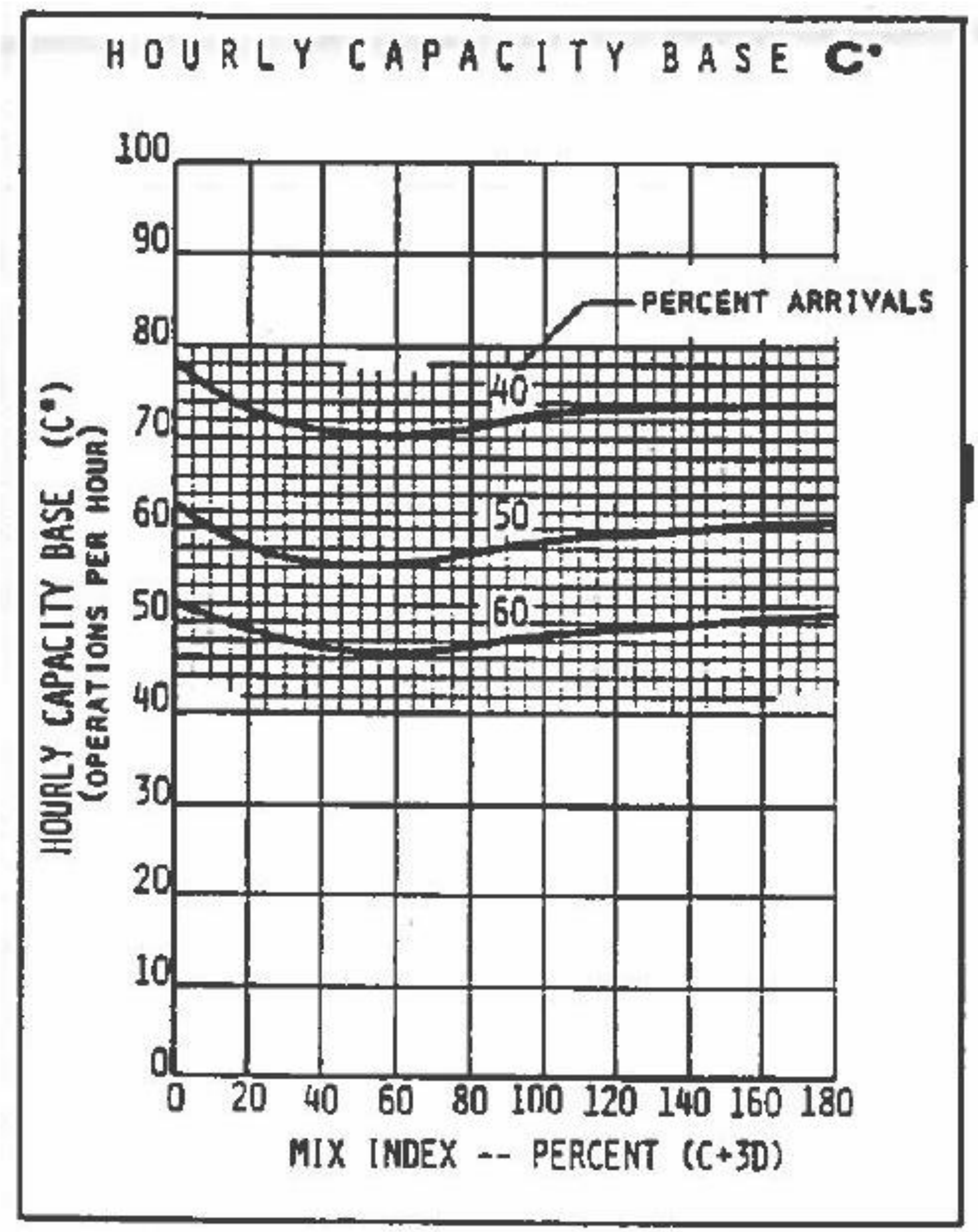
SOURCE: AC 150/5060-5, *Airport Capacity and Delay*, Figure 3-3.

FIGURE 2 Configuration 2: VFR Runway 17/35



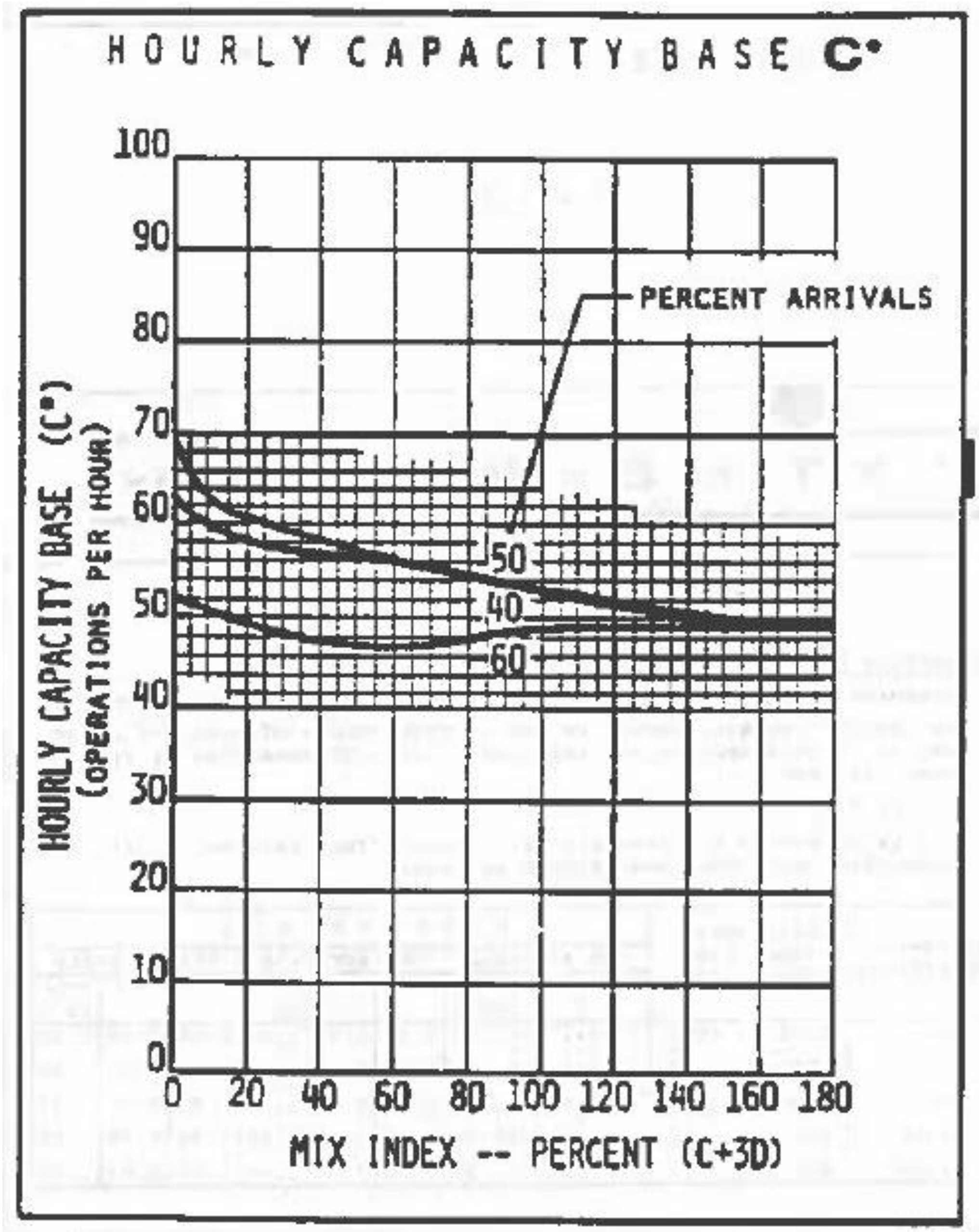
SOURCE: AC 150/5060-5, Airport Capacity and Delay, Figure 3-3.

FIGURE 3 **Configuration 3: IFR Runways 8R/26L and 8L/26R**



SOURCE: AC 150/5060-5, *Airport Capacity and Delay*, Figure 3-3.

FIGURE 4 Configuration 4: IFR Runway 17/35



SOURCE: AC 150/5060-5, *Airport Capacity and Delay*, Figure 3-3.

The touch-and-go factor (T) is determined based on the aircraft mix index (1 percent) and percent touch-and-go (50 percent). A table in AC 150/5060-5 specific to the runway use configuration identifies T based on pairing these two factors. With PUB's current runway use configuration, T equals 1.2 in VFR conditions and one in IFR conditions. The exit factor (E) is determined by several factors including aircraft mix index, percent arrivals, and the average number of exits located in the appropriate exit range separated by at least 750 feet. Based on the number of exit taxiways, E is 1.0 for the parallel runways and 0.86 for Runway 17/35. Lastly, using C*, T, and E described above, the hourly capacities of PUB are as follows:

- **Configuration 1:** VFR Runways 8R/26L and 8L/26R
  - *C* x T x E* = 200 x 1.2 x 1.0 = 240.0 operations.
- **Configuration 2:** VFR Runway 17/35
  - *C* x T x E* = 102 x 1.2 x 0.86 = 105.3 operations.
- **Configuration 3:** IFR Runways 8R/26L and 8L/26R
  - *C* x T x E* = 60 x 1.0 x 1.0 = 60.0 operations.
- **Configuration 4:** IFR Runway 17/35
  - *C* x T x E* = 60 x 1 x 0.86 = 51.6 operations.

Annual Service Volume Calculation

ASV provides an estimate of an airport's annual practical capacity. It accounts for differences in runway use, aircraft mix, weather conditions, pattern of demand (peaking), and other factors that impact an airport. When calculating the ASV, three variables are considered: weighted hourly capacity (C_w), the ratio of annual demand to average daily demand during the peak month (D), and the ratio of average daily demand to average peak hour demand during the peak month (H).

The weighted hourly capacity blends several inputs to be used in the final determination of an airport's annual capacity. Both the IFR and VFR hourly capacities are used, as well as the percentage of IFR and VFR weather. Using the weighted hourly capacity formula found in AC 150/5060-5, C_w at PUB is 157.28 operations.

The Daily Demand Ratio (D) is the ratio of annual demand to average daily demand during the peak month. Using 2019 operational levels identified in **Chapter B – Aviation Activity Forecasts**, this ratio is calculated as follows:

D = Annual Demand/Peak Month Average Daily Demand
D = 217,424/673
D = 323.07

The Hourly Demand Ratio (H) is the ratio of the peak month average daily demand to average peak hour demand during the peak month. This ratio is calculated using 2019 operational levels as shown below:

H = Peak Month Average Daily Demand/Peak Hour Demand
H = 673/74
H = 9.09

Lastly, the ASV is calculated below. Due to rounding shown for simplicity during the narrative process, the number shown does match exactly.

$ASV = C_W \times D \times H$
ASV = 157.28 x 323.07 x 9.09
ASV = 462,108

Since AC 150/5060-5 does not provide clear guidance for estimating change in ASV over time, a typical airfield capacity analysis fixes ASV at a given number (such as 462,108 operations) throughout the planning period, instead of fluctuating with operational demand. Consequently, with an existing ASV of 462,108 and a 2019 number of 217,424 total operations, PUB is currently assumed to be operating at approximately 47.1 percent of its annual capacity.

Appendices

Appendix F. Snow Removal Equipment Estimation

Appendix F. Snow Removal Equipment (SRE) Estimation

Executive Summary

The PUB Snow Removal Equipment (SRE) eligibility assessment follows the process outlined in AC 150-5220-20A, *Airport Snow an Ice Control Equipment*. The findings are that PUB is eligible for a total of eight dedicated SRE vehicle chassis, with a combination of attachments as they prefer. The combination of functions in a particular vehicle and equipment attachments is a choice for PUB to make, but based on the guidance PUB is eligible for vehicles and attachments to have at least two dedicated Class V rotary plows (blowers) with 4,000 ton per hour capacity; four dedicated very-large runway plow trucks with plow blades at least 25 feet long; a large sweeper broom truck with a 25-foot broom, and a material spreader vehicle with 6 cubic-yard hopper as support. The SRE inventory at PUB currently does not have the capacity to meet the snow clearance time of ½ hour as determined by the operations level, size of Priority 1 paved areas, and commercial airport standards. Should PUB acquire a combo-truck that has attachments for blower/blade/broom it should not interfere with acquisition of additional plow/spreader trucks and a separate sweeper truck.

The recommendations made are to replace the existing SRE vehicles that do not meet standards and exceed the expected useful lifespan. Cost effectiveness for maintenance, repair and reliability are justifications for replacement. As a general practice, when equipment is aged 10-15 years it would be a reasonable expectation to acquire a replacement. Equipment condition and serviceability will vary depending on shelter, frequency of use and maintenance practices.

The key for Airport Improvement Program (AIP) eligibility is to have sufficient equipment to clear the Priority 1 areas identified in the snow and ice control plan within ½ hour and leave the runways bare and wet. One-hour is the standard time allowed for commercial airports with greater than 40,000 annual aircraft operations to clear the Priority 1 paved surfaces. That standard of outcome requires vehicles that plow, blow, sweep and de-ice to work together simultaneously. Operational flexibility is gained where attachments can be switched out quickly. Should a vehicle experience a mechanical failure, another vehicle can be configured to replace it with minimal loss in operational effectiveness. There are also variables in snow removal activity and areas of use that can be accommodated through equipment configuration changes. Once the Priority 1 areas are cleared, vehicles can serve the needs of secondary areas as identified in the snow and ice control plan. A plow truck that has a 25-foot plow for the runway can be converted to a box type pusher plow for apron clearing operations. A sweeper broom can also be used during the rest of the year for Foreign Object Debris (FOD) control. Multiple uses and multiple configurations allow PUB to have greater utilization of the vehicles which equates to greater value for the dollar.

The smaller SRE vehicles PUB acquired through non-AIP funding sources or are still operationally viable can serve the additional support function to clear aprons, access roads, taxilanes, and hangar areas. These areas are not included in the FAA's AIP SRE eligibility determination but that doesn't mean the AIP funded equipment can't be used there. The AIP grant assurance requirement is such that the AIP funded equipment shall not be used for landside public roads and other off-airport surfaces. PUB could utilize any non-AIP funded equipment to support off-airside snow removal operations.

Introduction

The Federal Aviation Administration (FAA) standards and other guidance for SRE are found in AC 150-5220-20A for use in the purchase of AIP funded snow removal and ice control equipment. In general, use of this AC is not mandatory. However, use of this AC is mandatory for all projects funded with federal grant monies through the AIP and/or with revenue from the Passenger Facility Charge (PFC) Program.

This section explains the selection process for SRE provided by AC 150/5220-20A. Some of the equipment is determined using only the first step in the process while the remaining equipment follows a two-step process. Both steps apply the same assumption, which is to remove 1 inch of snow weighing up to 25 pounds per cubic foot from the Priority 1 paved area within a specified time for the airport's annual aircraft operations. In the case of PUB, this is based on its classification as a commercial service airport with 196,260 operations per year. Furthermore, the AC applies an equipment efficiency factor equal to 70 percent. This assumption takes into account the need by such equipment to slow down and to change course (for example, approaching the end of a runway to reverse course), back-and-forth clearing operations common on stub taxiways and connector taxiways, and to account for slight snow spillage, slight overlapping of clearing operations, and poor visibility driving conditions.

Step 1 – Determination of Priority 1 paved areas

An airport's snow plan Priority 1 paved area is defined as the primary runway (which depends on wind direction), parallel taxiway, airport road, terminal ramp, ATCT access, and ARFF access. For equipment calculations, the larger runway and taxiway surface area is used for the calculation of areas to be cleared.

Runway 8R/26L is 10,498 feet long and 150 feet wide, giving a surface area of 1,574,700 square feet. Taxiway A is the full-length parallel taxiway for Runway 8R-26L. With a width of 75 feet and length of 10,543 feet, the parallel taxiway is 790,725 square feet. There are seven taxiway connectors between Taxiway A and Runway 8R/26L, with filets and the taxiway connector length they equal 4,986 feet in length and 75 feet wide, giving a surface area of 373,950 square feet. The surface area to be cleared as Priority 1 include the runway and taxiways for a total of 2,739,375 square feet.

Additional areas to be cleared as Priority 1 include the Airport Traffic Control Tower (ATCT) and Aircraft Rescue and Fire Fighting (ARFF) access. The distance inside the airport operations area from the ARFF doors to Taxiway A is 500 feet. At 20 feet wide, the path to be cleared is 10,000 square feet. The remaining pavement to be cleared as a Priority 1 area is the terminal apron and it is approximately 106,000 square feet. **TABLE 1** provides the total calculated Priority 1 pavement area at PUB.

TABLE 1 Priority 1 Areas (Square Feet)

LOCATION	PAVED AREAS (SQUARE FEET)
Main Runway (10,498' x 150')	1,574,700
Parallel Taxiway (10,543' x 75')	790,725
Seven taxiway connectors and fillets	373,950
ARFF Station access to Taxiway A	10,000
Terminal Apron	106,000
Total Priority 1 Paved Area	2,855,375

SOURCE: Mead & Hunt 2020.

Step 2 – Minimum SRE Requirements

The required minimum types and number of SRE equipment is based on several factors. Two parameters, namely the total square footage of the Priority 1 paved area and the airport's service classification, determine the types and number of runway brooms, solid material spreaders, and liquid material spreaders. The second parameter, selection of high-speed rotary plows and snowplows requires the tonnage of snow to be removed in a given time in addition to other parameters required by the equipment. Because high-speed rotary plows dictate the general clearing operation, supportive snowplows are selected with the condition that they match the speed and the snow removal capacity (tonnage per hour) of the high-speed rotary plow.

Commercial Service Airports

Commercial service airports with over 40,000 operations and more than 12 inches of annual snowfall should have a minimum of one high-speed rotary plow supported by two snowplows of equal snow removal capacity. National Weather Service records state that Pueblo Colorado receives an average of 31.3 inches of snow per year. **FIGURE 1** presents the monthly climate summary with averages recorded.

FIGURE 1 Pueblo Climate Data

PUEBLO WB AP, COLORADO (056738)

Period of Record Monthly Climate Summary

Period of Record : 09/01/1872 to 06/30/1954

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	47.2	52.2	54.8	66.8	74.0	86.1	90.2	88.0	81.9	71.0	56.0	48.6	68.1
Average Min. Temperature (F)	15.7	19.3	23.5	36.1	45.2	55.6	60.5	58.4	50.0	36.4	23.2	16.5	36.7
Average Total Precipitation (in.)	0.40	0.19	0.68	1.09	1.78	1.23	2.01	1.74	0.56	0.51	0.32	0.25	10.75
Average Total SnowFall (in.)	5.9	3.1	7.8	2.8	1.7	0.0	0.2	0.0	0.0	0.9	5.0	3.9	31.3
Average Snow Depth (in.)	1	0	0	0	0	0	0	0	0	0	0	0	0

Percent of possible observations for period of record.
Max. Temp.: 100% Min. Temp.: 100% Precipitation: 100% Snowfall: 100% Snow Depth: 99.7%
Check Station Metadata or Metadata graphics for more detail about data completeness.

Western Regional Climate Center, wrcc@dri.edu

Other Supporting Equipment

Other types of supporting equipment such as front wheel loaders or ice-melters may be needed to assist in the removal of snow from all non-critical, remaining operational areas including secondary taxiways or low priority aprons. AC 150/5200-30, *Airport Winter Safety and Operations* classifies such paved areas as Priority 2 or Priority 3 areas.

Selecting High-Speed Rotary Plows

High-speed rotary plows, also called “rotaries” or “snowblowers”, are used to cast heavy concentrations of plowed snow away from movement areas such as runways and taxiways. The selected high-speed rotary plow(s) should be capable of removing the volume of snow from the Priority 1 paved area with a pre-determined casting distance to comply with runway and taxiway snow-bank clearance criteria contained in AC 150/5200-30. This equipment, which may be self-propelled or attached to a conventional carrier vehicle, uses either one or more rotating elements to disaggregate a snowpack. The disaggregated snow is then broken into particles small enough to pass through a casting mechanism having a directional chute. Because of their large capacity, self-propelled high-speed rotary plows are frequently required at medium to large airports while high-speed rotary plows attached to a conventional carrier vehicle may be more appropriate at smaller facilities or facilities whose climate is less severe.

The size and number of high-speed rotary plows needed is based on the following conditions:

- Annual activity level equals greater than 40,000 operations with a reasonable clearance time of ½ hour for total Priority 1 paved areas.
- Accumulated snow on the runway and taxiway are to be cast at least 100 feet from the rotary plow when it travels along the paved edge. The casting distance sets equipment selection criterion 1.
- Average runway operating speed of the rotary plow unit is at least 25 mph to meet the reasonable clearance time of ½ hour based on the annual aircraft operations.
- Typical snow density is 25 lbs/ft^3.

Sub-Step 1 – Determine the total critical area for Priority 1

As determined above, the Priority 1 paved area is 2,855,375 square feet.

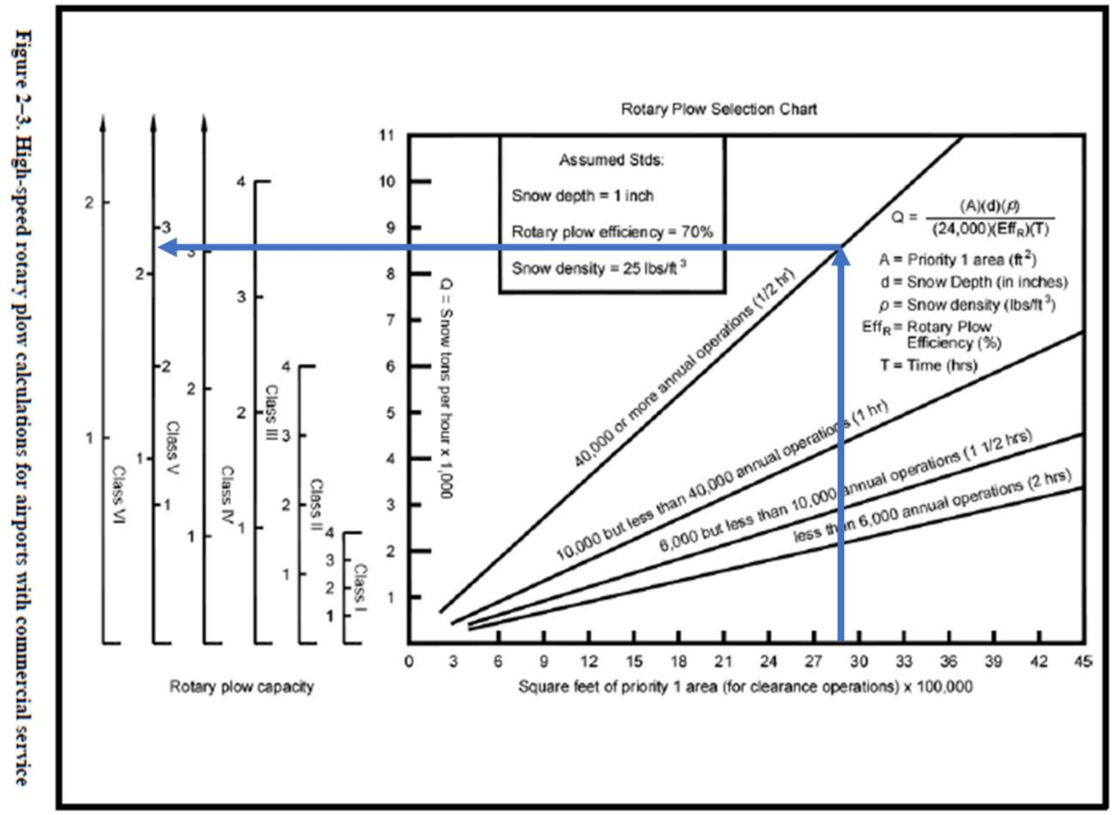
Sub-Step 2 – Use of Graph (FAA AC 5220-20A Figure 2-4)

Using the chart provided in **FIGURE 2**, start along the bottom scale for square feet of Priority 1 paved area, rounding up to the next 100,000 square feet. For PUB, the total area for Priority 1 equals 2,900,000 square feet. Go up the chart from 29 to the greater than 40,000 annual aircraft operations line. As a commercial service airport with more than 40,000 annual aircraft operations, PUB clearance time allowed is ½ hour. Moving from that position to the left side of the chart identifies the tons of snow to be removed per hour. The chart provides an expectation of 8,500 tons of snow per hour (assuming one inch of snow accumulation). To determine the number of rotary plows, continue the line to the left. PUB's Priority 1 paved area to be cleared in ½ hour requires two Class V rotary plows, each casting 4,000 tons of snow per hour.

PUB is currently equipped with one medium Class II rotary plow that does not meet the ½ hour clearance time requirement of 8,500 tons per hour. It is also over 26 years old and well past its life expectancy.

Rotary Plow Recommendation: It is recommended that PUB acquire two Class V vehicles, each moving up to 4,000 tons of snow per hour, to meet the ½ hour time clearing requirement.

FIGURE 2 **Rotary Plow Selection Chart**

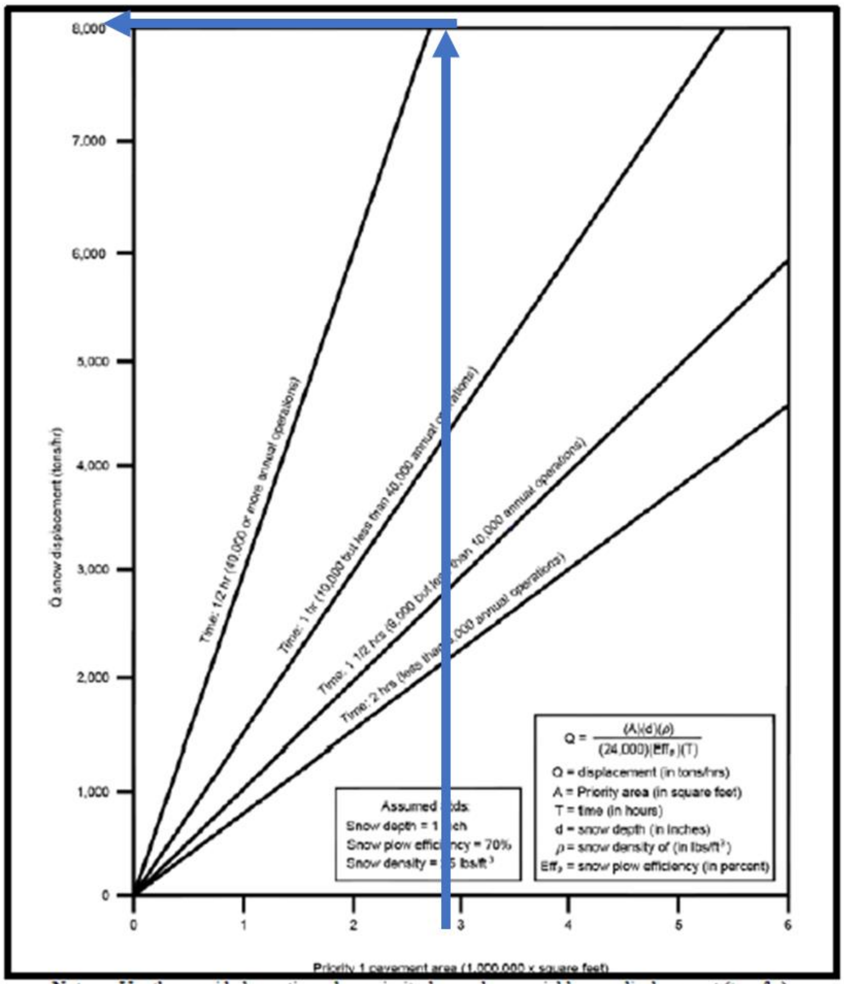


SOURCE: FAA AC 5220-20A Figure 2-3.

Selecting Snowplows

Snowplows consist of a cutting edge to shear snow from the pavement, and a moldboard to lift and cast the dislodged snow to the side of the cleared path. The cutting edge may ride in contact with the pavement or be held a small distance above it by means of shoes or caster wheels. A complete snowplow unit consists of the snowplow, a carrier vehicle (conventional or dedicated), hitch, and other accessories. Similar to the rotary plow determination process, AC 150/5220-20A requires use of Figure 2-5 to determine the amount of snow to be moved per hour for a commercial service airport. **FIGURE 3** provides the results, which are similar to the rotary plow determination for amount of snow to be removed per hour at 8,500 tons. Using the recommended 2 to 1 ratio of plows to rotary plows, there is a need for four snowplows at PUB.

FIGURE 3 **Tons of Snow to be Removed Per Hour**



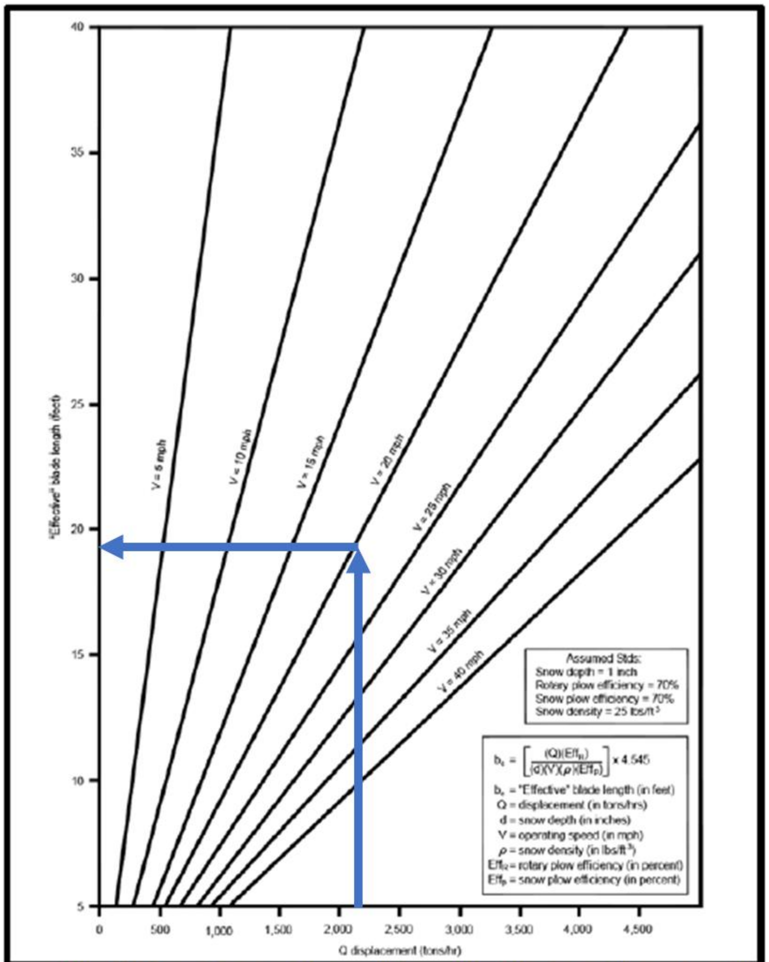
Note: Use the provided equation when priority 1 paved areas yield snow displacement (tons/hr) amounts greater than what the chart provides. When using the chart do not interpolate between clearance times.

Figure 2–5. Snow removal (tons/hr) for Priority 1 paved areas for commercial service airports

SOURCE: FAA AC 5220-20A Figure 2-5.

To determine the effective cutting edge of the snowplow blade at the required minimum operating speed of 25 mph, AC 150/5220-20A recommends use of Figure 2-7 with snow displacement provided in tons/hour. The capacity of tons per hour is shared by four support plows, which is 2,125 tons per vehicle. As presented in **FIGURE 4**, the cutting-edge effective blade length is recommended to be 20 feet.

FIGURE 4 **Snowplow Blade Cutting Edge Determination**



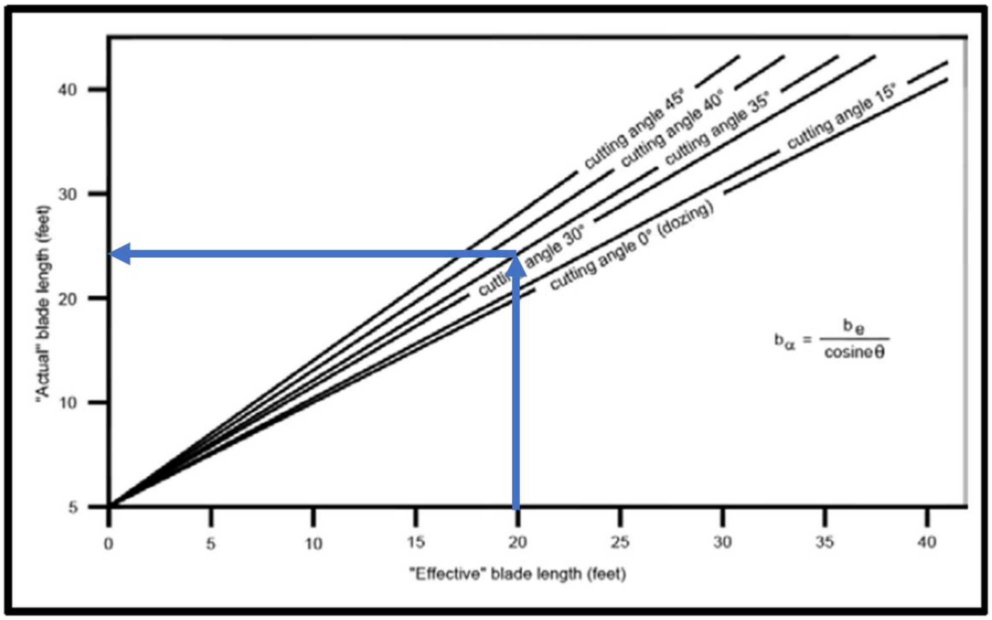
Note: Use the provided equation when snow displacement (tons/hr) needs exceed the amount provided by the chart. When using the chart do not interpolate between speeds.

Figure 2–7. Effective snow plow blade length related to snow displacement

SOURCE: FAA AC 5220-20A Figure 2-7.

To determine the actual cutting-edge snowplow blade length another chart is used. AC 150/5220-20A Figure 2-8 provides the effective snowplow blade length with the assumption being the blade is angled at 35 degrees to displace snow to one side. As presented in **FIGURE 5**, to provide at least 20 feet of effective cutting edge, the snowplow blade should be at least 25 feet wide.

FIGURE 5 **Snowplow Blade Cutting Edge Determination**



SOURCE: FAA AC 150/5220-20A Figure 2-7.

Snowplow sizes are categorized as follows:

- **Small snowplow.** This category includes snowplows with cutting edge lengths ranging from approximately 6 feet up to 10 feet. Included in this category are underbody-mounted truck scrapers with similar length cutting edges.
- **Intermediate snowplow.** This category includes snowplows with cutting edge lengths ranging from approximately 10 feet up to 15 feet. Included in this category are underbody-mounted truck scrapers with similar length cutting edges.
- **Large snowplow.** This category includes snowplows with cutting edge lengths ranging from approximately 15 feet up to 22 feet. Included in this category are ramp dozer plows and large special purpose plows.
- **Extra-large snowplow.** This category includes plows with cutting edge lengths greater than 22 feet. Included in this category are ramp dozer plows and extra-large special purpose plows.

With a requirement for snowplows equipment with blades 25 feet wide, PUB is recommended to have four extra-large snowplows. This includes equipment for specialty plow blades that can be used for ramps to collect and load snow for removal. Specifications for types of plow equipment purchased new are provided by SAE International ARP (Airport) 5943 in Section 4-3 of AC 150/5220-20A.

PUB is currently equipped with three small snowplows, three intermediate snowplows, and one large snowplow.

Recommendation for Plow Trucks: It is recommended that PUB acquire four new extra-large plow trucks capable of utilizing 25-foot snowplow blades.

Additional Equipment Selection

Material Spreader

The function of a material spreader is to provide a continuous, unrestricted, accurately metered flow of sand and solid or liquid deicers/anti-icers per AC 150/5200-30 to a pavement surface over a predetermined spread area. Spreader units may be permanently mounted on vehicles, a slip-in hopper, or they may be towed by a carrier vehicle. A spreader unit consists of a material storage compartment (hopper or tank), pre-wetting mechanism, a feed mechanism to carry the material to the discharge opening, a metering device to control the application rate, and a distribution mechanism. The selection of a material spreader is primarily defined by the carrying capacity of the hopper (cubic yards) or tankage (gallons) and by the ability to apply material in a uniform distribution pattern to a prescribed surface area (swath) at a predetermined application rate. A conventional slide-on spreader is adequate for most airport applications of dry chemicals and sand. Special requirements may justify alternative or multi-purpose types of spreaders (e.g., a tailgate spreader coupled with a dump truck body).

Dry Material Hopper Capacity

This type of material spreader for sand and solid de/anti-icers uses a hopper type material spreader combined, as standard, with a liquid reservoir for pre-wetting sand with an approved liquid de/anti-icer. The determination of dry hopper capacity applies the application rate to the paved area to be covered. Assuming an application rate of 3.0 ounces per square yard, AC 150/5220-20A Figure 2-9 Hopper Capacity – Sand as shown in **FIGURE 6**, recommends a hopper size of 6 yards for PUB.

PUB currently has one material spreader, a 2006 International 7500 dump truck with 14-foot blade and sander truck. This vehicle is past its expected useful lifespan.

Recommendation for Sand Spreader: In combination with new plow truck purchases recommended previously, it is also recommended to include at least one solid materials hopper with 6-yard capacity and spreader to achieve a 75-foot swath of coverage to de-ice the runway in three passes.

FIGURE 6 Sand Spreader Hopper Capacity

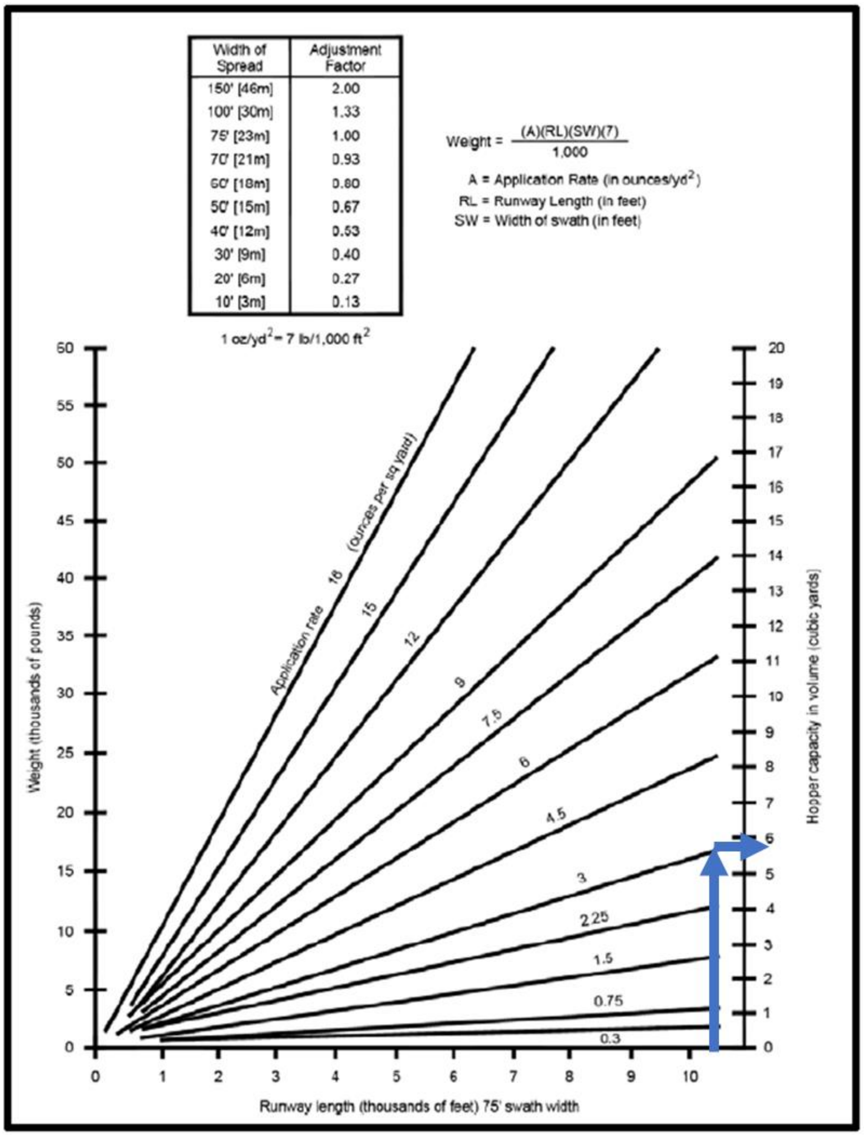


Figure 2–9. Hopper capacity – sand

SOURCE: FAA AC 150/5220-20A – Figure 2-9.

Runway Brooms

Runway brooms are primarily used in the high-speed sweeping and cleaning of snow, slush, ice, sand, and debris from movement and non-movement areas by using a brush. They incorporate high-speed brooms that consist of a number of brush sections, which may be front mounted to a carrier vehicle (conventional or dedicated), mounted underbody, or mounted on a trailer that is towed by a carrier vehicle. All can sweep wet slushy snow as well as fine dry snow from pavement surfaces. Complementing a runway broom with an airblast system located behind the brush assembly helps in the sweeping process, dries the pavement surfaces, and can be used to clear snow from around runway lights.

Runway Broom Classification

The following two general classes constitute the family of runway brooms. Measure all swath widths when the broom is angled 30 degrees from the transverse position.

- **Small swath sweeper.** This class may be of any physical design having a demonstrated or manufacturer's certified snow or slush removal and broadcasting ability sufficient to produce clear pavement within the swath width at the rated speed. The sweeper must have a minimum broom diameter of 36 inches and a swath width of not more than 12 feet.
- **Large swath sweeper.** This class may be of any physical design having a demonstrated or manufacturer's certified snow or slush removal and broadcasting ability sufficient to produce clear pavement within the swath width at the rated speed. The sweeper must have a minimum broom diameter of 36 inches and a swath width greater than 12 feet.

The selection process follows the process described in SAE ARP 5564, Runway Brooms, paragraph 6.1 and Appendix A of the SAE ARP specification.

PUB is in not currently equipped with a broom sweeper truck.

Recommendation for Sweeper Truck: It is recommended that PUB be equipped with a large swath sweeper truck with a 25-foot-wide sweeper broom equipped with an airblast system.

SRE Vehicle Housing Determination

SRE are typically costly pieces of complex and technologically advanced equipment. To protect and service this equipment and protect local and federal investment, specifically designed maintenance and storage buildings are needed. SRE should be housed in a building capable of maintaining 50 degrees Fahrenheit to prolong the useful life of the equipment and to enable more rapid response to operational needs. Operationally, inspections should be conducted after each use to determine the necessity for additional maintenance or repair. Guidance on storing SRE is provided in AC 150/5220-18, *Buildings for Storage and Maintenance of Airport Snow and Ice Control Equipment and Materials*.

AC 150/5220-18 uses airport size classification, based on the amount of paved runway area to be cleared, as one factor for facility planning purposes. The AC uses the following definitions of airport size. This definition considers the practice where an airport operator closes a smaller runway, such as a GA runway, to *focus its equipment fleet on the identified runway(s)*. In other words, airport size relates only to open runways. The total paved runway area in turn determines the size of the building. The values provided below exclude paved taxiways and aprons/gate areas. Landside operation areas do not contribute to the airport size definitions listed below.

- **Small Airport.** Airport having less than 420,000 square feet of total paved runway.
- **Medium Airport.** Airport having at least 420,000 but less than 700,000 square feet of total paved runway.
- **Large Airport.** Airport having at least 700,000 but less than 1,000,000 square feet of total paved runway.
- **Very Large Airport.** Airport having at least 1,000,000 square feet of total paved runway.

During snow events, PUB has plans to open one runway as Priority 1 surface, then clear the other runways as time permits. As presented earlier, PUB has a Priority 1 runway surface area of 1,574,700 square feet, making PUB a very large airport.

SRE building space refers to the total space allocation for three areas defined as follows:

- **Storage Area.** The term refers to designated areas leading to and including the parking areas for snow removal and friction measuring equipment, storing snow and ice control materials (e.g., de/anti-icers and heated sand), and equipment parts (e.g., bristles, neoprene blades, and brushes). Some items, such as chemicals and sand, could be stored in separate buildings.
- **Support Areas.** The term refers to administrative and equipment maintenance areas. Administrative areas include a supervisor's office, a mechanic's/clerk's office, separate or joint-use training and lunchroom, lockers, and lavatories. Equipment maintenance areas include repair bays, steam cleaning bays, and a welding area.
- **Special Equipment Areas.** The term refers to rooms or areas for heating, ventilation, and air conditioning (HVAC) equipment, steam generation, emergency power, and air compressor equipment as well as the machine room(s).

Planning for a SRE storage and maintenance facility should consider the following factors:

- Easy access to the runway and taxiway environment
- Building orientation

- Fueling facilities
- Building configuration accommodating all required personnel and equipment
- Design layout consisting of either a drive through, a center aisle, vehicle back-in, or modified (combination of layouts)
- Specific Features
    - General storage areas provided for oil, grease, tires, recycled oil, used oil and antifreeze, and equipment components such as bristles, sweeper wafers, plow blades, hitches, and spreader boxes.
    - Sheltered storage that prevents the deterioration or change in composition of sand and solid de/anti-icing chemicals, thereby retaining their handling properties and effectiveness. This storage can be either within the main building or a separate facility that offers a “conditioned” environment.
    - Welding area that, as preferred by airport operators, should be open and adjacent to a repair bay.
    - Wash and steam cleaning bay provided for the removal of accumulated dirt and chemical contamination to prevent deterioration and extend the life and proper function of SRE. Dirt and chemical contamination should be removed from equipment after storm events.

Additionally, all FAA regulations on building location must be followed, including:

- The height and configuration of the building must not constitute a hazard or obstruction to airspace criteria contained in AC 150/5300-13, Airport Design.
- The height and configuration of the building must not interfere with navigational and surveillance aids.
- The height and configuration of the building must not block airfield surveillance to any portion of any runway, taxiway, or terminal areas by the ARFF service and by the ATCT (direct line of sight).
- Chemical runoffs, such as by de/anti-icing chemicals, oils, fuel, and greases common to such buildings must be mitigated in accordance with federal or state Environmental Protection Agency (EPA) regulations for storm water discharges.
- All building construction or expansion on public-use airports requires an advance notice to the appropriate FAA regional Airports Division.
- For federally assisted airports, the building and associated support areas must be shown on the approved Airport Layout Plan (ALP).

Total Space Allocation

The total space allocation for a SRE facility is based on the sum of the individual areas determined necessary to meet three functionally defined purposes: (1) ***Storage Areas,*** (2) ***Support Areas,*** and (3) ***Special Equipment Areas***. Space allocations for each of these areas are determined by values provided in tables in AC 150/5220-18A, equipment clearance values, or local building codes and ordinances. Since available SRE varies widely in widths and lengths, the concept of an Equipment Safety Zone (ESZ) surrounding the equipment is employed. **TABLE 2** provides ESZ clearance standards in accordance with equipment location and fixed or moving objects.

TABLE 2 Equipment Safety Zones

	MINIMUM CLEARANCES FOR EQUIPMENT SAFETY ZONE (ESZ)			
Parked Equipment Use the parked vehicle without attachments	5' When next to side walls or other stationary objects.	4' When rear of parked equipment faces a wall or other stationary objects.	10' Parallel to other parked equipment (parallel parking)	10' From door opening.
Moving Equipment	Between single drive through lane	Between dual drive-through lanes		
Assumes a 7' carrier vehicle width with attachments at 30-degree perpendicular to vehicle body	15' From parked equipment that includes a front safe walk around zone of at least 3'	10' Small Plows 10' or less	14' Intermediate Plows and Small Sweepers Over 10' up to 15'	20' Large Plows and Sweepers Over 15' up to 22'

SOURCE: FAA AC 150/5220-18A Table 3-1.

Storage and Ice Control Materials

The space allocations for solid de/anti-icers and sand should be determined by the airport operator's operational requirements and historical usage amounts. It is recommended the final value represent sufficient material on hand to last several storm events (two to three events). Storage tanks for fluid de/anti-icers are recommended to hold at a minimum 120 percent of the amount of fluid used for a single storm (a "single" storm event may also represent several closely spaced storm events in a given week). **TABLE 3** provides a range for floor areas.

TABLE 3 **Solid Materials Storage Space Allocation (Square Feet)**

MATERIAL TYPE	RANGE
Sand Storage	150 - 500
Bagged or Bulk Solid Deicer	100 - 400
Salt Storage[1]	100 - 300

SOURCE: FAA AC 150/5220-18A Table 3-2.
NOTE: [1]*Salt is only for landside use*. Federal funding for salt storage areas is not allowed under the Airport Improvement Program or Passenger Facility Charge Program.

Support Areas

Support areas fall into two basic areas: (1) an area dedicated to administrative duties, an operational area or "snow desk," employee areas, such as a kitchen, eating area, training/conference room, restrooms, and sleeping areas; and (2) an area dedicated to the maintenance and repair of equipment. **TABLE 4** provides typical space allocations for items that fall under the category of Support Areas.

TABLE 4 **Support Area Space Allocation (Square Feet)**

ITEMS UNDER SUPPORT AREA	AIRPORT SIZE		
	SMALL[1]	MEDIUM	LARGE/VERY LARGE
Snow Desk[3]	100	144	200 - 400
Supervisor's Office[3]	120	140	140
Mechanic's Office	100*	150	150
Administrative Area[3]	200*	200	400
Training Room[3]	300	400	400
Lunchroom[3]	Combine with training room	300	600
Kitchen[3]	Combine with training room	Combine with lunchroom	200
Rest Room/Lavatory for Men and Women (or local building code)[3]	300	500	700
Lockers[3]	Combine with rest rooms	500	700
Sleeping Quarters[2] Bunk area per person	56	56	56
Parts Area (snow removal operation)	600*	800	1000
Parts Area (snow removal vehicles)	200	300	400
Lubrication, Oil, Grease Storage	100-150	150 - 200	150 - 200
Welding Area	200*	200	400
Recycled Oil and Used Anti-freeze	150	200	200
Mechanic's Bench Area (along walls)	100	200	400
Repair Bay – number and square footage per bay	1* 600	1 1,000	2 1,000
Cleaning Bay	600*	1,000	1,000
Emergency First Aid Room[3]	Combine with lunchroom	Combine with training room	75

SOURCE: FAA AC 150/5220-18A.

NOTES: [1] Airports with less than 225,000 square feet of total paved runway will not necessarily need items marked with an asterisk (*).
[2] Certain airport operators may deem it necessary to have sleeping quarters.
[3] Small airports may have a separate building that houses and services equipment and chemicals, while another building, such as the terminal, houses administrative functions and crew facilities.

Special Equipment Area

TABLE 5 shows typical space allocations for items that fall under the category of Special Equipment Area. Local building and ordinances may require larger areas than stated in **TABLE 6**. In such cases, local building and ordinances must be followed.

TABLE 5 Special Equipment Areas (Square Feet)

ITEMS UNDER SPECIAL EQUIPMENT AREA	RANGE
HVAC Area	300 - 800
Recycled Oil and Used Anti-freeze	150 - 300
Emergency Power Generation	100 - 300
Hydraulic Lift, Vacuum Pumps, and Air Compressor	100 - 200
Steam Generation	100 - 150
Major/Large Power Tools	100 - 200
Overhead Crane	One per building with very large-airports having two

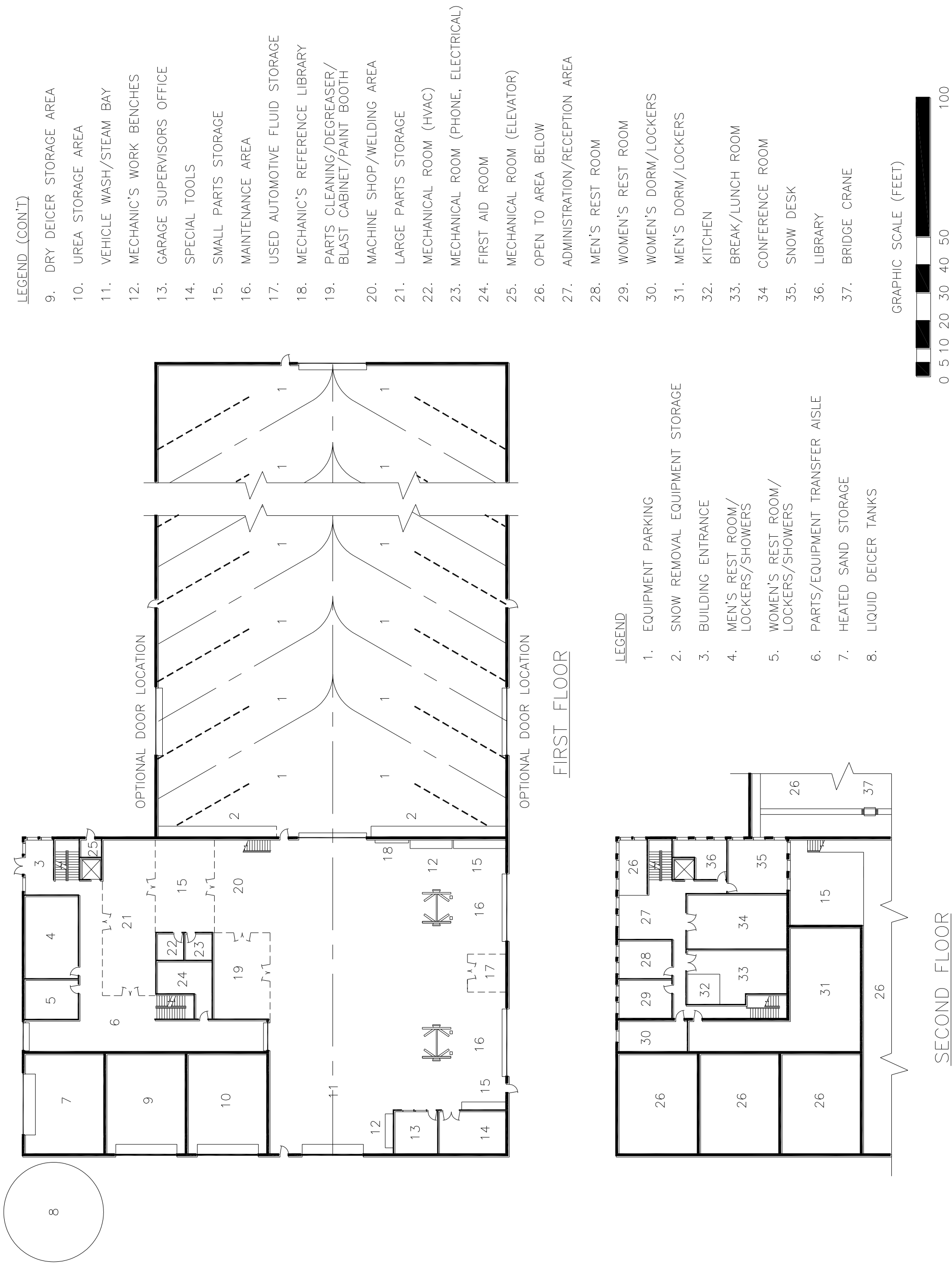
SOURCE: FAA AC 150/5220-18A.

SRE Storage and Maintenance Facility Recommendations:

PUB has an existing SRE and Maintenance facility consisting of approximately 15,800 square feet. The space is limited so that equipment attachments and materials are currently stored outside. Using the guidance contained in AC 150/5220-18A, a total SRE storage and maintenance facility consisting of approximately 20,000 square feet is required. The existing facility is limited in providing adequate space to accommodate the larger recommended SRE.

When considering an expansion or replacement of the existing facility to accommodate newly acquired replacement vehicles, consultation with a specialized engineering and architectural firm to design the facility within AC 150/5220-18A design and construction standards is recommended. **FIGURE 7** illustrates a typical SRE equipment maintenance and materials storage facility. SRE and maintenance facilities should also be located to provide direct access to the aprons and taxiway system for efficient response to snow events.

FIGURE 7 Typical Large to Very Large Airport Fleet Facility



SOURCE FAA AC 150/5220-18A Figure 3-3.

Appendices

Appendix G. Airport Layout Plan

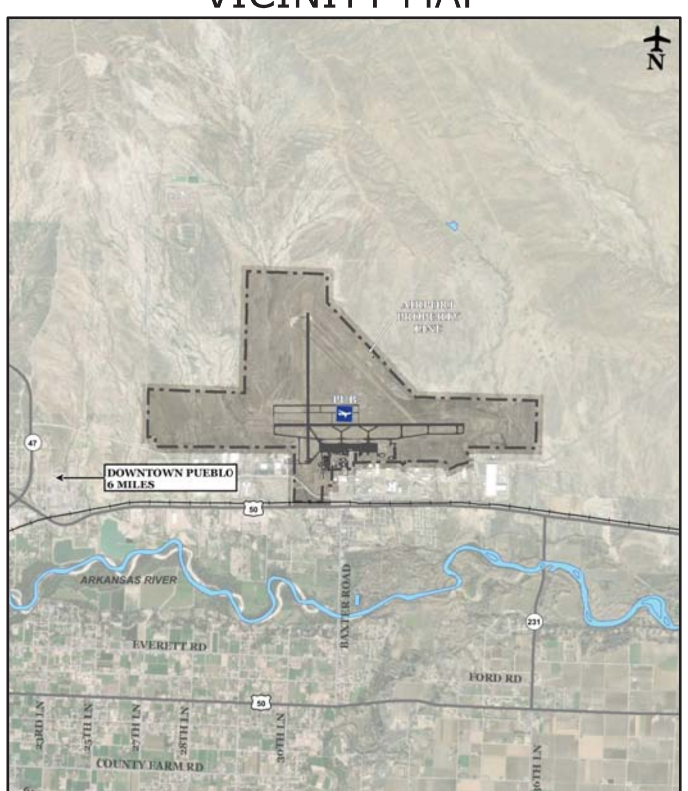
PUEBLO MEMORIAL AIRPORT (PUB)

PUEBLO COUNTY
PUEBLO, COLORADO

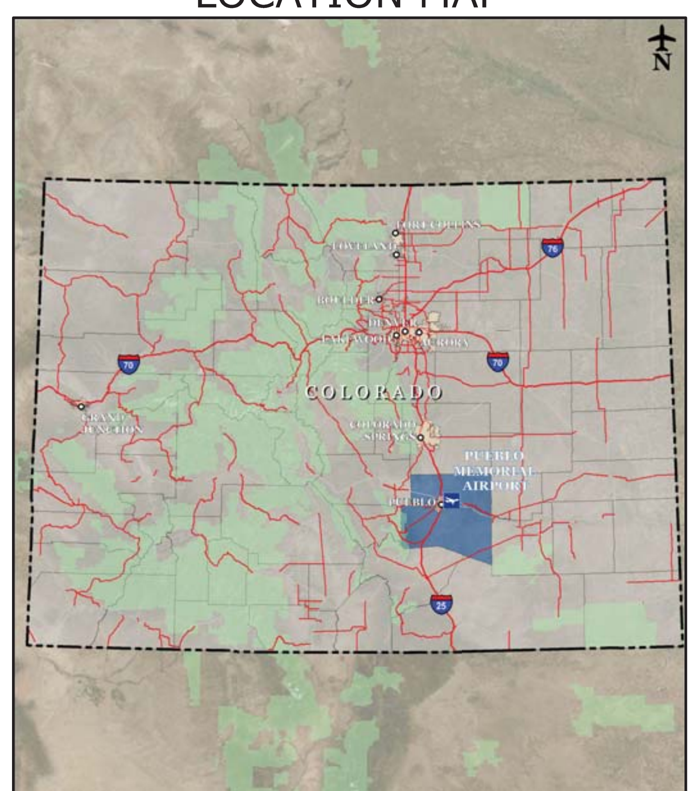
DRAFT AIRPORT LAYOUT PLAN

OCTOBER 2021

VICINITY MAP



LOCATION MAP



SHEET INDEX

DRAWING	SHEET
TITLE SHEET	1
AIRPORT DATA SHEET	2
RUNWAY DATA SHEET	3
AIRPORT LAYOUT PLAN - EXISTING	4
AIRPORT LAYOUT PLAN - FUTURE	5
AIRPORT AIRSPACE	6
RUNWAY 8R EXISTING INNER APPROACH	7
RUNWAY 26L EXISTING & FUTURE INNER APPROACH	8
RUNWAY 17 EXISTING & FUTURE INNER APPROACH	9
RUNWAY 35 EXISTING & FUTURE INNER APPROACH	10
RUNWAY 8L EXISTING INNER APPROACH	11
RUNWAY 26R EXISTING INNER APPROACH	12
RUNWAY 8L FUTURE INNER APPROACH	13
RUNWAY 26R FUTURE INNER APPROACH	14
RUNWAY 8R DEPARTURE SURFACE	15
RUNWAY 26L DEPARTURE SURFACE	16
RUNWAY 17 DEPARTURE SURFACE	17
RUNWAY 35 DEPARTURE SURFACE	18
TERMINAL AREA - EXISTING	19
TERMINAL AREA - FUTURE	20
LAND USE - ON AIRPORT	21
LAND USE - OFF AIRPORT	22
EXHIBIT A	23

SPONSOR APPROVAL

BY: ____________________

TITLE: ____________________

DATE ____________

REV	DATE	DESCRIPTION

DIBBLE

DATE:	XX
DESIGNED BY:	VS
DRAWN BY:	VS
REVIEWED BY:	CM
FILE NAME:	19046_1_TITLE

city of PUEBLO colorado

PUEBLO MEMORIAL AIRPORT

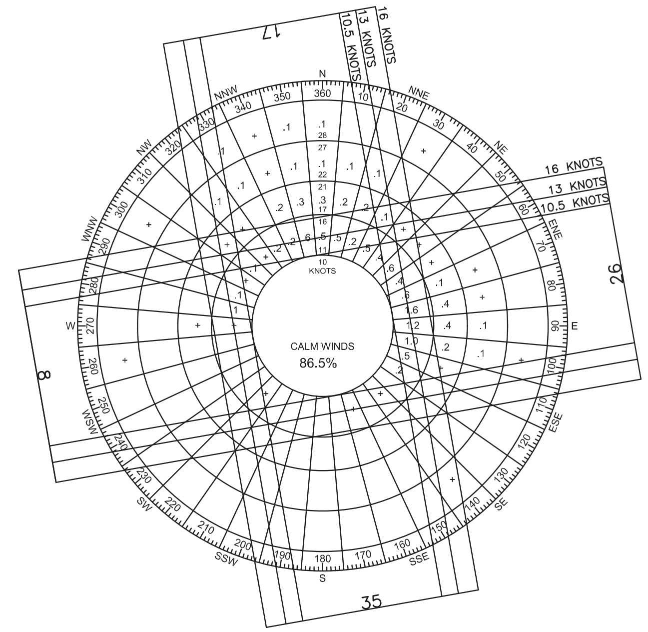
TITLE SHEET

SHEET 1 OF 23

DWG: K:\2019\019046_PUB_MP_Update\CAD\19046_1_Title.dwg DATE:10/05/21 TIME: 9:50am

AIRPORT DATA

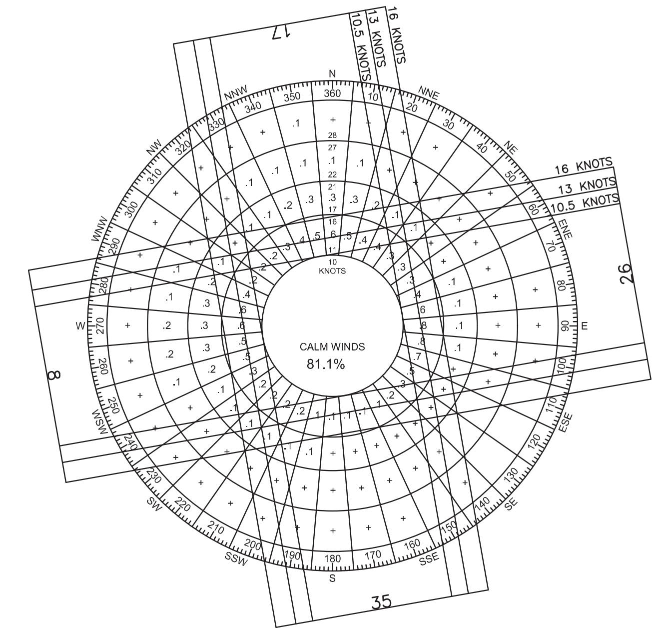
ITEM		EXISTING (E)	FUTURE (F)
AIRPORT REFERENCE CODE (ARC)		C-II	C-III
MEAN MAX. TEMP OF HOTTEST MONTH (°F) (JULY)		92.9	92.9
AIRPORT ELEVATION (MSL, FT) (NAVD 88)		4,729.30	4,729.30
AIRPORT NAVIGATIONAL AIDS		ILS, GPS, VOR	ILS, GPS
AIRPORT REFERENCE POINT (ARP) COORDINATES (NAD 83)	LATITUDE	38-17-23.8110N	38-17-23.8110N
	LONGITUDE	104-29-52.9010W	104-29-52.9010W
MISCELLANEOUS FACILITIES		ASOS, ASR-11, PAPI, REIL, MALSR, ATCT, ARFF	ASOS, ASR-11, PAPI, REIL, MALSR, ATCT, ARFF
ARC AND CRITICAL AIRCRAFT	ARC	C-II	C-III
	AIRCRAFT	Bombardier CRJ 200	Embraer E-175
	WINGSPAN (FT)	68.67	85.33
	MAIN GEAR WIDTH (MGW)(FT)	13.25	20.5
	APPROACH SPEED (KTS)	140	124
AIRPORT MAGNETIC VARIATION	VARIATION	7°32' E ±0°22'	TBD
	DATE	16-Apr-21	TBD
	SOURCE	NOAA	NOAA
NPIAS SERVICE LEVEL/ASSET CATEGORY		Primary, Non-hub	Primary, Non-hub
STATE EQUIVALENT SERVICE		Comm. Service	Comm. Service



IFR WIND ROSE

RUNWAY	VISIBILITY MINIMUMS	10.5 KNOTS / 13 MPH	13 KNOTS / 16 MPH	16 KNOTS / 20 MPH
8R/26L	Cat 1 ≥ 1/2 mile / ≥ 3/4 mile	89.55%	91.93%	93.90%
17/35	≥ 1 1/4 mile / ≥ 1 mile	90.49%	94.38%	98.10%
COMBINED	N/A	98.34%	99.33%	99.72%

WIND DATA SOURCE: NOAA, Pueblo Memorial Airport ASOS (Station 724640)
COLLECTION DATES: 2009-2018
NUMBER OF OBSERVATIONS: 8,307



ALL WEATHER WIND ROSE

RUNWAY	10.5 KNOTS / 13 MPH	13 KNOTS / 16 MPH	16 KNOTS / 20 MPH
8R/L & 26R/L	90.29%	93.43%	96.05%
17/35	87.76%	92.29%	96.48%
COMBINED	97.86%	99.30%	99.81%

WIND DATA SOURCE: NOAA, Pueblo Memorial Airport ASOS (Station 724640)
COLLECTION DATES: 2009-2018
NUMBER OF OBSERVATIONS: 110,425

DECLARED DISTANCES

	RUNWAY OPERATIONAL DIRECTION	TORA (FT)	TODA (FT)	ASDA (FT)	LDA (FT)	STOPWAY PROVIDED (FT)	CLEARWAY PROVIDED (FT)	FAA APPROVAL DATE
EXISTING	8L	4,690	4,690	4,690	4,690	N/A	N/A	
	26R	4,690	4,690	4,690	4,690	N/A	N/A	
FUTURE	8C	4,690	4,690	4,690	4,690	N/A	N/A	
	26C	4,690	4,690	4,690	4,690	N/A	N/A	
EXISTING	8R	10,496	10,496	10,496	10,496	N/A	N/A	
	26L	10,496	10,496	10,496	10,496	N/A	N/A	
FUTURE	8R	10,496	10,496	10,496	10,496	N/A	N/A	
	26L	10,496	10,496	10,496	10,496	N/A	N/A	
EXISTING	17	8,310	8,310	8,310	8,310	N/A	N/A	
	35	8,310	8,310	8,310	8,310	N/A	N/A	
FUTURE	17	8,310	8,310	8,310	8,310	N/A	N/A	
	35	8,310	8,310	8,310	8,310	N/A	N/A	

NON-STANDARD CONDITIONS TO BE CORRECTED

NO.	DESCRIPTION	EXISTING CONDITION	FAA STANDARD (ARC)	PROPOSED ACTION
1	Runway 8R/26L ROFA width	Exisintg ROFA width is 660' due to presecnce of equipmet bldg.	Standard for RDC is 800'	Relocate FAA equipment bldg. outside of standard ROFA width
2	Runway 8R/26L Hold Line Separation	Runway C/L to existing hold line is 275'	Standard for RDC plus elevation correction is 297'	Re-mark hold lines in correct position
3	Runway 17/35 Hold Line Separation	Runway C/L to existing hold line is 250+'	Standard for RDC plus elevation correction is 297'	Re-mark hold lines in correct position
4	Runway 17/35 gradient	Runway 17/35 gradient in the last 25 percent of runway length exceeds standards	Standard runway gradient witihn 25 percent of runway length must be 0.08% or below	Evaluate at next scheduled runway pavement reconstruction

MODIFICATION TO STANDARDS TABLE

NO.	STANDARD TO BE MODIFIED	EXISTING	PROPOSED	FAA AIP NO.	APPROVAL DATE
1	FAA AC 150/5300-13A, Chapter 4, Section 418 Surface Gradient	Transverse and logitudinal slopes would exceed standards	Match existing transverse and longitudinal slopes for Taxiways A3, A6, and E after pavement rehabilitation	3-08-0046-036-2018	February 22, 2019

REV	DATE	DESCRIPTION

DIBBLE

DATE: XX
DESIGNED BY: VS
DRAWN BY: VS
REVIEWED BY: CM
FILE NAME: 19046_2-3_AIRPORTDATA

city of PUEBLO colorado

PUEBLO MEMORIAL AIRPORT

AIRPORT DATA SHEET

SHEET
2 OF 23

DWG: K:\2019\019046_PUB_MP_Update\CAD\19046_2-3_AirportData.dwg
DATE:10/05/21 TIME: 9:52am

RUNWAY DATA

ITEM		RW 8R/26L - EXISTING (E)		RW 8R/26L - FUTURE (F)		RW 8L/26R - EXISTING (E)		RW 8C/26C - FUTURE (F)		RW 17/35 - EXISTING (E)		RW 17/35 - FUTURE (F)		RW 8L/26R - FUTURE (F) (NEW THIRD PARALLEL)	
RUNWAY IDENTIFICATION		8R	26L	8R	26L	8L	26R	8L	26R	17	35	17	35	8L	26R
RUNWAY DESIGN CODE (RDC)		C-II/2400		C-III/2400		B-II/VIS		B-II/VIS		C-II/5000		C-III/2400		A-I(S)/VIS	
APPROACH REFERENCE CODE (APRC)		D-VI/2400		D-VI/2400		D-IV/VIS; D-V/VIS		D-IV/VIS; D-V/VIS		D-VI/5000		D-VI/2400		B-I(S)/VIS	
DEPARTURE REFERENCE CODE (DPRC)		D-VI		D-VI		D-IV; D-V		D-IV; D-V		D-VI		D-VI		B-I(S)	
SURFACE MATERIAL, PAVEMENT STRENGTH & TREATMENT	SURFACE MATERIAL	ASPHALT		ASPHALT		ASPHALT		ASPHALT		ASPHALT		ASPHALT		ASPHALT	
	STRENGTH BY WHEEL LOADING (LBS)	75,000 SWG; 170,000 DWG; 250,000 2D		75,000 SWG; 170,000 DWG; 250,000 2D		20,000 SWG		20,000 SWG		93,000 SWG; 110,000 DWG; 170,000 2D		93,000 SWG; 110,000 DWG; 170,000 2D		12,500 SWG	
	PCN (FOR BEARING STRENGTH OF 12,500 LBS OR GREATER)	73 F/D/X/T		73 F/D/X/T		7.6 F/D/Z/T		7.6 F/D/Z/T		57 F/B/X/T		58 F/B/X/T		TBD	
	SURFACE TREATMENT	GROOVED		GROOVED		GROOVED		GROOVED		GROOVED		GROOVED		GROOVED	
RUNWAY GRADIENT	EFFECTIVE (%)	0.20%		0.20%		0.08%		0.08%		0.97%		0.97%		TBD	
	MAXIMUM (%)	0.64%		0.64%		1.20%		1.20%		1.00%		0.08%		0.50%	
	LINE OF SIGHT MET (Y OR N)	Y		Y		Y		Y		Y		Y		Y	
PERCENT WIND COVERAGE (ALL WEATHER)	A/B-I-10.5 KTS	90.29		TBD		90.29		TBD		87.76		TBD		TBD	
	A/B-II-13 KTS	93.43		TBD		93.43		TBD		92.29		TBD		N/A	
	A/B-II, C-I through C-III-16 KTS	96.05		TBD		96.05		TBD		96.48		TBD		N/A	
	A-IV, B-IV, C-IV through C-VI-20 KTS	N/A		N/A		N/A		N/A		N/A		N/A		N/A	
RUNWAY DIMENSIONS															
RUNWAY DIMENSIONS (FT)		10,498' x 150'		10,498' x 150'		4,690' x 75'		4,690' x 75'		8,310' X 150'		8,310' X 150'		4,000' X 60'	
RUNWAY COORDINATES (NAD 83)	RUNWAY END LATITUDE	38-17-13.6348N	38-17-16.7526N	38-17-13.6348N	38-17-16.7526N	38-17-24.3081 N	38-17-25.7014 N	38-17-24.3081 N	38-17-25.7014 N	38-18-15.0609 N	38-16-52.9717 N	38-18-15.0609 N	38-16-52.9717 N	38-17-39-372 N	38-17-40.533 N
	RUNWAY END LONGITUDE	104-30-36.2409W	104-28-24.6616W	104-30-36.2409W	104-28-24.6616W	104-30-36.6451 W	104-29-37.865 W	104-30-36.6451 W	104-29-37.865 W	104-30-14.6942 W	104-30-11.6348 W	104-30-14.6942 W	104-30-11.6348 W	104-30-37.208 W	104-29-47.055 W
	DISPLACED THRESHOLD LATITUDE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	DISPLACED THRESHOLD LONGITUDE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RUNWAY ELEVATIONS (NAVD 88)	RUNWAY END (FT)	4,669.4	4,648.8	4,669.4	4,648.8	4,681.20	4,677.00	4,681.20	4,677.00	4,729.30	4,648.10	4,729.30	4,648.10	4,696.74	4,697.82
	DISPLACED THRESHOLD (FT)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	TOUCHDOWN ZONE (TDZ)	4,671.4	4,658.9	4,671.4	4,658.9	4,681.20	4,678.10	4,681.20	4,678.10	4,729.30	4,676.90	4,729.30	4,676.90	TBD	TBD
	HIGH POINT (FT)	4,671.40		4,672.40		4,681.20		4,681.20		4,729.30		4,729.30		TBD	TBD
	LOW POINT (FT)	4,648.80		4,649.80		4,677.00		4,677.00		4,648.10		4,648.10		TBD	TBD
RUNWAY LIGHTING TYPE		HIRL		HIRL		MIRL		MIRL		MIRL		HIRL		N/A	
RUNWAY MARKING TYPE		PRECISION	PRECISION	PRECISION	PRECISION	BASIC	BASIC	BASIC	BASIC	NON-PRECISION	NON-PRECISION	NON-PRECISION	PRECISION	BASIC	BASIC
VISUAL AND INSTRUMENT NAVAIDS		MALSR, PAPI, GPS, ILS	REIL, PAPI, ILS, VOR	MALSR, PAPI, GPS, ILS	MALSR, REIL, PAPI, ILS	PAPI, REIL	PAPI, REIL	PAPI, REIL	PAPI, REIL	PAPI, REIL, GPS	PAPI, REIL, GPS	PAPI, REIL, GPS	MALSR, PAPI, GPS	REIL, PAPI	REIL, PAPI
14 CFR PART 77 APPROACH SURFACES	RUNWAY TYPE	LARGER-THAN-UTILITY		LARGER-THAN-UTILITY		LARGER-THAN-UTILITY		LARGER-THAN-UTILITY		LARGER-THAN-UTILITY		LARGER-THAN-UTILITY		UTILITY	
	APPROACH TYPE	PRECISION	NON-PRECISION	PRECISION	PRECISION	VIS	VIS	VIS	VIS	NON-PRECISION	NON-PRECISION	NON-PRECISION	PRECISION	VIS	VIS
	VISIBILITY MINIMUMS (STATUTE MILES)	≥ 1/2 SM	≥ 3/4 SM	≥ 1/2 SM	≥ 1/2 SM	3+ SM	3+ SM	3+ SM	3+ SM	≥ 1 1/4 SM	≥ 1 SM	≥ 3/4 SM	≥ 1/2 SM	3 + SM	3+ SM
	APPROACH SURFACE DIMENSIONS (FT) (L x IW x OW)	50,000 x 1,000 x 16,000	10,000 x 1,000 x 4,000	50,000 x 1,000 x 16,000	50,000 x 1,000 x 16,000	5,000 X 500 X 1,500	5,000 X 500 X 1,500	5,000 X 500 X 1,500	5,000 X 500 X 1,500	10,000 X 500 X 3,500	10,000 X 500 X 3,500	10,000 x 1,000 x 4,000	50,000 x 1,000 x 16,000	5,000 X 250 X 1,250	5,000 X 250 X 1,250
	APPROACH SLOPE	50:1/40:1	34:1	50:1/40:1	50:1/40:1	20:1	20:1	20:1	20:1	34:1	34:1	34:1	50:1/40:1	20:1	20:1
RUNWAY PROTECTION ZONE (RPZ)	APPROACH RPZ (FT) (L x IW x OW)	2,500 x 1,000 x 1,750	1,700 x 1,000 x 1,510	2,500 x 1,000 x 1,750	2,500 x 1,000 x 1,750	1,000 x 500 x 700	1,000 x 500 x 700	1,000 x 500 x 700	1,000 x 500 x 700	1,700 x 500 x 1,010	1,700 x 500 x 1,010	1,700 x 1,000 x 1,510	2,500 x 1,000 x 1,750	1,000 X 250 X 450	1,000 X 250 X 450
	DEPARTURE RPZ (FT) (L x IW x OW)	1,700 x 500 x 1,010	1,700 x 500 x 1,010	1,700 x 500 x 1,010	1,700 x 500 x 1,010	N/A	N/A	N/A	N/A	1,700 x 500 x 1,010	1,700 x 500 x 1,010	1,700 x 500 x 1,010	1,700 x 500 x 1,010	1,000 X 250 X 450	1,000 X 250 X 450
RUNWAY SAFETY AREA (RSA)	WIDTH (FT)	500		500		150		150		500		500		120	
	LENGTH BEYOND DEPARTURE END (FT)	1,000	1,000	1,000	1,000	300	300	300	300	1,000	1,000	1,000	1,000	240	240
	LENGTH PRIOR TO THRESHOLD (FT)	600	600	600	600	300	300	300	300	600	600	600	600	240	240
RUNWAY OBJECT FREE AREA (ROFA)	WIDTH (FT)	**660**		800		500		500		800		800		250	
	LENGTH BEYOND DEPARTURE END (FT)	1,000	1,000	1,000	1,000	300	300	300	300	1,000	1,000	1,000	1,000	240	240
	LENGTH PRIOR TO THRESHOLD (FT)	600	600	600	600	300	300	300	300	600	600	600	600	240	240
PRECISION OBSTACLE FREE ZONE (POFZ)	WIDTH (FT)	800	N/A	800	800	N/A		N/A		N/A		N/A	800	N/A	N/A
	LENGTH (FT)	200	N/A	200	200	N/A		N/A		N/A		N/A	200	N/A	N/A
OBSTACLE FREE ZONE (OFZ)	WIDTH (FT)	400		400		250		250		400		400		250	
	LENGTH BEYOND RUNWAY END (FT)	200	200	200	200	200	200	200	200	200	200	200	200	200	200
TYPE OF AERONAUTICAL SURVEY REQUIRED FOR APPROACH		VERTICALLY GUIDED		VERTICALLY GUIDED		NON-VERTICAL		NON-VERTICAL		NON-VERTICAL		VERTICALLY GUIDED		NON-VERTICAL	
THRESHOLD SITING SURFACE (TSS)	APPROACH SURFACE DIMENSIONS (FT) (IW x L x OW)	800 x 10,000 x 3,400	400 x 10,000 x 3,400	800 x 10,000 x 3,400	800 x 10,000 x 3,400	400 x 10,000 x 1,000	400 x 10,000 x 1,000	400 x 10,000 x 1,000	400 x 10,000 x 1,000	400 x 10,000 x 3,400	400 x 10,000 x 3,400	400 x 10,000 x 3,400	800 x 10,000 x 3,400	250 X 5,000 X 700	250 X 5,000 X 700
	DISTANCE FROM RUNWAY END (FT)	200	200	200	200	0	0	0	0	200	200	200	200	0	0
	APPROACH SLOPE	34:1	20:1	34:1	34:1	20:1	20:1	20:1	20:1	20:1	20:1	20:1	34:1	20:1	20:1
	PPROACH SURFACE FOR IAPs W/ VERTICAL GUIDANCE (IW x L x OW)	350 x 10,000 x 1,520	350 x 10,000 x 1,520	350 x 10,000 x 1,520	350 x 10,000 x 1,520	N/A	N/A	N/A	N/A	N/A	N/A	350 x 10,000 x 1,520	350 x 10,000 x 1,520	N/A	N/A
	DISTANCE FROM RUNWAY END (FT)	0	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A	0	0	N/A	N/A
	APPROACH SLOPE FOR IAPs W/ VERTICAL GUIDANCE	30:1	30:1	30:1	30:1	N/A	N/A	N/A	N/A	N/A	N/A	30:1	30:1	N/A	N/A
	APPROACH PENETRATIONS	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
	RUNWAY DEPARTURE SURFACE (YES OR N/A)	YES	YES	YES	YES	N/A	N/A	N/A	N/A	YES	YES	YES	YES	N/A	N/A
	DEPARTURE SURFACE DIMENSIONS (FT) (IW1 x IW2 x L x OW)	150 x 1,000 x 12,152 x 7,512	150 x 1,000 x 12,152 x 7,512	150 x 1,000 x 12,152 x 7,512	150 x 1,000 x 12,152 x 7,512	N/A	N/A	N/A	N/A	150 x 1,000 x 12,152 x 7,512	150 x 1,000 x 12,152 x 7,512	150 x 1,000 x 12,152 x 7,512	150 x 1,000 x 12,152 x 7,512	N/A	N/A
	DISTANCE FROM DEPARTURE RUNWAY END (FT)	0	0	0	0	N/A	N/A	N/A	N/A	0	0	0	0	N/A	N/A
	DEPARTURE SLOPE	40:1	40:1	40:1	40:1	N/A	N/A	N/A	N/A	40:1	40:1	40:1	40:1	N/A	N/A
	DEPARTURE PENETRATIONS	NONE	NONE	NONE	NONE	N/A	N/A	N/A	N/A	NONE	TERRAIN, ELEC. TRANS. TOWERS	NONE	TERRAIN, ELEC. TRANS. TOWERS	N/A	N/A
RUNWAY SEPARATION DISTANCE (FT)	RUNWAY C/L TO PARALLEL RUNWAY C/L	1,075		1,075		1,075		1,075		N/A		N/A		1,525	
	RUNWAY C/L TO HOLD POSITION	**275**		297		200		200		**250**, **257**, 311,350		297		125	
	RUNWAY C/L TO PARALLEL TAXIWAY/TAXILANE CENTERLINE	775, 500		775, 500		400		400		500, 650		500, 650		150	
	RUNWAY C/L TO AIRCRAFT PARKING POSITION	1,080 +		1,080 +		2,160 +		2,160 +		750 +		750 +		3797+	

TAXIWAY AND TAXILANE DIMENSIONS

TAXIWAY DESIGNATION	TAXIWAY A / CONNECTORS A1 - A12 (E)	TAXIWAY A / CONNECTORS A1 - A12 (F)	TAXIWAY B & CONNECTORS (E, F)	TAXIWAY C/D & CONNECTORS (E)	TAXIWAY C/D & CONNECTORS (F)	TAXIWAY F & CONNECTORS (F)
TAXIWAY DESIGN GROUP (TDG)	5	3	2	3/5	3	1A/1B
TAXIWAY WIDTH (FT)	75	50	35	50/75	50	25
TAXIWAY SHOULDER WIDTH	N/A	N/A	15	20/30	20	10
TAXIWAY LIGHTING	MITL	MITL	NONE	MITL	MITL	NONE
TAXIWAY SAFETY AREA (FT)	118	118	79	118	118	49
TAXIWAY OBJECT FREE AREA (FT)	186	186	131	186	186	89
TAXIWAY CENTERLINE TO PARALLEL TAXIWAY/TAXILANE CENTERLINE (FT)	270 / 350+	SAME	N/A	1,143	900	150
TAXIWAY CENTERLINE TO FIXED OR MOVABLE OBJECT (FT)	93	93	65.5	93	93	39.5
TAXIWAY WINGTIP CLEARANCE (FT)	34	34	26	34	34	20

TAXILANE DESIGNATION	TAXILANE E (MAIN APRON) (E)	TAXILANE E (MAIN APRON) (F)	WEST APRON GA BOX HANGARS 1 (E) (F)	WEST APRON GA BOX HANGARS 2 (F)	SOUTHWEST APRON NESTED T-HANGARS (F)	CENTRAL APRON BOX HANGARS (F)	EAST APRON BOX HANGARS (E,F)
TAXILANE WIDTH (FT)	70	50	50	35	25	35	50
TAXILANE SAFETY AREA (FT)	118	118	49	79	49	79	79
TAXILANE OBJECT FREE AREA (FT)	162	162	79	115	89	115	115
TAXILANE CENTERLINE TO FIXED OR MOVABLE OBJECT (FT)	81	81	39.5	57.5	39.5	57.5	57.5
TAXILANE WINGTIP CLEARANCE (FT)	27	27	15	18	15	18	18

HORIZONTAL DATUM: NORTH AMERICAN DATUM OF 1983 (NAD 83); VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM 1988 (NAVD 88). EXISTING ELEVATIONS & RUNWAY END COORDINATES FROM WOOLPERT INC., SURVEY DATA DATED 10/15/15.

NOTE: BOLD FONT INDICATES A NON-STANDARD CONDITION THAT REQUIRES ALTERATION.

REV	DATE	DESCRIPTION

DIBBLE

city of PUEBLO colorado

DATE: XX
DESIGNED BY: VS
DRAWN BY: VS
REVIEWED BY: CM
FILE NAME: 19046_2-3_AIRPORTDATA

PUEBLO MEMORIAL AIRPORT

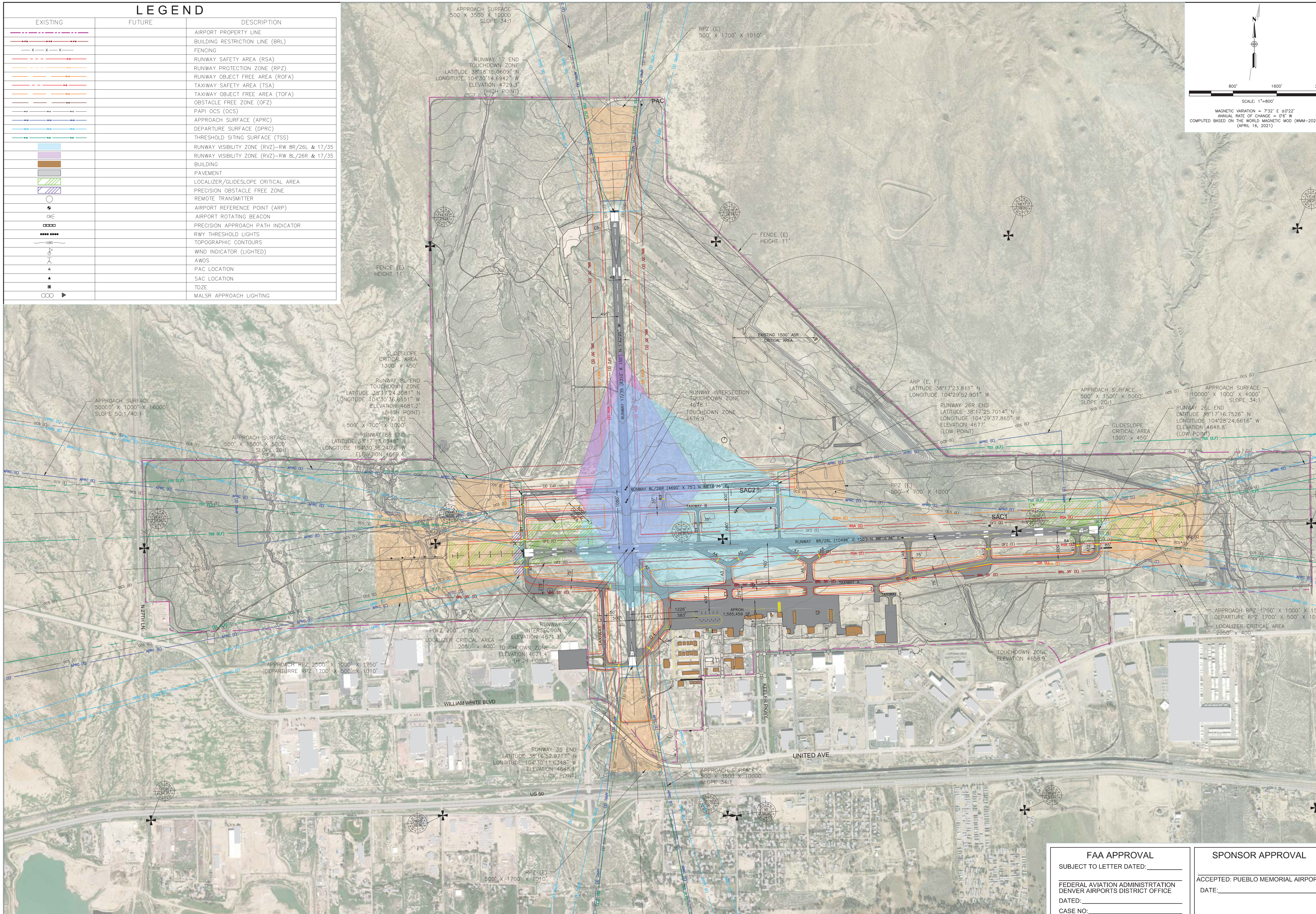
RUNWAY DATA SHEET

SHEET 3 OF 23

DWG: K:\2019\019046_PUB_MP_Update\CAD\19046_2-3_AirportData.dwg
DATE: 10/05/21 TIME: 9:52am

LEGEND

EXISTING	FUTURE	DESCRIPTION
		AIRPORT PROPERTY LINE
		BUILDING RESTRICTION LINE (BRL)
		FENCING
		RUNWAY SAFETY AREA (RSA)
		RUNWAY PROTECTION ZONE (RPZ)
		RUNWAY OBJECT FREE AREA (ROFA)
		TAXIWAY SAFETY AREA (TSA)
		TAXIWAY OBJECT FREE AREA (TOFA)
		OBSTACLE FREE ZONE (OFZ)
		PAPI OCS (OCS)
		APPROACH SURFACE (APRC)
		DEPARTURE SURFACE (DPRC)
		THRESHOLD SITING SURFACE (TSS)
		RUNWAY VISIBILITY ZONE (RVZ)–RW 8R/26L & 17/35
		RUNWAY VISIBILITY ZONE (RVZ)–RW 8L/26R & 17/35
		BUILDING
		PAVEMENT
		LOCALIZER/GLIDESLOPE CRITICAL AREA
		PRECISION OBSTACLE FREE ZONE
		REMOTE TRANSMITTER
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
		PRECISION APPROACH PATH INDICATOR
		RWY THRESHOLD LIGHTS
1080		TOPOGRAPHIC CONTOURS
		WIND INDICATOR (LIGHTED)
		AWOS
		PAC LOCATION
		SAC LOCATION
		TDZE
		MALSR APPROACH LIGHTING



FAA APPROVAL	SPONSOR APPROVAL
SUBJECT TO LETTER DATED:________	ACCEPTED: PUEBLO MEMORIAL AIRPORT
FEDERAL AVIATION ADMINISTRTATION DENVER AIRPORTS DISTRICT OFFICE	DATE:________
DATED:________	
CASE NO:________	

REV	DATE	DESCRIPTION

DIBBLE

city of PUEBLO colorado

DATE:	XX
DESIGNED BY:	VS
DRAWN BY:	VS
REVIEWED BY:	CM
FILE NAME:	19046_4-5_ALP

PUEBLO MEMORIAL AIRPORT

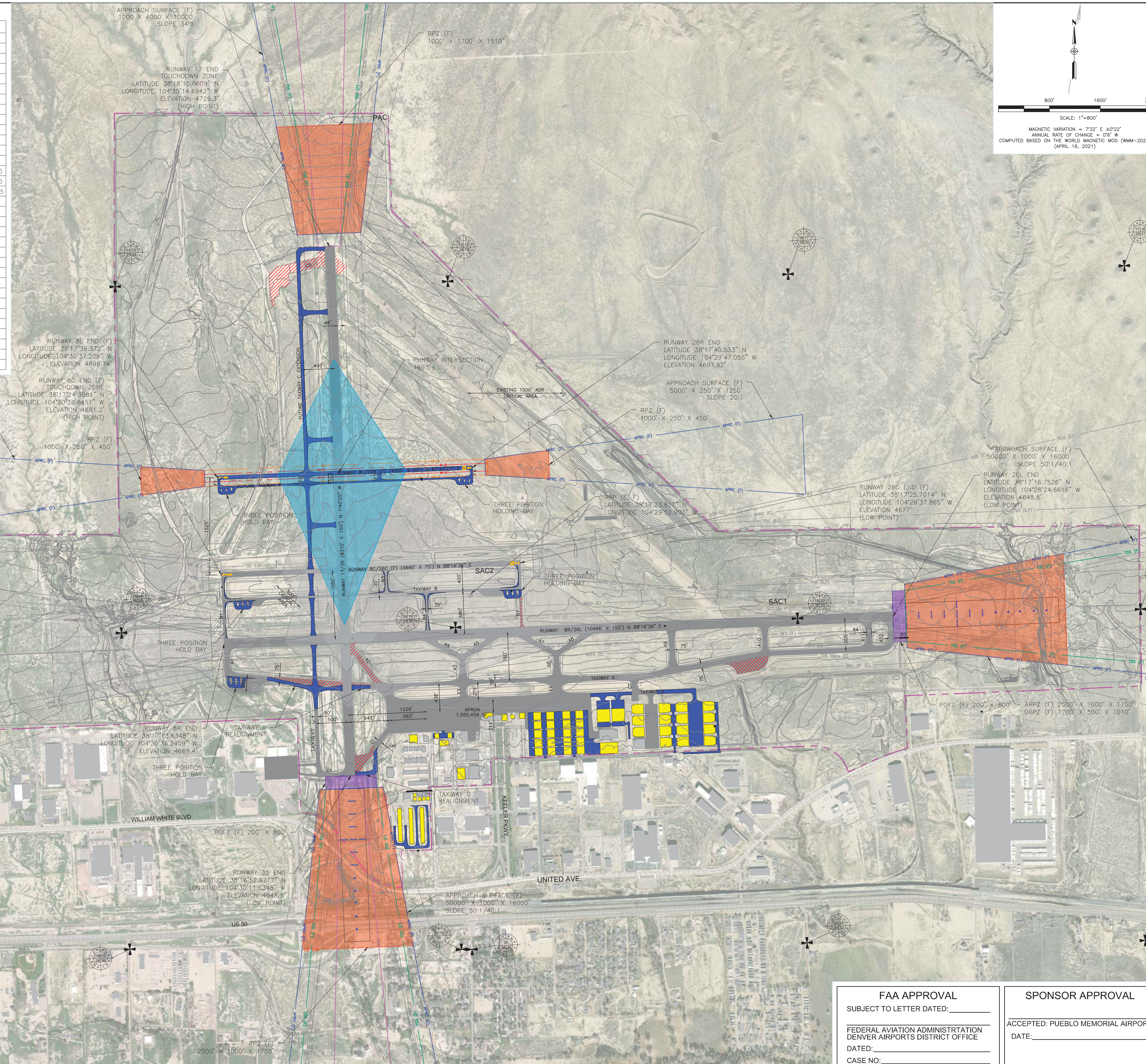
AIRPORT LAYOUT PLAN - EXISTING

SHEET 4 OF 23

DWG: K:\2019\019046_PUB_MP_Update\CAD\19046_4-5_ALP.dwg
DATE: 10/05/21 TIME: 9:54am

LEGEND

EXISTING	FUTURE	DESCRIPTION
		AIRPORT PROPERTY LINE
		BUILDING RESTRICTION LINE (BRL)
—x—x—x—	—xx—xx—xx—	FENCING
		RUNWAY SAFETY AREA (RSA)
		RUNWAY PROTECTION ZONE (RPZ)
		RUNWAY OBJECT FREE AREA (ROFA)
		TAXIWAY SAFETY AREA (TSA)
		TAXIWAY OBJECT FREE AREA (TOFA)
		OBSTACLE FREE ZONE (OFZ)
		PAPI OCS (OCS)
		APPROACH SURFACE (APRC)
		DEPARTURE SURFACE (DPRC)
		THRESHOLD SITING SURFACE (TSS)
		RUNWAY VISIBILITY ZONE (RVZ)–RW 8R/26L & 17/35
		RUNWAY VISIBILITY ZONE (RVZ)–RW 8L/26R & 17/35
		RUNWAY VISIBILITY ZONE (RVZ)–RW 8L/26R (F) & 17/35
		BUILDING
		PAVEMENT
		PAVEMENT REMOVAL
		LOCALIZER/GLIDESLOPE CRITICAL AREA
		PRECISION OBSTACLE FREE ZONE
		REMOTE TRANSMITTER
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
		PRECISION APPROACH PATH INDICATOR
		RWY THRESHOLD LIGHTS
—1080—		TOPOGRAPHIC CONTOURS
		WIND INDICATOR (LIGHTED)
		AWOS
		PAC LOCATION
		SAC LOCATION
		TDZE
		MALSR APPROACH LIGHTING



800' 1600' 2400'

SCALE: 1"=800'

MAGNETIC VARIATION = 7°32' E ±0°22'
ANNUAL RATE OF CHANGE = 0°6' W
COMPUTED BASED ON THE WORLD MAGNETIC MOD (WMM-2020)
(APRIL 16, 2021)

REV	DATE	DESCRIPTION

DIBBLE

city of PUEBLO colorado

DATE:
DESIGNED BY: VS
DRAWN BY: VS
REVIEWED BY: CM
FILE NAME: 19046_4-5_ALP

XX

PUEBLO MEMORIAL AIRPORT

AIRPORT LAYOUT PLAN - FUTURE

FAA APPROVAL

SUBJECT TO LETTER DATED:__________

FEDERAL AVIATION ADMINISTRTATION
DENVER AIRPORTS DISTRICT OFFICE

DATED:__________

CASE NO:__________

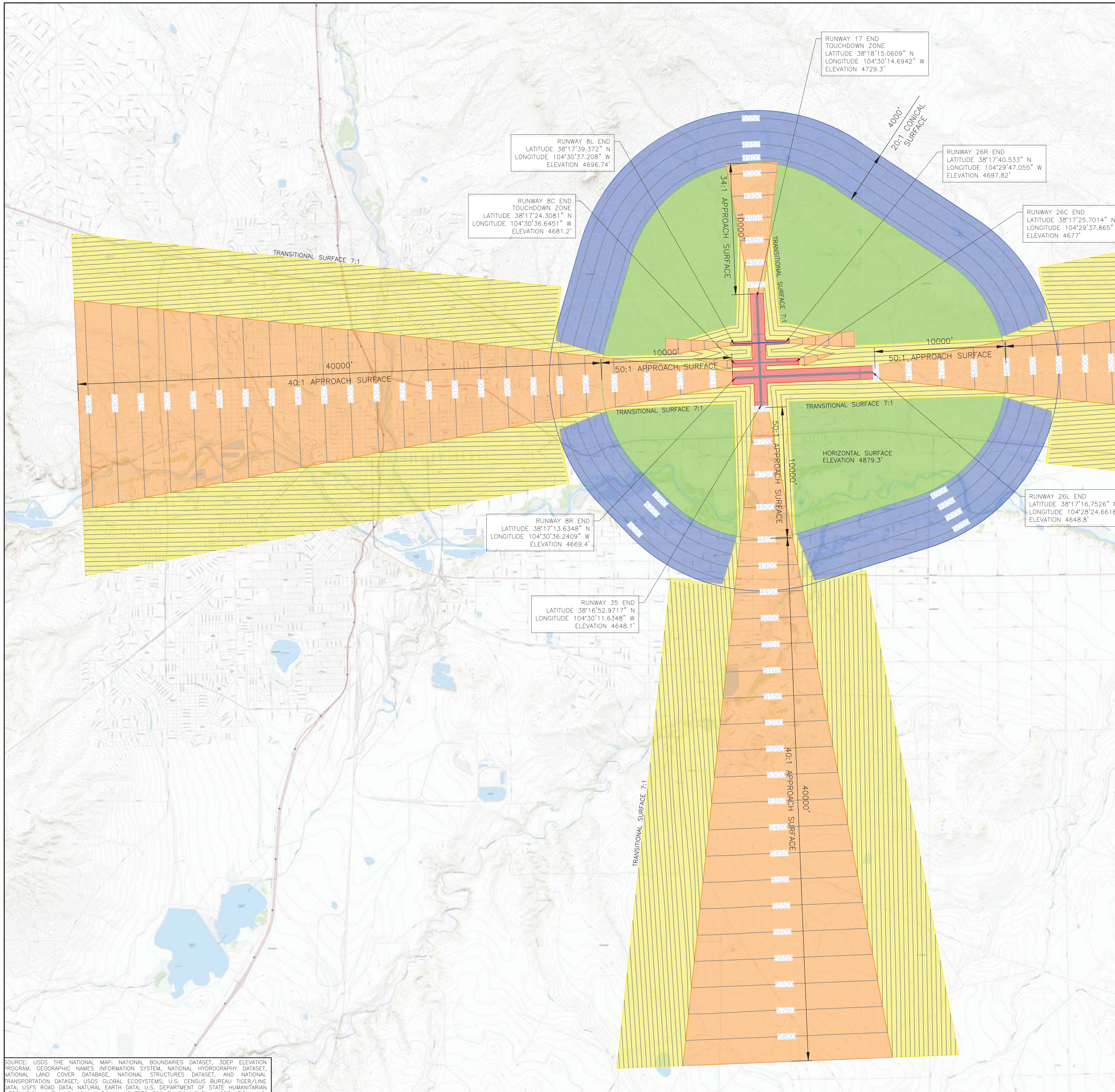
SPONSOR APPROVAL

ACCEPTED: PUEBLO MEMORIAL AIRPORT

DATE:__________

SHEET 5 OF 23

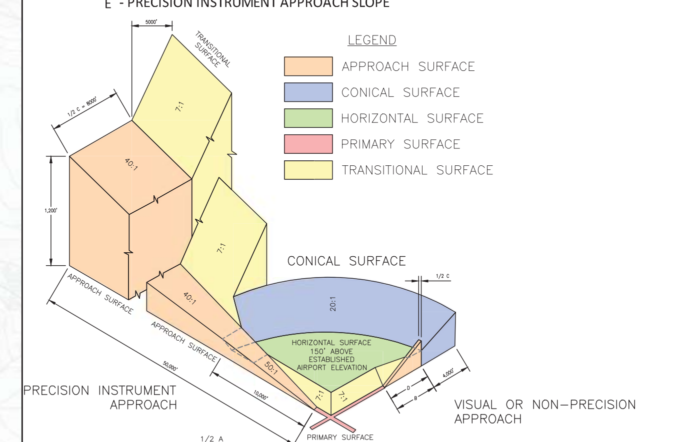
DWG: K:\2019\019046_PUB_MP_Update\CAD\19046_4-5_ALP.dwg
DATE:10/05/21 TIME: 11:01am



DIM	ITEM	DIMENSIONAL STANDARDS (FT)					
		VISUAL RUNWAY		NON-PRECISION INSTRUMENT RUNWAY			PRECISION INSTRUMENT RUNWAY
		A	B	A	B		
					C	D	
A	WIDTH OF PRIMARY SURFACE & APPROACH SURFACE WIDTH AT INNER END	250	500	500	500	1,000	1,000
B	RADIUS OF HORIZONTAL SURFACE	5,000	5,000	5,000	10,000	10,000	10,000
		VISUAL RUNWAY		NON-PRECISION INSTRUMENT RUNWAY			Z
		V	W	V	W		
					X	Y	
C	APPROACH SURFACE WIDTH AT END	1,250	1,500	2,000	3,500	4,000	16,000
D	APPROACH SURFACE LENGTH	5,000	5,000	5,000	10,000	10,000	*
E	APPROACH SLOPE	20:1	20:1	20:1	34:1	34:1	*

* PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000' AND 40:1 FOR AN ADDITIONAL 40,000'

A - UTILITY RUNWAYS
B - RUNWAYS LARGER THAN UTILITY
C - VISIBILITY MINIMUMS GREATER THAN 3/4 MILE
D - VISIBILITY MINIMUMS AS LOW AS 3/4 MILE
E - PRECISION INSTRUMENT APPROACH SLOPE



REV | DATE | DESCRIPTION

DIBBLE

DATE: XX
DESIGNED BY: VS
DRAWN BY: VS
REVIEWED BY: CM
FILE NAME: 19046_6_AIRPORTAIRSPACE

city of PUEBLO colorado

PUEBLO MEMORIAL AIRPORT

AIRPORT AIRSPACE

SHEET 6 OF 23

DWG: K:\2019\019046_PUB_MP_Update\CAD\19046_6_AirportAirspace.dwg
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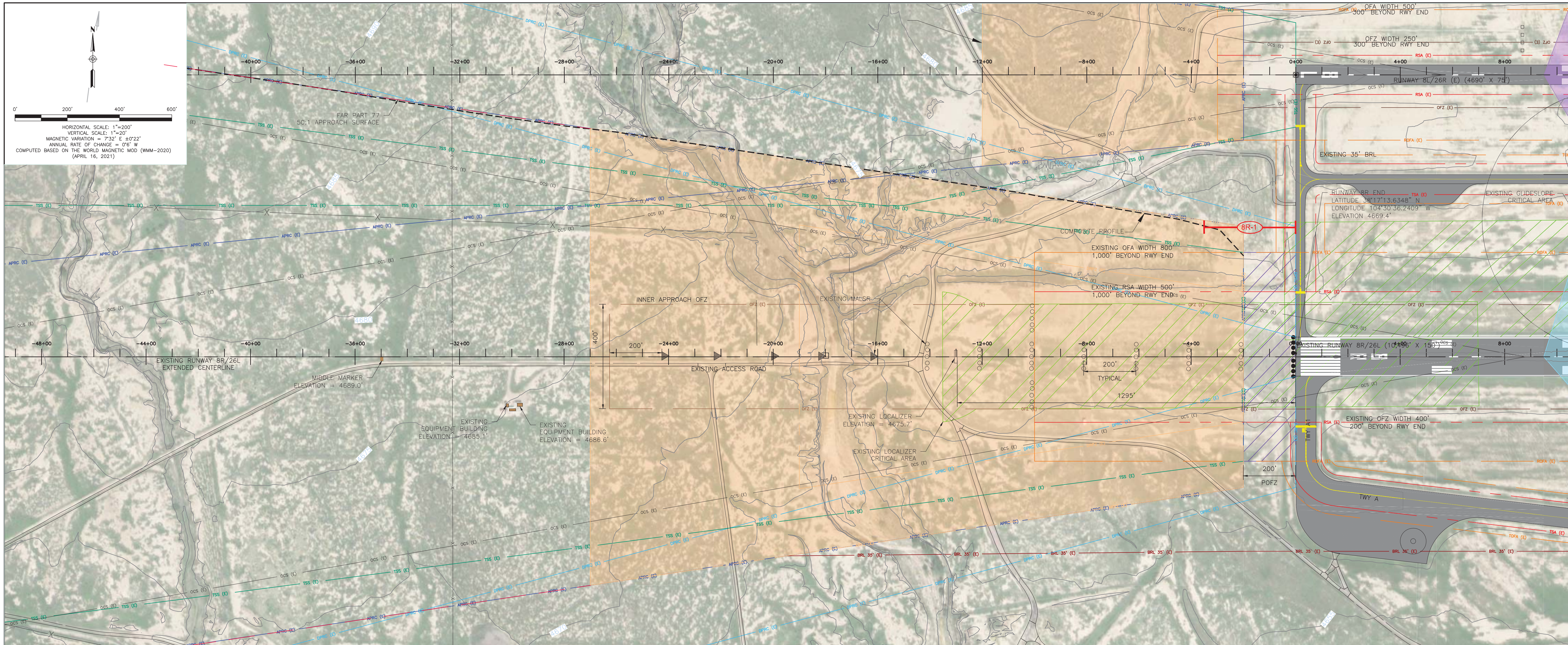

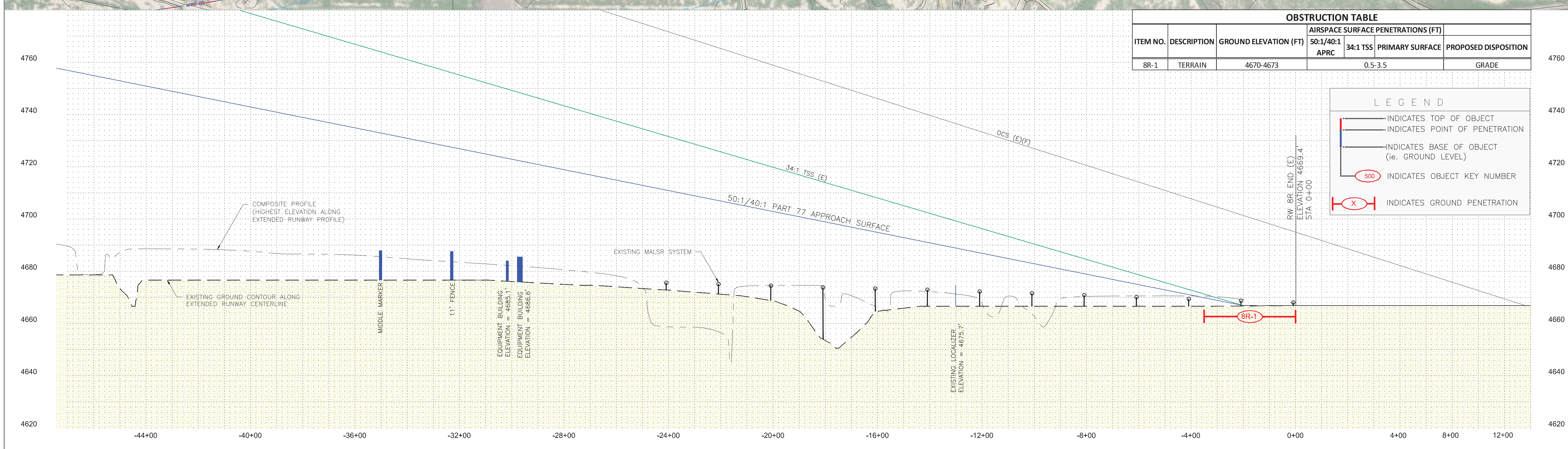

OBSTRUCTION TABLE

ITEM NO.	DESCRIPTION	GROUND ELEVATION (FT)	AIRSPACE SURFACE PENETRATIONS (FT)			PROPOSED DISPOSITION
			50:1/40:1 APRC	34:1 TSS	PRIMARY SURFACE	
8R-1	TERRAIN	4670-4673	0.5-3.5			GRADE

LEGEND

- INDICATES TOP OF OBJECT
- INDICATES POINT OF PENETRATION
- INDICATES BASE OF OBJECT (ie. GROUND LEVEL)
- 500 INDICATES OBJECT KEY NUMBER
- X INDICATES GROUND PENETRATION

REV	DATE	DESCRIPTION

DIBBLE

DATE: XX
DESIGNED BY: VS
DRAWN BY: VS
REVIEWED BY: CM
FILE NAME: 19046_7-12_INNERAPPROACH

city of PUEBLO colorado

PUEBLO MEMORIAL AIRPORT

RUNWAY 8R EXISTING INNER APPROACH

SHEET 7 OF 23

DWG: K:\2019\1019046_PUB_MP_Update\CAD\19046_7-12_InnerApproach.dwg
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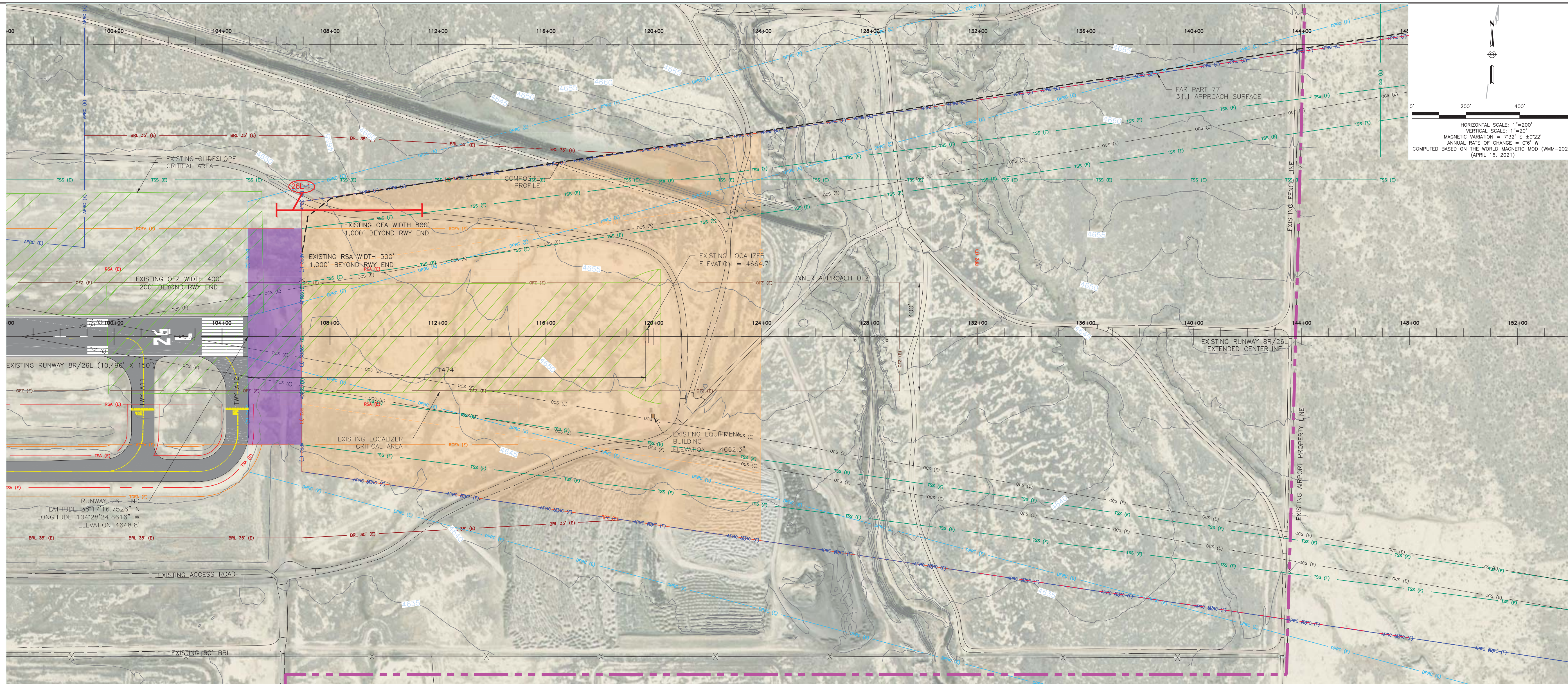
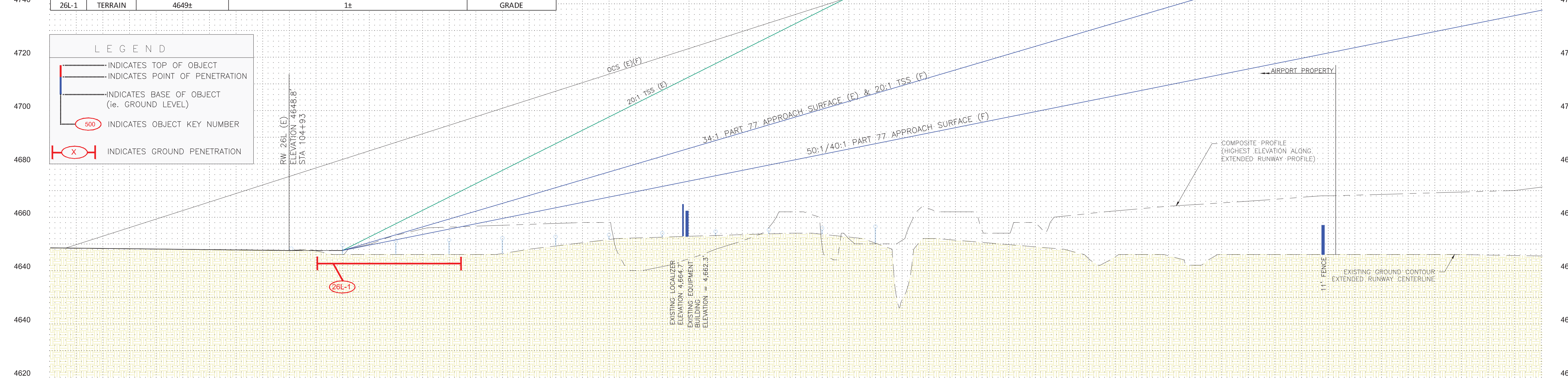


OBSTRUCTION TABLE

ITEM NO.	DESCRIPTION	GROUND ELEVATION (FT)	AIRSPACE SURFACE PENETRATIONS (FT)					PROPOSED DISPOSITION
			34:1 APRC (E)	20:1 TSS (E)	PRIMARY SURFACE	50:1/40:1 APRC (F)	34:1 TSS (F)	
26L-1	TERRAIN	4649±	1±					GRADE



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REV	DATE / DESCRIPTION
DATE:	XX
DESIGNED BY:	VS
DRAWN BY:	VS
REVIEWED BY:	CM
FILE NAME:	19046_7-12_INNERAPPROACH

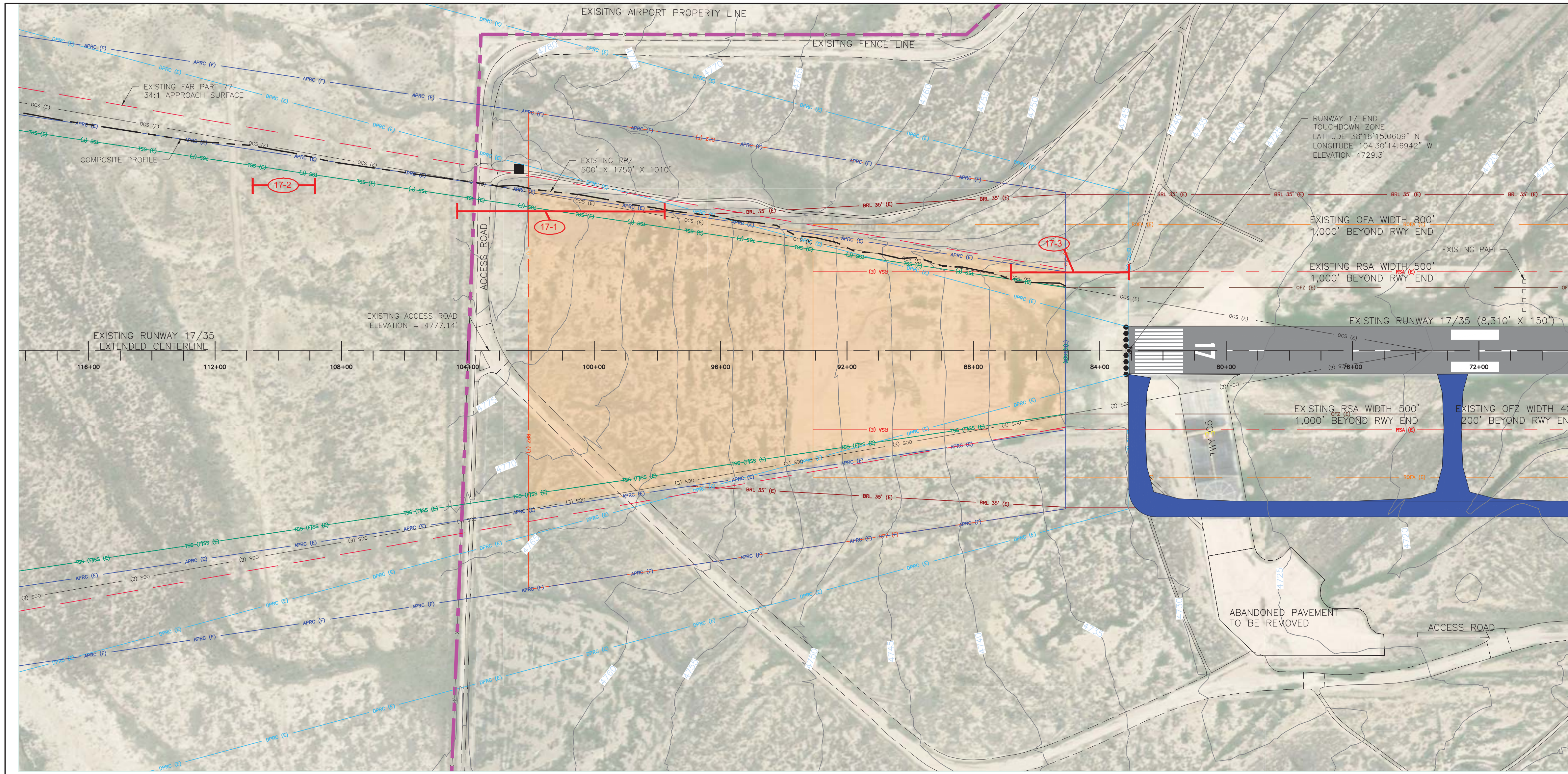
DIBBLE

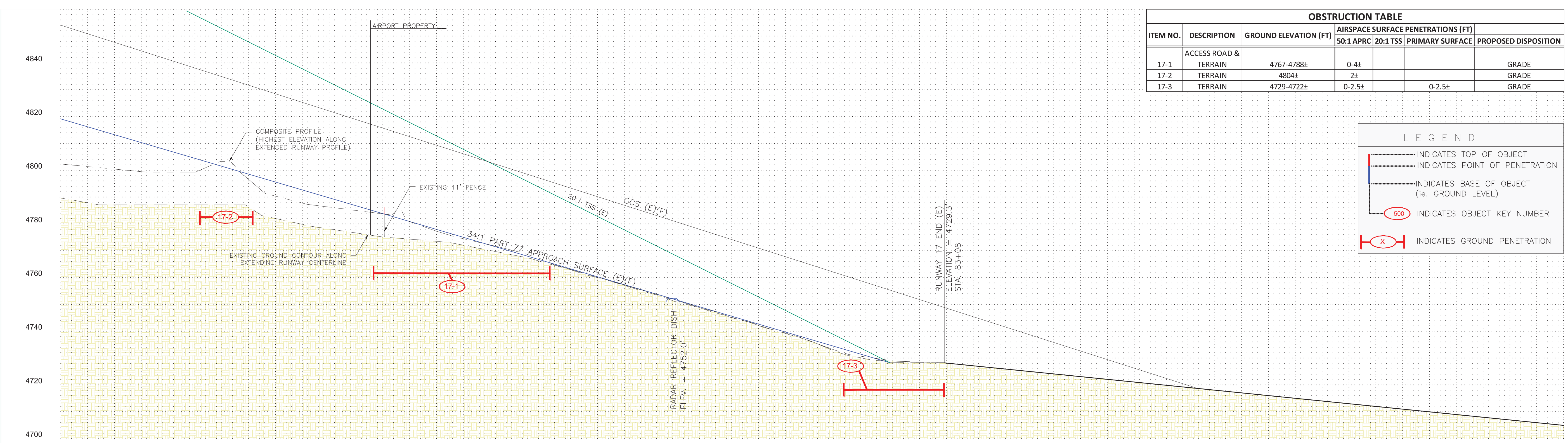
city of PUEBLO colorado

PUEBLO MEMORIAL AIRPORT

RUNWAY 26L EXISTING & FUTURE INNER APPROACH

SHEET 8 OF 23





OBSTRUCTION TABLE

ITEM NO.	DESCRIPTION	GROUND ELEVATION (FT)	AIRSPACE SURFACE PENETRATIONS (FT)			PROPOSED DISPOSITION
			50:1 APRC	20:1 TSS	PRIMARY SURFACE	
17-1	ACCESS ROAD & TERRAIN	4767-4788±	0-4±			GRADE
17-2	TERRAIN	4804±	2±			GRADE
17-3	TERRAIN	4729-4722±	0-2.5±		0-2.5±	GRADE

L E G E N D

- INDICATES TOP OF OBJECT
- INDICATES POINT OF PENETRATION
- INDICATES BASE OF OBJECT (ie. GROUND LEVEL)
- 500 INDICATES OBJECT KEY NUMBER
- X INDICATES GROUND PENETRATION

REV	DATE	DESCRIPTION

DIBBLE

DATE: XX
DESIGNED BY: VS
DRAWN BY: VS
REVIEWED BY: CM
FILE NAME: 19046_7-12_INNERAPPROACH

city of PUEBLO colorado

PUEBLO MEMORIAL AIRPORT

RUNWAY 17 EXISTING & FUTURE INNER APPROACH

SHEET 9 OF 23

DWG: K:\2019\019046_PUB_MP_Update\CAD\19046_7-12_InnerApproach.dwg
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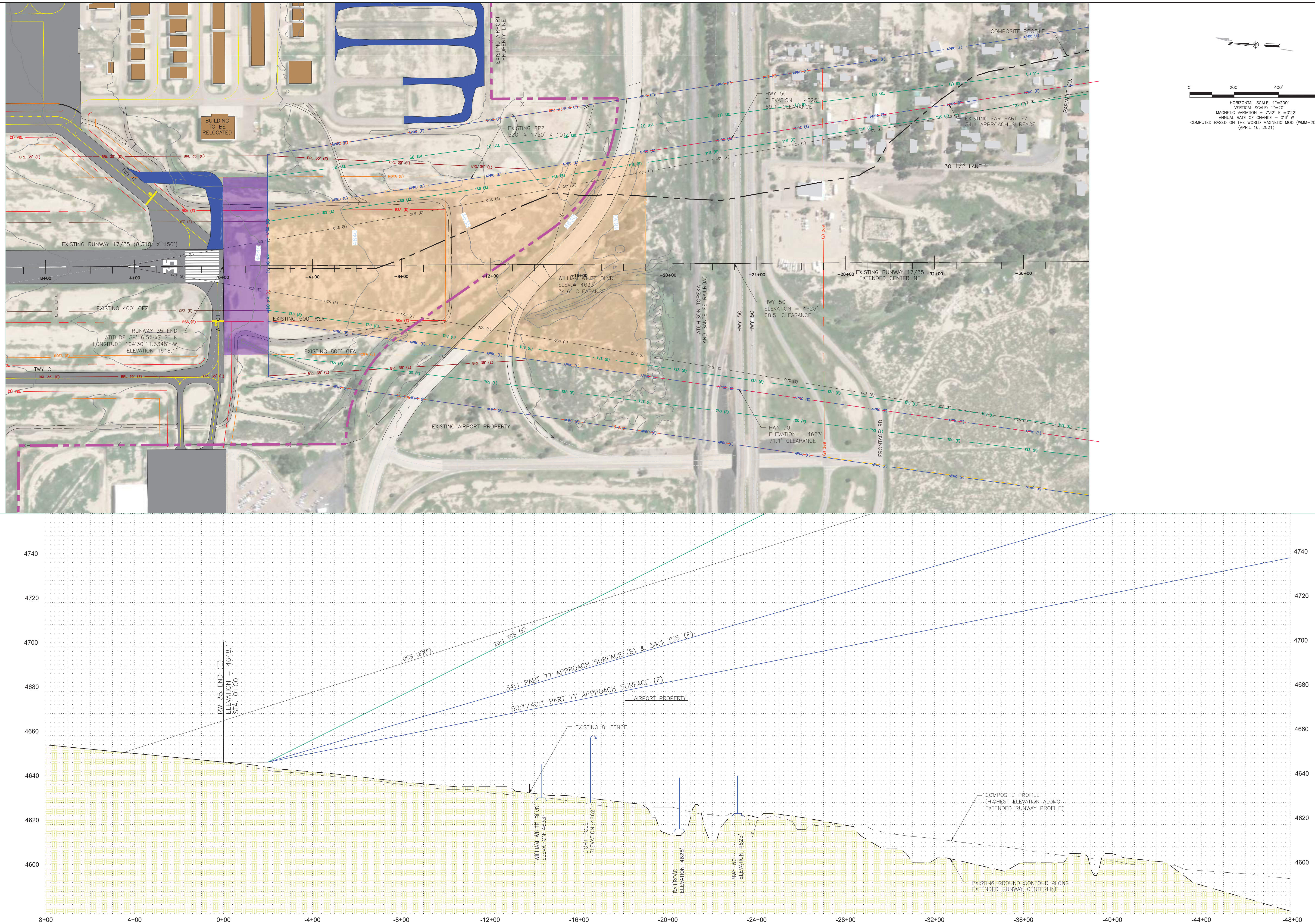

REV	DATE	DESCRIPTION

DIBBLE

DATE: XX
DESIGNED BY: VS
DRAWN BY: VS
REVIEWED BY: CM
FILE NAME: 19046_7-12_INNERAPPROACH

city of PUEBLO colorado

PUEBLO MEMORIAL AIRPORT

RUNWAY 35 EXISTING & FUTURE INNER APPROACH

SHEET 10 OF 23

DWG: K:\2019\019046_PUB_MP_Update\CAD\19046_7-12_InnerApproach.dwg
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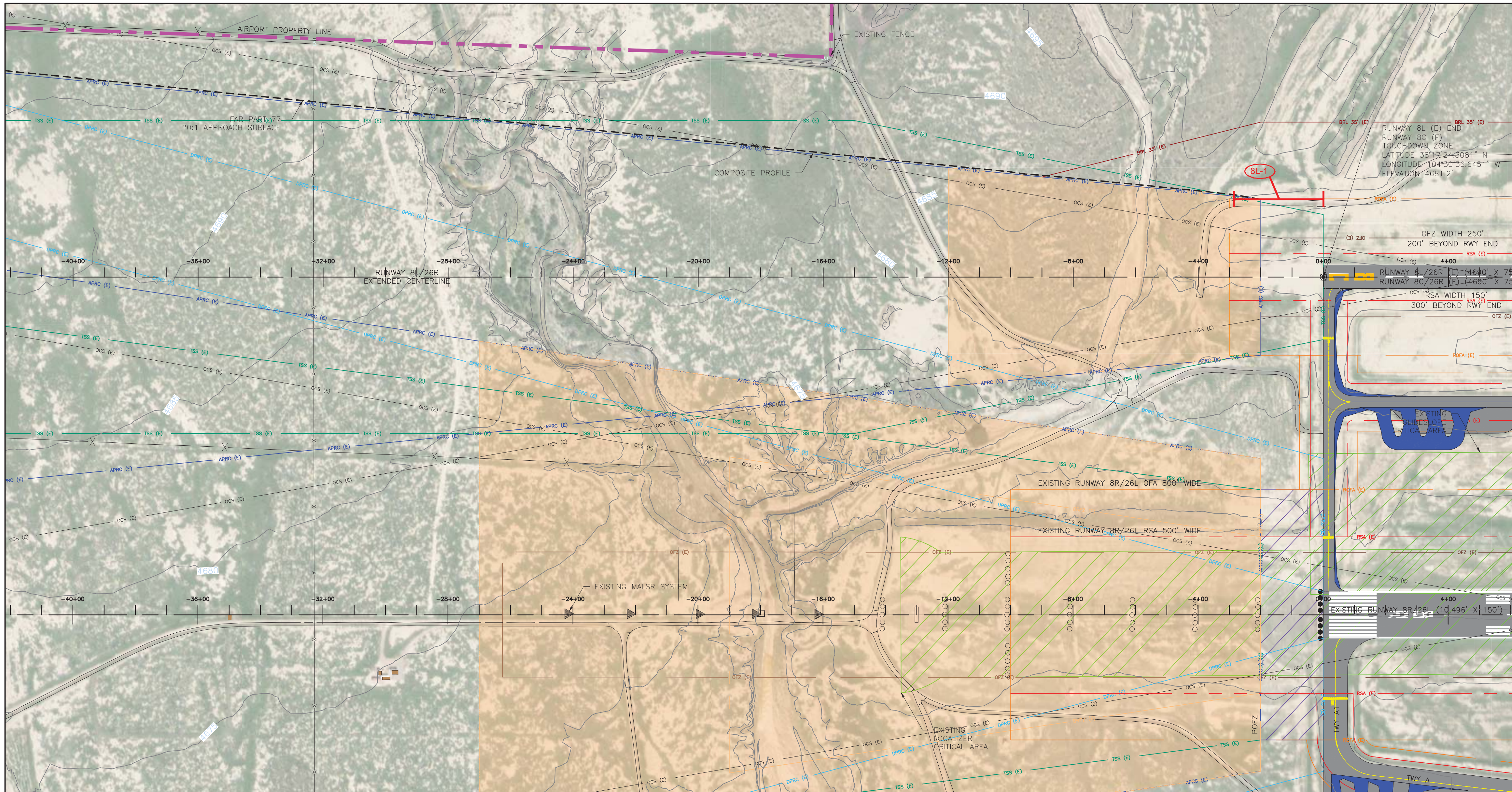

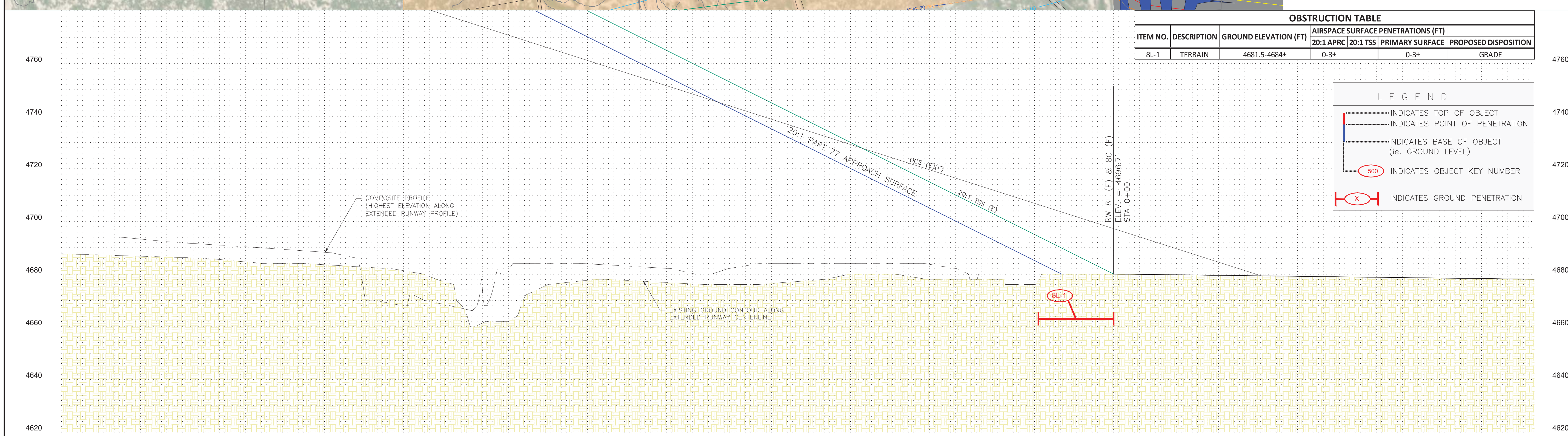

OBSTRUCTION TABLE

ITEM NO.	DESCRIPTION	GROUND ELEVATION (FT)	AIRSPACE SURFACE PENETRATIONS (FT)			
			20:1 APRC	20:1 TSS	PRIMARY SURFACE	PROPOSED DISPOSITION
8L-1	TERRAIN	4681.5-4684±	0-3±		0-3±	GRADE

LEGEND

- INDICATES TOP OF OBJECT
- INDICATES POINT OF PENETRATION
- INDICATES BASE OF OBJECT (ie. GROUND LEVEL)
- 500 INDICATES OBJECT KEY NUMBER
- X INDICATES GROUND PENETRATION

REV	DATE	DESCRIPTION

DIBBLE

DATE: XX
DESIGNED BY: VS
DRAWN BY: VS
REVIEWED BY: CM
FILE NAME: 19046_7-12_INNERAPPROACH

city of PUEBLO colorado

PUEBLO MEMORIAL AIRPORT

RUNWAY 8L (E) & 8C (F) EXISTING INNER APPROACH

SHEET 11 OF 23

DWG: K:\2019\1019046_PUB_MP_Update\CAD\19046_7-12_InnerApproach.dwg
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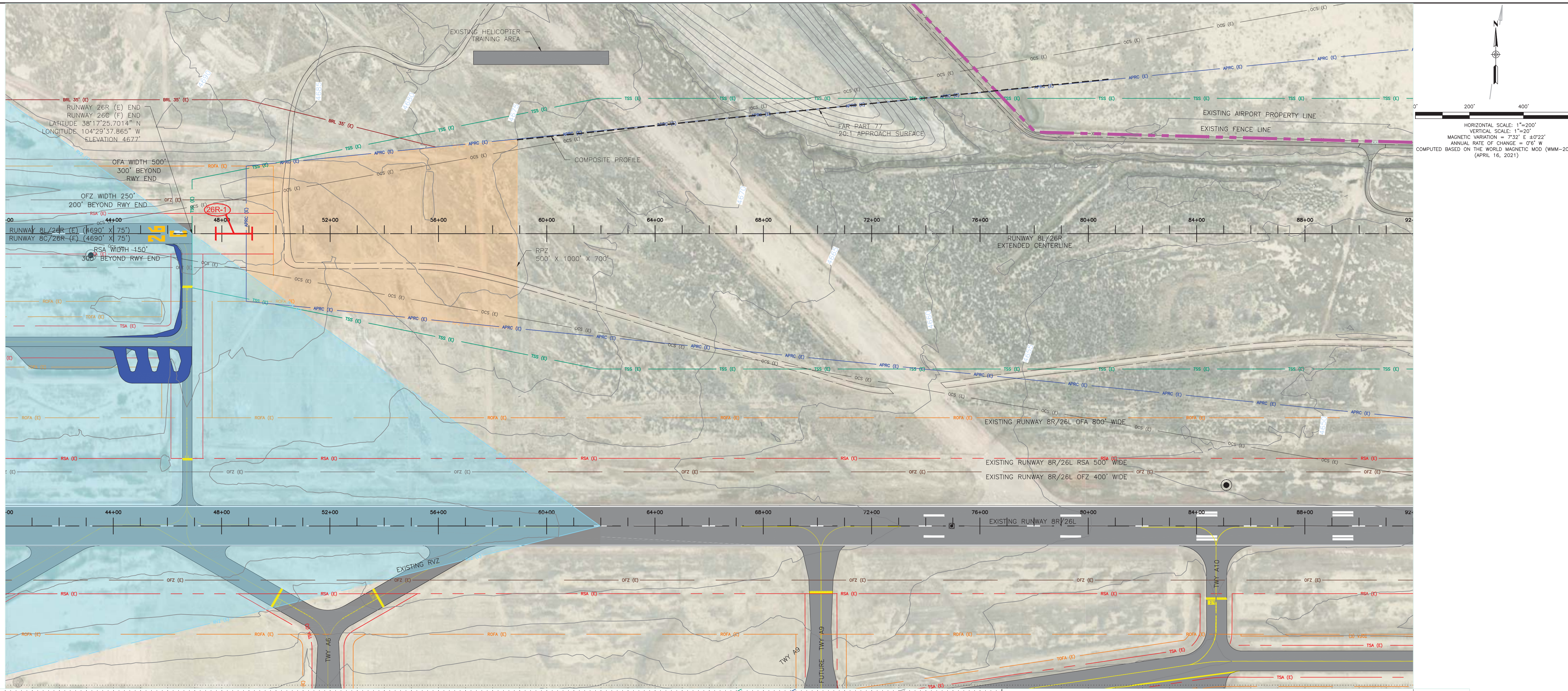


OBSTRUCTION TABLE

ITEM NO.	DESCRIPTION	GROUND ELEVATION (FT)	AIRSPACE SURFACE PENETRATIONS (FT)			PROPOSED DISPOSITION
			20:1 APRC	20:1 TSS	PRIMARY SURFACE	
26R-1	TERRAIN	4677-4678±	0-1±		0-1±	GRADE

DWG: K:\2019\1019046_PUB_MP_Update\CAD\19046_7-12_InnerApproach.dwg
DATE:10/05/21 TIME: 9:59am

REV | DATE | DESCRIPTION

DIBBLE

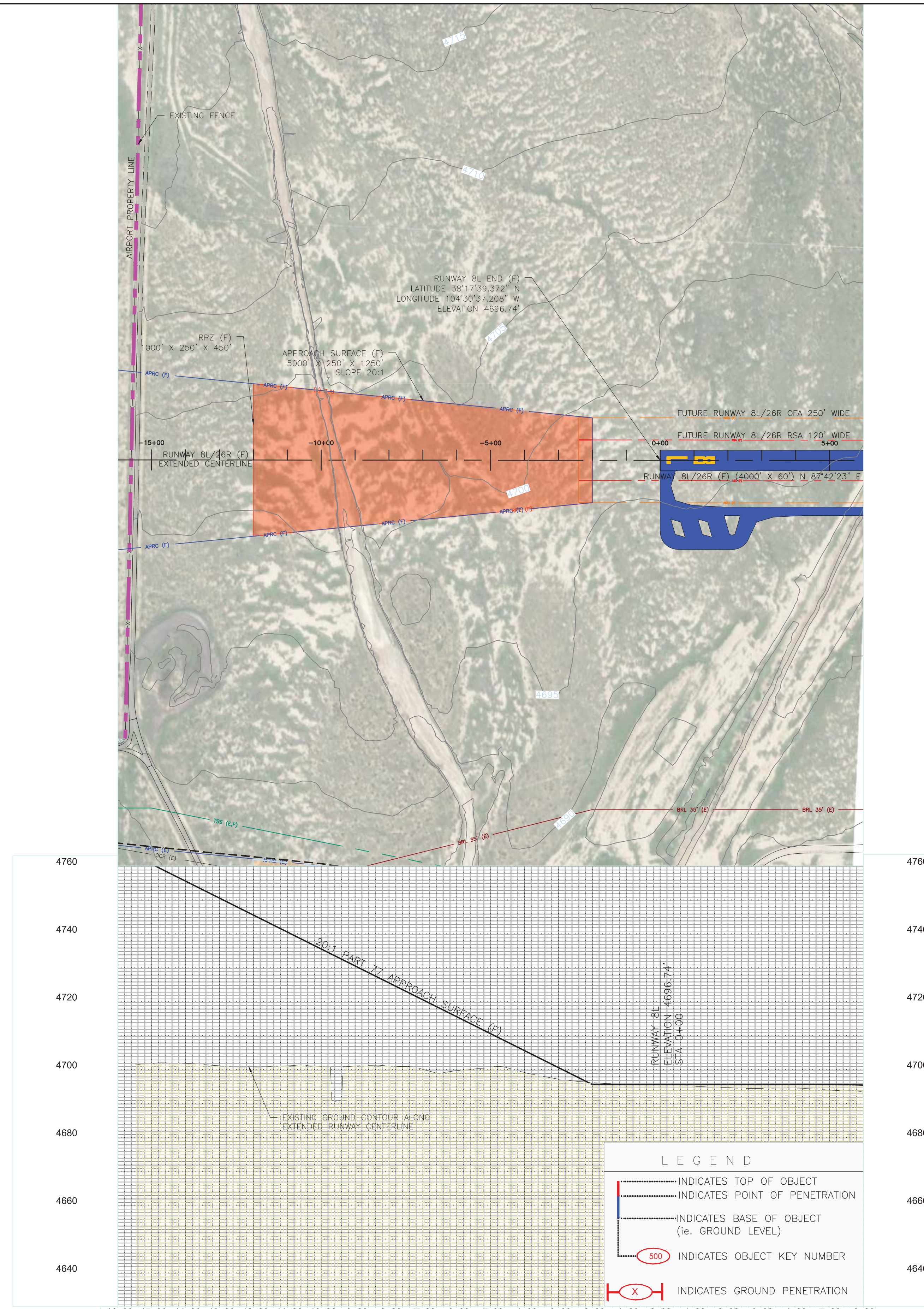
DATE: XX
DESIGNED BY: VS
DRAWN BY: VS
REVIEWED BY: CM
FILE NAME: 19046_7-12_INNERAPPROACH

city of PUEBLO colorado

PUEBLO MEMORIAL AIRPORT

RUNWAY 26R (E) & 26C (F) EXISTING INNER APPROACH

SHEET
12 OF 23



0' 200' 400' 600'

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'
MAGNETIC VARIATION = 7°32' E ±0°22'
ANNUAL RATE OF CHANGE = 0°6' W
COMPUTED BASED ON THE WORLD MAGNETIC MOD (WMM-2020)
(APRIL 16, 2021)

REV	DATE	DESCRIPTION

DIBBLE

city of PUEBLO colorado

DATE: XX
DESIGNED BY: VS
DRAWN BY: VS
REVIEWED BY: CM
FILE NAME: 19046_13-14_INNERAPPROACH

PUEBLO MEMORIAL AIRPORT

RUNWAY 8L FUTURE INNER APPROACH

SHEET
13 OF 23

DWG: K:\2019\1019046_PUB_MP_Update\CAD\19046_13-14_InnerApproach.dwg
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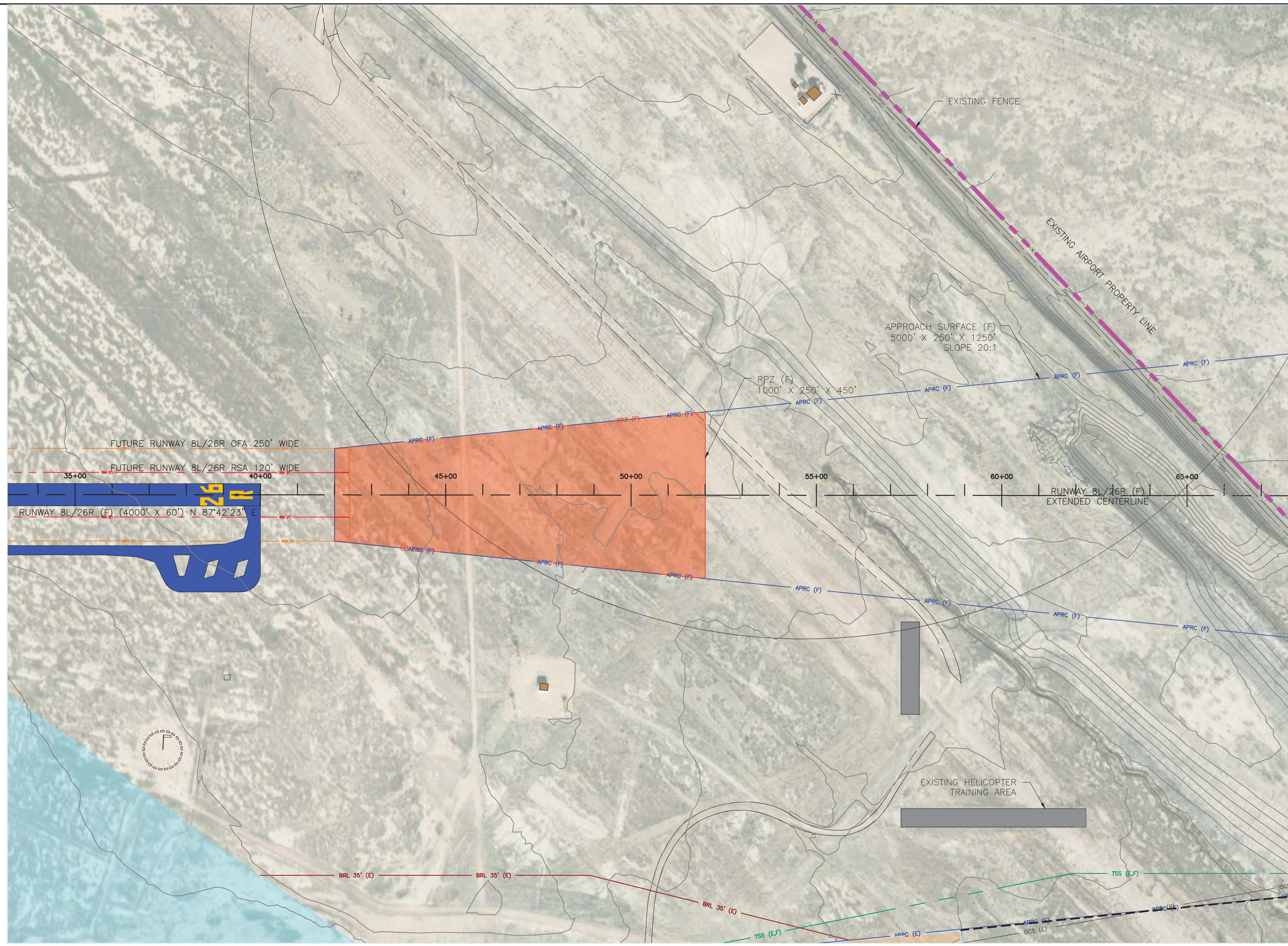

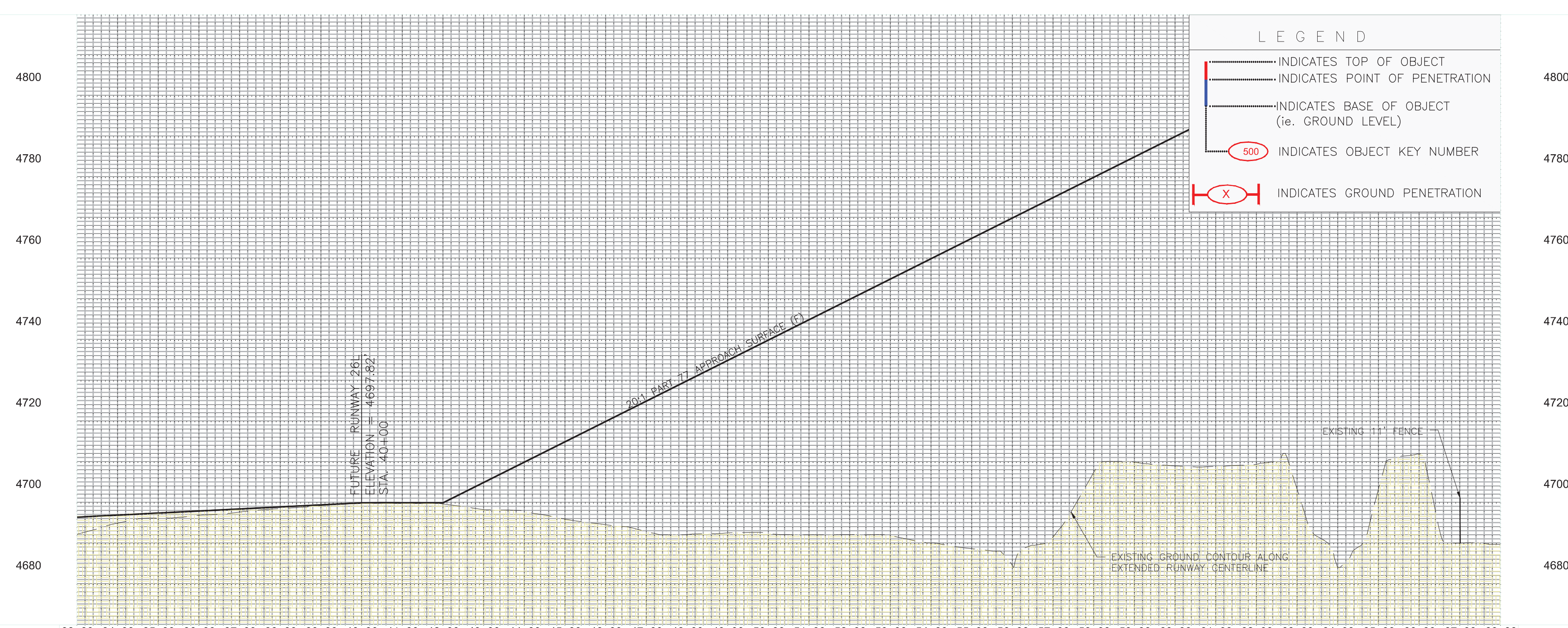

N

0' 200' 400' 600'

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'
MAGNETIC VARIATION = 7°32' E ±0°22'
ANNUAL RATE OF CHANGE = 0°6' W
COMPUTED BASED ON THE WORLD MAGNETIC MOD (WMM-2020)
(APRIL 16, 2021)

REV	DATE	DESCRIPTION

DIBBLE

DATE:	XX
DESIGNED BY:	VS
DRAWN BY:	VS
REVIEWED BY:	CM
FILE NAME:	19046_13-14_INNERAPPROACH

city of PUEBLO colorado

PUEBLO MEMORIAL AIRPORT

RUNWAY 26R FUTURE INNER APPROACH

SHEET
14 OF 23

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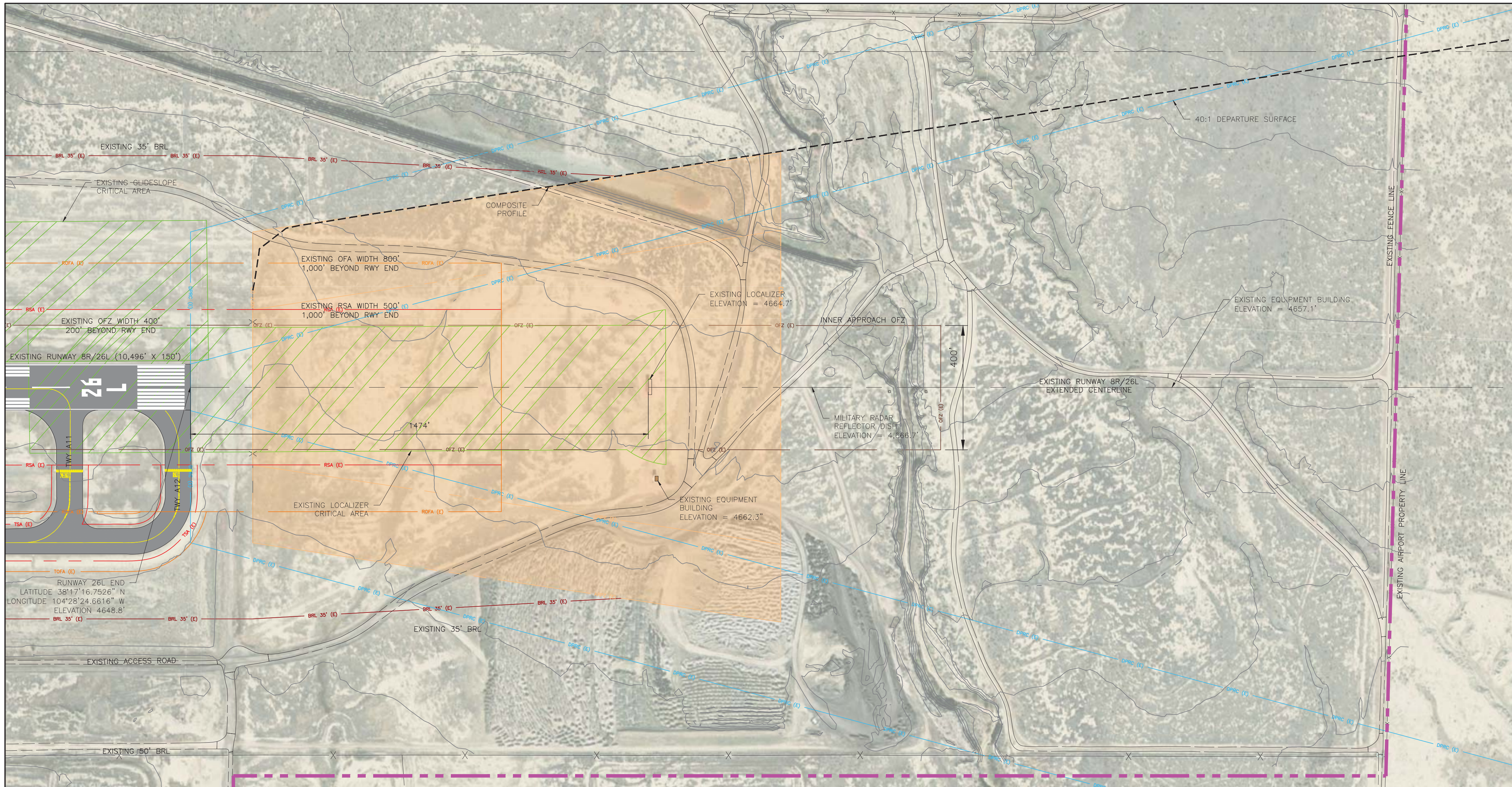

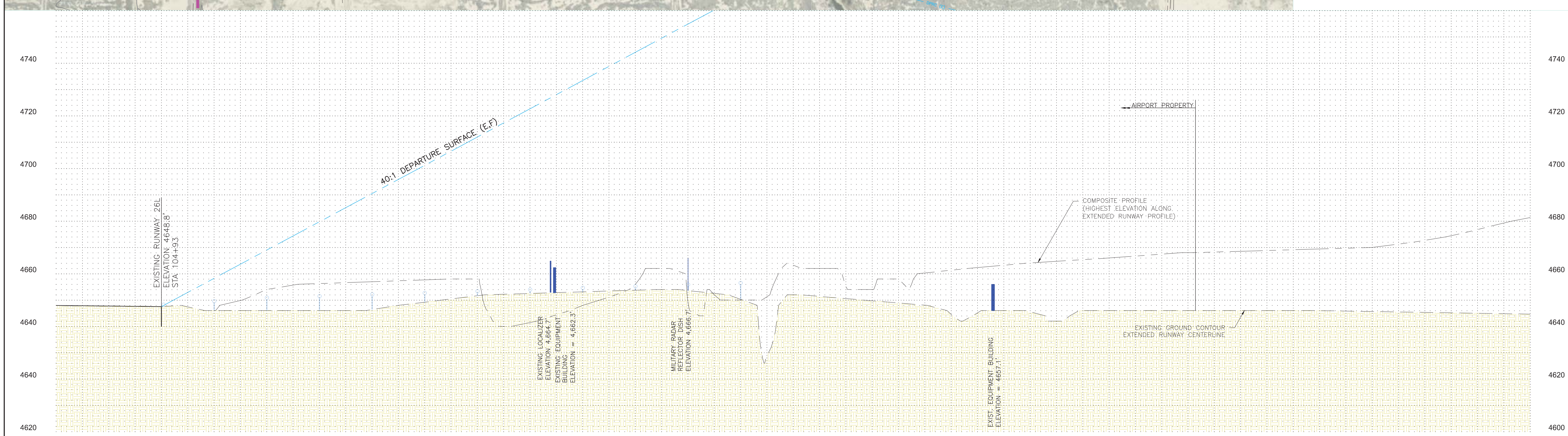

DESCRIPTION	DATE	REV

DIBBLE

DATE: XX
DESIGNED BY: VS
DRAWN BY: VS
REVIEWED BY: CM
FILE NAME: 19046_15-16_DEPARTURE

city of PUEBLO colorado

PUEBLO MEMORIAL AIRPORT

RUNWAY 8R DEPARTURE SURFACE

SHEET 15 OF 23

DWG: K:\2019\1019046_PUB_MP_Update\CAD\19046_15-16_Departure.dwg
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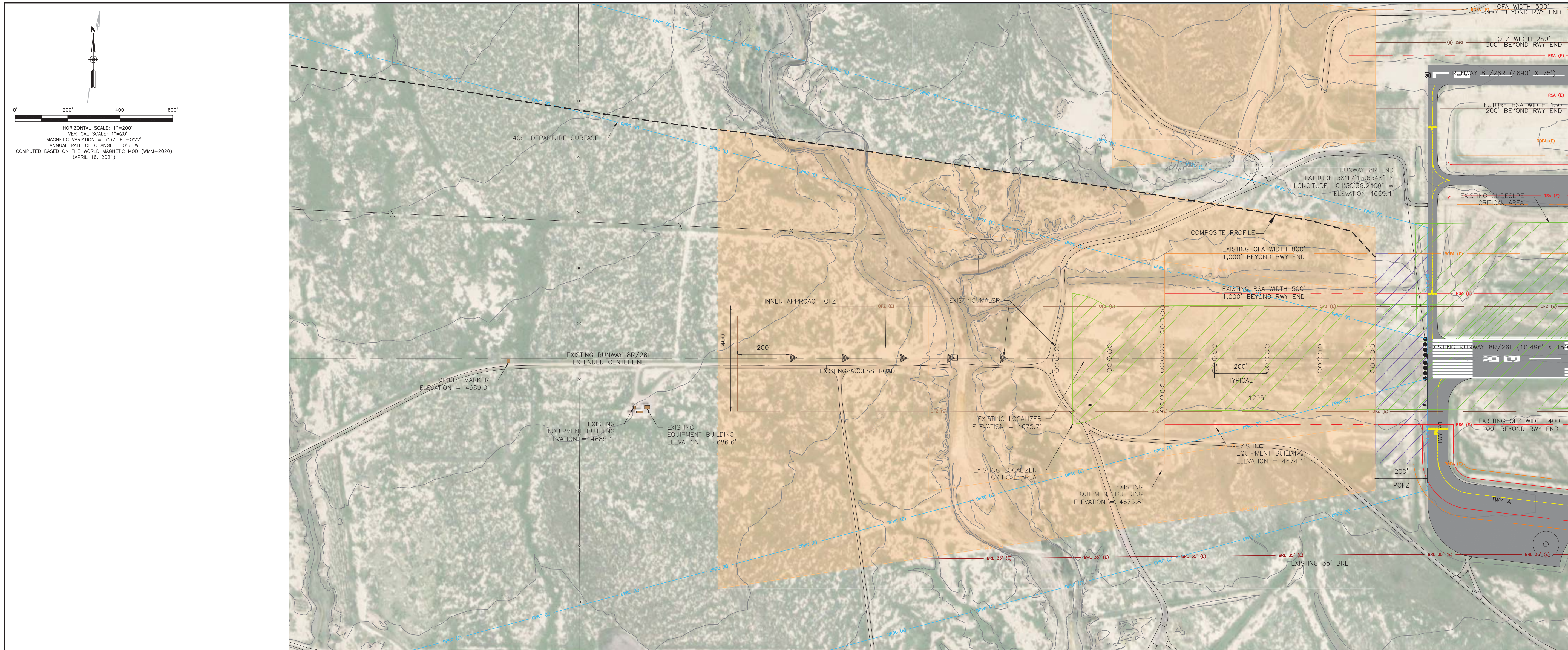

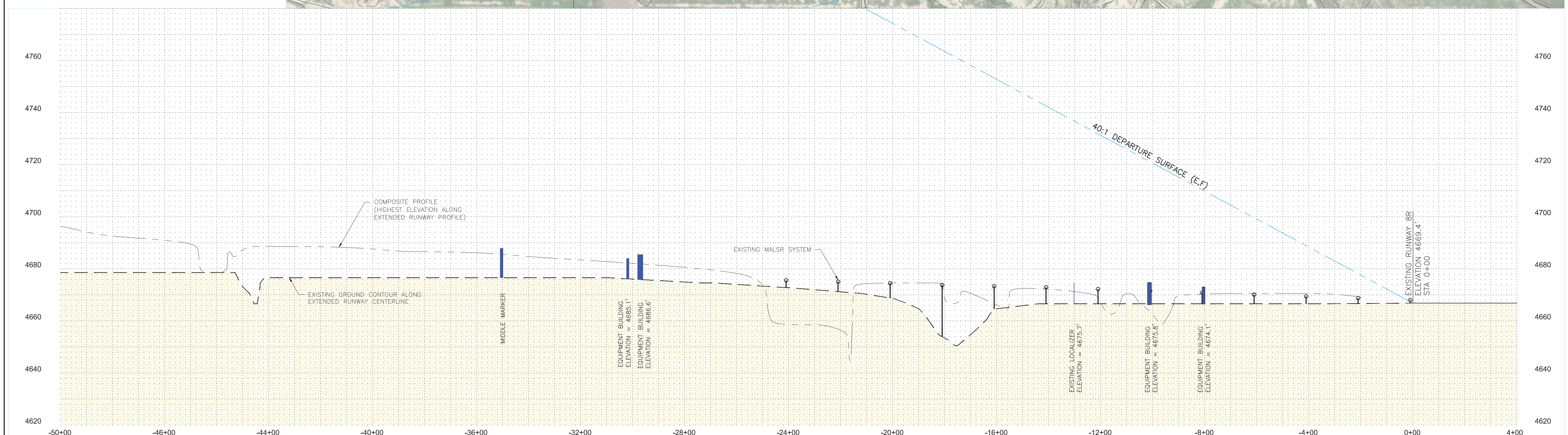

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DATE:10/05/21 TIME: 10:03am

REV	DATE	DESCRIPTION

DIBBLE

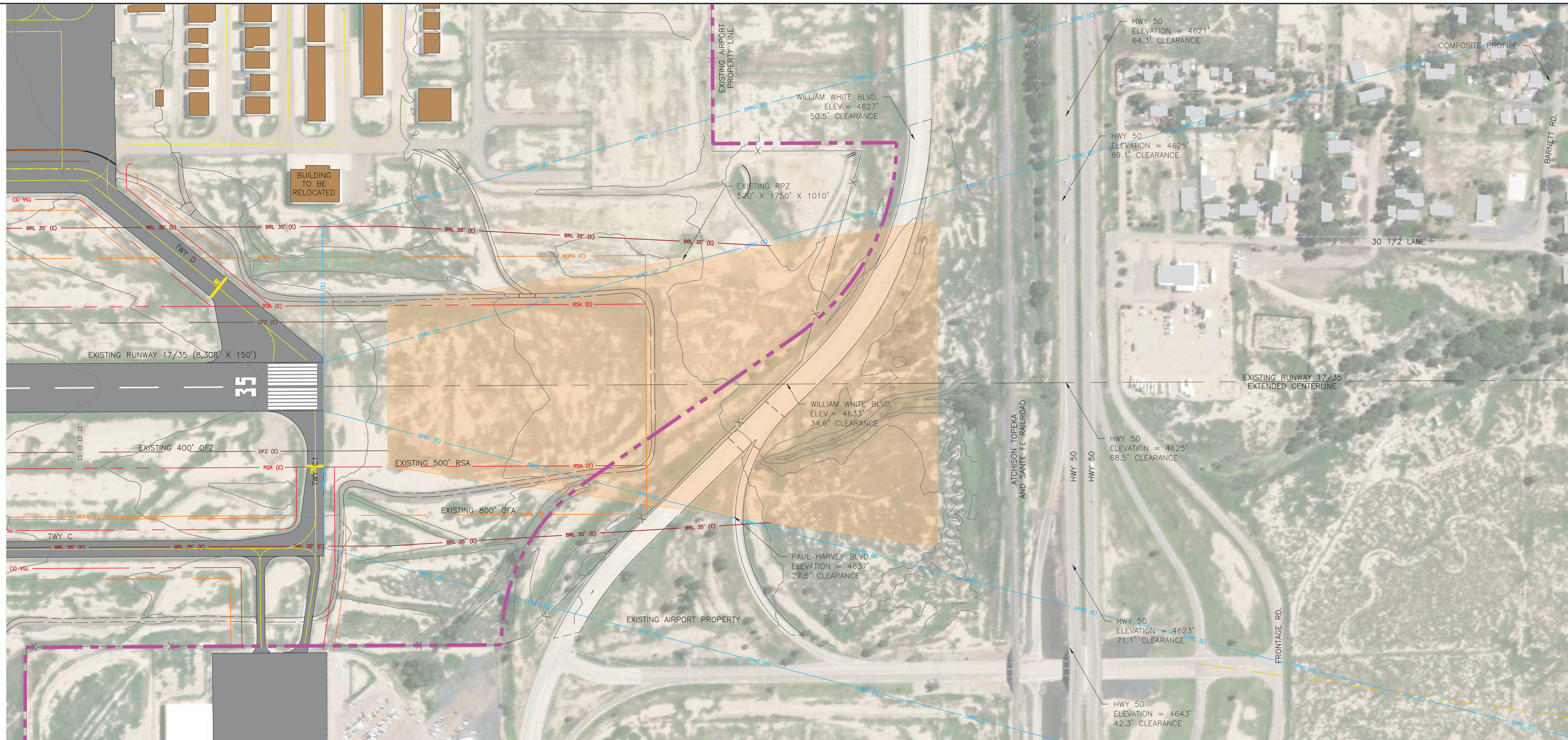
city of PUEBLO colorado

DATE: XX
DESIGNED BY: VS
DRAWN BY: VS
REVIEWED BY: CM
FILE NAME: 19046_15-16_DEPARTURE

PUEBLO MEMORIAL AIRPORT

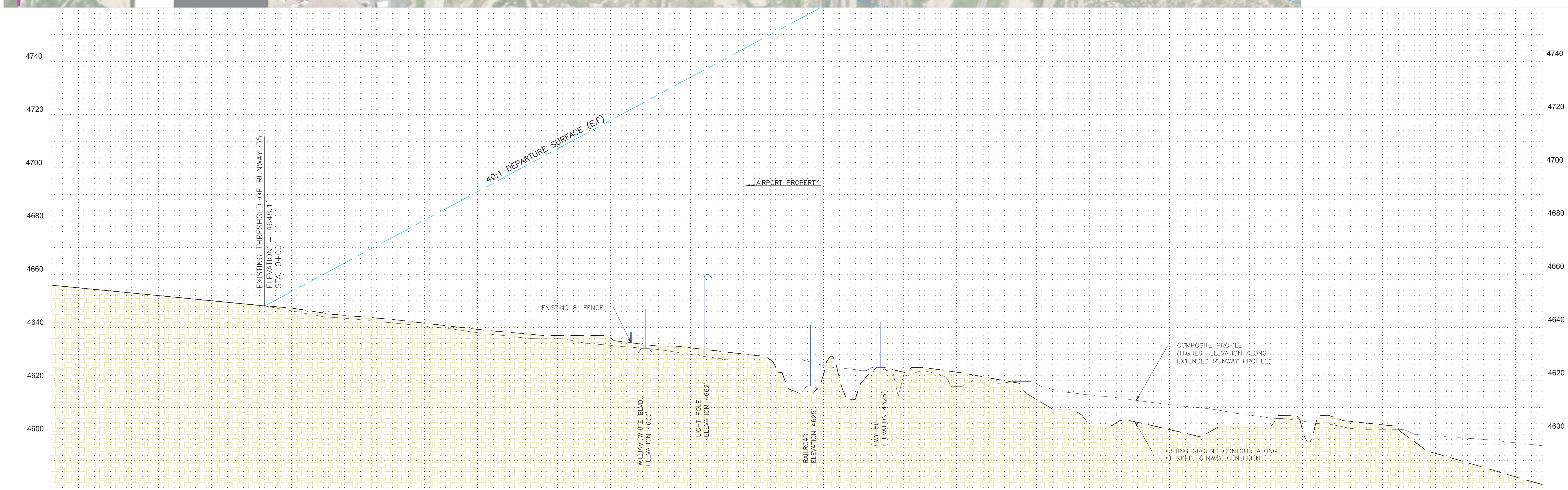
RUNWAY 26L DEPARTURE SURFACE

SHEET
16 OF 23



0' 200' 400' 600'

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'
MAGNETIC VARIATION = 7°32' E ±0°22'
ANNUAL RATE OF CHANGE = 0°6' W
COMPUTED BASED ON THE WORLD MAGNETIC MOD (WMM=2020)
(APRIL 16, 2021)



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REV	DATE	DESCRIPTION

DIBBLE

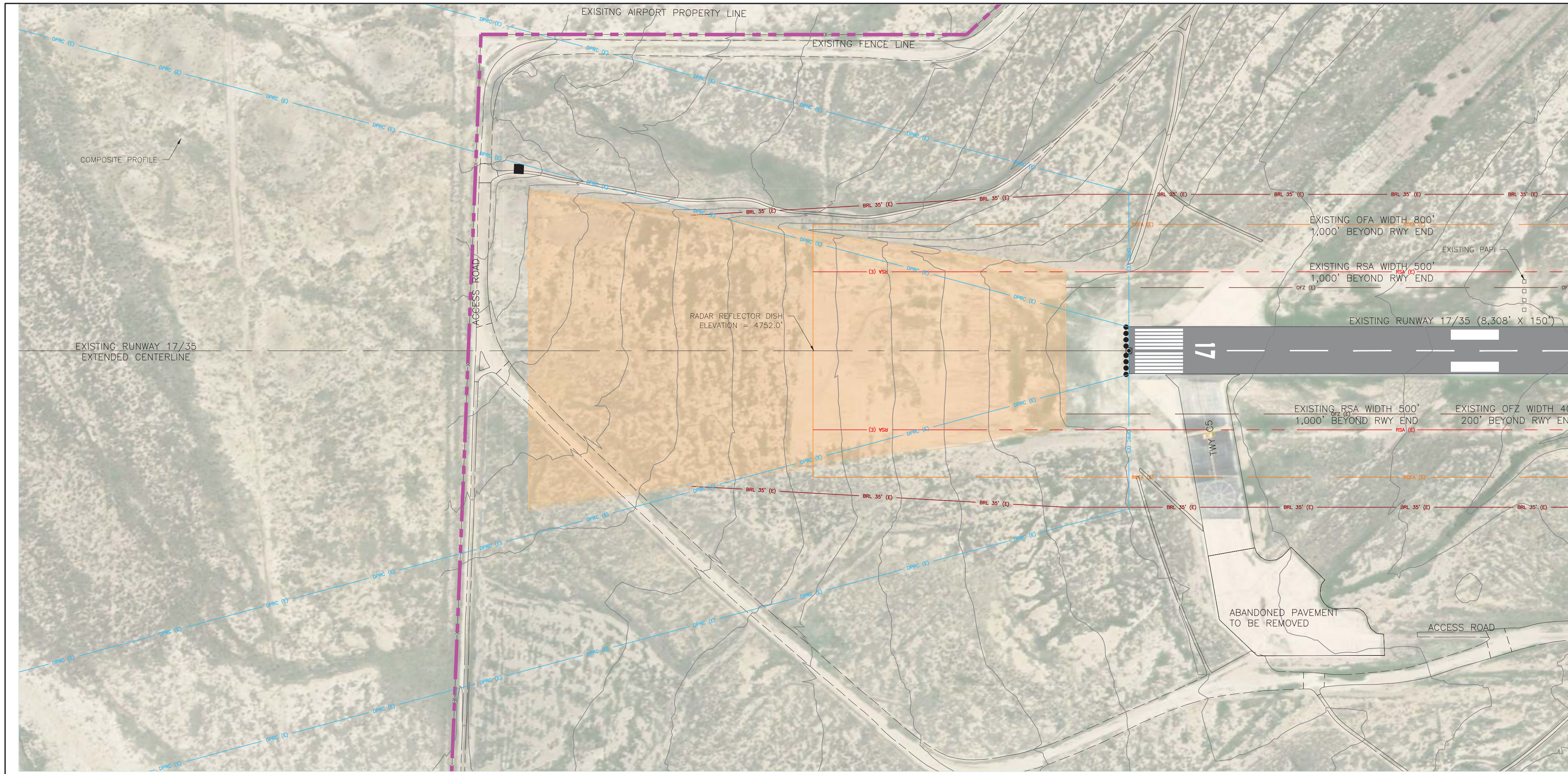
DATE:	XX
DESIGNED BY:	VS
DRAWN BY:	VS
REVIEWED BY:	CM
FILE NAME:	19046_17-18_DEPARTURE

city of PUEBLO colorado

PUEBLO MEMORIAL AIRPORT

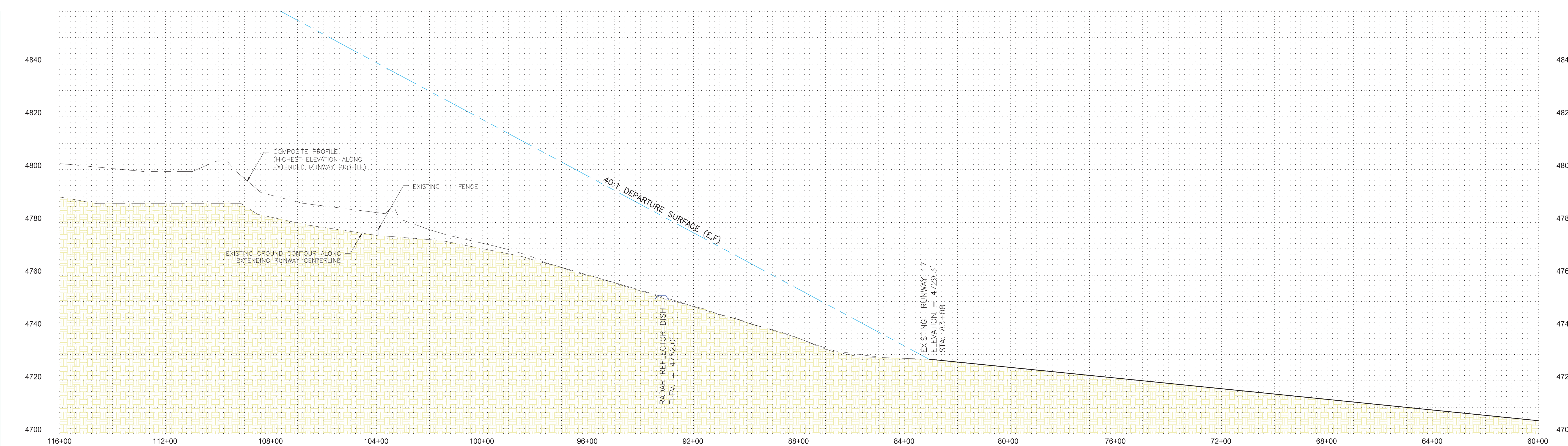
RUNWAY 17 DEPARTURE SURFACE

SHEET
17 OF 23



0' 200' 400' 600'

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'
MAGNETIC VARIATION = 7°32' E ±0°22'
ANNUAL RATE OF CHANGE = 0°6' W
COMPUTED BASED ON THE WORLD MAGNETIC MOD (WMM-2020)
(APRIL 16, 2021)



REV	DATE	DESCRIPTION

DIBBLE

DATE: XX
DESIGNED BY: VS
DRAWN BY: VS
REVIEWED BY: CM
FILE NAME: 19046_17-18_DEPARTURE

city of PUEBLO colorado

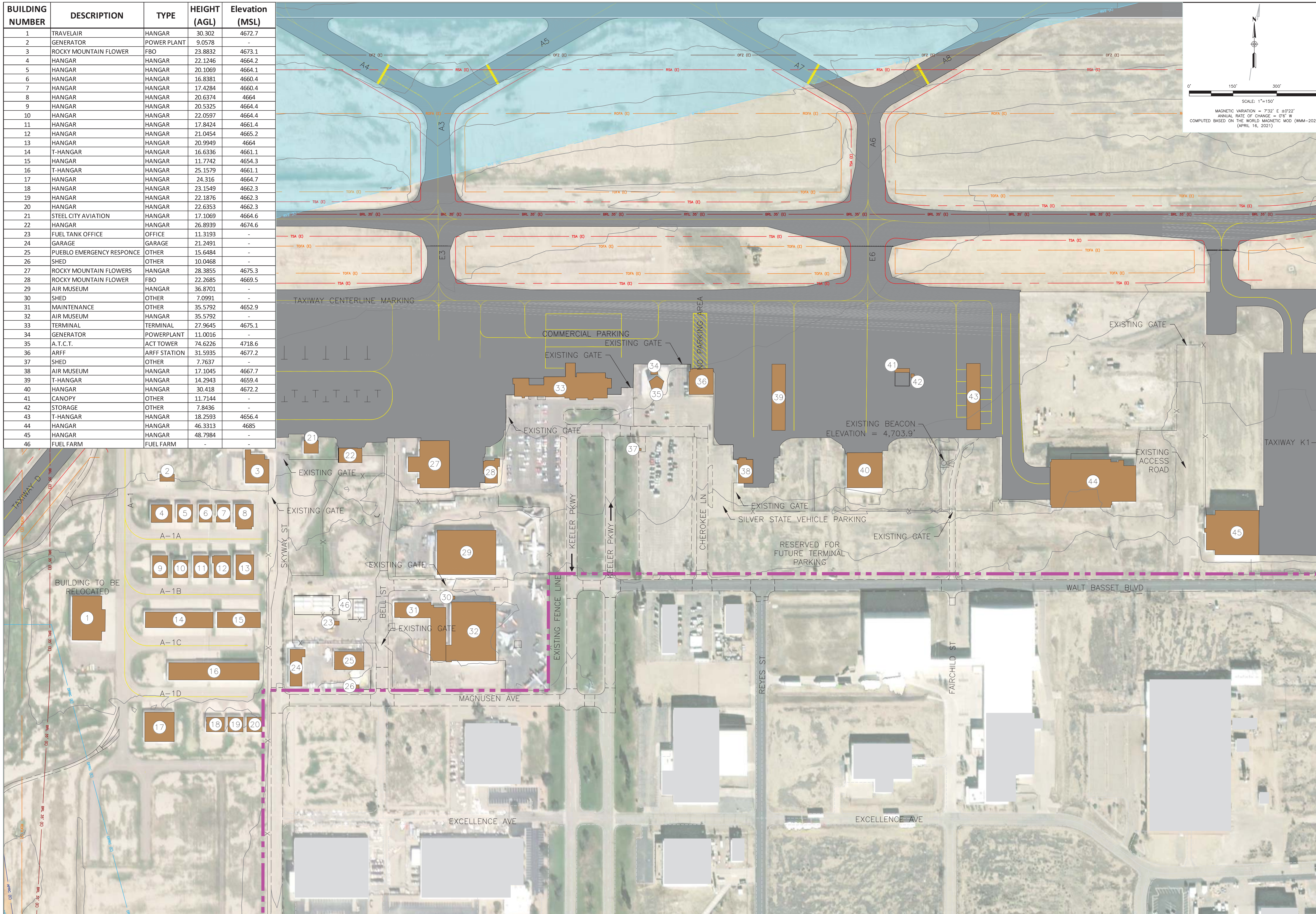
PUEBLO MEMORIAL AIRPORT

RUNWAY 35 DEPARTURE SURFACE

SHEET
18 OF 23

DWG: K:\2019\019046_PUB_MP_Update\CAD\19046_17-18_Departure.dwg
DATE:10/05/21 TIME: 10:05am

BUILDING NUMBER	DESCRIPTION	TYPE	HEIGHT (AGL)	Elevation (MSL)
1	TRAVELAIR	HANGAR	30.302	4672.7
2	GENERATOR	POWER PLANT	9.0578	-
3	ROCKY MOUNTAIN FLOWER	FBO	23.8832	4673.1
4	HANGAR	HANGAR	22.1246	4664.2
5	HANGAR	HANGAR	20.1069	4664.1
6	HANGAR	HANGAR	16.8381	4660.4
7	HANGAR	HANGAR	17.4284	4660.4
8	HANGAR	HANGAR	20.6374	4664
9	HANGAR	HANGAR	20.5325	4664.4
10	HANGAR	HANGAR	22.0597	4664.4
11	HANGAR	HANGAR	17.8424	4661.4
12	HANGAR	HANGAR	21.0454	4665.2
13	HANGAR	HANGAR	20.9949	4664
14	T-HANGAR	HANGAR	16.6336	4661.1
15	HANGAR	HANGAR	11.7742	4654.3
16	T-HANGAR	HANGAR	25.1579	4661.1
17	HANGAR	HANGAR	24.316	4664.7
18	HANGAR	HANGAR	23.1549	4662.3
19	HANGAR	HANGAR	22.1876	4662.3
20	HANGAR	HANGAR	22.6353	4662.3
21	STEEL CITY AVIATION	HANGAR	17.1069	4664.6
22	HANGAR	HANGAR	26.8939	4674.6
23	FUEL TANK OFFICE	OFFICE	11.3193	-
24	GARAGE	GARAGE	21.2491	-
25	PUEBLO EMERGENCY RESPONCE	OTHER	15.6484	-
26	SHED	OTHER	10.0468	-
27	ROCKY MOUNTAIN FLOWERS	HANGAR	28.3855	4675.3
28	ROCKY MOUNTAIN FLOWER	FBO	22.2685	4669.5
29	AIR MUSEUM	HANGAR	36.8701	-
30	SHED	OTHER	7.0991	-
31	MAINTENANCE	OTHER	35.5792	4652.9
32	AIR MUSEUM	HANGAR	35.5792	-
33	TERMINAL	TERMINAL	27.9645	4675.1
34	GENERATOR	POWERPLANT	11.0016	-
35	A.T.C.T.	ACT TOWER	74.6226	4718.6
36	ARFF	ARFF STATION	31.5935	4677.2
37	SHED	OTHER	7.7637	-
38	AIR MUSEUM	HANGAR	17.1045	4667.7
39	T-HANGAR	HANGAR	14.2943	4659.4
40	HANGAR	HANGAR	30.418	4672.2
41	CANOPY	OTHER	11.7144	-
42	STORAGE	OTHER	7.8436	-
43	T-HANGAR	HANGAR	18.2593	4656.4
44	HANGAR	HANGAR	46.3313	4685
45	HANGAR	HANGAR	48.7984	-
46	FUEL FARM	FUEL FARM	-	-



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REV	DATE	DESCRIPTION

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city of PUEBLO colorado

DATE: XX
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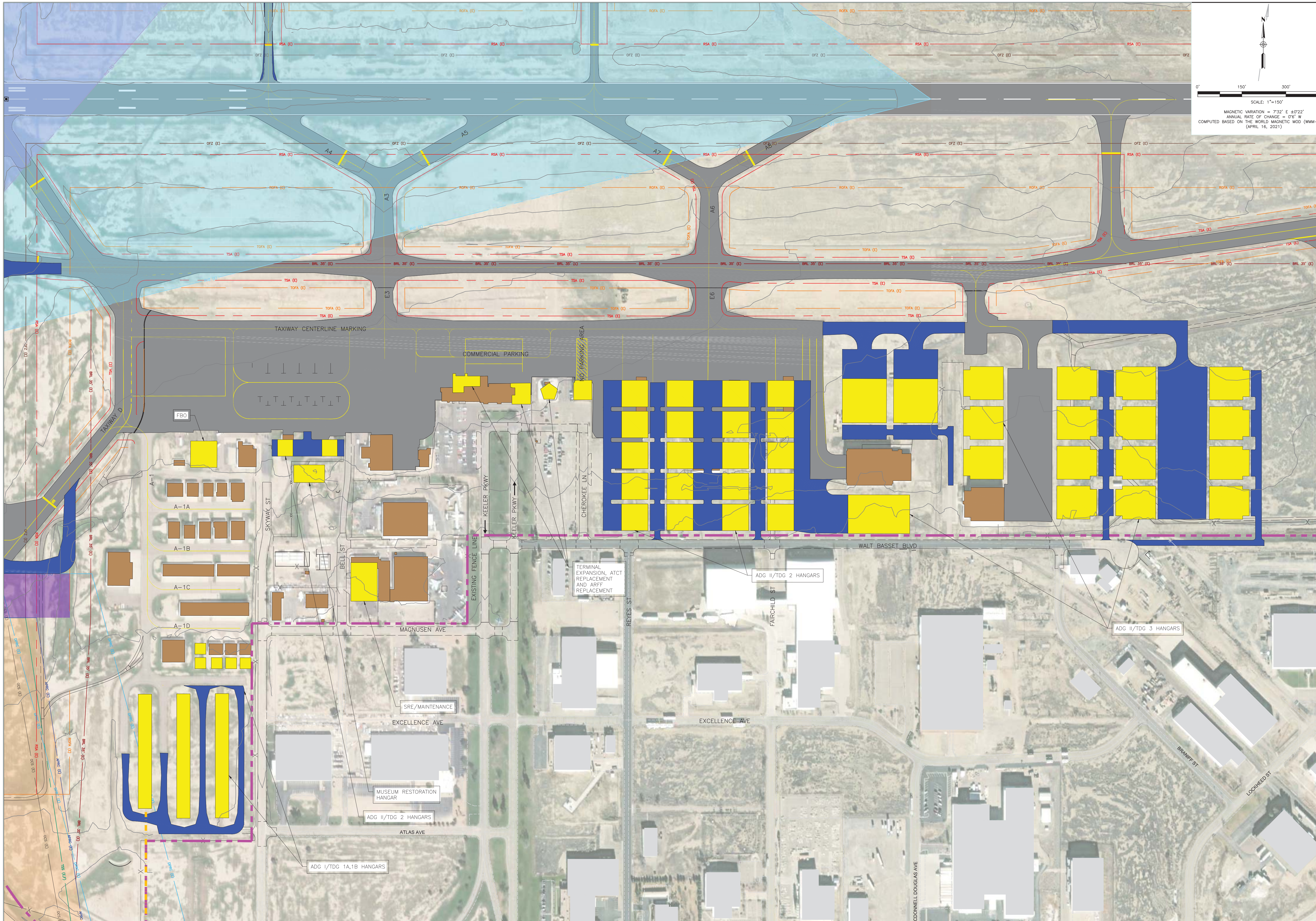
REVIEWED BY: CM
FILE NAME: 19046_19-20_TERMINALAREA

PUEBLO MEMORIAL AIRPORT

TERMINAL AREA - EXISTING

SHEET
19 OF 23



REV | DATE | DESCRIPTION

DIBBLE

city of PUEBLO colorado

DATE: XX
DESIGNED BY: VS
DRAWN BY: VS
REVIEWED BY: CM
FILE NAME: 19046_19-20_TERMINALAREA

PUEBLO MEMORIAL AIRPORT

TERMINAL AREA - FUTURE

SHEET 20 OF 23

DWG: K:\2019\019046_PUB_MP_Update\CAD\19046_19-20_TerminalArea.dwg
DATE:10/05/21 TIME: 11:01am

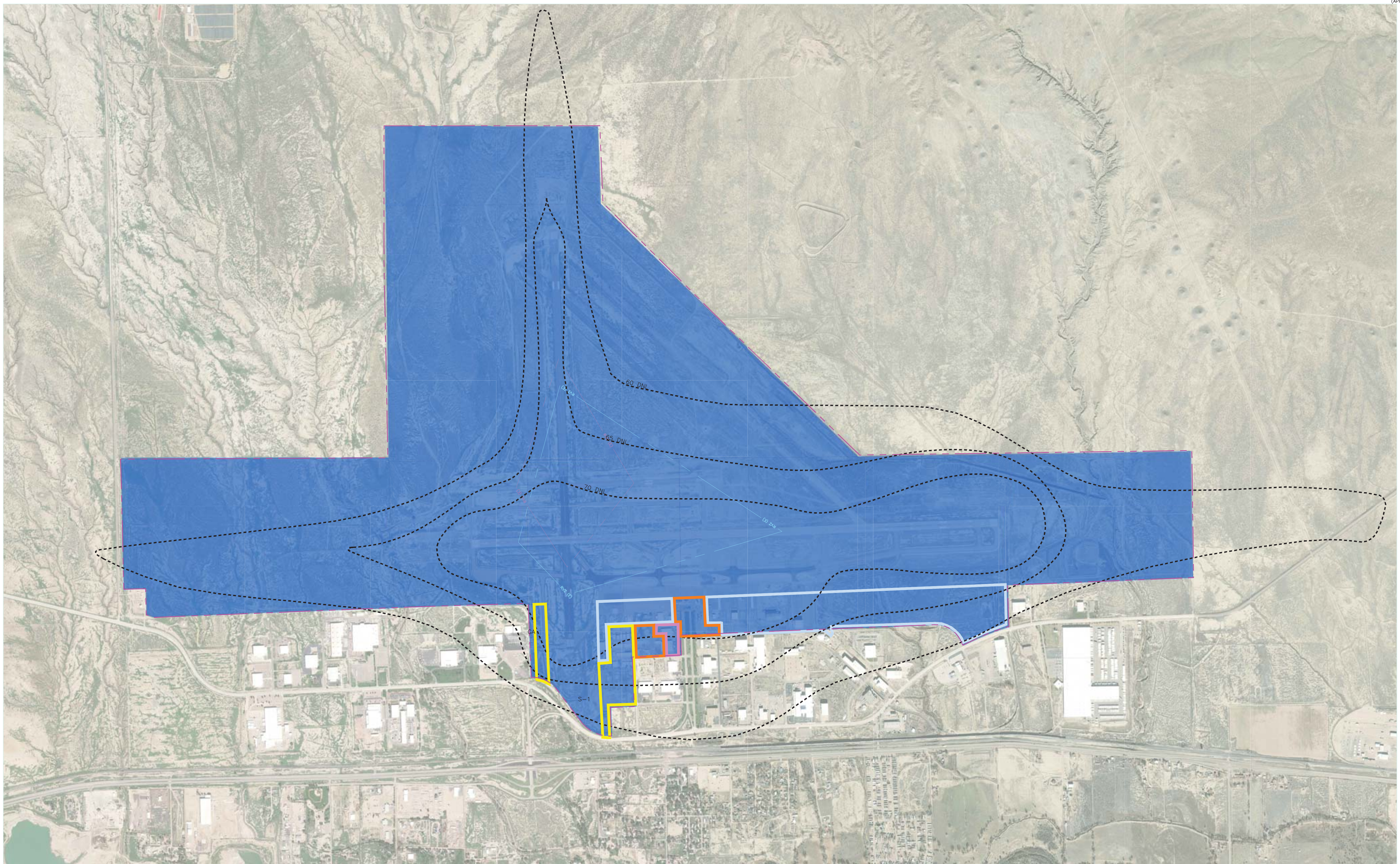
LEGEND - ON AIRPORT PROPERTY LAND USE

(light blue line)	GA COMMERCIAL (GENERAL AVIATION COMMERCIAL)
(yellow line)	GA (GENERAL AVIATION NON-COMMERCIAL)
(orange line)	TERM. (AIRPORT AND TERMINAL SUPPORT)
(pink line)	MUS. (MUSEUM)
(blue line)	S-1 (SPECIAL)
(dashed line)	DNL

0' 1000' 2000' 3000'

SCALE: 1"=1000'

MAGNETIC VARIATION = 7°32' E ±0°22'
ANNUAL RATE OF CHANGE = 0°6' W
COMPUTED BASED ON THE WORLD MAGNETIC MOD (WMM-2020)
(APRIL 16, 2021)



SOURCES
NOISE CONTOURS – Pueblo Memorial Airport Noise Contour Update; Barnard Dunkelberg and Company, Mestre Greve Associates, Isbill Associates, Inc., November 1996

DWG: K:\2019\1019046_PUB_MP_Update\CAD\19046_21-22_LandUse.dwg
DATE:10/05/21 TIME: 10:09am

REV	DATE	DESCRIPTION

DIBBLE

DATE:	XX
DESIGNED BY:	VS
DRAWN BY:	VS
REVIEWED BY:	CM
FILE NAME: 19046_21-22_LANDUSE	

city of PUEBLO colorado

PUEBLO MEMORIAL AIRPORT

LAND USE - ON AIRPORT

SHEET
21 OF 23

LEGEND - OFF AIRPORT PROPERTY LAND USE

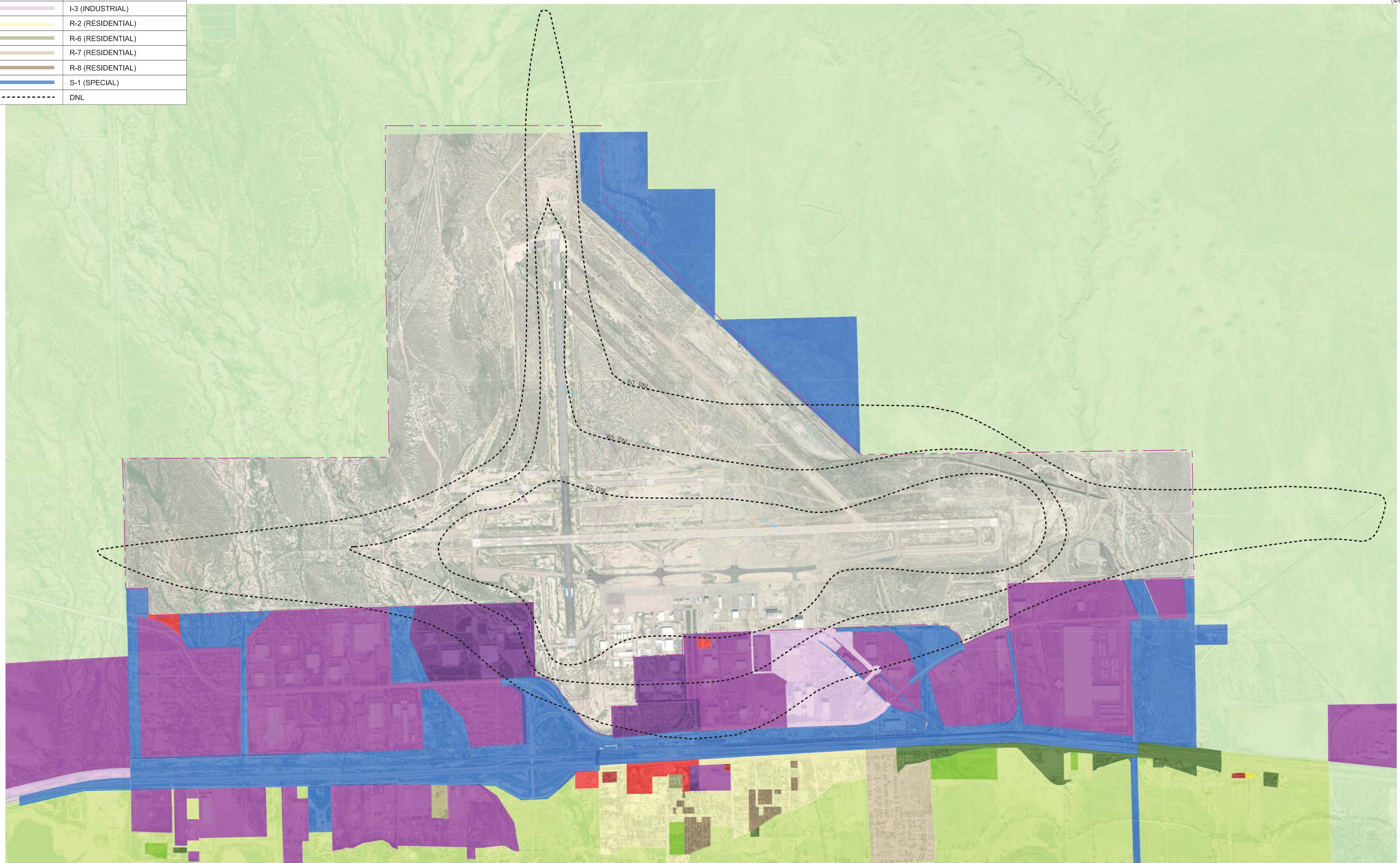
(swatch)	A-1 (AGRICULTURAL)
(swatch)	A-2 (AGRICULTURAL)
(swatch)	A-3 (AGRICULTURAL)
(swatch)	A-4 (AGRICULTURAL)
(swatch)	B-1 (BUSINESS)
(swatch)	B-4 (BUSINESS)
(swatch)	I-1 (INDUSTRIAL)
(swatch)	I-2 (INDUSTRIAL)
(swatch)	I-3 (INDUSTRIAL)
(swatch)	R-2 (RESIDENTIAL)
(swatch)	R-6 (RESIDENTIAL)
(swatch)	R-7 (RESIDENTIAL)
(swatch)	R-8 (RESIDENTIAL)
(swatch)	S-1 (SPECIAL)
----------	DNL

N

1000' 2000' 3000'

SCALE: 1"=1000'

MAGNETIC VARIATION = 7°32' E ±0°22'
ANNUAL RATE OF CHANGE = 0°6' W
COMPUTED BASED ON THE WORLD MAGNETIC MOD (WMM-2020)
(APRIL 16, 2021)



SOURCES
NOISE CONTOURS – Pueblo Memorial Airport Noise Contour Update; Barnard Dunkelberg and Company, Mestre Greve Associates, Isbill Associates, Inc., November 1996

DWG: K:\2019\1019046_PUB_MP_Update\CAD\19046_21-22_LandUse.dwg
DATE:10/05/21 TIME: 10:09am

REV	DATE	DESCRIPTION

DIBBLE

DATE:	XX
DESIGNED BY:	VS
DRAWN BY:	VS
REVIEWED BY:	CM
FILE NAME: 19046_21-22_LANDUSE	

city of PUEBLO colorado

PUEBLO MEMORIAL AIRPORT

LAND USE - OFF AIRPORT

SHEET
22 OF 23

LEGEND

EXISTING	FUTURE	DESCRIPTION
		AIRPORT PROPERTY LINE
		RUNWAY SAFETY AREA (RSA)
		RUNWAY PROTECTION ZONE (RPZ)
		RUNWAY OBJECT FREE AREA (ROFA)

EXISTING AIRPORT PROPERTY DATA

NO.	PARCEL	GRANTOR	OWNER	± Acres	DATE RECORDED	CONVEYANCE INSTRUMENT	TYPE OF INTEREST	LIBER/BOOK AND PAGE	PURPOSE FOR ACQUISITION	FAA PARTICIPATION
I	0426000015, 0425000037, 0400000033, 0400000088, 0300000003, 0330000084, 0300000021	UNITED STATES OF AMERICA	CITY OF PUEBLO	2107.7	JULY 20, 1948	QUITCLAIM DEED	FEE	1074 @ 87	AERONAUTICAL USE	
II	400000131	JOHN H. THATCHER	CITY OF PUEBLO	160	MAY 19, 1972	QUITCLAIM DEED	FEE	1718 @ 96	AERONAUTICAL USE	
III	300000021	JOHN H. THATCHER	CITY OF PUEBLO	40	MAY 19, 1972	QUITCLAIM DEED	FEE	1718 @ 96	AERONAUTICAL USE	
H	425004011	CITY OF PUEBLO	CITY OF PUEBLO	238.14	OCTOBER 11, 1995	SUBDIVISION PLAT	FEE	2836 @ 665	AERONAUTICAL USE	

PROPERTY TO BE ACQUIRED

NO.	PARCEL	CURRENT OWNER (GRANTEE)	INTEREST	± Acres	PURPOSE
1	425000003	CARL ANTHONY MASSET	FEE	0.6	TO BE PURCHASED FOR RWY 17/35 PRECISION APPROACH
2	425000016	LARRY E & JACQUELINE MINKLER	FEE	4	TO BE PURCHASED FOR RWY 17/35 PRECISION APPROACH
3	425000033	BAXTER ONE TEN LLC	FEE	1.6	TO BE PURCHASED FOR RWY 17/35 PRECISION APPROACH
4	425000007	3JCLARKHOMES, LLC	FEE	0.4	TO BE PURCHASED FOR RWY 17/35 PRECISION APPROACH
5	425000006	GREG RIGGERT	FEE	0.2	TO BE PURCHASED FOR RWY 17/35 PRECISION APPROACH

RELEASED AIRPORT PROPERTY

NO.	± Acres	TYPE OF INTEREST	OWNER	LIBER/BOOK AND PAGE	DATE RECORDED
IV	54	RELEASED BY RESOLUTION NO. 2887	JOHN THATCHER	1717 @ 816	MAY 17, 1972
V	57.8	RELEASED BY RESOLUTION NO. 2887	JOHN THATCHER	1717 @ 816	MAY 17, 1972
VI	80.4	RELEASED BY RESOLUTION NO. 2887	JOHN THATCHER	1717 @ 816	MAY 17, 1972
VII	10	RELEASED BY RESOLUTION NO. 2887	JOHN THATCHER	1717 @ 816	MAY 17, 1972

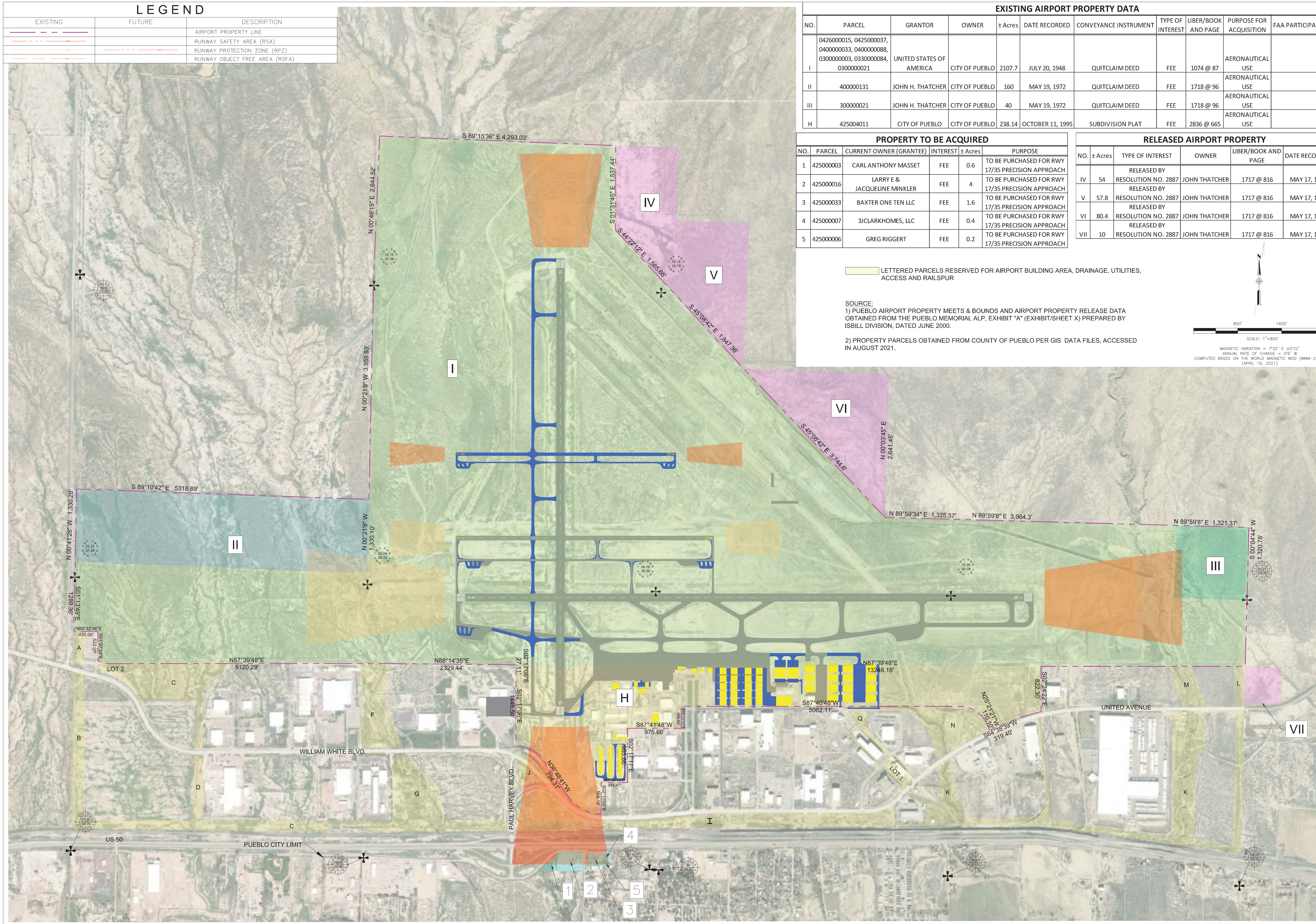
LETTERED PARCELS RESERVED FOR AIRPORT BUILDING AREA, DRAINAGE, UTILITIES, ACCESS AND RAILSPUR

SOURCE:
1) PUEBLO AIRPORT PROPERTY MEETS & BOUNDS AND AIRPORT PROPERTY RELEASE DATA OBTAINED FROM THE PUEBLO MEMORIAL ALP, EXHIBIT "A" (EXHIBIT/SHEET X) PREPARED BY ISBILL DIVISION, DATED JUNE 2000.

2) PROPERTY PARCELS OBTAINED FROM COUNTY OF PUEBLO PER GIS DATA FILES, ACCESSED IN AUGUST 2021.

SCALE: 1"=800'

MAGNETIC VARIATION = 7°32' E ±0°22'
ANNUAL RATE OF CHANGE = 0°6' W
COMPUTED BASED ON THE WORLD MAGNETIC MOD (WMM-2020) (APRIL 16, 2021)



DIBBLE

city of PUEBLO colorado

DATE:	XX
DESIGNED BY:	VS
DRAWN BY:	VS
REVIEWED BY:	CM
FILE NAME:	19046_23_EXHIBITA

DESCRIPTION	DATE	REV

PUEBLO MEMORIAL AIRPORT

EXHIBIT A - AIRPORT PROPERTY MAP

SHEET 23 OF 23

DWG: K:\2019\019046_PUB_MP_Update\CAD\19046_23_ExhibitA.dwg
DATE:10/05/21 TIME: 11:02am

Appendices

Appendix H. Pro Forma Analysis

Account Activity	Historical		Forecasted					
Passenger Airline Aeronautical Revenue	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**
Passenger airline landing fees	$ 44,221	$ 35,569	$ 35,996	$ 36,428	$ 36,865	$ 37,307	$ 37,755	$ 38,208
Terminal arrival fees - rents - utilities	$ 23,889	$ 21,941	$ 22,204	$ 22,471	$ 22,740	$ 23,013	$ 23,289	$ 23,569
Terminal area apron charges/tiedowns	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Federal Inspection Fees	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Other passenger aeronautical fees	$ -	$ 24,476	$ 24,770	$ 25,067	$ 25,368	$ 25,672	$ 25,980	$ 26,292
Total Passenger Airline Aeronautical Revenue	$ 68,110	$ 81,986	$ 82,970	$ 83,965	$ 84,973	$ 85,993	$ 87,025	$ 88,069
Non-Passenger Aeronautical Revenue	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**
Landing fees from cargo	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Landing fees from GA and military	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
FBO revenue - contract or sponsor-operatec	$ 53,912	$ 86,921	$ 87,877	$ 88,844	$ 89,821	$ 90,809	$ 91,808	$ 92,818
Cargo and hangar rentals	$ 68,109	$ 60,513	$ 61,481	$ 62,465	$ 63,464	$ 64,480	$ 65,511	$ 66,560
Aviation fuel tax retained for airport use	$ 98,648	$ 76,990	$ 78,530	$ 80,100	$ 81,702	$ 83,336	$ 85,003	$ 86,703
Fuel sales net profit/loss or fuel flowage fees	$ 128,207	$ 105,662	$ 106,824	$ 107,999	$ 109,187	$ 110,388	$ 111,603	$ 112,830
Security reimbursement from Federal Government	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Other non-passenger aeronautical revenue	$ 88,217	$ 86,992	$ 88,732	$ 90,506	$ 92,317	$ 94,163	$ 96,046	$ 97,967
Total Non-Passenger Aeronautical Revenue	$ 437,093	$ 417,078	$ 423,444	$ 429,915	$ 436,492	$ 443,177	$ 449,971	$ 456,878
Total Aeronautical Revenue	$ 505,203	$ 499,064	$ 506,414	$ 513,880	$ 521,465	$ 529,169	$ 536,996	$ 544,947
Non-Aeronautical Revenue	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**
Land and non-terminal facility leases and revenues	$ 31,210	$ 39,142	$ 39,925	$ 40,723	$ 41,538	$ 42,369	$ 43,216	$ 44,080
Terminal-food and beverage	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Terminal-retail stores and duty free	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Terminal-services and other	$ 25,833	$ 39,833	$ 40,311	$ 40,795	$ 41,284	$ 41,780	$ 42,281	$ 42,788
Rental cars-excludes customer facility charges	$ 6,366	$ 3,910	$ 3,957	$ 4,004	$ 4,052	$ 4,101	$ 4,150	$ 4,200
Parking and ground transportation	$ 2,400	$ 2,100	$ 2,125	$ 2,151	$ 2,177	$ 2,203	$ 2,229	$ 2,256
Hotel	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Other Non-Aeronautical Revenue (Subtotals below)	$ 13,018	$ 254,153	$ 259,236	$ 264,421	$ 269,709	$ 275,103	$ 280,605	$ 286,218
Security Badge Fees	$ 4,395	$ 4,420						
Penalties	$ 1,217	$ 2,872						
Misc Revenue		$ 246,861						
Total Non-Aeronautical Revenue	$ 78,827	$ 339,138	$ 345,554	$ 352,094	$ 358,760	$ 365,555	$ 372,482	$ 379,542
Total Operating Revenue	$ 584,030	$ 838,202	$ 851,968	$ 865,974	$ 880,225	$ 894,725	$ 909,478	$ 924,489
Operating Expenses	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**
Personnel compensation and benefits	$ 688,995	$ 950,810	$ 969,826	$ 989,223	$ 1,009,007	$ 1,029,187	$ 1,049,771	$ 1,070,766
Communications and utilities	$ 398,448	$ 375,737	$ 383,252	$ 390,917	$ 398,735	$ 406,710	$ 414,844	$ 423,141
Supplies and materials	$ 255,480	$ 764,944	$ 780,243	$ 795,848	$ 811,765	$ 828,000	$ 844,560	$ 861,451
Contractual services	$ 601,121	$ 828,810	$ 845,386	$ 862,294	$ 879,540	$ 897,131	$ 915,073	$ 933,375
Insurance claims and settlements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Other Operating Expenses	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Subtotal - Operating Expenses	$ 1,944,044	$ 2,920,301	$ 2,978,707	$ 3,038,281	$ 3,099,047	$ 3,161,028	$ 3,224,248	$ 3,288,733
Depreciation	$ 1,696,592	$ 1,727,288	$ 1,761,834	$ 1,797,070	$ 1,833,012	$ 1,869,672	$ 1,907,066	$ 1,945,207
Total Operating Expenses	$ 3,640,636	$ 4,647,589	$ 4,740,541	$ 4,835,352	$ 4,932,059	$ 5,030,700	$ 5,131,314	$ 5,233,940
Operating Income (Loss)	$ (3,056,606)	$ (3,809,387)	$ (3,888,573)	$ (3,969,377)	$ (4,051,834)	$ (4,135,975)	$ (4,221,836)	$ (4,309,451)
Non-Operating Revenues (Expenses) and Capital	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**
Interest Income	$ 6,273	$ 3,609	$ 3,681	$ 3,755	$ 3,830	$ 3,906	$ 3,985	$ 4,064
Interest expense	$ -	$ (2,427)	$ (2,427)	$ (2,427)	$ (2,427)	$ (2,427)	$ (2,427)	$ (2,427)
Grant receipts	$ 973,015	$ 6,377,147	$ -	$ 718,088	$ 8,972,925	$ 464,400	$ 11,466,005	$ 11,065,275
Passenger Facility Charges	$ 55,963	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Capital Contributions	$ 1,457,662	$ 308,621	$ -	$ -	$ -	$ -	$ -	$ -
Special items (loss)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Other Non-Operating Revenue	$ 4,915	$ 2,247	$ 2,292	$ 2,338	$ 2,385	$ 2,432	$ 2,481	$ 2,530
Total Non-Operating Revenue	$ 2,497,828	$ 6,689,197	$ 3,546	$ 721,753	$ 8,976,712	$ 468,312	$ 11,470,043	$ 11,069,443
Net Assets	2019	2020	2021	2022	2023	2024	2025	2026
Change in net assets	$ (558,778)	$ 2,879,805	$ (3,885,027)	$ (3,247,624)	$ 4,924,879	$ (3,667,663)	$ 7,248,208	$ 6,759,992
Net assets (deficit) at beginning of year	$ 45,715,928	$ 451,571,500	$ -	$ -	$ -	$ -	$ -	$ -
Net assets (deficit) at end of year	$ 45,157,151	$ 48,036,954	$ -	$ -	$ -	$ -	$ -	$ -
Capital Expenditures and Construction in Progress	2019	2020	2021	2022	2023	2024	2025	2026
Airfield	$ 593,747	$ -	$ -	$ 2,083,300	$ 9,627,400	$ 928,800	$ 14,670,100	$ 11,349,000
Terminal	$ -	$ -	$ -	$ -	$ 2,047,500	$ -	$ -	$ -
Parking	$ -	$ -	$ -	$ -	$ 399,500.0	$ -	$ -	$ -
Roadways - Rail - Transit	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Other Capital Expenditures	$ 88,898	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Capital Expenditures	$ 682,645	$ -	$ -	$ 2,083,300	$ 12,074,400	$ 928,800	$ 14,670,100	$ 11,349,000
Indebtness at End of Year	2019	2020	2021	2022	2023	2024	2025	2026
Long Term Bonds	$ -	$ -						
Loans and interim financing	$ -	$ -						
Special facility bonds	$ -	$ -						
Total Debt at End of Year	$ -	$ -	$ (2,123,193)	$ (3,533,854)	$ (5,316,509)	$ (2,726,791)	$ (5,514,827)	$ (2,643,801)

Appendices

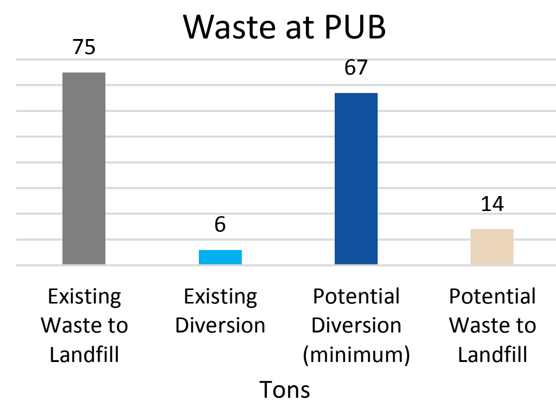
Appendix I. Recycling and Solid Waste Plan

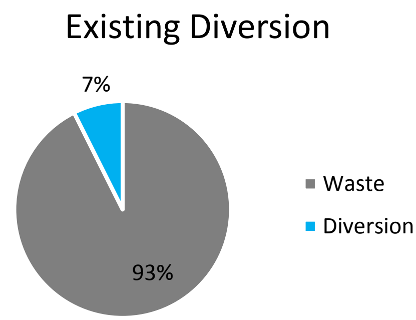
Appendix I. Recycling and Solid Waste Plan

Summary

Pueblo Memorial Airport (PUB) can reduce waste generation and increase landfill diversion by:

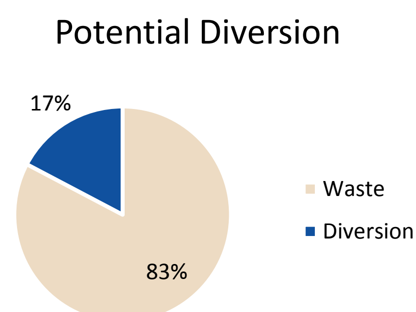
- **Integrating waste diversion practices into airport operations.**
- **Improving purchasing practices, reducing disposable items, and reusing supplies.**
- **Introducing a recycling program.**
- **Tracking and voluntarily reporting waste metrics and diversion progress.**





The existing program at PUB generates approximately 75 tons of landfill-bound waste annually, as well as an additional six tons of recycled scrap metal. These recommended strategies have the potential to divert at least eight tons of general materials from the landfill a year.

Reducing waste generation and increasing landfill diversion align with PUB's efforts to operate in a responsible manner.



Planning for solid waste and recycling under the on-going master plan fulfills PUB's federal obligation under the **Federal Aviation Administration (FAA) Modernization and Reauthorization Act of 2012, FAA Reauthorization Act of 2018,** and associated guidance.

Recommendations

The following recommendations to improve waste management at PUB include waste reduction, reuse, and recycling strategies. Evaluation for each recommendation considered estimated relative cost and diversion potential; the suggested implementation time frame; and noted alignment with best practices or standard programs. **Table 1** shows the key for quick comparison of the impact of each recommendation on diversion.

Table 1: Recommendation Key

ITEM	ICONS	SIGNIFICANCE
Relative Cost	$ (1 of 3)	Low cost
	$ $ (2 of 3)	Medium cost
	$ $ $ (3 of 3)	High cost
Estimated Diversion Potential	🗑 (1 of 3)	Low diversion potential
	🗑 🗑 (2 of 3)	Medium diversion potential
	🗑 🗑 🗑 (3 of 3)	High diversion potential
Suggested Implementation Time Frame	🕓 (1 of 3)	Short range (<1 year)
	🕓 🕓 (2 of 3)	Medium range (1-3 years)
	🕓 🕓 🕓 (3 of 3)	Long range (3+ years)
Alignment	BMP	Best Management Practice
	TRUE	BMP and Total Resource Use and Efficiency (TRUE) Certification program element

Recommendation 1: Integrate Waste Diversion in Airport Operations

Description

Waste diversion is the concept of avoiding and/or managing waste to avoid landfill disposal. Waste diversion strategies include practices such as reduction, reuse, donation, sustainable procurement, recycling, and composting. These strategies offer various levels of fiscal, environmental, and social benefits.

Action

It is recommended that PUB continue to integrate waste diversion concepts and practices into existing policies and operations, for example, in maintenance operations, purchasing practices, and tenant requirements.

Justification

Most of the municipal solid waste generated at PUB is disposed of at a local landfill except for recycled scrap metal (see **Current Waste Management Program**). Waste diversion would reduce the volume of waste sent to the landfill as well as reduce the financial and social impacts of waste.

Information Needed

- **Communication tools to reach PUB staff and tenants.**
- **Waste diversion information.**

Action Plan

- **Emphasize the importance of waste diversion to PUB staff and tenants.**
- **Adopt additional waste diversion policy or integrate in existing guidance documents.**
- **Identify sources of waste and promote strategies to avoid, reduce, or divert these materials.**
- **Encourage waste diversion in future tenant and project contracts.**

Relative Cost

$ $ $

Estimated Diversion

Time Frame

Alignment

BMP

Recommendation 2: Improve Purchasing Practices, Reduce, & Reuse

Description

To reduce the facility's volume of waste sent to the landfill, PUB should reduce waste generation and reuse materials where possible. PUB staff's existing purchasing practices may generate waste in the form of single-use and/or disposable items and supplies and tracking of these items could reveal opportunities for reduction and reuse.

Action

It is recommended PUB adopt a purchasing policy prioritizing durable (versus disposable) items and supplies that are reusable, recyclable, compostable, and/or made from recycled content. It is also recommended that PUB identify supplies and materials which can be avoided, reused on site, or donated to a third party.

Justification

Waste reduction is the most environmentally preferred waste management strategy as determined by the **Environmental Protection Agency (EPA)**. Reduction and reuse simultaneously lower waste program costs by producing a smaller material stream.

Information Needed

- **Purchasing records.**
- **Waste stream information.**

Action Plan

- **Adjust practices which generate waste (printing, housekeeping, etc.)**
- **Substitute durable alternatives for single use or disposable items in the administration office and staff areas.**
- **Reuse items and materials where possible and encourage reuse by passengers, tenants, and contractors.**
- **Support food donation by Peter's In & Out.**

Relative Cost

$ $ $

Estimated Diversion

Time Frame

Alignment

BMP

Recommendation 3: Introduce Recycling

Description

Recycling is the practice of collecting specific materials, so they can be used in the manufacture of new items. Recyclable materials generated at PUB likely include office paper, plastic bottles, aluminum cans, and cardboard that can be recycled in the local area with the existing contractor.

Action

It is recommended that PUB introduce a simple recycling program that should include designated bins, collection services, and signage. Partnership with the local Pueblo RecycleWorks (see **Technical and Economic Factors**) could assist in establishing a recycling program.

Justification

Where waste cannot be avoided or reduced, recycling allows some materials to avoid landfill disposal by incorporating them into new products. Pueblo County has recycling infrastructure and PUB's waste collection contractor offers recycling services.

Information Needed

- **Accepted materials list from hauler.**
- **Information about waste-generating activities at PUB.**
- **Inventory of existing garbage cans.**
- **Estimated costs for recycling service, dumpster rental, and other elements.**

Action Plan

- **Collaborate with waste hauler to determine which materials generated at PUB are the best candidates for recycling (based on volume generated).**
- **Negotiate recycling services contract for PUB.**
- **Convert surplus garbage receptacles into labelled recycling bins, supplement with new bins where needed, and collocate all recycling bins with garbage receptacles.**
- **Train employees and tenants on the recycling program to explain its purpose, requirements, and importance.**
- **Monitor and adjust recycling program using feedback from waste hauler.**

Relative Cost

$ $ $

Estimated Diversion

Time Frame

Alignment

TRUE

Recommendation 4: Tracking & Reporting

Description

Monitoring waste metrics provides feedback on the efficiency of diversion efforts. Sharing this information with stakeholders has been shown to increase participation in diversion practices.

Action

It is recommended that PUB begin to regularly estimate and track the volume of waste sent to the landfill and diverted through reduction, reuse, donation, recycling, or other strategies as well as the costs associated with these services. It is also recommended PUB discuss these trends with the waste hauler and share this information with program stakeholders (PUB staff and tenants).

Justification

PUB does not currently track metrics associated with its waste. Trends associated with PUB's waste generation, landfill, diversion, and associated costs could indicate opportunities for improvement.

Information Needed

- **Waste generation, disposal, and cost estimates.**
- **Simple tracking tool (spreadsheet).**
- **Estimates of volume of waste diverted by various strategies and avoided costs.**
- **Mechanism for communicating progress to stakeholders.**

Action Plan

- **Collaborate with waste hauler to measure or estimate waste disposal.**
- **Obtain estimate of associated costs from City of Pueblo.**
- **Enter estimates into tracking tool.**
- **As strategies are implemented, update tracking tool to reflect waste avoided, diverted, and costs.**
- **Evaluate data for additional opportunities to set and pursue waste diversion goals.**
- **Share and celebrate progress with stakeholders.**

Relative Cost

$ $ $

Estimated Diversion

Time Frame

Alignment

TRUE

Attachments

1. Additional Recommendations for Consideration

In addition to the primary recommendations stated previously, the Waste Plan Team suggested several other items that could be implemented at PUB. These supplementary recommendations may be found in **Table 2**.

Table 2: Additional Recommendations for PUB Waste Recycling Plan

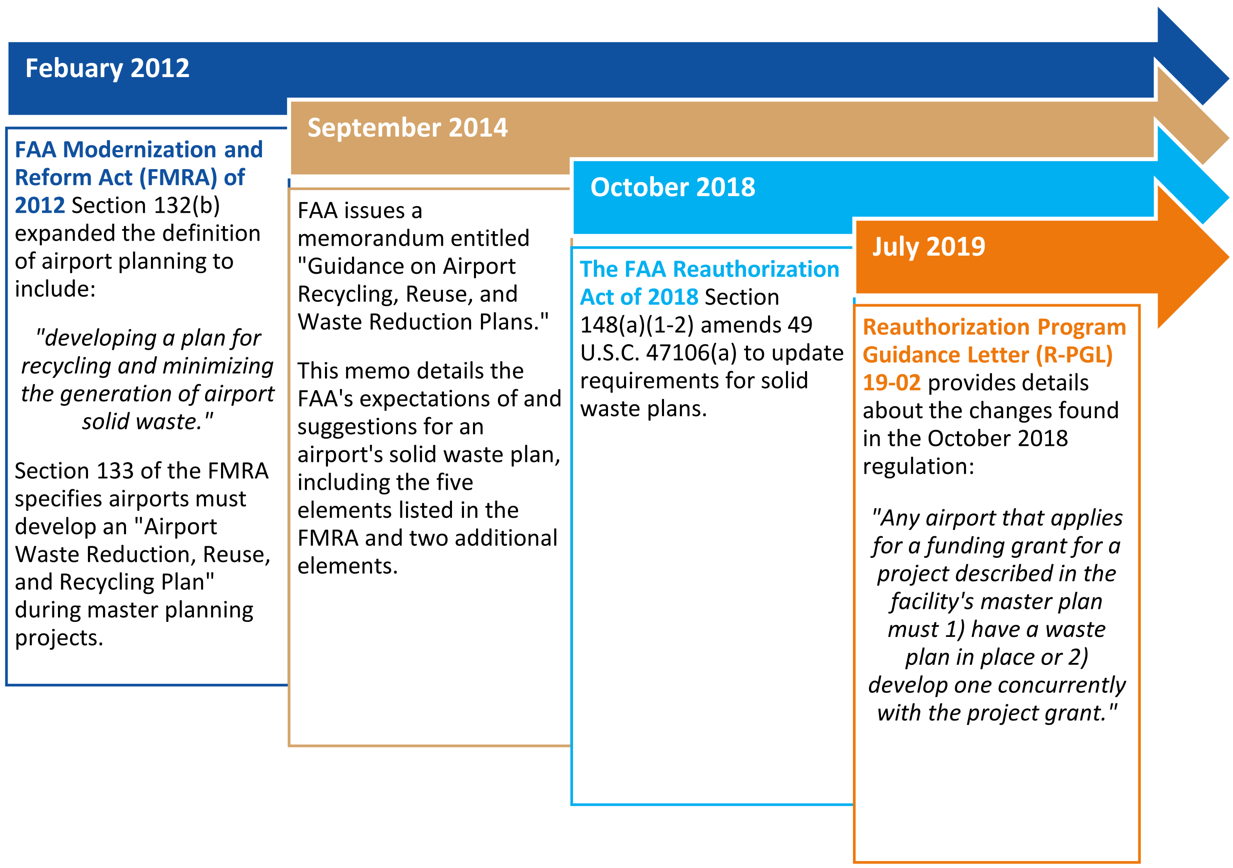
RECCOMENDATIONS SUMMARY
Objectives and Targets ▪ Set specific, measurable, achievable, realistic, and time-bound (SMART) goals for PUB's waste program.
Tenant Requirements ▪ Revise rules and regulations and/or minimum standards to encourage or require waste diversion among tenants, including recycling.
Additional Facilities and New Development ▪ Consider waste diversion and management in the design and construction process of future airport projects.
Continuous Improvement ▪ Maintain and improve the recycling and waste program per the *Plan Do Check Act* cycle.

SOURCE: Mead & Hunt.

2. Regulatory Background

Figure 1 outlines the introduction timeline and specifics of FAA's waste planning requirement. The FAA provides content guidance for airport waste plans in the September 2014 memo on the topic (available on the FAA's website).

Figure 1: FAA Solid Waste Recycling Planning Requirement Timeline and Details



SOURCES: FAA; Mead & Hunt.

Figure 2 details the elements which are required for a solid waste recycling plan per the FMRA (marked with an asterisk, *) or suggested for inclusion in a plan in the FAA Memo (marked with two asterisks, **). **Figure 3** lists the factors influencing the scope and nature of an airport's waste program, as described in the FAA memo.

Figure 2: Elements of Airport Solid Waste Management

- Facility description and background**
- Waste audit**
- Feasibility of solid waste recycling*
- Operation and maintenance requirements*
- Review of waste management contracts*
- Potential for cost savings or revenue generation*
- Plan to minimize the generation of solid waste*

SOURCES: FAA; Mead & Hunt.

Figure 3: Factors Influencing Airport Solid Waste Management Programs

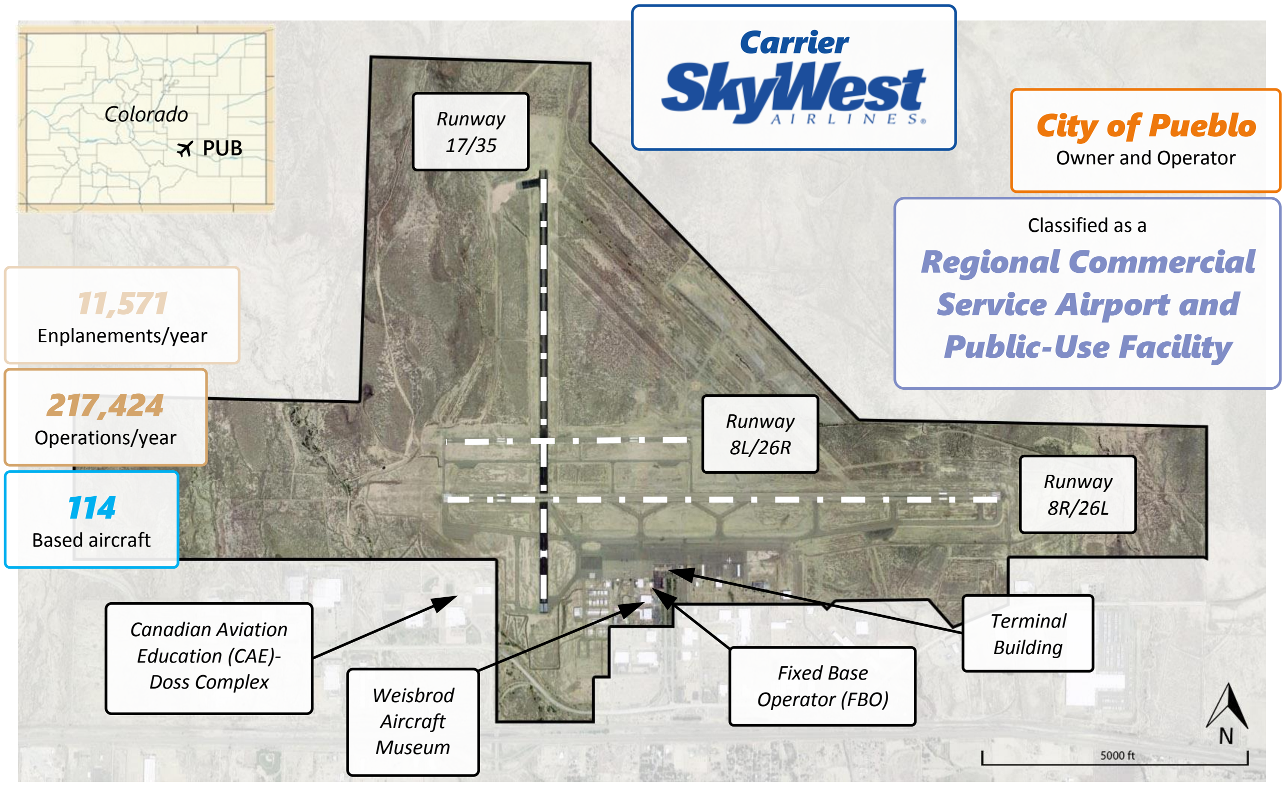
- Airport size, location, layout, and logistics
- Amount and type of waste generated
- Markets for recyclable commodities
- Costs to transport and process materials
- Local infrastructure
- Willingness of an airport and tenants to implement waste diversion practices
- Interaction between reduction, reuse, recycling, composting, landfill, and other alternatives

SOURCES: FAA; Mead & Hunt.

3. Airport Information

Figure 4 shows a summary of background information about PUB, including its location, operations, air carrier, layout, governance, and classification.

Figure 4: PUB Background Information



SOURCES: Pueblo Airport; Mead & Hunt.
Google Basemap (Earth n.d.); Colorado County Map (NordNordWest 2009).

4. Plan Scope

Municipal Solid Waste (MSW) consists of everyday items that are used and then discarded. This plan focuses on the management of MSW and other materials that may be recycled or disposed of in a municipal solid waste landfill. There are five primary types of MSW generated at airports: **general MSW**, **food waste**, **green waste (yard waste)**, **deplaned waste**, and **construction and demolition (C&D) waste**. This plan does not address the management of other waste types regulated by federal, state, or local laws, specifically: hazardous, universal, or industrial waste; waste from international flights, or C&D waste that is subject to special requirements/handling.

Facilities at PUB include buildings and areas over which PUB has a varying degree of control or influence over waste management practices. Some areas fall under direct control of PUB and its staff, while others PUB has influence over but not direct control. According to FAA guidance, areas over which PUB has direct control or influence should be included in the Recycling, Reuse, and Waste Reduction Plan; areas outside PUB's control or influence may be excluded.

Table 3 lists a breakdown of the areas PUB controls, influences, and neither controls nor influences.

Table 3: Waste Management Areas at PUB

MANAGEMENT LEVEL	DESCRIPTION
Areas under direct control	Airport Administration Areas
	Public Terminal Areas *Parking and curbside* *Ticketing lobby, baggage claim, gates, restrooms, and hold rooms*
	Pueblo Weisbrod Museum
	Aircraft Rescue and Firefighting (ARFF) Station 10
	Maintenance and Snow Removal Equipment (SRE) Buildings
Areas under influence	Terminal Tenants (Spaces owned by Airport, leased by tenants) *Peter's In and Out restaurant* *Airline ticketing counters and offices* *Car rental areas (future)* *TSA office spaces*
	GA Hangars *Hangars owned by Airport, leased by tenants*
	Fixed-Base Operator (FBO) Building *Building owned by Airport, leased by FBO*
	Specialized Aviation Service Operators *Southern Colorado Flight Professionals* *Travel Aire Charter Service* *Buildings owned by Airport, leased by tenants*
Areas not under control or influence	Air Traffic Control Tower (ATCT)
	Specialized Aviation Service Operators *Doss Aviation*
	TSA Security Screening Area

SOURCES: Pueblo Airport; Mead & Hunt.

5. Current Waste Management Program

The waste program at PUB is maintained by facilities staff. **Figure 5** details the existing waste infrastructure in place at PUB.

Figure 5: Existing PUB Infrastructure

Interior Waste Bins

5
Waste bins in the passenger terminal

Waste Dumpsters

5
Dumptsters

Dumpster Capacities

6
Cubic Yards each

Weekly
Waste Collection

Collection Service

WASTE CONNECTIONS INC.
Connect with the Future®

SOURCES: Pueblo Airport; Mead & Hunt.

Waste Connections is the waste collection contractor for PUB. Two dumpsters are provided by the City of Pueblo for use by the airport administration and maintenance facilities. Three additional dumpsters used by the restaurant, FBO, and museum are individually managed by each tenant. Each tenant is responsible for custodial activities in their leased areas including transferring waste to the appropriate dumpsters. One dumpster is used for scrap metal recycling and is picked up on an as-needed basis by a separate contractor.

6. Waste Audit

PUB staff provided information about the following categories to assist with this plan:

- **Airport buildings and facilities**
- **Areas that generate waste**
- **Types of waste generated in each area.**

An evaluation of PUB's information and records, as well as aviation industry waste and recycling trends, supported efforts to identify the source, composition, and quantity of waste generated at PUB, including areas under PUB's direct control or influence. This information then served as a foundation to identify opportunities to improve and monitor program effectiveness.

Quantity

The project team estimated a total of 75 tons of MSW is generated at PUB annually. These volumes are based upon the capacity and frequency of collection service for each of the facility's dumpsters and the EPA's volume-to-weight conversion factors for MSW. Scrap metal is recycled on a yearly basis at PUB; the average weight of scrap recycled between 2018 and 2020 was six tons annually. There is no MSW recycling program at PUB, and scrap metal is the only item currently recycled.

Sources and Composition

Based on the activities taking place at PUB, a varied waste stream can be expected. **Table 4** lists each area included in the scope of this plan and the type(s) of waste likely generated there. A sort could also be used to identify opportunities to improve the composition of the waste stream (by item substitution, by improving recycling to reduce the volume of waste, etc.).

A physical waste material sort could provide more detailed information about the specific composition of waste at PUB. This information may include:

- **Types of items included in each general category**
- **Contamination rate of the recycling stream**
  (items that are not recyclable in the recycling bins)
- **Recovery rate for recycling**
  (the proportion of recyclable items that are segregated properly).

Table 4: **PUB Waste by Area and Material**

AREA | MATERIAL	OFFICE PAPER	NEWSPAPERS	MAGAZINES	PLASTIC	ALUMINUM	CARDBOARD	GLASS	FOOD WASTE	PAPER PRODUCTS	LIQUIDS	TOILETRIES	DEPLANED WASTE	PACKAGING	STYROFOAM	METALS	GREEN WASTE	C & D WASTE	OTHER WASTE
TERMINAL BUILDING																		
Public areas Curbs, restrooms, seating areas		x	x	x	x		x	x	x	x			x					x
Airline Areas	x	x	x	x	x	x	x	x	x	x		x	x					x
Tenant areas Airline ticketing, restaurant	x	x	x	x	x	x	x	x	x	x			x					x
TSA Security Checkpoint		x	x	x	x		x	x		x	x		x					
AIRPORT SUPPORT BUILDINGS																		
Airport Administration Offices	x	x	x	x	x	x	x	x	x				x	x				x
Maintenance Building	x	x	x	x	x	x	x	x	x	x			x	x				x
Airport Maintenance Activities			x	x	x	x				x			x		x	x	x	x
Rocky Mountain Flower Aviation (FBO)	x		x	x	x	x	x							x				
OTHER AIRPORT BUILDINGS																		
GA Hangars	x	x	x	x	x	x	x	x	x	x			x					
Pueblo Weisbrod Aircraft Museum	x	x	x	x	x	x	x	x	x				x	x				

SOURCES: Pueblo Airport; Mead & Hunt Feasibility Analysis.

Purchases

PUB staff do not currently track the quantity and type of disposable items and supplies purchased for the facility. This information could provide insight on some of the materials coming into the airport that will go back out as waste (other materials are brought on-site by visitors, employees, and vendors). Identifying and tracking the type and quantity of all disposable items purchased will allow PUB to identify opportunities to reduce outgoing waste, including:

- **Some items that could be eliminated**
- **Items that have reusable or recyclable alternatives.**

Many factors impact the feasibility of recycling at PUB; some are universal, and others are specific to the facility. The following sections describe the more influential of these factors.

Commitment and Support

The willingness of PUB, PUB staff, and its contractors and tenants to support the facility's recycling program are critical to the success of such a program. Without committing resources such as funding, labor and time, space, and access to secure areas, a waste management program could struggle.

Airport Policy and Local Dedications

Based on the resources allocated to local recycling programs, the City of Pueblo and Pueblo County appear to generally support waste diversion, responsible waste management, and sustainable operations.

Technical and Economic Factors

Local Markets and Infrastructure

Markets for recycled materials fluctuate widely based on many factors and interactions. Local waste haulers typically accept materials that can be recycled cost-effectively in the area. Manufacturers purchasing recycled material want it to be predictable and ready for use; therefore, recycling facilities are discriminatory about what materials they accept. They almost unilaterally prefer materials that are of high value, clean, and easy to separate.

Recycling across Pueblo County is managed by Pueblo RecycleWorks, a division within the City of Pueblo Public Works Department that operates and manages the County's recycling center. Materials listed in **Table 5** may be recycled through the County's recycling program. As noted above, inclusion in such programs typically indicates that the market and/or infrastructure for these materials is strong. (Pueblo RecyclingWorks: City of Pueblo n.d.)

Table 5: Materials Accepted for Residential Recycling in the City of Pueblo

ACCEPTABLE RECYCLABLE MATERIALS	
Cardboard (flattened & clean)	Newsprint
Office papers	Plastics (#1-5 & 7)
Glass	Aluminum
Steel/Tin cans	

SOURCES: City of Pueblo; Mead & Hunt.

The Pueblo RecycleWorks facility accepts recycling from commercial enterprises in the County and is located seven-and-a-half miles southwest of PUB. Advanced Disposal is Pueblo RecycleWorks' collection and transportation partner.

The primary landfill for MSW in Pueblo County is the Southside Landfill, and is operated by Waste Connections for the waste needs of the County. The landfill is located 16 miles southwest of PUB, and it is anticipated that the landfill has adequate capacity to serve PUB and the local area for the foreseeable future.

Logistical Considerations and Constraints

To maintain a recycling program at PUB, certain elements must be in place. These include:

- **A proactive and engaged custodial staff**
- **A willing and affordable hauling contractor**
- **Space for bins, dumpsters, and compactors**
- **Hauler access to secure areas of the facility (including airside ramps and sterile areas).**

At present, these elements appear unconstrained. Additional resources including custodial labor, waste hauling services, space, and airport access are anticipated to be available to support the introduction and/or expansion of the recycling program at PUB.

Recycling, Landfill, And Energy-From-Waste Facility Requirements

Components that seem recyclable (plastic, glass, or metal parts) may make up some items generated at PUB; however, the recycling facility has specific material standards which should be followed to protect the stream. It is important that non-recyclable items are not included in future recycling efforts at the facility. Waste items that may be generated at PUB but are not supported by the Pueblo RecyclingWorks facility are outlined in **Table 6**.

Table 6: **Materials Not Accepted by Pueblo RecyclingWorks**

UNACCEPTABLE RECYCLABLE MATERIALS	
Soiled recyclable materials	Single-use items (paper plates or cups)
#6 Plastics	Fuel cans/tanks
Plastic bags, film, or wrap	Styrofoam
Juice/Milk/Broth paper cartons	Trash/Garbage
Compost/Yard waste	Food waste
Windowpane/tempered glass	Hazardous waste

SOURCES: City of Pueblo; Mead & Hunt.

Costs

PUB strives to be as self-sustaining as is feasible; therefore, it is imperative that programs implemented and maintained at PUB, including recycling, are as cost-effective as possible. See **Financial Analysis**.

Guidelines and Policies

To evaluate PUB's existing recycling plan in the context of local, state, and national requirements, the consultant reviewed federal, Colorado State, and local-level waste and recycling regulations, policies, and factors.

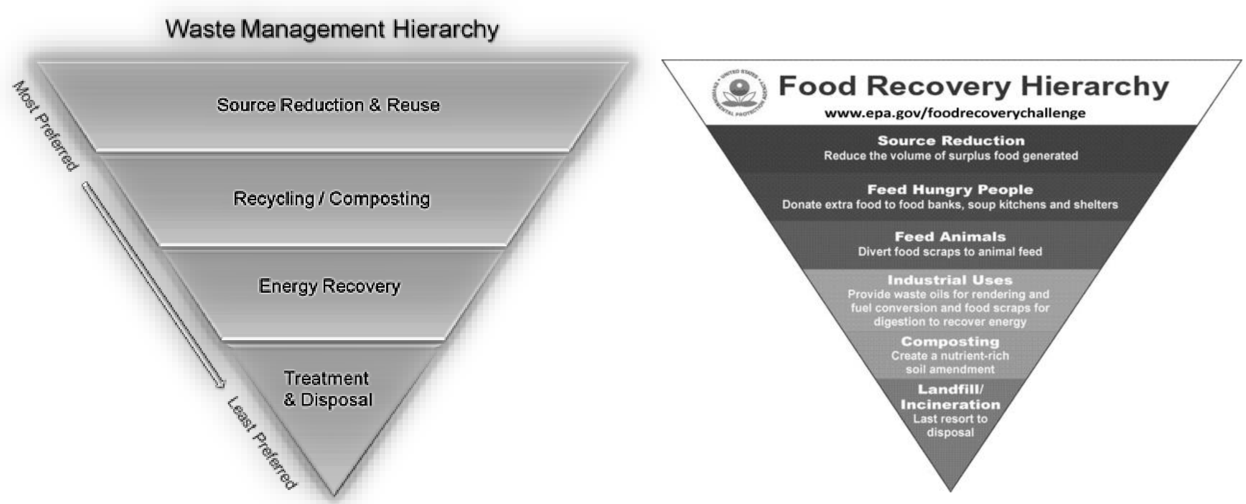
Federal

As described in **Regulatory Background**, the FAA's definition of airport planning includes planning for recycling and waste minimization.

The United States **Environmental Protection Agency (EPA)** is responsible for developing a solid waste management program under the **Resource Conservation and Recovery Act (RCRA)** and related policies and guidance. RCRA provides the framework for management of hazardous and non-hazardous waste. All generators of hazardous waste, including airports, are required to comply with RCRA and all other federal waste laws and regulations.

Figure 6 shows a hierarchy of waste management strategies developed by the EPA. This hierarchy on the left ranks these strategies from most- to least-environmentally preferred and places emphasis on reducing, reusing, and recycling. In addition to the general waste management hierarchy, the EPA has also developed a preference ranking of management strategies for food waste, as shown in the figure at the right.

Figure 6: **Waste Management and Food Recovery Hierarchies**



SOURCE: United States Environmental Protection Agency, (Waste Management Hierarchy n.d.), (Food Recovery Hierarchy n.d.)

State

The State of Colorado adopted the *Colorado Integrated Solid Waste & Materials Management Plan* in August 2017 as a roadmap for solid waste management in the state. The Plan introduced a series of goals to evaluate diversion measures across the state:

- **28 percent diversion by 2021**
- **35 percent diversion by 2026**
- **45 percent diversion by 2036.**

To meet these diversion goals, the Front Range Region is required to achieve higher standards than the rest of the State. The goals of the Front Range Region are to collectively achieve:

- **32 percent diversion by 2021**
- **39 percent diversion by 2026**
- **51 percent diversion by 2036.**

The Plan additionally notes that the majority of waste generated throughout the state originates from the “Front Range Region”. Counties in the Front Range are characterized in the Plan with larger population centers and Front Range Counties, such as Pueblo, are more readily able to reach the diversion goals of the state largely due to local support and closer proximity to participating centers. (Burns & McDonnell and Skumatz Economic Research Associates 2016)

Local

Both Pueblo County and the City of Pueblo offer recycling management through Pueblo RecyclingWorks. Items currently accepted by the program are listed in **Table 5**. RecyclingWorks does not directly collect waste or recycling; instead, it serves as a drop-off point for waste haulers and private users. Waste contractors including C & C Disposal, Pueblo Disposal, and Roots Recycling offer a range of residential and commercial options for residents of Pueblo County. The *Colorado Integrated Solid Waste & Materials Management Plan*, however, identifies Pueblo County as a potential area with gaps in recycling access. This consideration makes recycling at PUB more difficult, but not altogether impossible.

Based on the availability of residential and commercial recycling, this plan assumes the residents of the communities surrounding PUB, and therefore its employees and visitors, have been exposed to recycling, receive on-going messaging about its importance, and are generally supportive of recycling efforts.

7. Review of Waste Management Contracts

The FAA memorandum titled "Guidance on Airport Recycling, Reuse, and Waste Reduction Plans" explains that the purpose of reviewing waste management contracts is to "identify opportunities for improving (waste) program scope and efficiency, as well as identify constraints."

Contract information for SkyWest and TSA tenant areas were reviewed as part of this study for provisions related to waste management. These contracts detail general housekeeping requirements and related expectations for managing trash; they provide no specific information about or requirement to reduce waste or recycle outside of federal, state, and local regulations. The contracts do not necessarily impede recycling or other waste management strategies, but neither do they explicitly require conformance with or support of any future airport-related waste efforts.

The waste service provider, Waste Connections, is contracted and funded by the City for waste pickup at all its facilities, including PUB. Any changes to contract language or fees would be processed through the City and not airport staff.

8. Financial Analysis

According to the FAA memo "Guidance on Airport Recycling, Reuse, and Waste Reduction Plans," an analysis of the financial aspects of waste management assists airport sponsors in determining the cost versus benefit of all existing and proposed enhancements to an airport's practices and should include capital costs, physical infrastructure, transport, and labor.

The estimated cost for collection and disposal per cubic yard under Waste Connections for waste collection of PUB's two dumpsters came to $15.01. The size of dumpsters and the frequency at which they are serviced represents a significant contributor to the average cost per cubic yard, and a reduction of either or both factors would reduce the total spend. A reduction in dumpster size and or servicing frequency would allow a shift to recycling without changing the total cost of the program. Reduction and reuse practices would further lower the program's cost, as these materials would not need to be recycled or landfilled.

9. Resources

Citations

Sources

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10.Glossary

(sorted by chronology)

Federal Aviation Administration (FAA) – regulatory body of the US government that regulates all national aviation activities.

FAA Modernization and Reform Act of 2012 (FMRA) – legislation that seeks to improve aviation safety and capacity of the national airspace system and provide a stable funding system.

FAA Reauthorization Act of 2018 – reauthorization of FMRA 2012 to extend funding and administrative authority to the FAA.

Total Resource Use and Efficiency (TRUE) – Zero waste certification program administered by the Green Business Certification Inc. (GBCI).

Environmental Protection Agency (EPA) – independent agency of the US government that establishes policies that protect the natural environment.

Reauthorization Program Guidance Letter (R-PGL) 19-02 – implements provisions to FAA Reauthorization Act of 2018 that changed project eligibility, scope, or funding under 49 U.S.C., Chapter 471.

Municipal Solid Waste (MSW) – everyday items that are used and then discarded. There are five primary types of MSW generated at airports:

- **General MSW** – common inorganic waste, such as product packaging, disposable utensils, plates and cups, bottles, and newspaper. Less common items, such as furniture and clothing, are also considered general MSW.
- **Food waste** – either food that is not consumed or the waste generated and discarded during food preparation. Food waste and green waste make up a waste stream known as compostable waste.
- **Green waste (yard waste)** – tree, shrub and grass clippings, leaves, weeds, small branches, seeds, pods, and similar debris generated by landscape maintenance activities. Food waste and green waste make up a waste stream known as compostable waste.
- **Deplaned waste** – waste removed from passenger aircraft. These materials include bottles and cans, newspaper and mixed paper, plastic cups, service ware, food waste, food-soiled paper, and paper towels.
- **Construction and demolition (C&D) waste** – any non-hazardous solid waste from land clearing, excavation, and/or the construction, demolition, renovation or repair of structures, roads, and utilities. C&D waste commonly includes concrete, wood, metals, drywall, carpet, plastic, pipes, land clearing debris, cardboard, and salvaged building components.

Resource Conservation and Recovery Act (RCRA) – federal law of the US governing the disposal of solid or hazardous waste.

Appendices

Appendix J. Outreach and Communications Plan

Appendix J. Outreach and Communications Plan

Introduction

This Outreach and Communications Plan for the Pueblo Memorial Airport (PUB or the Airport) was developed as part of the Master Plan effort to identify outreach and communication goals, develop a formal process for stakeholder engagement, and design an approach for sharing the Airport's Master Plan vision throughout the planning process. Outreach facilitates and supports involvement by key stakeholders and interested members of the public—providing the opportunity for all stakeholders to participate and be heard. This plan describes coordination and communication efforts intended to inform, educate, and engage the public and airport users. The following sections identify key messages, key audiences, anticipated stakeholder concerns, outreach methods and activities, a proposed outreach timeline, and communication protocols.

Outreach and Communications Plan Goals

- **Establish a process to inform stakeholders and the broader community (both City and County) about the master planning process in a collaborative setting.**
- **Support Airport Staff and the Mead & Hunt Team in developing the Master Plan.**
- **Consult with those most affected by Airport operations and development to foster collaboration.**
- **Collaborate with the Study Committee (SC) to identify recommendations for incorporation into the Master Plan, to the extent possible.**
- **Build community and stakeholder awareness and understanding of the Master Plan process, establishing realistic expectations for what will be considered and accomplished.**
- **Inform the public on how they can be involved and how their input will be considered.**
- **Collect substantive and meaningful public input at appropriate milestones.**
- **Conduct a public engagement process that is efficient, effective, and results in informed and engaged stakeholders and community members.**
- **Implement virtual outreach strategies, as needed, that align with COVID-19 travel restrictions, stay-at-home orders, and other in-person gathering restrictions within the current operating environment.**

By nature, this Outreach and Communications Plan is dynamic. As the technical work on the Master Plan progresses, there may be circumstances that require an amendment to the plan to better achieve the above goals. If there is a substantial amendment to the plan, stakeholders will be made aware of the change through an updated version posted to the project website.

Key Messages

The key messages presented in the list below frame the background information on the Pueblo Airport and Master Plan and will be used to provide clear and consistent messaging regarding the planning process, project schedule, and public involvement opportunities.

General Messages

- **The Pueblo Memorial Airport is conducting a Master Plan Study, a process that will be completed in 2021, with the majority of work taking place before April 2021. The Master Plan will serve as the Airport's 20-year blueprint for the layout, improvement, and expansion of its physical facilities.**
- **This Study will serve to provide up-to-date information about the Airport and identify possible new projects that will support the Airport's long-term viability and enhance facility safety, while supporting economic development and the Airport's commitment to be a good neighbor.**
- **We want to hear from you! Let us know what you think about the future of Pueblo Airport – send us comments, engage with us virtually, and attend public meetings to learn more about the Airport and the Master Plan.**

Airport Background

- **Pueblo Memorial Airport is classified as a primary non-hub commercial service airport. PUB is an essential air service (EAS) airport, with a current contract for regional commercial air service through United Airlines (SkyWest). PUB also supports initial flight screening for the US Air Force and other GA-related activities. With over 130 existing based aircraft, the Airport serves the general aviation needs of the Pueblo Metropolitan Statistical Area (MSA) and the surrounding communities.**
- **PUB is an important part of the local economy, providing a regional economic impact of approximately $103.7 million annually. This includes support for over 775 direct jobs at airport businesses with an annual payroll of $38.7 million.[1]**
- **Canadian Aviation Education (CAE)-Doss, a provider of military pilot training and screening, is a major tenant at PUB. The Airport's Air Traffic Control Tower (ATCT) currently records Doss's operations as military flights, which creates potential conflicts between the Airport and the future projected growth predicted by the Federal Aviation Administration (FAA) in their Terminal Area Forecast (TAF). These numbers will be an important component of the Master Plan.**
- **The Airport is a self-supporting entity that is owned by the City of Pueblo.**

[1] *2020 Preliminary CDOT Economic Impact Study of Colorado Airports.*

Master Plan Background

- In March 2020 the Airport formed the Study Committee (SC) to support the development of the Airport Master Plan. The SC will serve in an advisory role to oversee the Master Plan process and provide recommendations to the Airport and consultant team.
- The Airport must have a current Master Plan to be eligible for project funding from the FAA. The FAA provides 90% of the funding for the planning process.
- There are two elements of a Master Plan the FAA is required to review and approve: the forecasts of aviation activity and the airport layout plan (ALP).

Master Plan Purpose and Process

- This Study will recommend future improvements that enhance operational safety, align with the Airport's economic development and strategic goals, and follow federal, state, and local regulatory guidelines.
- The planning process will describe existing airport conditions, identify future facility needs, and outline possible alternatives to meet those needs.
- It is critical to have accurate counts of airworthy based aircraft at PUB as it helps inform the forecasts and could impact potential future AIP funding for which PUB is eligible.
- Alternatives will be evaluated to consider the environment, businesses, and residents adjacent to the Airport, modes of transportation, and other airports in the region.
- This Plan will incorporate feedback from residents, airport users, tenants, the PUB Study Committee, Airport Staff, and the FAA.
- The Final Master Plan will be brought before the Pueblo City Council for adoption in 2021.

Public Involvement

- Public/Stakeholder involvement and coordination is crucial to the success of the Master Plan.
- The project Study Committee will help to guide development of the plan. The Study Committee is comprised of Airport Advisory Committee members, airport tenants, stakeholders, and representatives from the City of Pueblo.
- Current plan information will be posted on the Airport's website throughout the course of the project.
- Comments and requests for information can also be submitted through the website.

Key Audiences

Three key audience groups have been identified by the SC and the project team. These include SC members and the organizations they represent, selected stakeholders and community members, and the general public. **TABLE 1** identifies specific audiences within each group. Information about organizational meetings is included, where available.

TABLE 1: Key Audience Groups

AUDIENCE GROUP	MEMBERS
Sc Members and Represented Organizations	▪ SC members (SC meetings coincide with working paper deliverables)
Community, Business, And Internal Stakeholders	▪ Airport Leaseholders ▪ City of Pueblo ▪ Pueblo County
General Public	▪ Recognized City of Pueblo and Pueblo County neighborhoods and neighborhood associations in the airport vicinity (coordinated through Airport Staff)

Anticipated Stakeholder Concerns

This section identifies anticipated stakeholder concerns that should be verified by project stakeholders at the onset of the project. Early involvement helps identify key concerns and enhance communication between the public and the consultant team, which can drastically improve the focus as well as, ultimately, the results of the master planning process. While it is unlikely that every concern voiced by stakeholders can be eliminated, obtaining input from the public before developing recommendations provides the opportunity to mitigate concerns, garner broader support, and develop a more successful Master Plan.

Potential stakeholder concerns related to the Pueblo Airport Master Plan could involve a range of topics, including but not limited to:

- **Balancing economic development priorities with safety enhancements.**
- **Coordinating future development with the Airport Traffic Control Tower and the viability of future scheduled commercial service.**
- **Potential changes in proposed land uses surrounding the Airport.**
- **Potential environmental impacts associated with proposed future development projects.**
- **Future hangar capacity and other landside development needs.**
- **Optimizing future development of the Airport according to the stakeholder, which sometimes results in conflicting priorities.**
- **Private sector development and involvement.**
- **Development project funding sources.**

The consultant team intends to use plain language and minimize the use of acronyms and technical jargon that may be unfamiliar to a public audience as much as possible in its outreach and communication efforts. This includes proactively providing definitions of technical terms and explanations of relevant regulations when used in project messages, and using easy-to-understand graphics, tables, and charts in addition to narrative descriptions. In some cases, concerns and objections expressed by stakeholders occur due to a lack of understanding or a misunderstanding on a specific topic. Should the need arise, Mead & Hunt will assist Airport Staff in addressing the issue, which may include refining the FAQs on the project website, providing more information at the next milestone event, or developing targeted fact sheets or other project communications. Including the topic as an agenda item at a SC meeting may provide clarity to the issue while delivering more information to SC members, which they can help distribute to their constituents and the public.

Proposed Communication Tools and Engagement Techniques

The primary communication and engagement techniques proposed to accomplish the outreach and communication goals of the Master Plan are a combination of in-person* interactions (in the form of briefings and public informational meetings) and informative communication materials (including a project website, informational materials, and social media posts). These activities will each be tailored to their respective audiences.

*In-person interactions will be held only if local, state, and federal orders allow at the time these engagement opportunities are required. Care will be taken to follow all applicable social distancing guidelines and best practices in effect at the time. Should restrictions due to the COVID-19 pandemic preclude in-person interactions, Mead & Hunt will implement alternative delivery and collaboration solutions to meet the project's needs.

Communication Tools

Mead & Hunt will work with the Airport to develop communication tools and materials that support the planning process, which may include:

- **Key messages and speaking points:** The list of key messages (presented at the beginning of this plan) provides a breakdown of messages, by topic, that may be used to develop speaking points for presentations and briefings and to respond to inquiries. Using these key messages provides consistency in project messaging; messages will be updated to reflect current project conditions and responses to community questions.
- **Project website:** The Airport will create an area for the Master Plan on the Airport's existing website.[2] Specific content for the website will be developed by Mead & Hunt and may include reports, tables, infographics, drawings, narrative text, and other content as required. The project website will include:
  - Project background, purpose, process, and schedule.
  - Public project documents (working papers, outreach materials, and other supporting documents).
  - Information on community engagement opportunities, including this Outreach and Communications Plan; dates, times and locations of public meetings; how to sign up for email notifications; and an online comment form for consideration in the Master Plan development process.
  - Helpful terms and definitions.
  - Project frequently asked questions (FAQs).

[2] Per FAA policy in the AIP Handbook, Appendix E-2, the public will not be required to register to view and/or download documents.

- **E-news updates:** Periodic project updates will be sent out through the City of Pueblo's email subscription service to all subscribers of the News Flash – Aviation list. Updates will include project progress, milestones, and notification of community engagement opportunities, such as public open houses or availability of public project documents.
- **Presentations:** A library of presentation slides will be used to tailor briefings for key stakeholders, the SC, and the public. These slides may be used in various combinations according to the group and timeframe available for the presentation. Hard copy handouts of the presentations may be most appropriate for individual or small group briefings.
- **Presentation boards:** Presentation boards will be developed for the public open-house informational meetings. These can be left with Airport administration staff to be displayed in the terminal following the meetings, if desired.
- **Frequently Asked Questions (FAQs):** An FAQs document will be maintained based on communications and comments received. The document will be posted to the project website and may also be used as leave-behind material at briefings.
- **Social media:** Social media posts on the Fly Pueblo Facebook page will be crafted to coincide with the availability of new content on the website, distribution of e-news updates, and announcements of public meetings or other project activities. Notice of social media posts will be provided to City of Pueblo for sharing via their social media channels.
- **Public notices:** Public notices announcing the public open house meetings will be provided to the Airport for distribution through local media outlets serving the City of Pueblo and Pueblo County.
- **Website links, banners or infographics to drive traffic to PUB website:** Web banners and/or infographics will be developed and offered for placement on the Pueblo City and County websites (if allowed by those entities) in an effort to raise awareness of the ongoing Airport Master Plan and to drive traffic to the PUB website where more information can be obtained. If banners and infographics are not able to be posted on those websites, a text link will be offered instead.

Engagement Activities

The following proposed engagement activities have been scoped and are suggested to reach the broadest audience possible and will be used to target specific audiences interested in the Master Plan:

- **Five (5) Study Committee meetings (Stakeholder briefings):** SC meetings will be used to provide updates on technical work, issued through a series of working papers. Draft materials will be distributed to SC members in advance, while the meetings themselves will be used to solicit feedback for incorporation to the extent possible. When possible, SC meetings will be held in-person, with a virtual meeting option available for those who need it. When meeting in person is not possible due to the COVID-19 pandemic, travel restrictions, and in-person gathering restrictions, SC meetings will be held exclusively in virtual settings.
- **Four (4) individual or organizational briefings:** Formal briefings will be offered to primary stakeholders at key points during the planning process. These briefings will be offered to the Pueblo City Council or other groups as necessary. The consultant team will provide a master slide deck and any informational packets needed for these briefings, whether the consultant team's in-person attendance is required or not. For any briefings where the consultant team is not present, prep packets and additional coordination with Airport staff will also be provided, as requested. To the extent possible, SC and public meeting dates will be scheduled to coincide with any briefings that would occur on a set schedule (i.e., City Council briefings) to minimize travel expenses. Additional briefings, or follow-up visits, will be provided as needed or requested.
- **Two (2) public open house meetings:** Mead & Hunt will coordinate two public open house informational meetings at key project milestones to provide the public with the opportunity to learn about the project and submit input that may inform the Master Plan. Mead & Hunt will draft and provide the Airport with public notices to be distributed through local and social media outlets, informing the public about the information meetings with date, time, and location information. Per the scope of services, the Airport will be responsible for securing a venue for these meetings.

TABLE 2 identifies the relationship of project communication and engagement tools to the target audiences.

TABLE 2: Target Audience Engagement Tools

TARGET AUDIENCE GROUP	PRIMARY COMMUNICATION TOOLS	PRIMARY ENGAGEMENT ACTIVITIES
Study Committee Members	▪ Presentations (including summary of public involvement activities) ▪ Project website	▪ SC meetings
Community, Business, and Internal Stakeholders	▪ Presentations ▪ Project website ▪ FAQs ▪ Social media posts ▪ Key messages and speaking points ▪ Comment form	▪ Individual or organizational briefings ▪ Public open house meetings
General Public	▪ Project website ▪ Presentation boards ▪ Presentations ▪ FAQs ▪ Public notices ▪ Social media posts ▪ Comment Form	▪ Public open house meetings ▪ Individual or organizational briefings

Engagement Activity Support

For each of the meetings/events described in **TABLE 2**, Mead & Hunt will support Airport Staff by:

- **Coordinating logistics.**
- **Jointly developing informational materials, presentations, public notices, social media posts, and/or talking points.**
- **Participating in preparation sessions by phone or in-person (when possible).**
- **Providing staffing as appropriate.**
- **Summarizing key stakeholder comments, questions, and concerns to help determine next steps.**

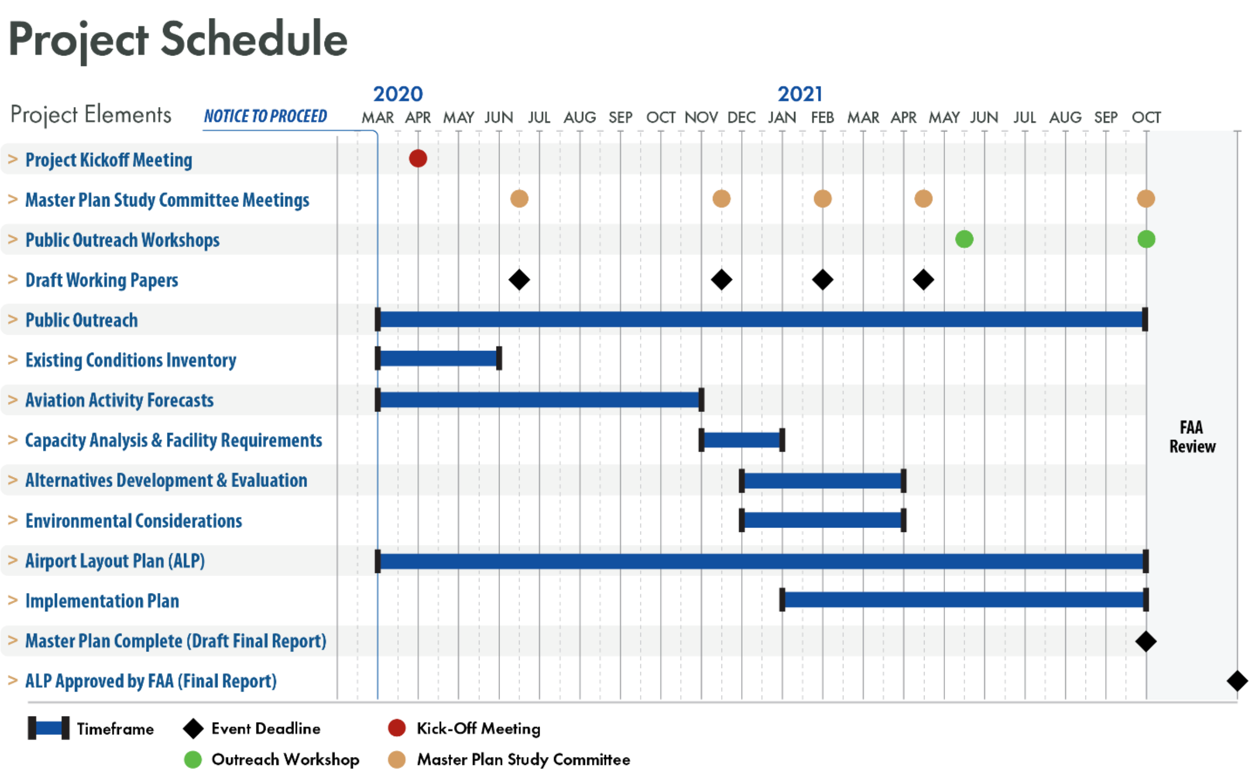
Proposed Outreach Timeline

Stakeholders and the public will be involved at key milestones throughout the planning process—from initial education to information sharing about key data, to discussion of comments, questions, and concerns.

General timing considerations for outreach and communication activities supporting the Master Plan process are illustrated in **FIGURE 1**. The proposed schedule includes SC meetings and larger-scale public open houses/meetings at critical milestones (the Conceptual Development Plan and the Draft Final Master Plan Report).

If necessary, Ryan Hayes, the Mead & Hunt Project Manager, may attend up to four (4) additional meetings not included in the schedule. These meetings could include additional SC meetings, neighborhood/interest group meetings, City Council meetings, or FAA coordination meetings either at the Denver ADO or other locations as required.

FIGURE 1: Project Schedule with Key Public Involvement Milestones



Communication Protocols

The following communication protocols should be used to deliver key messages clearly and consistently throughout the planning process. These protocols also support the ability to respond to requests in a timely manner.

- **Requests for Information:** Airport Staff (via direct phone/email contact) will field requests for information and identify the appropriate project team member to provide a response. Mead & Hunt will prepare a draft response for review, whenever possible. All final responses will be sent by Airport Staff.
- **Requests for meetings/briefings:** Airport Staff (via direct phone/email contact) will field requests for meetings/briefings. In follow-ups, team members will gather as much information about the briefing as possible, including schedule options, number of anticipated attendees, details about the meeting space, and issues of interest. Once this information is collected, staffing needs and the availability of the consultant team and Airport Director will be discussed internally before a commitment is made to provide the briefing. For all briefings, a summary should be documented on the Airport's project website.
- **Comments:** The Airport will provide regular reports of comments received on a bi-weekly basis to the project team (as needed). Verbal summaries of recent questions will be provided to SC members at their meetings.
- **Material updates:** Materials will be regularly reviewed and updated to ensure consistent and accurate messaging that is responsive to project conditions.

Mead & Hunt