1. INVENTORY AND FACILITY REQUIREMENTS FINAL

The purpose of this chapter is to establish existing conditions at the Central Wisconsin Airport (CWA or the Airport) to serve as a baseline for the Terminal Area Master Plan (TAMP or the Master Plan). This chapter will also evaluate the existing facilities to determine their ability to meet forecasted activity and demand as well as Federal Aviation Administration (FAA) design standards. The forecast for TAMP can be found in **Appendix A**.

CWA completed a Master Plan in 2019 focusing on the decoupling of the runways. Existing condition information from the Master Plan is re-purposed for this chapter, as appropriate. The primary focus of TAMP will be on the buildings and aprons surrounding the terminal area; however, multiple existing features will affect future development around these areas. Existing conditions and facility needs are described in the following sections:

- Airport Background
- Federal, State, and Local Airport-Related Plans
- Airport Zoning and Land Use
- Airside Facilities
- Landside Facilities
- Commercial Service Passenger Terminal
- Support Facilities
- Inventory Summary

1.1 Airport Background

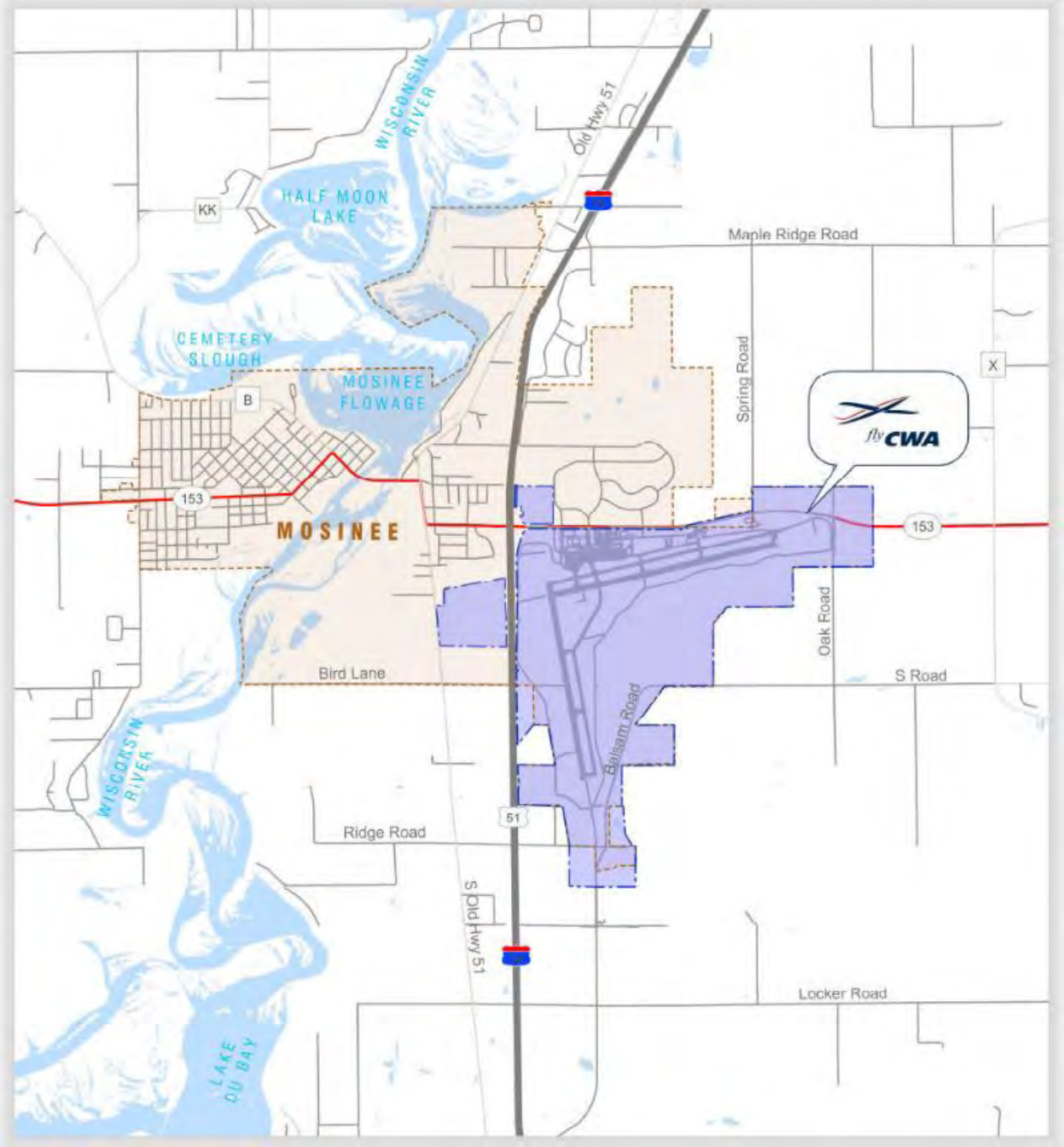
1.1.1 Airport Location and History

CWA is located in Marathon County on the east side of the City of Mosinee, approximately two miles from the city center, shown on **Figure 1-1** and **Figure 1-2**. CWA first opened in October of 1969 and, throughout the 1970s, the Airport expanded the original runway, constructed a second runway, and built several general aviation facilities. Since then, development has continued, and CWA is now home to several businesses, a fixed-base operator (FBO), and a renovated terminal area with a consolidated rental car facility. The Airport is currently served by two airlines: American Airlines serving Chicago O'Hare and Delta Air Lines serving Minneapolis. **Table 1-1** shows nearby airports that offer commercial service including approximate distances and driving times. **Figure 1-3** shows airport locations.

Figure 1-1 Airport Location Map

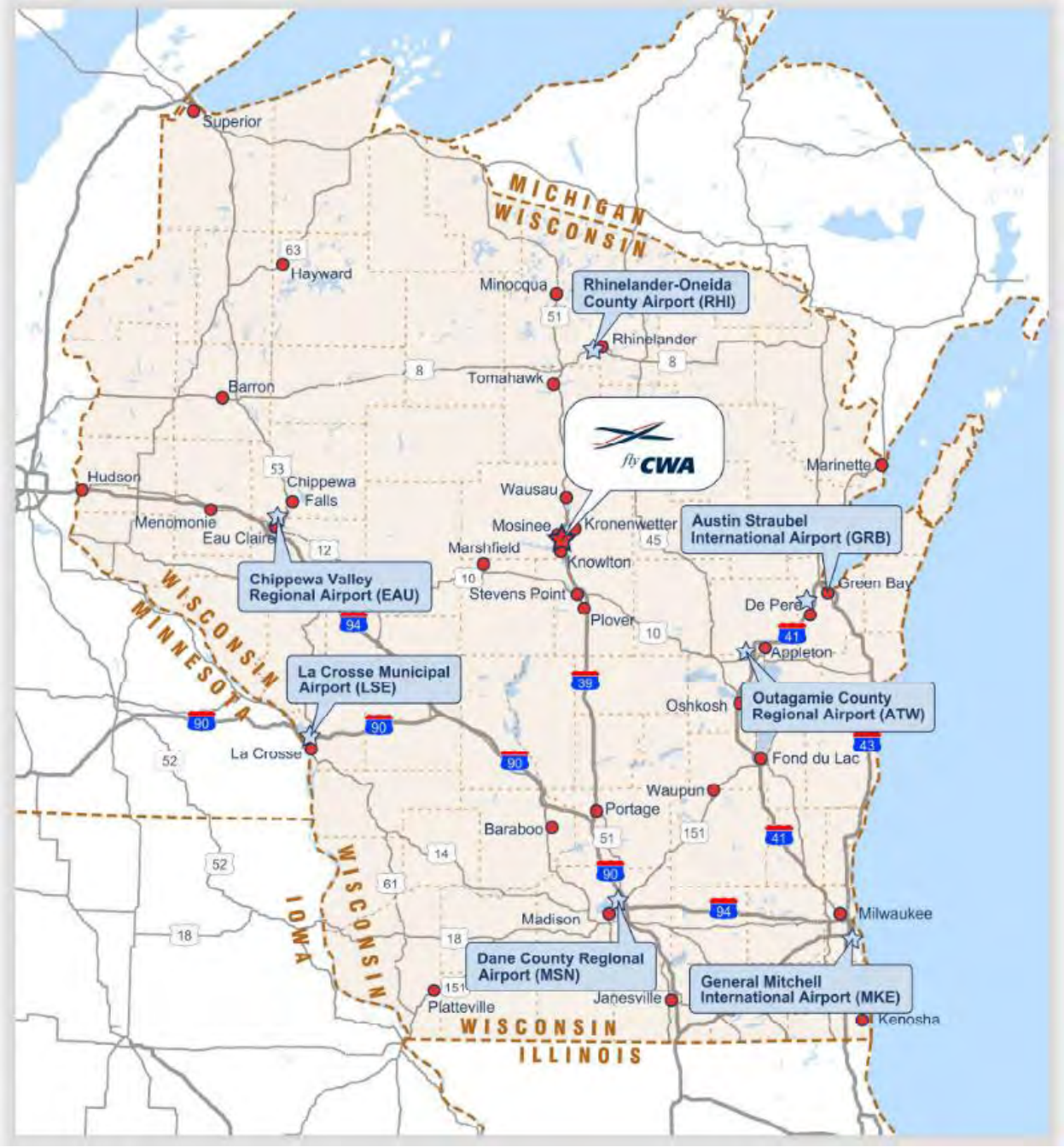
Source: ArcGIS.

Figure 1-2 Vicinity Map



Source: ArcGIS.

Figure 1-3 Nearby Airports



Source: ArcGIS.

Table 1-1 Nearby Commercial Service Airports

Airport	Distance (Miles)	Driving Time (Minutes)
General Mitchell International (MKE)	155	164
Dane County Regional (MSN)	115	111
La Crosse Regional (LSE)	101	138
Chippewa Valley Regional (EAU)	84	101
Austin Straubel International (GRB)	79	93
Appleton International (ATW)	68	82
Rhinelander/Oneida County (RHI)	60	67

1.1.2 Climate, Topography, and Natural Resources

Climate

CWA has an Automated Weather Observing System (AWOS) on the airfield that collects and reports weather data. This data includes wind information that dictates the optimum direction of aircraft arrivals and departures and orientation of runways. Prevailing winds for all weather conditions, visual meteorological conditions (VMC), and instrument meteorological conditions (IMC) were evaluated, and the wind roses shown on **Exhibit 1-1** depicts that wind primarily blows from the west and north directions matching the orientation of both existing runways.

The FAA recommends that the runways at an airport provide 95 percent wind coverage for all allowable crosswind components as dictated by the runway design code (RDC). The RDC for both runways is C-III-2400 which has an allowable maximum crosswind component of 16 knots. The wind coverage for both runways was evaluated using three crosswind components: 10.5 knots, 13 knots, and 16 knots. **Table 1-2** summarizes the wind coverage at the airport. The runways meet the recommended 95 percent collectively for all weather, VMC, and IMC under all three crosswind components.

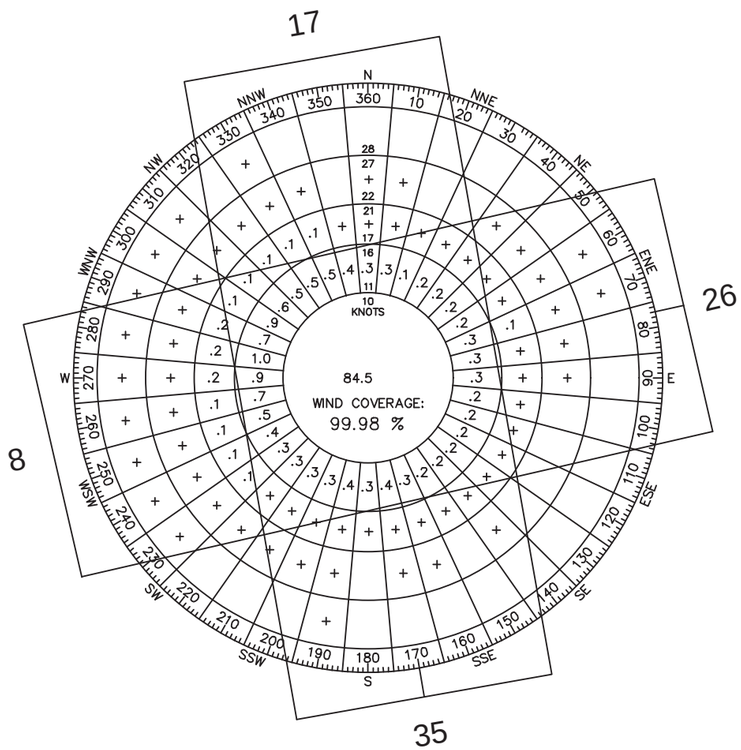
Terrain

The topography at CWA has significant grade changes throughout airport property. The terrain typically slopes downward from north to south and west to east. The field elevation at CWA is 1,277.3 feet dictated by the Runway 17 threshold elevation.

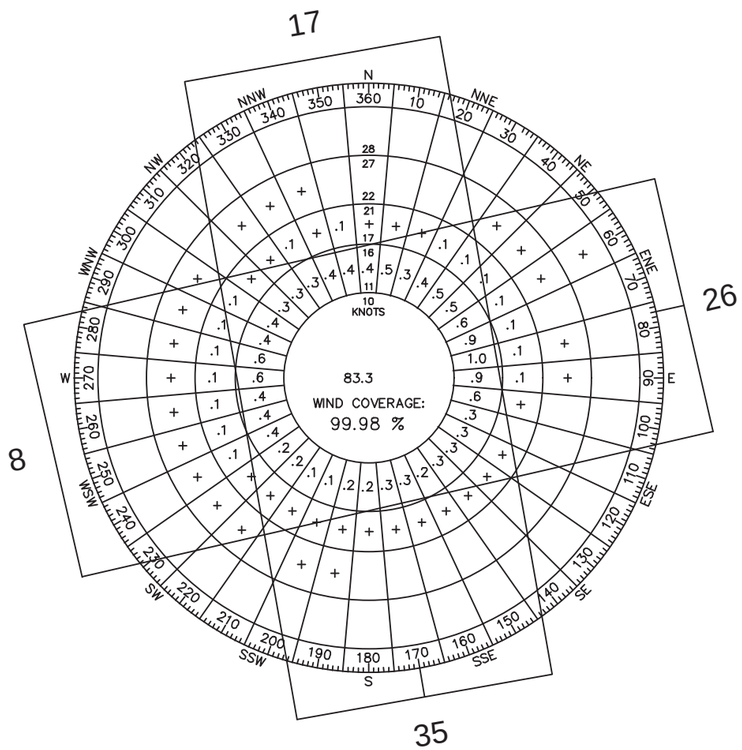
Natural Resources

Natural resources are found both in the vicinity of and within airport property of CWA. Wetlands are common throughout airport property, although most are congregated on the south and west side of the Airport. A vast number of trees are present on airport property primarily in the southeast corner.

All Weather



IFR



VFR

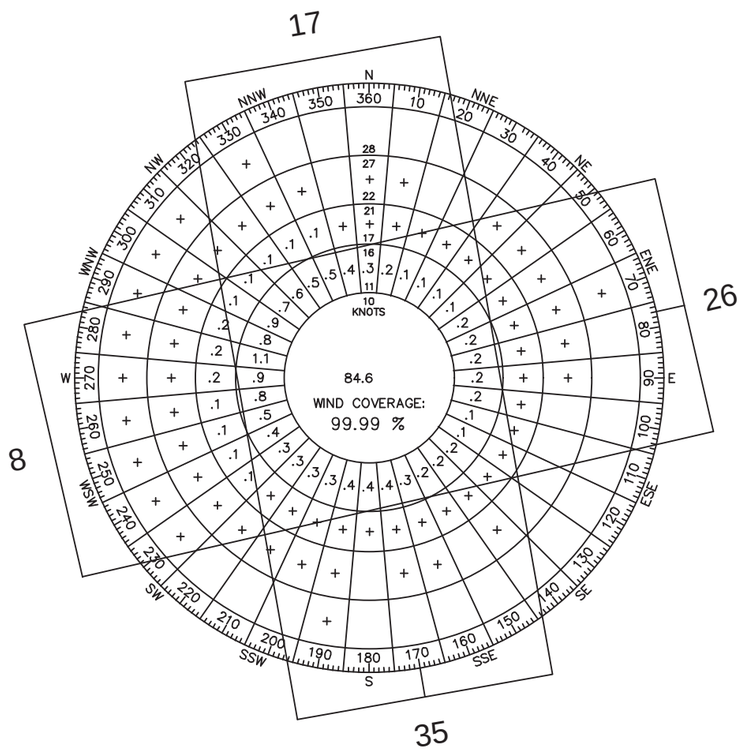


Table 1-2 Wind Coverage

Crosswind	Runway		
	8/26	17/35	Combined
All Weather			
10.5 knots	94.03%	91.93%	99.29%
13 knots	96.96%	95.42%	99.88%
16 knots	99.41%	98.68%	99.98%
IMC			
10.5 knots	94.62%	90.25%	99.28%
13 knots	97.30%	94.33%	99.86%
16 knots	99.50%	98.45%	99.98%
10.5 knots	93.92%	92.16%	99.31%
13 knots	96.90%	95.58%	99.89%
16 knots	99.40%	98.72%	99.99%

Sources: FAA Wind Rose Generator Tool.

1.1.3 Airport Management and Operations

CWA is owned by Marathon and Portage Counties and governed by a seven-member Central Wisconsin Joint Airport Board. Marathon County supplies four members, and Portage County supplies three. Chair and vice chair positions rotate between the two counties. Marathon County provides additional support through legal and human resources services. Approximately 100 people are employed on the Airport grounds including airport, airline, and tenant staff. Airport employees provide maintenance, operational, Aircraft Rescue and Firefighting (ARFF), and security services for the Airport with support from the Mosinee Police Department.

1.2 Federal, State, and Local Airport-Related Plans

Source documents that were surveyed are summarized in this section and include the following:

- National Plan of Integrated Airport Systems
- Wisconsin State Airport System Plan
- Wisconsin State Freight Plan
- Marathon County Comprehensive Plan
- Portage County Comprehensive Plan
- North Central Wisconsin Regional Planning Commission Comprehensive Economic Development Strategy

1.2.1 National Plan of Integrated Airport Systems

The National Plan of Integrated Airport Systems (NPIAS) is a FAA report issued every two years that identifies airports that are integral to the national air transportation network. An airport must meet a set of

criteria (such as based aircraft counts and locational requirements) in order to be included in the NPIAS. Airports in the NPIAS are eligible for development grants under the FAA's Airport Improvement Program (AIP). Of the 19,853 airports in the United States, 4,783 are publicly owned, and of those, only 3,247 are included in the NPIAS as of 2022.

CWA is currently listed as a Primary Commercial Service airport in the NPIAS. Primary Commercial Service airports are defined as public airports receiving scheduled passenger service and having 10,000 or more enplaned passengers per year. There are 383 airports nationwide that are considered Primary Commercial Service. CWA is also currently listed as a Nonhub airport in the NPIAS. Of the 383 nationwide Primary Commercial Service airports, 238 are considered Nonhub airports. Together, these airports account for 3% of nationwide passenger enplanements. The determination of hub status for an airport is made by dividing the number of annual enplanements at that airport by the number of nationwide annual enplanements. Based on the resulting percentage, that airport may be categorized as a Large Hub, Medium Hub, Small Hub, or Nonhub. CWA is classified as Nonhub as its annual passenger enplanements comprise less than 0.05% of all U.S. enplanements. The NPIAS indicates that Primary Nonhub Commercial Service Airports are also heavily used by general aviation aircraft.

The NPIAS provides estimated five-year costs for airport improvements, which are eligible for federal development grants under the AIP. The NPIAS lists an estimated five-year total development cost of approximately $13.7 million for CWA for federal fiscal years 2023 through 2027.

1.2.2 Wisconsin State Airport System Plan

The Wisconsin State Airport System Plan (SASP) was adopted on February 19, 2015 and provides an inventory and evaluation of the Wisconsin Airport System's 98 airports and implementation strategies to meet the goals and objectives established by the plan. The SASP is developed by of the Wisconsin Department of Transportation (DOT) Bureau of Aeronautics. The SASP classifies CWA as a commercial service airport, which is defined as an airport that supports regularly scheduled year-round commercial airline service and supports the full range of General Aviation (GA) activity to domestic and international destinations. Based on the SASP, the three counties surrounding CWA (Marathon, Portage, and Wood) were expected to grow in population between 0.6% and 1.0% per year through 2035. Passenger enplanements were anticipated to increase 0.7% at CWA from 2010 to 2030, slightly above the average of 0.5% for all commercial enplanements in Wisconsin. Excluding MKE, total enplanements in Wisconsin were projected to grow from 1.7 million in 2010 to 2.2 million in 2030. The SASP states that additional flights are often added once passenger load factors reach the 74% to 80% range but expects that enplanements will grow faster than commercial operations as airlines keep tight control on capacity increases. **Appendix A** discusses CWA's forecasted commercial operations.

1.2.3 Wisconsin State Freight Plan

Wisconsin DOT is currently updating the State Freight Plan (SFP) which was adopted on April 24, 2018. The goal of SFP is to plan, address, and implement the state's freight transportation needs over the next

eight years. According to the plan, approximately 115,042 tons of air freight was loaded onto cargo aircraft in Wisconsin in 2019, with a total value of over $12 billion. Air freight consists largely of shipments that are time-sensitive, highly specialized, high value, or bulk items. The plan states that about 77% of the State's total air cargo in 2019 was handled at MKE, while nearly all the remaining 23% was handled at MSN and ATW. Approximately 0.3% of the State's 2019 tonnage was moved through CWA. Based on US DOT T100 Data, CWA air cargo is largely directed to/from MKE and MSN, as discussed in **Section 1.4.7**.

1.2.4 Marathon County Comprehensive Plan

Marathon County is home to 41 towns, 15 villages, and 6 cities. The 2016 Marathon County Comprehensive Plan (MCCP) provides guidance to County decision makers on a wide array of issues over the next twenty years for the 135,000 residents of the County. The mission of Marathon County is as follows:

> *Marathon County government serves people by leading, coordinating and providing county, regional, and statewide initiatives. It directly, or in cooperation with other public and private partners, provides opportunities that make the Marathon County area a preferred place to live, work, visit and do business.*

The MCCP lists CWA as essential to the continued economic competitiveness of Marathon County. While the MCCP acknowledges that airports throughout the country often struggle in the current economy, the MCCP recognizes that CWA provides connectivity for both businesses and residents in Marathon County. Therefore, CWA should remain a viable provider of air transportation and continue to provide a link from the county to other markets. One of the economic development goals listed in the MCCP is to support CWA by maintaining the existing partnership between Portage and Marathon Counties.

1.2.5 Portage County Comprehensive Plan

Portage County is home to 17 towns, 6 villages, and 1 city. The 2025 Portage County Comprehensive Plan (PCCP) provides uniform policies for decision makers to guide growth throughout the communities residing in the County. The mission of Portage County is as follows:

> *It is the mission of Portage County government to enhance the quality of life for all its residents by providing fiscally responsible services that enable our citizens to build productive communities, families and lives.*

The PCCP recognizes CWA as an airport that provides quality air service to the Central Wisconsin region. The PCCP states it will endorse development and maintenance of the Airport, among other transportation services, to the necessary levels to meet needs.

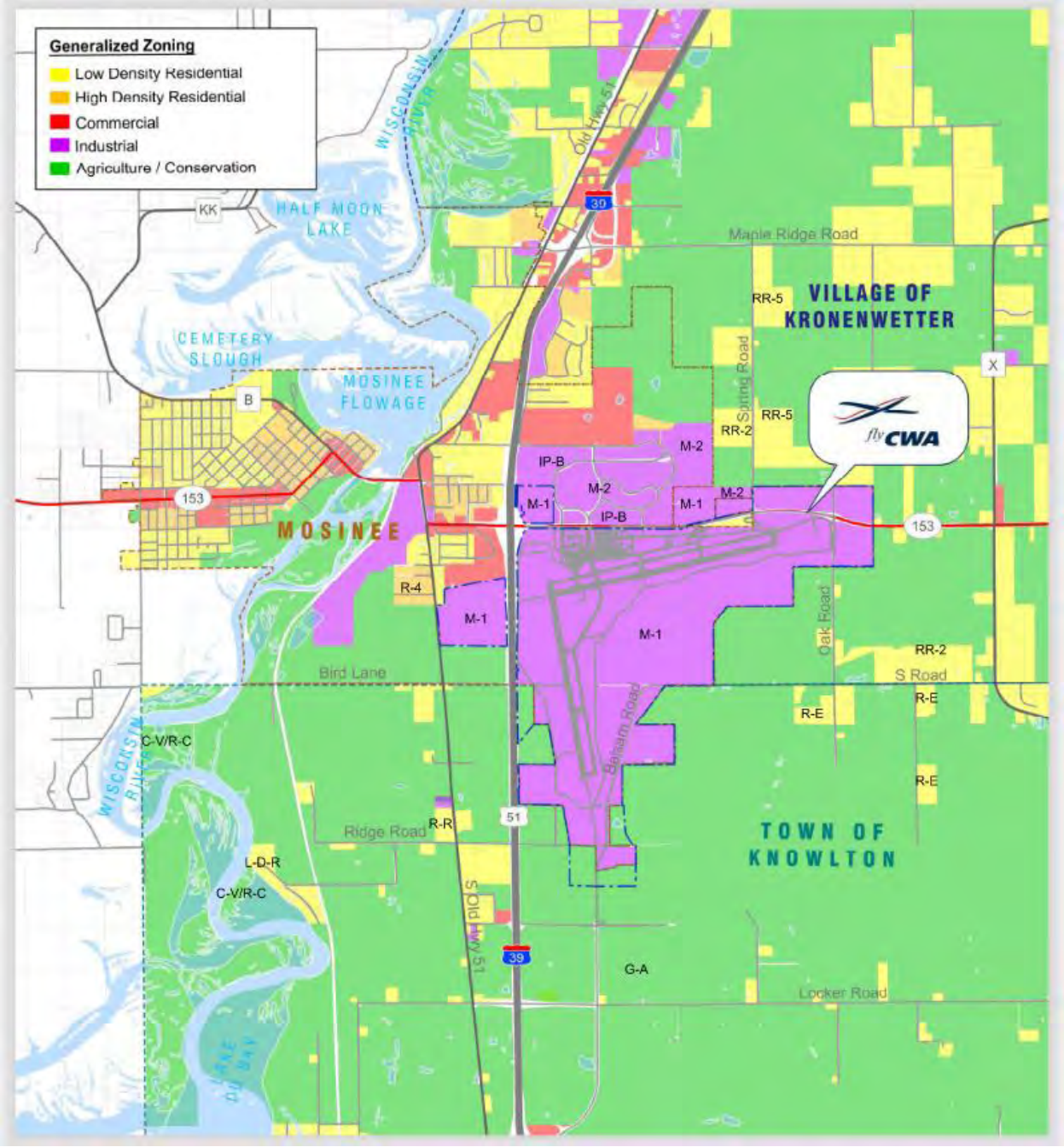
1.2.6 North Central Wisconsin Regional Planning Commission *Comprehensive Economic Development* Strategy

The North Central Wisconsin Comprehensive Economic Development Strategy (CEDS) is published by the North Central Wisconsin Regional Planning Commission (NCWRPC). The NCWRPC was created in 1973 under Wisconsin State Statute 66.0309, *Creation, Organization, Powers and Duties of Regional Planning Commissions*. The NCWRPC is designated as an Economic Development District by the US Department of Commerce and includes all of Adams, Forest, Juneau, Langlade, Lincoln, Marathon, Oneida, and Vilas Counties, and parts of Portage and Wood Counties. The CEDS is designed to provide baseline information on demographics and economic data. The NCWRPC aims to aid the development of strategies and identify potential projects within the Economic Development District. This region contains two commercial service airports, CWA and RHI. In order to meet business infrastructure needs the NCWRPC seeks to expand cargo and passenger service in the region as a whole through continued cooperation with the airports.

1.3 Airport Zoning and Land Use

CWA is located in the southeast corner of the Mosinee city limits. Due the Airport's location on the edge of the city, it is surrounded by several municipalities and associated zoning districts. This section identifies each of these districts as they pertain to the Airport. A combined zoning map of land surrounding CWA is shown in **Figure 1-4**. The City of Mosinee limits structure heights surrounding the Airport under City Ordinance Section 42-708, *Height Regulations in the Vicinity of Airports*.

Figure 1-4 Zoning Map



Source: ArcGIS.

1.3.1 City of Mosinee

The Airport is located within the City of Mosinee Zone M-1 (Limited Industrial). Zone M-1 is designed to provide an environment suitable for industrial activities that do not create appreciable nuisances or hazards, or that require a pleasant, hazard and nuisance free environment. Immediately north of the Airport on the opposite side of Highway 153 are Zones IP-B (Industrial Park Business) and M-2 (General Industrial). This area is occupied by manufacturing and various other businesses. Generally, residential areas are separated from the Airport. However, to the west of Runway 8 is Zone R-4 (General Multi-Family), but the nearest residential developments are approximately 3/4 miles from the Runway 8 threshold.

1.3.2 Town of Knowlton

The Town of Knowlton is located to the south of the Airport. Although the majority of the Town near the Airport is zoned G-A (General Agriculture), there are isolated areas of Zones R-E (Rural Estate), R-R (Rural Residential), and L-D-R (Low Density Residential). These residential areas are less than 1 mile to the southeast of the Runway 26 threshold. Despite this proximity, these homes are not located in the approach area and generally are not exposed to overflight noise and land use compatibility concerns. Surrounding Peplin Creek, approximately 5 miles to the south of the Airport, is an area categorized as Zone C-V/R-C (Conservancy & Recreation). However, this area is not associated with any Wisconsin Department of Natural Resource areas, and the distance from the Airport eliminates the likelihood of noise or wildlife impacts.

1.3.3 Village of Kronenwetter

The Village of Kronenwetter borders CWA to the northeast and east. Parcels northeast of the Airport are largely occupied by Holland Trucking Company, which is Zone M-1 (Limited Industrial) and Zone M-2 (General Industrial). Zone M-1 is intended to accommodate primarily light industrial, storage, office, and other compatible businesses and support uses. Zone M-2 is similar, though it may have significant off-site impacts such as noise, heavy traffic, or odors. The remainder of Kronenwetter adjacent to the Airport is zoned for residential or agricultural use. Zone RR-2 and RR-5 are Rural Residential and intended mainly for single-family, detached residential development on large rural lots. Additionally, sections of Zone SF (Single Family Residential) are located sporadically in isolated areas near the Airport. Generally, the area northeast of the Airport is sparsely populated.

1.3.4 Runway Protection Zones

A Runway Protection Zone (RPZ) is a trapezoidal area centered about the extended runway centerline. The RPZ serves to protect people and property on the ground, and to this end, airport ownership of this area is encouraged by the FAA. Land uses that require coordination with the FAA when an airfield project or change in the RPZ include the following:

- Buildings and structures
- Recreational land use
- Transportation facilities
- Fuel storage facilities

- Hazardous material storage
- Wastewater treatment facilities
- Above ground utility infrastructure

At CWA, several roads are within the RPZs. The Runway 26 and 17 RPZs overlap Wisconsin State Highway 153; the Runway 8 RPZ overlaps Interstate 39; and the Runway 35 RPZ overlaps several low volume rural roads to the south. The RPZ dimensions for each runway, which are determined by the RDC are shown in **Table 1-3**.

Table 1-3 RPZ Dimensions

Runway	Length (feet)	Inner Width (feet)	Outer Width (feet)
Runway 8	2,500	1,000	1,750
Runway 26	1,700	1,000	1,510
Runway 17	1,700	500	1,010
Runway 35	2,500	1,000	1,750

Source: AC 150/5300-13B.

1.4 Airside Facilities

This section discusses the various airside facilities at CWA. The FAA released the latest edition of Advisory Circular (AC) 150/5300-13B, *Airport Design*, in March of 2022. The standards in this document will serve as the design standards for this TAMP.

1.4.1 Runways and Taxiways/Taxilanes

Inventory

The airfield at CWA consists primarily of two runways and a system of supporting taxiways. The primary runway, Runway 8/26, is oriented in the east-west direction. The secondary runway, Runway 17/35, is oriented in the north-south direction. The runways and their associated navigational aids (NAVAIDs) are depicted on **Exhibit 1-2** and **Exhibit 1-3**, respectively.

Exhibit 1-2: Existing Runway 8/26 (Decoupled Runways)

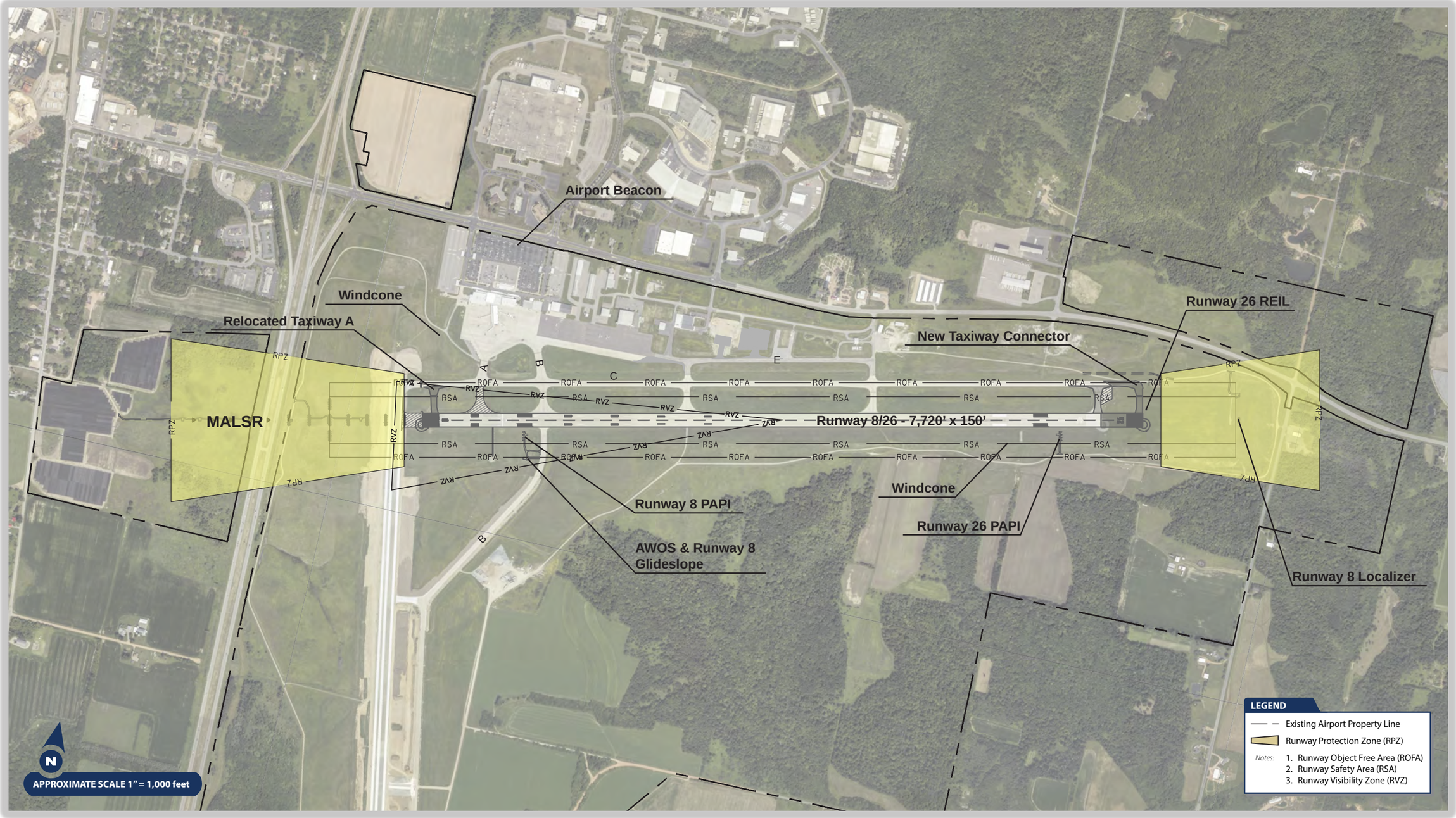
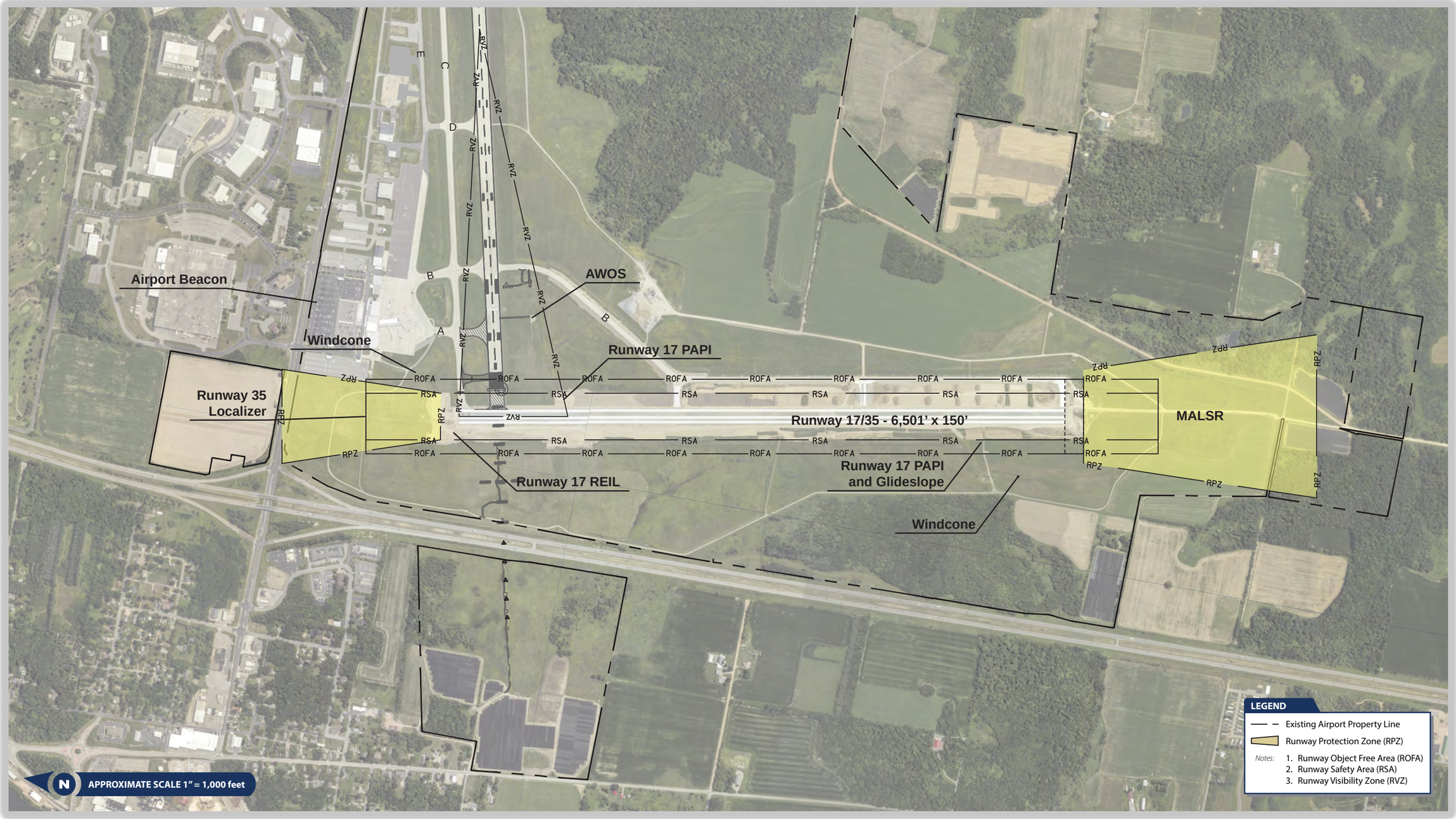


Exhibit 1-3: Existing Runway 17/35 (Decoupled Runways)



The decoupling of Runway 8/26 and Runway 17/35 was one of the primary focal points of the 2019 Master Plan. Since then, Runway 17/35 has been reconstructed and Runway 8/26, along with its associated landing aids and approach lights, is planned to shift 373 feet and extend 72 feet to the east in 2023. This shift will eliminate the existing hot spot caused by the proximity of runway thresholds due to the intersecting runways. In accordance with the previous master plan, the southern portion of Taxiway A will be shifted to serve as an entrance and exit taxiway for Runway 8. This taxiway relocation will eliminate direct access from the apron to the runway. Additionally, the runway shift and extension will require the construction of an additional entrance and exit taxiway for Runway 26. Due to the timing of the Runway 8/26 shift project and timing of this TAMP, all components of the Runway 8/26 shift will be depicted as existing conditions following the completion of this chapter.

The runways at CWA are supported by Taxiways A, B, C, and D. Taxiway A and the portion of Taxiway B north of Runway 8/26 provide access to the terminal apron. The portion of Taxiway B south of Runway 8/26 runs parallel to and supports Runway 17/35, at Taxiway Connector B1. Taxiway C is a full parallel taxiway to Runway 8/26. Taxiway D is an exit taxiway for Runway 8/26.

Taxilanes at CWA connect the apron areas to various hangars throughout the northern portion of the airfield. Taxilanes 1, 2, and 3 connect the general aviation apron to three rows of T-hangars located north of the apron. Taxilane 4 provides access to corporate hangars located east of the general aviation apron. Taxilane E provides access from the general aviation apron to the eastern portion of the airfield which includes several corporate hangars and potential future development.

Requirements

According to AC 150/5300-13B, having an apron that connects directly to a runway without forcing a pilot to make a turn on a taxiway can cause a loss of situational awareness leading to a pilot unintentionally entering a runway. The configuration of both Taxiways A and B currently provide direct access from the air carrier apron to Runway 8/26. As mentioned above, the southern portion of Taxiway A is planned to shift to the west to serve as an entrance and exit taxiway to the shifted Runway 8 threshold. This shift will eliminate the direct access issue for Taxiway A. The Alternatives Analysis chapter will consider relocating the northern portion of Taxiway B to eliminate that direct access issue.

AC 150/5300-13B states that the maximum allowable longitudinal taxiway gradient is 1.50 percent. The current gradient for both Taxiways A and B (north of Runway 8/26) is approximately 2.35 percent, exceeding the allowable slope. As mentioned in **Section 1.1.2**, there are significant grade changes throughout airport property, with one of those areas being the apron to Taxiway C. Given the proximity of Taxiway C to the apron, there is not enough distance for the taxiway connector's slope to meet FAA standards. Two possible solutions exist to eliminate this slope issue: lowering the apron or raising the elevation of Taxiway C. Both solutions would be very costly and have significant consequences. Lowering the apron's elevation requires reconstructing all the buildings as the buildings' foundations would be impacted. Raising Taxiway C's elevation requires the rest of the airfield's elevation to be raised as well since other taxiway and runway intersections will be affected by the change in elevation. Over time, it is very possible that the airfield's

elevation can be raised through pavement overlays; however, there is not a near-term solution to eliminate this non-standard condition. As mentioned above, the northern portion of Taxiway B will be relocated and as part of the Alternative Analysis, alternatives will attempt to reduce the non-standard slope however, it may not be possible at this time to eliminate the slope issue. A modification of standards (MOS) to this non-standard condition was issued in 2003; however, the MOS has exceeded its lifespan. A new MOS request will be submitted with the Airport Layout Plan (ALP).

1.4.2 Navigational Aids

Inventory

NAVAIDs assist pilots when arriving, departing, and maneuvering through an airport. CWA consists of both visual and instrument NAVAIDs. **Table 1-4** summarizes these NAVAIDs and their role at the Airport.

Table 1-4 Existing NAVAIDs Summary

NAVAID	Associated Runway(s)	Description
Subheading		
Rotating Beacon	N/A	Helps pilots locate and identify the Airport during nighttime hours, when visibility is less than 3 miles, and/or when ceilings are less than 1,000 feet.
PAPI	17, 26, 35[1]	Indicate to pilots the necessary height corrections when approaching to land on a runway.
MALSR	8, 35	Helps pilots align aircraft to runway centerline.
REIL	17, 26	Helps pilots identify runway ends during poor visibility.
Wind Indicators	N/A	Aid operations by indicating surface wind strength and direction.
Instrument		
ILS	8, 35	Helps pilots land during poor visibility. Composed of a localizer, glide slope antenna, marker beacon, and approach lights.
GPS	All	Transmits location signals to properly equipped aircraft so that location, altitude, direction of travel, and speed can be determined.

Notes: [1] A four light PAPI is planned for Runway 8 as part of the runway project..
PAPI – Precision Approach Path Indicator.
MALSR – Medium-Intensity Approach Lighting System with Runway Alignment.
REIL – Runway End Identification Light.
ILS – Instrument Landing System.
GPS – Global Positioning System.

Requirements

Airport NAVAID needs will not be evaluated by this TAMP. The Airport has a desire to relocate the airport beacon from the main parking lot. The Alternatives Chapter will identify possible locations for its relocation.

1.4.3 Aprons

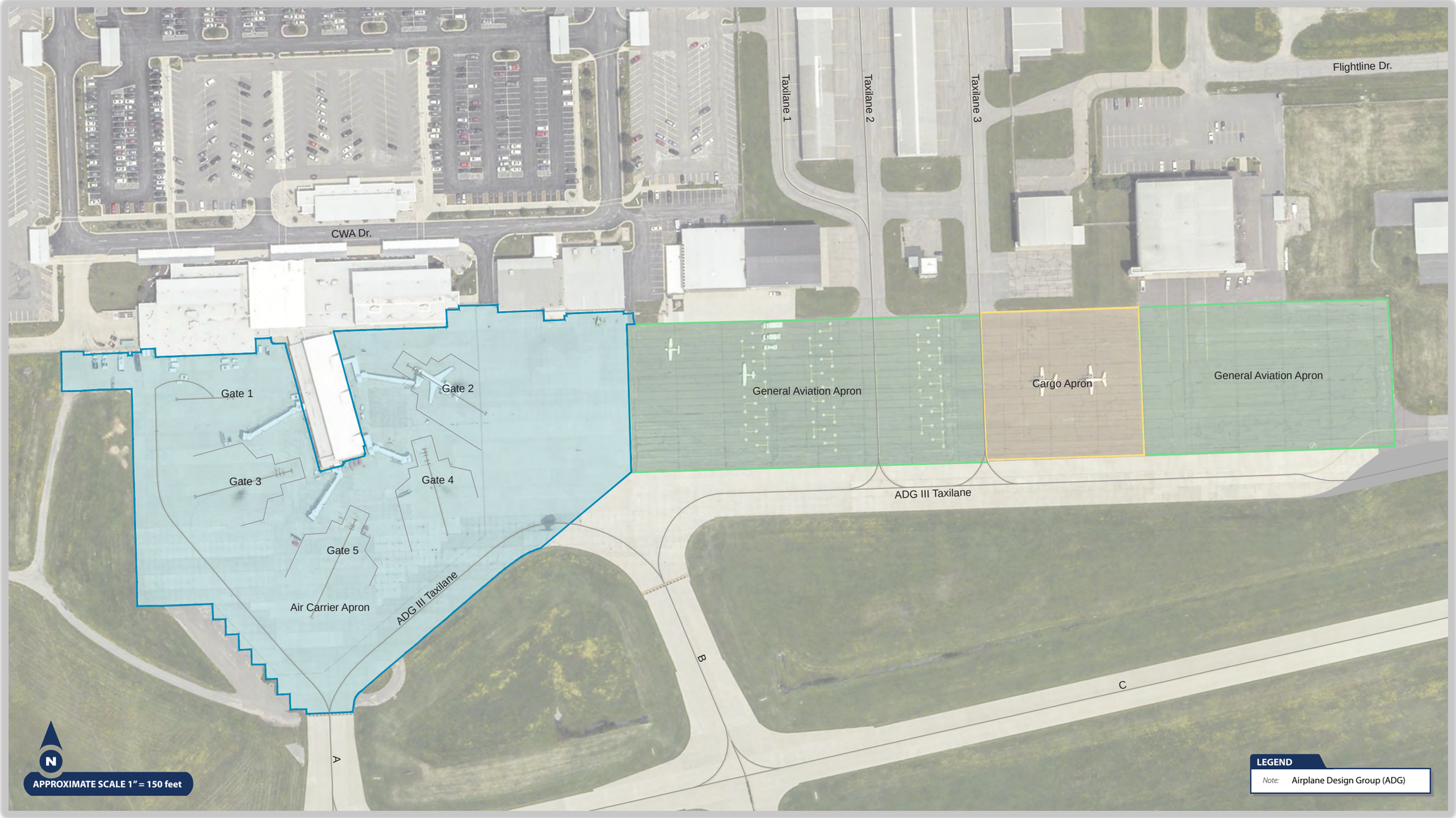
Inventory

CWA is served by one continuous apron extending across the terminal area. The western half of the apron is used by the commercial service passenger terminal and is approximately 260,000 square feet of concrete. The eastern half of the apron is used by based and transient general aviation aircraft and is approximately 300,000 square feet of asphalt. Aprons are depicted on **Exhibit 1-4**.

The air carrier apron accommodates five gates. Gate 1 is a ground-loaded gate while Gates 2 through 5 are contact gates that enplane and deplane passengers via passenger boarding bridges (PBBs). The PBBs were replaced in 2019. For safety purposes, all aircraft at CWA must be pushed back from the gates. The aircraft at the gates are serviced by ground service equipment (GSE) which are stationed behind Gate 1 and stored inside the terminal building.

The western portion of the GA apron is used by itinerant aircraft arriving to the GA terminal. It provides 27 nested tiedown positions that are primarily used by transient aircraft since most based aircraft prefer to be housed in a hangar. A pair of taxilanes, Taxilanes 2 and 3, connect the apron to the T-hangars located to the north. Taxilane 1 diverges from Taxilane 2 to access the other side of the T-hangar. The middle portion of the apron is dedicated as the cargo apron and is used by freight aircraft. The eastern portion of the apron is also used by itinerant aircraft; however, due to its pavement condition it cannot support substantial loads.

Exhibit 1-4: Existing Aprons



Air Carrier Apron Requirements

Existing Issues

The current layout of the air carrier apron has multiple issues as shown on **Exhibit 1-5**. The first issue is, when larger airplane design group (ADG) III aircraft are parked at Gates 3 and 4, their tails penetrate the taxilane object free area (OFA). This issue stems from the apron not providing enough depth to fit the length of these aircraft at Gates 3 and 4. As a result, the taxilane is then restricted to ADG II aircraft, not allowing other ADG III aircraft to circulate the apron until those aircraft move from those gates.

Another issue is that the air carrier apron supports several activities in a constrained amount of space. CWA does not have a designated deicing location, so aircraft are deiced on the air carrier apron. Due to the limited space, deicing aircraft prevent other aircraft from pushing back from the surrounding gates until deicing is complete. The eastern deicing location, shown on **Exhibit 1-5**, also interrupts activity coming from the ARFF and snow removal equipment (SRE) building, as well as GA corporate jets parked adjacent to the GA apron as discussed in more detail in below.

The third issue with the air carrier apron is that it provides limited space for GSE parking and circulation. The lack of depth at the apron does not allow GSE vehicles to maneuver around parked aircraft without entering the taxilane OFA.

Existing Air Carrier Apron Capacity

To evaluate the existing capacity of the air carrier apron, a ramp chart was created using the existing flight schedule which includes the low-cost carrier that is scheduled to begin operations in October of 2023. The air carrier ramp chart is displayed on **Table 1-5**. The ramp chart depicts the existing average day of the peak month (ADPM). The low-cost carrier schedule depicted is based on anticipated arrival and departure times, not necessarily reflecting the true schedule. Gate 3 currently serves the Delta Air Lines scheduled flights and Gate 5 serves the American Airlines scheduled flights. Gate 4 will likely serve the low-cost carrier once it begins operations. The number of gates is sufficient to support the number of flights; however, with an ADG III aircraft parked at Gate 4, the taxilane is restricted to an ADG II taxilane. This becomes an issue when there is another ADG III on the apron that is scheduled to arrive or depart while the aircraft is parked at Gate 4 as shown around 11:30 AM. During the winter months, the ADG III aircraft parked at Gate 5 scheduled to depart around 11:30 AM cannot circulate behind the ADG III parked at Gate 4, instead it must taxi to Taxiway A, then onto Taxiway C, and then onto Taxiway B to arrive at its deicing location.

Exhibit 1-5: Air Carrier Apron Existing Issues

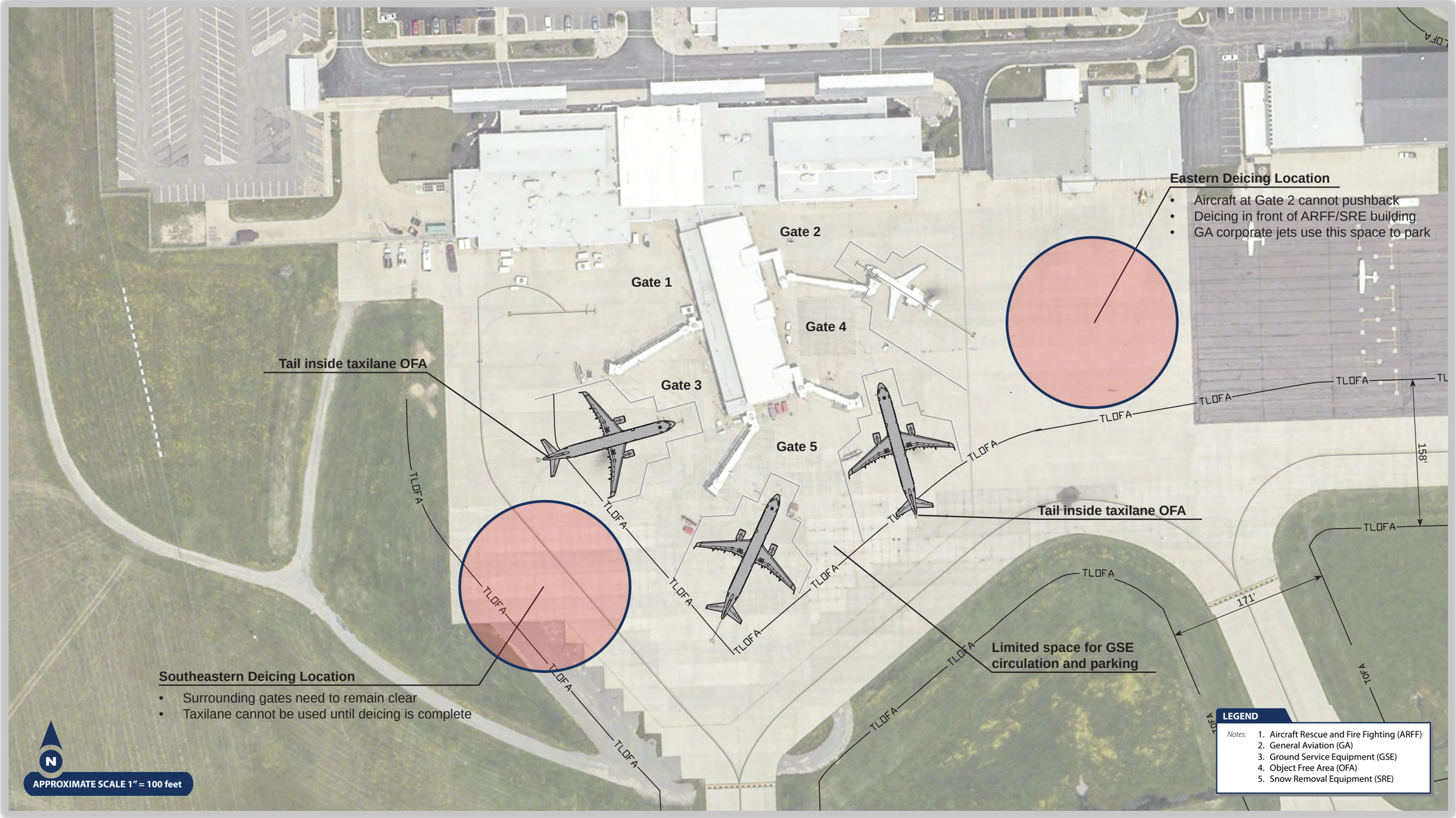
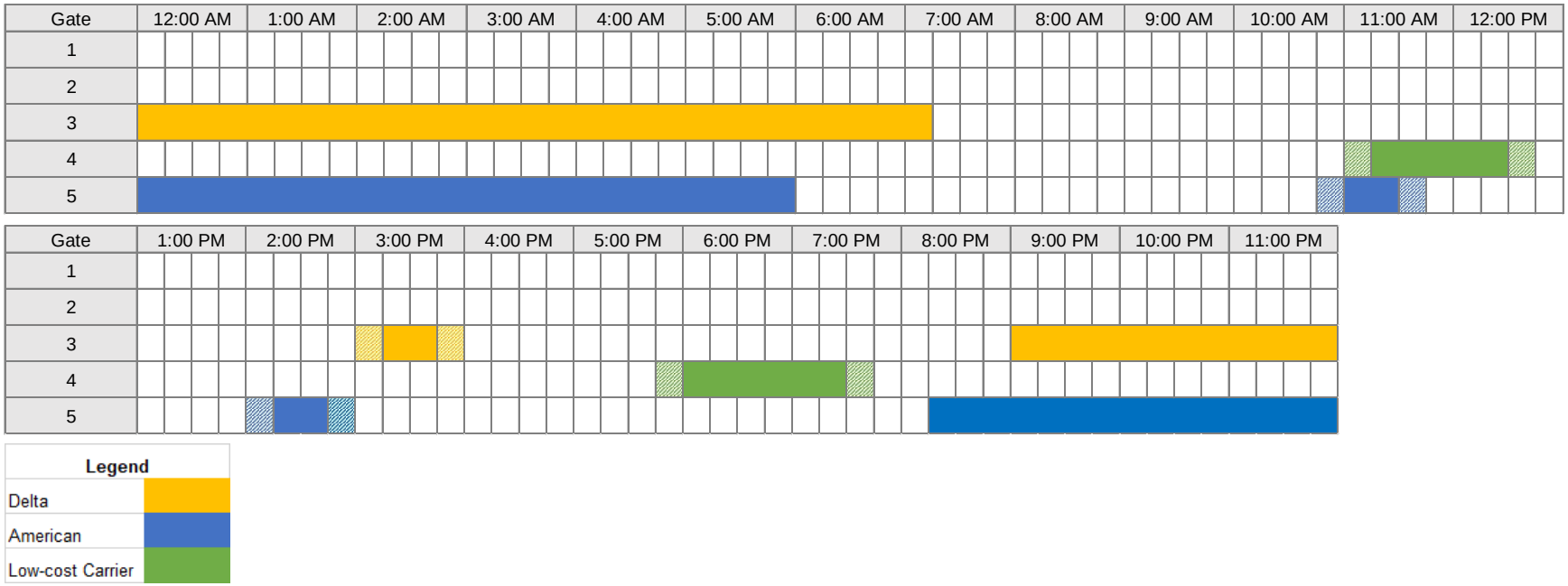


Table 1-5 Air Carrier Ramp Chart



Needs

The needs of the air carrier apron include additional apron depth and designated deicing locations (discussed in **Section 1.4.5**). The additional depth needed is dependent on ensuring all aircraft parked at the gates will remain clear of the taxilane OFA. To quantify the depth needed, the position of the longest ADG III aircraft that could be serviced at the gate was analyzed (considering the upgauging of aircraft trend in the industry). For both Gates 3 and 4, an Airbus A321 was determined to be the longest aircraft. The stop line position of the Airbus A321 on the lead-in line was measured to the taxilane OFA. That distance was compared to the length of an Airbus A321 to determine the additional depth required to ensure that aircraft tails would remain outside of the taxilane OFA AC 150/5300-13B recommends a 25-foot safety clearance surrounding a parked ADG III aircraft; therefore, 25 feet will be added to the additional required depth. **Table 1-6** summarizes the needs of air carrier apron using existing lead-in lines; however, lead-in lines may be reoriented during the Alternatives Analysis chapter which may affect the required depth.

Table 1-6 RPZ Dimensions

Gate	Length (feet)	Required Length (feet)
3	119	146
4	116	146
5	163	146
	Minimum Recommended Shift	146 – 116 + 25 = 55

General Aviation Apron Requirements

Existing Issues

Existing issues with the general aviation are discussed below.

- As discussed above, the entire general aviation apron is paved with asphalt. Larger corporate jets such as Gulfstream G550s and Bombardier Global Express aircraft that arrive at the Airport are too heavy to park on asphalt. Therefore, these corporate jets typically park on the concrete in front of the ARFF and SRE building. When these aircraft park on the concrete, operations staff must maneuver equipment around the parked aircraft. At times, when equipment is parked in front of the building, the corporate jets are forced to park on the asphalt, deteriorating the pavement since it is not designed to accommodate those loads. See **Image 1-1** through **Image 1-4** for examples.
- The apron is only approximately 210 feet deep. Although the depth is not an issue for ADG I aircraft, CWA currently must accommodate several ADG II and ADG III aircraft simultaneously. However, the apron can only accommodate two to three ADG II aircraft side-by-side, depending on the given wingspan. **Table 1-7** summarizes the number of aircraft that can park side-by-side depending on the aircraft group. See **Image 1-5** for an example.

Table 1-7 GA Apron Number of Aircraft Parked Side-by-Side Based on Wingspan

ADG	Wingspan Range	Minimum Wingtip Clearance	Number of Aircraft (Low Range Wingspan)	Number of Aircraft (High Range Wingspan)
I	< 49’	10’	N/A	3
II	49’ < x < 79’	10’	3	2
III	79’ < x < 118’	25’	2	1

- The FBO often needs to move parked aircraft so other aircraft can get in and out of hangars. This issue results from the apron not providing enough space for aircraft to park in areas that do not interrupt other activities on or around the apron. See **Image 1-6** for an example.
- Fuel trucks are parked on the apron near aircraft. The fuel trucks park over tie-down positions reducing available space for aircraft parking. They also introduce the possibility of an incident occurring because of the limited space to maneuver aircraft on the apron. See **Images 1-2** and **1-3** for examples.
- Taxilane OFAs account for a large portion of the apron. A portion of the apron is inside the Taxilane E OFA. Although not marked as taxilanes, the areas in front of the eastern transient hangar and the aircraft maintenance hangar should be reserved as taxilane OFAs so that aircraft do not need to be moved to get other aircraft in and out of those hangars.
- The cargo apron is in the middle of the GA apron interrupting aircraft flow and taking up space that could otherwise be used for GA aircraft parking. With the limited space on the apron, this location would ideally be used for GA aircraft rather than cargo aircraft.
- As discussed in more detail in **Section 1.4.4**, the asphalt on the GA apron is in poor condition and cannot accommodate substantial loads.
- The aircraft maintenance hangar located northeast of the cargo apron will require a large hardstand for CRJ-900 aircraft soon and there is currently no space on the apron to accommodate one.

The apron appears to be designed for ADG I aircraft with the ability to accommodate a small number of larger GA aircraft. However, the Airport currently must accommodate ADG II and ADG III aircraft and is struggling to find space to park these larger aircraft in areas that does not interrupt other activity on or around the apron. **Exhibit 1-6** illustrates the areas in which aircraft can park without interrupting other activity. Compared to the 300,000 square feet of apron, only approximately 96,350 square feet remains available for parking. **Exhibit 1-6** also shows that the apron does not provide an area to park an ADG III aircraft without interrupting other activity. The areas surrounding the one existing ADG III taxilane do not allow an ADG III aircraft to park there (the area west of the ADG III taxilane is the cargo apron and the area east of the taxilane does not provide enough width to fit the length of an ADG III aircraft). In order to accommodate an ADG III aircraft Taxilane 2 would need to bump up to an ADG III taxilane requiring more space for the OFA and reducing the total available parking space from 96,350 square feet to 86,850 square feet. Since an ADG III aircraft is included in the forecast, 86,850 square feet will be used as the total available parking space in the tables below.

Image 1-1 Corporate Jet Parked on Concrete Apron

For orientation, this image was photographed from the passenger terminal and is facing east. This image depicts a corporate jet parked on the concrete in front of the ARFF/SRE building interrupting activity coming in and out of the building. As mentioned above, larger corporate jets are too heavy to park on asphalt; therefore, parking this aircraft on the asphalt will deteriorate the pavement.

Image 1-2 Corporate Jet Parked on Asphalt Apron

For orientation, this image was photographed from the passenger terminal and is facing east. This image captures a time where SRE vehicles are parked in front of the ARFF/SRE building forcing corporate jets to park on the asphalt apron. The pavement was not designed to support these loads which can lead to pavement structure issues.

Image 1-3 Corporate Jet Parked on Asphalt Apron

For orientation, this image was photographed from the passenger terminal and is facing east. Similar to Image 1-2, this image captures a different day where SRE vehicles parked in front of the ARFF/SRE building and a corporate jet can be seen parked on the asphalt behind the SRE vehicles.

Image 1-4 Corporate Jet Parked on Asphalt Apron

For orientation, this image was photographed from the passenger terminal and is facing east. This image captures a corporate jet parked on the asphalt. A corporate jet of that size typically parks on the concrete adjacent to the GA apron; however, given that there is liquid on the concrete, it appears as if some other vehicle or equipment was using that space prior to the corporate jet arriving to the apron. That is likely the reason the jet is parked on the asphalt rather than the concrete.

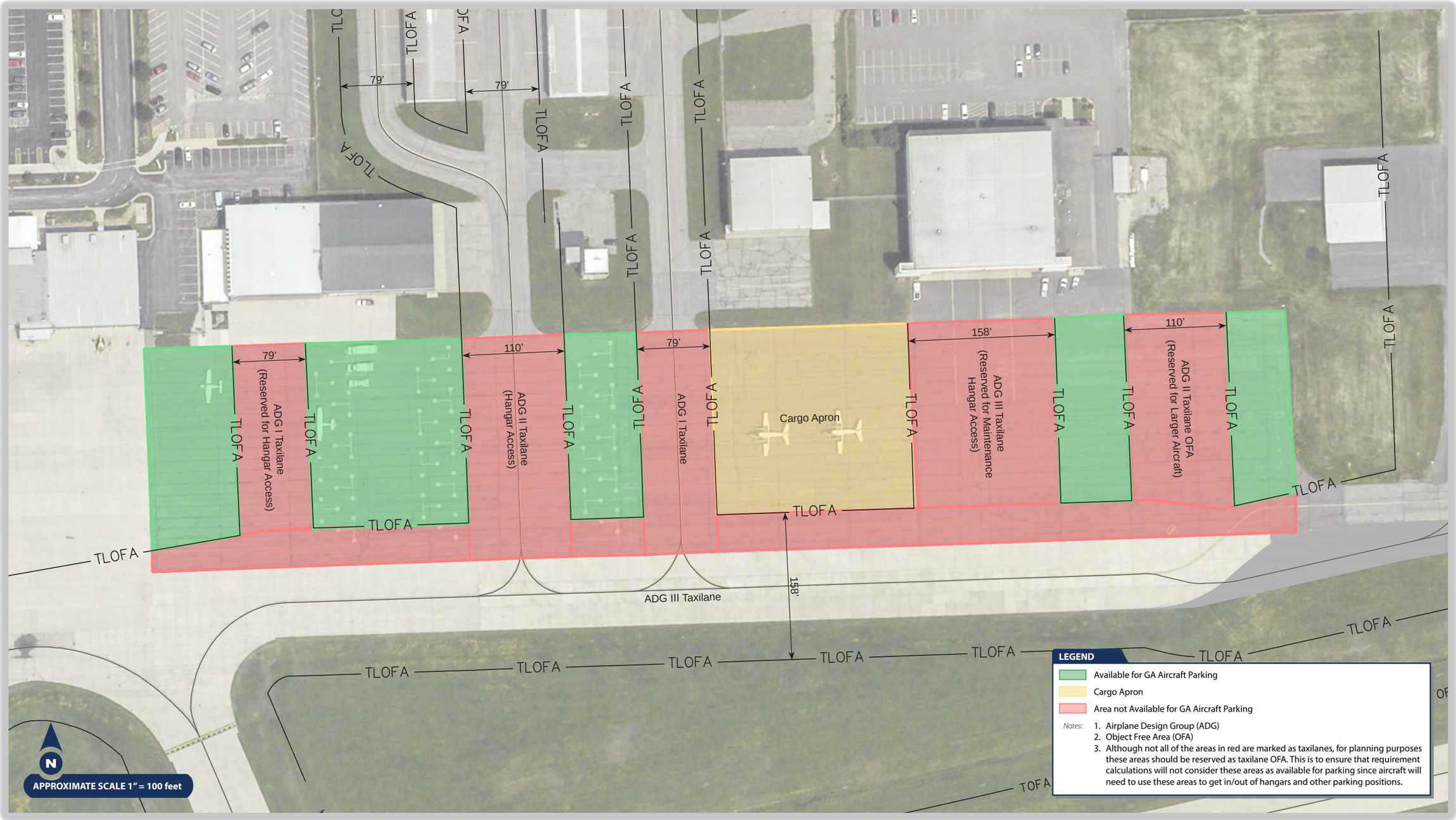
Image 1-5 Jets Parked Side by Side

For orientation, this image was photographed from the passenger terminal and is facing east. This image captures that with FAA recommended wingtip separations and safety clearances surrounding parked aircraft, no more than two jets can park side by side because the apron depth does not provide enough space. The depth of the apron limits the total number of jets that can be parked on there at a given time.

Image 1-6 Jets Parked in Front of FBO Hangar

For orientation, this image was photographed from the passenger terminal and is facing east. This image captures the issue of aircraft parking in a space that interrupts other activity. These jets are parked in front of the west transient hangar. At least two of these aircraft would need to be moved if an aircraft needed to get in or out of the hangar.

Exhibit 1-6: Existing General Aviation Apron Available Parking Areas



Existing GA Apron Capacity Evaluation

To evaluate the capacity of the existing GA apron, five years of data was obtained from FlightRadar24. The data consisted of only the summer months (June through August) between 2018 through 2022. Only the summer months were considered because the Forecast, provided in **Appendix A**, determined that August was the busiest month for GA activity but all three summer months were considered in case of any fluctuations. This relative information that the data set provided includes the days and times aircraft arrive and depart, aircraft types, and operation types. The data was analyzed and organized into **Tables 1-8, 1-9, and 1-10** before that data was used to create a ramp chart to depict the capacity and demand during the average day of the peak month.

The first step in evaluating the data, was to identify the total aircraft at the Airport during the ADPM which is summarized in **Table 1-8**. This table provides user type, ADG classification, number of aircraft, and the representative aircraft type. A total of 17 aircraft are expected to park on the apron throughout the ADPM. The data shows a total of eight ADG I aircraft, eight ADG II aircraft, and one ADG III aircraft at CWA during the ADPM. The eight ADG II aircraft include four cargo aircraft.

Table 1-8 ADPM Aircraft Types

User Type	ADG	Aircraft	Representative Aircraft
Air Taxi/Military	III	1	Gulfstream G6650
	II	2	Citation Latitude
Cargo	II	4	Cessna 208
General Aviation	II	2	Citation Latitude
	I	8	Cirrus SR22
Total Aircraft		**17**	

Source: Mead & Hunt Analysis of FlightRadar24 data.

The next step was to take the 17 aircraft from the ADPM and estimate the general timeframe of each operation's arrival and departure. This data is summarized in **Table 1-9**. GA operations are constant throughout the day, with aircraft arriving and departing regularly from 6:00 AM to 9:00 PM, with one GA operation remaining overnight. Cargo operations typically arrive early in the morning and depart in the evening. Air Taxi/Military operations typically arrive and depart in the afternoon with one early morning arrival and one operation that remains overnight. The majority of operations occur in the early morning and afternoon.

Table 1-9 ADPM Arrivals and Departures

Time Period	General Aviation		Cargo		Air Taxi/Military		Total
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	
6am-9am	2	1	4	0	1	0	**8**
9am-12pm	2	2	0	0	0	0	**4**
12pm-3pm	2	2	0	0	2	2	**8**
3pm-6pm	2	3	0	0	0	1	**6**
6pm-9pm	1	2	0	4	0	0	**7**
9pm-6am	1	0	0	0	0	0	**1**
Total	**10**	**10**	**4**	**4**	**3**	**3**	**34**

Source: Mead & Hunt Analysis of FlightRadar24 data.

The third step was to depict each of the 17 aircraft's activity which is summarized in **Table 1-10**. This table illustrates when each aircraft on the ADPM arrives at the airport, how long it is parked at the airport, and when it departs from the airport. This table shows that the apron is busiest during the afternoon between 12:00 PM through 3:00 PM. This table also depicts that ADG I arrive at the airport consistently throughout the day and are parking on the apron for a short period of time. As mentioned above, cargo aircraft arrive in the morning, sit on the apron throughout the day, and depart in the evening. ADG II aircraft tend arrive in the mornings or early afternoons and tend to park on the aircraft for a few hours before departing in the late afternoon or evening. ADG III aircraft tend to arrive in the afternoon, park on the apron for a few hours, and then depart in the late afternoon.

Table 1-10 GA Apron Activity Chart

Operation	ADG	6am-9am	9am-12pm	12pm-3pm	3pm-6pm	6pm-9pm	9pm-6am
Air Taxi/Military 1	III			Arrive	Depart		
Air Taxi/Military 2	II	Arrive	Parked	Depart			
Air Taxi/Military 3	II			Arrive	Parked	Depart	
Cargo 1	II	Arrive	Parked	Parked	Parked	Depart	
Cargo 2	II	Arrive	Parked	Parked	Parked	Depart	
Cargo 3	II	Arrive	Parked	Parked	Parked	Depart	
Cargo 4	II	Arrive	Parked	Parked	Parked	Depart	
General Aviation 1	II		Arrive	Parked	Depart		
General Aviation 2	II	Arrive	Parked	Parked	Parked	Depart	
General Aviation 3	I	Arrive	Depart				
General Aviation 4	I		Arrive	Depart			
General Aviation 5	I		Arrive	Depart			
General Aviation 6	I			Arrive	Depart		
General Aviation 7	I			Arrive	Depart		
General Aviation 8	I				Arrive	Depart	
General Aviation 9	I	Depart				Arrive	Parked
General Aviation 10	I	Parked	Depart				Arrive
Total Aircraft on Ground	I	3	4	4	3	2	2
	II	6	7	8	7	6	0
	II	0	0	1	1	0	0
	-	**9**	**11**	**13**	**11**	**8**	**2**

Source: Mead & Hunt Analysis of FlightRadar24 data.

The fourth step was to determine the number of GA and cargo parking positions available on the apron. Since GA parking positions (other than tie downs) are not marked on the GA apron, GA parking positions are based on ADG I aircraft. **Table 1-11** calculates that a total of four ADG I aircraft can park side-by-side given the depth of the GA apron (210 feet). There are four areas on the GA apron where five ADG I aircraft can park side-by-side equating to a total of 20 parking positions for ADG I aircraft (reference **Exhibit 1-6** for the four areas of available parking for GA aircraft). **Table 1-11** also calculated the number of parking positions ADG II and ADG III aircraft would occupy. The cargo apron can accommodate a total of four ADG II cargo aircraft parking positions.

Table 1-11 GA Apron Number of Aircraft Parked Side-by-Side Based on Wingspan

ADG	Representative Aircraft Wingspan	Minimum Wingtip Clearance	Number of Aircraft Parked Side-by-Side	How many ADG I aircraft positions will larger aircraft occupy?
I	38’	10’	4	-
II	72’	10’	3	= (72’+10’)/(38’+10’) = 1.7 aircraft
III	94’	25’	2	= (94’+25’)/(38’+10’) = 2.5 aircraft
Cargo	52’	10’	3	= (52’+10’)/(38’+10’) = 1.3 aircraft

Source: Mead & Hunt Analysis of FlightRadar24 data.

The final step was to take the information from each table and create a ramp chart that illustrates where aircraft park throughout the day. The ramp chart is displayed on **Table 1-12**. The ramp chart shows that the existing apron is at capacity for jets during the peak period; however, there are four smaller GA aircraft parking positions available.

Table 1-12 GA Apron Ramp Chart

Location	Position	6am-9am	9am-12pm	12pm-3pm	3pm-6pm	6pm-9pm	9pm-6am
West (two areas with unmarked taxilane between)	GA 1	GA 1					
	GA 2	General Aviation 3					
	GA 3	General Aviation 10					GA 10
	GA 4		General Aviation 4				
	GA 5			Air Taxi/Military 1			
	GA 6						
	GA 7			Reserved for WTC			
	GA 8	GA 9				General Aviation 9	
In front of ATCT (only fits ADG I)	GA 9				General Aviation 8		
	GA 10		General Aviation 5				
	GA 11			General Aviation 6			
	GA 12			General Aviation 7			
Cargo	Cargo 1	Cargo 1					
	Cargo 2	Cargo 2					
	Cargo 3	Cargo 3					
	Cargo 4	Cargo 4					
East (two areas with unmarked taxilane between)	GA 13	General Aviation 2					
	GA 14						
	GA 15	Reserved for WTC					
	GA 16	Air Taxi/Military 2					
	GA 17		General Aviation 1				
	GA 18						
	GA 19		Reserved for WTC				
	GA 20			General Aviation 2			

Source: Mead & Hunt Analysis of FlightRadar24 data.

Notes: WTC – Wingtip clearance.
The ramp chart avoids parking small aircraft near larger aircraft because the FAA recommends that aircraft park next to similarly sized aircraft.

Needs

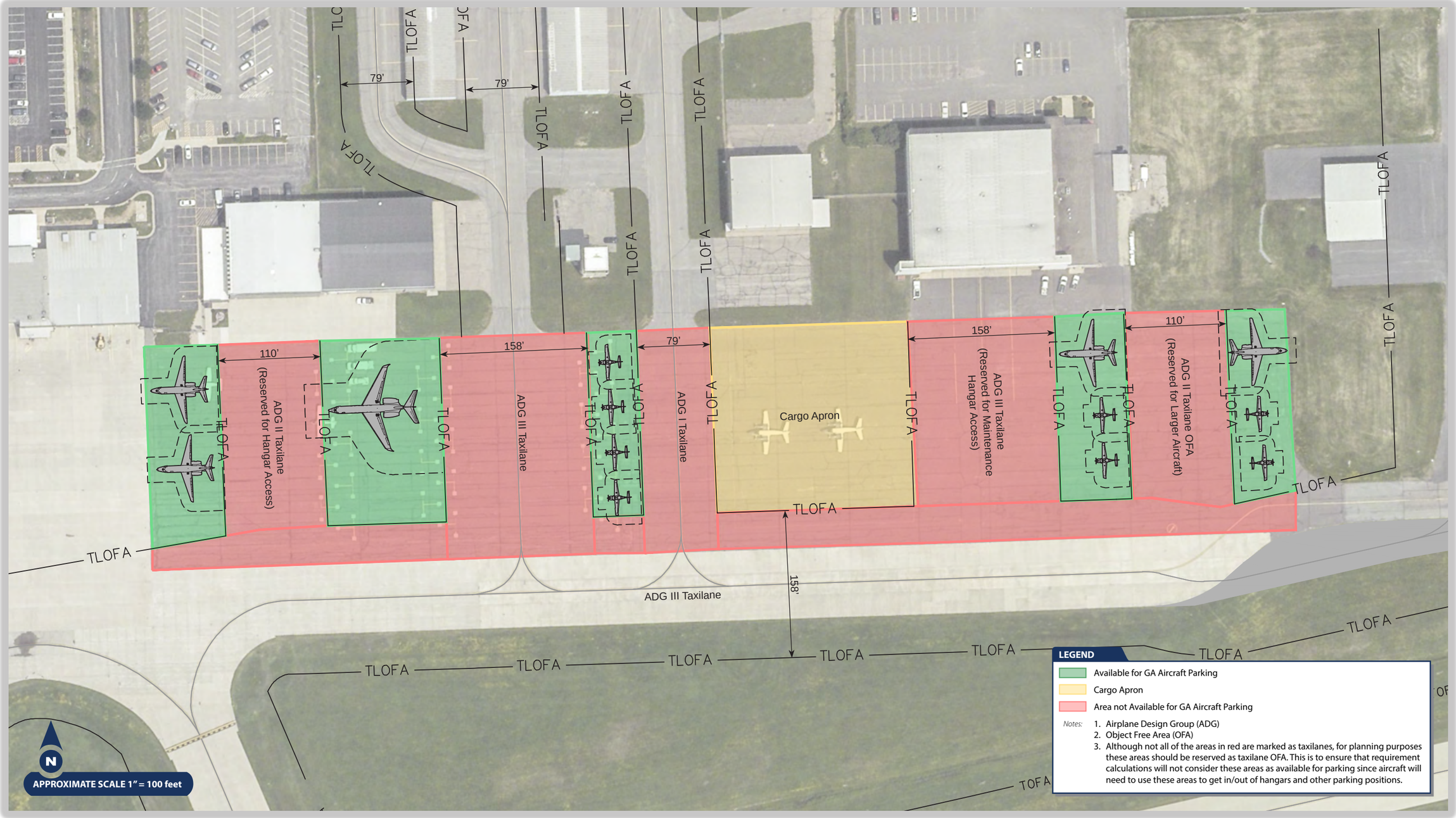
To determine needs for the GA apron, three scenarios were considered: ADPM itinerant operations, AirVenture, and times when there are two ADG III aircraft parked on the apron. Using the ADPM, it was assumed that one aircraft would account for two operations (arriving and departing) and that all the aircraft on the average day would be parked on the apron at the same time. These assumptions along with Table E-1 from AC 150/5300-13B determined the apron space required throughout the planning horizon. **Table 1-13** summarizes the apron requirements and **Exhibit 1-7** depicts a parking scenario meeting those requirements. The forecasted aircraft in **Table 1-13** only include the GA and air taxi/military aircraft operations from the ADPM and ramp chart discussed above (**Table 1-8** through **Table 1-12**); the table excludes the cargo aircraft operations. The table shows that the apron is appropriately sized for current ADPM demand; however, long-term forecasted aircraft cannot be accommodated which can be seen on **Exhibit 1-7** with the limited additional available space on the apron.

Table 1-13 ADPM Itinerant Operations

Aircraft Size	Baseline	2027	2032	2037	2042
ADG I					
Forecasted Aircraft	8	9	10	11	11
Cumulative Aircraft Growth	-	+1	+2	+3	+3
ADG II					
Forecasted Aircraft	4	5	6	6	7
Cumulative Aircraft Growth	-	+1	+2	+2	+3
ADG III					
Forecasted Aircraft	1	1	1	1	1
Cumulative Aircraft Growth	-	+0	+0	+0	+0
TOTAL					
Forecasted Aircraft	9	11	13	14	15
Cumulative Aircraft Growth	-	+2	+4	+5	+6
Total Apron Demand (sq. ft.)	76,370	87,775	115,180	118,130	126,585
Additional Required Apron (sq. ft.)	-	+925	+28,330	+31,280	+39,735

Notes: 1. ADG I required area per aircraft = 2,950 square feet.
2. ADG II required area per aircraft = 8,455 square feet.
3. ADG III required area per aircraft = 18,950 square feet (Table E-1 does not provide an area for ADG III aircraft so this was manually calculated using similar principles as the other values in the table).

Exhibit 1-7: Existing General Aviation Apron Parking Scenario



AirVenture is an annual event that occurs in July at Wittman Regional Airport (OSH) in Oshkosh, Wisconsin. During AirVenture, CWA hosts dozens of Piper Cherokees on the apron that fly in for the event. In recent years, the Cherokees have filled the entire apron and, at times, are required to park on the southern taxilane and grass areas since there is not enough space on the apron to accommodate all the aircraft (see **Images 1-7** through **1-9** for examples). Although it is not necessary to plan the apron to accommodate the aircraft seen during AirVenture, planning the apron to be flexible with different parking scenarios will help CWA as they do see several different peak parking scenarios.

The third scenario considers when a second ADG III aircraft arrives at the Airport. If not planned for, the apron will not be able to accommodate two ADG III aircraft parked on the apron at the same time. Therefore, the ADPM was adjusted to account for a second ADG III aircraft so the apron can be planned for that scenario. The forecasted aircraft in **Table 1-14** only include the GA and air taxi/military aircraft operations from the ADPM and ramp chart discussed above (**Table 1-8** through **Table 1-12**); the table excludes the cargo aircraft operations. This scenario will also provide flexibility for AirVenture allowing more Cherokees to park on the apron. **Table 1-14** summarizes this scenario.

Table 1-14 ADPM Itinerant Operations with Two ADG III

Aircraft Size	Baseline	2027	2032	2037	2042
ADG I					
Forecasted Aircraft	8	9	10	11	11
Cumulative Aircraft Growth	-	+1	+2	+3	+3
ADG II					
Forecasted Aircraft	4	5	6	6	7
Cumulative Aircraft Growth	-	+1	+2	+2	+3
ADG III					
Forecasted Aircraft	2	2	2	2	2
Cumulative Aircraft Growth	-	+0	+0	+0	+0
TOTAL					
Forecasted Aircraft	14	16	18	19	20
Cumulative Aircraft Growth	-	+2	+4	+5	+6
Total Apron Demand (sq. ft.)	95,320	106,725	134,130	137,080	145,535
Additional Required Apron (sq. ft.)	+8,470	+19,875	+47,280	+50,230	+58,685

Image 1-7 Cherokee Fly In

For orientation, this image was photographed from the passenger terminal and is facing east. This image captures the morning of the Cherokee Fly In event at CWA. Sixteen aircraft are parked on the apron. At this point in the day, aircraft are parked comfortably away from each other, with space to accommodate additional small aircraft.

Image 1-8 Cherokee Fly In

For orientation, this image was photographed from the passenger terminal and is facing east. This image was captured a few hours after Image 1-7. More aircraft have arrived and one of the new arrivals is a jet that required a few of the originally parked Cherokees to be relocated onto Taxilane E.

Image 1-9 Cherokee Fly In

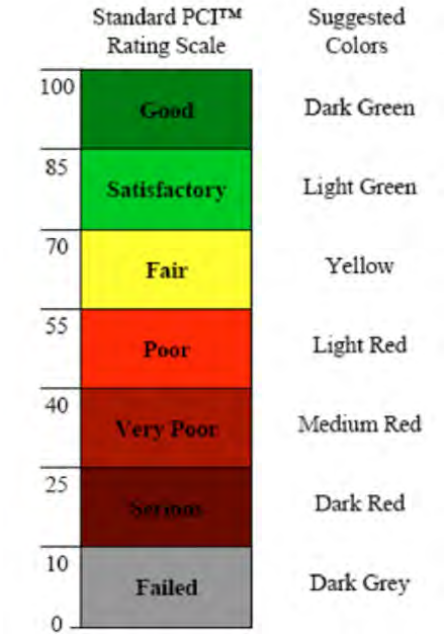
For orientation, this image was photographed from the passenger terminal and is facing east. This image was captured a few hours after **Image 1-8**. More aircraft have arrived throughout the day including another jet which requires more Cherokees to be moved to Taxilane E.

1.4.4 Pavement Conditions

Inventory

According to AC 150/5380-7B, *Airport Pavement Management Program*, maintaining a pavement in good condition over its life cycle is four to five times less expensive than periodically rehabilitating a pavement in poor condition. Based upon a visual inspection by experienced engineers, a pavement condition index (PCI) rating is assigned to a particular piece of pavement but does not necessarily reflect its structural integrity. The PCI rating is scored on a scale of 1-100, where, according to the American Society for Testing and Materials (ASTM), a score of 100 indicates the pavement is in good condition, a score of 70 indicates the pavement is in fair condition, and a score of 55 or less indicates the pavement is in poor condition. The scale is further broken down into the following categories:

Figure 1-5 ASTM PCI Rating Scale



Source: ASTM.

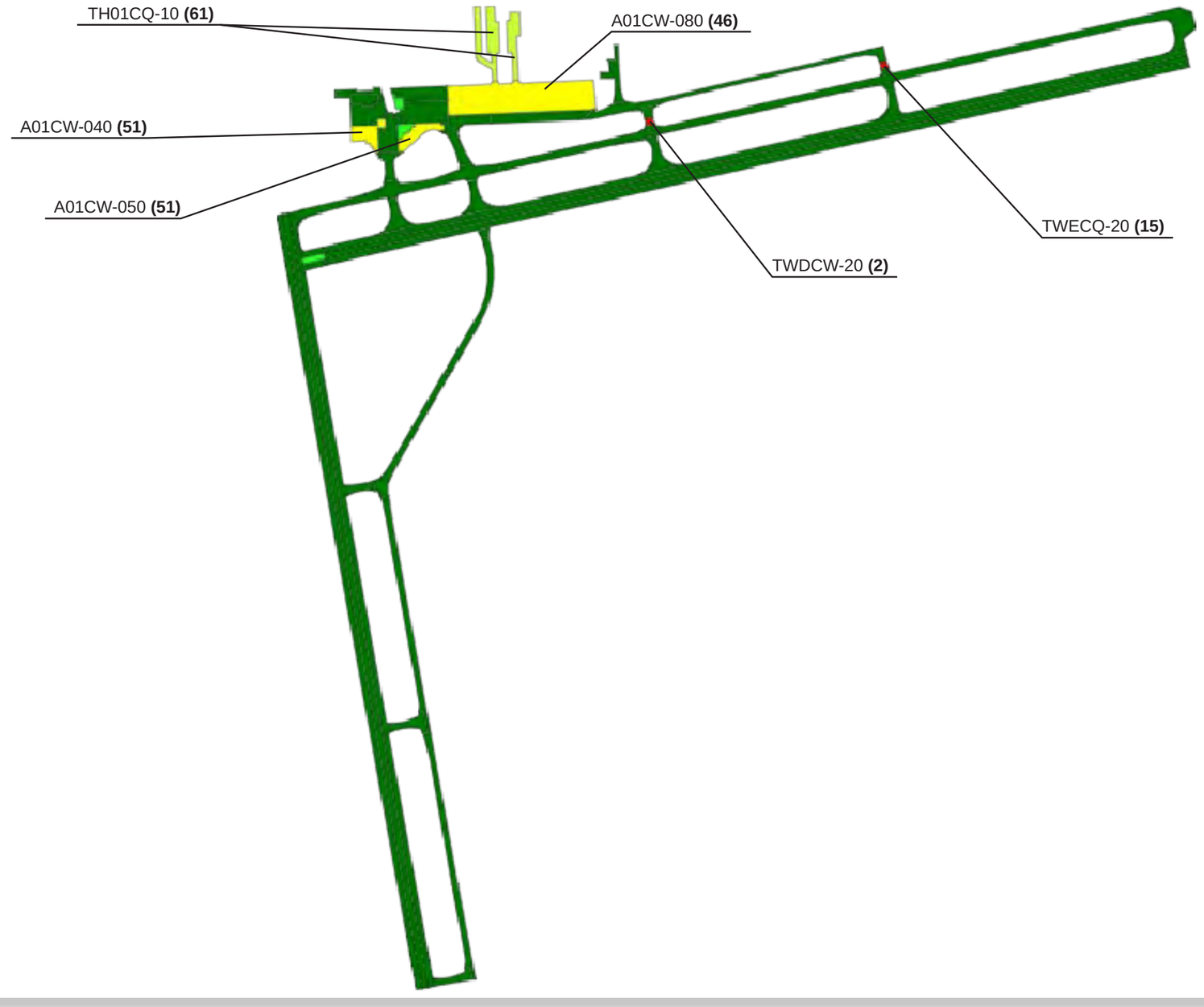
All PCIs for CWA pavements are discussed below and are shown on **Exhibit 1-8**.

According to a 2021 Pavement Condition Report, completed by Applied Pavement, the Airport has an overall PCI of 93. Most sections of pavement at the airport are in good condition; however, there are a few sections of pavement that are in fair to poor condition.

Both Runway 8/26 and Runway 17/35 are in good condition. Taxiways A, B, and C are all in good condition. Taxiway D and Taxilane E are generally in good condition, but the report indicates that both have a middle section, connecting to Runway 8/26, in poor condition. The taxilanes connecting to the T-Hangars are in fair condition, all three with a PCI of 61.

The air carrier apron is in overall satisfactory condition, with an average PCI of 83. Most panels are in good condition with PCI scores in the mid and upper 90; however, there are two panels on the outer edges of the apron with a PCI of 51, and two panels underneath Gates 2 and 4 with scores of 76 and 74, respectively.

The asphalt supporting the general aviation apron is in poor condition with a PCI of 46.



N
NOT TO SCALE

LEGEND

Note: Pavement sections that have a PCI score of 71 or less are listed by name in this exhibit.

Requirements

This section focuses on the pavement sections that have a PCI score of 70 or less. These sections do not meet satisfactory conditions and therefore require rehabilitation or reconstruction. These sections, along with their recommended maintenance actions, are summarized in **Table 1-15**. Failure to repair these sections will cause further deterioration leading to unsafe conditions for aircraft to park and maneuver.

Table 1-15 Recommended Pavement Maintenance Actions

Section	General Location Description	PCI Score	Maintenance Action
A01CW-040	Air Carrier Apron (Gate 3)	51	Major Rehab
A01CW-050	Air Carrier Apron (Gate 4)	51	Major Rehab
A01CW-080	General Aviation Apron	46	Major Rehab
TH01CW-10	T-Hangar Taxilanes	61	Major Rehab
TWDCW-20	Middle Section of Taxiway D	2	Major Rehab
TWECW-20	Section of Taxilane E	15	Major Rehab

Source: Applied Pavement.

The two biggest factors that contribute to deteriorating pavement are heavy loads and weather. Considering that CWA is seeing larger GA jet activity, the Alternatives Analysis chapter will consider the use of asphalt versus concrete on the GA apron. Although concrete in the short term may be more expensive, it can sustain higher loads and is less susceptible to weathering, and therefore has a longer lifespan compared to asphalt.

1.4.5 Aircraft Deicing

Inventory

CWA does not currently have a designated deicing location. Aircraft deicing typically occurs at either the southwestern portion of the air carrier apron, behind Gate 3, or the eastern portion of the air carrier apron, in front of the ARFF and SRE building (see **Image 1-10** for an example). CWA currently uses approximately 10 to 20 thousand gallons of deicing fluid per year. The Airport uses Type I and Type IV deicing fluids which are stored in two tanks located east of the fuel farm.

Existing Deicing Capacity Evaluation

A ramp chart, shown on **Table 1-16**, was created to evaluate the capacity of the deicing locations. As mentioned above, there currently is not a designated location so locations 1 and 2 shown in the chart are generic areas. The ramp chart was created using an average day of the peak winter month. Similar to the air carrier ramp chart (see **Table 1-5** under **Section 1.4.3**), the low-cost carrier flight is included in this ramp chart. This ramp chart shows that two aircraft are scheduled to depart within an hour of each other and both need to deice within the same hour. Two deicing locations are needed to avoid delays.

Image 1-10 Deicing Aircraft

For orientation, this image was photographed from the passenger terminal and is facing east. This image captures an aircraft deicing on the GA apron. SRE vehicles are parked outside the ARFF/SRE building which means the aircraft had to be deiced on asphalt. The pavement was not designed to support the loads of commercial service aircraft.

Table 1-16 Deicing Ramp Chart

Deicing	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM
1													
2													

Deicing	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM
1											
2											

Legend	
Delta	
American	
Low-cost Carrier	

Requirements

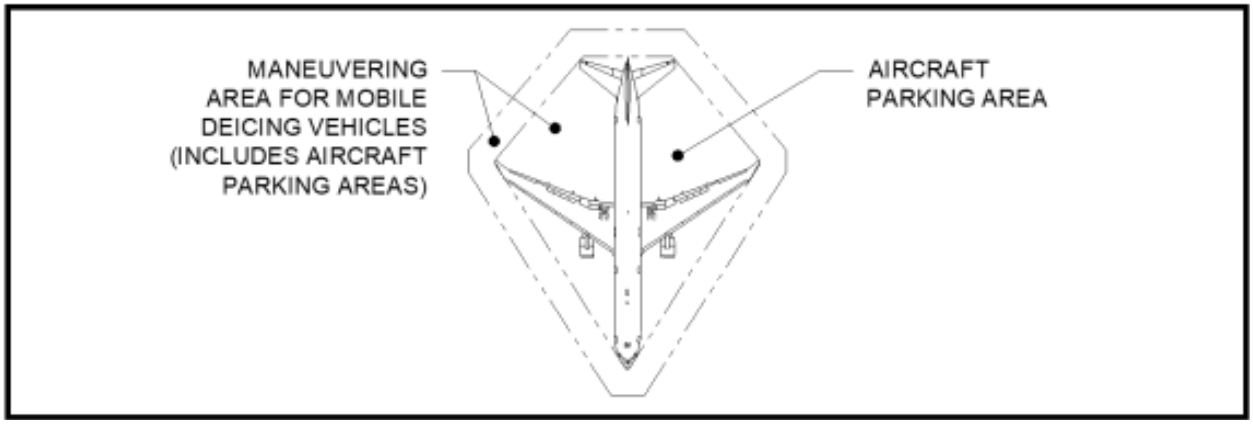
As mentioned in **Section 1.4.3**, deicing aircraft on the air carrier apron causes issues with surrounding activities; therefore, potential deicing locations will be considered as part of the Alternatives Analysis chapter. This section will explore the number of deicing locations required and the space required for each location.

To determine the number of locations required for deicing, the departure peak hour in CWA's flight schedule was evaluated. There are two departures during CWA's peak hour and deicing takes approximately 20 minutes. Therefore, at least one deicing location is required. However, after taking a closer look at CWA's flight schedule, there are often days in the winter months when two flights are scheduled to depart within 20 minutes of each other. Providing only one deicing location would allow only one of the two scheduled departures to deice in that position, forcing the other to either wait to deice or deice on the air carrier apron causing the issues already discussed. Because of this, requirements will be based on providing two deicing locations rather than one.

According to AC 150/5300-14D, *Design of Aircraft Deicing Facilities*, aircraft deicing locations consists of two areas (see **Figure 1-6**):

1. An inner area for the parked aircraft to receive deicing treatment.
2. An outer area to allow two or more deicing vehicles to circulate.

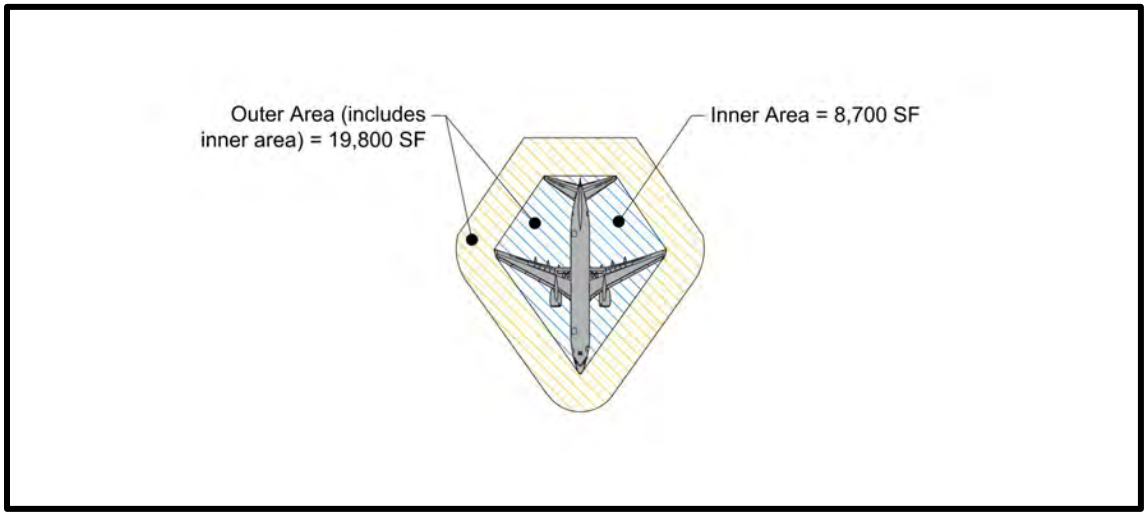
Figure 1-6 Deicing Location Envelope



Source: AC 150/5300-14D, *Design of Aircraft Deicing Facilities*.

The size of the inner area is determined by the most demanding aircraft that will use the deicing location. CWA's design day flight schedule shows that a Boeing 737-800 will be the critical aircraft for the deicing location. The size of the outer area is composed of at least two lanes which equal 12.5 feet per lane (25 feet total). The required area for each deicing position is shown in **Figure 1-7**.

Figure 1-7 Deicing Location Envelope



Source: Mead & Hunt.

1.4.6 Airport Security and Perimeter Fence

Inventory

The Airport's airfield is enclosed by a security and wildlife fence that limits access to the airfield allowing only authorized personnel to enter. A network of perimeter roads approximately seven miles long follows the interior of the fence line to provide inspection and access to the security gates. The perimeter road also provides a connection to various airport equipment on the airfield and outdoor storage.

Requirements

Portions of the security fence are in poor condition and will require maintenance or replacement. Although a portion of the fence appears to be inside the Runway 26 OFA, the fence is at a lower elevation compared to the runway meaning the fence does not penetrate the OFA.

1.4.7 Air Cargo Facilities

Inventory

Air cargo activity occurs in the middle portion of the general aviation apron, just southeast of the Air Traffic Control Tower (ATCT). Air cargo operations are conducted to and from regional destinations such as MKE and MSN by Freight Runners (under contract with UPS) using the Beech 99 Airliner and by CSA Air (under contract with FedEx) using the Cessna Caravan. Although most cargo operations are conducted by dedicated cargo carriers, passenger airlines may also carry cargo. However, this has become less prominent at CWA since 2008.

Requirements

The primary issue with the air cargo apron is that it is in the middle of the GA apron. The Alternatives Analysis chapter will evaluate potential locations to relocate the cargo apron. Any alternatives with a relocation of the apron will ensure that the apron maintains sufficient space for the loading and unloading of four cargo aircraft, GSE maneuvering, and the loading and unloading of delivery trucks.

1.5 Landside Facilities

This section discusses the various landside facilities at CWA.

1.5.1 Airport Access Roads

Inventory

CWA Drive provides one-way access and circulation to the parking lots, commercial service passenger terminal, and consolidated rental car facilities. There are five parking lots north of the commercial service passenger terminal: West Parking Lot, East Parking Lot, North Center Parking Lot, South Center Parking Lot, and the Rental Car Parking Lot. The West Parking Lot is currently closed due to narrow driving lanes. **Exhibit 1-10** depicts the circulation and parking areas and **Table 1-17** summarizes the number of parking spaces available in each lot. The parking spaces provided in the table do not include additional localized parking for the GA terminal, maintenance facility, and tenants. Most of the parking lot lighting is LED controlled either by an integral or central photocell.

Requirements

The Alternatives Analysis chapter will evaluate the need to relocate or provide additional access roads as required by other facility concepts.

1.5.2 Ground Access, Circulation, and Auto Parking

Inventory

CWA Drive provides one-way access and circulation to the parking lots, commercial service passenger terminal, and consolidated rental car facilities. There are five parking lots north of the commercial service passenger terminal: West Parking Lot, East Parking Lot, North Center Parking Lot, South Center Parking Lot, and the Rental Car Parking Lot. The West Parking Lot is currently closed due to narrow driving lanes. **Exhibit 1-10** depicts the circulation and parking areas and **Table 1-17** summarizes the number of parking spaces available in each lot. The parking spaces provided in the table do not include additional localized parking for the GA terminal, maintenance facility, and tenants. Most of the parking lot lighting is LED controlled either by an integral or central photocell.

Exhibit 1-9: Existing Roadways

Exhibit 1-10: Existing Parking

Table 1-17 Public Parking Spaces

Parking Lot	Parking Spaces
West Parking Lot	422
North Center Parking Lot	477
South Center Parking Lot	373
East Parking Lot	204
Rental Car Parking Lot	195
Grand Total	**1,671**

Requirements

As mentioned above, the West Parking Lot does not provide adequate space for driving lanes. The Alternatives Analysis chapter will evaluate reconfiguration of the lot to provide the necessary space required. This parking lot will also be evaluated to provide electric vehicle charging and will be considered as a potential location for solar panels.

1.5.3 Commercial Service Passenger Terminal

Inventory

The commercial service passenger terminal was originally constructed in 1969 and the concourse was originally constructed in 1998. The terminal building has undergone two renovations, one in 2006 and the most recent in 2016. In 2019, the four PBBs were replaced.

Requirements

A Terminal Area Master Plan Addendum for CWA was completed in 2009. This addendum evaluated the needs of the passenger terminal over a 20-year period. Following the completion of the addendum, the passenger terminal was expanded in 2016. With the expansion, the existing terminal was designed to accommodate approximately 250,000 annual enplanements.

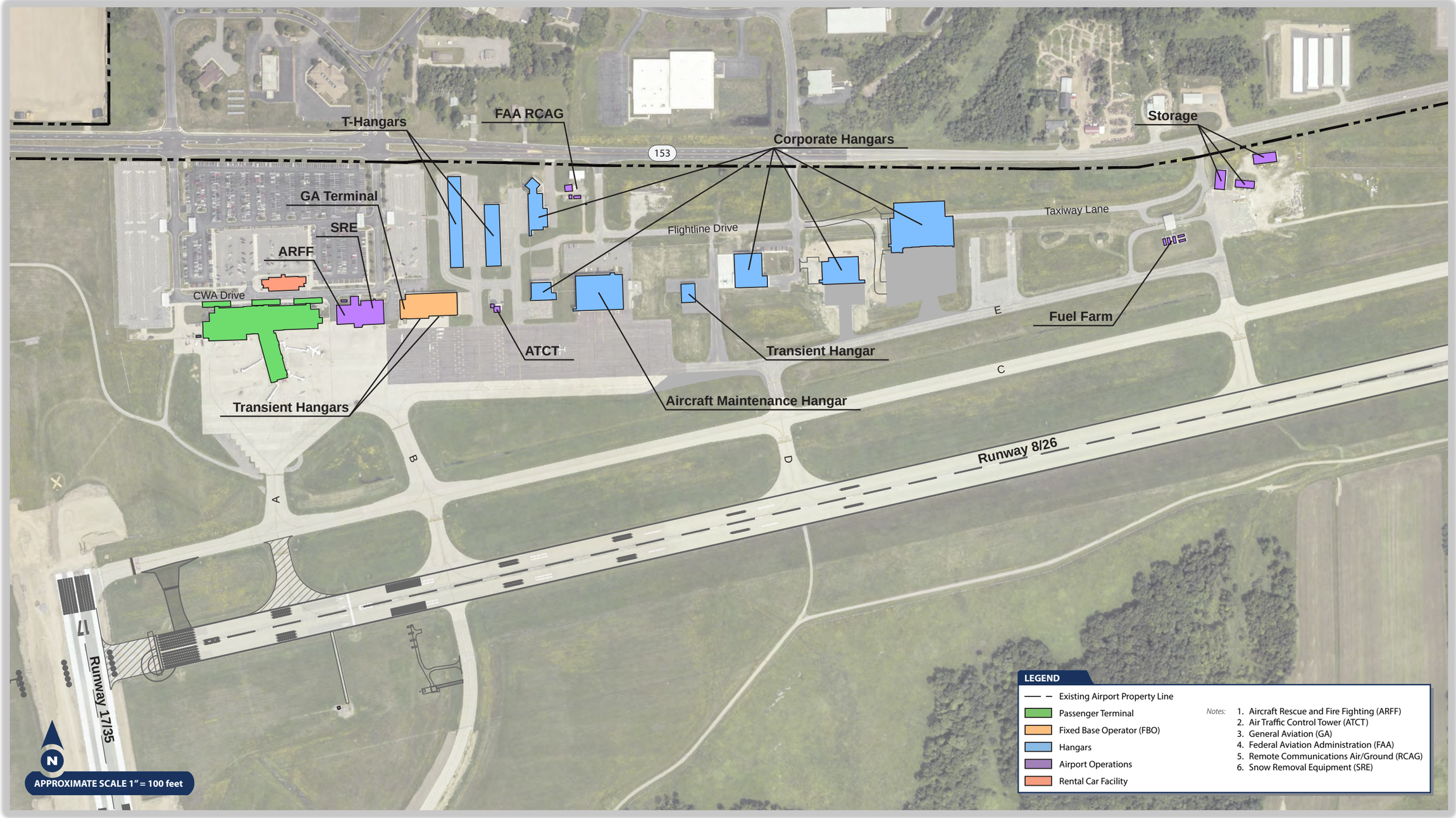
Based on US DOT T100 Data, CWA has a total of 76,583 annual enplanements. It is not anticipated that CWA will reach 250,000 annual enplanements during the TAMP 20-year planning horizon and all passenger terminal needs are expected to be accommodated in the existing terminal; therefore, further needs will not be considered as part of this TAMP.

The existing outbound baggage room is currently designed for regional jets. With the addition of the regularly scheduled Boeing 737 flights at CWA, the existing room requires an expansion.

1.6 Support Facilities

This section discusses the various support facilities provided by CWA. For orientation, **Exhibit 1-11** provides an overview of the existing support facilities and airport buildings.

Exhibit 1-11: Existing Buildings and Support Facilities



1.6.1 Air Traffic Control Tower

Inventory

The ATCT is located immediately east of the FBO between Taxilane 2 and Taxilane 3. It is in operation between the hours 6:00 AM through 10:00 PM and operated by Midwest Air Inc. During this time, it controls the movement areas of the airfield which includes the runways and taxiways. Pilots must receive clearance from the tower before accessing a movement area. During the inoperative hours, pilots use their best judgment to determine when it is safe to access a runway or taxiway. The building is fed electrically from the main electrical vault in the ARFF building, with its own diesel generator located outside of the building.

Airspace

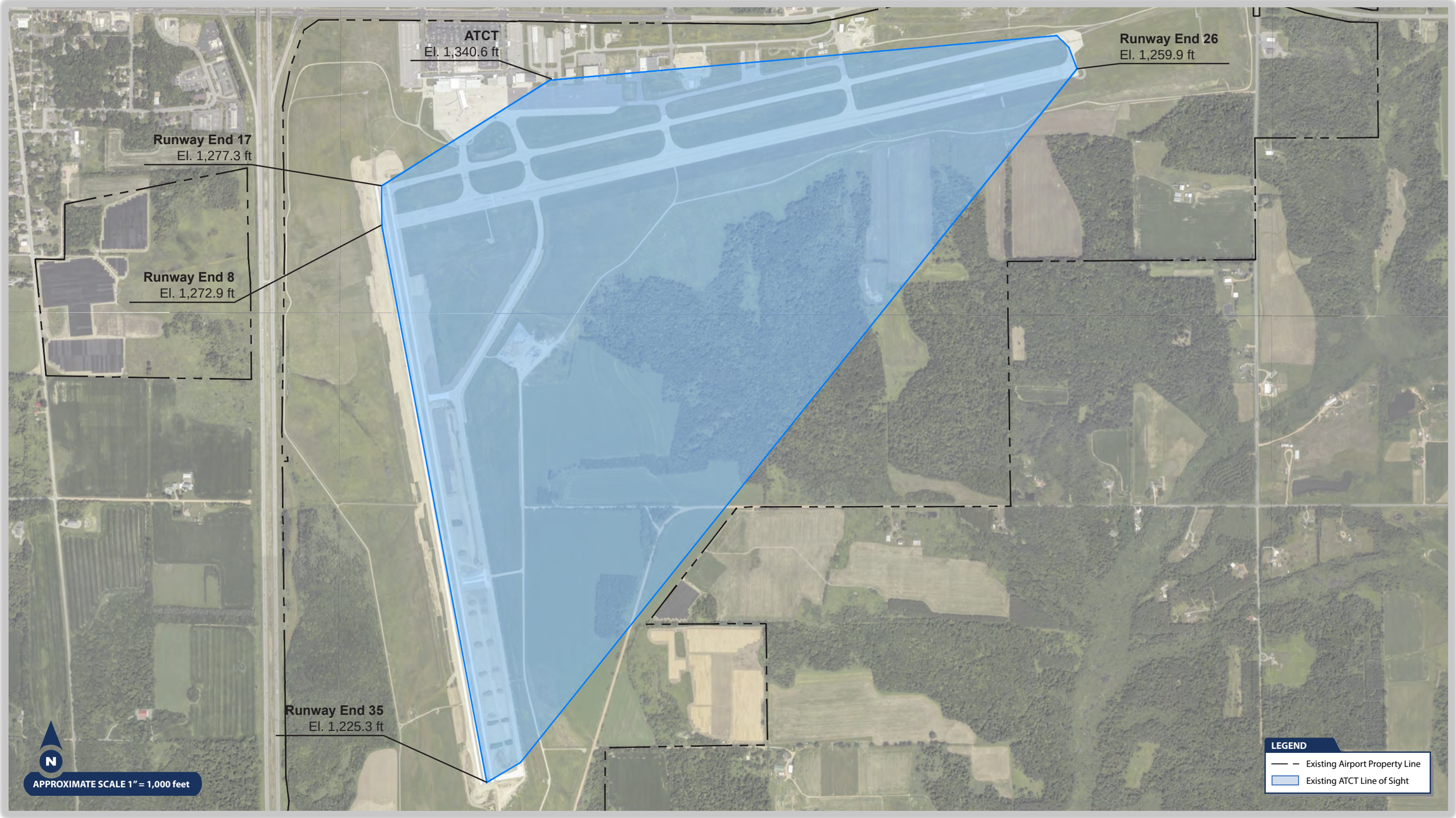
Controlled airspace is a term that applies to all airspace in which FAA ATC service is provided. This does not mean, however, that controlled airspace must have a control tower in its immediate vicinity, but instead that some type of ATC authority is extended to the airspace.

There are five classes of controlled airspace: Class A, Class B, Class C, Class D, and Class E. When the ATCT is in operation, the Airport is in Class D airspace; however, during the hours that the ATCT is not in operation the Airport is in Class E airspace.

Requirements

There are currently no objects impeding the ATCT line of sight on any of the movement areas as shown in **Exhibit 1-12**. The Alternatives Analysis chapter will evaluate any proposed objects that may impede the controller's eye level and will attempt to minimize any shadows that may be cast on movement areas.

Exhibit 1-12: Air Traffic Control Tower – Line of Sight



1.6.2 ARFF Facility

Inventory

The ARFF building is positioned directly east of the commercial service passenger terminal and adjacent to the air carrier apron, providing easy and immediate access to the airfield. This facility houses the ARFF, Emergency Operations Center (EOC), a large portion of the SRE, and maintenance vehicles. CWA has an ARFF index of B (see **Table 1-18** for ARFF index determination). Two Oshkosh Striker vehicles are used to meet ARFF index requirements at CWA. As the personnel that provide snow removal at CWA are also responsible for ARFF response, it is desirable for the SRE and ARFF facilities to be easily accessible or have personnel in the ARFF area while air carrier operations are conducted.

Table 1-18 ARFF Index Determination

Index Aircraft Length
A Less than 90 feet
B At least 90 feet but less than 126 feet
C At least 126 feet but less than 159 feet
D At least 159 feet but less than 200 feet
E At least 200 feet

Source: CFR 139.315.

Requirements

The ARFF and SRE facilities currently use a shared facility as stated in the Inventory. **Table 1-18** shows the ARFF index and associated determining aircraft length. As an Index B ARFF designated Airport, CWA is obligated by CFR 139.317, *Aircraft Rescue and Firefighting: Equipment and Agents* to house either of the following:

- One vehicle carrying at least 500 pounds of sodium-based dry chemical, halon 1211, or clean agent and 1,500 gallons of water and the commensurate quantity of aqueous firefighting foam (AFFF) for foam production.
- Two vehicles; one vehicle carrying at least 500 pounds of sodium-based dry chemical, halon 1211, or clean agent; or 450 pounds of potassium-based dry chemical and water with a commensurate quantity of AFFF to total 100 gallons for simultaneous dry chemical and AFFF application. And one vehicle carrying an amount of water and the commensurate quantity of AFFF so the total quantity of water for foam production carried by both vehicles is at least 1,500 gallons.

The ARFF index is determined by the most demanding air carrier aircraft that conducts five or more average daily departures. Index B is for aircraft at least 90 feet but less than 126 feet in length The aircraft to exceed five daily departures at CWA are the CRJ 900 (119 feet) (3 flights) and the ERJ-145 (98 feet) (3 flights), both are greater than 90 feet and therefore CWA is an Index B Airport. Future critical aircraft, the CRJ 900 (119 feet) and ERJ-175 (104 feet), are also Index B.

The ARFF has two Oshkosh Striker vehicles which meet Airport ARFF needs. These vehicles each have a capacity of 1,500 gallons of water and 450 pounds of potassium based dry chemical and are therefore classified as Class 4 ARFF vehicles which are only required at Index B airports and above.

In addition to serving as the ARFF facility, the building could serve as an EOC for the city during a local crisis. The Federal Emergency Management Agency (FEMA) provides a checklist of items to consider when determining a location for an EOC. The checklist assists in determining if the facility can provide the capability needed while demonstrating survivability, security, interoperability, and other important elements to a successful and resilient EOC. Although more thorough coordination with the City and FEMA would be needed to confirm, the current ARFF facility location offers several initial advantages for an EOC, as it is an accessible building with existing security features.

Federal Aviation Regulation (FAR) 139.319, *Aircraft Rescue and Firefighting: Operational Requirements*, requires that from the time of the alarm at least one ARFF vehicle must be able to reach the midpoint of the farthest runway serving air carrier aircraft from its assigned post within three minutes. These factors will be accounted for when considering alternatives.

1.6.3 Maintenance and Snow Removal Equipment Storage

Inventory

SRE storage is housed in the same building as the ARFF equipment. Although this provides a central location for maintenance and emergency operations, the building size is not sufficient to house both operations. **Table 1-19** identifies SRE Equipment.

Table 1-19 Identification of Justifiable SRE

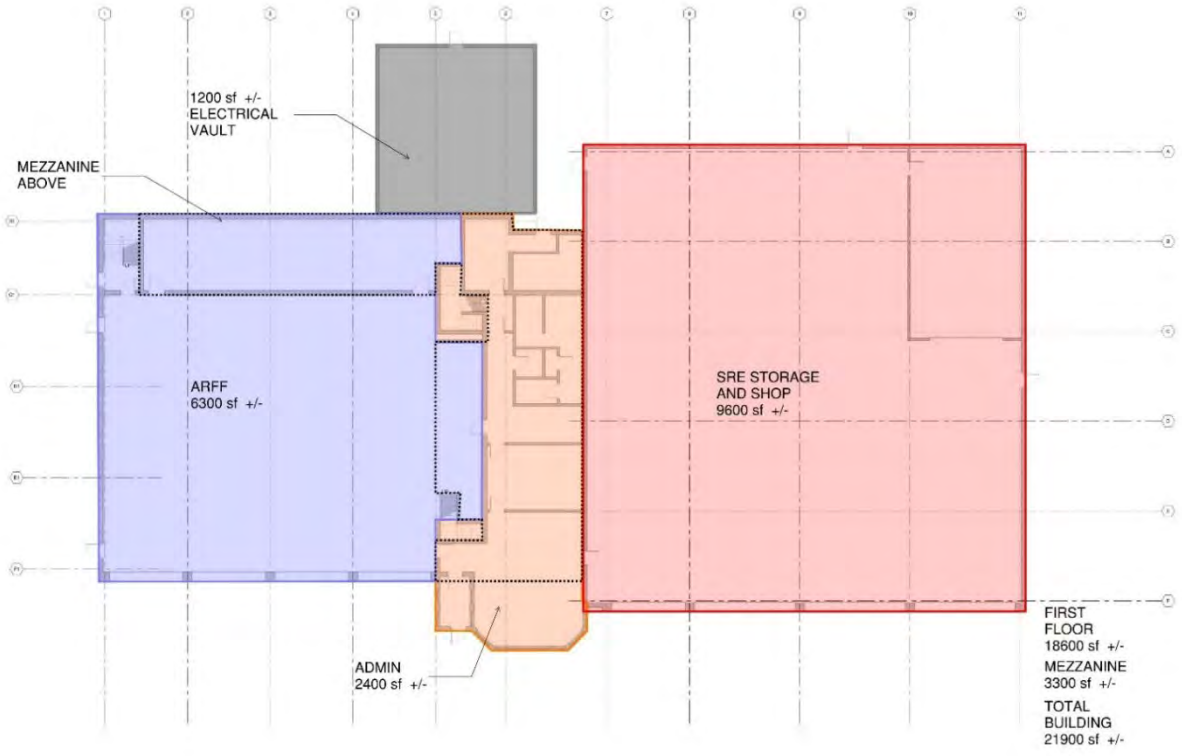
Eligible Items	Max Quantity
Snow Blower	2
Plow	4
Sweeper	3
Hopper Spreader	3
Front End Loader	1

Notes: Justifiable SRE based on average annual snowfall of 59.6 inches; removal of snow from priority surfaces with one hour; priority surfaces including primary runway (8/26), secondary runway (17/35), parallel taxiways (B & C), and 50% of terminal and GA aprons; rotary plow efficiency of 70%; and displacement plow operating speed of 20 mph, efficiency of 75%, and cutting angle of 30%.

The existing combined operations building (see **Figure 1-8**) is generally rectilinear in shape of approximately 22,000 square feet and was originally built in the 1970s with additions and renovations in 1992. The building is generally arranged around two large apparatus bays. The west bay houses the ARFF equipment and has a 1992 addition of shop space to the north with the addition of a mezzanine. The south wall of the west bay has (4) 18'wx16'h overhead doors. The center of the building houses the office and support functions, and the east bay houses the SRE equipment. This bay was expanded in 1992. The south

wall of the east bay has (1) 16'w x 16'h door and (3) 22'w x 16'h overhead doors. A small addition to the office space was added to the south side of the facility during the 1992 renovation.

Figure 1-8 Existing Operations Building



Source: Airport Record Drawings.

Requirements

Response time to clear snow from the Airport environment is based on the number of operations at the Airport. Total Airport operations in 2022 were 6,035 and are projected to grow to 12,927 in 2042. Based on guidance in AC 150/5200-30D, *Airport Field Condition Assessments and Winter Operations Safety*, because the Airport has more than 6,000 operations but less than 10,000 operations, it should have enough equipment to clear priority areas within one and one-half hours. Within the planning period it is expected that the airport will have more than 10,000 operations but less than 40,000 operations; therefore, it should have enough equipment to clear priority areas within one hour. The Airport owns and maintains a variety of maintenance equipment and SRE, including two snow blowers, four plows, three sweepers, four spreaders, and two front end loaders. A list of these vehicles and equipment by vehicles make/model is presented in **Table 1-20**.

Based on the FAA Snow Removal Equipment Calculation spreadsheet, the AIP-eligible SRE fleet is determined based on calculations for primary runway, taxiways, and critical apron area, coupled with airport

size and winter climate history. Only eligible equipment can be used to properly size an SRE facility, and vehicles and equipment identified as ineligible cannot be used to determine the facility's square footage. Eligible equipment for CWA according to the SRE calculations spreadsheet is shown in highlighted cells in **Table 1-20**.

Table 1-20 CWA SRE/Maintenance Vehicles and Equipment

Equipment Type	Year	Make Model	Dim (feet)	Eligible (SF)	Year to be Replaced
Snow Blower	2017	MB4	35x9x12	940	N/A
Snow Blower	2017	Sno-Go LR-44	11x10x10	N/A	N/A
CFME	2022	Ford/Halliday F-250/RT3	25x7x9	595	N/A
Sand Truck	2003	Oshkosh P2538	31x11x12	861	N/A
Naac Truck	1996	Oshkosh P2538	33x11x12	903	2035
Sand Truck	2005	Oshkosh P2538	31x11x12	861	N/A
E-36 Truck	1984	Oshkosh P2525	33x12x12	946	2035
Plow Truck	2017	MB MB2	67x24x13	2,618	2033
Runway Broom*	2017	MB 4600-CRDL	67x24x13	N/A	2033
Plow Truck	2017	MB MB2	67x24x13	2,618	2033
Runway Broom*	2017	MB 4600-CRDL	67x24x13	N/A	2033
Plow Truck	2019	MB MB2	67x24x13	2,618	2033
Runway Broom*	2019	MB 4600-CRDL	67x24x13	N/A	2033
Blower Loader	2019	CAT 972M	34x10x14	880	N/A
Ramp Plow Loader	2008	Volvo L110F	22x9x13	608	N/A
Ramp Plow Loader	2004	CAT 924G	20x8x11	540	2029
Sand Loader	1989	Case 821	22x9x13	608	N/A
Sidewalk Sweeper	2019	Kubota RTV-X1100CWL-H	11x6x8	N/A	N/A
Sidewalk Blower	2018	John Deere Signature Series X739	11x6x7	N/A	N/A
Salt Truck	2022	Ford F-350	20x7x9	N/A	N/A
Total Eligible Area Based on Equipment 15,001					

Source: Airport Records.
Notes: * Denotes attachment. Year to be replaced N/A indicates no year listed in the Airport fleet replacement plan.

Existing Issues

Although the Airport is currently near the maximum amount of eligible equipment, some of the equipment is old and needs to be replaced. As stated previously, duplicate equipment provides redundancy when repairs are needed. By replacing older pieces of equipment with new models, operation and maintenance costs would be reduced. When relocating or reconstructing the SRE building, personnel efficiency and safety must be considered. Ideally, equipment storage would have an entrance on each side so that vehicles can enter or exit and backing in or out is not required.

Equipment must often be pulled out for all SRE to be nested in way that will accommodate the building's storage capabilities. SRE that does not fit into the facility is stored in several cold storage units located approximately 3/4 miles east of the SRE/ARFF facility to the north of Taxilane E and consists of three buildings of approximately 3,000 square feet each. This not only makes for a less efficient configuration, as personnel must travel nearly 1 1/2 miles to retrieve equipment and return to the terminal area, but the general condition of the cold storage units is poor. Cold temperatures and exposure to the elements shorten the useful life of equipment and increases maintenance requirements and wear. Currently, when maintenance is performed on vehicles, other vehicles must be parked on the apron to provide enough space within the building. This is undesirable as it not only requires additional staff time but occupies apron parking space intended for aircraft parking and circulation. The SRE fleet is aging and, as older equipment tends to be less reliable, additional equipment provides redundancy. However, this system requires additional maintenance and monetary support to keep aging equipment in working order. Finally, as there is not sufficient space within the main SRE facility, maintenance must often take place outside on the aircraft apron in front of the SRE facility. Outdoor maintenance is undesirable, as it is not only less efficient for personnel and impedes on surrounding activity, but also presents the potential for oils and solvents released during the process to drain uninhibitedly, which may affect the surrounding environment.

Architectural – Exterior

The building is one story approximately 26' tall, and the standing seam roof slopes down south to north with the north elevation approximately 18' high. A small utility building is also located directly north of the ARFF wing and is connected with direct access from the operation building.

The exterior walls of the facility are primarily comprised of 12" masonry (unknown but assumed they are not insulated, except at the addition) to 8'-0 with metal panel upper to roof level. The upper walls are comprised of z-girts and faced insulation with steel metal panel exterior cladding surrounding a steel frame structure or a post and beam steel structure. A low slope standing seam metal roof with insulation between the purlins slopes covers the building.

Exterior doors are hollow metal with hollow metal frames and single pane glazing. Windows are an aluminum window system with single pane glazing.

Architectural – Interior

The interior of the facility consists mainly of painted concrete masonry unit (CMU) walls, ceilings, and tile and epoxy flooring. Vinyl composition tile (VCT) is present in some of the offices/workrooms. The storage areas and apparatus bays are sealed concrete floors and exposed ceilings.

A wash bay exists in the northeast corner of the facility with walls of metal stud and metal panels.

A mezzanine was added above the north addition infill at the existing mezzanine. This room includes CMU walls and a cast-in-place concrete deck.

The toilet facilities are original to the facility and include broken fixtures, peeling paint, an inefficient layout, and an insufficient quantity of fixtures.

Ceilings in the facility are acoustical ceiling tile (ACT) in regularly occupied areas such as offices, and hallways and exposed structure in the bays, mechanical rooms, and storage.

Structural

The structure of the ARFF/SRE is a pre-engineered metal building system. As are most pre-engineered metal buildings, this structure was a delegated design. Thus, the design drawings for this structure were created during the construction phase of the project and submitted as shop drawings. The shop drawings for this facility have not been located. Thus, there is very little information available about the existing structural design. The building code mandates that if loads are altered or increased on any structure that the structure be validated to meet the proposed new arrangements. To perform analysis to validate changes to the existing structure would require detailed information about the existing structure. Since this information is missing it would have to be obtained with extensive examination and documentation of the existing structure.

Reports of extensive leakage in the roof suggest that there could be extensive corrosion of the roof framing. The building code requires that the condition of any structure to be altered to be validated by engineering practices. This would require examination and documentation of the current conditions of the existing superstructure.

There are no structural drawings for the electrical vault and generator room. In this case, there are no extant design drawings. Therefore, alteration or modification of these rooms would require even more extensive examination and documentation before any validation of the existing structure could be performed. It is unknown what foundation type is underneath the facility. Examination of the existing foundation is likely not possible without demolishing the entire foundation. For all of these reasons, there is little potential for altering this facility.

Pre-engineered metal building systems are inexpensive superstructures because they are designed precisely to the minimum loading and maximum allowed material stress. These structures are optimized with continuous purlin and girt systems. The primary framing may have multiple size flanges and yield strength steel, not to mention the tapered members. The level of engineering applied to a pre-engineered metal building is very sophisticated. While they may appear simple their design is actually very complicated. There has always been tremendous competition among the companies that offer these structures. This competition has driven the industry to produce the absolute lightest and least cost structure with intricate systems at the very barest of profit margins. For these reasons, even when shop drawings are available, making alterations to pre-engineered metal building systems requires extensive structural analysis and detailing.

Electrical

The ARFF and SRE Building houses the primary electrical service serving the main airport buildings. The existing 500 kW diesel generator is located in its own room adjacent to the main electrical vault. This generator is original to the building and the Airport has commissioned studies in the past regarding its eventual replacement. Overall, the electrical equipment in the vault is in good condition with no nuisance tripping or other electrical issues. The primary data closet in this facility is located in a closet leading to the electrical room. Most lighting throughout the facility appears to be original to the building with new lamping. Lighting is controlled via simple single pole switches.

Technology

The ARFF and SRE buildings share telecommunications space in the center of the building. The space is a plywood closet built in a hallway rather than a purpose built equipment room. The closet is where the fiber circuit is brought over from the terminal, and it also feeds the GA terminal and maintenance buildings as part of the facility fiber loop. The closet houses network, paging, phone lines and lighting controls. The closet is not secured by lock or alarm. The fiber that runs through the closet extends systems from the terminal, including the fire alarm system. The closet has no temperature control and is somewhat dusty. Dust and extreme temperature can be detrimental to equipment and shorten service life. The fiber cables are fed through underground conduit into the closet, then out to the GA terminal. The fiber loop is primarily single-mode 12 strand which is current standard, but 12 strands may not be enough for future expansion. There is room in the conduits for additional fiber runs. The majority of the ethernet cable in the ARFF/SRE building is a Category 6 cable (Cat6) which is the current standard, but there is some Category 5e cable (Cat5e) which is considered out of date and may not be able to carry higher bandwidth signals in the future. The airport antenna head end equipment is located in a separate room in a dedicated two-post rack. The room nor the rack are locked or alarmed and equipment could potentially be damaged or knocked out of adjustment. The fiber appears to be in good shape and the staff report few transmission issues.

Mechanical/Heating, Ventilation, and Air Conditioning (HVAC)

The ARFF and SRE Building spaces are primarily heated by overhead gas-fired infrared heaters. The heaters are typically vented through the wall above the overhead doors in the west ARFF storage bay and the east wall in the east SRE storage bay. Both the ARFF and SRE areas have paddle type ceiling destratification fans to provide air movement.

The ARFF area is served by two exhaust systems. One exhaust used for general ventilation is located on the west wall. The second exhaust system is roof mounted with exhaust ductwork extending from the fan to the floor of the ARFF and then running beneath a workbench at the rear of the space. It is assumed this system is intended to remove fumes from floor level. A gas-fired furnace is installed in a room above the central admin area that supplies heated air to the mezzanine space at the rear of the ARFF. A gas-fired furnace is installed on the mezzanine above the central admin area that supplies heated/cooled air to the office spaces between the ARFF and SRE. This unit has an air-cooled condensing unit on the roof that rejects heat as part of the cooling system. These systems appear to be reaching the end of their expected lifespan and are showing signs of wear.

The SRE area is served by three exhaust systems. One exhaust used for general ventilation is located on the east wall. The other exhaust systems are roof mounted with exhaust ductwork extending from each fan to the floor of the SRE and then running beneath workbenches at the rear of the space. It is assumed these systems are intended to remove fumes from floor level. The SRE is also served by a gas-fired makeup air unit suspended from the structure with associated ductwork for air distribution. This unit draws air from a large wall hood on north wall of the facility and provides heated outside air to replace air exhausted from the space. These systems appear to be reaching the end of their expected lifespan and are showing signs of wear.

The generator room HVAC systems include generator combustion air intakes with gravity dampers and a propeller style wall exhaust fan. The electrical room HVAC systems include an outdoor air intake louver with motorized damper above the entrance door and an electric unit heater suspended from the structure. These systems appear to be reaching the end of their expected lifespan and are showing signs of wear.

The gas service for the facility is located on the west wall of building.

Each system has its own independent controls and no central Building Automation System exists.

Project Space Requirements

FAA AC 150/5200-18A, *Building for Storage and Maintenance of Airport Snow and Ice Control Equipment and Materials*, provides guidance on storing maintenance and SRE. SRE and Maintenance building needs are related to paved areas, activity levels, and climate. Increases in runway, taxiway, and apron pavement, as well as increases in activity levels, result in additional need for SRE building space. Maintenance, SRE, and sand should be housed in a heated building to prolong the useful life of the equipment and to assist with a more rapid, effective response to operational needs. Additionally, facilities should have available area within the building for onsite equipment maintenance and repair during the winter season. Based on the eligible equipment at CWA, space in the current SRE facility is inadequate. Vehicle storage, maintenance bays, sand and chemical storage, and other areas will be assessed individually in each section below and the total space requirements for the proposed SRE building will be summarized.

Vehicle Storage and Circulation

Nearly 10,000 square feet is available for vehicle storage in the current SRE facility. However, this is an approximate area, with entrances only on one side. Vehicles are often parked in a manner that requires those in the front to be moved to allow others to exit or enter. This layout makes circulation difficult and is inefficient for personnel. It is estimated that the Airport could acquire funding for a total of 15,001 square feet of space for vehicle storage and circulation under current AIP eligibility requirements, as shown in **Table 1-20**. A center aisle angled parking building layout or multiple drive through aisles are preferred as it would improve circulation and efficiency.

Maintenance Bay

FAA Order 5100.38D, *Airport Improvement Program (AIP) Handbook*, allows for funding of a maintenance bay up to 1,500 square feet. The current space has limited access, which makes it difficult to service equipment. The industry standard for SRE equipment is growing, and new industry standard bays allow for overhead oil, grease, and air, and an overhead hoist for heavy equipment. A larger space should be provided and would be fully eligible for AIP funding at CWA.

Parts and Equipment Storage

There is minimal space in the main SRE facility to store additional equipment and vehicle attachments. Equipment that is used more seldom is often stored in the cold storage facilities located to the east of the main facilities. As previously stated, these buildings are in poor condition and expose stored equipment to the elements. In addition, the distance between these cold storage units and the main facility creates inefficiency as personnel must travel between them. Designated storage areas in one location would help to centralize maintenance activities. It is estimated that approximately 1,500 square feet should be provided for parts and equipment storage at CWA. However, parts and equipment storage spaces are not typically eligible for FAA funding under current AIP guidelines.

Sand and Chemical Storage

Current AIP eligibility requirements allow for funding of indoor sand and chemical storage areas. Heated sand storage prevents moisture from freezing in the sand, which requires significantly more effort to load, and may hamper response times during snow events. It is estimated that approximately 5,000 square feet of sand storage and 2,500 square feet of chemical storage would be eligible for AIP funding at CWA.

Office and Personnel Support Space

Although office and personnel support spaces are not eligible for FAA funding under current AIP guidelines, they are important considerations when determining facility needs. As the current facility is shared between the ARFF and SRE function, the personnel space in the facility is largely dedicated to ARFF for emergency response. An area available for training and other support roles should be included in a new SRE facility. It is estimated that approximately 1,000 square feet should be provided for office and personnel support.

Space Assessment Summary

SRE and maintenance space requirements for each functional area are summarized in Table 1-21. Development alternatives for SRE and maintenance space will seek to satisfy these requirements. It is expected that it will not be practical or feasible to fulfill these requirements in the existing location as the ARFF and SRE buildings are collocated, and several of the satellite equipment storage locations are in poor condition. The following chapter will evaluate alternative sites on Airport property for a larger and more efficient SRE and maintenance facility.

Table 1-21 SRE Space Requirements

Functional Area	Required SF	AIP Eligible
Vehicle Storage and Circulation	15,001	Yes
Maintenance/Wash Bays	1,500	Yes
Parts and Equipment Storage	1,500	No
Sand and Chemical Storage	7,500	Yes
Office and Support Space	1,000	No
Total	**26,501**	**24,001**

Source: Mead & Hunt, Airport Staff.

Notes: Required space needs are estimated. Additional analysis will be required to determine federal funding eligibility and building/layout dimensions.

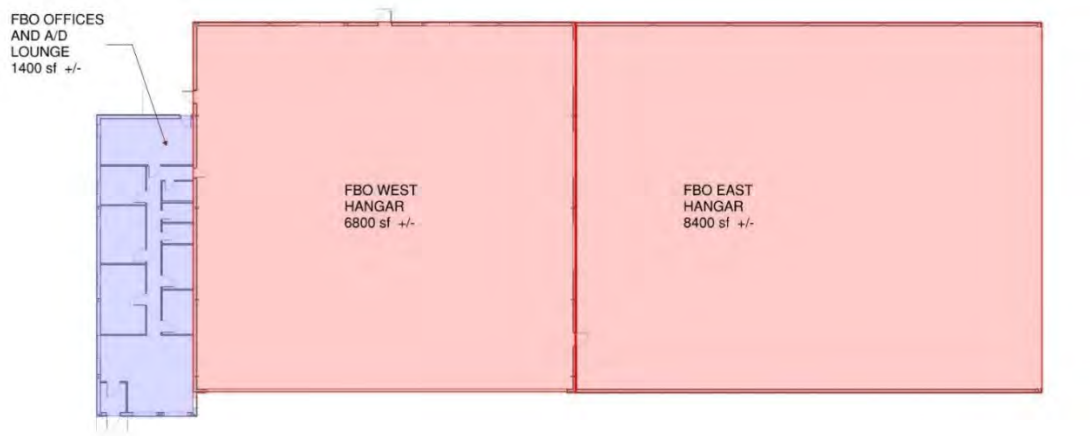
1.6.4 Fixed Base Operator (FBO) / General Aviation Terminal

Inventory

FBO services at CWA are provided by Central Wisconsin Aviation, a full service FBO. The FBO operates a GA terminal located approximately 500 feet east of the commercial service passenger terminal and provides aircraft maintenance, inspections, fueling and deicing, flight training, and a pilot lounge. The GA terminal (see **Figure 1-9**) is located in a 1,400 square foot lean-to addition to the approximately 6,800 square foot steel hangar. This hangar and addition were built in 1972. A second hangar of approximately 8400 square feet was built as an addition to the east in the 1990's. The GA terminal has space for passenger waiting, vending, public restrooms, a conference room, FBO offices, and operations. Although the GA terminal has direct access to the two hangars, the office building itself is aging and constrained. The GA terminal is accessed off CWA Drive which serves the commercial terminal building. There are approximately 34 parking spaces located near the GA terminal. See **Exhibit 1-11** for map of existing terminal area.

CWA is well suited to support corporate operations due to its runways and geographic location. The current GA terminal location also has good proximity to the consolidated rental car facility and commercial service passenger terminal. The GA terminal is often the face of the Airport when corporate traffic is arriving or departing.

Figure 1-9 Existing GA Terminal and Hangar Facility



Source: Airport Record Drawings.

Requirements

The objective of establishing facility requirements is to determine the quality, size, and types of facilities that are required for the facility to operate efficiently and to the desired level of service through the 20-year planning period. All buildings must meet functional objectives in addition to quality, energy consumption, and safety expectations represented by code requirements.

Arrivals and departures (A/D) buildings for general aviation perform a similar function to the commercial service passenger terminal building at a larger airport – as the main point of public interchange between the air and land transportation systems. An important distinction between a commercial terminal and an A/D building is that both passengers and pilots are members of the traveling public in an A/D building. For this reason, an A/D building needs several facilities that are commonly found in commercial service passenger terminal buildings, such as public restrooms and waiting areas but it also needs to provide facilities for pilots, such as flight planning and a pilot briefing area.

Existing Issues

In general, the facility is well-maintained, While the existing buildings were built in compliance with past code requirements, they are no longer fully compliant with current code requirements. Future renovations to these buildings will require that all affected portions be brought into compliance with current code. While many code issues, such as the tactile exit signs, can be remedied with little effort, other issues are inherent to the building's layout and construction. These components include the building roof and exterior walls which do not meet current commercial energy code requirements for insulation values. Additionally, the windows and doors need replacement because they leak and do not meet current energy requirements for insulation values. In general, the layout of the building is functionally acceptable with exceptions for areas including the public entry and restrooms which are not Americans with Disabilities Act (ADA) compliant. Several aspects of the GA terminal should be considered to better meet the Airport's needs. The front area

is congested with limited space for employees to interact with passengers and pilots without interfering with people in the waiting area. While the current crew rest area is partially separated from the rest of the GA terminal and provides a quiet environment, access and capacity is limited. The layout of the building could be changed so that each function within the building is more efficient.

Structural

The structure of the GA terminal is similar to a pre-engineered metal building system. Overall, there is a significant lack of information available about the existing structural design. The building code mandates that if loads are altered or increased on any structure that the structure be validated to meet the proposed new arrangements. Performing analysis to validate changes to the existing structure would require detailed information about the existing structure. Since this information is missing it would have to be obtained with extensive examination and documentation of the existing structure.

Electrical

The building is fed electrically from the main electrical vault in the ARFF building. The electrical infrastructure dates from the 1990s and most of the equipment shows significant wear and tear. The lighting in the hangar areas appears to be original to the building and with new lamping. Lighting in the hangar areas is controlled through panel breakers which is not code compliant and will require the addition of code compliant switching. Building operators have reported that circuiting going to special outlets could be mislabeled and has caused damage when equipment is attempted to be connected.

Technology

The GA terminal single mode fiber optic is run from the ARFF/SRE building through underground conduit as part of the facility fiber loop. The fiber then runs east through the hangar to the tower and also out to Gate C. The run through the hangar is not in conduit which exposes it to potential damage. There is a network cabinet in an office closet and in the hangar as well. The ethernet cables are Cat6 which is current standard. There is very little room in the GA terminal cabinet for additional equipment. This could present problems if the building is expanded. The current fiber is about half utilized so capacity for expansion is limited. The fiber appears to be in good shape and the staff report few transmission issues.

Mechanical/HVAC

The GA terminal office space is conditioned by a gas-fired separated combustion type furnace with separate direct expansion (DX) cooling coil suspended from the wall in the adjacent hangar. The furnace system also contains a humidifier system and an outside air ventilation duct connected to the furnace return air from the exterior. The supply air from the furnace is ducted underground and delivered to the facility via floor registers. Return air is ducted overhead. A single thermostat is installed in the corridor outside the breakroom area. Toilets are exhausted via a roof mounted exhaust ventilator. These systems appear to be reaching the end of their expected lifespan and are showing signs of wear.

Space Requirements

Like a commercial service passenger terminal, facilities in an A/D building are evaluated based on peak passenger activity. All facilities must be capable of adequately meeting the demands of this peak event. The CWA A/D building has been programmed for a peak usage of 30 passengers and pilots along with their baggage. This number is based on existing peak activity reported by the Airport Manager. Aviation forecasts show that future peak usage is expected to remain relatively steady for the foreseeable future.
Many of the recommendations for functional areas needed to meet future facility requirements have been developed using two primary references for airport terminal design which are listed below:

- FAA's AC 150/5360-9, Planning and Design of Airport Terminal Building Facilities at Non-Hub Locations.
- FAA's AC 150/5360-13, Planning and Design Guidelines for Airport Terminal Facilities.

The recommendations provided in the ACs were developed in the 1980s for airport terminal buildings, they are still useful today and can be applied to a general aviation A/D building.

Operational and Functional Requirements

Recommendations for changes to the facilities are based on addressing shortfalls and improving operational and/or functional performance. Building mechanical performance, for example, can be improved by replacing the existing mechanical equipment with more efficient equipment.

The primary purpose of the CWA A/D building is to serve the traveling public but it has secondary purposes as well. While these secondary uses are not eligible for federal funding, they are still necessary for the operation of the facility. The building will have the following additional operational requirements:

- A multi-purpose training room capable of accommodating approximately 5-10 attendees.
- Centralized FBO facilities that can be operated by 1-2 employees.
- A flight school.
- Circulation access to storage and maintenance hangars.
- Janitor facilities and general storage.

Project Space Requirements

The 2019 CWA Master Plan Update provided the following recommendations for public facilities, noting that these needs were not new at the time the Master Plan was written but have, in fact, been deferred for years:

- Immediate need for additional automobile parking.
- Need for additional hangars.
- Need for a new Arrivals/Departures building.

The recommendations for facilities provided in the 2019 CWA Master Plan Update are still valid today. The physical condition of the existing buildings is such that the existing FBO building would require replacement per Table 3-2 of Order 5100.38D, *Airport Improvement Program (AIP) Handbook*.

This TAMP provides the facility requirements for both buildings in greater detail than the 2019 CWA Master Plan Update in order to provide sufficient space for the complete facility.

A matrix is provided below, comparing the sizes of existing areas with facility requirements to meet expected usage:

Matrix 1 Existing Areas Compared to Facility Requirements

Program/Room	Eligibility	Suggested SF	Existing SF
Client-Facing	ELIGIBLE	1,420	475
Client-Support	PRORATED	1,550	675
Flight-Support	INELIGIBLE	1,050	190
Building Support	PRORATED	1,320	100
	TOTAL	**5,340**	**1,440**

Notes: 1. Based on AC 150-5210-15A.
2. Based on AIP Table O-1.

Recommendation Summary

Although the GA terminal facility and layout are outdated, its location has several advantages. The location of the building is central to the Airport, easily accessible via nearby parking, and located near the GA hangars. The public area should be expanded and/or reconfigured to improve circulation and the crew rest area should be moved further from high traffic areas to increase isolation and decrease noise. The GA terminal is often the face of CWA when corporate traffic is arriving or departing, and the new facility should be designed to provide a welcoming and impactful presence.

1.6.5 Hangars and Corporate Aviation Facilities

Inventory

Hangars at CWA are located east of the passenger terminal building. CWA provides three different types of hangars: T-hangars, transient hangars, and corporate hangars. There are two sizes of T-hangar units available at CWA, 10 larger units and 18 smaller units. T-hangar units are leased to private tenants although not all 28 units are currently leased. The transient hangars are owned by the Airport; however, two are currently leased to the FBO. The FBO hangars house aircraft rentals as well as private tenants. The corporate hangars at CWA are owned by private tenants on land leased by the Airport. Three new corporate hangars were recently constructed, and stakeholders anticipate that corporate activity will continue to grow at CWA.

Requirements

Existing Issues

One of the primary issues with the hangars relates to the condition of the T-hangars. Some units are in poor condition which includes certain portions of the building frames. Although they are still structurally sound,

the requirements assessment will not consider any of the existing T-hangars as available space for accommodating based aircraft growth.

Another issue with hangars is that CWA does not have a transient hangar large enough to house a large corporate jet. All corporate jets must park outside on the apron regardless of the weather conditions which is not ideal for pilots arriving during bad weather.

Needs

Hangar requirements were determined using the based aircraft forecast as summarized in **Table 1-22**.

Table 1-22 Forecasted Fleet Mix

Aircraft Type	Baseline	2027	2032	2037	2042
Single Engine	17	19	21	23	25
Multi Engine	3	3	4	4	5
Jet	5	6	6	7	7
Helicopter	1	1	1	1	2
Total	**26**	**29**	**32**	**35**	**39**

Source: Appendix A.

The exact size and type of hangars needed throughout the planning period is impossible to predict since it is driven by aircraft owner needs and preferences. Airport Cooperative Research Program (ACRP) Report 113 recommends that hangar sizes should be flexible because hangar ownership can change frequently. Providing a larger hangar can allow different aircraft sizes to use that hangar in the future. The typical approximate requirements for hangar sizes are summarized in **Table 1-23** and the hangar requirements are summarized in **Table 1-24**.

Table 1-23 Typical Approximate Hangar Unit Sizes for Aircraft Fleet Mix

Aircraft Type	Examples	Hangar Dimensions	Hangar Square Feet
Single Engine (Piston/Turboprop)	Cessna 172, Cirrus SR-22	T-hangar Units	1,400
Multi Engine (Piston/Turboprop)	Piper Seneca, Beechcraft King Air	Executive Hangar Units	3,600
Jet (midsize/corporate)	Gulfstream G550, Global Express	120 x 120	14,400
Helicopter	Sikorsky S-76, Bell 206	120 x 140[1]	16,800

Source: ACRP Report 113 used for approximate hangar sizes.

Note: Helicopter hangar dimensions are based on the approximate size as the existing helicopter hangar.

Table 1-24 Total Hangar Requirements for Forecasted Based Aircraft

Aircraft Type	Baseline	2027	2032	2037	2042
Single Engine					
Forecasted Aircraft	17	19	21	23	25
Total Hangar Demand (sq. ft.)	23,800	26,600	29,400	32,200	35,000
Multi Engine					
Forecasted Aircraft	3	3	4	4	5
Total Hangar Demand (sq. ft.)	10,800	10,800	14,400	14,400	18,000
Jet					
Forecasted Aircraft	5	6	6	7	7
Total Hangar Demand (sq. ft.)	72,000	86,400	86,400	100,800	100,800
Helicopter					
Forecasted Aircraft	1	1	1	1	2
Total Hangar Demand (sq. ft.)	16,800	16,800	16,800	16,800	33,600
Total					
Forecasted Aircraft	26	29	32	35	39
Total Hangar Demand (sq. ft.)	123,400	140,600	147,000	164,200	187,400

All the existing (baseline) based aircraft are currently housed in hangars. Although there are some units currently available in the T-hangars, as mentioned above, due to the condition of the T-hangars, that space will not be considered available space for accommodating based aircraft growth. **Table 1-25** summarizes hangar demand for forecasted based aircraft excluding the existing based aircraft.

Table 1-25 Based Aircraft Hangar Requirements Excluding Baseline

Aircraft Type	2027	2032	2037	2042
Single Engine				
Forecasted Aircraft Growth	+2	+4	+6	+8
Total Hangar Demand (sq. ft.)	+2,800	+5,600	+8,400	+11,200
Multi Engine				
Forecasted Aircraft Growth	+0	+1	+1	+2
Total Hangar Demand (sq. ft.)	+0	+3,600	+3,600	+7,200
Jet				
Forecasted Aircraft Growth	+1	+1	+2	+2
Total Hangar Demand (sq. ft.)	+14,400	+14,400	+28,800	+28,800
Helicopter				
Forecasted Aircraft Growth	+0	+0	+0	+1
Total Hangar Demand (sq. ft.)	+0	+0	+0	+16,800
Total				
Forecasted Aircraft Growth	+3	+6	+9	+13
Total Hangar Demand (sq. ft.)	+17,200	+23,600	+40,800	+64,000

The forecast indicates that CWA will see a need for more single engine aircraft hangars than corporate jet hangars; however, stakeholder groups have expressed that corporate users will be attracted to the Airport if their needs can be accommodated. To attract those users, the Alternatives Analysis chapter will consider providing additional corporate hangars while meeting the requirements for the other based aircraft.
In addition to attracting corporate users, the reservation of space using corporate hangars does provide flexibility in the case that the single and multi-engine hangar needs exceed the forecast.

1.6.6 Fuel Storage and Dispensing Facilities

Inventory

All fueling at CWA occurs above ground and is dispensed from the fuel farm. The fuel farm is located on the eastern portion of the airfield. It provides both airside and landside access. The fuel farm is accessible on the airside to fuel trucks via Taxilane E, allowing the trucks to fuel at the tanks and return to the general aviation apron to fuel aircraft. The fuel trucks are stationed on the general aviation apron in front of the GA terminal. Landside access to the fuel farm is provided via Flightline Drive which is accessed from Highway 153.

The fuel farm consists of five tanks and provides three different types of fuel: 40,0000 gallons of Jet A located on the west of the fuel farm, 20,0000 gallons of 100LL (low lead) located in the middle of fuel farm, and 10,000 gallons of unleaded diesel located on the east of the fuel farm.

The electrical services provided to these buildings are mostly fed from smaller utility provided transformers. Lighting in the fuel storage and dispensing facilities is original with new lamping.

Requirements

The Alternatives Analysis chapter will consider relocating the unleaded diesel closer to the terminal area. The chapter will also consider a new location for fuel trucks to park that is not as close to aircraft activity. Additional needs for fueling facilities will not be considered as part of TAMP.

1.6.7 Utilities

The primary electrical service at the Airport is provided via a utility owned 500kVA 480V 3PH transformer that feeds into a utility vault located in the ARFF building. There are two diesel generators on site that backfeed the primary electrical equipment throughout all of the main airport buildings. The newest generator located west of the terminal building is rated at 750 kW 480V 3PH and currently backfeeds the terminal building with an automated transfer switch (ATS) located in the ARFF utility vault. The existing diesel generator in the utility vault is rated at 500 kW 480V 3PH and currently provides standby power for the maintenance facility, airfield lighting, consolidated rental car building, GA terminal, and the commercial passenger service terminal. In addition, prior to the recent commercial passenger service terminal addition and remodel project, this generator also provided standby power for the landside portion of the terminal via a 1,600A transfer switch located in the maintenance building. This transfer switch is still connected to the generator; however, it was to be disabled (configured to not switch to generator power) as part of the terminal addition project. Staff has reported that this switch was not disabled. According to the facility operators the facilities peak demand for the service was 447 kW. The ATCT has its own 100 kW 208V 3PH generator to provide standby power to it.

1.7 Inventory and Requirements Summary

The goal of this chapter was to develop an understanding of existing facilities at the Airport. Using **Appendix A**, which provides CWA's aviation forecasts, the existing facilities were then evaluated based on whether they can meet future demand. Facilities that cannot meet existing or forecasted demand will be evaluated further in the Alternatives Analysis chapter.