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APPENDICES

APPENDIX 1: ALP PLAN SET

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ACRONYMS

100LL – 100 Low Lead

AAF – Army Airfield

AAGR – Annual Average Growth Rate

ACAIS – Air Carrier Activity Database

ADIP – Airport Data and Information Portal

AIP – Airport Improvement Program

ASOS – Automated Surface Observing System

AST – Above Ground Storage Tank

ASV – Annual Service Volume

ATC – Air Traffic Control

BIL – Billings Logan International Airport

BIL – Bipartisan Infrastructure Law

BLM – Bureau of Land Management

BNSF – Burlington Northern Sante Fe Railway

CatEx – Categorical Exclusion

CFR – Code of Federal Regulation

CIP – Capital Improvement Plan

CTAF – Common Traffic Advisory Frequency

DEN – Denver International Airport

EAS – Essential Air Service

FAA – Federal Aviation Administration

FBO – Fixed Base Operator

GA – General Aviation

GGW – Wokal Field / Valley County Airport

IAP – Instrument Approach Procedure

lb – Pounds

LWCF – Land and Water Conservation Fund

MDT – Montana Department of Transportation

MIRLs – Medium Intensity Runway Lights

MITL – Medium Intensity Taxiway Lights

MSL – Mean Sea Level

NAS – National Airspace System

NAVAID – Navigational Aid

NDB – Non-Directional Beacon

NEPA – National Environmental Policy Act

NPE – Non-Primary Entitlement

NPIAS – National Plan of Integrated Airport Systems

NRHP – National Register of Historic Places

NWS – National Weather Service

OFA – Object Free Area

PCI – Pavement Condition Index

PCL – Pilot Controlled Lighting

PILT – Payments in Lieu of Taxes

REILs – Runway End Identifier Lights

SASP – State Aviation System Plan

TES – Threatened and Endangered Species

TFMSC – Traffic Flow Management System Counts

TSA – Transportation Security Administration

USACE – US Army Corps of Engineers

USDOT – US Department of Transportation

VOR - Very High Frequency Omnidirectional Range

EXECUTIVE SUMMARY

This document presents the Airport Master Plan for Glasgow Airport in Glasgow, Montana. An Airport Master Plan and associated Airport Layout Plan update requires a comprehensive study to identify the most appropriate development plans for the airport to meet Federal Aviation Administration design and safety standards and to continue to meet future aviation demand. This Airport Master Plan is an update to the 2013 Glasgow Airport Layout Plan which did not include a formal aviation demand forecast. The updated Glasgow Airport Master Plan describes orderly execution of development projects for Glasgow Airport over the next 20 years.

The Glasgow Airport is a public-use airport approximately one mile northeast of Glasgow and approximately 55 miles south of the Canadian border in northeastern Montana. The airport is in close proximity to US Route 2 and Montana Highway 24. The Glasgow Airport is an important link for commercial, business, medevac, and general aviation for the Glasgow community and northcentral Montana.

The Glasgow airport has two lighted runways (Runway 12/30 and Runway 8/26), an adjoining taxiway (Taxiway C), aprons, taxilanes, and associated airport infrastructure (e.g., terminal, fueling facility, hangars, tiedown area, operational support buildings). Runway 12/30 is the primary runway and is asphalt-paved with dimensions 5,001 feet long and 100 feet wide. Secondary Runway 8/26 is asphalt-paved with dimensions 5,000 feet long and 75 feet wide.

This Airport Master Plan describes the update process and presents recommendations in the following chapters:

- **Inventory of Existing Conditions** – Establishes the current airport conditions and use.
- **Forecast** – Presents methods and results of forecasting and expected aircraft use of the airport.
- **Facility Requirements** – Identifies airport needs to meet design and safety standards and to meet the usage forecast.
- **Alternatives** – Presents three project alternatives specifically for improvements to Taxiway C. Evaluation methods are described including consideration of comments and concerns of the public, stakeholders, advisory committee, and project team. Three alternatives are presented:
    - Alternative 1 (Preferred Alternative) – Relocate Existing Taxiway C
    - Alternative 2 – Develop New Taxiway to the West
    - Alternative 3 – Relocate Taxiway C with New Entrances and Runway Extensions
- **Airport Layout Plan** – Introduces the drawings depicting the current airport layout and future layout.
- **Airport Capital Improvement Plan** – Presents the Capital Improvement Plan projects recommended to be constructed during the 20-year planning period. Capital Improvement plan projects (1-16) are categorized by development periods: imminent, short-term, medium-term, and long-term. The chapter includes descriptions of all projects including the short-term CIP project for taxiway improvements (Alternative 1). This chapter also addresses estimated costs for each project.

The Glasgow Airport Master Plan update provides a detailed development plan to attain the following goals: preserve existing infrastructure in good repair, improve infrastructure to meet design and safety standards, and develop portions of the airport to enhance safety and utility. The updated Airport Master Plan recommends the following suite of projects to accomplish these goals.

Glasgow Airport – Proposed Capital Improvement Projects

Imminent – Development Project (Current)	
Project 1	Relocate Electrical Vault – from terminal to separate structure
Short-Term Development Projects (Years 1 – 5)	
Project 2	Relocate Taxiway C – Environmental Assessment
Project 3	Acquire Snow Removal Equipment
Project 4	Repair Perimeter Gate Deficiencies – gate from Airport Road to the apron
Project 5	Runway 12/30 and Runway 8/26 Mill and Overlay – Design
Project 6	Relocate Taxiway C – Design
Project 7	Runway 12/30 and Runway 8/26 Mill and Overlay – Construction
Project 8	Replace Automated Surface Observing System – coordinate with National Weather Service
Project 9	Relocate Taxiway C – Construction
Medium-Term Development Projects (Years 6- 10)	
Project 10	New Terminal
Project 11	Acquire Snow Removal Equipment – continue replacement
Long-Term Development Projects (Years 11-20)	
Project 12	Build New Hangars
Project 13	Parallel Taxiway to Runway 8/26
Project 14	Partial Parallel Taxiway to Runway 12/30
Project 15	Replace Existing T-Hangar
Project 16	Create helicopter landing area – provide adequate separation from fixed-wing aircraft operations

1. INVENTORY OF EXISTING CONDITIONS

1.1 INTRODUCTION

1.1.1 Glasgow Community

Glasgow, Montana is the County Seat of Valley County Montana. Valley County covers over 5,000 square miles with a population of approximately 7,500. Glasgow is located along US Highway 2, a major east-west traffic corridor of Montana and the northern Great Plains region, and locally referred to as "The Hi-Line." East of Glasgow is Montana Highway 24, a major north-south route connecting more populated areas to the south and Canada to the north. The northern US Burlington Northern Santa Fe Railway (BNSF) line and National Railroad Passenger Corporation (Amtrak) passenger service, parallels much of the Hi-Line.

The Glasgow area was home to various tribes of Plains Indians for thousands of years. These Native American tribes were primarily regionally nomadic, following buffalo migration routes and local water sources. Just prior to most European and other settlements, the predominant tribes were associated with the Sioux / Lakota bands.

The town of Glasgow was formally established in the late 1800s and closely related to transcontinental railroad development. As most first-time visitors will often notice, many of Montana's Hi-Line communities have names similar to European cities and landmarks. This was by design, as railroad interests at the time wanted to convey a more modern feel for some of the obviously remote communities. Glasgow's most recent official population estimate is 3,202 (2020 Census). It is one of the more populated areas along the Hi-Line and is considered the hub of northcentral Montana. From Glasgow, one must travel about 140 miles east to Sydney, near the North Dakota border, or 150 miles west to Havre before finding a larger town. A 2018 *Washington Post* article described Glasgow as "the middle of nowhere" since "Of all towns with more than 1,000 residents, Glasgow…is farthest – about 4.5 hours in any direction – from any metropolitan area of more than 75,000 people." The population of Glasgow has fluctuated since its establishment, responding to major infrastructure projects (rising when the Fort Peck Dam was built) and military activity (rising during the operation of and then declining after the closure of the Glasgow Army Airfield (1942 to 1946) and the Glasgow Air Force Base (1957to 1976). The population has been relatively stable since about 1990.

The Glasgow Chamber of Commerce touts Glasgow as a busy regional hub for the area's agriculture, commerce, economics, healthcare, and other services. Valley County's draft 2021 Capital Improvement Plan (CIP) states that the County has a relatively diverse economy with government services, farming, accommodation and food services, and retail trade as the top four sectors in terms of job numbers.

The western portion of Fort Peck Indian Reservation lies within Valley County. This is the ninth largest Indian reservation in the US and home to two separate nations, the Assiniboine and Sioux tribes. The most populated town within the reservation is Wolf Point, approximately 50 miles east of Glasgow. Wolf Point has a commercial, essential air service (EAS) airport.

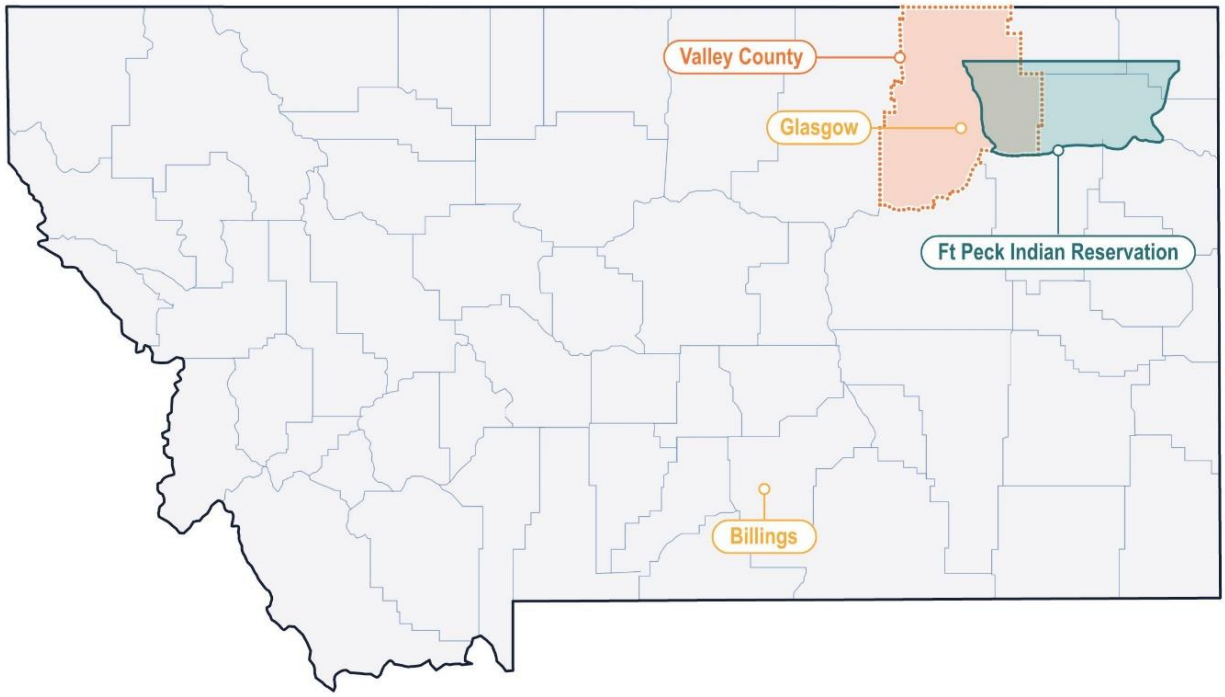


Figure 1-1. Map of Montana and Areas Discussed in this Master Plan.

1.1.2 Glasgow Airport

Wokal Field / Valley County Airport (GGW) is locally known as both Wokal Field and Glasgow Airport. The designation of Wokal Field was added to the airport name nearly 20 years ago, in honor of longtime local pilot Vic Wokal.

GGW is a public use airport and an important link for commercial, business, and general aviation (GA) interests for the local Glasgow community and north-central Montana. GGW is about one mile northeast and immediately adjacent to the city of Glasgow, Montana and approximately 55 miles south of the Canadian border. GGW is owned and operated jointly by Valley County and the City of Glasgow.

Figure 1-2. Glasgow Airport

GGW has two lighted runways (Runway 12/30 and Runway 8/26), an adjoining taxiway, ramp areas, and other airport infrastructure. The airport has no control tower but supports instrument approach procedures (IAP) and an on-field Very High Frequency Omnidirectional Range (VOR) navigation system. Development on the field includes a passenger terminal, several airport operation support buildings, and private and commercial hangar development. GGW has no full-time / full service fixed-base operator (FBO) on the field. GGW provides 100 low lead (100LL) and Jet A fuel sales. The airport is usually attended 16 hours per day (0600 to 2000) by airport personnel. GGW staff includes one full-time manager and three full- or part-time support employees. According to the Montana Department of Transportation (MDT) 2016 Economic Impact Study, GGW contributes approximately $24.39 million in annual on-airport spending, $2.75 million in construction spending, and $1.2 million in visitor spending, with spin-off effects of that activity generating nearly another $28 million in economic benefits to the community.

GGW is included in the National Plan of Integrated Airport System (NPIAS). NPIAS airports typically include most commercial service, reliever, and general aviation airports that are important to the national transportation system. Airports without a key role in the National Airspace System (NAS) and private airports are not included in the NPIAS. Inclusion in the federal NPIAS is required to receive Federal Aviation Administration (FAA) funding for allowable developments and planning projects.

1.2 AIRPORT HISTORY

In the 1930s, Glasgow had a small, but regionally important municipal airport. At the beginning of WWII, the Glasgow Chamber of Commerce recognized "the urgency of the War and the potential of a large airbase on the hill." Chamber President Paul J. Campbell garnered the support of Montana's congressional delegation, including influential Montana senator Burton K. Wheeler and convinced the US Army to establish a satellite airfield in northeastern Montana. One of the arguments that persuaded the military to locate the airfield at Glasgow was to protect the Fort Peck Dam. Once the military decided to locate the airfield at Glasgow, it was necessary to obtain additional land to extend the runways. This land was obtained by the military from local landowners and the State of Montana.

Construction of the Glasgow Army Airfield (Glasgow AAF, aka Glasgow Satellite Airfield) began in May 1942 and was finalized in November 1942. Construction of the project was directed by the Missouri River Division of the US Army Corps of Engineers (USACE). The H. R. Green Company drafted the plans for the Glasgow AAF. The Inland Construction Company of Omaha, Nebraska was the prime contractor for the airfield at Glasgow, and C. W. Bennett and L. B. Lewis of Great Falls and Billings were contracted for the electrical work. All materials for the base were shipped in via railroad. Upon completion, the Glasgow AAF consisted of a runway complex, at least one rifle/pistol range, a cantonment area, a complex drainage system, a sewage treatment facility, and an extensive water distribution system.

Figure 1-3. B-17 Flying Fortress

The airfield housed the 96th Bombardment Squadron and 614th Bombardment Squadron of Boeing B-17 Flying Fortresses (Figure 1-3). On December 7, 1942, the first of the B-17 bombers arrived at the Glasgow AAF. The military ceased use of the airfield in 1944, but the site was reorganized and established as a camp for German prisoners of war, until the end of the war. On July 15, 1946, the Glasgow AAF was classified as surplus and was transferred to the War Assets Administration on November 18, 1946.

In May 1948, the War Assets Administration transferred ownership of the Glasgow AAF and all associated structures and property to the City of Glasgow and Valley County for use as a civilian airport. Although much of the Army infrastructure was demolished and/or abandoned, the old Army runways and taxiways contributed to the current airport layout.

Figure 1-4. Glasgow Army Airfield Norden Bombsite Storage Vault.
Source: Historic Register Application

In 2011, the Glasgow Army Airfield Norden Bombsight Storage Vault (on airport property) was added to the US Department of the Interior National Register of Historic Places (NRHP). This building (Figure 1-4) is about ½ mile north of Glasgow, in the northeast section of GGW property. The description of this building from the registration application reads as follows:

"The Glasgow Army Airfield Norden Bombsight Vault is located on the northeast side of the Glasgow Airport, just north of Glasgow, Montana. The US Army Air Force constructed the storage vault in 1942 to house the top secret Norden Bombsight. The Glasgow Army Airfield was one of three satellite airfields to East Base (now Malmstrom Air Force Base) in Great Falls, Montana that trained B-17 "Flying Fortress" squadrons during World War II. Constructed of reinforced concrete, the structure has changed little since 1942. The concrete is in good condition despite not having been actively maintained since the mid-1940s and is structurally identical to a bombsight storage vault at the Lewistown Satellite Airfield Historic District (24FR0851). The building retains good integrity…Because the storage vault sits in a remote section of the airport, the setting is largely intact and its association with the World War II components of the airport endures."

The boundaries of this historic site extend 50 feet to the north, south, east, and west to include the structure and the approximate location of the perimeter fence, sentry box, and entry gate.

1.3 AIRPORT ROLE

GGW serves the local Glasgow community and is an important regional hub throughout the north-central and eastern Montana areas. The FAA has classified GGW as a Local, Commercial Service airport as part of the NPIAS. Airports receiving federal funding must adhere to strict FAA design and operational standards.

GGW has a significant role in supporting travel for medical reasons. Rapid, reliable access to advanced medical care for patients with serious injuries or medical conditions is critical. Commercial and medevac flights transport patients from GGW to medical facilities available outside the area. Commercial flights also allow medical professionals to visit Glasgow and periodically provide services. At least one hospital (in Billings) provides a monthly off-site clinic at Glasgow with both staff and equipment flying into GGW. This allows some local residents to receive specialized medical attention without traveling.

GGW is a home base for Northeast Montana STAT Air Ambulance Cooperative (STAT Air), which provides aviation medical support throughout eastern Montana. STAT Air houses three Pilatus PC-12 aircraft on field and supports others as well. The nearest city with a major hospital is Billings, a large medical and commercial hub in southern Montana, 277 road miles south of Glasgow.

GGW infrastructure supports aviation services including corporate and business travel, freight and cargo service, agricultural operations, flight training, and transient government and military traffic for training and overflight operations. GGW also provides commercial airline service, via Cape Air, as part of the US Government EAS program. Cape Air provides multiple daily connections to Billings Logan International Airport (BIL) and connection to broader commercial air travel locations. Local and transient GA activity is robust. The area surrounding GGW is very popular for tourism and recreation, including hunting, fishing, and boating, especially on nearby Fort Peck Reservoir.

1.4 AIR CARRIER SERVICE

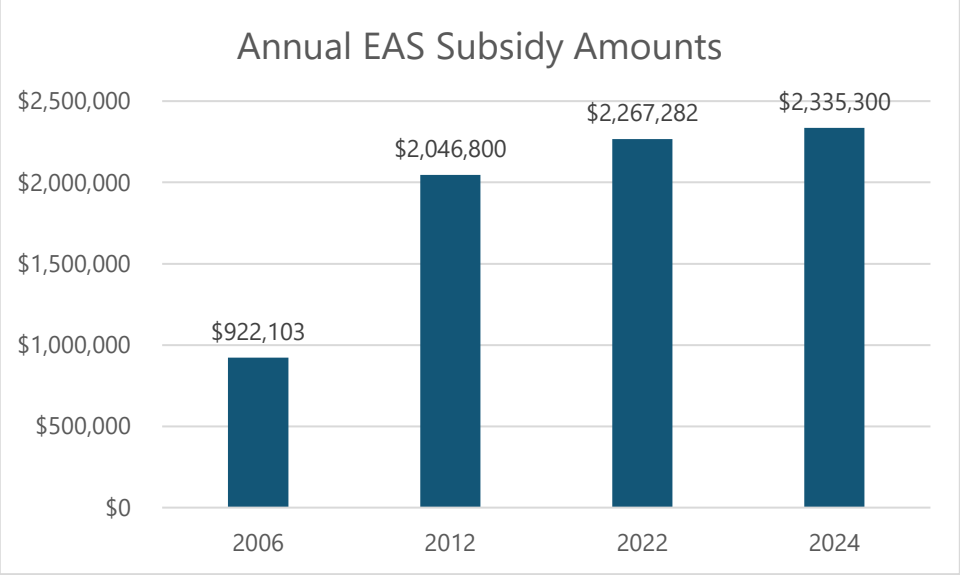
1.4.1 Essential Air Service

To be eligible for the EAS program, an airport must meet requirements set forth under the program by the US Department of Transportation (USDOT). Potential EAS air service providers submit performance bid proposals every two to four years to the USDOT to vie for selection. EAS service providers then receive varied compensatory rates from the federal government in support of the air service they provide to underserved communities. The EAS program enables communities, such as Glasgow, who would otherwise have to drive hundreds of miles to reach a commercial service connection, to fly to larger regional hubs. Cape Air, through the EAS program, currently provides two daily flights to BIL with small, twin-engine aircraft.

GGW has participated in the EAS program for over 40 years. Big Sky Airlines provided scheduled carrier service under an EAS contract to GGW from 1986 until 2008. Great Lakes Airlines began EAS flight service in 2009, and Silver Airlines provided the EAS flights from 2011 to 2013. Cape Air has provided EAS service at GGW since 2013. Prior to formal EAS service and US airline deregulation in the 1970s, Frontier Airlines provided commercial service at GGW. The nearest large/medium hub airport (in the US) to GGW is Denver International Airport (DEN), which is 709 miles away, and the nearest small hub is BIL, which is 285 miles away.

The current USDOT EAS agreement with Cape Air extends from January 1, 2023, to December 31, 2027. The annual subsidy rate of the agreement is $2,335,300 (Table 1-1).

Table 1-1. GGW Historical EAS Annual Subsidy



1.4.2 Airport Certification

Commercial airports which serve aircraft with more than nine passenger seats are certificated through the FAA as meeting standards set forth in 14 Code of Federal Regulation (CFR) Part 139. Although GGW does provide commercial services, the aircraft used by Cape Air have a seating capacity under this

threshold, so GGW is not required to comply with 14 CFR Part 139. To avoid the significant costs associated with maintaining Part 139 certification, GGW returned their Part 139 Certificate to the FAA in December 2013.

1.4.3 Transportation Security Administration

The Transportation Security Administration (TSA) has designated GGW as a Category IV Airport. As such, the airport is required to have a Supporting Airport Security Program that is approved by the TSA. The TSA provides security screening for commercial passengers departing from GGW. However, there is no requirement that GGW have access controls, badging, or designated restricted areas (e.g., Air Operations Area, Security Identification Display Area, Secured Area). There is a small sterile area that holds passengers after screening until boarding.

1.5 MANAGEMENT

GGW is jointly owned and operated by Valley County and the City of Glasgow; however, Valley County provides a much larger role in terms of financial and operational support than the City. An Airport Advisory Board, consisting of five officials, appointed by County and City representatives, meets once per month to oversee financial management of the airport. The board has some autonomy in making limited capital development decisions for the airport. GGW has a full-time airport manager with three rotating part- to full-time support positions that assist with day-to-day operation of the facility. Daily duties conducted by support staff primarily include selling and dispensing fuel and general upkeep, such as mowing and repair. The airport manager is usually the sole representative for GGW at most planning and financial meetings, such as the Montana Loan and Grant hearing, EAS meetings, and applicable national conferences.

There are three other airports located in Valley County: Fort Peck, Opheim, and Hinsdale. The GGW airport manager also oversees the upkeep of each of these airports. These airports are small, turf airports that generate little revenue and support very limited GA activity. Valley County helps to financially support these airports. The other three Valley County airports are generally described below.

- Fort Peck (37S) – a grass/turf strip near Fort Peck Dam
    - 18 miles south of Glasgow via Montana State Highway 24
    - Owned by Valley County
    - 2024 operating budget of $4,400
- Opheim (S00) – a grass/turf strip adjacent to Opheim, near the Canadian border
    - 45 miles north of Glasgow via Montana State Highway 24
    - Owned by Opheim and Valley County
    - 2024 operating budget of $3,300
- Hinsdale (6U5) – a grass/turf strip adjacent to Hinsdale on US Route 2
    - 30 miles northwest of Glasgow via US Route 2
    - Owned by Valley County
    - 2024 operating budget of $2,350

1.6 FINANCES

The Airport Advisory Board receives income from a variety of sources, including hangar rentals, lot leases, office leases, crop leases, fuel sales, and government taxes. Revenue in 2023 (not including FAA grants) was $939,992. Total non-capital expenses for 2023 were $1,013,037. GGW expenses include the operational expenses of the Glasgow, Fort Peck, Opheim, and Hinsdale airports. The non-Glasgow airport expenses usually total less than $20,000 per year. Most airport revenue is generated by fuel sales and building, land, and agricultural leases. GGW receives a small portion ($10,355 in 2023) of State entitlement share money and a small amount ($2,215 in 2023) from the US Bureau of Land Management (BLM) for oil exploration on lands within the County. The County and City commissioners have been consistently supportive of the airport, and when matching fund needs arise, the commissioners strive to allocate the funds or draw from Payments in Lieu of Taxes (PILT) funding. PILT are funds paid by the federal government to local governments to offset the lost revenue taxes incurred by the governments due to the presence of federal, tax-exempt lands in their jurisdiction. The ultimate goal of GGW is to be entirely self-funded, and GGW tries to maintain a minimum $100,000 cash balance. To help support its income, GGW provides many FBO services including fuel sales, line service, hangars, and pilot supplies. GGW expects significant expenses in the next few years to provide the sponsor's airport match for FAA funding of projects, including a taxiway realignment. In the past, GGW was able to draw from a Valley County mill levy; however, commissioners had to direct the monies elsewhere due to other economic priorities.

MDT Aeronautics Division collects and publishes information related to rates and charges from most airports in Montana. This information helps airport managers to understand what other airports are doing across the state.

The 2023 MDT Rates and Charges Survey lists the following items for GGW:

- GGW employs 1 manager and three full or part time employees
- Annual tax revenue of approximately $26,000 per year
- Tiedown / hangar rentals generate approximately $53,830 per year
- Large hangar rates are $0.15 square foot (sq ft) per year
- T-hangar rates range between $1,000 and $1,400 per year
- A fuel flowage tax generates approximately $470,500 per year
- The airport does not generally charge landing fees
- Building rents generate approximately $46,280 per year
- Counter space rates are approximately $6.41 sq ft per month
- Office space rates are approximately $5.63 sq ft per month
- TSA office rates are approximately $3.33 sq ft per month
- Utilities are included with rent
- Parking fees are not collected

- The airport collects 10 percent of vending machine concessions, which generates only about $175 per year
- Land leasing generates approximately $30,306 per year
- Improved airport land rates are approximately $0.15 sq ft per year
- Unimproved airport land rates are approximately $0.15 sq ft per year
- 815 acres of leased wheat and barley crops generate approximately $29.73 per acre
- 137 acres of livestock pasture generates approximately $8.03 per acre
- GGW does not collect revenue from advertising; however, there is an electronic display in the terminal lobby; advertising is free for community events.

Major funding sources for airport improvement projects usually include:

- FAA Airport Improvement Program (AIP) funds
- MDT Aeronautics Division Loan and Grant Program
- Other Montana state and national grant programs (e.g., InterCap, Bipartisan Infrastructure Law [BIL], American Rescue Plan Act/Corona Virus Response and relief Supplemental Appropriation Act)

1.7 RECENT FAA GRANT HISTORY

The FAA Airport Improvement Program (AIP) provides grants for airport infrastructure projects such as runways, taxiways, airport signage, and airport lighting. Airports are usually entitled to a certain amount of AIP funding each year, based on criteria such as the size of the airport, passenger volume, and CIPs. If capital project needs exceed available entitlement funds, the FAA can supplement entitlements with discretionary funding.

GGW is generally guaranteed some FAA entitlement funding each year. GGW airport receives Non-Primary Entitlement (NPE) and BIL entitlement funding. In addition, GGW can apply for much larger non-entitlement funding (FAA State Apportionment and Discretionary funding). Highlights of entitlement funding are:

- Non-Primary Entitlement

  If future CIP planning shows the need, GGW is eligible to receive up to $150,000 each year from the FAA NPE for use toward FAA-eligible projects, at 90 percent of match. NPE amounts are allocated to GGW based on projects within the GGW CIP over the next five-year period.

- Bipartisan Infrastructure Law

  Under the recently passed BIL, GGW is being awarded approximately $159,000 annually, for five years, beginning in 2022. BIL funds are similar to NPE funds but follow some different rules regarding project eligibility and spending.

FAA AIP program funding is sourced from a variety of government entities and a primary source is from

user fees, in the form of tax applied to commercial flights.

Figure 1-5 lists the top GGW project funded by grants for Fiscal Year (FY) 2005 to FY 2022. Table 1-2 lists all GGW grants provided by the FAA since 2003.

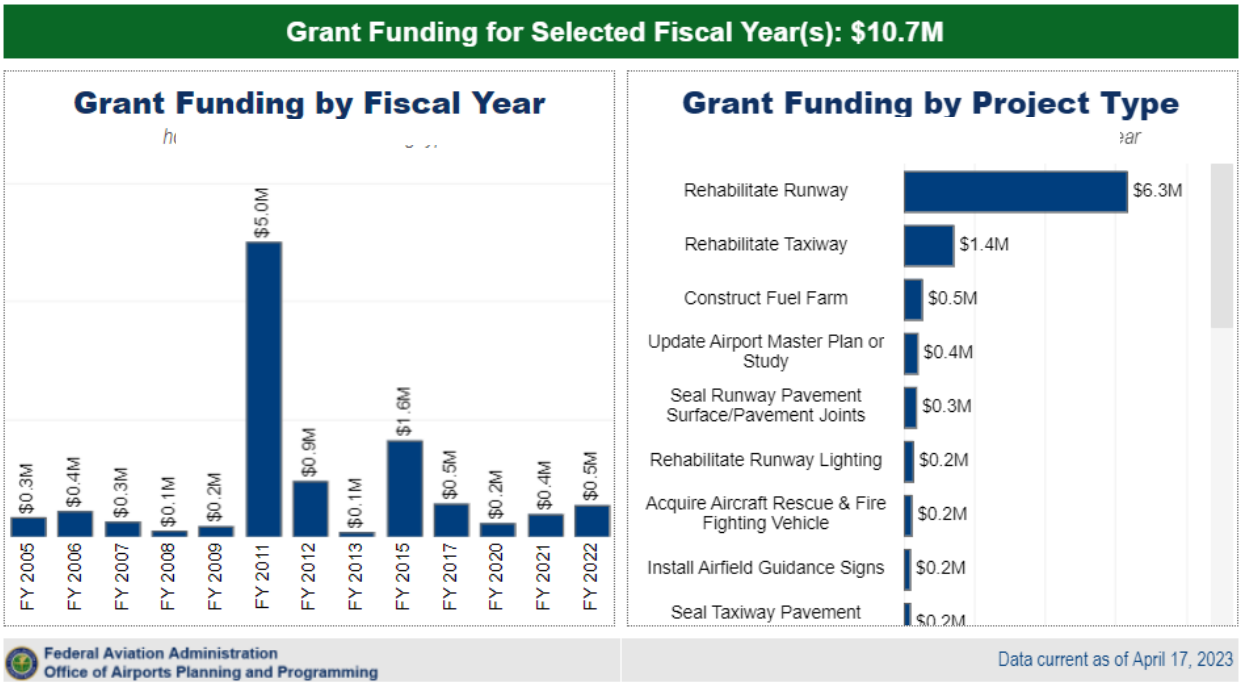


Figure 1-5. Top GGW Projects Funded by Grants, FY 2005 to FY 2022

Table 1-2. FAA AIP grants awarded to GGW, FY2003 - FY2022

Fiscal Year	AIP Grant(s)	Purpose
2003	$855,000	Rehabilitate runway 8/26 Rehabilitate runway lighting 8/26
2004	None	--
2005	$331,999	Install airfield guidance signs Acquire snow removal equipment Rehabilitate runway 12/30, taxiway, and apron
2006	$436,000	Acquire aircraft rescue and firefighting (ARFF) vehicle Rehabilitate runway 12/30 & taxiway Groove runway 8/26
2007	$251,750	Improve terminal building Conduct aeronautical survey for wide area augmentation system approach runway ends 12 and 30 Acquire snow removal equipment
2008	$104,000	Rehabilitate runway 8/26
2009	$155,259	Rehabilitate runway 12/30 - Phase I (Design) Update the Airport Master Plan or Study
2010	None	--
2011	$4,815,870	Rehabilitate runway 12/30 – Phase II & Phase III Rehabilitate runway lighting 12/30 Rehabilitate taxiway
2012	$942,010	Rehabilitate runway 12/30 – Phase IV
2013	$125,000	Conduct wildlife hazard assessment
2014	None	--
2015	$1,417,500	Rehabilitate runways 8/26 & 12/30 Rehabilitate taxiway Rehabilitate apron
2016	None	--
2017	$551,200	Construct fuel farm Rehabilitate parking lot
2018	None	--
2019	None	--
2020	$167,236	Install runway vertical/visual guidance system Rehabilitate runway Rehabilitate taxiway Rehabilitate apron CARES Act Funds
2021	$343,682	Update Airport Master Plan or Study CRRSA Act Funds
2022	$537,964	Seal apron pavement surface/pavement joints General ARPA Funds

Sources: CARES Act: Coronavirus Aid, Relief, and Economic Security Act of 2020 | CRRSA Act: Coronavirus Response and Relief Supplemental Appropriations Act of 2021 | ARPA: American Rescue Plan Act of 2021

1.8 AIRSPACE

To establish safe separation for aircraft, the FAA regulates airspace by dividing the airspace into various classes, with each class having different separation standards and restrictions. These classes of airspace are published and used by pilots and air traffic controllers to efficiently move air traffic. Figure 1-6 provides a graphic visualization of some of the different FAA airspace classes.

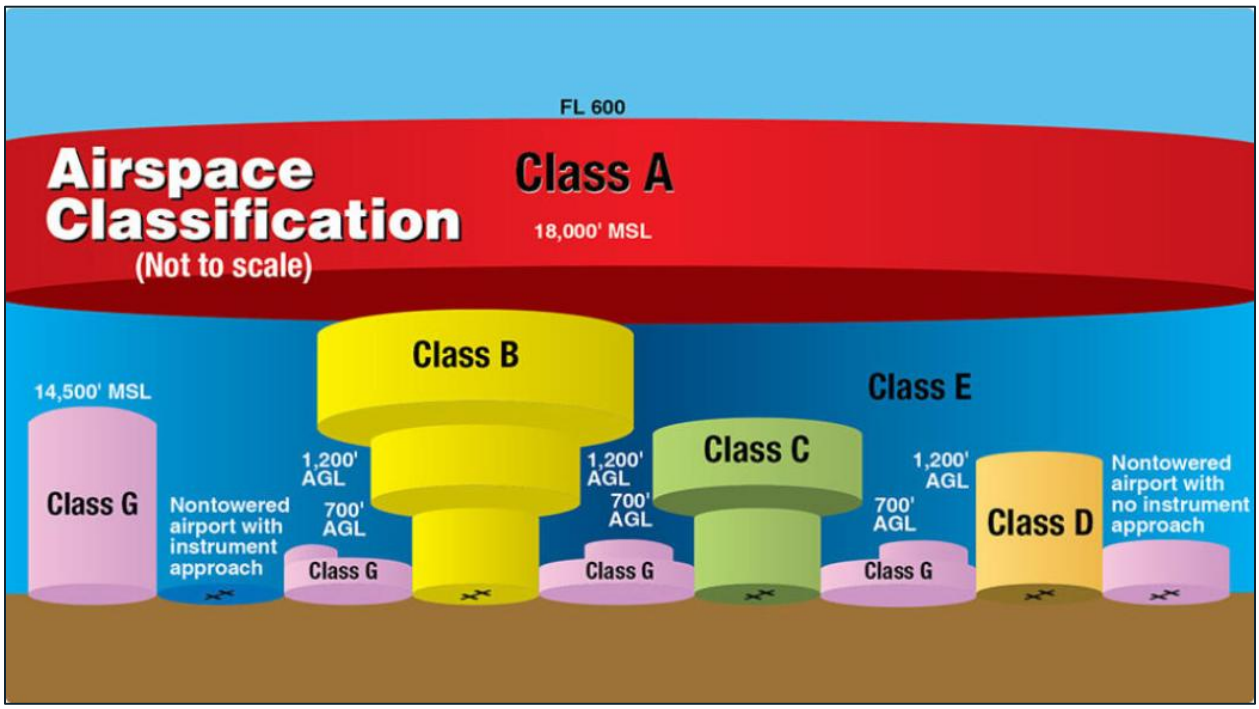


Figure 1-6. FAA Airspace Classes.
(FL = Flight Level; AGL = above ground level; MSL = above mean sea level)

The FAA has designated the airspace above GGW as Class E Airspace. Class E is controlled airspace that is not Class A, B, C, or D and is intended to provide air traffic service and adequate separation for IFR aircraft from other aircraft. The airspace generally includes 700 or 1200 feet above ground level (AGL) to the bottom of Class A airspace at 18,000 above mean sea level (MSL). GGW itself is uncontrolled.

1.9 INSTRUMENT APPROACH PROCEDURES

Instrument approach procedures (IAPs) are developed by the FAA to allow specially trained pilots, using appropriately equipped aircraft, to fly an approach to an airport under limited visibility conditions. The availability of an IAP at an airport greatly enhances the use of and accessibility to the airport. IAPs are classified as either precision or non-precision, depending on the type of approach. Precision approaches offer both horizontal and vertical guidance.

GGW has non-precision IAPs to Runway 12/30. Non-precision approaches only provide lateral guidance without the vertical component of precision approaches. The approaches allow pilots to fly in and out of GGW with ceilings as low as 200 feet above the airport elevation, with visibility as low as ¾ mile. It is important to ensure that these approaches are not compromised by incompatible development or obstructions. There are currently four published non-precision IAPs at GGW:

- RNAV (GPS) RWY 12 – lowest minimums at 2,544 feet MSL (250 feet AGL) with 7/8 mile visibility
- RNAV (GPS) RWY 30 – lowest minimums at 2,494 feet MSL (200 feet AGL) with 3/4 mile visibility
- VOR RWY 12 – lowest minimums at 2,700 feet MSL (500 feet AGL) with 1 mile visibility
- VOR RWY 30 – lowest minimums at 2,740 feet MSL (500 feet AGL) with 1 mile visibility

As new technologies emerge and navigation becomes increasingly more dependent on GPS-based systems and navigational aids (NAVAIDs), GGW is part of a shrinking network of airports that still maintains an on-field VOR (Very High Frequency Omnidirectional Range), ground-based navigational infrastructure. The FAA has been phasing out the non-directional beacon (NDB) navigational aids, especially where co-located with VORs. As a result, the non-directional beacon (NDB) approach that served GGW has been terminated. At this time, GGW has both a GPS-supported IAP (the RNAV procedures) and a ground-based IAP (the VOR procedures) for each end of Runway 12/30.

1.10 EXISTING FACILITIES

1.10.1 General Information and Facilities

Table 1-3 and Table 1-4 provide basic information about GGW and its facilities and services.

Table 1-3. General Information and Services at GGW

Feature	Description
Location Identification	GGW
FAA Site Number	12375.*A
Owner	Valley County / City of Glasgow
Address	89 Airport Road, Glasgow, Montana 59230
Manager	Position unfilled
Attended	Yes – Hours: 0600 – 2000 (7 days)
Telephone	406-228-2719
Fuel Available	Yes – 100LL and Jet A
Airframe & Powerplant Repair	Yes – Major
Tiedowns & Hangars Available	Yes

Table 1-4. General Facilities at GGW

Feature	**Description**
Elevation	2,295.9 feet MSL (surveyed)
Latitude / Longitude	$48^0$12′ 44.8″ N / 106^0 36′ 53.3″ W (estimated)
Area	1,552 acres
Control Tower	No
Traffic pattern operations	Normal
UNICOM / CTAF	122.8
Windsock / Segmented Circle	Yes
Beacon	Yes / lighted sunset to sunrise
Runway Lighting	Pilot Controlled

1.11 AIRSIDE FACILITIES

GGW has two paved runways (12/30 and 8/26), one taxiway (Taxiway C), (see figure 1-7). There is also a terminal area, multiple aprons, tiedowns, hangars, and taxilanes (see figure 1-8). The runways are described below, and features of each are listed in Table 1-5.

1.11.1 Runways

The primary runway at GGW is Runway 12/30. FAA designates runway names by magnetic orientation – Runway 12/30 is oriented along magnetic headings 120°/300° which is a roughly southeast-northwest orientation. Runway 12/30 is asphalt paved and is 5,001 feet long and 100 feet wide. The surface of the runway is currently listed as being in good condition and was recently maintained as part of a 2022 crack fill, seal, and remarking project. Threshold elevation of Runway 12 is 2,290.9 feet MLS; threshold elevation of Runway 30 is 2,287.7 feet MSL. The runway surface is designed for use by aircraft with gear weights for single wheel of 75,000 pounds (lb) dual wheel of 90,900 lb, and tandem dual of 99,900 lb or less. Runway markings meet requirements for non-precision instrument approaches and are suitable for the existing IAPs at GGW. Markings include runway designator numbers (12/30), a threshold bar, eight threshold stripes at each runway end, aiming points, and a centerline stripe. An overrun/blast pad marked with yellow chevrons is separated from the threshold of Runway 12 by a lead-in taxiway. There is a turnaround perpendicular to the threshold of Runway 30. Runway 12/30 has medium intensity runway lights (MIRLs) as well as Runway End Identifier Lights (REILs) installed. Lighting on Runway 12/30 can be activated using Pilot Controlled Lighting (PCL) by clicking the radio microphone several times while on the common traffic advisory frequency (CTAF).

Figure 1-7. GGW Airside Facilities

The secondary crosswind runway at GGW is Runway 8/26. The runway surface is asphalt paved and is 5,000 feet long by 75 feet wide. The surface of the runway was also part of the 2022 pavement maintenance project. However, Runway 8/26 needs a mill/overlay or possible reconstruction. Threshold elevation of Runway 8 is 2,284.2 feet MSL; threshold elevation of Runway 26 is 2,295.4 feet MSL. The runway surface is designed for use by aircraft with gear weights for single wheel of 25,000 lb, dual wheels of 45,000 lb, and tandem dual of 75,000 lb or less. The runway has basic visual markings including runway designator numbers (8/26), aiming points, and a centerline stripe. Runway 8 has a blast pad marked with yellow chevrons and is separated from the runway threshold by an aligned taxiway. There is a turnaround perpendicular to the threshold of Runway 26. Runway 8/26 has nighttime MIRLs as well as REILs installed. These lights can be activated remotely by pilots using the CTAF.

Table 1-5. GGW Runway Characteristics

Runway	12/30	8/26
Length (feet)	5,001	5,000
Width (feet)	100	75
FAA Runway Design Group	B-II	B-II
Surface Type	Asphalt / Grooved	Asphalt / Grooved
Runway Weight Capacity	Single – 75,000 lb	Single – 25,000 lb
	Dual – 90,900 lb	Dual – 45,000 lb
	Tandem Dual – 99,900 lb	Tandem Dual – 75,000 lb
Runway Edge Lighting	MIRL - PCL	MIRL - PCL
Precision Approach Path Indicator (PAPI)	Yes – 4 box	Yes – 2 box
REIL	Yes	Yes
Visual Glide Slope Indicator	PAPI-4	PAPI-2
Markings	Non-precision	Basic
Threshold crossing height	40 / 40	30 / 32
Visual glide angle	3.00 / 3.00	3.00 / 3.00
Obstruction clearance slope	34:1 / 34:1	34:1 / 34:1
Take Off Run Available (TORA) (feet)	5,001/5,001	5,000/5,000
Take Off Distance Available (TODA) (feet)	5,001/5,001	5,000/5,000
ASDA (feet)Accelerate Stop Distance Available (ASDA) (feet)	5,001/5,001	5,000/5,000
Landing Distance Available (LDA (feet)	5,001/5,001	5,000/5,000
Federal Aviation Regulation (FAR) Part 77 Category	C - Other than utility with NP IAP with visibility minimum to ¾ mile	B(V) – Other than utility with visual approach
IAP Approach Type	RNAV(GPS)/VOR	Visual
NAVAIDs	PAPI-4/ REIL	PAPI-2/ REIL

Source: FAA 5010 Master Record (last inspection May 15, 2023)

1.11.2 Taxiways/Taxilanes

GGW has one taxiway (Taxiway C) linking the ramp and terminal areas to the runways. The taxiway is 35 feet wide and lighted by medium-intensity taxiway edge lights (MITL). In the absence of a full parallel taxiway, aircraft must "back taxi" on active runways to reach the other end.

GGW has several taxilanes within the apron area to facilitate movement between private hangars and the main apron area. Taxilanes are depicted in Figure 1-8.

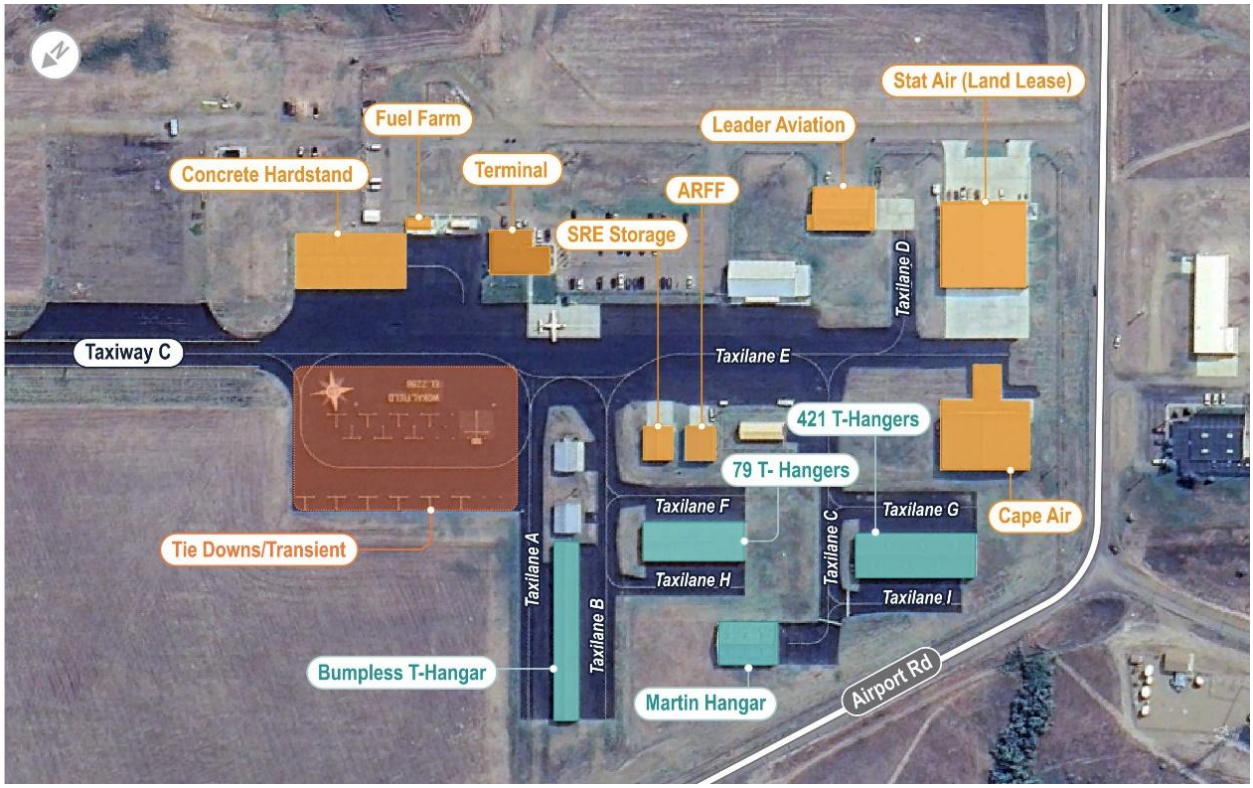


Figure 1-8. GGW Apron and Taxilane Layout

1.11.3 Helipad

There is no dedicated helipad at GGW. One helicopter is based at the airport. There is usually ample room within the tiedown apron area to allow for transient helicopter operations and a concrete hardstand area to allow for heavier rotorcraft. GGW experiences frequent helicopter traffic from the military and government agencies such as US Fish and Wildlife Service, US Department of Energy, and US Department of Agriculture. The airport manager reports that when military helicopters use the airport to refuel, it can be common to see as many as two Bell UH-1 Huey and seven Sikorsky UH-60 Black Hawk helicopters simultaneously on the apron.

1.11.4 Apron

Although there are no clear delineations, GGW is often described as having five apron areas intended for:

- Terminal Operations

- Agricultural Operations
- Fueling
- Tiedowns and Transient Parking
- Concrete Hardstand

Most of the ramp and apron areas were included in the pavement maintenance project in 2022, with crack fill and seal coats applied with remarking.

1.11.5 Weather Reporting and Meteorology

GGW has on-site weather reporting provided by an Automated Surface Observing System (ASOS) located in the infield area to the west of the intersection of Runways 12 and 8. The ASOS is owned and maintained by the National Weather Service (NWS). The ASOS provides critical information to pilots using the airport including visibility, cloud ceiling, wind velocity and direction, temperature, dew point, density altitude, and precipitation detection.

According to the former Airport Manager and local NWS technical staff the ASOS is rather old and has had recent service interruptions. The return to service has been delayed due to the time needed to procure replacement parts. These issues are not unique to GGW; other airports with older ASOS equipment encounter similar service interruptions and delays for repairs.

1.11.6 Hangars

There are T-hangars and private hangars on the GGW airport. T-hangars can be directly leased by the airport or are subleased by other owners. There are currently 20 T-hangars and three private hangar leases with GGW. The airport has been discussing the possibility of developing more hangars in the near future with local developers. Due to the fluctuating nature of leases and ownership, and to provide reasonable privacy, a comprehensive list of hangar tenants was not included within this plan. Updated tenant lists are public information and available from airport management. Figure 1-9 shows the Stat Air hangar at GGW.

Figure 1-9. STAT Air Hangar

1.11.7 Pavement Condition Index

FAA grant assurances stipulate that NPIAS eligible airports that receive federal funding for pavement improvements must develop a program to assess and manage their pavements. Montana Department of Transportation, Aeronautics Division routinely provides inspection of airfield pavements to assist Montana airports in complying with federal requirements.

A Pavement Condition Index (PCI) is usually determined by trained inspectors. The pavement is inspected, random pavement samples are collected, and the samples tested to determine pavement distress – type, severity, and quantity. The type of distress provides insight into what is causing the pavement to deteriorate. Determining cause of the deterioration is the first step in selecting the appropriate repair and schedule for maintenance. The pavement inspection information is then uploaded into an industry standard data management system called MicroPaver (or an equivalent). Data is broken into segments relating to runways, taxiways, and aprons. This data is then summarized into an easy-to-interpret PCI.

The PCI is a range from 0 to 100, with 100 considered new, undamaged pavement in excellent condition. An associated color map of the pavement sections and PCIs is also generated by the data management system. PCI values are impacted by the age of pavement and maintenance activities and schedule. PCIs with a value of 60 or less are generally considered at high risk for complete failure without immediate preventative maintenance or an asphalt overlay. Once PCI values fall into the 50s and below, pavements are generally considered as having failed, with a score of 40 or less usually requiring full depth reconstruction (see Table 1-6). PCI values are somewhat interpretive and not usually considered definitive on their own, especially regarding type and timing of maintenance. PCIs are just one of the tools sponsors and stakeholders have for planning.

Table 1-6. GGWPCI Scoring and Map Color Coding

PCI Range	Pavement Condition	Color Coding
86-100	Good	Dark Green
71-85	Satisfactory	Light Green
56-70	Fair	Yellow
41-55	Poor	Orange
26-40	Very Poor	Light Red
11-25	Serious	Dark Red
0-10	Failed	Grey

GGW pavement PCIs were determined in 2021, and the pavements received a mix of rankings ranging from poor to good. These rankings were commensurate with the age of past reconstruction and maintenance projects. Because of the recent 2022 pavement maintenance project, it can be assumed that some of the pavement ratings in the GGW PCI have been elevated. The 2021 pavement inspection results for GGW are shown in Figure 1-10 (color-coded graphic) and Table 1-7 (description of results, by paved section).

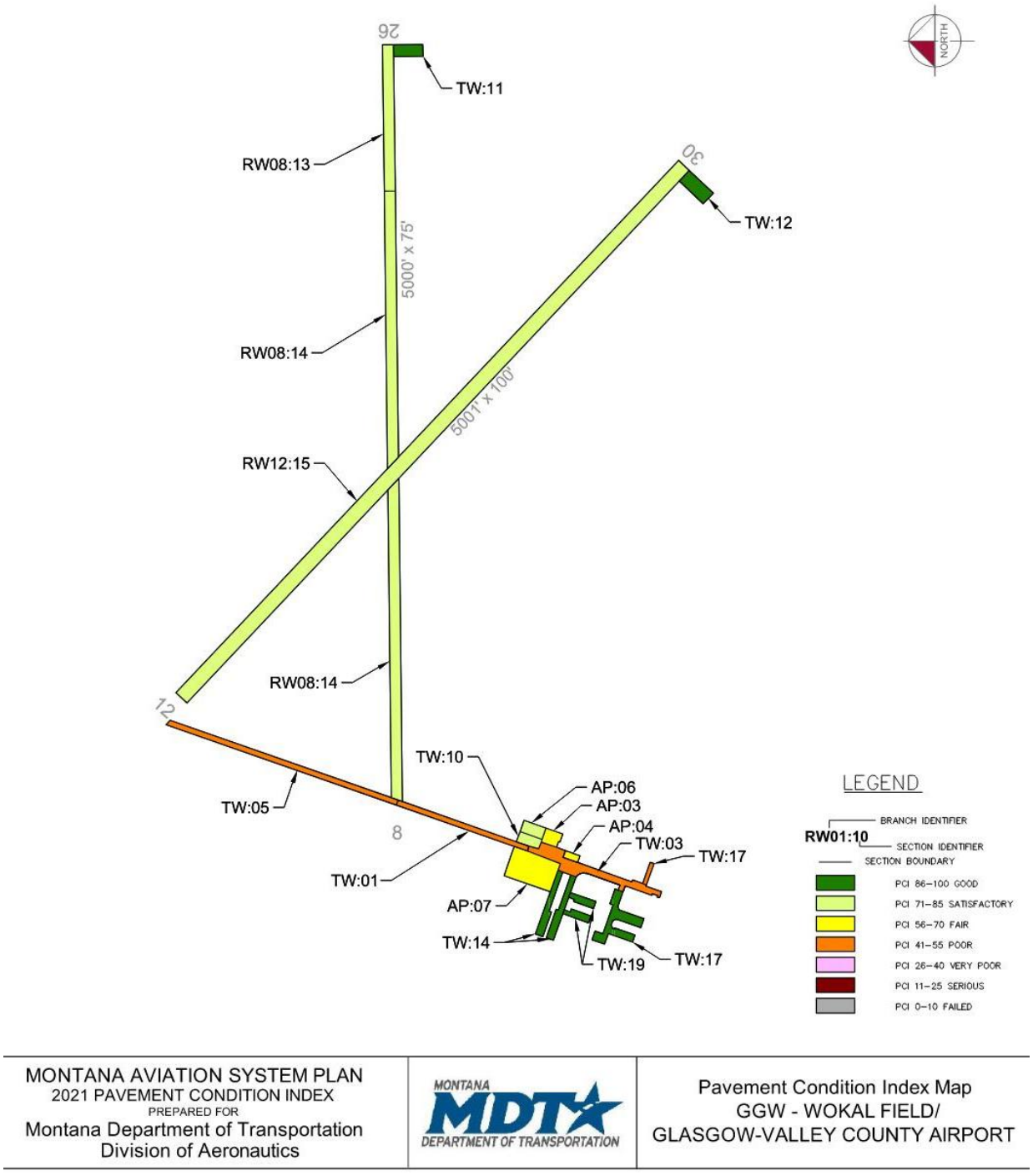


Figure 1-10. 2021 GGW Pavement Condition Index Illustration

Table 1-7. 2021 GGW PCI Data

Branch ID	Section ID	Branch Name	Surface Type	Section Area (SF)	Approx. Age at Inspection (Years)	Last Major Work Date	Last Inspection Date	Pavement Condition Index	PCI Category
AP	03	Apron	AC	47,400	19.3	8/1/2002	8/30/2021	58	Fair
AP	04	Apron	PCC	5,250	35.3	8/15/1986	8/30/2021	63	Fair
AP	06	Apron	PCC	12,800	21.3	8/1/2000	8/30/2021	72	Satisfactory
AP	07	Apron	AC	68,675	19.3	8/1/2002	8/30/2021	63	Fair
RW08	13	Runway 08-26	AAC	101,250	18.3	8/1/2003	8/30/2021	79	Satisfactory
RW08	14	Runway 08-26	AC	298,125	18.3	8/1/2003	8/30/2021	77	Satisfactory
RW12	15	Runway 12-30	AC	500,100	9.2	9/1/2012	8/30/2021	82	Satisfactory
TW	01	Taxiway	AAC	58,500	35.3	8/15/1986	8/30/2021	46	Poor
TW	03	Taxiway	AAC	70,900	25.3	8/1/1996	8/30/2021	43	Poor
TW	05	Taxiway	AAC	74,250	25.3	8/1/1996	8/30/2021	52	Poor
TW	10	Taxiway	AC	11,200	21.3	8/1/2000	8/30/2021	75	Satisfactory
TW	11	Taxiway	AC	16,000	18.3	8/1/2003	8/30/2021	86	Good
TW	12	Taxiway	AC	22,500	9.2	9/1/2012	8/30/2021	86	Good
TW	14	Taxiway	AC	38,964	5	11/4/2016	8/30/2021	88	Good
TW	17	Taxiway	AC	36,750	5	11/4/2016	8/30/2021	91	Good
TW	19	Taxiway	AC	17,020	5	11/4/2016	8/30/2021	90	Good

History of Pavement Projects

GGW has undergone a number of pavement development and maintenance projects. These are also recorded as part of the PCI determination process. Table 1-8 identifies pavement projects at GGW since 1980, as noted in the 2021 pavement inspection report.

Table 1-8. GGW Airfield Pavement Work History

Year	AIP Grant No.	Description of Work
1986/1987	AIP-001-1986/ AIP-002-1987	Center 100-foot overlay with open-graded emulsified ac; prior to overlay, cracks sealed, stress-relief cracks were constructed and Petromat® laid and tacked; overlay also includes p-609 (single application).
1993	Non-AIP	Construct hangar access taxiways and concrete parking pad.
1996	AIP-004-1996	Rehabilitate Runway 12/30 and taxiways; construct Runway 30 turnaround.
1997	AIP-004-1997	45-foot-width, centerline only 2-inch overlay.
2000	AIP-006-2000	Construct heavy apron (AP:06) and connections.

2001	AIP-007-2001	Crack seal, fog seal and remark.
2002/ 2003	AIP-008-2002 AIP-009-2003	Runway 8/26 - Reconstruct west 4,000-foot , mill and overlay east 1,000 feet; mill and overlay fueling apron (A-3); reconstruct apron (AP:07).
2005	AIP-010-2005	Crack seal
2006	AIP-011-2006	Groove runway 8/26 (RW08:13, RW08:14); fog seal and remark other airport pavements.
2008	AIP-013-2008	Crack seal, fog seal, and remark.
2012	AIP-017-2012	Reconstruct Runway 12/30 (R-W12:5); reconstruct turnaround (TW:12); crack seal, fog seal, and remark taxiways; crack seal Runway 8/26 (RW08:13, RW08:14) and apron (AP:07).
2015	AIP-019-2015	Reconstruct taxiways (TW:14, TW:17, TW:19); crack seal, surface seal and remark runways, turnarounds and aprons.
2021	AIP-026-2022/ARPA	Install runway vertical/visual guidance system; rehabilitate taxiway; rehabilitate apron; rehabilitate runways

1.11.8 Signage

GGW has signage commensurate with types of operations and use. Although the signs are satisfactory, many of them are quite old and no longer meet FAA useful life requirements. Airfield signs include taxiway location, destination, runway holding position, and Runway 12/30 distance remaining.

1.11.9 Navigational Aids

Navigational aids (NAVAIDs) are physical devices on the ground, or electronic equipment that communicates with aircraft to assist with navigation. GGW is equipped with several light-based and electronic air navigational aids.

GGW NAVAIDs include:

- PAPIs
  - Runways 12 and 30 have 4-box PAPIs
  - Runways 8 and 26 have 2-box PAPIs
- MIRLs – Runways 12, 30, 8, and 26 have pilot-controlled MIRLs.
- REILs – Runways 12, 20, 8, and 26 (Figure 1-11)
- Wind cone – A lighted wind cone and segmented circle are located between Runways 12 and 8 about 500 feet past the thresholds. There are supplemental lighted wind cones near the ends of Runways 30 and 26.

Figure 1-11. REIL at GGW

- Rotating Beacon – A lighted rotating airport beacon (white and green), is located just southwest of the terminal ramp area.
- VOR – A VOR is located east of Taxiway C, between Runways 12 and 8.

1.11.10 Commercial Aircraft Support

GGW offers limited services to commercial aircraft. Cape Air owns a small tow-behind deicing unit. GGW staff operate the deicing unit as necessary.

1.12 LANDSIDE FACILITIES

1.12.1 Perimeter Security

The airfield is currently fully fenced with 9-foot-high wildlife and security fence. The fence is in good condition. Access through the fence is via an electronic gate with a cipher lock system. The gate power and ground loop need to be replaced on the access gate.

1.12.2 Roadways

GGW is 1.5 miles northeast of the city of Glasgow with direct access to US Route 2 and Montana Highway 24. In addition to these major roadways, the BNSF railway crosses through the city of Glasgow, providing freight and passenger service. GGW is accessed by Airport Road that terminates at US Route 2 to the west and Montana Highway 24 to the east. Airport Road provides access from both highways and from the city of Glasgow (through various connector roads) to the southern border of the airport. Airport Road is maintained by the County.

Access to the terminal and developed portion of the airfield is provided by a turnoff from the main Airport Road onto a smaller access road, also called Airport Road.

1.12.3 Terminal and Parking

The GGW terminal building includes a passenger waiting area, a TSA screening area, a pilot lounge, offices, and vending machines. The TSA screening area occupies most of the southern end of the terminal building. The airport/ FBO office and counter are on the northern end of the terminal building. Cape Air has an office and ticket counter adjacent to the screening area. FedEx leases a large room without a public interface. In the rear of the building are the pilot lounge, "snooze room," and a shared space with table and chairs. There is no restaurant or other concessionaires. The Glasgow terminal has one gate. Free Wi-Fi is provided in the building.

The terminal is very congested during commercial flight activity. The TSA screening area was expanded in 2015 to make room for the large-baggage X-ray machine, and this expansion reduced lobby space. Currently, passengers must queue in the lobby in front of the entry door to enter passenger screening. After screening, passengers wait in the very small often crowded seating area beyond the secure checkpoint. At boarding, passengers must exit through the lobby and out the front door to the aircraft. During boarding, TSA screeners line up to physically separate the screened passengers from unscreened persons in the lobby. This process is not desirable, and TSA does not like this arrangement. However, given the limited terminal space, this is the current process by which passengers are screened and boarded.

In addition to not providing standard passenger screening and boarding facilities, the terminal building has standing water under the building, the west wall is rotting, and the windows are failing. A new terminal building is needed.

Rental cars are available through Scottie Auto Rentals, LLC. Public transportation is provided by Valley

County Transit bus service, which provides on-call service to the airport.

Public auto parking is available at the GGW terminal building. The terminal parking area has 51 designated parking spaces – 7 parking spaces immediately adjacent to the terminal building and 44 spaces in the lot just south of the building. GGW does not collect parking fees. The parking lot is deteriorating and in need of replacement.

1.13 SUPPORT FACILITIES

GGW offers a variety of aviation services to both based and transient aircraft including Jet A and 100LL fuel, crop-dusting services, air ambulance services, aircraft parking and storage, pilot instruction, and aircraft rental.

1.13.1 General Aviation

GGW has 20 T-Hangars spread out over three different buildings. There are seven private T-Hangars in a separate structure. Three large commercial hangars are leased by Leader Aviation, STAT Air, and Cape Air. The airport provides land leases for an additional two private hangars. In addition to the hangar facilities, there are 17 tiedowns available for transient aircraft.

1.13.2 Fuel

GGW sells and dispenses 100LL and Jet A fuel. The airport recently upgraded its fuel system by removing the underground storage tank and related components and installing a new above ground tank (AST) and fueling system immediately adjacent to the fueling apron. GGW has one 10,000-gallon AST for 100LL and one 20,000-gallon AST for Jet A (Figure 1-12). Both 100LL and Jet A can be dispensed via a self-serve credit card pump, or full service can be provided by a fuel truck and operator (Figure 1-13). There are no 100UL or sustainable aviation fuels available.

Figure 1-12. Jet A and 100LL ASTs

Figure 1-13. Jet A Fuel Truck

1.13.3 Fixed-Base Operator and Services

There is no fixed-base operator (FBO) at GGW. An FBO is an organization granted the right by an airport to provide aeronautical services such as fueling, hangar space, tiedown and parking, aircraft rental, aircraft maintenance, and flight instruction. GGW provides some of the services that normally would be provided by an FBO.

1.13.4 Maintenance

Leader Aviation is the sole maintenance provider at GGW. Leader Aviation has one mechanic that provides various maintenance services but not including engine overhauls.

1.13.5 Flight Instruction and Aircraft Rentals

Leader Aviation provides flight instruction and aircraft rental from its on-field location at GGW. Both private and commercial flight instruction is available as well as tailwheel aircraft instruction. There is one Cessna 172 available for rent.

1.13.6 Cargo

FedEx rents ground vehicle parking areas and office space in the Glasgow Terminal. FedEx does not rent counter space or other public-facing facilities. FedEx stopped operating cargo flights at GGW in mid-2023.

There are no scheduled cargo flights operating out of Glasgow at the time of preparation of this plan.

1.13.7 Utilities

GGW is on City of Glasgow water and sewer systems. Electricity is provided by Northwestern Energy. Natural Gas is provided by Montana-Dakota Utilities. There is also a stormwater management system. There are no facilities for deicing fluid containment due to the limited amount used. The electrical vault will be removed from the terminal and placed in its own structure in 2024. The current utility infrastructure is sufficient for future needs.

1.13.8 Snow Management

Glasgow's average snowfall is 34 inches annually. GGW must maintain sufficient personnel and equipment to manage the snow and keep the airport open for use by aircraft and the travelling public.

Snow Removal Equipment List

- 2006 Freightliner FL80 with 14' Root Spring Plow (Root Spring has gone out of business)
- 2005 New Holland TV145 with loader bucket and box plow attachment. MB Broom Attachment
- 1991 Oshkosh H-Series Snow Blower (Acquired by Sheriff through 1033 Program)
- 1991 Ford 8000 with 14' Sweepster Broom (Acquired by Sheriff through 1033 Program, Sweepster no longer supports this broom)
- 1983 Oshkosh P-Series truck with 21' Wausau Plow

1.14 BASED AIRCRAFT

Based aircraft at are tracked using the National Based Aircraft Inventory Program. The information from the Based Aircraft Inventory is also posted on the Airport Master Record. Based aircraft reported as of May 15, 2023, are listed in Table 1-9.

Table 1-9. Based Aircraft at GGW

Aircraft Type	# Aircraft
Single Engine (SE)	44
Multi-Engine (ME)	0
Jet	0
Helicopters	1
Total	**45**
Gliders	0
Military	0
Ultra-Light	0

1.15 OPERATIONS

The Airport Master Record provides the number of operations estimated to occur at GGW. An operation is either a takeoff or landing. Table 1-10 lists GGW annual operations.

Table 1-10. GGW Annual Operations

Operation Type	# Operations
Air Carrier	0
Air Taxi	3,460
General Aviation Local	3,500
General Aviation Itinerant	1,250
Military	20
Total Operations	8,230
Operations for 12 months ending:	05/15/2023

1.15.1 Scheduled and Unscheduled Passenger Service

Cape Air provides the only scheduled passenger service at GGW with its fleet of Tecnam P2012 Traveller, twin-engine aircraft. These planes have nine removable passenger seats which, when removed, allow the aircraft to be used for cargo service as well. Table 1-11 lists the scheduled air service at GGW.

Table 1-11. GGW Scheduled Operators

Operator	Service	Passenger Enplanements 2022	Primary Aircraft	Base Airport
Cape Air	Scheduled two flights per day	2,982	Tecnam P2012 Traveller	Billings (BIL)

Source: Enplanements data from the Air Carrier Activity Database

Unscheduled charter/air taxi services are also available by companies that operate throughout the area.

1.16 SURROUNDING LAND USE

Land use planning and management is an effective means to ensure that activities near the airport are compatible with aviation. The airport is owned jointly by the City of Glasgow and Valley County; however, the airport is located outside the incorporated areas of Glasgow. The land to the south of the airport is occupied by the City of Glasgow. To the north of the airport, the land belongs to and is controlled by Valley County. An overview of land ownership is depicted in Figure 1-14.

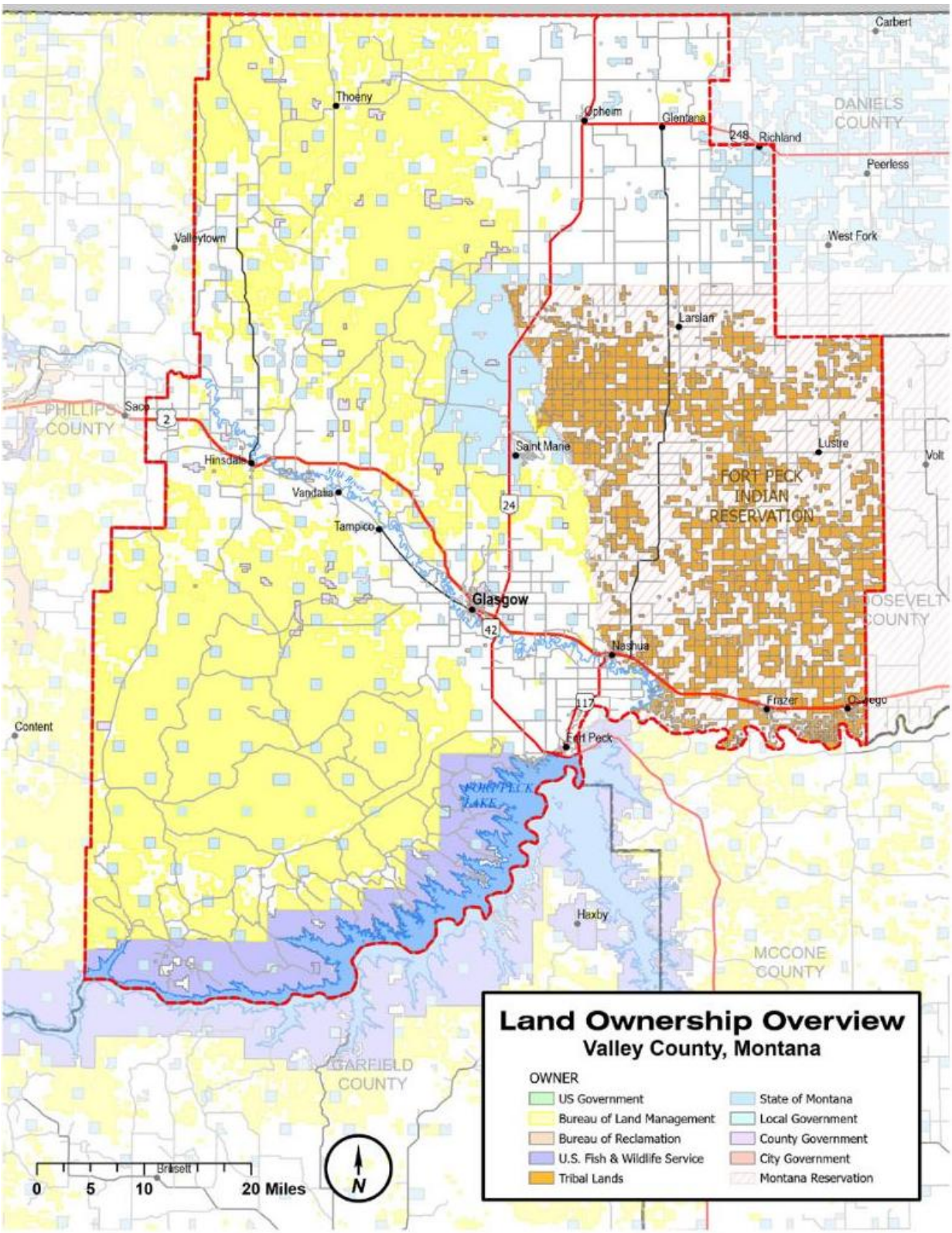


Figure 1-14. Land Use Planning and Zoning Designations

Land Use Planning & Zoning Designations

The City of Glasgow and Valley County have limited zoning or other restrictions on land use. However, the State does provide some protections by designating the area around the airport as an Airport Affected Area. Airport Affected Areas can designate height limitations for structures, designate incompatible land uses such as residences and schools, or limit bird attractants such as landfills.

1.17 ENVIRONMENTAL CONDITIONS

This section addresses environmental conditions of the airport and resource categories consistent with FAA Order 1050.1F. To assist with developing an accurate summary of environmental conditions, agencies with trust resources were contacted through an informal scoping effort. A copy of the template and responses can be found in Appendix 3.

1.17.1 National Environmental Policy Act Considerations

Federally funded projects are subject to the provisions of the National Environmental Policy Act (NEPA), including any projects at the airport funded through the FAA. It is assumed all projects would be funded by the FAA or otherwise require an FAA action, thus necessitating environmental documentation required under NEPA.

NEPA considers a variety of environmental factors from cultural resources to threatened and endangered species and everything in between. The following topics are of particular interest and/or concern to the airport and its surrounding areas:

Historic/Cultural Resources – The airport is the site of the Glasgow Army Airfield Norden Bombsight Storage Vault, located on Old Hangar Road, which is listed on the National Register of Historic Places (NRHP) (Reference Number 11000824). Resources listed on the NRHP are subject to consideration under Section 106 of the National Historic Preservation Act of 1966 (54 USC § 306108) which further requires federal agencies to consider the impacts of proposed actions and decisions on historic properties. Properties listed on the NRHP are also subject to the provisions of Section 4(f) of the U.S. Department of Transportation Act of 1966 (23 USC § 138 and 49 USC § 303) as well as FAA Order 1050.1E which provides consideration of park and recreation lands, wildlife and waterfowl refuges, and historic sites of federal, state, or local importance during transportation development.

Recreational Resources – A review of Google Earth and local recreation plans indicates three small city/community parks (Bundy Park, Candy Cane Park, and Scotty Park) are located within 0.5 mile of the airport. Recreational resources are provided protection under the provisions of Section 4(f) as well as FAA Order 1050.1E.

Threatened and Endangered Species – The U.S. Fish and Wildlife Service's Information for Planning and Consultation (IPaC)[1] list was reviewed in September 2024 for the airport and surrounding areas and one federally threatened species, the piping plover (*Charadrius melodus*), and one federal candidate species, the monarch butterfly (*Danaus plexippus*) were identified. Impacts to federally threatened and endangered species (TES) are protected under Section 7 of the Endangered Species Act (16 USC § 1536) which requires

[1] *USFWS. "Information for Planning and Consultation." IPaC, ipac.ecosphere.fws.gov/location/UNYY4FPCDRFJ3IJGDOJ3OBDWSI/resources#endangered-species. Accessed 5 Sept. 2024.*

federal agencies to requires federal agencies to ensure that proposed actions are not likely to jeopardize TES or adversely modify critical habitat for TES. In addition, bald eagles and fifteen species of migratory birds are known to occur within the vicinity of the airport. Federal regulations such as the Bald and Golden Eagle Protection Act (16 USC 668-668d) and the Migratory Bird Treaty Act (16 USC § 703-712) ensure the protection and consideration of eagles and migratory birds respectively.

Aquatic Resources – The National Wetland Inventory[2] was reviewed in September 2024 and three freshwater emergent wetlands, and two riverine habitats were identified within the airport boundary. It is important to note that a formal wetland delineation was not completed for the purpose of this plan and would be needed to formally determine whether or not the aforementioned resources would qualify for protection under Section 404 of the Clean Water Act (33 USC § 1344). Section 404 of the Clean Water Act regulates discharges of pollutants into Waters of the United States (WOTUS). Should a project anticipate impacts to WOTUS, permitting through state and federal agencies would be required prior to construction.

Hazardous Materials and Wastes – The Montana Department of Environmental Quality online database[3] was reviewed and one regulated storage tank (Facility 29250) was identified in the southwestern section of the airport. No brownfields, state or federal superfund sites, or underground storage tanks were identified. Proper use and disposal of hazardous materials and wastes would be required. In addition, it is worth noting that the airport disposes of solid waste in the Valley County Landfill and waste oil is collected and burned as waste oil by a separate entity.

The following resource topics are considered under NEPA, but after review were determined not present within the vicinity of the airport:

Section 6(f) Resources – A review of the Land and Water Conservation Fund (LWCF) Grant Mapper[4] was completed in September 2024 and no sites receiving funding from LWCF were identified within the vicinity of the airport. LWCF sites are protected under Section 6(f) of the LWCF Act (36 CFR Part 59) which prohibits the conversion of properties developed with the assistance of the LWCF without the approval of the Department of the Interior.

Coastal Resources/National Marine Sanctuaries – The airport is located in Montana which does not have any coastal resources and is not located within the vicinity of any national marine sanctuaries.

Farmland – A review was completed utilizing Natural Resource Conservation Service Web Soil Survey tool[5] in September 2024 and no soils within the vicinity of the airport were identified as prime, unique, or locally important farmland. Therefore, the Farmland Policy Protection Act (7 CFR Part 658) would not

[2] *NWI. National Wetlands Inventory, fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/. Accessed 5 Sept. 2024.*

[3] *MDEQ. "Discover DEQ Throughout Montana." ArcGIS Web Application, gis.mtdeq.us/portal/apps/webappviewer/index.html?id=f554f421c3e64f5599e76b5cb8dd3391. Accessed 5 Sept. 2024.*

[4] *LWCF. "LWCF Past Projects." The Land and Water Conservation Fund, lwcf.tplgis.org/mappast/. Accessed 5 Sept. 2024.*

[5] *USDA, NRCS. Web Soil Survey, websoilsurvey.nrcs.usda.gov/app/. Accessed 5 Sept. 2024.*

apply.

Floodplains – the airport is located within the Federal Emergency Management Agency's flood insurance rate map number 3001710020A which indicates that there are no mapped floodplains within the airport property.

Wilderness Areas – The airport is located in Valley County, Montana, which does not have any protected wilderness areas.

Wild and Scenic Rivers – The nearest section of Wild and Scenic Rivers is the Missouri River which is located over 100 miles away from the airport. The closest river under state jurisdiction is the Milk River which is approximately three miles south of the airport.

Environmental Justice – Executive Order 12898 requires that federal agencies, to the greatest extent practicable, identify and address disproportionately high and adverse impacts to low-income and minority populations. Refer to Section 2.3 for specific information regarding the socioeconomic and population conditions surrounding the airport. It is important to note that for each future project, population data would need to be reviewed to ensure that no disproportionate or adverse impacts occur to environmental justice populations.

Noise – Noise associated with the airport is associated with day-to-day aircraft operations and maintenance. No noise sensitive areas are located within 0.25 mile of the airport.

Air Quality – The airport is located within Valley County which is in attainment for all regulated criteria pollutants and in compliance with national ambient air quality standards.

For minor projects at the airport, an application can be completed to be considered for a categorical exclusion (CatEx). To request a CatEx determination from the FAA, the project sponsor should review environmental resources, review the requirements of the applicable special purpose laws, and consult with the airports district office and/or regional airports division office about the type of information needed. The form and supporting documentation should be completed in accordance with the provisions of FAA Order 5050.4B, paragraph 302b, and submitted to the appropriate FAA airports district or division office. A CatEx cannot be approved until all information and documentation is received and all requirements have been fulfilled

2. FORECAST

2.1 INTRODUCTION AND BACKGROUND

Forecasting future levels of aviation activity is the basis for making critical decisions in airport planning. If an airport is poised to see growth, the master plan defines the steps needed to accommodate the demand. Because forecasting can have a large influence on the recommendations of a master plan, it is critical to collect appropriate information, apply reasonable judgements, and use FAA approved methodologies to help forecast the level of activity and the types of aircraft at the airport. The intent of the aviation activity forecasts is to quantify future airport demand so realistic development goals can be appropriately planned for and phased.

The Wokal Field, Glasgow/Valley County Airport (GGW) forecast was conducted in accordance with the Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5070-6B, "Airport Master Planning" and FAA guidance document "Forecasting Aviation Activity by Airport."

Non-towered commercial service airports, like GGW, present some challenges to forecasting, due to limited amounts of data available. Discussions with airport management, common users, tenants, and other stakeholders are very useful in mitigating these challenges, especially in determining current and future demand, fleet mix, and types of operations.

This aviation forecast includes elements of local socioeconomics, demographics, geography, aviation trends, and external factors. It will project airport operations over a 20-year planning period from 2023 to 2042.

The total information available for a specific airport depends upon several variables, including; if the airport has a control tower; the type of commercial operations at the airport; Instrument Approach Procedures available for use at the airport; and other related factors. The GGW forecast utilizes reliable information available relevant to type and number of aircraft operations, based aircraft, commercial enplanements, and instrument approaches. Federally reportable information that was used in the development of the GGW forecast was derived from the following sources and described in further detail below:

- FAA Terminal Airport Forecast (TAF)
- FAA Traffic Flow Management System Counts (TFMSC)
- FAA Air Carrier Activity Information System (ACAIS)
- Bureau of Transportation Statistics (BTS) T-100
- Previous planning studies

2.2 PREVIOUS MASTER PLAN

Previous Master Plans and airport forecasts may also be relevant in the development of a current forecast projection. The last known planning effort at GGW was an ALP update conducted in 2013, and it did not include any formal aviation demand forecast. There are no known previous planning efforts at GGW that included a demand forecast that would be of any benefit to the current forecast, due to the length of time

that has passed since any effort was conducted.

2.3 SOCIOECONOMIC CONDITIONS

GGW is a public use airport that serves as an important link for commercial, business, and general aviation (GA) interests for the local Glasgow community and north-central Montana. GGW is located just northeast of the city of Glasgow, in Valley County. It is approximately 55 miles south of the Canadian border.

The nearest commercial service airport is Wolf Point, located on the Fort Peck Indian Reservation which is approximately 50 miles east of Glasgow. The closest primary commercial service airports in Montana are Great Falls and Billings, located 271 miles and 277 miles, respectively, by road from Glasgow.

One of the most important functions at GGW is medevac support. GGW is a home base for STAT Air, which provides aviation medical support throughout eastern Montana. STAT Air houses three (3) Pilatus PC-12 aircraft on field and supports others as well. The nearest city with a major hospital is Billings, a large medical and commercial hub in southern Montana.

Figure 2-1. Valley County, Montana.
Source: Google Maps

2.3.1 Population

Glasgow and Valley County Census and Projections

One important local consideration to be evaluated during the planning process is the census projection for the populations of the city and the county. Glasgow, a municipality located in Valley County, acts as regional hub for much of northcentral Montana. GGW airport serves not only Glasgow and Valley County, but also much of the surrounding region.

Population is arguably the largest socioeconomic factor affecting the Glasgow Airport. Glasgow is the population center for northeast Montana. As published by the US Census Bureau, the City's population has varied considerably over the last 10 years resulting in no overall growth from 2010 to 2021. Similarly, Valley County also had a 0% population growth from 2010 to 2022. The Montana Department of Commerce predicts a decrease in Valley County population.

As shown in Figure 2-2, after a steady increase from 2010 to 2015, the population of Glasgow gradually declined with a sharp decrease in 2020. As shown in Figure 2-3, the Montana Department of Commerce forecasts Valley County will have an average annual decrease of 0.3% from the last reported population in 2022 (7,422) to the forecasted population in 2040 (7,008).

The decline in Valley County population should be factored in when determining the GGW Forecast.

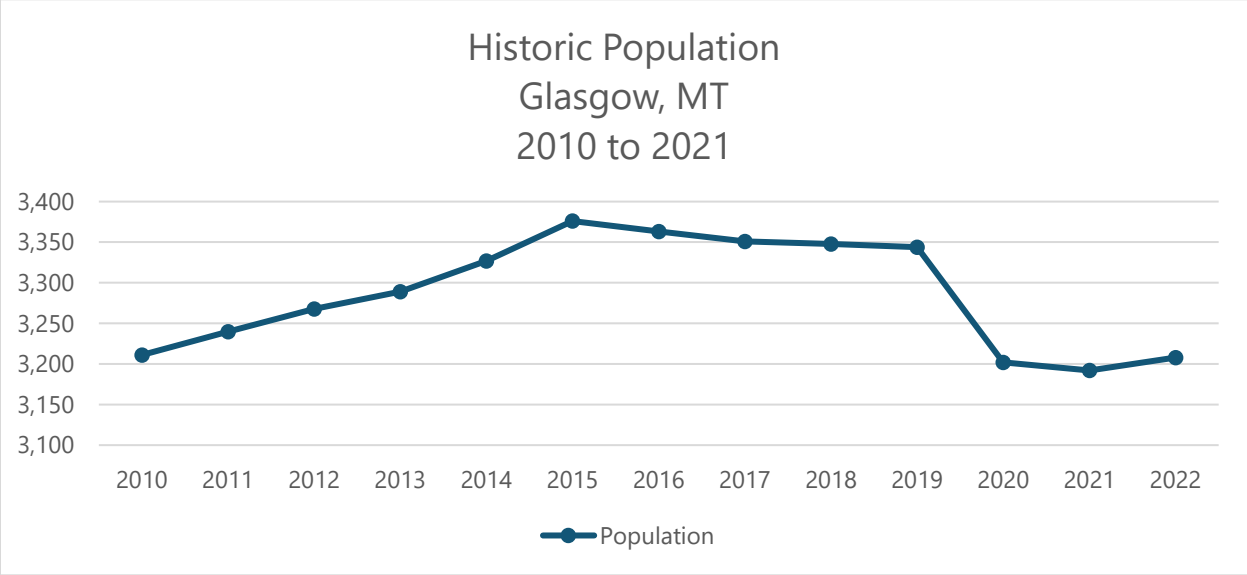


Figure 2-2. Population of Glasgow from 2010 to 2021.
Source: US Census Bureau

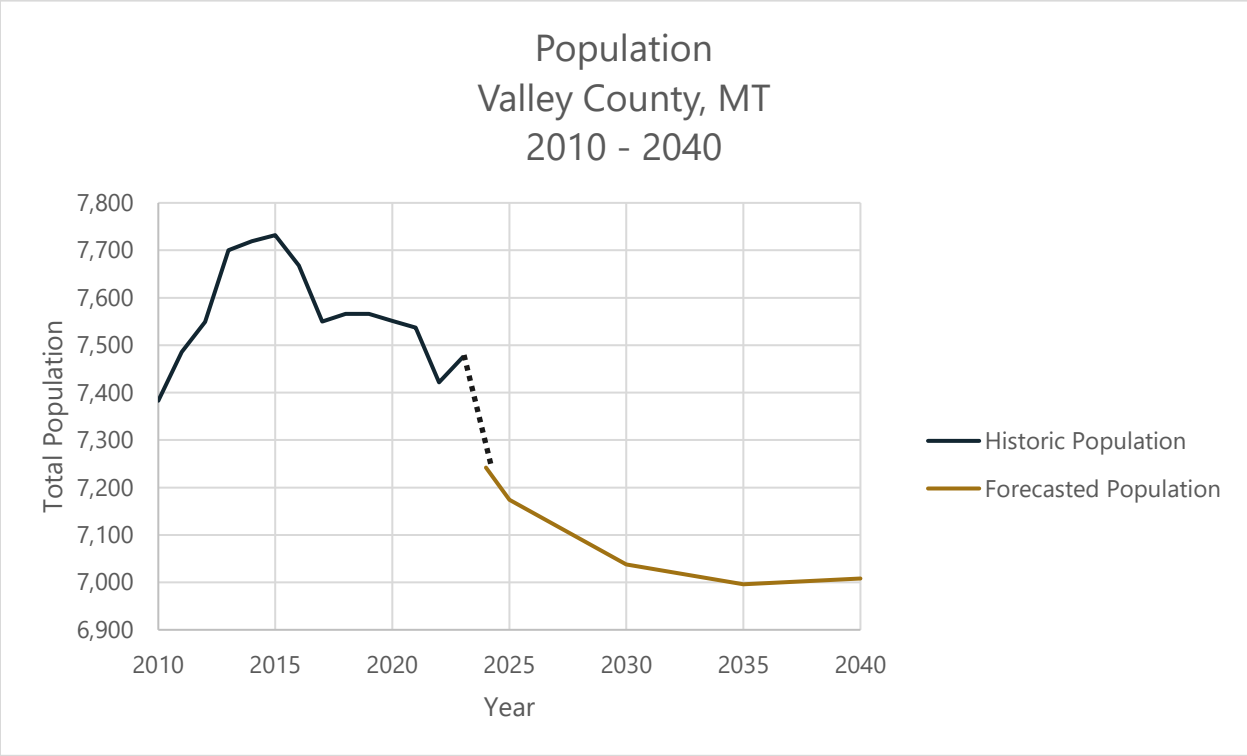


Figure 2-3. Historic Population of Valley County 2010 to 2022. Forecasted population 2025 to 2040.
Source: Montana Department of Commerce

State of TMT Census & Projections

The State of Montana census and projection data can predict trends for all state airports, including GGW. As shown in Figure 2-4, Montana population projections reveal that the State is forecasted to experience very modest growth over the forecast period. Similar to the local city and county data evaluated, this information will be useful in adjusting future forecast trends.

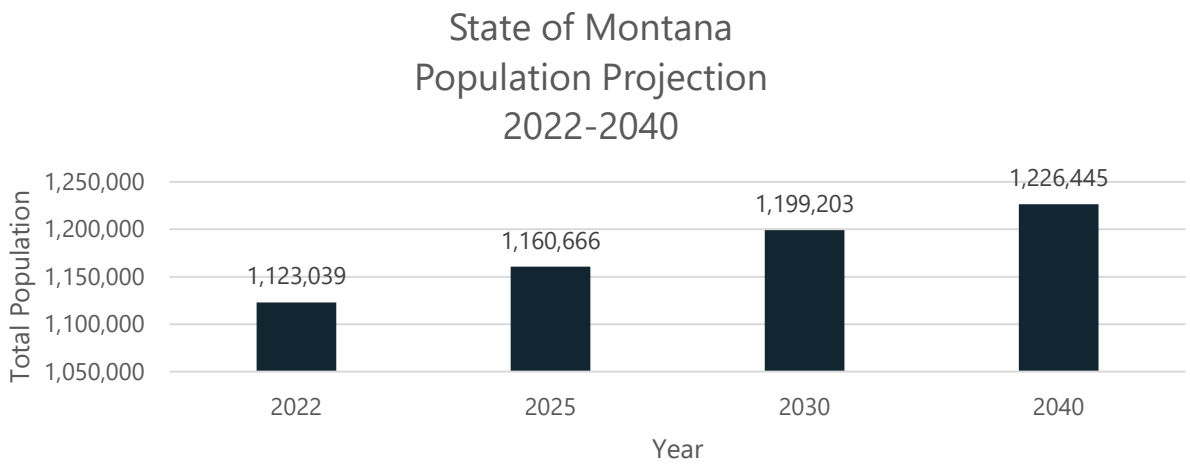


Figure 2-4. Estimated Population Projection for State of Montana, 2022 to 2040.
Source: Montana Department of Commerce

2.3.2 Economic and Employment Trends

The Montana Department of Commerce produces a wide variety of forecasts for the State of Montana, utilizing both state specific and nationwide data. After a record-setting year in 2021, the Montana economy grew at a more moderate pace in 2022.

Source: US Bureau of Economic Analysis

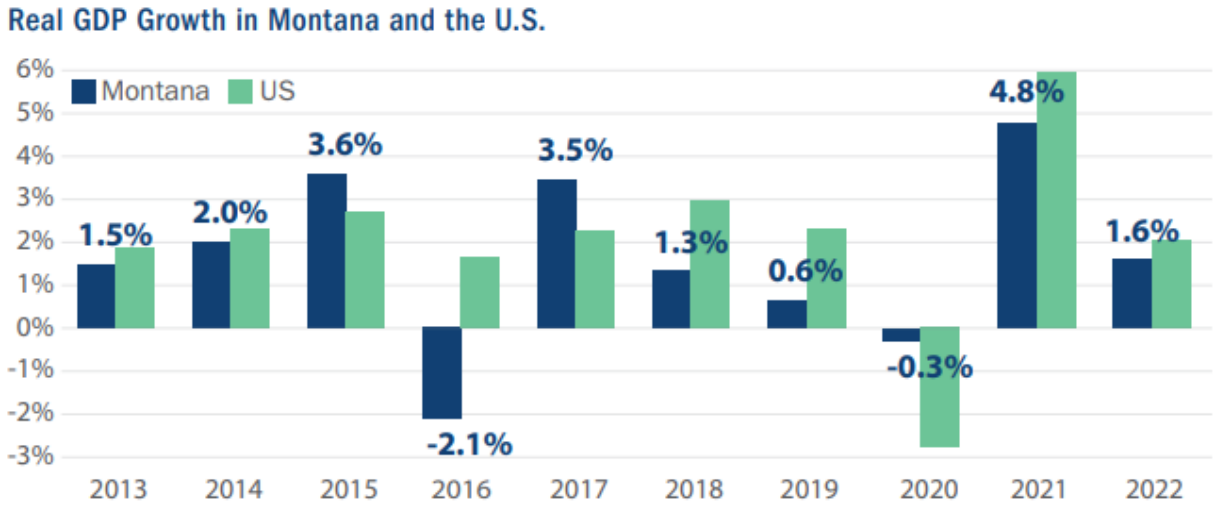


Figure 2-5. Real GDP Growth in Montana and the US.
Source: US Bureau of Economic Analysis

Employment projections published by the Montana Department of Labor and Industry (MTDLI) has forecasted a 4.4% growth in employment across the state (Figure 2-6) from 2023 to 2033. Glasgow, located in the eastern economic region is forecasted to experience a .4% employment growth during the same period.

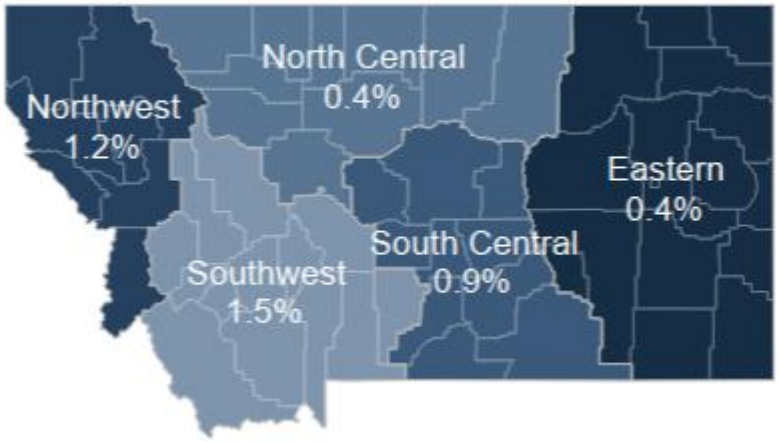


Figure 2-6. Statewide and Regional Employment Projections Summary, 2023-2032.
Source: Montana Department of Labor and Industry

Table 2-1 depicts Montana's recent growth rates by industry for payroll and self-employed workers. Total employment grew slower than payroll employment, as a tight labor market was combined with modest raises in wages, which drew some self-employed workers into payroll jobs. Many of the industries included in the table have obvious potential to positively impact aviation in Montana. Transportation expects a modest growth rate of 0.7%from 2022-2032.

Table 2-1. Montana Compounding Annual Employment Growth by Industry

Industry	2019-2021 Growth Rate	2022-2024 Growth Rate	2022-2024 Annual Job Growth	2011-2021 Growth Rate	2022-2032 Growth Rate	2022-2032 Annual Job Growth
Construction	8.0%	3.1%	1,120	4.6%	2.6%	1,060
Healthcare	1.3%	1.3%	990	1.3%	1.0%	820
Accommodation and Food	10.1%	1.3%	760	2.1%	1.2%	720
Professional and Technical	7.7%	2.7%	760	3.4%	2.0%	590
Retail Trade	3.9%	0.8%	510	1.1%	0.8%	500
Manufacturing	3.8%	1.3%	280	2.3%	1.3%	300
Wholesale Trade	3.8%	2.0%	370	1.1%	1.1%	210
Local Government	1.6%	1.0%	210	1.0%	0.9%	210
Agriculture	4.7%	2.9%	200	3.8%	2.4%	190
Finance	3.2%	1.3%	230	1.6%	1.0%	180
Other	3.7%	0.9%	180	1.3%	1.0%	180
Real Estate	8.3%	1.9%	140	3.1%	1.6%	120
Admin and Support Services	6.8%	0.8%	160	0.5%	0.6%	120
Transportation & Warehousing	2.9%	0.6%	90	1.2%	0.7%	110
Education	1.8%	0.2%	80	0.2%	0.2%	100
Arts and Entertainment	6.2%	0.8%	100	1.3%	0.7%	90
Federal Government	-2.2%	1.8%	170	-0.5%	0.4%	40
Mining	0.4%	1.1%	70	-3.2%	0.3%	20
Management	-0.6%	0.7%	20	-0.2%	0.3%	10
Utilities	-0.1%	0.7%	20	-1.4%	0.1%	0
State Government	-0.4%	-0.2%	-30	-0.3%	0.0%	0
Postal Service	-2.0%	-1.9%	-40	-0.8%	-0.7%	-10
Information	-0.5%	-0.4%	-20	-1.8%	-0.5%	-30
Payroll Employment	4.2%	1.3%	6,360	1.4%	1.1%	5,510
Total Employment	3.8%	1.2%	6,420	1.50%	0.90%	5,330

Source: Montana Department of Labor & Industry Employment Projections, 2022-2032. Note: The healthcare and education industries include both private and public employment. All other public employment is included in government.

The economic and employment trends for the State of Montana do not provide sufficient relevant information in which to base the Forecast. However, this data will be considered when evaluating the final Forecast.

2.3.3 Oil Price

The future direction of oil prices presents another uncertainty in producing the forecast. In the long term, the forecasts are generally aligned, projecting a price of about $91 per barrel in 2030 and about $118 per barrel by the end of the forecast period in 2043. Oil prices averaged $55 per barrel over the five years

ending in 2021 but were forecasted to rise to about $75 per barrel in 2022 (forecast prior to the war in Ukraine) before rising steadily to $87 by the end of the forecast period; however, there are other oil price forecasts that are considerably more aggressive than the FAA base forecast. This includes the latest Energy Information Administration (EIA) Annual Energy Outlook released in March 2023. By 2030, it anticipates the spot price of oil will reach $106 per barrel and by 2043, $153 per barrel, rates that are considerably higher than the FAA base forecast of $118. Over the long run, lower oil prices give consumers an impetus for additional spending, including air travel, and should enhance industry profitability. In the case where oil prices turn out to be higher than the FAA forecast, it is expected that spending would decrease on air travel by consumers.

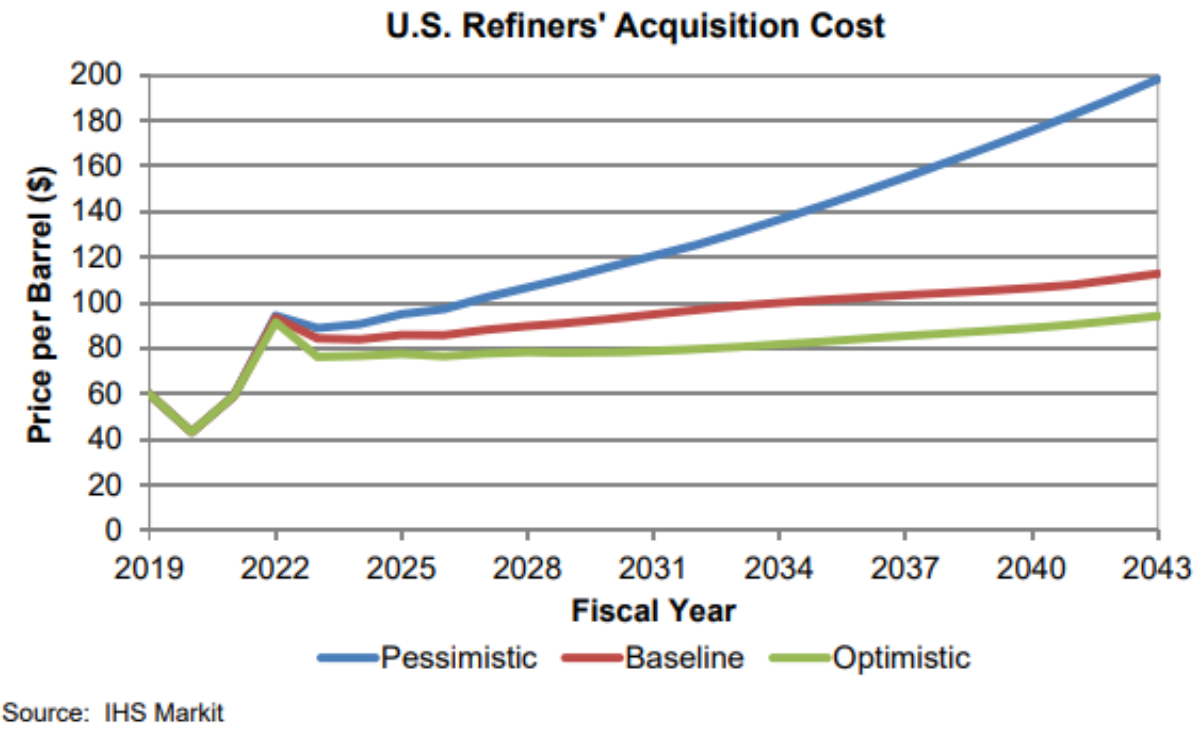


Figure 2-7. FAA Aerospace Forecast Refining Data
Source: FAA 2023-2043 Aerospace Forecast

2.3.4 National General Aviation Activity

Fleet Size

General aviation forecasts are robust. The FAA uses estimates of fleet size, hours flown, and utilization rates from the General Aviation and Part 135 Activity Surveys as baseline figures to forecast the national GA fleet and activity. In 2022, deliveries of general aviation aircraft manufactured in the U.S. increased to 1,954, 17% higher than in 2021 and 10.3% higher than the 2019 level. Deliveries of single-engine piston aircraft were up 15%, while the much smaller segment of multi-engine piston deliveries were up 40% (totaling a 15.4% increase in the fixed-wing piston engine deliveries). Business jet deliveries increased by

20.5% and turboprop deliveries were up 17%, amounting for a 18.8% increase in fixed-wing turbine shipments.

The GA sector, which was not as severely affected by the pandemic as the airlines, completely recovered by activity, surpassing 2019 levels. The long-term outlook for general aviation, driven by turbine aircraft activity, remains stable. The active general aviation fleet, which showed an increase of 2.5% between 2020 and 2021, is projected to increase from its 2021 level of 209,195 aircraft to 216,395 by 2043, as the declines in the fixed-wing piston fleet were offset by increases in turbine, rotorcraft, experimental, and light sport fleets. The total active general aviation fleet will grow by a small increase of 0.2% annually. When measured from the 2019 levels, the growth rate for the turbine-powered fleet is 1.9%.

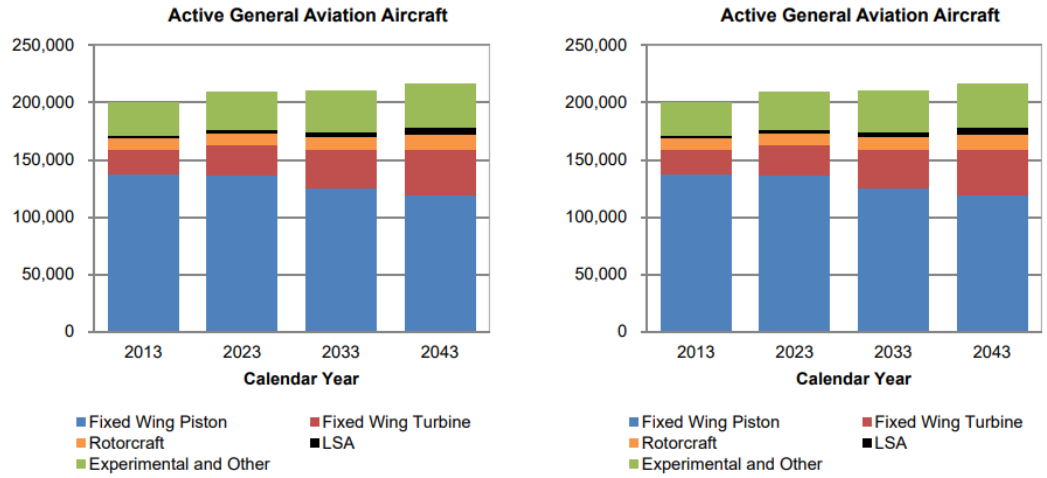


Figure 2-8. Forecasts of GA Aircraft and Hours Flown.
Source: FAA National GA Forecast

Pilots

The number of active general aviation pilots (excluding students and Airline Transport Pilots) is projected to increase slightly between 2022 and 2043 from 309,608 to 314,570. The Airline Transport Pilot category is forecast to increase by 29,360 (up 0.8% annually). The much smaller category of sport pilots is predicted to increase by 2.5% annually over the forecast period. Commercial pilot certificates, which have been on an increase for five consecutive years, are projected to remain flat between 2022 and 2043. Alternatively, private pilot certificates are projected to decrease at an average annual rate of 0.1% over the forecast horizon. (Figure 2-9).

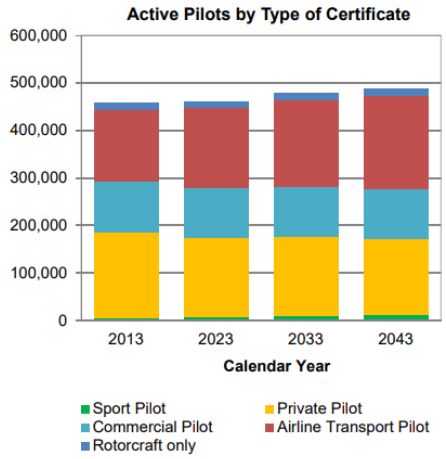


Figure 2-9. FAA Aerospace Forecast Pilot Data
Source: FAA 2023-2042 Aerospace Forecast

2.4 FORECAST METHODOLOGY

Practical considerations dictate the level of detail and effort that should go into an airport planning forecast. FAA AC 150/5070-6B gives guidance on the methodologies to be used when forecasting data in an airport master plan. These types of methodologies include:

- Regression analysis – A statistical technique that ties aviation demand (dependent variables), such as enplanements, to economic measures (independent variables), such as population and income. This type of analysis should be restricted to relatively simple models with independent variables for which reliable forecasts are available.
- Trend analysis and Extrapolation – Typically uses the historical pattern of an activity and projects this trend into the future. This approach is useful where unusual local conditions differentiate the study airport from other airports in the region.
- Market Share Analysis or Ratio Analysis – This technique assumes a top-down relationship between national, regional, and local forecasts. Local forecasts are a market share (percentage) of regional forecasts, which are a market share of national forecasts. Historical market shares are calculated and used as a basis for projecting future market shares. This type of forecast is useful when the activity to be forecast has a constant share of a larger aggregate forecast.
- Smoothing – A statistical technique applied to historical data, giving greater weight to the latest trends and conditions at the airport; it can be effective in generating short-term forecasts.

A wide range of factors were reviewed to determine how to accurately calculate the GGW forecast. It was determined that a Trend Analysis and Extrapolation provides the most accurate forecast due to the unique attributes of the Glasgow Airport. This forecast will utilize a combination of Trend Analysis and Extrapolation with Smoothing to create a forecasted annual average growth rate (AAGR).

2.5 HISTORICAL AND FORECASTED AVIATION ACTIVITY

2.5.1 Historical Aircraft Operations

FAA Traffic Flow Management System Counts (TFMSC)

The TFMSC is a federal database that disseminates collected information related to federally reportable aircraft operation activity at individual airports. The data generally includes information only related to flights operating under Instrument Flight Rules (IFR). Information collected is captured by FAA computers that collect IFR enroute data, and by other data reported directly to the FAA. Most VFR operations and some non-enroute IFR traffic is excluded. TFMSC source data is captured when flight plans are filed or when flights are detected by the National Airspace System (NAS), via RADAR. TFMSC records are assembled by the FAA NAS Data Warehouse by combining electronic messages transmitted to the Enroute Automation Modernization (ERAM) system for each flight into a complete record of that flight. Data captured includes various information, including aircraft ownership & design characteristics, points of departure and arrival, types of operations, and other useful information. Due to the nature of how the data is collected, the TFMSC data is much more relevant to commercial traffic operations (air carriers and air taxis), than to GA activity.

Table 2-2. FAA GGW TFMSC Data

Year	Operations	% Change
2002	2,319	
2003	1,837	-20.78%
2004	1,657	-9.80%
2005	1,889	14.00%
2006	1,735	-8.15%
2007	2,388	37.64%
2008	1,800	-24.62%
2009	3,251	80.61%
2010	3,185	-2.03%
2011	2,681	-15.82%
2012	2,495	-6.94%
2013	2,618	4.93%
2014	2,798	6.88%
2015	2,188	-21.80%
2016	2,482	13.44%
2017	2,527	1.81%
2018	2,676	5.90%
2019	2,914	8.89%
2020	2,837	-2.64%
2021	2,836	-0.04%
2022	2,567	-9.49%
2023	2,786	8.53%
AAGR		1%

Source: FAA Traffic Flow Management System Counts

The historical trend analysis of TFMSC data shows a 1% rate of growth from 2002 to 2023. Though this dataset is not inclusive of all the operations performed at GGW, the growth rate can be applied to the formulation of the aviation demand forecast.

Flight Aware

Flight Aware is a private company widely known in the aviation industry for making applications available that allow users to track flight data in real time. They also produce products available for purchase that provide detailed analytical information regarding aircraft activity at airports. Flight Aware has developed algorithms to search large FAA databases, such as the FAA's TFMSC, for very specific information, including IFR operations, and is able to cross reference that data with other similar databases to produce a more reliably accurate picture of operations at an airport. Flight aware then makes this data available for a fee. The FAA has similar data available, especially the TFMSC data. However, when comparing FAA TFMSC to data provided by Flight Aware, with similar parameters, there are often significant differences. The primary reason for this variation is due to the different sources of information that each one captures. This includes FlightAware's ability include relevant ADS-B and radar information. Because of the increased level of confidence in the reliability of the data available, Flight Aware products were used to supplement the GGW forecast.

Data reflecting a 3-year history of IFR traffic at GGW is summarized in Table 2-3. A complete list of all the GGW IFR data provided by Flight Aware can be found in the appropriate appendix. It is likely that some of the IFR operations reflected in the data for GGW does not correlate directly to an actual takeoff or landing at the airport since some data captured may have the result of an IFR approach, or flight plan, that did not include an actual landing at GGW. However, the data is still statistically relevant to the forecast. As can be seen graphically in Figure 2-10, IFR operations captured by the Flight Aware data at GGW indicates a relatively steady amount of growth over the reported 3-year period, although, there is an anomaly near the end of 2023 that lowered total operations captured, but there is no reason to suggest it will repeat or continue. Because of the relatively short length of time the Flight Aware data encompasses, it was not used to calculate the forecast. However, the data indicates a higher level of activity than the TFMSC.

Table 2-3. GGW IFR Operations Counts, TFMSC vs. Flight Aware

GGW IFR Operations Counts TFMSC vs. Flight Aware		
Year	TFMSC	Flight Aware
2020 (Mid Sept to Dec)	2,837	1,527
2021	2,836	5,068
2022	2,567	4,994
2023 (Jan to Mid Sept)	2,786	3,055

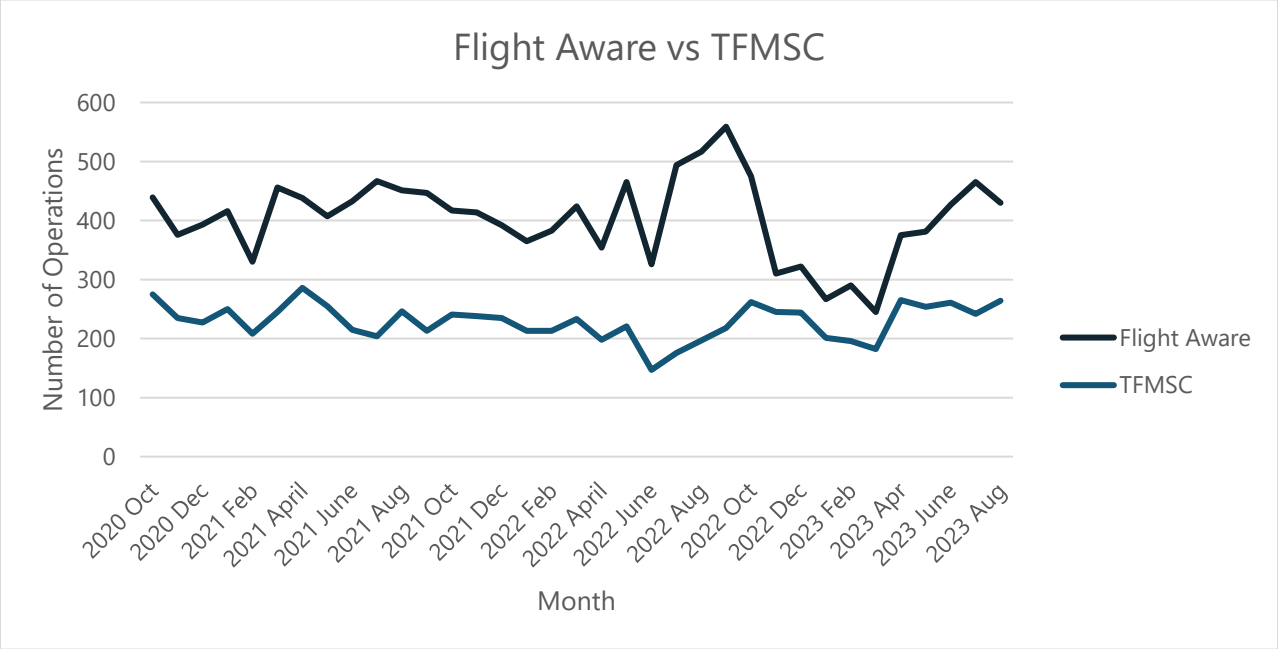


Figure 2-10. Number of Operations per Flight Aware vs. Number of Operations per TFMSC

2.6 HISTORICAL AND FORECASTED PASSENGER ACTIVITY

Enplanements are another important factor in determining both the Forecast and needs of the airport. They should be carefully evaluated during the master planning process. Cape Air has an EAS contract with the US DOT to provides passenger service to GGW. Cape Air operates two (2) flights daily in accordance with the EAS contract, which has been renewed through 2027. Since Cape Air took over the EAS contract in 2013, they have consistently offered two (2) flights daily. Enplanements have increased over the previous 20-year period. As such further evaluation of the terminal and passenger facilities is warranted. The general trend of an increase of passenger activity will be taken into account when evaluating the Forecast.

ACAIS

The ACAIS (Air Carrier Activity Database) is an FAA database that contains revenue passenger boarding and cargo data. The data is collected via mandatory reporting requirements by scheduled and nonscheduled certificated air carriers, commuter air carriers, and small certificated air carriers. In addition, the FAA also conducts an annual survey of air taxi/commercial operators who report their nonscheduled activity. The usefulness of ACAIS information in relation to forecasts generally depends upon the amount of commercial activity at an airport. GGW does have some reportable ACAIS activity with the EAS service provided by Cape Air. Figure 2-11 displays the number of total GGW enplanements reported within ACAIS, from 2003 thru 2022.

The overall data shows a general trend of enplanement increase. The average annual rate of growth from 2003 to 2022 is 1.2%.

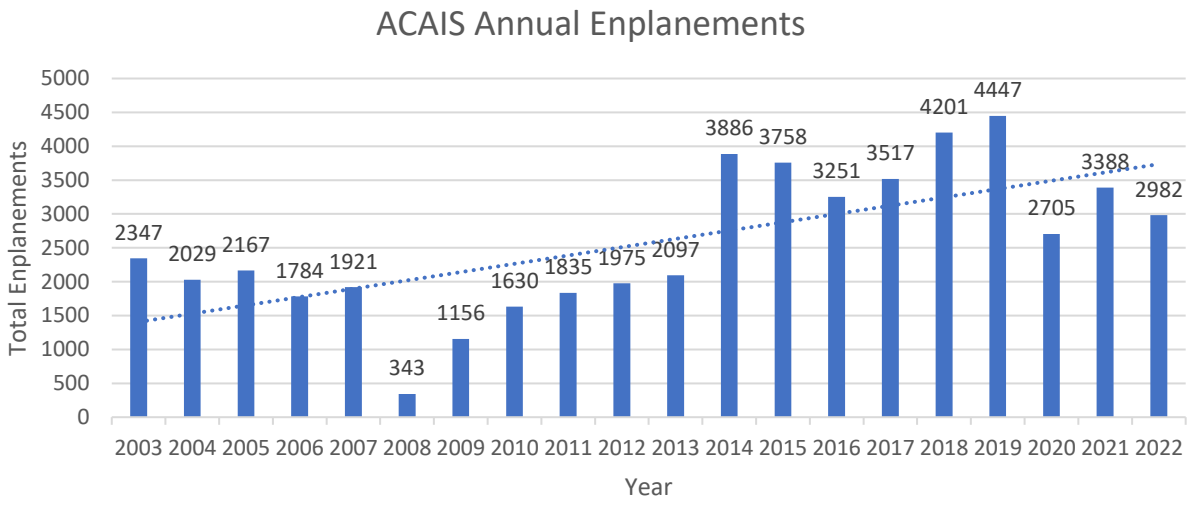


Figure 2-11. GGW Annual Enplanements
Source: Air Carrier Activity Information System

Bureau of Transportation Statistics (BTS) Air Carrier Statistics (Form 41)

The BTS is traffic data reported by certificated U.S. and foreign air carriers on transported passengers and freight, collected by BTS monthly, quarterly, semiannually, and annually. Submission of BTS Form 41 is a requirement under 14 CFR 241.22 for large, certificated air carriers, and for this reason, has limitations in its ability to capture Part 135 activity. Figure 2-12 displays the historical operations counts for the 20-year study period, which shows a steady increase of 2% average annual growth.

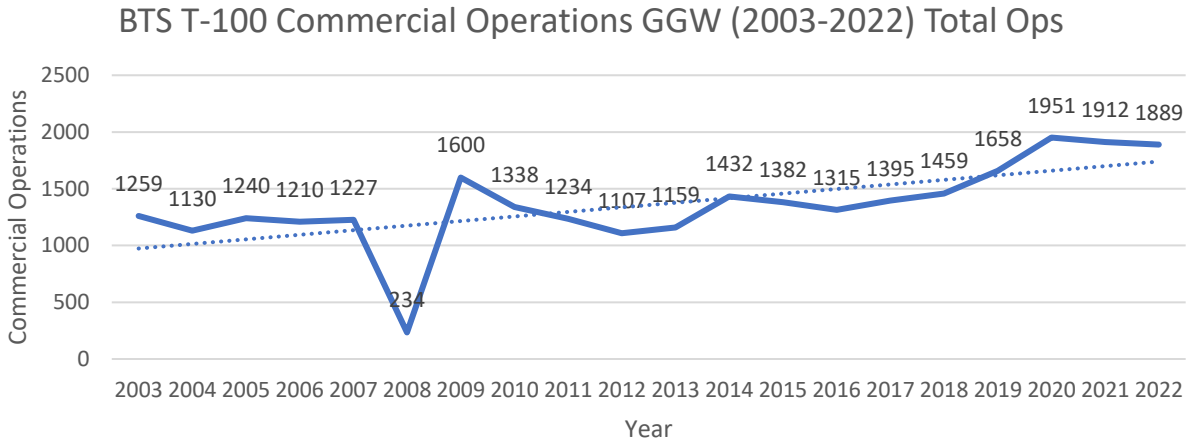


Figure 2-12. BTS T-100 GGW Historical Commercial Operations
Source: BTS T-100 Database

2.7 HISTORICAL AND FORECASTED CARGO ACTIVITY

Evaluating cargo is also a factor in the master planning process. Cargo operations can factor into the type of aircraft that operate at the airport and the facilities needed to process the cargo. Figures 2-13 and 2-14 below show the cargo enplanement and offload totals for the previous 20-year period. FedEx operated out of GGW from 2019 to 2022, causing a temporary increase in activity. This information has been separated into its own table.

There are currently no cargo operators with regular service at GGW. However, periodic unscheduled cargo operations do still occur. Due to the lack of current or anticipated scheduled cargo carrier operations, is it difficult to evaluate how cargo will impact the Forecast. Future master planning efforts should re-evaluate the needs and operations of cargo carriers at GGW if these operators return.

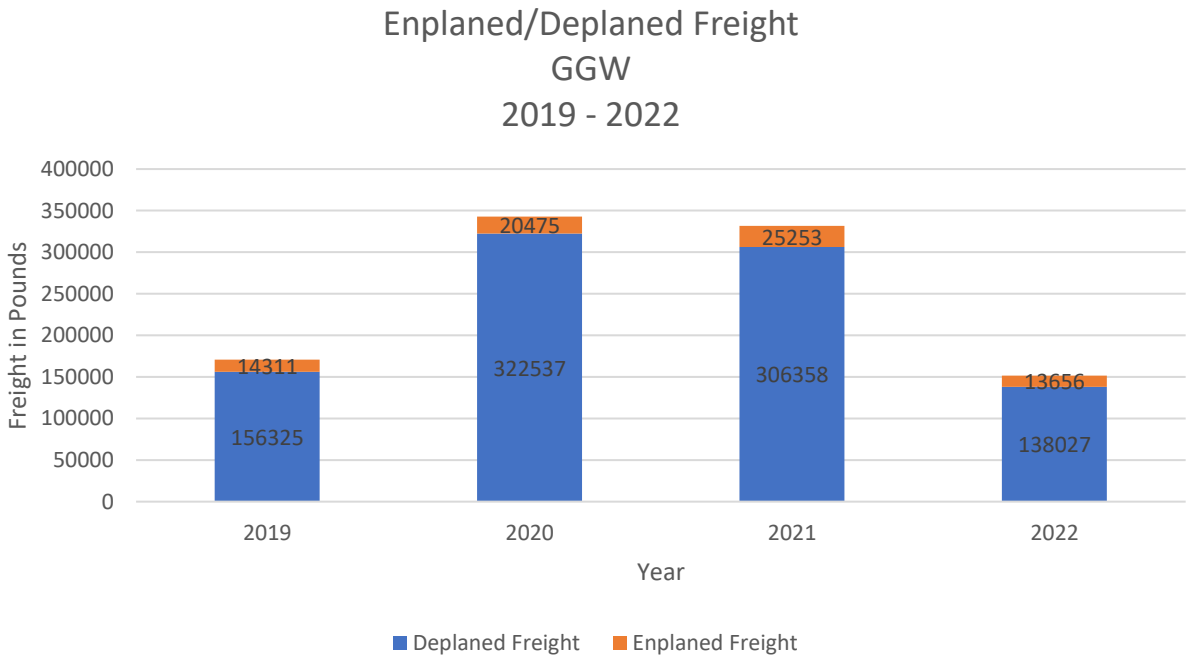


Figure 2-13. Historical Enplaned/Deplaned Freight
Source: BTS T-100, 2019-2022

2.8 FLEET MIX AND BASED AIRCRAFT

Based Aircraft

Based aircraft data for GGW is reported by the airport to the FAA using the online web portal basedaircraft.com. This information is then included on the Airport Master Record (AMR). The site requires airport representatives to enter detailed information regarding the based aircraft, including ownership, N number and specific type. The FAA GGW 5010 currently lists 45 based at the facility (Figure 2-14). Basedaircraft.com shows the 45 based aircraft at GGW with only 42 of the aircraft validated. Being validated indicates that the N-Number is only being reported at GGW and not another airport.

BASED AIRCRAFT	
90 SINGLE ENG:	44
91 MULTI ENG:	0
92 JET:	0
93 HELICOPTERS:	1
TOTAL:	45
94 GLIDERS:	0
95 MILITARY:	0
96 ULTRA-LIGHT:	0

Figure 2-14. FAA Airport Master Record GGW Based Aircraft
Source: FAA Airport Master Record GGW dated 5/16/2024

Fleet Mix

Fleet mix describes the type of aircraft that operate at an airport. GGW has a wide variety of aircraft operating; however, the majority of the aircraft are classified as medium commuter and small equipment.

Table 2-4 shows the total operations by weight class from the period of 2003 to 2022. Figure 2-15 defines the weight classes.

Table 2-4. Total Operations by Weight Class.

GGW FAA TFMSC Total Ops by Weight Class 2003 thru 2022	
Weight Class	**Total Ops**
Unknown	303
Heavy Eqpt	40
757 Class	5
Large Jet	20
Large Commuter	149
Medium Commuter	11,810
Small Eqpt	37,017
Other	17

Source: TFMSC.

Weight Class Definitions

Heavy = Any aircraft weighing more than 255,000 lb such as the Boeing 747 or the Airbus A340

Large Jet = Large jet aircraft weighing more than 41,000 and up to 255,000 lbs such as the Boeing 737 or the Airbus A320

Large Commuter = Large non-jet aircraft (such as the Aerospatiale/Alenia ATR-42 and the Saab SF 340), and small regional jets (such as the Bombardier Canadair Regional Jet), weighing more than 41,000 and up to 255,000 lbs

Medium Commuter = Small commuter aircraft including business jets weighing more than 12,500 up to 41,000 lbs such as the Embraer 120 or the Learjet 35; and

Small = Small, single, or twin engine aircraft weighing 12,500 lbs or less such as the Beech 90 or the Cessna Caravan

Figure 2-15. Weight Class Definitions
Source: FAA

2.9 REVIEW OF PUBLISHED FORECASTS

Existing Forecasts

Existing planning studies and forecasts must be considered when developing projections. As previously mentioned, GGW has no complete master plan on record prior to this study and has no meaningful prior demand forecasts to compare against except for the FAA TAF.

FAA TAF – GGW

The Terminal Area Forecast (TAF) is the official FAA forecast of aviation activity for U.S. airports. It is referenced for budgeting, staffing, and planning needs by the FAA and users of the National Airspace System. The TAF contains active airports in the National Plan of Integrated Airport Systems (NPIAS). The airport activity data contained in the TAF consist of the following:

- Enplanements
- Itinerant Operations
- Local Operations

Table 2-5 shows the historical TAF for a 20-year period from 2002 to 2021 and the projected TAF for a 20-year period to 2042.

FAA TAF forecasts for non-towered and/or GA airports, like GGW, is far simpler than those of larger, towered airports. For non-towered airports The TAF forecast is usually developed by simply extrapolating current baseline data, without adjustment, forward to the end of the forecast period. This usually results in a "flatline" forecast into the future for each element.

FAA guidance requires comparison of the Airport Master Plan (AMP) forecast with that of the TAF as part of the forecast approval process regardless of the potentially inaccuracies inherent with the GGW TAF. A comparison of this airport's forecasted data and the FAA's published TAF is discussed in Section 2.14 of this Chapter.

Since the FAA TAF also provides a historical look at past operational numbers and numbers of based aircraft at GGW, it seems logical to use that information to help establish a historical trend for each. However, there is a problem doing this for GGW, as the TAF has been created without any actual operational counts. A cursory look at the historical trend of the data seems to also confirm this, since operation numbers varied from near 30,000 to abruptly leveling at just over 8,000, without any account as to why.

The data presented within the same FAA TAF for GGW for total based aircraft, however, is likely much more accurate than the total operations numbers because based aircraft are much easier for inspectors and airport personnel to count. Using the data provided within the historical years included in the GGW TAF, based aircraft increased from 29 in 2002 to 45 in 2024 showing a strong increase and then a decrease over the entire 20-year period. Based aircraft reached a high in 2007 with the numbers gradually falling since. The long-term trend of an increase in based aircraft will be taken into account when evaluating the Forecast.

Table 2-5. FAA GGW TAF
Source: FAA APO TAF (Issued January 2024)

FAA TAF - Historical Operations & Based Aircraft - GGW														
	Enplanements			Itinerant					Local			Totals	Total Tracon	Based Aircraft
Year	Air Carrier	Commuter	Sub Total	Air Carrier	Air Taxi	GA	Military	Sub Total	Civil	Military	Sub Total			
2002	0	1,963	1,963	1,248	6,150	13,300	110	20,808	6,100	0	6,100	26,908	0	29
2003	0	2,117	2,117	0	7,398	13,300	110	20,808	6,100	0	6,100	26,908	0	29
2004	0	1,816	1,816	0	7,398	13,300	110	20,808	6,100	0	6,100	26,908	0	37
2005	0	2,205	2,205	0	7,398	13,300	110	20,808	6,100	0	6,100	26,908	0	36
2006	0	1,873	1,873	0	7,398	13,300	110	20,808	6,100	0	6,100	26,908	0	36
2007	0	1,844	1,844	0	10,500	13,300	110	23,910	6,100	0	6,100	30,010	0	88
2008	0	884	884	0	10,500	13,300	110	23,910	6,100	0	6,100	30,010	0	84
2009	0	723	723	0	10,500	13,300	110	23,910	6,100	0	6,100	30,010	0	84
2010	0	1,570	1,570	0	10,500	13,300	110	23,910	6,100	0	6,100	30,010	0	79
2011	0	1,703	1,703	0	10,500	13,300	110	23,910	6,100	0	6,100	30,010	0	79
2012	0	1,928	1,928	0	10,500	13,300	78	23,878	6,100	0	6,100	29,978	0	77
2013	0	2,157	2,157	0	3,460	1,250	105	4,815	3,500	0	3,500	8,315	0	76
2014	0	3,298	3,298	0	3,460	1,250	105	4,815	3,500	0	3,500	8,315	0	76
2015	0	3,784	3,784	0	3,460	1,250	20	4,730	3,500	0	3,500	8,230	0	67
2016	0	3,382	3,382	0	3,460	1,250	20	4,730	3,500	0	3,500	8,230	0	67
2017	0	3,412	3,412	0	3,460	1,250	20	4,730	3,500	0	3,500	8,230	0	55
2018	0	3,978	3,978	0	3,460	1,250	20	4,730	3,500	0	3,500	8,230	0	55
2019	2	4,068	4,070	0	3,460	1,250	20	4,730	3,500	0	3,500	8,230	0	53
2020	0	2,920	2,920	0	3,460	1,250	20	4,730	3,500	0	3,500	8,230	0	46
2021	8	3,224	3,232	0	3,460	1,250	20	4,730	3,500	0	3,500	8,230	0	51

Source: FAA APO 2022 TAF (Issued February 2023)

FAA TAF - Current Reported Baseline – GGW														
2022	0	3,132	3,132	0	3,460	1,250	20	4,730	3,500	0	3,500	8,230	0	51
FAA TAF - Forecasts - GGW (FAA TAF forecasts for small airports usually remain left unchanged from last reported data)														
2023*	0	2,857	2,857	0	3,460	1,250	20	4,730	3,500	0	3,500	8,230	0	51
2024*	0	2,871	2,871	0	3,460	1,250	20	4,730	3,500	0	3,500	8,230	0	51
2025*	0	2,885	2,885	0	3,460	1,250	20	4,730	3,500	0	3,500	8,230	0	51
2026*	0	2,899	2,899	0	3,460	1,250	20	4,730	3,500	0	3,500	8,230	0	51
2027*	0	2,913	2,913	0	3,460	1,250	20	4,730	3,500	0	3,500	8,230	0	51
2028*	0	2,927	2,927	0	3,460	1,250	20	4,730	3,500	0	3,500	8,230	0	51
2029*	0	2,941	2,941	0	3,460	1,250	20	4,730	3,500	0	3,500	8,230	0	51
2030*	0	2,955	2,955	0	3,460	1,250	20	4,730	3,500	0	3,500	8,230	0	51
2031*	0	2,969	2,969	0	3,460	1,250	20	4,730	3,500	0	3,500	8,230	0	51
2032*	0	2,983	2,983	0	3,460	1,250	20	4,730	3,500	0	3,500	8,230	0	51
2033*	0	2,997	2,997	0	3,460	1,250	20	4,730	3,500	0	3,500	8,230	0	51
2034*	0	3,011	3,011	0	3,460	1,250	20	4,730	3,500	0	3,500	8,230	0	51
2035*	0	3,025	3,025	0	3,460	1,250	20	4,730	3,500	0	3,500	8,230	0	51
2036*	0	3,039	3,039	0	3,460	1,250	20	4,730	3,500	0	3,500	8,230	0	51
2037*	0	3,053	3,053	0	3,460	1,250	20	4,730	3,500	0	3,500	8,230	0	51
2038*	0	3,067	3,067	0	3,460	1,250	20	4,730	3,500	0	3,500	8,230	0	51
2039*	0	3,081	3,081	0	3,460	1,250	20	4,730	3,500	0	3,500	8,230	0	51
2040*	0	3,095	3,095	0	3,460	1,250	20	4,730	3,500	0	3,500	8,230	0	51
2041*	0	3,109	3,109	0	3,460	1,250	20	4,730	3,500	0	3,500	8,230	0	51
2042*	0	3,123	3,123	0	3,460	1,250	20	4,730	3,500	0	3,500	8,230	0	51
Trend Percentage (%)												**0.0%**		**0.0%**

FAA TAF - Montana

The FAA TAF developed for the State of Montana (Table 2-6) provides dependable trend data and is relevant when considering general trends for the GGW forecast. Data associated with GA airports in Montana has virtually no role in influencing the development of the State of Montana FAA TAF, because the GA airports have flatline TAF forecasts. However, the trends of other, more active airports, are meticulously examined, and their forecast projections are combined and averaged in the development of the Montana FAA TAF. Local GA airport trends often mirror overall statewide trend projections, and their trend percentages need to be considered in developing local airport forecasts, including GGW.

Table 2-6. FAA State of Montana TAF

FAA TAF – Historical Operations & Based Aircraft – State of Montana														
	Enplanements			Itinerant					Local			Totals	Total Tracon	Based Aircraf
Year	Air Carrier	Commuter	Sub Total	Air Carrier	Air Taxi	GA	Militar y	Sub Total	Civil	Militar y	Sub Total			
2002	771,695	509,258	1,280,953	56,122	145,847	309,496	23,651	535,116	307906	9778	317684	852,800	162,459	2,072
2003	730,756	588,219	1,318,975	42,806	163,346	303,722	24,128	534,002	296502	9727	306229	840,231	163,505	2,088
2004	524,221	857,601	1,381,822	43,682	163,142	303,193	21,183	531,200	304240	7435	311675	842,875	157,537	2,266
2005	492,039	1,021,219	1,513,258	43,519	169,462	308,697	19,544	541,222	314991	4929	319920	861,142	156,538	2,216
2006	429,088	1,024,075	1,453,163	44,239	157,147	350,452	18,987	570,825	342303	6682	348985	919,810	151,158	2,254
2007	458,548	1,040,248	1,498,796	46,000	149,817	347,566	20,086	563,469	347036	7500	354536	918,005	143,911	2,475
2008	465,056	1,072,256	1,537,312	44,757	131,400	338,143	19,392	533,692	348942	6955	355897	889,589	173,164	2,439
2009	395,850	1,055,177	1,451,027	45,520	122,524	322,395	18,679	509,118	332328	5266	337594	846,712	128,221	2,428
2010	346,592	1,139,143	1,485,735	36,236	128,571	320,180	16,549	501,536	341045	5649	346694	848,230	121,593	2,376
2011	425,088	1,152,255	1,577,343	36,627	125,795	304,831	17,143	484,396	337219	5659	342878	827,274	121,122	2,341
2012	481,116	1,187,856	1,668,972	34,674	127,062	302,970	16,888	481,594	346140	3731	349871	831,465	122,720	2,432
2013	515,209	1,151,032	1,666,241	36,109	115,105	291,342	15,974	458,530	341643	4410	346053	804,583	113,949	2,368
2014	641,296	1,131,653	1,772,949	38,230	116,022	289,044	14,176	457,472	342914	5033	347947	805,419	111,920	2,389
2015	731,724	1,105,547	1,837,271	42,327	114,362	292,880	15,610	465,179	332667	6720	339387	804,566	115,997	2,302
2016	800,166	1,129,007	1,929,173	43,346	106,189	269,657	14,421	433,613	317739	6546	324285	757,898	110,398	2,386
2017	917,116	1,082,437	1,999,553	45,319	99,877	271,201	16,065	433,062	308741	5817	314558	747,620	114,708	2,329
2018	999,046	1,136,746	2,135,792	49,127	100,855	270,900	14,872	435,754	323513	6432	329945	765,699	112,373	2,403
2019	1,199,712	1,177,720	2,377,432	52,542	107,123	277,033	15,508	452,206	342512	6630	349142	801,348	115,548	2,374
2020	720,622	773,570	1,494,192	45,593	100,932	273,016	13,124	432,665	326304	5873	332177	764,842	108,644	2,348
2021	1,129,093	1,029,213	2,158,306	65,987	104,462	295,039	14,646	480,134	335768	7195	342963	823,097	120,734	2,369
FAA TAF - Current Reported Baseline – GGV														
2022	1,630,471	970,718	2,601,189	56041	100274	295101	14714	466130	329760	6327	336087	802,217	114,852	2320
FAA TAF - Forecasts - GGV (FAA TAF forecasts for small airports usually remain left unchanged from last reported data)														
2023*	1,941,300	907,433	2,848,733	58,671	98,052	292,502	14,819	464,044	343813	6724	350537	814,581	122,555	2,338
2024*	2,011,808	999,180	3,010,988	61,558	97,111	294,835	14,819	468,323	345431	6724	352155	820,478	123,999	2,350
2025*	2,085,788	1,039,236	3,125,024	64,243	97,877	295,345	14,819	472,284	345646	6724	352370	824,654	126,500	2,362
2026*	2,135,890	1,061,951	3,197,841	66,873	97,596	295,856	14,819	475,144	345862	6724	352586	827,730	128,464	2,375
2027*	2,189,433	1,085,551	3,274,984	68,343	98,159	296,372	14,819	477,693	346077	6724	352801	830,494	129,497	2,388
2028*	2,245,125	1,110,125	3,355,250	69,743	98,887	296,894	14,819	480,343	346293	6724	353017	833,360	130,542	2,402
2029*	2,296,383	1,133,035	3,429,418	71,029	99,600	297,418	14,819	482,866	346511	6724	353235	836,101	131,536	2,416
2030*	2,347,431	1,155,955	3,503,386	72,308	100,313	297,947	14,819	485,387	346729	6724	353453	838,840	132,530	2,430
2031*	2,398,791	1,179,025	3,577,816	73,592	101,033	298,482	14,819	487,926	346948	6724	353672	841,598	133,527	2,444
2032*	2,451,551	1,202,593	3,654,144	74,903	101,761	299,018	14,819	490,501	347167	6724	353891	844,392	134,536	2,458
2033*	2,505,673	1,226,714	3,732,387	76,243	102,499	299,561	14,819	493,122	347385	6724	354109	847,231	135,559	2,473
2034*	2,559,909	1,250,898	3,810,807	77,582	103,243	300,108	14,819	495,752	347605	6724	354329	850,081	136,584	2,488
2035*	2,616,850	1,276,275	3,893,125	78,987	104,001	300,658	14,819	498,465	347827	6724	354551	853,016	137,645	2,503
2036*	2,674,183	1,301,770	3,975,953	80,396	104,762	301,215	14,819	501,192	348048	6724	354772	855,964	138,708	2,518
2037*	2,732,982	1,327,948	4,060,930	81,842	105,536	301,776	14,819	503,973	348270	6724	354994	858,967	139,792	2,534
2038*	2,792,077	1,354,159	4,146,236	83,289	106,312	302,340	14,819	506,760	348491	6724	355215	861,975	140,872	2,551
2039*	2,853,371	1,381,323	4,234,694	84,789	107,102	302,909	14,819	509,619	348714	6724	355438	865,057	141,980	2,567
2040*	2,917,588	1,409,705	4,327,293	86,357	107,905	303,482	14,819	512,563	348937	6724	355661	868,224	143,120	2,584
2041*	2,981,545	1,438,063	4,419,608	87,918	108,713	304,062	14,819	515,512	349161	6724	355885	871,397	144,258	2,601
2042*	3,048,386	1,467,639	4,516,025	89,547	109,535	304,645	14,819	518,546	349384	6724	356108	874,654	145,428	2,618

Source: FAA APO TAF (Issued January 2024)

FAA TAF – Northwest Mountain Region

Similar to the TAF developed for the State of Montana, the FAA also develops a TAF that encompasses airports within all the States in the FAA Northwest Mountain Region (NWMR), Including Washington, Oregon, Idaho, Montana, Wyoming, Utah, and Colorado (Table 2-7). This TAF can be relevant to airports like GGW, but it does have some limitations since the economies of the airports in the NWMR can vary considerably.

Table 2-7. FAA TAF – Northwest Mountain Region

FAA TAF – Historical Operations & Based Aircraft – Northwest Mountain Region														
	Enplanements			Itinerant					Local			Totals	Total Tracon	Based Aircraft
Year	Air Carrier	Commuter	Sub Total	Air Carrier	Air Taxi	GA	Military	Sub Total	Civil	Military	Sub Total			
2002	42,280,626	9,703,115	51,983,741	1,116,086	1,471,537	4,599,908	228,300	7,415,831	4,119,229	95,171	4,214,400	11,630,231	3,227,926	21,998
2003	42,582,938	10,804,260	53,387,198	1,014,968	1,586,678	4,568,088	230,731	7,400,465	4,087,850	106,853	4,194,703	11,595,168	3,218,326	22,068
2004	44,006,416	13,345,634	57,352,050	1,024,860	1,652,552	4,536,290	211,092	7,424,794	4,027,475	113,403	4,140,878	11,565,672	3,216,217	23,080
2005	45,336,356	15,560,270	60,896,626	1,131,879	1,585,877	4,430,505	168,689	7,316,950	4,117,232	107,159	4,224,391	11,541,341	3,233,467	23,465
2006	47,328,071	16,108,915	63,436,986	1,198,691	1,515,169	4,507,708	160,874	7,382,442	4,239,502	103,754	4,343,256	11,725,698	3,144,413	23,765
2007	49,157,802	17,027,518	66,185,320	1,256,654	1,483,817	4,546,877	143,349	7,430,697	4,341,093	129,803	4,470,896	11,901,593	3,158,781	24,967
2008	50,118,419	17,536,635	67,655,054	1,394,501	1,386,133	4,228,436	186,594	7,195,664	4,376,466	88,294	4,464,760	11,660,424	3,175,723	22,476
2009	47,268,486	16,978,751	64,247,237	1,357,681	1,192,880	4,083,065	185,997	6,819,623	4,155,584	84,222	4,239,806	11,059,429	2,993,636	22,910
2010	46,256,248	19,194,995	65,451,243	1,337,847	1,169,106	3,929,105	202,092	6,638,150	4,026,676	91,461	4,118,137	10,756,287	2,963,910	21,902
2011	48,344,452	19,166,392	67,510,844	1,343,871	1,130,285	3,839,062	206,500	6,519,718	3,882,200	92,215	3,974,415	10,494,133	2,932,576	21,511
2012	49,465,692	18,397,896	67,863,588	1,304,991	1,050,334	3,850,312	198,162	6,403,799	3,811,495	91,723	3,903,218	10,307,017	2,840,736	21,524
2013	50,348,360	17,910,312	68,258,672	1,290,888	1,002,186	3,791,315	199,430	6,283,819	3,737,311	106,833	3,844,144	10,127,963	2,775,624	22,100
2014	52,498,349	18,165,525	70,663,874	1,321,239	972,334	3,682,337	197,035	6,172,945	3,740,635	113,376	3,854,011	10,026,956	2,834,102	22,434
2015	55,166,561	18,693,610	73,860,171	1,372,916	885,160	3,706,282	189,265	6,153,623	3,894,194	117,755	4,011,949	10,165,572	2,860,833	21,913
2016	60,163,533	19,255,516	79,419,049	1,464,985	855,487	3,623,805	193,461	6,137,738	3,747,413	124,194	3,871,607	10,009,345	2,928,600	23,095
2017	64,793,927	19,021,779	83,815,706	1,548,335	826,275	3,557,933	241,325	6,173,868	3,652,465	185,604	3,838,069	10,011,937	3,012,336	22,079
2018	68,651,588	19,390,853	88,042,441	1,582,049	859,508	3,665,740	252,937	6,360,234	3,750,651	189,192	3,939,843	10,300,077	3,190,552	22,514
2019	72,016,229	20,862,156	92,878,385	1,652,657	864,666	3,709,666	255,460	6,482,449	3,798,416	189,311	3,987,727	10,470,176	3,284,036	21,958
2020	41,265,254	12,461,699	53,726,953	1,260,085	789,977	3,554,206	215,042	5,819,310	3,797,527	168,168	3,965,695	9,785,005	2,729,222	21,261
2021	49,340,487	14,851,333	64,191,820	1,458,504	860,456	3,666,790	227,340	6,213,090	3,949,458	163,775	4,113,233	10,326,323	3,080,595	21,523
FAA TAF - Current Reported Baseline – GGV														
2022	70,459,566	16,934,782	87,394,348	1,576,668	838,747	3,695,439	219,670	6,330,524	3,977,418	144,591	4,122,009	10,452,533	3,189,068	21,391
FAA TAF - Forecasts - GGV (FAA TAF forecasts for small airports usually remain left unchanged from last reported data)														
2023*	81,234,610	15,442,466	96,677,076	1,680,025	820,499	3,659,273	212,703	6,372,500	4,122,994	129,169	4,252,163	10,624,663	3,236,601	21,628
2024*	87,685,164	15,991,258	103,676,422	1,802,250	799,506	3,748,642	212,710	6,563,108	4,182,226	129,169	4,311,395	10,874,503	3,375,945	21,829
2025*	92,031,901	16,724,053	108,755,954	1,906,094	794,746	3,807,989	212,717	6,721,546	4,230,381	129,169	4,359,550	11,081,096	3,508,187	22,033
2026*	94,431,592	17,121,700	111,553,292	1,987,828	769,805	3,857,747	212,724	6,828,104	4,260,717	129,169	4,389,886	11,217,990	3,575,186	22,232
2027*	96,873,242	17,534,192	114,407,434	2,042,743	768,518	3,901,063	212,731	6,925,055	4,291,534	129,169	4,420,703	11,345,758	3,638,007	22,432
2028*	99,393,936	17,959,098	117,353,034	2,090,740	775,188	3,934,699	212,738	7,013,365	4,322,724	129,169	4,451,893	11,465,258	3,693,989	22,635
2029*	101,784,386	18,362,296	120,146,682	2,135,623	781,872	3,968,940	212,745	7,099,180	4,354,464	129,169	4,483,633	11,582,813	3,746,853	22,836
2030*	104,196,687	18,769,845	122,966,532	2,180,828	788,612	4,003,819	212,752	7,186,011	4,386,789	129,169	4,515,958	11,701,969	3,800,064	23,038
2031*	106,622,460	19,180,862	125,803,322	2,226,212	795,378	4,039,355	212,759	7,273,704	4,419,703	129,169	4,548,872	11,822,576	3,853,445	23,240
2032*	109,076,285	19,596,099	128,672,384	2,272,013	802,224	4,075,561	212,766	7,362,564	4,453,218	129,169	4,582,387	11,944,951	3,907,321	23,443
2033*	111,544,765	20,013,618	131,558,383	2,317,973	809,157	4,112,444	212,773	7,452,347	4,487,365	129,169	4,616,534	12,068,881	3,961,383	23,648
2034*	114,017,377	20,431,155	134,448,532	2,363,862	816,173	4,150,017	212,780	7,542,832	4,522,146	129,169	4,651,315	12,194,147	4,015,412	23,855
2035*	116,610,888	20,870,816	137,481,704	2,411,972	823,316	4,188,342	212,787	7,636,417	4,557,575	129,169	4,686,744	12,323,161	4,071,751	24,066
2036*	119,295,740	21,325,576	140,621,316	2,461,761	830,561	4,227,385	212,794	7,732,501	4,593,686	129,169	4,722,855	12,455,356	4,129,866	24,280
2037*	122,038,907	21,790,002	143,828,909	2,512,551	837,914	4,267,171	212,801	7,830,437	4,630,467	129,169	4,759,636	12,590,073	4,189,038	24,493
2038*	124,769,799	22,252,948	147,022,747	2,562,976	845,375	4,307,722	212,808	7,928,881	4,667,978	129,169	4,797,147	12,726,028	4,247,916	24,709
2039*	127,585,981	22,730,885	150,316,866	2,614,964	852,937	4,349,062	212,815	8,029,778	4,706,196	129,169	4,835,365	12,865,143	4,308,401	24,928
2040*	130,512,064	23,228,100	153,740,164	2,669,008	860,611	4,391,214	212,822	8,133,655	4,745,164	129,169	4,874,333	13,007,988	4,371,027	25,152
2041*	133,413,696	23,720,965	157,134,661	2,722,399	868,393	4,434,180	212,829	8,237,801	4,784,909	129,169	4,914,078	13,151,879	4,433,035	25,379
2042*	136,459,262	24,239,135	160,698,397	2,778,532	876,287	4,478,003	212,836	8,345,658	4,825,448	129,169	4,954,617	13,300,275	4,497,850	25,605

Source: FAA APO TAF (Issued January 2024)

2.10 CURRENT BASELINES (OPERATIONS AND BASED AIRCRAFT)

It is important to establish a baseline for specific data elements to assist with developing historical trends and to project forecasts from. For non-towered airports, like GGW, accurate baseline data can be somewhat elusive with so many different sources of information. The baseline for the GGW forecast, as described within the scope for this project, is calendar year 2022.

Stakeholder Interviews & Discussions

GGW airport sponsor, stakeholder, and management discussions regarding type of operations and other information proved exceedingly valuable, especially concerning the current role of the airport and the fleet mix. Local users and stakeholders were often involved in airport meetings and during public open houses to lend information and opinions about the nature of airport use. The results of some of these discussions yielded some valuable points, many of which need to be taken into consideration as to their influence in augmenting forecast trends based on published reportable operations and fleet mix data. Some of these points include:

- Although TFMSC, Flight Aware, and other data captured some very relevant information, it is notable that it primarily relies on IFR related information, or dependent upon aircraft in the vicinity being equipped with ADS-B transponders.
- Visual recollections, collected from discussion with various stakeholders, of the type of aircraft that operate out of GGW generally correspond with the types of aircraft reported to operate at GGW from other reportable published sources.
- GGW rebounded rather quickly from a significant drop in activity during the COVID pandemic. However, the recent uptick in activity has generally stabilized.

The final baseline was determined using extrapolation after reviewing forecasts, operational data, and information from on-site personnel. The baseline for 2022 operations is listed in Table 2-8.

Table 2-8. 2022 Baseline Data Extrapolated from Various Data Sources

Selected GGW Baseline Data & Sources & Final Baseline Estimate											
Source	**Enplanements**		**Itinerant Ops**				**Local Ops**		**Total Ops**	**Based AC**	**IFR Ops**
	Air Carrier	**Commuter**	**Air Carrier**	**Air Taxi**	**GA**	**Military**	**Civil**	**Military**			
Basedaircaft.com										45	
TAF	0	3,135	0	3,460	1,250	20	3,500	0	8,230	51	
TFMSC	0	0	1,266	14	1,087	3			2,567		2,567
Flt Aware											4,994
ACAIS	0	2,982									
Baseline	**0**	**3,000**	**0**	**3,500**	**1,400**	**20**	**3,500**	**0**	**8,420**	**45**	**3,800**

The following methodologies were used to calculate the final 2022 baseline.

- GGW has no Air Carrier activity to include in the baseline.
- Commuter enplanements were chosen at 3,000 as a middle ground between the TAF and ACAIS data. As the TAF is an estimated figure and ACAIS is a reported figure the ACAIS number was used as a baseline with a slight rounding for simplicity.
- With the TAF being an estimated number for Air Taxi, the evaluator chose simply to round Air Taxi baseline up to 3,500.
- GA operations were not counted during the master planning process. The evaluator believes these numbers are underreported due to discussions with on-site personnel and the overall increase in piston fuel sales in the last seven years (see Table 2-11). The evaluator has chosen to increase the GA Operations to reflect GA activity that is believed to have been historically underreported.
- Military operations were taken directly from the TAF as there is no additional information to warrant a change in the number.
- Total Operations were calculated by adding each of the categories.
- There is known to be 45 based aircraft currently at GGW.
- IFR Ops was calculated by averaging TFMSC and Flight Aware operations counts and rounding up.

2.11 IDENTIFICATION OF CRITICAL AIRCRAFT

The Critical Aircraft determination is an important part of an airport forecast since it will directly impact the design requirements such as runway length, distances between runways and taxiways, safety areas, and many others. Determining fleet mix and a critical aircraft for non-towered airports can be challenging since many aircraft operations are not officially recorded by a tower or the FAA, especially non-commercial VFR operations. GGW is a non-towered airport which is known to host a wide variety of aircraft. Discussions with airport management and regular users of the facility were used to help identify the current fleet mix. Data supplied by a third-party commercial firm that can capture local use of ADS-B technology in conjunction with IFR operations was also valuable in determining fleet mix. This data is combined and compared with other available data and interviews to identify the current and forecast critical design aircraft for the airport.

The FAA has classified aircraft into specific design categories related to various dimensions and performance characteristics, such as wingspan, tail heights, and approach speeds. These are categorized alphanumerically, such as A-I, B-II, C-III, etc. The letter indicates Aircraft Approach Category (AAC). The roman numeral represents Airplane Design Group (ADG) which is based on aircraft tail height and wingspan. The smaller the letter and number, generally the slower and smaller the aircraft represented.

The current GGW AAC/ADG is B-II for both runways 12-30 and 8-26. With an existing length of approximately 5,000 feet and an elevation of 2,296 feet, GGW is well suited to handle aircraft within its current B-II design standards. There is a very diverse range of aircraft currently using GGW, commonly ranging from small single engine piston type aircraft to medium sized twin-engine turboprop and even jet aircraft. Table 2-9 for lists Flight Aware data for operations on Runway 8-26. As previously discussed, Flight Aware data does not account for VFR operations. An evaluation should be conducted before the next major construction project on Runway 8-26 to determine if the runway should be downsized.

Table 2-9. Number of BI and BII Operations on Runway 8-26 for 2021 and 2022.

Year	Category	Operations
2021	BI	118
2021	BII	238
2022	BI	106
2022	BII	246

Source: Flight Aware

FAA guidance specifies that the critical aircraft is indicated as the largest and fastest aircraft using the facility, with at least 500 forecast operations annually. Verification of the operations are primarily based upon reportable data. For non-towered GA airports, like GGW, available data is often augmented with other reliable information gathered from airport representatives, or other sources, to provide the most reasonable estimate of which type or class of aircraft satisfies FAA guidance.

Flight Aware operations information shows the Pilatus PC-12 (ADG A-II) as the make and model aircraft

with the highest activity at GGW with 1,181 operations (base year 2022). This is also substantiated by the FAA's TFMSC which also indicates the PC-12 as the most common aircraft with over 820 operations. As Cape Air recently started flying the Tecnam P2012 Traveller, it should also be evaluated. This aircraft is a design group A-1 Small, and therefore not the most demanding aircraft.

Utilizing published FAA TFMSC data to obtain recent and historical operations at GGW, Table 2-10 shows total number of operations by AAC/ADG through the 20-year planning period. The data represented in the table reinforces the information gathered from local sources as to the fleet mix observed utilizing the airport. The comparatively large number of B-II operations reflected in the TFMSC data is corroborated with the Flight Aware information. The B-II ADG designation also fits well within the existing roles that the airport currently serves, especially related to numerous stopovers by air ambulance, large corporate, and government aircraft.

The most reliable information suggests the appropriate current and future ADG designation based on a minimum of 500 operations per year is the B-II AAC/ADG. The Critical Aircraft has changed. It was previously a Beechcraft 1900 and is now the Super King Air which had 268 counted operations reported in the TFMSC data for 2022 The B-II fleet includes the Super King Air, the King Air 90, and the Merlin 4, among other small twin engine aircraft. The slight growth forecasted for GGW only serves to reinforce that status quo for the type of operations at GGW. These combined factors support a reasonable conclusion as B-II as the future ADG designation for both runways, 12-30 and 8-26 at GGW.

Table 2-10. Total Ops by AAC/ADG for the period of 2002-2022

FAA TFMSC-GGW 2002 - 2022 AAC/ADG vs. Total Ops	
AAC/ADG	**Total Ops**
Unknown	729
A-I	4,025
A-II	8,455
B-I	17,791
B-II	17,890
B-III	3
B-IV	6
C-I	104
C-II	207
C-III	16
C-IV	16
D-I	78
D-II	4
D-III	11
D-IV	5
D-V	9
D-VI	3
Total	**49,352**

Source: FAA TFMSC

2.12 TREND ANALYSIS

Because of the relatively limited number of operations, of all types, at GGW, it is inconsequential to create and use different multipliers to adjust individual types of operations, (unless specifically noted), or to develop different multipliers to create different forecasts groups for low, medium, and high forecast possibilities. The final percentage multiplier developed adjusts average annual increases equally for all operational categories. Although GGW remained relatively stable in comparison to the entire aviation industry from the effects of COVID, care was exercised to not underestimate, or overestimate, historical trend averages that might have been unduly influenced from events over the last four years.

Below are the numerous factors that were evaluated to determine how this information would affect the forecast trend.

Flight Aware

Analysis of Flight Aware calculated operations from the period of October 2020 to August 2022. The short duration and fluctuations of the data does not allow a discernible trend to project an accurate forecast.

Annual Enplanements

Historical annual enplanements showed a wide variability in year over year changes. Due to the EAS contract, recently renewed through 2027, enplanement numbers are not expected to influence operations as Cape Air's EAS contract provides for 2 flights daily. Since Cape Air took over the EAS contract in 2013, they have consistently offered two flights daily. As such, operations by passenger aircraft are expected to remain flat. However, enplanements show a very modest increase of 1.2%

TFMSC Data

The Traffic Flow Management System Counts (TFMSC) provides a 20-year history of IFR operations. A review of Figure 2-16 shows a trend of increases and decreases through the evaluation period however, the general trend shows an overall increase in IFR operations.

The average annual growth rate for the TFMSC data over the 20-year period showed an increase of operations by 1%. The below graph's trendline highlights (dotted line) and verifies this trend.

Figure 2-16. TFMSC Data Operations by Year

Fuel Sales

As shown in Table 2-11, for the years 2016 – 2022 fuel sales show a fairly consist increase in 100LL with only a small dip in 2021. Jet A shows a fairly consistent decrease through the same time period. Fuel sales do not provide enough consistent information to base a forecast on, however, the 100LL data does indicate an increase in piston activity.

Table 2-11. GGW Fuel Sales 2016 – 2022

GGW Fuel Sales (selected years)			
Year	Fuel Type		Totals
	100LL (gal)	Jet A (gal)	
2016	33,088	92,880	125,968
2017	34,520	92,725	127,245
2018	36,681	107,368	144,049
2019	35,261	83,239	118,500
2020	40,912	95,254	136,166
2021	39,406	88,131	127,537
2022	44,706	77,500	122,206
% Change	4.4%	-2.6%	-0.4%

Source: GGW

Final Analysis

A Trend Analysis and Extrapolation methodology using historic IFR traffic counts was determined to be the best method to calculate future activity. GGW is an EAS airport, which stabilized the number of commercial operations outlined in the contract between Cape Air and the US Department of Transportation. Cape Air is to provide two flights a day through December of 2027.

After thorough review, the FAA's historical TFMSC operations data proved to be the most conclusive dataset for this historical trend analysis. This dataset is also supported by the airport's positive trend in 100LL piston aircraft fuel sales. Additionally, the growth measured in IFR operations mirrors the published TAF projection for the Northwest Mountain Region of 1.1%.

Economic and demographic characteristics have shown little to no growth and are expected to remain stable for this portion of Montana. For this reason, the average annual growth rate of 1% measured by both the TFMSC and the FAA's TAF for the Northwest Mountain Region is the growth rate chosen to forecast projected aviation demand at GGW for the short, medium, and long term forecast periods. Similarly, enplanements are expected to remain stable and the historical average annual growth rate of 1.2% is carried forward into the projected enplanements for the short, medium, and long term forecast periods.

2.13 AVIATION FORECAST

In developing the GGW Forecast, historic and current operational data from a variety of sources were evaluated. It was determined that the best indicator of future activity was previous activity at the airport. Using FAA Traffic Flow Management System Counts (TFMSC), GGW showed a 1% growth rate for operations from 2002 to 2023. An evaluation of TFMSC is discussed further in Section 2.5.1. Other operational data was investigated and validated the TFMSC data. Using experience and the evaluation of all relevant data, including socioeconomic conditions, population, fuel sales, based aircraft, and enplanements, the forecaster determined that none of these factors warrant an adjustment to the TFMSC rate. It is believed 1.0% is the most reasonable expectation of growth for operations. This 1.0% will be applied uniformly across all forecast timeframes, short-term, mid-term, and long-term for aircraft operations. Passenger enplanements will reflect the 1.2% growth rate as discussed in Section 2.6. Table 2-12 depicts the projections forward from current baselines for GGW for the forecasted periods of 2022 to 2027 (short-term), 2028 to 2032 (medium-term), and 2033 to 2042 (long-term). Due to the limited number of annual operations and the inability to differentiate separate operational categories (i.e., commercial, GA, military, and cargo), a single multiplier was used across all reportable categories.

Table 2-12. GGW Forecasts – 2022 through 2042

GGW Forecasts - 2022 through 2042 (Presented in Same Format as Industry Reportable Categories)										
Period	**Enplanements**		**Itinerant**				**Local**		**Totals**	**Based CAC**
	air carrier	**commuter**	**air carrier**	**air taxi**	**GA**		**civil**			
Baseline	**0**	**3,000**	**0**	**3,500**	**1,400**	**20**	**3,500**	**0**	**8,420**	**45**
2023	0	3,036	0	3,535	1,414	20	3,535	0	8,504	45
2024	0	3,072	0	3,570	1,428	20	3,570	0	8,589	46
2025	0	3,109	0	3,606	1,442	21	3,606	0	8,675	46
2026	0	3,147	0	3,642	1,457	21	3,642	0	8,762	47
2027	**0**	**3,184**	**0**	**3,679**	**1,471**	**21**	**3,679**	**0**	**8,850**	**47**
2028	0	3,223	0	3,715	1,486	21	3,715	0	8,938	48
2029	0	3,261	0	3,752	1,501	21	3,752	0	9,027	48
2030	0	3,300	0	3,790	1,516	22	3,790	0	9,118	49
2031	0	3,340	0	3,828	1,531	22	3,828	0	9,209	49
2032	**0**	**3,380**	**0**	**3,866**	**1,546**	**22**	**3,866**	**0**	**9,301**	**50**
2033	0	3,421	0	3,905	1,562	22	3,905	0	9,394	50
2034	0	3,462	0	3,944	1,578	23	3,944	0	9,488	51
2035	0	3,503	0	3,983	1,593	23	3,983	0	9,583	51
2036	0	3,545	0	4,023	1,609	23	4,023	0	9,679	52
2037	0	3,588	0	4,063	1,625	23	4,063	0	9,775	52
2038	0	3,631	0	4,104	1,642	23	4,104	0	9,873	53
2039	0	3,674	0	4,145	1,658	24	4,145	0	9,972	53
2040	0	3,719	0	4,187	1,675	24	4,187	0	10,072	54
2041	0	3,763	0	4,228	1,691	24	4,228	0	10,172	54
2042	**0**	**3,808**	**0**	**4,271**	**1,708**	**24**	**4,271**	**0**	**10,274**	**55**

2.14 TAF FORECAST COMPARISON

FAA Advisory Circular 150/5070-6B requires comparison of airport demand forecasts to the FAA TAF. Master plan forecasts for operations and based aircraft are considered consistent with the TAF if the following criteria for non-hub airports are met:

- Forecasts differ by less than 10 percent in the five-year forecast period.
- Forecasts differ by less than 15 percent in the ten-year forecast period.

If an inconsistency is found, further analysis and explanation of why the differences occur are required as part of the forecast. It is common to have inconsistencies between the FAA TAF and forecasts developed for non-towered GA airports. Table 2-13 contrasts the FAA TAF and the GGW Forecast data.

Table 2-13. GGW Forecasts versus TAF – Comparison

GGW Forecasts -vs. TAF - Comparison (Baseline / 5yr / 10yr)										
Period	**Enplanements**		**Itinerant**				**Local**		**Totals**	**Based AC**
Data Set	**air carrier**	**commuter**	**air carrier**	**air taxi**	**GA**	**military**	**civil**	**military**		
Baseline										
TAF	0	3,132	0	3,460	1,250	20	3,500	0	8,230	51
Forecast	0	3,000	0	3,500	1,400	20	3,500	0	8,420	45
% Diff	**0%**	**4%**	**0%**	**1%**	**11%**	**0%**	**0%**	**0%**	**2%**	**-13%**
2027										
TAF	0	2913	0	3,460	1,250	20	3,500	0	8,230	51
Forecast	0	3,184	0	3,679	1,471	21	3,679	0	8,850	47
% Diff	**0%**	**9%**	**0%**	**6%**	**15%**	**5%**	**5%**	**0%**	**7%**	**-9%**
2032										
TAF	0	2983	0	3,460	1,250	20	3,500	0	8,230	51
Forecast	0	3,380	0	3,866	1,546	22	3,866	0	9,301	50
% Diff	**0%**	**13%**	**0%**	**11%**	**19%**	**10%**	**9%**	**0%**	**12%**	**-2%**

There are discrepancies between the forecast and TAF regarding total numbers of itinerant GA operations. As described in Section 2.9, the projections developed in the FAA TAF for GGW were created by taking the current operations and based aircraft database and flatline projecting the data forward into the future (equivalent to 0.0% growth over time). As also described earlier, due to the nature of how the FAA TAF is developed, the data within the TAF should be regarded as unreliable.

Definitions

The following selected list of definitions and acronyms will assist in navigating the material presented by defining the common terms used by the Federal Aviation Administration and the aviation industry in relation to forecasts, as identified within FAA TAF, TFMSC, and related FAA publications:

Air Carrier Enplanements - Sum of domestic and international revenue passenger enplanements on mainline US commercial air carriers plus international revenue passenger enplanements on mainline foreign flag air carriers. Data includes both scheduled and non-scheduled enplanements as reported to the U.S. Department of Transportation (DOT), Bureau of Transportation Statistics (BTS) on T-100 reports.

Air Taxi Enplanements - Revenue passenger enplanements on on-demand air carriers. The data are reported voluntarily on the Airport Activity Survey, FAA Form 1800-31. Airport Operations - Takeoffs and landings at an airport. The two types of airport operations are local and itinerant. Approach Control ID - Terminal Radar Approach Control (TRACON) Identifier.

Aircraft - Three- or four-character code identifying the aircraft, followed by name of aircraft.

Aircraft ID (ACID) - Aircraft identification code.

Airplane Approach Category (AAC) - Grouping of aircraft based on approach speeds. See the FAA's aircraft characteristics database for more information on aircraft characteristics.

Airplane Design Group (ADG) - Grouping of aircraft based on wingspan. See the FAA's aircraft characteristics database for more information on aircraft characteristics.

Arrival - Three-letter code identifying the airport of arrival, followed by name of airport.

Arrival (AC+AT, GA, MIL, Total) - Total number of arrivals listed as Air Carrier and Air Taxi, General Aviation, and Military.

Arrival Date - Date of arrival of selected flight.

Arrival Hour - One-hour interval of selected flight arrival (minutes are not included).

Arrival Location ID - Three-letter code identifying the arrival airport.

Arrival Seats - Total number of seats on all arriving aircraft.

Arrivals - Number of arrivals at a selected airport or group of airports.

Average Arrival Seats - Average number of seats per arrival.

Average Departure Seats - Average number of seats per departure.

Based Aircraft - An aircraft that is operational and air worthy and is based at an airport for the majority of the year. The types of based aircraft in the TAF are: Single - Single Engine General Aviation Aircraft Jet - Turbojet and Turbofan General Aviation Aircraft Multi - Multiengine General Aviation Aircraft Helicopter - Helicopter General Aviation Aircraft Other - Other Aircraft (e.g., Gliders, Military, Ultra-Light)

Business Aviation - Grouping option for all equipment used by the part of general aviation that focuses on the business use of airplanes and helicopters.

Business Jet - Filter option indicating jet aircraft owned by a single or a group of individuals/corporations, and which is usually not operated in a schedule.

Carrier Code - Three-letter code identifying the carrier.

Commercial Airport Operations - Sum of itinerant air carrier plus itinerant air taxi & commuter operations.

Commuter Enplanements - Starting in FY 2003,

includes revenue passenger enplanements for those airlines whose primary function is to provide feed to mainline carriers, regardless of aircraft size. As of October 2002, all scheduled and non-scheduled operations using aircraft with ten or more seats to transport commuter (regional) passengers must report on T-100. (Historic enplanement statistics include originating passengers on scheduled commuter or regional carriers as reported on DOT Form 41 and 298-C; where possible adjustments were made to include connecting passengers. Historically, Form 298-C included carriers operating at least five scheduled round trips per week whose fleet consists of aircraft having 60 or fewer seats.)

Departure - Three-letter code identifying the airport of departure, followed by name of airport.

Departure (AC+AT, GA, MIL, Total) - Total number of departures sorted as Air Carrier and Air Taxi, General Aviation, and Military.

Departure Date - Date of departure of selected flight.

Departure Hour - One-hour interval of selected flight departure (minutes are not included).

Departure Location ID - Three-letter code identifying the departure airport.

Departure Seats - Total number of seats on all departing aircraft.

Departures - Number of departures at a selected airport or group of airports.

Domestic Air Carrier Enplanements - Revenue passenger enplanements flying within the US on mainline US commercial air carriers.

DZ to AZ (hh:mm) - Difference between arrival and departure message times sent by the En Route Modernization Automation Modernization (ERAM) system to TFMS expressed in hours and minutes.

Enplanements - The total number of revenue passengers boarding aircraft. Includes both originations and transfers.

Estimated Time Enroute. - The flight plan filed ETE (Estimated Time Enroute) is the planned airborne time, in minutes.

Fiscal Year - Time period beginning on October 1 of previous calendar year and ending on September 30 of the current calendar year.

Flight Index - One component of the TFMS primary key provided by the NAS Data Warehouse.

Flight Type - Filter option indicating flight direction. Permitted variables are: Domestic (both arrival and departure are in the US), US to Foreign, Foreign to US, and Foreign (both arrival and departure are in a foreign country).

Flights - Number of flights.

Hour - In reports generated in the Distributed OPSNET view only, hour interval used by TFMS to distribute OPSNET counts, expressed by the 24-hour clock.

Hub Size - Classification of airports based on percentage of total U.S. revenue passenger enplanements in a one-year period. The definitions of the hub sizes are: Large Hub - 1.00% or more of total U.S. revenue passenger enplanements Medium Hub - at least 0.25% but less than 1.00% of total U.S. revenue passenger enplanements Small Hub - at least 0.05% but less than 0.25% of total U.S. revenue passenger enplanements Non-Hub - less than 0.05% of total U.S. revenue passenger enplanements

Itinerant Air Carrier Operations - Itinerant airport operations performed by aircraft with seating capacity of more than 60 seats or a maximum payload capacity of more than 18,000 pounds, carrying passengers or cargo for hire or compensation. Includes US and foreign flag carriers.

Itinerant Air Taxi Operations - Itinerant airport operations performed by aircraft with seating capacity of 60 seats or less or a maximum payload capacity of 18,000 pounds or less, carrying passengers or cargo for hire or compensation.

Itinerant General Aviation Operations - Itinerant airport operations performed by all civil aircraft, except air carriers or air taxis/commuters.

Itinerant Military Operations - Itinerant airport operations performed by military aircraft.

Itinerant Operations - Airport operations performed by an aircraft, either IFR or VFR, that land at an airport arriving from outside the airport area or depart from an airport and leave the airport area.

Local Civil Operations - Local airport operations performed by private and commercial aircraft.

Local Domestic Originating Share - Percentage of total domestic passenger enplanements

Local Military Operations - Local airport operations performed by military aircraft.

Local Operations - Airport operations performed by an aircraft that remain in the local traffic pattern, execute simulated instrument approaches or low passes at the airport, and operations to or from the same airport within a designated practice area within a 20-mile radius of the airport.

Maximum Altitude Level (100ft) - The maximum altitude level that was achieved by the aircraft during flight.

Oceanic - A flight that crosses an ocean and generates "TO" messages. Oceanic flights must have values for all fields in the record to be used for metric computation. Incomplete flight records are not used for metric computation but are included in Efficiency Counts at airports. As a grouping option, it indicates enroute IFR or overflights that cross oceanic airspace. (Yes/No).

OPSNET Total - Total operation counts reported by OPSNET and distributed by TFMS into departures and arrivals and by the hour of the day. Variable available in reports generated in the Distributed OPSNET view only.

Physical Class - Categories of aircraft engines. Permissible values are: turbine, jet, piston, and helicopter.

Region - FAA Regional Office. The regions are: Alaskan Central Eastern Great Lakes New England Northwest Mountain Southern Southwest

Regional Jet - Filter option indicating a commercial jet aircraft carrying fewer than 100 passengers (i.e., Embraer 190 or Bombardier CRJ-200).

Seats - The number of seats derived from the equipment type.

Seats per Flight - Number of seats per selected flight.

Statute Miles (or Statute Miles Flown) - Number of statute miles flown based on city pair great circle route.

Statute Miles per Flight - Number of statute miles flown per flight based on city pair great circle route.

Taxiway Design Group (TDG) - Grouping of aircraft based on gear geometry affecting turning radius. See the FAA's aircraft characteristics database for more information on aircraft characteristics.

TFMS Equipment - TFMS Aircraft Type designator, followed by the name of the aircraft. The designator is usually a three- or four-character field extracted from an TFMS flight plan.

TFMS Total - Total count of flights reported by

TFMS Variable does not include TFMS records if user class is 'Other' or missing and does not include TFMS records missing specific times (hour = NA). This variable is available in reports generated in the Distributed OPSNET view only.

TFMS% of OPSNET - Comparison between distributed OPSNET counts and TFMS counts expressed as a percentage. Variable does not include TFMS records if user class is 'Other' or missing and does not include TFMS records missing specific times (hour = NA). Variable available in reports generated in the Distributed OPSNET view only.

Time Flown (hh:mm) - Amount of time flown, expressed in hours and minutes based on the DZ to AZ time.

Time Flown Per Flight - Amount of time flown per flight, expressed in hours and minutes based on the DZ to AZ time.

Total International Enplanements - Sum of US Flag Enplanements and Foreign Flag Enplanements.

Total Operations - Total number of operations at a selected airports or group of airports.

Total Overflights - Sum of IFR and VFR operations performed by an aircraft that originate outside the tower's or TRACON's airspace without landing. Includes helicopter operations that land or depart from an airport non-movement area or from an off-airport location.

TRACON (Terminal Radar Approach Control Facility) - An FAA air traffic control facility using radar and air/ground communications to provide approach control services to aircraft arriving, departing, or transiting the airspace controlled by the facility. Service may be provided to both civil and military airports.

TRACON Operations - Arrivals, departures, and overflights handled by the TRACON. The categories of TRACON operations are: Air Carrier Air Taxi General Aviation Military Overflights

User Class - Designations assigned by the NAS Data Warehouse based on the equipment reported: Commercial, Freight, Air Taxi, General Aviation, and Military.

Weight Class - TFMS Aircraft are divided into categories related to impact on wake turbulence: (A) heavy (any aircraft weighing more than 255,000 lb such as the Boeing 747 or the Airbus A340); (B) B757 for Boeing 757 all series; (C) large jet (large jet aircraft weighing more than 41,000 and up to 255,000 lbs such as the Boeing 737 or the Airbus A320); (D) large commuter (large commuter non-jet aircraft including small regional jets weighing more than 41,000 and up to 255,000 lbs such as the Aerospatiale/Alenia ATR-42 , the Bombardier Canadair Regional Jet, or the Saab SF 340); (E) medium (small commuter aircraft including business jets weighing more than 12,500 up to 41,000 lbs such as the Embraer 120 or the Learjet 35); and (F) small equipment (small, single, or twin engine aircraft weighing 12,500 lbs or less such as the Beech 90 or the Cessna Caravan). Unknown refers to unspecified equipment.

Western-Pacific Reliever - Airports designated by the FAA to relieve congestion at Commercial Service Airports and to provide improved general aviation access to the overall community. These may be publicly or privately owned.

Acronyms

AAC - Domestic Air Carrier Enplanements

AAT - Air Taxi Enplanements

AC - Air Carrier Operations

ADSB – Automatic Dependent Surveillant Broadcast

ALP – Airport Layout Plan

AMR – Airport Master Record

AT - Air Taxi Operations

CIP – Capital Improvement Program

FAC_CLASS - Facility Classification

FRGN_FLAG - Foreign Flag International Air Carrier Enplanements

GA - General Aviation

GARD – General Automatic Recording Device

HELO - Helicopter General Aviation Aircraft

ITN - Itinerant

JET - Turbojet and Turbofan General Aviation Aircraft

LOC - Local

LOCID - Location Identifier

MIL - Military

MTDLI – Montana Department of Labor and Industry

MULTI - Multiengine General Aviation Aircraft

OPS - Operations

REG - Federal Aviation Administration Regional Office

SINGLE - Single Engine General Aviation Aircraft

TOT_AOPS - Total Airport Operations

TOTBA - Total Based Aircraft

TOTENPL - Total Enplanements

TOTOVERS - Total Overflights

TR - TRACON

TRACON - Terminal Radar Approach Control Facility

US_FLAG - US Flag International Air Carrier Enplanement

3. FACILITY REQUIREMENTS

The purpose of the Facility Requirements chapter is to define the existing and future development needs for GGW. GGW facility requirements described in this chapter are based on:

- Evaluation of whether the current facility meets FAA standards.
- Maintenance needs for existing facilities.
- Facility expansion needs driven by current and future demand.
- Issues and needs identified by users, airport staff, the FAA, or other stakeholders.

3.1 CRITICAL (DESIGN) AIRCRAFT

The critical (design) aircraft is the most demanding aircraft with at least 500 annual operations that operates, or is expected to operate, at the airport. This is the aircraft that drives GGW design standards, safety zones, separation between facilities, and overall facility layout. The outcome of this master plan is a long-term resolution of current non-standard conditions that will allow GGW to meet FAA design standards and facilitate safer, more efficient airfield activity.

The critical (design) aircraft category for GGW is B-II, this was determined using FAA TFMSC data, FlightAware data, and input from representatives at GGW. The B-II category includes the Beech 200 Super King Air and the Beech 90 King Air. Other common types of aircraft that utilize GGW include the Cessna 402 (A-I) and Tecnam P2012 (A-I) operated by Cape Air and the PC12 Pilatus (A-II).

3.2 AIRFIELD AND AIRSPACE REQUIREMENTS

3.2.1 Airfield Capacity

Airfield capacity is an estimate of the number of aircraft operations a runway can handle without an unacceptable level of delay. When demand begins to approach capacity, unacceptable delays can occur. Factors affecting capacity can include runway configuration, obstructions, Air Traffic Control (ATC) procedures, weather conditions, and fleet mix. In accordance with AC 150/5060-5, the annual service volume (ASV) for GGW intersecting runway configuration is 215,000. GGW currently has about 8,400 operations per year. The 20-year forecast estimates GGW annual operations reaching just under 10,500. Since the forecast is so far under the ASV, it is concluded that GGW has adequate runway capacity throughout the planning period.

3.2.2 Runway Requirements

Runway Alignment and Wind Coverage

According to the FAA ADIP, using the All Weather Windrose the wind coverage for Runway 8/26 and Runway 12/30 is 98.77 percent (2014-2023) at 13 knots. FAA AC 150/5300-13B, states that 95% is ideal wind coverage for an airport based on at least 10 years of reported weather observations. Thus, at 98.77 % the all-weather wind coverage for Runway 12/30 and Runway 8/26 combined at GGW is adequate (Table 3-1).

Table 3-1. Wind Coverage at 13 Knots, 2014-2023

Runway	All- Weather	IFR
12/30	93.28%	90.60%
8/26	95.38%	92.27%
All Runways	98.77%	97.74%

Source: ADIP

One concern with the wind analysis is whether winds support the need for multiple runways. The 2013 wind analysis shows the primary Runway 12/30 as having a 98.2% wind coverage at 13 knots. The FAA has argued that the secondary runway is not needed with wind coverage at greater than 95% for All-Weather conditions. However, due to changes in weather, the 2023 data shows Runway 12/30 as only having a 93.28% coverage in all weather and a 90.60% during IFR conditions. GGW does not have the 95% coverage the FAA AC 150/5300-13B recommends without Runway 8/26. Therefore, GGW should continue to maintain Runway 8/26, and the FAA should evaluate funding repairs for this runway.

Runway Length and Width

Results of a runway length analysis performed using the criteria in FAA AC 150/5325-4B *Runway Length Requirements for Airport Design* to determine the runway length requirements for various aircraft configurations are provided in Table 3-2. This analysis indicates that the present runway lengths of 5,000 feet (RWY 8/26) and 5001 feet (RWY 12/30) are adequate to meet current and future operational demands for small airplanes with 10 or more passenger seats as well as 100 percent of small airplanes with less than 10 passenger seats.

A 1,199-foot runway extension is described on the 2013 ALP. This extension is not anticipated to be needed during the 20-year planning period covered by this Master Plan. However, the runway extension will remain as a potential project in the event conditions warrant regular commercial jet traffic. By keeping the extension as a potential project, GGW ensures the land is available if and when the extension becomes necessary.

Table 3-2. GGW Runway Length Analysis

Mean Daily Max. Temp. of the Warmest Month of the Year	85.5 degrees Fahrenheit (July)
Airport Elevation	2295.9 ft MSL (surveyed)
Critical Design Aircraft	ADG B-II
Aircraft Weight Category	Small airplanes with maximum certificated takeoff weight of 12,500 lb or less
Small airplanes with less than 10 passenger seats	
95% of these small airplanes	3,900 feet
100% of these small airplanes	4,500 feet
Small airplanes with 10 or more passenger seats	4,500 feet

Source: FAA Advisory Circular 150/5325-4B: Runway Length Requirements for Airport Design | NOAA National Centers for Environmental Information, Data Search | National Centers for Environmental Information (NCEI) (noaa.gov)

Runway Lighting

Runway lighting is currently sufficient for both Runways 12/30 and 8/26. However, the runway lighting on Runway 8/26 is near the end of its useful life and requires frequent repairs. In addition, the industry is moving away from halogen lighting toward LED lighting. Runway 8/26 lighting should be replaced with LED lights during the next appropriate project. Runway 12/30 lighting should be replaced with LED lights when it reaches the end of its useful life.

3.2.3 Runway Separation and Safety Standards

Separation standards are established by the FAA with the purpose of preventing conflicts between two aircraft passing on surfaces such as runways and taxiways. Safety standards include various areas and zones created to ensure space adjacent and around runways is safe for operating aircraft. Table 3-3 and Table 3-4 provide a description of each of these runway separation and safety standards with a discussion of any corrective actions needed to meet these standards for each runway.

Table 3-3. Runway 12/30 Design Standards

Runway 12/30	FAA ADG II Standard (feet)	Runway 12 Existing Dimensions (feet)	Runway 30 Existing Dimensions (feet)	Corrective Action
Runway Length	4,500	5,001	5,001	None
Runway Width	75	100	100	None
Runway Shoulder Width	10	10	10	None
Runway Safety Area Length	300 feet beyond runway end	300 feet	300 feet	None
Runway Safety Area Width	150	150	150	None
Runway Object Free Area Length	300	300	300	None
Runway Object Free Area Width	500	500	500	None
Runway Protection Zone	500 x 700 x 1,000	1,510 x 1,700 x 1,000	1,500 x 1,700 x 1,000	None
Runway Centerline to Taxiway Centerline	240	N/A	N/A	None
Building Restriction Line	Does not penetrate Part 77 standards	500 feet provides 35-foot building height	500 feet (provides a 35-foot building height)	None

Sources: Design Standards from FAA AC 150/5300-13B | Existing Conditions from 2024 ALP

Table 3-4. Runway 8/26 Design Standards

Runway 8/26	FAA ADG II Standard (feet)	Runway 8 Existing Dimensions (feet)	Runway 26 Existing Dimensions (feet)	Corrective Action
Runway Length	4,500	5,000	5,000	None
Runway Width	75	75	75	None
Runway Shoulder Width	10	10	10	None
Runway Safety Area Length	300 feet beyond runway end	300	300	None
Runway Safety Area Width	150	150	150	None
Runway Object Free Area Length	300	300	300	None
Runway Object Free Area Width	500	500	500	None
Runway Protection Zone	500 x 700 x 1,000	1,510 x 1,700 x 1,000	1,500 x 1,700 x 1,000	None
Runway Centerline to Taxiway Centerline	240	N/A	N/A	None
Building Restriction Line	Does not penetrate Part 77 standards	500 feet provides a 35-foot building height	500 feet (provides a 35-foot building height)	None

Sources: Design Standards from FAA AC 150/5300-13B | Existing Conditions from 2024 ALP

Recommended Action: Replace Runway 8/26 lighting with LED lights. Maintain the 100-foot width for Runway 12/30. Although the existing width exceed the standards, removing the excess width and relocating the runway lights would be more costly than simply maintaining the pavement already in place.

Change Runway 12/30 to an LED runway lighting system after the current system reaches the end of its useful life.

3.2.4 Taxiways and Taxilanes

Two short taxiways at Runway ends 26 and 30 each function as a place for aircraft to turn around after landing or before taking off. Figure 3-1 shows one of these turnaround taxiways. However, these turnarounds do not meet the recommended guidance provided by FAA AC 150/5300-13B (Figure 3-2). The turnaround has an appearance of a stub taxiway, but it ends abruptly about 220 feet from Runway 30. Pilots unfamiliar with GGW may inadvertently expect this taxiway to connect to a parallel taxiway or turnaround area. Runway 26 has the same configuration.

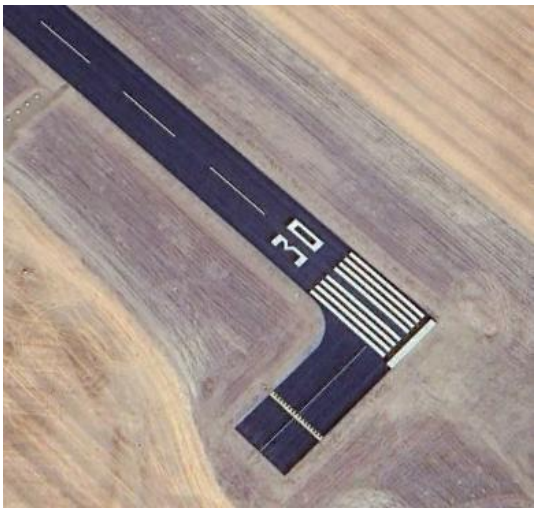


Figure 3-1. Runway 30 Turnaround

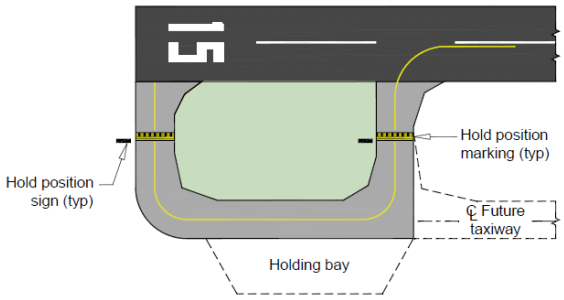


Figure 3-2. Recommended Turnaround Design.
Source: FAA AC 150/5300-13B

GGW has one taxiway (Taxiway C) that connects the developed apron area to runway ends 8 and 12. Taxiway C does not meet FAA standards. The first issue is that there are no 90-degree turns between the apron and the runways, which creates the potential for a pilot to unknowingly enter a runway, causing a runway incursion. The second issue is the taxiway does not enter the runways directly at the runway threshold, which could create potential situations where taxiing aircraft may penetrate a protected surface. Finally, Taxiway C intersects the VOR 500-foot critical area where there is no stopping permitted.

Figure 3-3. Lead-in taxiway to Runway 8

Neither runway has a parallel taxiway. A parallel taxiway decreases risk of a runway incursion by limiting time aircraft are actively using the runway. Without a full-length parallel taxiway, aircraft need to back taxi on the active runway. Since GGW is an uncontrolled airport, the length of time an aircraft is on the runway increases the likelihood of a runway incursion. To resolve this issue, a full-length taxiway should be created for Runway 8/26 and a partial-length taxiway should be created from the approach end of Runway 30 and intersect the full-length taxiway parallel to 8/26. This deficit is noted in the 2015 State Aviation System Plan (SASP), and the State of Montana also recommends adding a full-length taxiway.

Constructing a parallel taxiway would address the non-standard stub taxiways protruding from Runways 26 and 30. Additionally, parallel taxiways would increase runway capacity. However, capacity is not anticipated to be an issue during this planning period.

Recommended Action: Relocate Taxiway C so that it meets FAA Standards. Add a full-length parallel taxiway to Runway 8/26 and a partial parallel taxiway to Runway 12/30.

3.2.5 Aprons and Hangars

The apron space at GGW is sufficient for current and future operational needs. There are 17 tiedowns that can be used by transient aircraft. GGW does not provide long term leases for tiedown spots.

Hangar space is provided by both the airport and private entities. Some GGW hangars are worn and nearing the end of their useful life. There are currently two people waiting for hangars. The remainder of the hangar wait list are people who would like to move to a better hangar.

The hangar wait list indicates a need for additional hangar space. There have been discussions on a public/private partnership to build new hangars. However, there are no definitive plans at this time.

Recommended Action: Work with the community to develop interest in public/private partnerships to either rebuild hangars at the end of their useful life or build new hangars. Alternately, GGW should explore grant or other funding options to replace or build new T-hangars.

3.2.6 Helicopter Landing Area

Helicopters frequently operate at GGW, generally using the tiedown area. Although there have been no incidents with fixed-wing and rotorcraft operating in close proximity, industry standards require separation between the two types of aircraft. If tiedown activity increases and adequate separation is not able to be maintained between fixed-wing and rotorcraft, a designated helicopter landing area should be created.

Recommended Action: Develop a helicopter landing area away from fixed-wing operations.

3.2.7 Pavement Condition

The most recent PCI report by the State of Montana is from 2021 – both runways showed "satisfactory" conditions and Taxiway C showed "poor" condition. An airport pavement maintenance project was completed in Summer 2022 to improve the pavement conditions at GGW. Cracks were repaired and sealed, and a sealcoat was applied over all paved surfaces. This project was completed as timely follow-up to the 2021 pavement condition evaluation.

Runway 12/30 was reconstructed in 2012. Although the pavement has been maintained, a mill and overlay should be conducted in the next few years to ensure the integrity of the pavement.

The last reconstruction for Runway 8/26 was in 2003. Airport management indicates that Runway 8/26 is in worse condition than the "Satisfactory" condition shown on 2021 PCI report. The FAA had previously determined that Runway 8/26 is not needed due to Runway 12/30 meeting the 95% wind coverage required by the FAA. As such, the FAA has not provided funding for more than basic maintenance. Due to changing wind patterns, Runway 8/26 is now needed to maintain the 95% wind coverage. As such, GGW should reopen discussions with the FAA to provide funding for a mill and overlay on Runway 8/26 before the runway condition deteriorates to the extent that a full reconstruction would become necessary.

The Taxiway C pavement is failing. Taxiway C should be relocated to address the configuration issues already noted. Any portion of Taxiway C that is not relocated, should be fully reconstructed.

Recommended Action: Discuss with the FAA the possibility of funding a rehabilitation of Runway 8/26 due to shifting wind patterns. Rehabilitate the portions of Taxiway C that will be in use after relocation. The rehabilitation should be done at the same time as the relocation project.

3.2.8 NAVAIDs

GGW has the normal NAVAIDs needed for a non-precision approach. Runway 12/30 and Runway 8/26 have MIRL, PAPIs, and appropriate markings. The Airport has a VOR located east of Taxiway C, between Runways 12 and 8. The FAA deactivated the NDB that previously existed at GGW.

The status of other airport NAVAIDs is as follows:

- Rotating Beacon – Operates normally, tower needs repainted.
- Windsocks – Operational and in good condition
- ASOS – Unit is old and prone to failure. ASOS unit should be replaced by the NWS.

Recommended Action: Ensure GGW NAVAIDs are maintained and operational. Coordinate with NWS to replace ASOS.

3.2.9 Airspace Requirements

Navigable airspace is defined by the FAA as the airspace at or above the minimum altitudes of flight that includes the airspace needed to ensure safety in the takeoff and landing of aircraft. 14 CFR Part 77 is the federal code governing navigable airspace. This code classifies airspace in the US into various categories of surfaces based on dimensions, use, allowable penetrations, etc. The different kinds of airspace are collectively referred to as Part 77 surfaces.

The size and location of each surface defined in Part 77 are based on the type and approach category of the runway. A diagram showing the various surfaces depicted is in Figure 3-4.

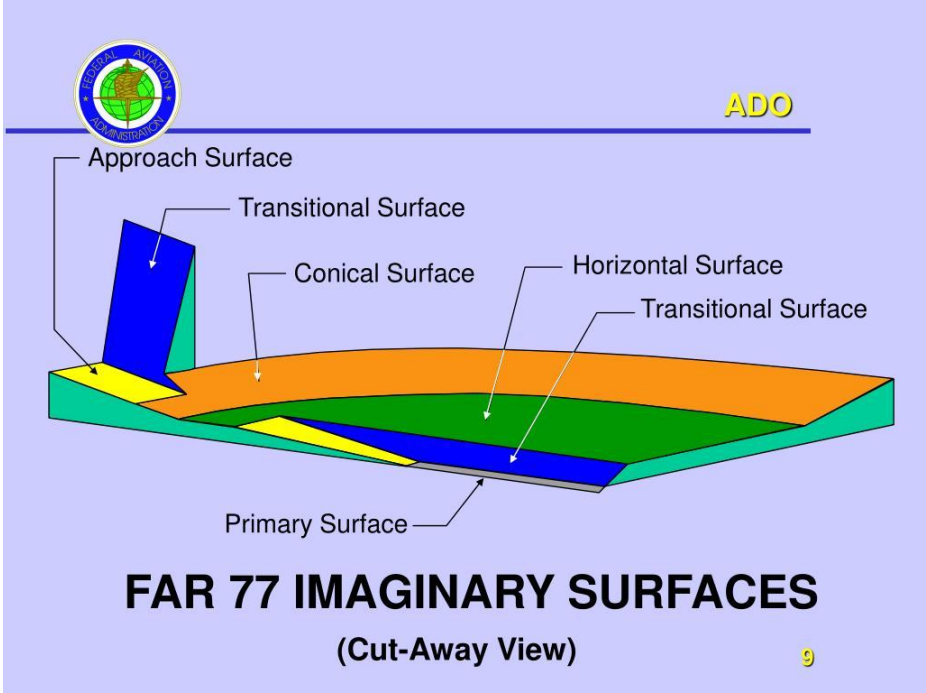


Figure 3-4. Part 77 Surfaces
Source: FAA

The following are the Part 77 categories for each runway at GGW.

- Runway 12/30 has an Approach Category as "Other than Utility Runway with a Non-Precision Approach having visibility Minimums greater than ¾ mile." The Approach Surface Slope is 34:1.
- Runway 8/26 has an Approach Category as "Other than Utility Runway with a Visual Approach." The Approach Surface Slope is 34:1.

There are seven vegetation/tree penetrations to GGW Part 77 surfaces, whose removal should be incorporated with future projects at GGW.

Recommended Action: Include removal of Part 77 penetrations in future projects. Work with Valley County and the City of Glasgow to ensure no Part 77 surfaces are impacted by future development.

3.2.10 Instrument Procedures

There are currently four published non-precision IAPs at GGW:

- RNAV (GPS) RWY 12 – lowest minimums at 2,544 feet MSL (250 feet AGL) with 7/8-mile visibility
- RNAV (GPS) RWY 30 – lowest minimums at 2,494 feet MSL (200 feet AGL) with 3/4-mile visibility
- VOR RWY 12 – lowest minimums at 2,700 feet MSL (500 feet AGL) with 1 mile visibility
- VOR RWY 30 – lowest minimums at 2,740 feet MSL (500 feet AGL) with 1 mile visibility

GGW is part of a Minimum Operation Network of VORs. Although decommissioned in many places nationwide, the FAA has recommended that select airports retain their VOR approaches, including GGW (per

2015 SASP), and has published VOR approaches for Runway 12 and Runway 30. The NDB approach to Runway 30 was terminated, as this technology has been decommissioned at GGW and many other places.

Recommended Action: Advocate for the FAA to continue to maintain the GGW VOR.

3.2.11 General Aviation Facilities

There is no FBO at GGW; however, airport staff provide fueling, parking, and other FBO services. Flight training, aircraft maintenance, and aircraft rentals are provided by Leader Aviation.

STAT Air operates out of GGW and provides air ambulance services for northeastern Montana. This critical service is needed due to the large distance to the nearest hospital with advanced facilities (Billings).

There are six lots identified on the ALP that are available for future development.

Recommended Action: Continue to support current tenants; encourage development of additional tenant lease lots.

3.3 ROADWAYS AND LANDSIDE ACCESS

3.3.1 Roadways

The current terminal is accessible via Airport Road, which connects with US Route 2 on the west and Montana Highway 24 on the east. Currently, access to the airport is not an issue. This road is owned and maintained by Valley County. Access roads are currently sufficient to support GGW.

There is only one powered gate used to access the hangar area. It is opened using a cipher code. This gate needs repairs to the powerline and ground loop sensors. There should be sufficient access into the apron area to reduce vehicle traffic on the taxilanes and provide redundancy if the main gate becomes unusable.

Recommended Action: Extend Airport Road to access the new terminal when it is developed. Repair the powerline and ground loop sensors at the main ramp gate. Evaluate need and location for additional powered gates.

3.3.2 Airport Terminal Building and Parking Facilities

A new, larger terminal is needed at GGW. The existing airport terminal is very congested when commercial flights are operating. The lobby area and secured checkpoint are too small, and screened passengers must currently board planes by exiting through the lobby where unscreened passengers are present. Concessions are limited to vending machines. In addition to not providing standard passenger screening and boarding facilities, the terminal building has standing water collecting under the building, the west wall is rotting, and the windows are failing.

Two new potential terminal sites have been identified on the ALP that would provide more space and improved facilities.

The terminal parking area currently has 51 spaces. The lot is in poor repair. A new parking lot would be required if a new terminal is built.

Recommended Action: Explore funding opportunities to develop a new terminal, access road, and vehicle parking lot.

3.4 SUPPORT FACILITIES

Support services and facilities at GGW include fuel, crop-dusting services, air ambulance services, aircraft parking and storage, charter air service, pilot instruction, and aircraft rentals.

3.4.1 Fuel

The GGW airport sells and dispenses its own fuel. Both 100LL and Jet A are available. The airport recently upgraded its fuel system by removing the old underground storage tank and related components and installing a new tank and system immediately adjacent to the fueling apron. GGW currently has one 10,000-gallon above ground storage tank for 100LL and one 20,000-gallon tank for Jet A. Both 100LL and Jet A can be dispensed via a self-serve credit card pump or full service can be provided by a fuel truck.

The FAA Reauthorization Act of 2024 requires all airports (except in the State of Alaska) to transition away from 100LL by no later than December 31, 2030. Discussions with airport management have indicated that GGW has not taken any steps to facilitate a switch to unleaded aviation fuels. Nor does the community support such a switch. However, due to this legislation, GGW will need to evaluate how to comply with the new regulations and create a transition plan. An outreach effort should be initiated to educate the community on the upcoming change.

Recommended Action: Develop a transition plan to switch to 100UL by the December 31, 2030, deadline.

3.4.2 Cargo

There are currently no scheduled cargo flights operating out of GGW. Cargo facilities previously used at GGW were small and in fair condition. It is recommended that GGW meet with FedEx and determine why they stopped flying into GGW. The airport should support the building or remodeling of cargo facilities to attract this type of operation back to the airport.

Recommended Action: Open discussions with FedEx or UPS to determine what would be necessary to return cargo services to GGW.

3.4.3 Utilities

Utilities facilities, including, water, electric, sewer, and communications currently meet the airport's needs. There is a project to move the electric vault out of the terminal into its own structure. There are no additional utility facility upgrades needed for the short or medium term.

Recommended Action: Extend utilities to relocated terminal and new lease lots.

3.4.4 Snow Management

Glasgow's average snowfall is 34 inches annually. It is important that GGW have sufficient personnel and equipment to manage the snow and keep the airport open for use by aircraft and the travelling public.

Snow Removal Equipment List

- 2006 Freightliner FL80 with 14-foot Root Spring Plow (Root Spring is no longer in business)
- 2005 New Holland TV145 with loader bucket and box plow attachment. MB Broom Attachment
- 1991 Oshkosh H-Series Snow Blower (Acquired by Sheriff through 1033 Program)

- 1991 Ford 8000 with 14-foot Sweepster Broom (Acquired by Sheriff through 1033 Program, Sweepster no longer supports this broom)
- 1983 Oshkosh P-Series truck with 21-foot Wausau Plow

Due to the age of the equipment and the inability to get replacement parts, GGW should invest in new snow removal equipment. A new broom, possibly with a blower attachment is scheduled for 2026.

Recommended Action: GGW should continue to replace or add new equipment as needed to be able to maintain the airport surfaces during winter conditions.

3.5 SUMMARY

This chapter has outlined the facilities required to meet the forecasted demand at GGW over the 20-year planning horizon. Table 3-5 lists the improvements and corrective actions identified to meet design standards, existing and forecasted capacity, and needed services. The discussion of how GGW may address facility needs and corrective actions is included in Chapter 4, Alternatives.

Table 3-5. GGW Corrective Actions Needed

Component	Identified Need or FAA Standard	Existing Condition	Corrective Action
Runway 12/30 – Runway Design Code B-II			
Alignment	95% crosswind coverage at 13 knots	93.28% crosswind coverage	Retain crosswind runway
Length	4,500 feet	5,001 feet	None
Width	75 feet	100 feet	Maintain runway width (more cost effective to retain width than to reduce width and relocate RWY lights)
Safety Area Width	150 feet	150 feet	None
Safety area length beyond runway end	300 feet	300 feet	None
Object Free Area (OFA) width	500 feet	500 feet	None
OFA beyond runway end	300 feet	300 feet	None
Runway 8/26 – Runway Design Code B-II			
Alignment	95% crosswind coverage at 13 knots	95.38% crosswind coverage	Retain crosswind runway, pursue AIP eligibility
Length	4,500 feet	5,000 feet	None
Width	75 feet	75 feet	None
Safety area width	150 feet	150 feet	None
Safety area length beyond runway end	300 feet	300 feet	None
OFA width	500 feet	500 feet	None
OFA beyond runway end	300 feet	300 feet	None

Component	Identified Need or FAA Standard	Existing Condition	Corrective Action
Taxiways			
Taxiway width	35 feet	35 feet	None
Taxiway Safety Area	79 feet	79 feet	None
Other taxiway needs	Limited taxi conflicts Minimize runway crossings	No parallel taxiway to RWY 12/30 or 8/26	Create full parallel taxiway to RWY 8/26 and a partial parallel taxiway to RWY 12/30
Other taxiway needs	Taxiway to enter runway at threshold. Taxiway to intersect with runway at 90-degree angle	Taxiway C does not enter Runway 8 or 12 at 90-degree angle and there are no 90-degree turns prior to entering the runway. Taxiway C does not enter either runway directly at the threshold.	Correct Taxiway C to intersect Runways 8 and 12 at 90-degree angles and directly at the threshold. Remove direct access from apron to runway by creating a 90-degree turn.
Other Taxiway Needs	Does not intersect VOR Critical Area	Intersects VOR Critical Area	Mitigated with “No Stopping in VOR Critical Area” signage
Taxilanes	Taxilane to be clearly separated from surrounding pavement	Taxilanes are clearly defined	None
Taxilanes	Taxilanes are used to access aircraft parking	No taxilanes to undeveloped areas	Create new taxilanes to access future hangar development as needed

Component	Identified Need or FAA Standard	Existing Condition	Corrective Action
Miscellaneous			
Apron Space		Sufficient for current short term and mid-term needs	Support hangar and terminal development by adding apron space as needed.
Pavement Condition/Strength	PCI ≥ 70	Pavement maintenance performed in 2021. Next pavement inspection scheduled 2024	Both Runway 12/30 and 8/26 and TWY C are aging and expect next PCI to be below 70. Need short-term mill/overlay for RWY 12/30,mill/overlay to reconstruction for RWY 8/26, and reconstruction of TWY C.
On-Airport NAVAIDs	Various	ASOS is old and prone to breakdowns	NWS should replace ASOS
Lighting			
Runway Edge Lighting	MIRL	MIRL	Replace RWY 8/26 lighting with LED lights. Update RWY 12/30 to LED lights as needed in future projects.
Taxiway Edge Lighting	MITL	MITL	Update to LED lights as needed in future projects
Runway Markings	RWY 12/30 Non-Precision RWY 8/26 Basic	RWY 12/30 Non-Precision RWY 8/26 Basic	None
Airfield Signage	Standard signage	Standard signage	None
Erosion Control and Drainage	Protect airfield	No erosion/drainage issues	None
Helipad	Helipad away from fixed-wing	Helicopters operate on apron next to fixed-wing	Develop helicopter parking area
Airspace			
Instrument Approach	RWY 12/30 – Non-Precision	RWY 12/30 – Non-Precision	None
Part 77 Surfaces	Free of obstacles or otherwise marked	There are vegetation/tree penetrations into the Part 77 Surfaces	Obstruction removal should be performed by airport staff if possible. If not, obstruction

Component	Identified Need or FAA Standard	Existing Condition	Corrective Action
			removal should be included in future near-term projects.
Landside			
Hangars	Provide hangar facilities to tenants	Insufficient hangar space available; some existing hangars in poor condition	Develop new hangars and replace existing hangars at the end of their useful life.
Lease Lots	Develop lease lots/aprons as needed	Expand as needed	None
Terminal Building	Preserve option for future public terminal	Inadequate space available and safety/security issues with existing terminal building	Develop new, larger terminal
Parking	Adequate vehicle parking	Adequate vehicle parking	Parking lot deteriorating, need to develop new lot with new terminal
Access Roads	Safe, efficient access	Safe, efficient access	Create access roads as needed for terminal and hangar development
GGW Facilities and Equipment	Adequate facilities and equipment	Snow removal equipment is old and lacks replacement parts	Obtain new snow removal equipment
Snow Storage	Adequate space	Adequate space	None
Utilities - water	Potable water	Municipal Water	None
Utilities - wastewater	Municipal sewage system	Municipal sewage	None
Utilities - telephone	Available at all lease lots	Available at all lease lots	None
Utilities - electric	Available at all lease lots; backup generation for runway lights and NAVAIDs	Available at all lease lots; backup generation for runway lights and NAVAIDs	Extend utilities as needed to future terminal and hangar developments
Fencing and Security	Secure airport perimeter fencing; adequate lighting	Perimeter fence – Access gate needs gate power and ground loop replaced	Repair gate deficiencies; Evaluate if additional powered gates are needed.

Component	Identified Need or FAA Standard	Existing Condition	Corrective Action
Fueling	Prohibit sale of 100LL by December 31, 2030	Does not offer 100LL alternate fuel	Create plan to switch to unleaded fuel by FAA deadline

4. AIRPORT DEVELOPMENT ALTERNATIVES

This chapter presents development alternatives for taxiway improvements at GGW and an evaluation of each option. Three alternatives were developed to address safety issues with the existing taxiway and potentially expand the airfield to better accommodate larger aircraft. Alternatives were developed by DOWL staff utilizing stakeholder input and public comments. Finally, alternatives were evaluated to determine the best option based on need, timing, and feasibility. Table 4-1 lists steps and describes the alternatives planning process.

Table 4-1. Alternatives Planning Process

	**Identify Development Alternatives** **Taxiway improvements**
	**Evaluate Alternatives** FAA Design Standards, Valley County Facility Needs, Environmental Constraints, Operational Efficiency, Land Use Considerations, Implementation Feasibility
	**Collaboration** FAA, Valley County, Airport Tenants and Users, City of Glasgow, and Military
	**Select Alternative to Implement** Choose the best alternative from the proposed options
	**Present the Recommended Plan** 20-year Airport Master Plan
	**Obtain FAA and Valley County Approval**

4.1 GGW ALTERNATIVES EVALUATION PROCESS

The principal screening criteria used to evaluate the development alternatives and recommended facility improvements include:

- FAA Design Standards
- GGW Facility Needs
- Operational efficiency – Improvements in operational capabilities and performance
- Environmental Considerations – Sensitivities of the natural environment (e.g., flora and fauna, historical and cultural sites)
- Land Use Considerations – Land acquisition and land use compatibility factors
- Implementation Feasibility – Constructability, phasing, affordability, and implementation factors.

The alternatives were discussed at a public meeting and during conversations with stakeholders. The meeting presentations and notes are provided in Appendix 2. This outreach process is summarized below:

- **Public Open House (August 8, 2023)** – A public meeting was held in Glasgow, Montana. The project team discussed components of an airport master plan, safety concerns at GGW, and the three proposed alternatives.
- **Email Comments** – The public was invited to submit comments via email.
- **Website** – The public had the opportunity to view information about the alternatives on the project website: https://www.dowl.com/outreach.

4.2 GGW ALTERNATIVES DEVELOPMENT

Taxiway C is the only connection between the terminal and developed apron area and Runway ends 8 and 12. Taxiway C does not meet FAA design standards. The taxiway does not intersect either runway at a 90-degree angle nor does it enter at the runway threshold. There is a lead-in taxiway that separates the blast pad from the runway threshold. Three alternatives were developed to remediate this issue and address a wide expanse of pavement at the apron-taxiway interface. Areas of safety concern are identified with red circles in Figure 4-1. The remainder of this subsection describes the three alternatives for Taxiway C.

Figure 4-1. Taxiway C Areas of Safety Concern

Alternative 1 – Relocate Existing Taxiway C

In Alternative 1, Taxiway C would exit the ramp north of the terminal to a 90-degree left turn toward Runway 8; intersect Runway 8 at a 90-degree angle, then reconnect with the existing taxiway to veer toward Runway 12 to intersect at a 90-degree angle. Figure 4-2 and Figure 4-3 depict the features for Alternative 1 (in dark pink).

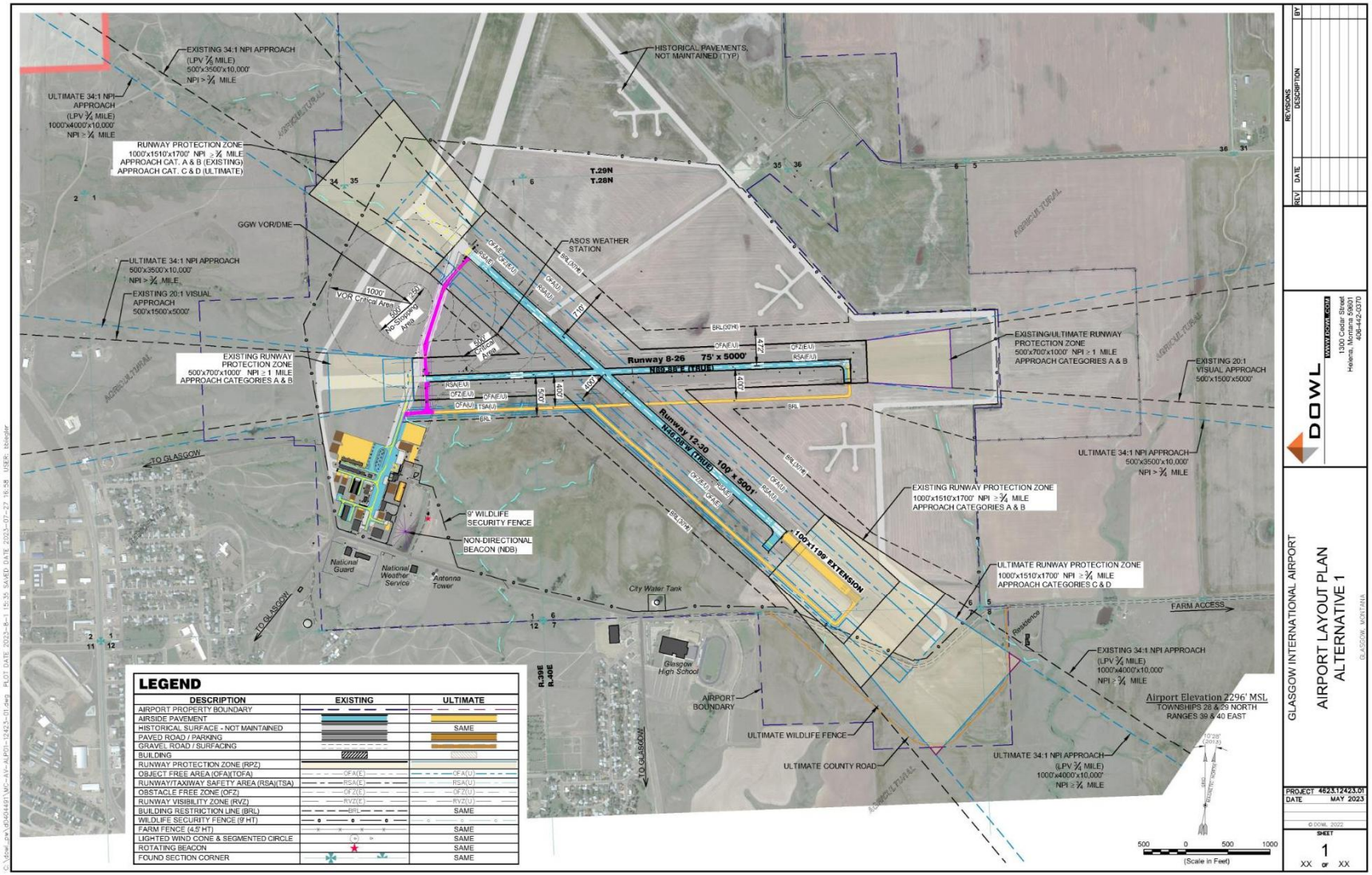


Figure 4-2. Alternative – Taxiway/Ramp Interchange

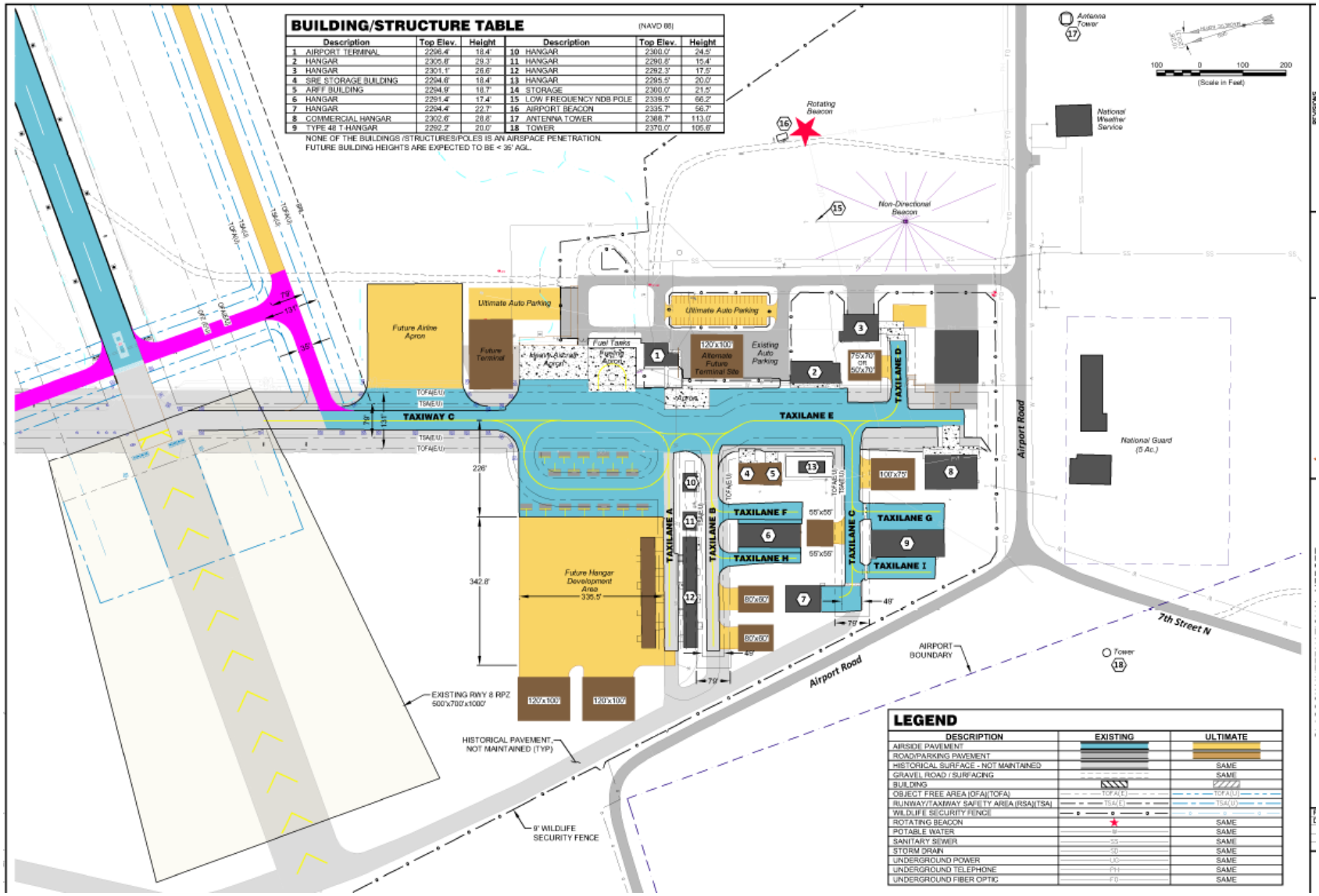


Figure 4-3. Alternative 1 Taxiway/Ramp Interchange

Alternative 2 – Develop New Taxiway to the West

Alternative 2 consists of constructing a new taxiway west of existing Taxiway C. Three entrances off the ramp would connect at 90-degree angles to the new taxiway. The new taxiway would intersect Runways 8 and 12 at 90-degree angles. Alternative 2 involves extending both runways toward the west and expanding the existing apron toward the west. Alternative 2 is depicted in Figure 4-4 and Figure 4-5 (in red).

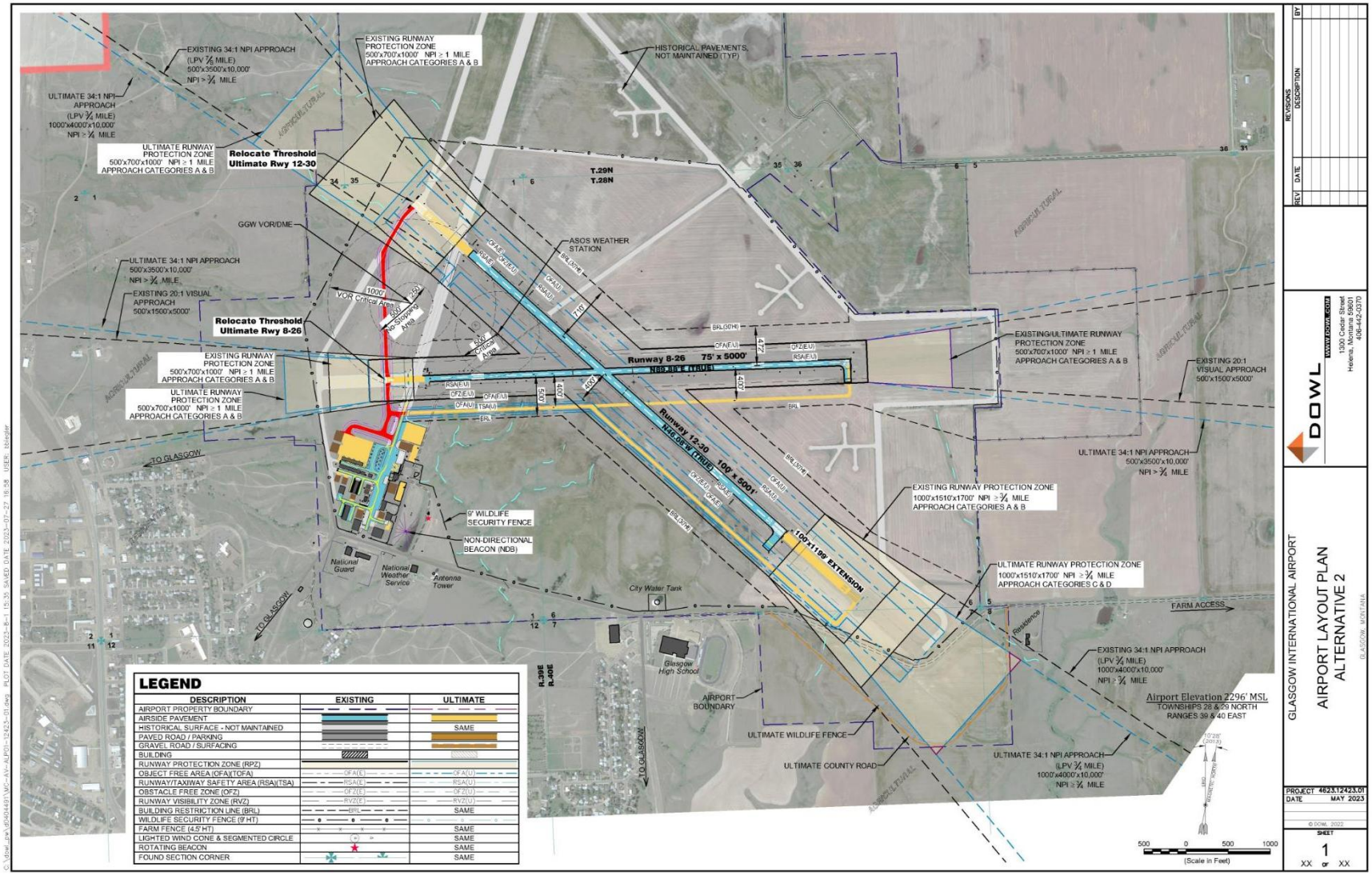


Figure 4-4. Alternative 2 – New Taxiway to the West

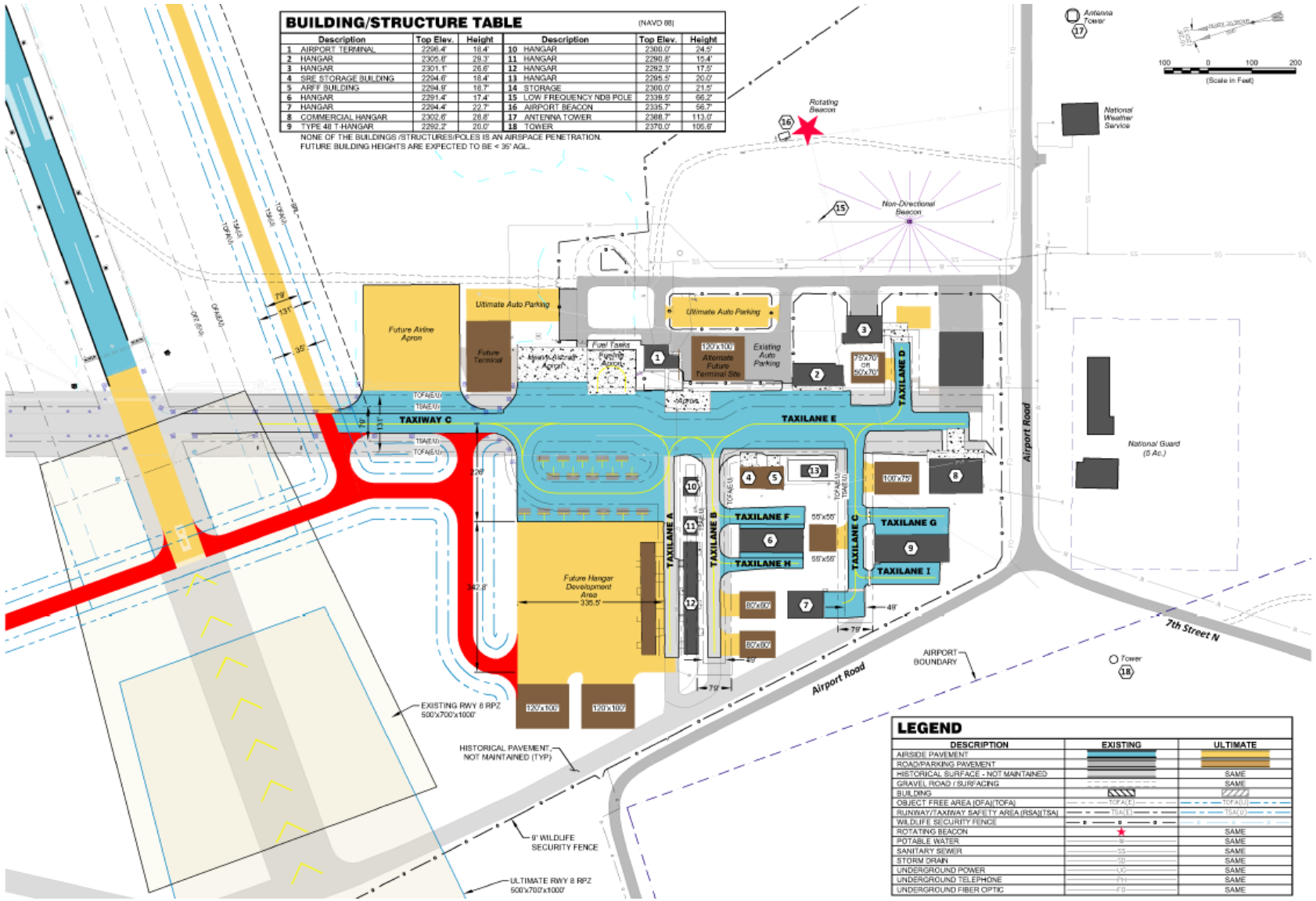


Figure 4-5. Alternative 2 – New Taxiway, Ramp/Taxiway Interchange

Alternative 3 – Relocate Taxiway C with New Entrances and Runway Extension

Alternative 3 involves constructing two new entrances off the existing ramp and reconstructing the old military taxiway to connect to Runway 8 and 12 at 90-degree angles. Alternative 3 would extend both runways to the west. Alternative 3 is depicted in Figure 4-6 and Figure 4-7 (in green).

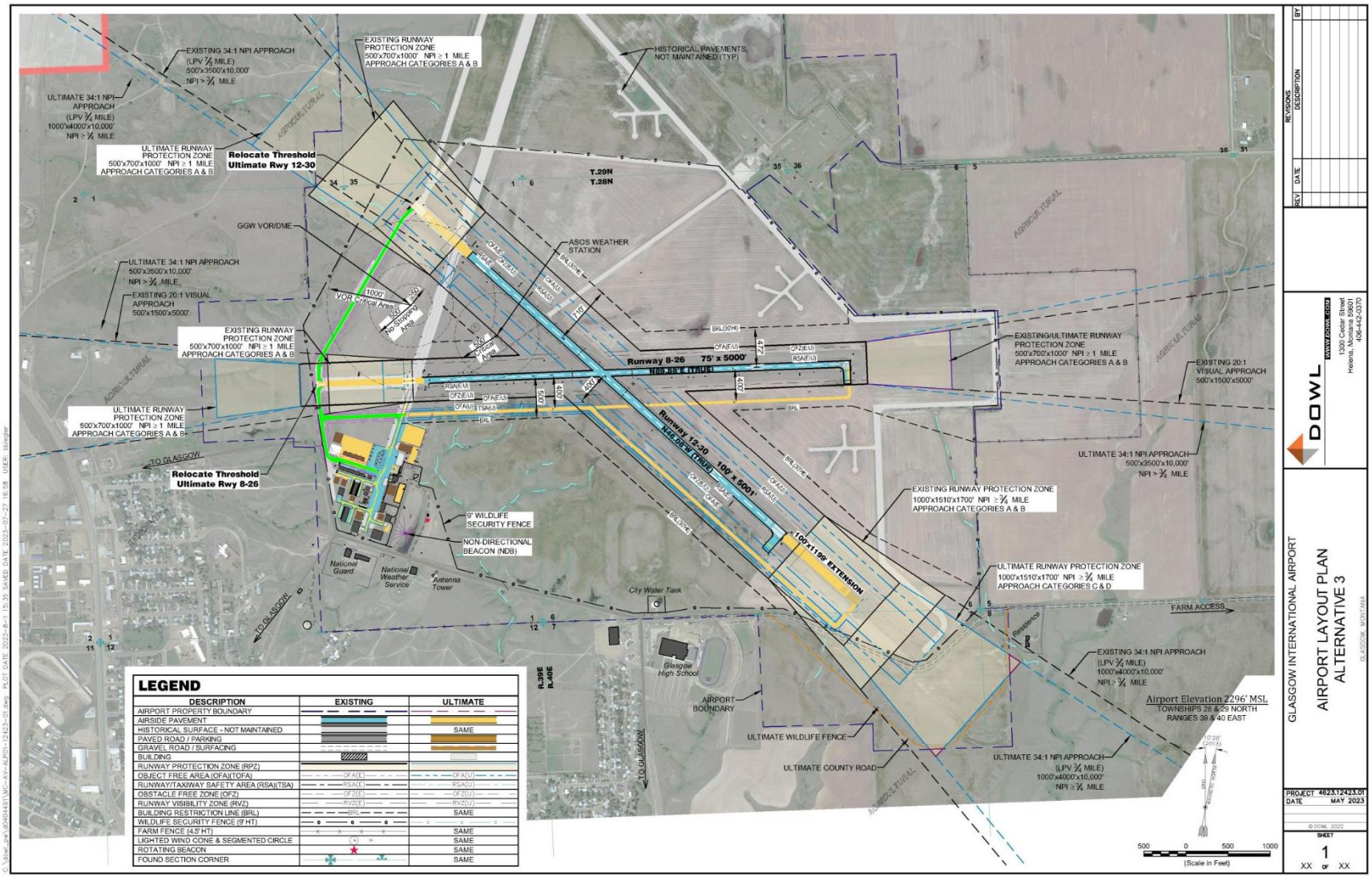


Figure 4-6. Alternative 3 – New Entrances and Runway Extensions

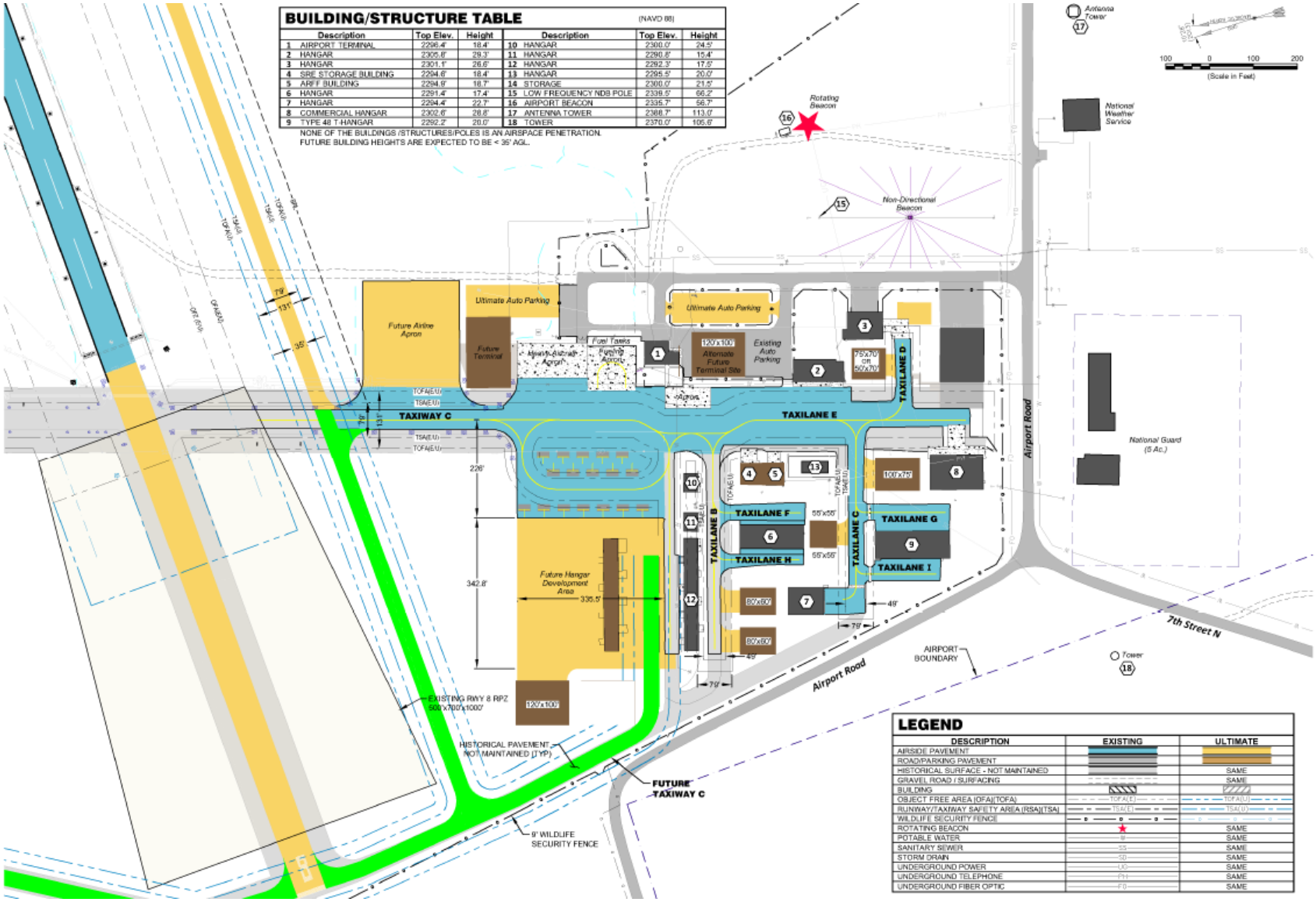


Figure 4-7. Alternative 3 – New Entrances and Runway Extensions, Ramp/Taxiway Interchange

4.2.1 Alternatives Analysis

Each alternative was analyzed to determine its benefits and disadvantages. Results of the alternatives evaluation results are provided in Table 4-2.

Table 4-2. Alternatives Analysis Results

Alternative	Benefits	Disadvantages
Alternative 1	• least expensive • smallest potential for environmental disturbances by using the existing taxiway • will upgrade the taxiway to comply with FAA standards	• intersects the VOR 250-foot critical area boundary
Alternative 2	• second least expensive alternative • will upgrade the taxiway to comply with FAA standards • does not intersect the 250-foot VOR critical area	• has the most potential for environmental disturbance • intersects the VOR 500-foot critical area boundary
Alternative 3	• avoids the VOR critical area boundary • will upgrade the taxiway to follow FAA standards • does not intersect the 500-foot VOR critical area boundary • recaptures the existing military taxiway	• most expensive alternative • a small potential for disturbance of a historical structure

4.2.2 Preferred Alternative

Based on the alternatives analysis, Alternative 1 was deemed to be the preferred alternative. Alternative 1 addresses safety issues by creating a 90-degree turn onto the taxiway and a 90-degree turn onto both Runways 8 and 12. Alternative 1 also allows for entrance onto Runways 8 and 12 directly at the threshold. Alternative 1 is the most cost-effective and efficient alternative as it uses the existing taxiway and does not add a runway extension. The existing runway length is adequate to meet the current forecasted demands. Alternative 1 would have the least environmental disturbance.

An ALP is a planning tool that depicts both existing facilities and planned development for an airport. As part of the master plan process the GGW ALP has been updated to reflect current conditions and denotes future airport needs.

5. AIRPORT LAYOUT PLAN

5.1 ALP PLAN SET

Once completed, the ALP must be approved by the FAA Airports District Office. Future projects must be on the approved ALP to be eligible for grant funding. A complete ALP plan set is provided in Appendix 1 of this master plan.

5.2 OBSTRUCTION EVALUATION

It is essential for an airport to limit Part 77 obstructions to the extent practicable. Obstructions can decrease safety margins, increasing minimums on instrument approaches, or potentially cause the FAA to nullify the approach during certain conditions. In October 2021 an aeronautical survey was conducted by Miller Creek as part of the GGW master plan process. This section describes results of the evaluation of obstructions identified during the 2021 survey.

Obstructions Identified:

Several Part 77 obstructions were identified in 2021. Table 5-1 lists the obstructions and remedies.

Table 5-1. Part 77 Obstructions Identified during 2021 Aeronautical Survey

Description	Affected Part 77 Surface	Maximum Penetration	Remedy
Lighted wind cone – approximately 500 feet SW Runway 12/30	Primary Surface	Approximately 0.3 feet	None (red obstruction light installed)
Vegetation – approximately 1,000 feet SW Runway 12/30	Primary Surface	Approximately 2.6 feet	Remove
Vegetation – approximately 1,000 feet SW Runway 12/30	Primary Surface	Approximately 1 foot	Remove
ASOS Antenna – approximately 1,300 feet W of Runways 8 and 12 intersection	Transitional Surface	Approximately 28 feet	None (red obstruction light installed)
Tree – approximately 775 ft SE Runway 26 threshold	Transitional Surface	Approximately 4.9 feet	Remove
Tree – approximately 1,200 feet SE of Runway 30 threshold	Primary Surface	Approximately 8.3 feet	Remove
Segmented Circle/wind cone – approximately 1,500 feet W of Runways 8 and 12 intersection	Transitional Surface	3 feet	None (red obstruction light installed)

Tree – approximately 700 feet NE of Runway 26 threshold	Transitional Surface	Approximately 3 feet	Remove
Tree – Approximately 550 ft NE of Runway 26 threshold	Transitional Surface	Approximately 10 feet	Remove
Tree – approximately 550 feet NE of Runway 26 threshold	Transitional Surface	Approximately 8 feet	Remove

6. AIRPORT CAPITAL IMPROVEMENT PLAN

The CIP describes projects expected during the 20-year planning period addressed by this plan. This plan provides guidance; however, implementation will be limited by available funding and adjusted to meet existing airport priorities. The CIP should be periodically reviewed to ensure the plan meets current and future needs. The CIP projects are divided into development periods as follows:

- Imminent – Projects already underway with expected completion by FY2025.
- Short-term – Projects to be completed in within the next 1 to 5 years.
- Medium-term – Projects to be completed within the next 6 to 10 years.
- Long-term – Projects to be completed within the next 11 to 20 years.

Table 6-1 provides the title, estimated cost, potential year of construction anticipated required NEPA environmental process for the CIP projects. The CIP projects are described in subsequent sections. The levels of NEPA review are described below from least to most impactful.

- NA – Not Applicable
- CATEX – Categorical Exclusion
- EA – Environmental Assessment
- EIS – Environmental Impact Statement

Table 6-1. CIP Projects Summary

Project	Title	Total Project Estimate	Year	NEPA Process
1	Relocate electrical vault	$548,327	2024	CATEX
2	Relocate Taxiway C	$250,000	2026	EA
3	Acquire snow removal equipment	$325,000	2026	CATEX
4	Repair perimeter gate deficiencies – power and ground loop replaced (may be addressed with operating budget)	$46,500	2026	N/A
5	Runway 8/26 and 10/30 runway mill and overlay design OR pavement maintenance design including LED runway lights	$540, 000	2026	CATEX
6	Relocate Taxiway C – Design	$420,000	2027	N/A
7	Runway mill and overlay OR pavement maintenance	$11,387,600	2027	CATEX

Project	Title	Total Project Estimate	Year	NEPA Process
	construction: including LED runway lights			
8	Replace ASOS – NWS	$525,000 (NWS)	2027	CATEX
9	Relocate Taxiway C – Construction	$3,123,724	2028	EA
10	New terminal and corresponding parking lot	$10,258,568	2031	EA
11	Replace snow removal equipment	$325,000	2032	CATEX
12	Build new T-Hangars	$10,151,642	2034	EA
13	Parallel Taxiway to Runway 8/26	$10,434,616	2036	EA
14	Partial Parallel Taxiway to Runway 12/30	$9,701,548	2038	EA
15	Replace aging T-Hangar	$6,851,300	2040	EA
16	Create helicopter landing area separated from fixed-wing operations	$1,877,988	2042	EA

6.1 IMMINENT DEVELOPMENT PROJECT (CURRENT)

6.1.1 Relocate Electrical Vault (Project 1)

Move the electrical vault that controls runway lighting from the terminal building to its own concrete structure. This project is currently underway.

6.2 SHORT-TERM DEVELOPMENT PROJECTS (1-5 YEARS)

6.2.1 Relocate Taxiway C – Environmental Assessment (Project 2)

Relocating Taxiway C is needed to comply with current FAA design standards and reduce the risk inherent in the current Taxiway C configuration. This project has been broken down into stages for the purpose of this CIP. The initial stage of the Relocate Taxiway C project is an EA.

6.2.2 Acquire Snow Removal Equipment (Project 3)

Current snow removal equipment fleet is aged, and repair parts are not readily available. The airport intends to purchase an Oshkosh broom with blower. This will be a replacement for current equipment.

6.2.3 Repair Perimeter Gate Deficiencies (Project 4)

The gate leading into the apron from Airport Road is aging and the powerline and ground loop sensors need to be replaced.

6.2.4 Runways 12/30 and 8/26 Mill and Overlay (Project 5 – Design)

A mill and overlay of Runway12/30 is expected to be necessary by 2026.

Runway 8/26 is in fair shape and will, at minimum, need a mill and overlay. It is more likely to need a full reconstruction. The runway lights have reached the end of their useful life and should be replaced with this project. The FAA should reconsider the eligibility of Runway 8/26 rehabilitation for grant funding due to changing wind conditions.

6.2.5 Relocate Taxiway C – Design (Project 6)

The next step after the EA for the Relocate Taxiway C Project is design. Design should include creation of the new segments of Taxiway C and rehabilitation of the paved portions of existing Taxiway C to be used in the new configuration. Also to be included are taxiway lighting and signs.

6.2.6 Runways 12/30 and 8/26 Mill and Overlay (Project 7 – Construction)

The final stage of the Runways 12/30 and 8/26 project is to construct the pavement that was designed in Project 5.

6.2.7 Replace ASOS (Project 8)

In conjunction with the NWS, the aging ASOS weather equipment will be replaced.

6.2.8 Relocate Taxiway C – Construction (Project 9)

The final stage of the Relocate Taxiway C Project is to perform the construction of the new sections of Taxiway C, rehabilitate portions of Taxiway C that will remain, and install new lighting and signs.

6.3 MEDIUM-TERM DEVELOPMENT PROJECTS (6-10 YEARS)

6.3.1 New Terminal (Project 10)

The current Glasgow Airport passenger terminal does not adequately meet airport needs and presents a security issue. The New Terminal Project would include a terminal apron ramp, extend utilities to the new location, extend Airport Road for terminal access, and provide a vehicle parking lot.

6.3.2 Acquire Additional Snow Removal Equipment (Project 11)

Due to the age of the current snow removal equipment fleet, GGW should continue to replace equipment at the end of its useful life. Project 11 will replace an additional piece of snow removal equipment (over and above Project 3).

6.4 LONG-TERM DEVELOPMENT PROJECTS (11-20 YEARS)

6.4.1 Build New Hangars (Project 12)

Construct new T-hangars to address the hangar wait list and generate revenue for the airport.

6.4.2 Parallel Taxiway to Runway 8/26 (Project 13)

Construct a parallel taxiway to Runways 8/26.

6.4.3 Partial Parallel Taxiway to Runway 12/30 (Project 14)

Construct a taxiway parallel to Runway 12/30. The taxiway would connect the Runway end 30 with the Runway 8/26 parallel taxiway.

6.4.4 Replace Existing T-Hangar (Project 15)

Replace T-Hangar that has reached the end of its useful life. In addition, more T-hangars should be built to address the hangar wait list and satisfy unmet demand.

6.4.5 Create Helicopter Landing Area (Project 16)

A designated helicopter landing area should be created to provide adequate distance from fixed-wing and rotorcraft operations.

6.5 PROJECTS BEYOND 20 YEARS

A 1,199-foot runway extension is described on the 2013 ALP. This extension is not anticipated to be needed during the 20-year planning period covered by this Master Plan. However, the runway extension will remain as a potential project should conditions warrant regular commercial jet traffic. By keeping the extension as a potential project, GGW ensures the land is available if and when the extension becomes necessary.