

## Appendix A. Aviation Activity Forecasts FINAL

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In support of the Terminal Area Master Plan (TAMP) for Central Wisconsin Airport (CWA or the Airport), this technical report presents updated air carrier and general aviation activity forecasts that reflect changes in aviation activity at CWA since the Airport's most recent Master Plan forecasts were developed using 2016 as a base year. The Master Plan forecasts prepared in 2018, These forecast updates are limited to commercial operations, general aviation operations, and based aircraft because these metrics most affect the TAMP scope of work, which focuses on the needs of the immediate terminal area and general aviation facilities. Passenger-related forecasts such as enplanements and peak hour passengers have not been included in this forecast effort, as this Terminal Area Master Plan effort focuses on identified airside deficiencies rather than the terminal building needs of the airport. In addition to traditional forecast methodologies, the impacts and recovery from the COVID-19 Pandemic on the aviation industry, coupled with the existing pilot shortage, have been examined and projected into CWA's aviation activity forecast results.

The TAMP Forecasts are presented in the following sections:

- Forecast Preparation
- CWA Air Carrier and Air Taxi/Commuter Operations Forecasts
- CWA General Aviation and Based Operations Forecasts
- CWA Itinerant Aircraft Demand

### A.1 Forecast Preparation

Preparation of aviation activity forecasts for CWA employed a variety of overall aviation industry and economic data, as well as aviation activity specific to CWA. The following inputs have been included as part of this forecast preparation:

- COVID-19 Pandemic Recovery
- Industry Forecasts Overview
- Demographics (Central Wisconsin/Wisconsin)
- Federal Aviation Administration (FAA) Aerospace Forecasts, 2022-2042
- Air Service Input

#### A.1.1 Definitions

For the purposes of this forecasting effort, aircraft operations by type are defined as follows:

- **Air Carrier.** Aircraft with seating capacity of more than 60 seats or a maximum payload capacity of more than 18,000 pounds, carrying passengers or cargo for hire or compensation. This includes US and foreign-flagged carriers. (FAA Operations Network (OPSNET), <https://aspm.faa.gov/>).
- **Commuter.** According to 14 Code of Federal Regulations (CFR) Part 135, commuter operations may be conducted in airplanes that have a maximum passenger-seating configuration of nine seats and a maximum payload capacity of 7,500 pounds, or in any rotorcraft. In addition,



commuter operations cannot be conducted in any turbo-jet aircraft  
([https://www.faa.gov/licenses\\_certificates/airline\\_certification/135\\_certification/cert\\_process](https://www.faa.gov/licenses_certificates/airline_certification/135_certification/cert_process))

- **Air Taxi.** Aircraft designed to have a maximum seating capacity of 60 seats or less or a maximum payload capacity of 18,000 pounds or less, carrying passengers or cargo for hire or compensation. (FAA OPSNET, <https://aspm.faa.gov>)

### A.1.2 COVID-19 Pandemic Recovery

The coronavirus disease 2019 (COVID-19) was first identified in December 2019 and was declared a pandemic by the World Health Organization (WHO) in March 2020. As of November 2022, the WHO reports that more than 600 million cases of COVID-19 have been confirmed worldwide, and more than 6.6 million deaths have resulted from the pandemic.

#### **National Impacts of the COVID-19 Pandemic**

The COVID-19 Pandemic has had a significant impact on the aviation industry due to travel restrictions and a decline in demand among travelers. Significant reductions in passenger numbers have resulted in flights being cancelled or planes flying empty between airports. Airports and airlines alike have employed a multitude of strategies to mitigate the adverse effects of the pandemic that have included the following:

- Elimination of flight change fees and cancellation waivers
- Expansion of self-service equipment and electronic mobile applications
- Passenger screenings for COVID-19 symptoms
- Supply of personal protective equipment (PPE) among passengers and employees
- Improved cleaning efforts in airports and on aircraft
- Reconsideration of fleets and routes.

#### **Local (CWA) Impacts of COVID-19 Pandemic**

Specifically, the impacts to CWA have been significant in terms of air carrier activity, yet general aviation activity has sustained consistent growth. **As a result of the COVID-19 Pandemic restrictions**, air carrier operations declined by nearly 65 percent from 2019 to 2020. Likewise, air taxi and commuter operations declined by 17 percent over the same period. In contrast, itinerant and local general aviation operations increased by 11 percent and 15 percent, respectively. During the base year of this forecast, 2022, the air carrier and commuter/air taxi operations remain 77 percent and 26 percent behind 2019, respectively.

#### **Anticipated Industry Recovery (FAA) - Highlights**

##### **Air Carrier**

According to the *FAA Aerospace Forecast Fiscal Years 2022-2042*, the national passenger average annual growth rate is forecasted to increase by 4.9 percent throughout the forecast horizon. Air carrier activity is anticipated to return to pre-pandemic levels by 2024.<sup>1</sup>

<sup>1</sup> FAA, *FAA Aerospace Forecast Fiscal Years 2022-2042*.



### **General Aviation**

The active national general aviation fleet count is forecasted to increase by 0.1 percent between 2022-2024. The general aviation fleet recorded a slight increase of 0.1 percent in 2021. The turbine aircraft fleet, including rotorcraft, did not experience a decline between 2019 and 2020 and is estimated to have increased slightly between 2020 and 2021. General aviation flight hours are anticipated to exceed pre-pandemic levels by the year 2025 and continue to grow at an annual rate of 1.0 percent thereafter.<sup>2</sup>

#### **A.1.3 Industry Forecasts Overview**

##### **Boeing Forecast**

Boeing anticipates a 4.0 percent average annual growth in long-term passenger traffic through 2040. They believe this growth effort will be led by the domestic and short-haul air carrier routes. Low-cost carriers are leading this recovery, and the network airlines will follow as long-haul commercial air service traffic continues to recover.<sup>3</sup>

##### **Airbus Global Market Forecast**

Airbus recognizes that the air traffic recovery effort is underway. They believe that the fundamental drivers of passenger demand remain in place, and similar to Boeing, anticipate air traffic (as a combination of daily utilization, average seats per flight, and load factor) to grow by 3.9 percent annually through 2040. They also anticipate the delivery of approximately 39,000 new aircraft, comprised of approximately 36,600 passenger aircraft (>100 seats) and 2,400 freighter aircraft (payload >10 tons) during this same period.<sup>4</sup>

##### **Airlines for America**

The recovery projection from Airlines for America, the trade association for the country's leading passenger and cargo airlines, specifies that new ticket sales are rising, but demand for corporate and long-haul international air travel continue to trail pre-pandemic levels. In addition, they point out that, similar to numerous other industries, the U.S. airlines are continuing to face inflationary pressures across several cost categories, including labor, fuel, maintenance, rent, and landing fees.<sup>5</sup>

#### **A.1.4 Economics/Demographics (Central Wisconsin and Wisconsin State)**

Local and regional key socioeconomic data, such as population and per capita income provide an indication of the potential for growth in aviation activities at airports. For this forecasting effort, census data was consulted to review economic and demographic histories for the City of Wausau, Marathon, and Portage Counties, and the State of Wisconsin.

Population totals for these regions grew slightly between the 2010 and 2020 United States (U.S.) Census. Their growth rates still trail the national rate of growth (7.4 percent) in the U.S. In contrast, the State of Wisconsin experienced a 29 percent increase in per capita income between 2010 and 2020. This exceeds

<sup>2</sup> FAA, *FAA Aerospace Forecast Fiscal Years 2022-2042*.

<sup>3</sup> Boeing Commercial Market Outlook 2021-2040.

<sup>4</sup> Airbus Global Market Forecast 2021-2040.

<sup>5</sup> Airlines for America Industry Review: Allocating Capital to Benefit Customers, Employees, and Investors, August 25, 2022.



the U.S. per capita income surge of 16 percent during the same timeframe. Marathon and Portage Counties and Wausau City experienced per capita income growth rates of 14 percent, 8 percent, and 4 percent, respectively, lagging behind both the State of Wisconsin and the U.S. **Table A-1** lists the demographic and economic data for Central Wisconsin/Wisconsin.

**Table A-1 Economic/Demographic Data**

	Wisconsin			Marathon County		
	2010	2020	% Change	2010	2020	% Change
Population	5,686,986	5,895,908	4%	134,063	137,648	3%
Income Per Capita	\$26,624	\$34,450	29%	\$29,585	33,608	14%

	Portage County			Wausau City		
	2010	2020	% Change	2010	2020	% Change
Population	70,025	70,468	1%	39,106	39,575	1%
Income Per Capita	\$29,843	\$32,268	8%	\$29,131	\$30,382	4%

Source: United States Census Bureau, <https://www.census.gov/>.

According to the City of Wausau Community & Economic Development, Wausau City is the transportation hub to Central Wisconsin and the associated Northwoods. The metropolitan statistical area (MSA) of Wausau includes a population in excess of 300,000 people. It is also reported that Wausau businesses remain strong on both the national and international fronts. Primary businesses and employers include those that provide building materials, manufacturing, healthcare, information technology and insurance. Likewise, a query of economic data for the Wausau-Weston, WI Metropolitan Statistical Area (MSA) Woods and Poole Economics, Inc.(2022), revealed a positive economic forecast for the area through the year 2040. Population, employment, and per capita income are all anticipated to rise at a faster rate in Wausau-Weston MSA than in the state of Wisconsin as a whole.

The combination of strong/dynamic business development coupled with steady growth and consistency in community population and per capita income over the past decade, will likely support the constant yet steady growth that CWA has experienced and anticipates to observe in the future.

### A.1.5 FAA Aerospace Forecasts 2022-2042

#### **Air Carrier and Air Taxi/Commuter Forecast**

The 2022 FAA Aerospace Forecast calls for U.S. carrier domestic passenger growth to increase by an average of 4.7 percent per year over the next 20 years. A significant part of this growth is attributed to double-digit growth in 2022 and 2023 as aviation activity recovers from the COVID-19 Pandemic. Following the recovery period, domestic air service rates are anticipated to increase by 2.6 percent annually through 2042.



According to the FAA Aerospace Forecast, the forecasted average annual rates of change for air carrier and air taxi/commuter operations at regional airports with a tower are presented in **Table A-2**.

**Table A-2 Forecasted National Air Carrier and Air Taxi/Commuter Operations Average Annual Growth Rates**

Period	Air Carrier	Air Taxi/Commuter
2021 - 2022	12.8%	6.8%
2022 - 2032	5.3%	0.0%
2022 - 2042	3.4%	0.5%

Source: FAA Aerospace Forecast Fiscal Years 2022-2042.

**General Aviation Forecast**

The FAA Aerospace Forecast notes that the general aviation sector was less affected than its air carrier counterpart during the COVID-19 Pandemic. The long-term outlook for general aviation is promising, but with marginal rates of increase throughout the FAA 20-year forecast period. Specifically, the general aviation fleet is forecast to increase by only 0.1 percent annually between 2022 and 2042. Likewise, the number of general aviation hours flown throughout the forecast period is anticipated to increase by 31.4 percent, an average increase of 1.2 percent annually.

According to the FAA Aerospace Forecast, the forecasted average annual rates of change for itinerant and local general aviation operations at regional airports with a tower are presented in **Table A-3**.

**Table A-3 General Aviation Annual Growth Rate**

Period	Itinerant	Local	Total GA
2021 - 2022	5.9%	2.2%	4.0%
2022 - 2032	0.8%	1.0%	0.9%
2022 - 2042	0.6%	0.7%	0.6%

Source: FAA Aerospace Forecast Fiscal Years 2022-2042.

**A.1.6 Air Service Input**

In preparation of the CWA terminal area forecasts, understanding the nature of the ever-evolving air carrier industry and its potential impact to operations at CWA was critical. As such, air service consultants were interviewed to determine immediate and near-term changes anticipated by the airlines operating at CWA. The existing airlines servicing CWA, Delta Air Lines and American Airlines, are upgauging the aircraft that service CWA from 50-seat regional jets to 70/76-seat regional jets. The initial upgauge will begin in June of 2023, and it is anticipated that the remaining air carrier service will be upgauged by the beginning of 2024. The increase in seating capacity on the aircraft servicing CWA will result in the way that the operations are reported. Currently, all of the 50-seat regional jet aircraft are recorded as commuter operations rather than air carrier operations according to FAA’s definition presented in 14 CFR 119.3, Title 14. Once these aircraft are upgauged to 70/76 seats, these operations will be reported as commercial



operations. Thus far, there have been no indications from air service or the airlines that the frequency of air carrier operations will be reduced due to the upgauging of aircraft.

In addition, air service consultants confirmed the intention of a new entrant carrier to provide service at CWA with Boeing 737/700-800 equipment. It is anticipated that this new air carrier will operate a total of eight operations weekly with service to two destinations. For reference, a letter of support from a potential new entrant air carrier is included as *Attachment 1* at the end of this report.

## A.2 CWA Air Carrier and Air Taxi/Commuter Operations Forecasts

### A.2.1 Historical Air Carrier and Air Taxi/Commuter Operations (2018-2022)

Existing air carrier and air taxi/commuter air service operations are presented in **Table A-4**. The data from these tables was derived from the FAA Terminal Area Forecasts (TAF), CWA Air Traffic Control Tower (ATCT) counts, and airline flight schedules. Passenger air service is currently provided by both American Airlines and Delta Air Lines with direct service from CWA to Chicago O’Hare International Airport (ORD) and Minneapolis-St. Paul International Airport (MSP). For clarification, commercial operations are conducted by aircraft with 60 or more seats, while scheduled operations by aircraft with less than 60 seats are counted as commuter operations. All unscheduled air carrier operations with fewer than 60 seats are counted as air taxi operations. Scheduled air carrier at CWA uses 50-seat regional jets, hence the much higher air taxi/commuter operations count than that of the air carrier operations.

Also notable, both Delta and American Airlines have aircraft remain overnight at CWA. Delta’s CRJ-900 currently parks overnight in an available hangar, and American’s ERJ-145 remains on the terminal ramp overnight.

**Table A-4 CWA Historical Air Carrier and Air Taxi/Commuter Operations (2018-2022)**

Year	Air Carrier		Air Taxi/Commuter		Total Operations
	Annual Operations	Annual Growth Rate	Annual Operations	Annual Growth Rate	
2018	168	-	7,946	-	8,114
2019	203	20.8%	8,048	1.3%	8,251
2020	72	-64.5%	6,688	-17%	6,760
2021	47	-35%	7,601	14%	7,648
2022*	42	-11%	5,993	-22%	6,035

Source: TAF, March 2022; ATCT counts 2021 and 2022.

### A.2.2 Forecasted Air Carrier and Air Taxi/Commuter Operations (2022-2042)

The air carrier activity forecasts prepared for CWA are based on a long-term forecast methodology that considers multiple factors that fluctuate over the course of the 20-year planning horizon. The forecasting methodology for CWA uses a blend of historical and forecasted growth rates, as CWA’s air carrier operations have fluctuated since the Recession of 2008. A reasonable confidence interval cannot be



achieved by using trendline forecasting methodology specifically for air carrier operations due to fluctuations caused by the COVID-19 Pandemic and the likelihood of additional service provided by a new entrant air carrier in the short-term. The forecast approach must consider a variety of factors that will ultimately influence air carrier operations activity at CWA for the short (0-5 year), medium (5-10 year), and long-term planning (20 year) horizons. Development of future activity forecasts employed input from the following sources:

- Demographic statistics
- FAA Aerospace Forecasts
- FAA TAF
- Industry Forecast Reviews
- Air Service Consultations

Air carrier forecasts for CWA were produced to represent three different growth level scenarios: low, medium, and high. Each of the growth scenarios account for a short-term growth rate 12.8 percent, as recommended by the FAA Aerospace Forecasts for regional airports with air traffic control towers that are still in the process of recovering the Pandemic. This growth rate is slightly inflated to account Pandemic recovery, but it does align closely with CWA's historical air carrier annual rate of growth that has averaged nearly 10 percent since 2010. Growth level scenarios are described in detail below.

### **Scenario 1 – Low Growth**

- 2023**
    - Existing air carrier and commuter operations.
    - Annual growth rate of 12.8 percent (FAA Aerospace Forecasts).
    - Upgauging of existing 50-seat commuter operations to 70/76-seat air carrier operations effective in June 2023.
  - 2024**
    - *Average annual rate of growth 7.5 percent (average of historical growth and projected growth by FAA Aerospace Forecasts).*
    - All 50-seat commuter operations up-gauged to 70/76-seat air carrier operations by 2024.
  - 2025-2027**
    - Average annual rate of growth 7.5 percent (average of historical growth and projected growth by FAA Aerospace Forecasts).
  - 2028-2032**
    - Projected average annual growth rate of 3.4 percent (FAA Aerospace Forecasts).
  - 2033-2042**
    - Projected average annual growth rate of 3.4 percent (FAA Aerospace Forecasts).
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**Scenario 2 – Medium Growth**

- 2023**
  - Existing air carrier and commuter operations.
  - Annual growth rate of 12.8 percent (FAA Aerospace Forecasts).
  - Upgauging of existing 50-seat commuter operations to 70/76-seat air carrier operations effective in June 2023.
  - New near-term entrant air carrier providing 8 weekly air carrier operations in a B737-7/800 beginning in November 2023.
- 2024**
  - Average annual rate of growth 7.5 percent (average of historical growth and projected growth by FAA Aerospace Forecasts).
- 2025-2027**
  - Average annual rate of growth 7.5 percent (average of historical growth and projected growth by FAA Aerospace Forecasts).
- 2028-2032**
  - Projected average annual growth rate of 3.4 percent (FAA Aerospace Forecasts).
- 2033-2042**
  - Projected average annual growth rate of 3.4 percent (FAA Aerospace Forecasts).

**Scenario 3 – High Growth**

- 2023**
  - Existing air carrier and commuter operations.
  - Annual growth rate of 12.8 percent (FAA Aerospace Forecasts).
  - Upgauging of existing 50-seat commuter operations to 70/76-seat air carrier operations effective in June 2023.
  - Entrance of a new low-cost air carrier providing eight weekly air carrier operations in a B737-7/800 beginning in November 2023.
- 2024**
  - Average annual rate of growth 7.5 percent (average of historical growth and projected growth by FAA Aerospace Forecasts).
- 2025-2027**
  - Average annual rate of growth 7.5 percent (average of historical growth and project growth by FAA Aerospace Forecasts).
  - New entrant air carrier (in addition to the new carrier introduced in 2023) providing four air carrier operations weekly on B-737-7/800 aircraft beginning in 2025.
  - This new entrant carrier is calculated in addition to the new carrier included in years 2023 and 2024 under Scenario 2.
- 2028-2032**
  - Projected average annual growth rate of 3.4 percent (FAA Aerospace Forecasts).
- 2033-2042**
  - Projected average annual growth rate of 3.4 percent (FAA Aerospace Forecasts).

Air carrier operations, as forecasted using growth Scenarios 1-3 described above, are presented in **Table A-5**. All forecast scenarios anticipate some level of growth throughout the forecast period. Historically, since 2010 with the exception of the Pandemic downturn year of 2020, CWA has realized an average annual growth rate of nearly 10 percent in air carrier operations.



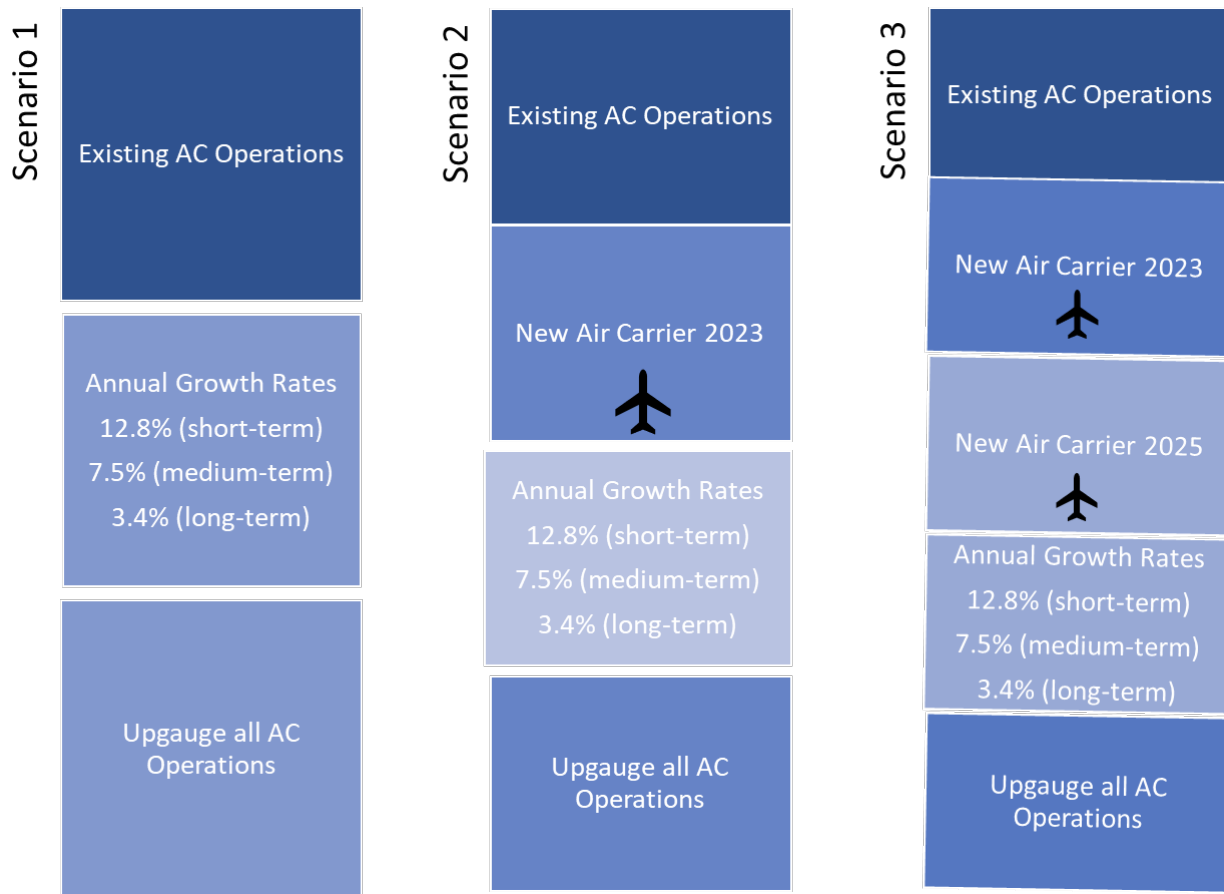


Table A-5 CWA Air Carrier Operations Forecast Scenarios (2022-2042)

Year	Scenario 1	Scenario 2	Scenario 3
2022	42	42	42
2023	1,853	1,943	1,943
2024	3,792	4,305	4,305
2027	4,703	4,975	5,215
2032	5,559	5,880	6,164
2037	6,571	6,950	7,286
2042	7,766	8,215	8,612

Figure A-1 illustrates the input into the air carrier forecasts for Scenarios 1-3.

Figure A-1 Air Carrier Forecast Scenarios



In addition to the air carrier forecasts, air taxi and commuter operations at CWA were forecasted through 2042. The air taxi and commuter operations were prepared under the following assumptions:

- 2023**
  - Baseline of 2022 operations.
  - Reduction of flights that will be upgauged and counted as air carrier rather than commuter operations beginning in June 2023.
  - Annual growth rate of 6.8 percent to account for a longer pandemic recovery (annual growth derived from historical growth and FAA Aerospace Forecast projections).
  - Anticipated continuation of air taxi and commuter activity throughout the forecast period due to air freight, medivac, and business jet commuter operations.
- 2024**
  - Annual growth rate of 6.8 percent to account for a longer pandemic recovery (annual growth derived from historical growth and FAA Aerospace Forecast projections) .
  - All 50-seat commuter operations up-gauged to 70/76-seat air carrier operations by 2024.
- 2025-2027**
  - Annual growth rate of 6.8 percent to account for a longer pandemic recovery (annual growth derived from historical growth and FAA Aerospace Forecast projections).
- 2028-2032**
  - Average annual growth rate of 0.5 percent (FAA Aerospace Forecast).
- 2033-2042**
  - Average annual growth rate of 0.5 percent (FAA Aerospace Forecast).

Due to the upgauging of aircraft in years 2023 and 2024, air taxi and commuter operations have been reduced. Many air taxi and commuter operations will remain, as CWA accommodates freight runner and medivac operations. In addition, many business jet operations qualify as commuter operations per FAA’s definition and are counted as such by air traffic control. **Table A-6** identifies the breakout of business jets and freight runner aircraft that operated at CWA in 2022.

**Table A-6 Air Taxi Aircraft Operating at CWA**

Aircraft	AAC	ADG
<b>Business Jets</b>		
Cessna Excel/XLS		
Cessna Citation Sovereign/Latitude/Longitude	B	II
Embraer Legacy 450		
Embraer Phenom 300		
Bombardier Learjet 60	C	I
Bombardier Challenger 300	C	II
Bombardier BD-700 Global Express	C	III



Aircraft	AAC	ADG
<b>Freight Operators</b>		
Cessna 208	A	II
Beech Airliner 99	B	I
Embraer Brasilia EMB 120	B	II
Beech 1900/C-12J		

Source: FAA TMFSC, 2022.

Following the initial reduction in operations due to upgauging in 2023 and 2024, air taxi/commuter operations are increased by an annual growth rate of 6.8% between the years 2025 and 2027 to allow for a longer than typical pandemic recovery. An annual growth rate of .5% has been applied to the long-term forecast (2028-2042), as recommended by the *FAA Aerospace Forecast 2022-2042*. Forecasted air taxi/commuter operations were developed using the assumptions described above are presented in **Table A-7**.

**Table A-7 CWA Historical/Forecast - Air Taxi/Commuter Operations**

Year	Air Taxi/Commuter
2018	7,946
2019	8,048
2020	6,688
2021	7,601
2022	5,993
2023	4,601
2024	3,113
2027	3,793
2032	3,888
2037	3,987
2042	4,712

Combined air carrier and air taxi/commuter operations forecast scenarios are presented in **Table A-8**. It is anticipated that the air carrier operations forecasts presented in Scenarios 2 and 3 will outpace the growth in commuter operations. This larger and faster rate of growth anticipated by air carrier operations, as presented in Scenarios 2 and 3, is due to the expectancy of new entrant carriers joining the CWA market that will operate aircraft with more than 60 seats. These aircraft will qualify as air carrier rather than commuter operations.



Table A-8 CWA Air Carrier and Air Taxi/Commuter Operations Forecast Scenarios (2022-2042)

Operations Category	Baseline	Short-Term			Medium-Term	Long-Term	
	2022	2023	2024	2027	2032	2037	2042
<b>Scenario 1</b>	<b>6,035</b>	<b>6,454</b>	<b>6,905</b>	<b>8,496</b>	<b>9,447</b>	<b>10,557</b>	<b>12,478</b>
AC	42	1,853	3,792	4,703	5,559	6,571	7,766
AT/Commuter	5,993	4,601	3,113	3,793	3,888	3,987	4,712
<b>Scenario 2</b>	<b>6,035</b>	<b>6,544</b>	<b>7,418</b>	<b>8,768</b>	<b>9,769</b>	<b>10,937</b>	<b>12,927</b>
AC	42	1,943	4,305	4,975	5,880	6,950	8,215
AT/Commuter	5,993	4,601	3,113	3,793	3,888	3,987	4,712
<b>Scenario 3</b>	<b>6,035</b>	<b>6,550</b>	<b>7,418</b>	<b>9,008</b>	<b>10,053</b>	<b>11,273</b>	<b>13,324</b>
AC	42	1,949	4,305	5,215	6,164	7,286	8,612
AT/Commuter	5,993	4,601	3,113	3,793	3,888	3,987	4,712

### A.3 CWA General Aviation Operations Forecasts

#### A.3.1 Historical General Aviation Operations (2018-2022)

This section provides an overview and forecast of general aviation operations and based aircraft at CWA. General aviation operations are those takeoffs and landings that are not generated by passenger airlines, cargo airlines, or the military. General aviation operations include, but are not limited to recreational flights, flight training, aerial applications, law enforcement, firefighting, infrastructure inspection, sightseeing, and traffic/weather reporting.

General aviation activity at CWA has witnessed continuous growth throughout the past several years. Despite the COVID-19 Pandemic, the total general aviation operations realized an average annual growth rate of nearly 10 percent since 2018. In comparison to the 2018 Master Plan forecast, total general aviation operations in 2022 have exceeded those forecasted for the year 2035 by 33 percent. More specifically, itinerant operations have increased on average by 4 percent, and local operations have had an annual growth of nearly 30 percent over the period. Most notably, both itinerant and general aviation operations at CWA did not experience a downturn from 2019 to 2020 as a result of the pandemic. Historical and existing general aviation operations at CWA are presented in **Table A-9**.

Table A-9 CWA Historical General Aviation Operations (2018-2022)

Year	Itinerant	Local	Total
<b>2018</b>	3,665	842	4,507
<b>2019</b>	3,345	1,387	4,732
<b>2020</b>	3,704	1,723	5,427
<b>2021</b>	3,889	1,963	5,852
<b>2022</b>	4,270	2,298	6,568

Source: FAA TAF, March 2022; CWA ATCT counts 2022.



### A.3.2 Forecasted General Aviation Operations (2018-2022)

Actual general aviation operations at CWA have surpassed forecasted operations by more than 6 percent, as presented in the TAF for 2022. Future years were not forecasted in the TAF issued for CWA in March 2022, as the number of general aviation operations held constant beyond 2022.

It is anticipated under the general aviation forecast that the Cherokees 2 OSH Fly-In, a summer fly-in attended by more than one hundred small general aviation aircraft, will continue during the month of July throughout the forecast period. **Figure A-2** shows apron demand during the Cherokees 2 OSH Fly-in.

**Figure A-2 Cherokees 2 OSH Fly-In**



In addition, Central Wisconsin Aviation offers flight training in a Cessna 172 and Piper Warrior II at CWA. Realizing an average annual growth rate of 56%, flight school operations have increased more than a tenfold since 2015.

**Table A-10** presents the forecast for both itinerant and local general aviation operations through 2042. Short-term rates of growth are consistent with the experienced historical operations at CWA. In addition, long-term forecast percentages have been derived from a combination of historical growth at CWA and forecasted long-term growth rates by the FAA Aerospace Forecasts. Likewise, rates of growth applied to general aviation operations also anticipate that demand from the local pilot base, flight school operations, and the Cherokees 2 OSH Fly-In will continue throughout the forecast period.

Table A-10 CWA General Aviation Operations Forecast (2022-2042)

	Year	Itinerant	Avg Annual %	Local	Avg Annual %	Total
Historical	2018	3,665	16%	842	12%	4,507
	2019	3,345	-9%	1,387	65%	4,732
	2020	3,704	11%	1,723	24%	5,427
	2021	3,901	5%	2,227	29%	6,128
Baseline	2022 <sup>1</sup>	4,270	9%	2,298	3%	6,568
Short-Term	2027*	5,195	4%	4,622	15%	9,817
Medium-Term	2032*	5,736	2%	6,185	6%	11,921
Long-Term	2037*	6,028	1%	6,829	2%	12,858
	2042*	6,336	1%	7,540	2%	13,876

Source: CWA ATCT Counts.

Notes: \* Forecasted.

### A.3.3 Based Aircraft

Historical based aircraft at CWA are presented in **Table A-11** for the years 2016-2022.

Table A-11 Historical Based Aircraft

Year	Based Aircraft
2018	23
2019	25
2020	25
2021	25
2022*	26

Source: FAA TAF, Issued March 2022.

\* 2022 National Based Aircraft Inventory, 11/11/2022.



Based aircraft by type, as presented in the National Based Aircraft Inventory ([www.basedaircraft.com](http://www.basedaircraft.com)), as of November 11, 2022, are listed in **Table A-12**.

**Table A-12 Based Aircraft by Type**

Aircraft by Type	No.
Single-Engine	17
Multi-Engine	3
Jet	5
Helicopter	1
<b>Total</b>	<b>26</b>
Other-Glider	1

Source: [www.basedaircraft.com](http://www.basedaircraft.com), 11/11/2022.

The FAA TAF issued March 2022 shows no growth in based aircraft, as it indicates a total of 25 based aircraft at CWA throughout 2042. In contrast, CWA has increased their total number of based aircraft in 2022 from 25 to 26. In 2022, CWA added three jet aircraft to their based aircraft fleet. A Cessna Latitude was added by GFO Aviation (fixed-base operator), and a Gulfstream G500 and a Dassault Falcon 2000EX, which are housed in new private hangars, were both relocated to CWA by Productivity Advantage. Based aircraft at CWA have experienced a constant, but fairly slow growth since 2016. To forecast based aircraft throughout the planning horizon, time series trend analysis was the forecast method used for this effort. Time series trend analysis uses historical patterns of activity to project future activity levels. Historically, since 2016, the average rate of growth of based aircraft at CWA has been 2.0 percent. When 2.0 percent is used as the annual rate of growth through the forecast period, the resultant-based aircraft total is forecasted to equal 39 aircraft by 2042. The historical and forecasted based aircraft totals are presented in **Table A-13**.

**Table A-13 Historical/Forecasted Based Aircraft**

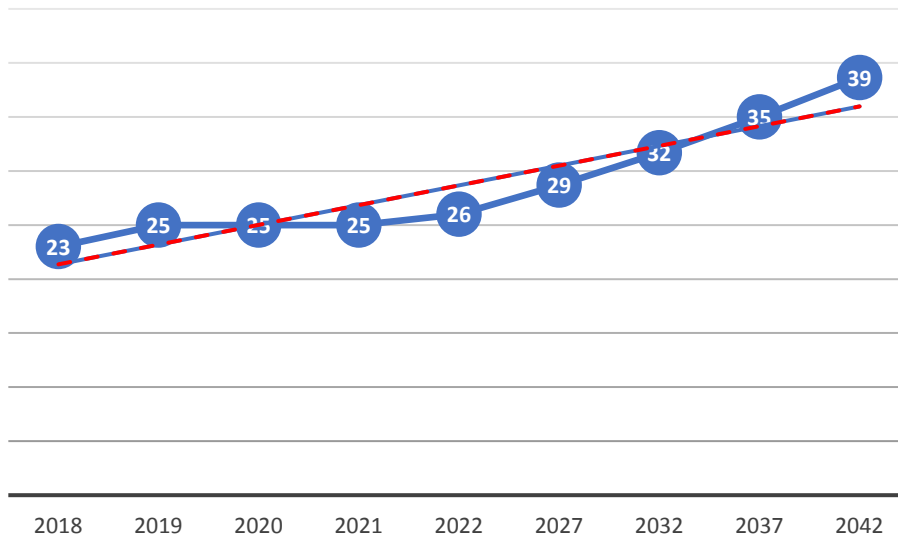
Year	Air Taxi/Commuter
<b>2018</b>	23
<b>2019</b>	25
<b>2020</b>	25
<b>2021</b>	25
<b>2022</b>	26
<b>2027*</b>	29
<b>2032*</b>	32
<b>2037*</b>	35
<b>2042*</b>	39

Note: \* Forecasted.



In addition, the trendline that accompanies this forecast is illustrated in **Figure A-3**.

**Figure A-3 Based Aircraft Projected Growth**



**Source:** Historical Based Aircraft (2016-2021), FAA TAF issued March 2022.

#### A.3.4 Itinerant General Aviation Aircraft Demand

Itinerant operations refer to aircraft arriving from or departing to another airport. Itinerant operations do not include training or touch-and-go operations. Temporary parking for visiting aircraft is typically provided for on an itinerant or transient aircraft parking apron within the general aviation services area. In accordance with FAA's *Advisory Circular 150/5070-6B, Change 2, Airport Master Plans*, parking apron requirements should be based on the regular use needs of the airport.

In order to plan an appropriate level of itinerant general aviation apron parking space, one must evaluate the itinerant aircraft demand at the airport. Typically, Average Day Peak Month (ADPM) is the calculation used to anticipate parking needs for itinerant aircraft. Based on reports from FAA's OPSNET and the ATCT tower counts, the month of July is peak at CWA for aircraft operations. In order to calculate ADPM, the total number of itinerant operations is divided by the number of days in the peak month. In the case of CWA, Cherokees 2 OSH-related operations were not included in the average calculation because they are due to a special event and are not considered regular use (by definition). The ADPM regular-use calculation totals 27 general aviation itinerant operations. The forecast was then developed by applying the same growth rates as those used to forecast general aviation operations. The subsequent aircraft forecast is displayed in **Table A-14**.





**Table A-14 Forecasted Itinerant GA Aircraft Operations**

	ADPM Itinerant Operations	Growth Rate
<b>ADPM 2022</b>	27	-
<b>2027</b>	33	4%
<b>2032</b>	36	2%
<b>2037</b>	38	1%
<b>2042</b>	40	1%

The resulting ADPM itinerant operation forecast indicates that parking for approximately 40 itinerant aircraft operations may be needed by the year 2042. To better understand the parking requirements necessary, aircraft demand is also broken down by the Aircraft Approach Category (AAC) and Airplane Design Group (ADG) applicable to the aircraft that are likely to use the parking apron. AAC is determined by the approach speed of an aircraft and ADG groups aircraft by type based upon wingspan and tail height. The parameters of the AAC and ADG groupings are highlighted in **Table A-15**.

**Table A-15 AAC/ADG Aircraft Grouping Parameters**

AAC	Approach Speed	ADG	Tail Height	Wingspan
<b>A</b>	< 91 knots	I	< 20 feet	< 49 feet
<b>B</b>	> 91 knots, < 121 knots	II	20 – 29 feet	49 – 78 feet
<b>C</b>	> 121 knots, < 141 knots	III	30 – 44 feet	79 – 117 feet
<b>D</b>	> 141 knots, < 166 knots	IV	45 – 59 feet	118 – 170 feet
<b>E</b>	> 166 knots	V	60 – 65 feet	171 – 213 feet
		VI	66 – 79 feet	66 – 79 feet

Source: FAA AC 150/5300-13B, *Airport Design*.

Using FAA’s Traffic Flow Management System Counts (TFMSC) data, historical itinerant aircraft data was sorted for the past five years by ADG/AAC, as illustrated in **Table A-16**.



Table A-16 TMFSC Historical Itinerant Aircraft Data

	2018		2019		2020		2021		2022 (through 10/31/22)	
	Count	% Total	Count	% Total	Count	% Total	Count	% Total	Count	% Total
A-I	349	29%	376	34%	407	42%	344	37%	288	32%
A-II	6	1%	13	1%	3	0.31%	5	1%	13	1%
A-III	1	0.08%	0	0%	0	0%	0	0%	0	0%
B-I	144	12%	121	11%	87	9%	115	13%	120	13%
B-II	510	43%	452	41%	357	37%	352	38%	335	37%
B-III	0	0%	0	0%	0	0%	0	0%	2	0.22%
C-I	139	12%	96	9%	94	10%	76	8%	81	9%
C-II	22	2%	37	3%	4	0%	20	2%	44	5%
C-III	0	0%	0	0%	0	0%	0	0%	4	0.45%
D-I	4	0.34%	0	0%	0	0%	0	0%	2	0.22%
D-II	6	1%	6	1%	8	1%	8	1%	2	0.22%
D-III	4	0.34%	2	0.18%	0	0%	0	0%	5	1%
<b>Totals</b>	<b>1,185</b>		<b>1,103</b>		<b>960</b>		<b>920</b>		<b>896</b>	

Source: [Traffic Flow Management System Counts \(faa.gov\)](https://www.faa.gov/traffic-flow-management-system-counts), 11/02/2022.

Then the percent for each AAC/ADG grouping of aircraft was calculated for each year and then averaged. The average percent of usage is further applied to the itinerant aircraft demand forecast in order to plan for appropriate aircraft parking space, as well as provide for maneuverability of each aircraft. The anticipated number of transient aircraft operations throughout the forecast period, sorted by group, is presented in **Table A-17**.



Table A-17 ADPM Itinerant Aircraft Demand

Forecast Year		2027	2032	2037	2042
<b>Itinerant Aircraft Operations</b>		<b>33</b>	<b>36</b>	<b>38</b>	<b>40</b>
<b>A-I</b>	35%	12	13	13	14
<b>A-II</b>	1%	1	1	1	1
<b>A-III</b>	.02%	1	1	1	1
<b>B-I</b>	12%	4	4	4	5
<b>B-II</b>	39%	13	14	15	16
<b>B-III</b>	.04%	1	1	1	1
<b>C-I</b>	10%	3	3	4	4
<b>C-II</b>	3%	1	1	1	1
<b>C-III</b>	.09%	1	1	1	1
<b>D-I</b>	.11%	1	1	1	1
<b>D-II</b>	1%	1	1	1	1
<b>D-III</b>	.22%	1	1	1	1

Aircraft, representative of the future itinerant general aviation aircraft fleet at CWA, are illustrated in **Figure A-4**.

Figure A-4 Representative Itinerant Aircraft



### A.4 TAF Comparison

The FAA Terminal Area Forecast (TAF), dated March 2022, was used as comparison to the prepared operations forecasts throughout the planning horizon. The referenced TAF is included as *Attachment 2* to this memo. The air carrier, air taxi/commuter, and general aviation forecasts for historical years 2018 – 2021, base year (2022) and forecasted years 2027 and 2042 are presented in **Table A-18**. In addition, the difference in operations numbers between the actual/forecasted and TAF values are presented as Delta ( $\Delta$ ).

**Table A-18 TAF/Forecast Comparison**

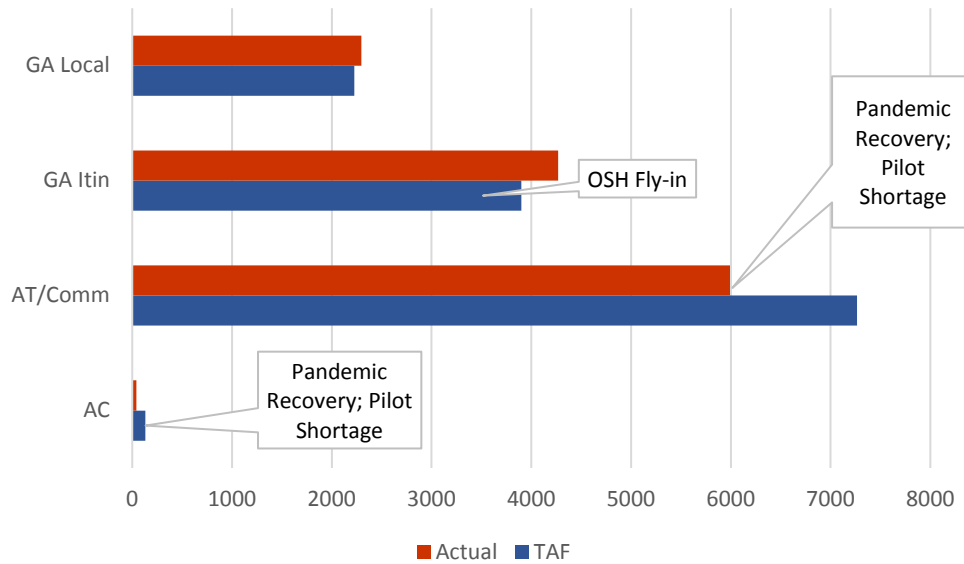
Year		AC	AT/Comm	GA Itinerant	GA Local
2018	Historical	168	7,946	3,665	842
2019		203	8,048	3,345	1,387
2020		72	6,688	3,704	1,723
2021		47	7601	3,889	1,963
		TAF	133	7,264	3,900
2022	Actual	42	5,993	4,270	2,298
	$\Delta$	68%	17%	-9%	-3%
	TAF	3,777	2,533	3,900	2,238
2027	Forecast	4,975	3,793	5,195	4,622
	$\Delta$	-32%	-50%	-33%	-107%
	TAF	3,950	3,004	3,900	2,238
2042	Forecast	8,215	4,712	6,336	7,540
	$\Delta$	-108%	-57%	-62%	-237%

**Table A-17** and the associated chart, *Figure 5*, show that in 2022, the actual itinerant and local general aviation operations exceeded the TAF by 9 percent and 3 percent, respectively. CWA did not realize a downturn in general aviation operations during the pandemic period. Strong local demand from flight schools and airport tenants supported the steady growth in local operations, while the Cherokees 2 OSH Fly-in created itinerant demand exceeding expectations of the TAF. In contrast, the air taxi/commuter operations were lower than projected in the TAF by 17 percent. Likewise, the actual air carrier operations fell below the forecasted operations for 2022 by 68 percent. The drastic difference in the air carrier operations is likely contributed to a slower pandemic recovery than what was anticipated by the TAF. In addition, CWA experienced a decrease in air carrier service due to pilot shortage. This shortage was sited by Delta Airlines as the reason that they discontinued service between CWA and Detroit Wayne International Airport (DTW) in 2023.

Differences between the TAF and the baseline for 2022 are further illustrated in **Figure A-5**.



Figure A-5 TAF vs. Forecast 2022



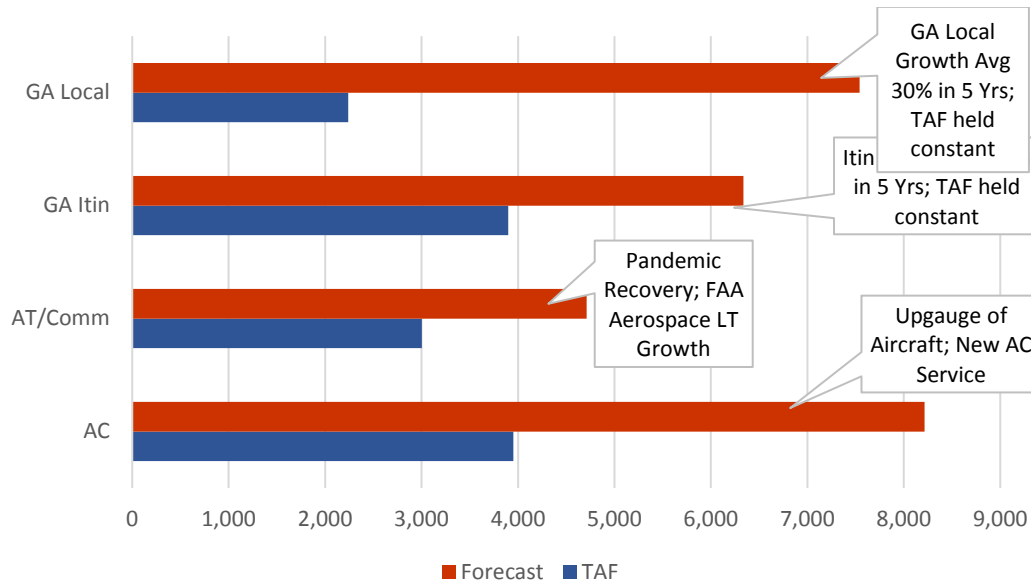
All forecasted operations at CWA exceed the TAF in the long-term, 2042. The significant difference in general aviation operations exceeded the baseline in 2022, and the TAF held general aviation operations constant allowing for no growth throughout the planning period. Projections for the general aviation operations, specifically in the short-term, mirror the historical rates of growth in the past five years. The rate of growth in the medium and long-term planning periods are slowed to emulate those recommended in the FAA Aerospace Forecast. However, due to the high percentage of growth in the short-term, both local and itinerant general aviation operations outpace those presented in the forecast.

The air taxi/commuter forecast lags behind that presented in the forecast. Specifically, the commuter air service at CWA was negatively impacted by the pilot shortage. In addition, CWA has also not rebounded from the impacts of the pandemic as quickly as projected by the FAA. These factors, combined with the near-term upgauging of aircraft that will essentially move how operations are counted from commuter to air carrier yields the forecast that is nearly 60 percent less than the TAF during the same long-term period. Likewise, the long-term air carrier forecast includes the upgauge of aircraft from less than 60 seat airplanes to airplanes with 70/76 seats on all air carrier aircraft in the future. The recommended air carrier forecast scenario also includes operations likely to be generated by an entrant air carrier in 2023 and forecasted to provide service throughout the long-term planning horizon.

Differences between the TAF and the forecast for 2042 are further illustrated in **Figure A-6**.



Figure A-6 TAF vs. Forecast 2042



### A.5 Forecast Summary

In summary, the forecast prepared for CWA examined future growth of air carrier operations, air taxi and commuter operations, general aviation operations, and itinerant aircraft demand. The forecasts accounted for the following at CWA:

- Recovery from COVID-19 Pandemic
- Upgauging of commercial aircraft
- New entrant air carriers
- Industry trends
- Historical operations

Scenario 2 was selected as the preferred forecast for air carrier operations for a host of reasons. First, Scenario 2 accounts for an annual rate of growth of 12.8 percent in 2023, as presented in the FAA Aerospace Forecasts for airports still in the recovery phase of the pandemic. This initial rate of growth was followed by smaller for annual rates of growth at 7.5 percent, also recommended by the FAA Aerospace Forecast, for the period 2024-2027. The long-term annual rate of growth applied to the period 2028-2042 was tapered to 3.4 percent, also recommended by the FAA Aerospace Forecasts. Secondly, Scenario 2 allows for the upgauge of all air carrier operations in the year 2023, and it is expected that the airlines will continue to operate 70/76 seat aircraft for the CWA markets into the foreseeable future. Lastly, Scenario 2 accounted for the entrance of a new low-cost air carrier in 2023, which added eight weekly operations to the air carrier forecast. A letter of intent to provide service from the anticipated to entrant air carrier is included as *Attachment 1* to this memo.



Scenario 1 was eliminated from further consideration, as it did not account for the growth in commercial operations that would be realized with the entrance of a new air carrier. CWA has received a letter of intent from an air carrier to utilize the Small Community Air Service Development program to assist with the funding of new service at CWA beginning in the summer of 2023.

Scenario 3 was not recommended as the preferred forecast, as it was deemed too aggressive in terms of commercial operations. Scenario 3 included multiple new air carriers providing operations to CWA within the short and medium timeframes. Whilst it is highly likely that CWA will receive and new commercial carrier within 2023, the likelihood of new carriers entering the market beyond that is unknown.

In short, Scenario 2, was deemed the forecast with the highest probability of being realized at CWA.

The recommended forecast for CWA is defined in **Table A-19**.

**Table A-19 CWA Recommended Forecast 2027-2042**

	Forecast Year	Air Carrier Operations (Scenario 2)	Air Taxi/Commuter Operations	General Aviation Operations	Based Aircraft	Itinerant ADPM Demand
<b>Short-term</b>	2027	4,975	3,793	9,817	29	33
<b>Medium-term</b>	2032	5,880	3,888	11,921	32	36
<b>Long-term</b>	2037	6,950	3,987	12,858	35	38
	2042	8,215	4,712	13,876	39	40



*Ms. Brooke Chapman, Associate Director  
Small Community Air Service Development Program  
Office of Aviation Analysis  
1200 New Jersey Avenue, SE W86-307  
Washington, DC 20590*

*Subject: Sun Country Airlines' Letter of Support for the Central Wisconsin Airport 2022 Small Community Air Service Development Grant Program*

*Dear Ms. Chapman,*

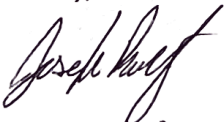
*Sun Country Airlines would like to express our support for the Small Community Air Service Development Program (SCASDP) application submitted by the Central Wisconsin Airport (CWA).*

*CWA is centrally located in the state of Wisconsin and plays a vital role in the economic vitality of north Central Wisconsin. The Central Wisconsin population, economy and business community depends on CWA to connect with the national transportation system.*

*The primary market area for CWA has a population of nearly 367,000. Within a 25-mile radius of CWA is a population of 187,915, expanding to nearly 460,000 in a 50-mile radius. The Central Wisconsin area has many local businesses, including industries from finance and insurance to retail and manufacturing to publishing and higher education. Multiple educational institutions are within the CWA catchment area as well, such as the University of Wisconsin-Stevens Point and Mid-State Technical College. Improved air service at CWA will benefit a broad section of the traveling public.*

*With the recent loss of one of the three air carriers serving CWA, United Airlines, the primary goal is to restore air service seat capacity to the region to some of CWA's top origin and destination markets. Much of the diversion to alternate airports is due to higher-than-average fares at CWA. Sun Country will be able to bring lower fares to a region with historically high fares and no low-cost carrier (LCC) service. Although Sun Country is confident the market will be a success, a risk-sharing revenue guarantee will be required to overcome the initial financial risks associated with a new station startup.*

*Sincerely,*



*Joe Beckendorf  
Director Network Planning and Airline Scheduling  
Sun Country Airlines*



# APO TERMINAL AREA FORECAST DETAIL REPORT

Forecast Issued March 2022

CWA

## AIRCRAFT OPERATIONS

Fiscal Year	Enplanements			Itinerant Operations				Local Operations			Total Ops	Total Tracon Ops	Based Aircraft	
	Air Carrier	Commuter	Total	Air Carrier	Air Taxi & Commuter	GA	Military	Total	Civil	Military				Total
<b>REGION:AGL STATE:WI LOCID:CWA</b>														
<b>CITY:MOSINEE AIRPORT:Mosinee/Central WI</b>														
2007	3,216	156,334	159,550	248	11,646	6,786	460	19,140	4,478	978	5,456	24,596	0	50
2008	2,999	154,607	157,606	107	11,738	6,015	334	18,194	3,391	640	4,031	22,225	0	25
2009	3,524	139,871	143,395	144	12,041	4,307	154	16,646	1,668	212	1,880	18,526	0	26
2010	3,003	151,669	154,672	122	12,143	4,417	306	16,988	1,994	604	2,598	19,586	0	26
2011	3,506	137,012	140,518	159	10,439	4,038	224	14,860	1,381	99	1,480	16,340	0	25
2012	3,703	120,293	123,996	143	9,204	4,013	109	13,469	1,636	139	1,775	15,244	0	29
2013	2,801	118,510	121,311	113	8,493	3,860	77	12,543	1,691	62	1,753	14,296	0	27
2014	2,646	123,968	126,614	139	8,366	3,594	22	12,121	1,440	36	1,476	13,597	0	27
2015	3,086	124,283	127,369	145	8,185	2,981	50	11,361	1,208	95	1,303	12,664	0	24
2016	3,706	114,207	117,913	99	8,017	2,952	52	11,120	1,204	50	1,254	12,374	0	23
2017	3,378	113,854	117,232	123	8,104	3,172	84	11,483	753	106	859	12,342	0	20
2018	3,036	117,736	120,772	168	7,946	3,665	46	11,825	842	44	886	12,711	0	23
2019	2,696	135,758	138,454	203	8,048	3,345	69	11,665	1,387	54	1,441	13,106	0	25
2020	1,737	77,932	79,669	72	6,688	3,704	56	10,520	1,723	40	1,763	12,283	0	25
2021*	1,038	79,685	80,723	53	7,346	3,901	60	11,360	2,227	95	2,322	13,682	0	25
2022*	1,578	105,091	106,669	133	7,264	3,900	60	11,357	2,217	95	2,312	13,669	0	25
2023*	2,006	132,582	134,588	360	7,002	3,900	60	11,322	2,224	95	2,319	13,641	0	25
2024*	2,174	143,375	145,549	1,295	5,869	3,900	60	11,124	2,231	95	2,326	13,450	0	25
2025*	2,221	146,334	148,555	2,540	4,358	3,900	60	10,858	2,238	95	2,333	13,191	0	25
2026*	2,248	148,143	150,391	3,669	2,987	3,900	60	10,616	2,238	95	2,333	12,949	0	25
2027*	2,277	150,045	152,322	3,777	2,533	3,900	60	10,270	2,238	95	2,333	12,603	0	25
2028*	2,307	151,975	154,282	3,794	2,561	3,900	60	10,315	2,238	95	2,333	12,648	0	25
2029*	2,334	153,793	156,127	3,808	2,591	3,900	60	10,359	2,238	95	2,333	12,692	0	25
2030*	2,361	155,532	157,893	3,822	2,620	3,900	60	10,402	2,238	95	2,333	12,735	0	25
2031*	2,387	157,259	159,646	3,834	2,650	3,900	60	10,444	2,238	95	2,333	12,777	0	25
2032*	2,414	159,014	161,428	3,847	2,680	3,900	60	10,487	2,238	95	2,333	12,820	0	25
2033*	2,440	160,723	163,163	3,859	2,711	3,900	60	10,530	2,238	95	2,333	12,863	0	25
2034*	2,466	162,462	164,928	3,871	2,742	3,900	60	10,573	2,238	95	2,333	12,906	0	25
2035*	2,493	164,199	166,692	3,883	2,773	3,900	60	10,616	2,238	95	2,333	12,949	0	25
2036*	2,518	165,902	168,420	3,895	2,805	3,900	60	10,660	2,238	95	2,333	12,993	0	25

# APO TERMINAL AREA FORECAST DETAIL REPORT

Forecast Issued March 2022

## AIRCRAFT OPERATIONS

Fiscal Year	Enplanements			Itinerant Operations				Local Operations			Total Ops	Total Tracon Ops	Based Aircraft	
	Air Carrier	Commuter	Total	Air Carrier	Air Taxi & Commuter	GA	Military	Total	Civil	Military				Total
2037*	2,543	167,488	170,031	3,905	2,837	3,900	60	10,702	2,238	95	2,333	13,035	0	25
2038*	2,566	169,019	171,585	3,914	2,870	3,900	60	10,744	2,238	95	2,333	13,077	0	25
2039*	2,589	170,543	173,132	3,922	2,903	3,900	60	10,785	2,238	95	2,333	13,118	0	25
2040*	2,613	172,102	174,715	3,932	2,936	3,900	60	10,828	2,238	95	2,333	13,161	0	25
2041*	2,636	173,650	176,286	3,941	2,970	3,900	60	10,871	2,238	95	2,333	13,204	0	25
2042*	2,660	175,189	177,849	3,950	3,004	3,900	60	10,914	2,238	95	2,333	13,247	0	25