Chapter 2
Forecasts

Demand is a key factor in airport planning. Proper planning must begin with a definition of demand that may reasonably be expected to occur during the useful life of an airport's key components (e.g., runways, taxiways, terminal buildings, etc.). In airport planning, this involves projecting potential aviation activity for at least a 20-year period. Aviation demand forecasting for Wilmington International Airport (ILM) will focus on demand indicators, including commercial airline passenger enplanements and operations, air cargo, based general aviation aircraft, based aircraft fleet mix, operations, military operations, and overall operational peaking periods.

The Federal Aviation Administration (FAA) has oversight responsibility to review and approve aviation forecasts developed in conjunction with airport planning studies. In addition, aviation activity forecasts are often an important input to future benefit-cost analyses associated with airport development, and the FAA reviews these analyses when federal funding requests are submitted.

The FAA will review individual airport forecasts with the objective of comparing them to its *Terminal Area Forecasts* (TAF) and the *National Plan of Integrated Airport Systems* (NPIAS). Even though the TAF is updated annually, it is developed by FAA personnel in Washington, D.C., and it is common to encounter a disparity between the TAF and more localized master planning forecast efforts. Historically, the disparity was primarily due to the TAF forecasters' lack of knowledge about local conditions or recent trends; however, the FAA updated its forecast model in recent years to be a more demand-driven forecast for aviation services, based on local and national economic conditions, as well as conditions within the aviation industry.

As stated in FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems (NPIAS)*, forecasts should be:

- Realistic;
- Based on the latest available data;
- Reflective of current conditions at the airport (as a baseline);
- Supported by information in the study; and
- Able to provide adequate justification for airport planning and development.

Historical operations at ILM, as reported by the airport traffic control tower (ATCT), are presented in **Table 2A**. This data will serve as a baseline for the development of new operational forecasts for ILM.

TABLE 2A | Operations History – Wilmington International Airport

	Itinerant Operations						Local Operations			
Calendar Year	Air Carrier	Air Taxi	Total Airline Operations	General Aviation	Military	Total Itinerant	General Aviation	Military	Total Local	Total Operations
2010	6,531	14,778	21,309	25,451	4,088	50,848	4,550	1,601	6,151	56,999
2011	4,620	15,990	20,610	23,714	3,992	48,316	5,868	1,366	7,234	55,550
2012	4,838	14,945	19,783	22,645	4,707	47,135	2,672	1,004	3,676	50,811
2013	6,801	13,039	19,840	23,309	4,678	47,827	3,318	834	4,152	51,979
2014	5,851	10,767	16,618	20,093	5,126	41,837	3,016	1,460	4,476	46,313
2015	6,466	10,016	16,482	20,276	4,698	41,456	5,047	2,371	7,418	48,874
2016	7,695	9,076	16,771	21,972	4,763	43,506	5,640	1,433	7,073	50,579
2017	7,278	10,079	17,357	24,009	6,459	47,825	7,807	2,198	10,005	57,830
2018	7,550	12,549	20,099	25,905	7,503	53,507	8,097	2,161	10,258	63,765
2019	8,626	13,912	22,538	25,855	7,740	56,133	9,283	3,690	12,973	69,106
2020	6,865	8,901	15,766	25,425	7,812	49,003	13,103	3,735	16,838	65,841
2021	10,870	10,868	21,738	29,403	9,250	60,391	13,468	4,511	17,979	78,370
2022	13,289	10,093	23,382	30,761	7,026	61,079	14,077	3,294	17,371	78,450
2023	15,408	10,021	25,429	33,113	5,968	64,510	20,074	3,078	23,152	87,662

Source: FAA Operations Network (OPSNET)

The forecast process in airport planning consists of a series of basic steps that vary in complexity, depending on the issues being addressed and the level of effort required. The steps include a review of previous forecasts, determination of data needs, identification of data sources, collection of data, selection of forecast methods, preparation of the forecasts, and evaluation and documentation of the results. FAA Advisory Circular (AC) 150/5070-6B (Change 2), *Airport Master Plans*, outlines seven standard steps involved in the forecast process, including:

1) **Identify Aviation Activity Measures**: The level and type of aviation activities likely to impact facility needs. For general aviation, this typically includes based aircraft and operations.

2) **Review Previous Airport Forecasts**: May include the FAA *Terminal Area Forecast*, state or regional system plans, and previous airport planning.

3) **Gather Data**: Determine what data are required to prepare the forecasts, identify data sources, and collect historical and forecast data.

4) **Select Forecast Methods**: Several appropriate methodologies and techniques are available, including regression analysis, trend analysis, market share or ratio analysis, exponential smoothing, econometric modeling, comparison with other airports, survey techniques, cohort analysis, choice and distribution models, range projections, and professional judgment.

5) **Apply Forecast Methods and Evaluate Results**: Prepare the actual forecasts and evaluate for reasonableness.

6) **Summarize and Document Results**: Provide supporting text and tables, as necessary.

7) **Compare Forecast Results with FAA's TAF**: Follow guidance in FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems*. In part, this Order indicates that forecasts should not vary significantly (more than 10 percent) from the TAF. When there is a greater than 10 percent variance, supporting documentation should be supplied to the FAA. (The FAA has provided additional guidance that indicates forecasts are consistent with the TAF when they differ by less than 10 percent in the first five years and less than 15 percent in the 10-year period.)

Aviation activity can be affected by many influences on the local, regional, and national levels, making it virtually impossible to predict year-to-year fluctuations of activity over 20 years with any certainty; therefore, it is important to remember that forecasts are intended to serve only as guidelines, and planning must remain flexible enough to respond to a range of unforeseen developments.

The forecasts prepared here will be compared to the FAA *Terminal Area Forecasts* issued in January 2024. A summary of the TAF for ILM is presented in **Table 2B**. The following sections of this chapter will discuss the reasonableness of each forecast and will establish the recommended forecast to be used.

TABLE 2B | FAA Terminal Area Forecast

	2023	2028	2033	2043
ENPLANEMENTS				
Air Carrier	331,065	332,229	365,730	441,447
Commuter	311,002	415,598	457,420	551,834
Total Enplanements	**642,067**	**747,827**	**823,150**	**993,281**
ANNUAL OPERATIONS				
Itinerant				
Air Carrier	15,301	17,824	19,371	22,799
Air Taxi/Commuter	9,903	10,396	10,956	12,162
General Aviation	32,372	32,776	33,186	34,021
Military	6,110	6,110	6,110	6,110
Total Itinerant	**63,686**	**67,106**	**69,623**	**75,092**
Local				
General Aviation	19,935	20,745	21,588	23,379
Military	3,129	3,129	3,129	3,129
Total Local	**23,064**	**23,874**	**24,717**	**26,508**
Total Operations	**86,750**	**90,980**	**94,340**	**101,600**
Based Aircraft	**111**	**130**	**150**	**190**

Source: FAA Terminal Area Forecast (January 2024)

The following forecast analysis was produced following these basic guidelines. Existing forecasts are examined and compared against current and historical activity. The aviation activity is then examined along with other factors and trends that can affect demand. The intent is to provide an updated set of aviation demand projections for ILM that will allow airport management to make planning adjustments, as necessary, to maintain a viable, efficient, and cost-effective facility.

NATIONAL AVIATION TRENDS

Each year, the FAA updates and publishes a national aviation forecast. Included in this publication are forecasts for large air carriers, regional/commuter air carriers, general aviation, and FAA workload measures. The forecasts are prepared to meet the budget and planning needs of the FAA and to provide information that can be used by state and local authorities, the aviation industry, and the public. The current edition when this chapter was prepared was *FAA Aerospace Forecast – Fiscal Years* (FY) *2023-2043*. The FAA primarily uses the economic performance of the United States as an indicator of future aviation industry growth. Similar economic analyses are applied to the outlook for aviation growth in international markets. The following discussion is a brief synopsis of highlights from the FAA's national commercial service and general aviation forecasts.

FAA COMMERCIAL SERVICE FORECASTS

The commercial airline industry in the United States has been subject to ups and downs that are primarily related to the economy, but that change is often volatile. For more than two decades after deregulation, commercial airlines were capital intensive as they competed for market share, which left the airline industry cash poor. While profits were evident in good economic times, the economic cycle (and the price of oil) would inevitably turn and airlines would suffer significant losses, sometimes resulting in bankruptcies or mergers.

The aftermath of the events of September 11, 2001 (9-11), prompted a new round of airline restructuring and consolidation as changes to airline business models began to take shape; however, the Great Recession that began in 2007 and carried into 2009 brought about perhaps the most deliberate change in how the U.S. airlines manage their operations and finances. The commercial airlines' focus fully shifted from increasing market share to boosting returns on invested capital. The airlines worked to minimize losses by lowering operating costs, focusing on profitable routes, and removing older and less fuel-efficient aircraft from their fleets. A key to this shift was capacity discipline, which became an industry buzz phrase. This discipline, combined with some airlines charging separately for certain services, resulted in 11 consecutive years of profits for the U.S. airline industry, extending through 2019.

The outbreak of the COVID-19 global pandemic brought an immediate end to the years of prosperity. While restrictions related to the pandemic nearly halted traffic overnight, airlines began to face a new reality. Because their business models emphasized capacity discipline, they were able to slash costs. With the balance sheets and credit ratings built up over the past decade, they were able to raise capital through borrowing and restructuring fleets. While several regional airlines were not able to survive through 2020, all the mainline carriers did.

These modifications will affect the airline industry for years. Airlines became smaller due to retiring aircraft reducing the workforce through the encouragement of voluntary retirements/separations. The fleet is now younger and more fuel-efficient, but the higher levels of debt are likely to limit capital investment spending, thus restraining growth.

Domestic leisure traffic led to the recovery; pent-up consumer demand due to travel restrictions was experienced, as predicted. Routes shifted somewhat to serve domestic vacation destinations, while business and international travel lagged. By the summer of 2022, leisure demand exceeded pre-pandemic levels. By the end of 2022, business travel stood at about 70-80 percent of pre-pandemic demand.

Over the long term, the airlines' business models developed during the past decade are expected to aid the recovery, demonstrating that the U.S. airline industry has left behind its capital intensive/cyclical tendencies for the discipline that can better generate returns on capital and sustain profits.

The 2023-2043 FAA forecast for U.S. domestic passengers projects an average growth of 2.7 percent annually over the next 20 years; however, that average included 8.5 percent growth expected in 2023 to result in near-full recovery to 2019 passenger levels. Beyond 2023, growth is predicted to average 2.2 percent annually through 2033, then grow to average 3.2 percent annually between 2033 and 2043. **Figure 2A** presents the U.S. domestic passenger enplanement forecasts.

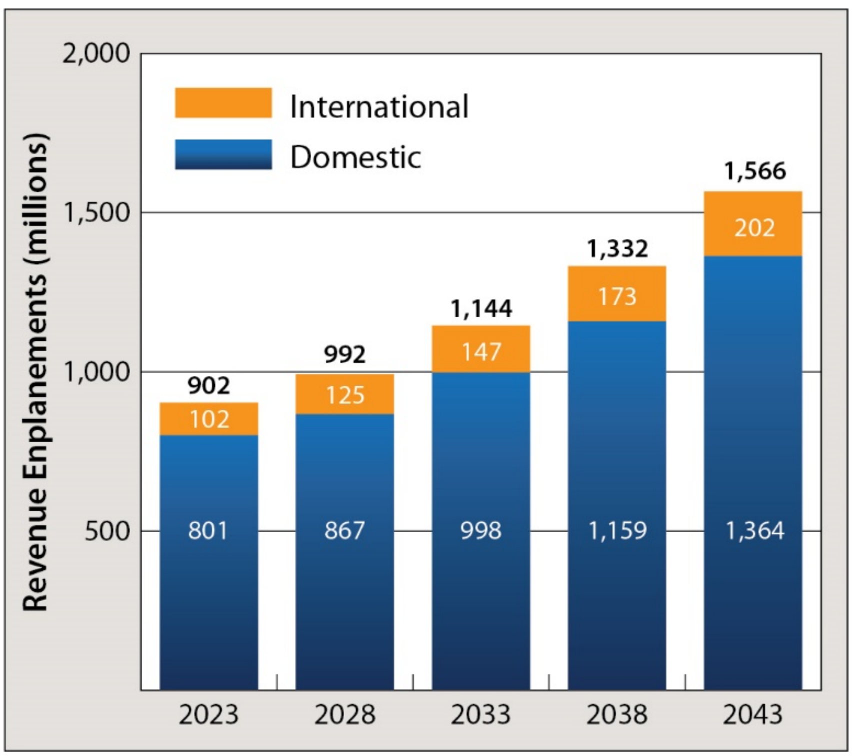


Figure 2A – Commercial Enplanement Forecasts

ADVANCED AIR MOBILITY (AAM)

Another segment of air travel that is becoming a factor for the future is the potential of the emerging industry of advanced air mobility (AAM). AAM utilizes manned and unmanned electric-powered aircraft that are capable of vertical takeoff and landing (eVTOL) to conduct air taxi operations, moving people around urban areas and providing connections to other transportation modes, including airports. Other segments within the AAM industry include emergency services, package delivery, traffic monitoring, and public safety.

AAM technology presents considerable opportunities for economic growth over the coming decades. Small package delivery is the segment that is anticipated to grow fastest in the short term. The FAA estimates that there will be 40,000 delivery fleet vehicles completing 500 million deliveries per year by 2030.

Passenger service promises even larger markets for AAM services. Full integration may be slowed by safety challenges, infrastructure, public acceptance, and evolving technology; regardless, several commercial companies continue to conduct test flights. For example, Joby Aviation received Part 135 certification in May 2022 for its eVTOL aircraft. The four-passenger aircraft currently has the capability to fly 150 miles on a full battery charge.

One of the potential challenges of eVTOL entering the marketplace is infrastructure. A system of vertiports for AAM services appears to be the preferred method of operation. Joby Aviation and Archer have partnered with parking garage operator REEF Technology with the goal of using parking garage rooftops as vertiports. Other options may include establishing vertiports at existing airports.

CORE SOCIOECONOMIC FORECASTS

Besides aviation industry trends, the local demographics and economy will affect airport demand. Key indicators selected for ILM are population, employment, gross regional product (GRP), and food and beverage retail sales by stores and serving places. The latter indicator was selected because of the high number of second homes and vacation room rentals that impact local air travel demand. **Table 2C** presents a history and forecasts of these indicators for the Wilmington metropolitan statistical area (MSA), as prepared by Woods & Poole.

Between 2000 and 2023, the population of the MSA has grown by a compound annual growth rate (CAGR) of 2.25 percent. Woods & Poole forecasts the population to grow at a CAGR of 1.32 percent through 2043. Total employment in the three-county MSA grew at a similar 2.33 percent CAGR between 2000 and 2023. The forecast for employment calls for 1.70 percent annual growth through 2043.

The economic indicators are presented in 2012 dollars, adjusted for inflation. GRP grew at a CAGR of 2.91 percent over the past 23 years. The forecast anticipates a higher growth rate of 2.39 percent annually through 2043. Over the same periods, the inflation-adjusted food and beverage retail sales grew at 2.74 percent CAGR, with a forecast of 2.79 percent annually through 2040.

TABLE 2C | Socioeconomic Forecasts – Wilmington MSA*

Year	Population	Employment	GRP (millions 2012 $)	Food & Beverage Retail Sales (millions 2012 $)
Actual				
2000	275,816	154,656	10,755.4	1,084.3
2005	318,743	184,568	13,651.6	1,080.3
2010	363,780	190,934	15,228.7	1,336.4
2015	386,796	214,610	16,738.6	1,473.9
2020	425,106	241,629	19,258.1	1,892.7
2023	467,337	263,188	20,836.0	2,020.6
Forecast				
2028	494,474	286,956	23,189.6	2,407.8
2033	528,951	312,982	26,271.2	2,739.7
2043	598,140	368,352	33,385.0	3,501.2
CAGR				
2000-2023	2.25%	2.33%	2.91%	2.74%
2023-2043	1.32%	1.70%	2.39%	2.79%

*The Wilmington MSA is comprised of New Hanover, Pender, and Brunswick Counties in North Carolina.

Source: Complete Economic and Demographic Data Source (CEDDS) 2020, Woods & Poole

COMMERCIAL SERVICE FORECASTS

To evaluate commercial service potential and future airline activity at Wilmington International Airport, two basic elements must be forecast: annual enplaned (boarding) passengers and annual airline operations. Annual enplaned passengers serve as the most basic indicators of demand for commercial passenger service activity. The combination of enplanements (departing passengers) and deplanements (arriving passengers) comprises the total number of passengers using an airport. The annual number of enplanements is the figure utilized by the FAA to determine various entitlement funding levels for commercial service airports.

Enplaning passengers can be further categorized as either originating or connecting. Originating passengers depart from a specific airport for either their destination airport or a hub airport to connect (transfer) to another flight to their final destination.

Connecting passengers are those who have departed from another location and are using the airport as an intermediate stop. These passengers may disembark their originating flight to wait in the terminal for their next flight or could simply remain on the aircraft at an intermediary stop as a through passenger. Wilmington International Airport almost exclusively serves originating passengers, while airline hubs like those in Charlotte, Atlanta, or Chicago have a significant percentage of connecting/transferring passengers.

WILMINGTON COMMERCIAL SERVICE BACKGROUND

Exhibit 2A graphically depicts the history of passenger enplanements at Wilmington International Airport over the past 20 years, as recorded by the U.S. Department of Transportation (USDOT). Over the past 20 years, ILM has seen its passenger activity grow from 280,051 in 2004 to an all-time high of 657,353 in 2023.

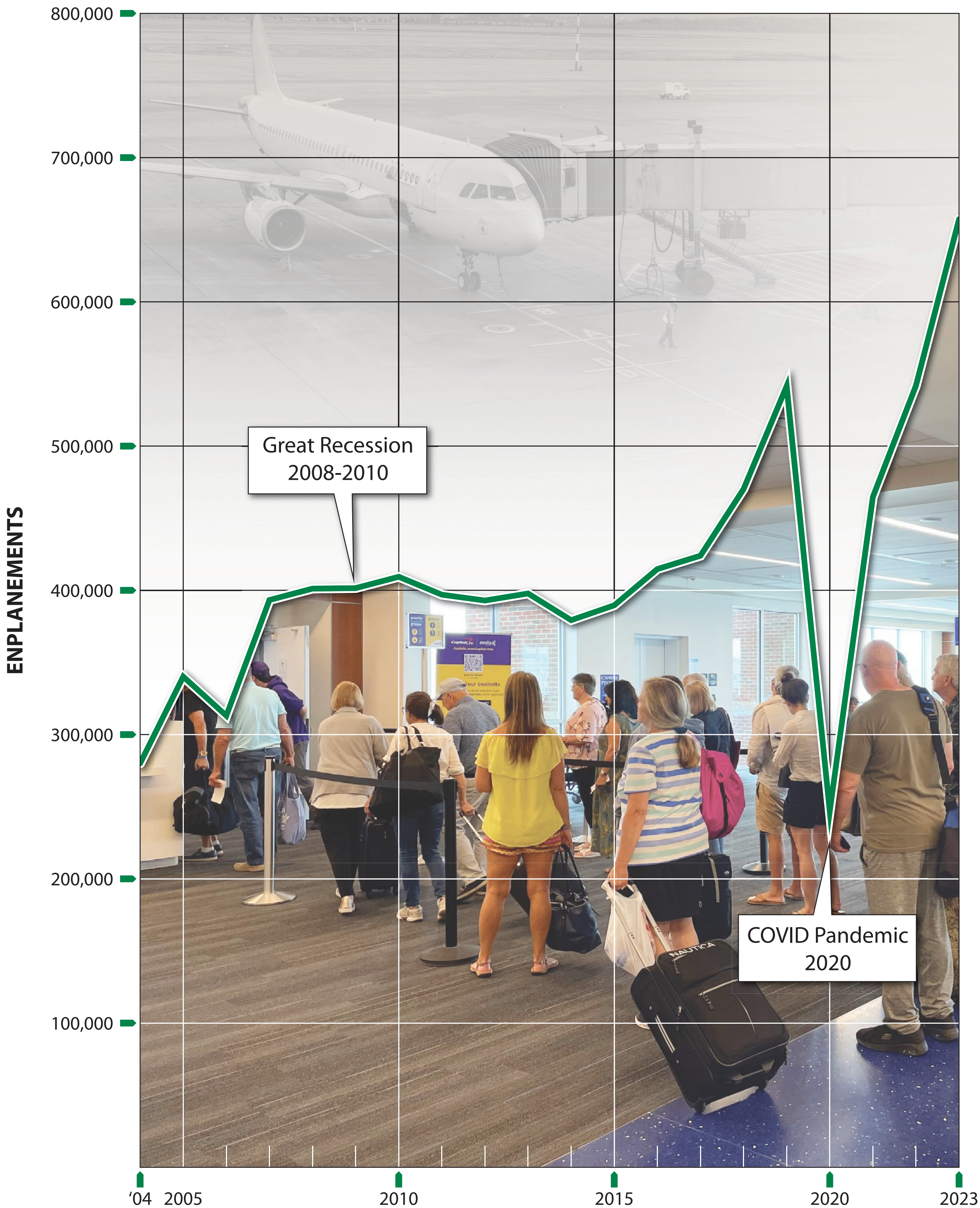


Exhibit 2A
ENPLANED PASSENGER HISTORY

The airport experienced strong passenger growth leading up to the Great Recession of 2008-2009. During the recovery from the recession, enplanements remained relatively flat through 2015. In 2016, ILM experienced a 6.4 percent increase over the previous year, raising enplanements to a record 414,749. A new high was set every year through 2019, when ILM reached 538,014 enplanements.

The COVID-19 pandemic in 2020 put a dramatic end to the year-over-year-growth. **Figure 2B** shows a month-by-month comparison of enplanements at ILM from 2019 through 2023. It is evident from the graph that 2020 enplanements started out higher than 2019, but travel restrictions began to have an impact in March, and traffic became almost nonexistent during the April shutdown, averaging just 60 enplanements a day. Traffic began to slowly return, and by June 2021, matched the levels of the same months in 2019. Enplanements in 2022 essentially matched 2019, and 2023 set a new all-time high of 21.3 percent over 2022 and 21 percent over pre-pandemic numbers.

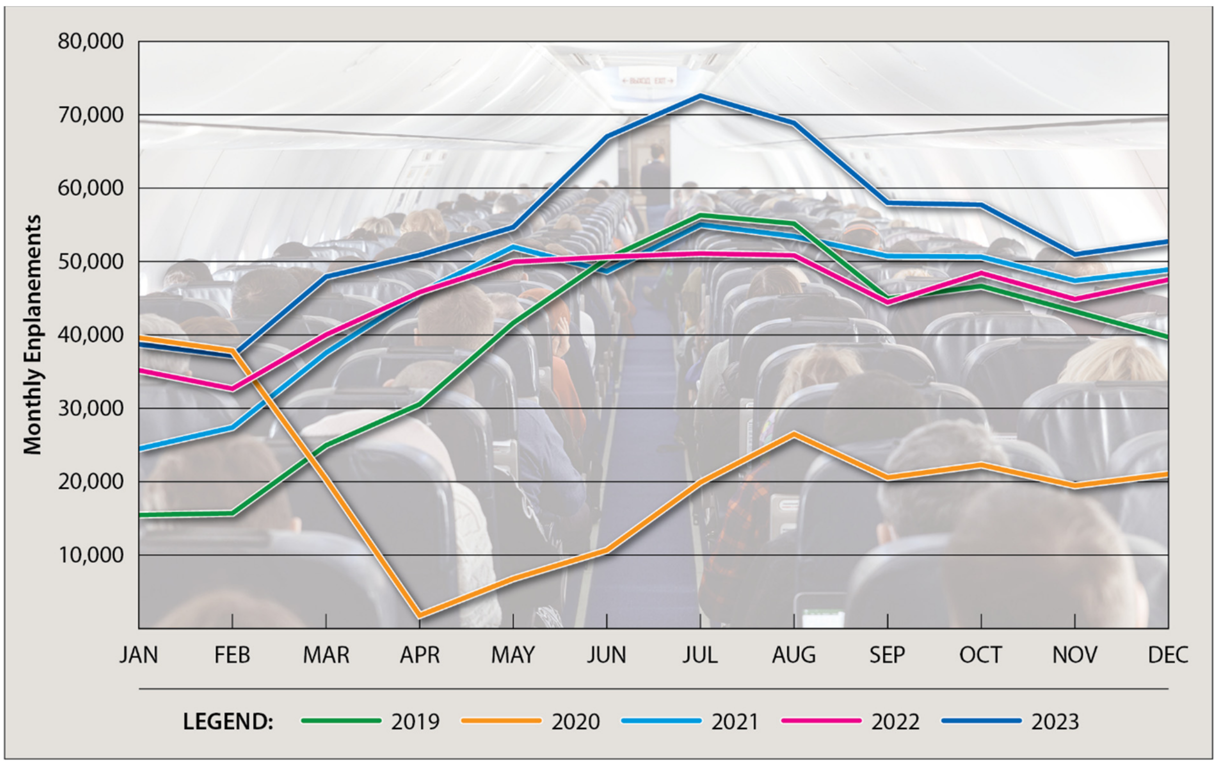


Figure 2B – Monthly Enplanements

ENPLANEMENT REPORTING

The Air Carrier Activity Information System (ACAIS) is the database where the FAA maintains information regarding revenue passenger enplanements. U.S. scheduled and nonscheduled certificated air carriers, commuter air carriers, and small certificated air carriers submit data to the DOT on Form 41 Schedule T-100. Foreign flag air carriers submit data to the DOT on Form 41 Schedule T-100(f). In addition, the FAA conducts an annual survey of air taxi/commercial operators that report their nonscheduled activity on FAA Form 1800-31, *Airport Activity Survey*. This information is used in the determination of annual entitlement funds for primary commercial service airports, such as ILM.

Exhibit 2A and **Figure 2B** were prepared from the enplanement statistics submitted by U.S. certificated air carriers and commuter air carriers to the DOT on Form 41 Schedule T-100 and by foreign carriers on T-100(f).

The ILM airport staff also records enplanements for New Hanover County Airport Authority's (NHCAA) records. Each airline operating at the airport is required to provide a monthly activity report that includes its enplanements and deplanements for revenue and non-revenue passengers. **Table 2D** presents a comparison of the sets of revenue enplanement data since 2019.

The final column includes historical enplanements listed for ILM in the 2023 FAA TAF. The data, as presented in the TAF, are by federal fiscal year (FY) instead of calendar year. Because the fiscal year begins in October of the previous year, the enplanement numbers will not necessarily match; however, the TAF historical data are also derived from T-100 data.

TABLE 2D | Historical Airport Reporting – Wilmington International Airport

	Annual Revenue Enplanements		
Year	**DOT T-100**	**NHCAA**	**FAA TAF**
2019	541,506	538,014	526,050
2020	246,826	242,157	317,743
2021	464,711	455,748	395,867
2022	541,936	545,899	523,072
2023	657,292	661,287	642,067

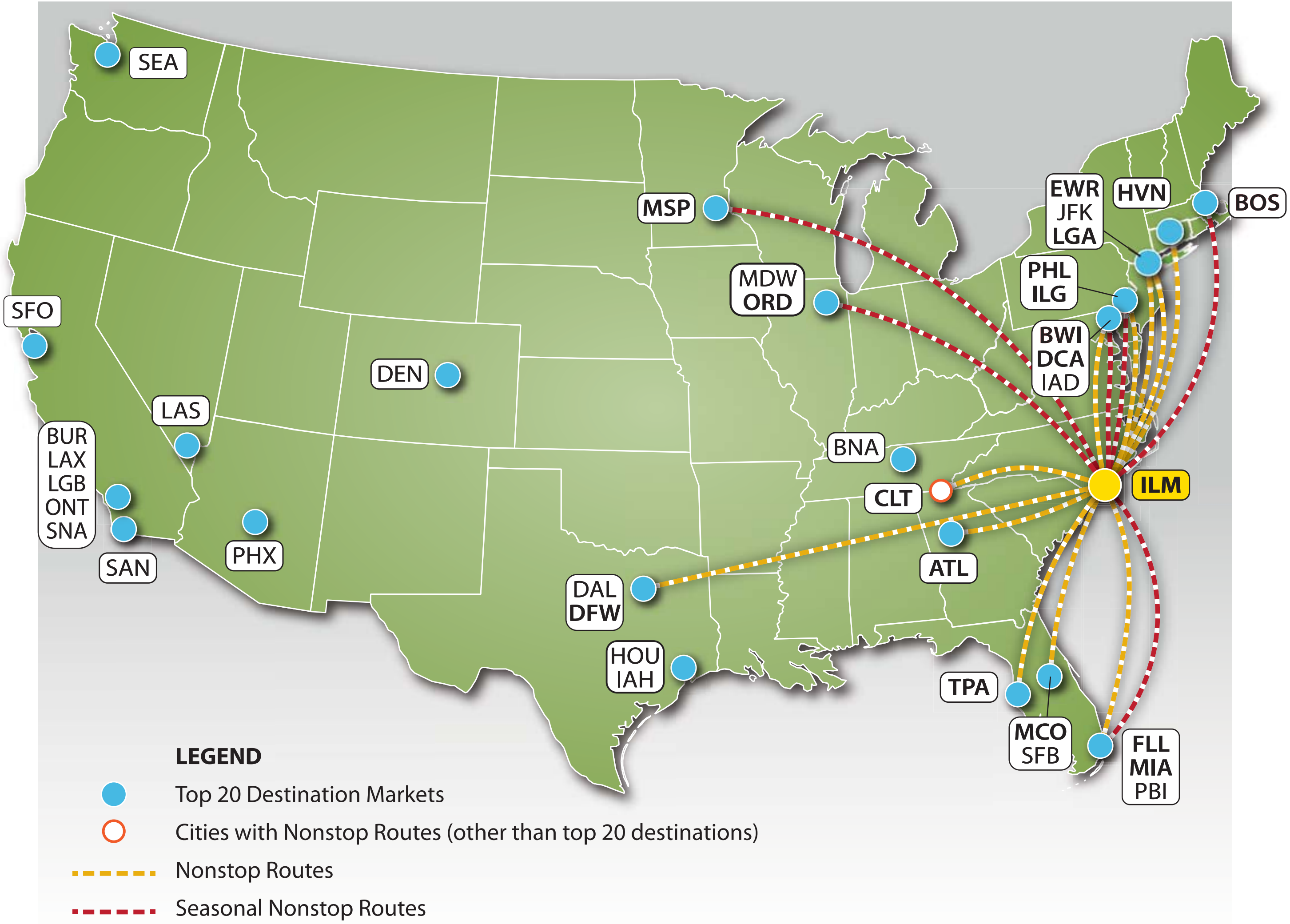
The NHCAA enplanement count varies slightly from the T-100 totals, which is likely due to some differences in reporting and/or counting. For the purposes of this forecast effort, the DOT T-100 records will be the historical baseline for enplanements. The difference between the two counts is consistently less than 1.5 percent. In addition, the T-100 data provide airline data – including origin-destination data, flight activity, and aircraft seat capacity – that are utilized in the forecast effort.

ORIGIN AND DESTINATION MARKETS

The U.S. DOT maintains a rolling quarterly survey of 10 percent of all airline tickets sold for each commercial service airport. This Origin and Destination (O&D) Survey provides information on passengers' starting and ending cities and shows the volume of traffic between city pairs.

Information obtained from the O&D Survey provides final destinations for those traveling from ILM. Origin-destination data are typically useful in examining the strength of the local market to and from other markets. The data include both ILM arrivals from (origins) and departures to (destinations) each of the top 20 markets. A market city is typically a metropolitan area and, in certain instances, may be served by multiple airports. For example, LaGuardia (LGA), Kennedy International (JFK), and Newark (EWR) Airports serve the New York-Newark market, and Midway (MDW) and O'Hare International (ORD) Airports serve the Chicago market. **Exhibit 2B** depicts Wilmington's top 20 markets and its nonstop destinations in 2023.

TOP 20 DESTINATIONS/NONSTOP ROUTES - 2023



TOP 20 DESTINATIONS - 2023

Rank	Market	Enplaned	Rank	Market	Enplaned
1	New York-Newark (EWR,JFK,LGA)	91,996	11	Chicago (MDW,ORD)	14,681
2	Miami-South Florida (FLL,MIA,PBI)	28,472	12	Denver (DEN)	11,669
3	D.C.-Baltimore (BWI,DCA,IAD)	25,801	13	Tampa-St. Petersburg (TPA)	10,258
4	Orlando (MCO,SFB)	25,365	14	Minneapolis-St. Paul (MSP)	9,841
5	Philadelphia (ILG,PHL)	21,393	15	Las Vegas (LAS)	9,637
6	Boston (BOS)	20,315	16	Phoenix (IWA,PHX)	9,032
7	Atlanta (ATL)	18,269	17	San Francisco (OAK,SFO,SJC)	8,623
8	Dallas-Ft. Worth (DAL,DFW)	17,381	18	Nashville (BNA)	7,660
9	New Haven (HVN)	17,262	19	Houston (HOU,IAH)	6,227
10	Los Angeles (BUR,LAX,LGB,ONT,SNA)	15,705	20	Seattle (SEA)	6,059

Exhibit 2B: TOP 20 MARKETS AND NONSTOP DESTINATIONS

Table 2E shows the top 20 markets for 2010, 2019, and 2023 with the intention of showing how destinations might have changed over time. Passenger levels in 2010 were at the end of the Great Recession, while 2019 represents traffic just prior to the COVID-19 pandemic. A new all-time high for passengers was set in 2023.

Notably, New York-Newark was the top-ranked O&D market in each of the three years. Furthermore, the top destination market grew its share of the ILM enplanements from 9.3 percent in 2010 to 14.7 percent in 2023, when it had more than triple the number of passengers of any other destination market. D.C.-Baltimore and Philadelphia have also remained in the top five. D.C.-Baltimore experienced market share growth from 3.4 percent in 2010 to 4.1 percent in both 2019 and 2023. Philadelphia captured a 3.4 percent market share in both 2010 and 2023.

Overall, 15 markets have remained in the top 20 all three years, and each of those markets had more ILM enplanements in 2023 than 2019. All but four markets experienced higher enplanements in 2023 than 2019.

ILM currently has nonstop flights to 17 airports in 13 different markets. New York-Newark, Philadelphia, D.C.-Baltimore, and Miami-South Florida each have nonstop flights to two airports. 12 of the top 20 markets are served by nonstop flights from ILM and the top nine markets are served by ILM nonstop flights. Charlotte, NC, is the only nonstop market that is not in ILM's top 20 destinations. New Haven, CT, became one of ILM's top 20 destinations for the first time in 2023 with 17,262 enplanements, compared to just 556 enplanements in 2019. New Haven is one of six destinations that are served with nonstop flights from ILM by Avelo Airlines, which began serving ILM in 2022.

TABLE 2E | Top 20 Destination Markets – Wilmington International Airport

Market	2010	Market	2019	Market	2023
1. New York-Newark	35,506	1. New York-Newark	48,847	1. New York-Newark	91,996
2. Orlando	20,044	2. D.C.-Baltimore	21,646	2. Miami-South Florida	28,472
3. Philadelphia	17,160	3. Atlanta	20,281	3. D.C.-Baltimore	25,801
4. Atlanta	14,180	4. Chicago	20,355	4. Orlando	25,365
5. D.C.-Baltimore.	12,805	5. Philadelphia	18,987	5. Philadelphia	21,393
6. Miami-South Florida	28,210	6. Miami-South Florida	16,616	6. Boston	20,315
7. Chicago	11,932	7. Los Angeles Basin	15,682	7. Atlanta	18,269
8. Boston	11,511	8. Boston	14,668	8. Dallas/Ft. Worth	17,381
9. Los Angeles Basin	10,758	9. Dallas/Ft. Worth	13,479	9. New Haven, CT	17,262
10. San Francisco Bay	8,576	10. Denver	11,781	10. Los Angeles Basin	15,705
11. Dallas/Ft. Worth	8,373	11. San Francisco Bay	10,435	11. Chicago	14,681
12. Denver	7,350	12. Cincinnati	9,520	12. Denver	11,669
13. Houston	6,428	13. Orlando	9,102	13. Tampa-St. Pete	10,258
14. Las Vegas	6,221	14. Las Vegas	8,587	14. Mpls-St. Paul	9,841
15. Tampa-St. Pete	6,105	15. Tampa-St. Pete	8,527	15. Las Vegas	9,637
16. Nashville	6,083	16. San Diego	7,700	16. Phoenix	9,032
17. Hartford, CT	5,788	17. Phoenix	7,645	17. San Francisco Bay	8,623
18. Detroit	5,758	18. Mpls-St. Paul	6,978	18. Nashville	7,660
19. Pittsburgh	5,497	19. Austin	6,740	19. Houston	6,227
20. Columbus	5,270	20. Pittsburgh	6,734	20. Seattle-Tacoma	6,059
Top 20 Total	**217,771**		**284,310**		**375,646**
Total True Destinations	**374,182**		**524,399**		**623,819**
Top 20 %	**58.2%**		**54.2%**		**60.2%**

COMMERCIAL SERVICE AREA

The service area for an airport is a geographic region from which an airport can be expected to attract the largest share of its activity. The service area is used to identify other factors, such as socioeconomic and demographic trends, which influence demand at an airport. Aviation demand is also impacted by the proximity of competing airports, the surface transportation network, and the strength of commercial airline services provided by the airport relative to competing airports.

Exhibit 2C depicts Wilmington International Airport in proximity to other airports that currently have scheduled commercial airline service. As seen on the exhibit, four other commercial service airports establish the drive-time service area for ILM. These four airports provide varying levels of service; only Myrtle Beach International Airport (MYR) is considered to offer an equal or higher level of service than ILM.

- **Albert J. Ellis Airport (OAJ)** – located in Onslow County, 56 miles (1:01 drive time) north of Wilmington International Airport – averaged seven daily flights and enplaned 131,000 passengers in 2023.
- **Fayetteville Regional Airport (FAY)** – located in Cumberland County, 90 miles (1:44 drive time) northwest of ILM – averaged eight daily flights and enplaned 157,000 passengers in 2023.
- **Florence Regional Airport (FLO)** – located in Florence County, SC, 132 miles (2:44 drive time) west of ILM – averaged two daily flights and enplaned 23,000 passengers in 2023.
- **Myrtle Beach International Airport (MYR)** – located in Horry County, SC, 81 miles (1:45 drive time) southwest of ILM – averaged 40 daily flights and enplaned 1.68 million passengers in 2023.

Based on the drive-time isochrone, the commercial service area for ILM includes New Hanover County, the majority of Brunswick and Pender Counties, and portions of Columbus, Bladen, Sampson, Duplin, and Onslow Counties. The greatest extension of the ILM service area is to the north along the county line between Sampson and Duplin Counties.

The census population within this service area has grown from 315,041 in 2000 to 448,041 in 2020; however, the core of the service area is the Wilmington MSA. The MSA 2020 census population within the service area totals 390,453, which comprises more than 87 percent of the service area population. It should be noted that the 2020 census population count includes Brunswick County for the purpose of comparison to the current Wilmington MSA.

ENPLANEMENT FORECASTS

The first step involved in updating an airport's forecasts includes reviewing previous forecasts in comparison to actual activity to determine what changes (if any) might be necessary. After the review comes the consideration of any new factors that could impact the forecasts, such as changes in the socioeconomic climate or the effects of changes in air carrier services.

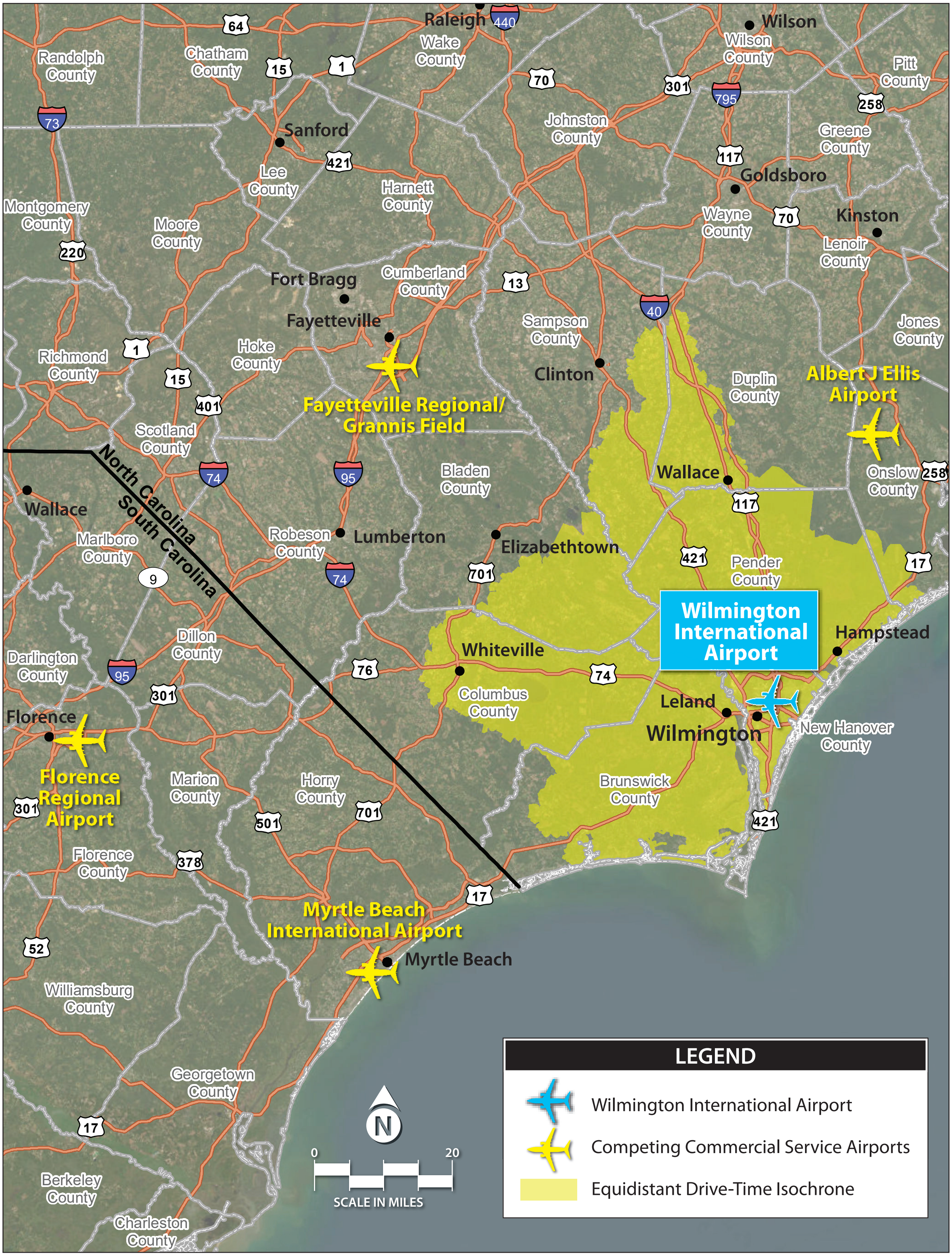


Exhibit 2C
COMMERCIAL AIRLINE SERVICE AREA

Previous Enplanement Forecasts

There are two recent forecasts of enplanement activity at Wilmington International Airport to consider:

- InterVista's estimates of passenger volumes for the *ILM Public Parking and Rental Car Programming Study* (October 2023)
- The FAA's 2023 *Terminal Area Forecast* (January 2024)

The forecasts for the airport's recent parking study were developed by InterVista from a three-year forecast prepared by the New Hanover County Airport Authority and expanded based on the growth rate used in the 2022 FAA TAF, which was issued in early 2023. The NHCAA had projected enplanements to reach 770,000 in 2026; InterVista projected enplanements to 2047 using a 2.3 percent annual growth rate based on the TAF growth rate.

As mentioned earlier, the FAA's TAF is updated annually and is utilized by the FAA as a starting point for considering the reasonableness of an airport's planning forecasts. The current TAF was issued in January 2024.

Table 2F presents these two enplanement forecasts for ILM. Recent historical enplanements are also included. As can be seen, the InterVista forecast is higher than the current TAF by 7.1 percent in 2026, growing to 15.4 percent higher in 2043. This is primarily due to a lower annual growth rate of 1.92 percent in the current TAF.

TABLE 2F | Previous Enplanement Forecasts – Wilmington International Airport

	2023	2026	2028	2033	2043
Actual	657,292				
ILM Parking Study (Oct. 2023)		770,000	818,000	917,000	1,146,000
2023 FAA TAF (Jan. 2024)		718,565	747,827	823,150	993,281

Enplanement Projections

The history of enplaned passengers at Wilmington International Airport over the past two decades has been discussed in earlier sections. Following the 2008-09 recession, enplanement levels flattened over an eight-year period. That pattern ended in 2016, when a new record of 415,000 enplanements was achieved, followed by three more record-setting years. The 2019 enplanement total of 541,500 completed a four-year growth of 32 percent. This strong growth period ended dramatically with the 2020 global pandemic, when passenger numbers decreased by more than 55 percent in one year. Enplanements regained to the 2019 level in 2022.

A variety of time-series extrapolation and regression analyses that used multiple variables, including aviation and socioeconomic factors, were tested in relation to historical ILM enplanements. For these analyses, the correlation coefficient (Pearson's "r") measures the association between the dependent variable (enplanements) and the independent variable(s). In social sciences, an r value greater than 0.90 generally indicates good predictive reliability. A value below 0.90 may still be considered, with the understanding that the predictive reliability is lower. Several variables were tested to determine if they might produce more reliable statistical trends.

The time-series analysis of enplanements from 2004 through 2023 generated a correlation coefficient of just 0.638. If the years of the COVID-19 pandemic and subsequent recovery (2020-2022) are removed, the r value increases to 0.848.

For the regression analyses, the independent variables tested included the Wilmington MSA socioeconomic factors (listed earlier in **Table 2C**) and U.S. domestic enplanements from the FAA *Aerospace Forecast – FY 2023-2043* (also discussed earlier and presented in **Exhibit 2A**). As with the time-series analysis, regressions for each single variable during the full period from 2004 through 2023 resulted in correlations below 0.070. Removing the COVID-impacted years of 2020-2022 provided much higher correlations, with each of the four socioeconomic factors returning correlation coefficients above 0.90; however, U.S. domestic enplanements resulted in an r value of just 0.67.

The results of this set of time-series and regression analyses are shown in **Table 2G**. The time-series regression resulted in an r value of 0.848, and the resulting projection is presented in the table. As can be seen, all four socioeconomic variables provided correlation coefficients above the 0.90 threshold. The highest r value for a single variable was 0.9102 for retail sales of food and beverages in stores and serving places. This appears to suggest the growth of food and beverage sales slightly better represents the growth of the local population, second homes, and tourism.

Multi-variable regressions were run for various combinations and the better correlations are presented in the table, as well. The best multi-variable correlations included food and beverage retail sales. While those three correlations all resulted in slightly higher r values, they also tend to place a greater emphasis on local population growth than visitor growth. As a result, the single-variable correlation of enplanements with food and beverage retail sales was selected as best representative of the regression analyses for further consideration.

TABLE 2G | Regression Analyses Projections

Year	ILM Enplanements	MSA Population	MSA Employment	Real GRP (millions 2012 $)	Food/Beverage Sales (millions 2012 $)
ACTUAL					
2004	280,051	305,825	174,554	12,678.2	5,648.2
2005	340,181	318,743	184,568	13,651.6	5,958.2
2006	313,093	332,210	194,022	14,462.8	6,193.5
2007	393,299	342,528	203,973	15,051.2	6,285.1
2008	401,204	351,517	202,148	14,998.9	6,037.6
2009	401,529	357,591	193,814	15,085.4	5,549.3
2010	409,400	363,780	190,934	15,228.7	5,714.3
2011	396,987	366,860	194,366	15,124.7	5,947.0
2012	392,938	369,844	196,843	14,752.2	6,097.3
2013	397,827	375,248	202,260	15,406.0	6,331.6
2014	379,323	380,338	208,989	16,079.1	6,573.5
2015	389,629	386,796	214,610	16,738.6	6,822.1
2016	414,749	395,043	222,857	17,701.3	7,077.3
2017	424,009	402,995	225,350	17,971.8	7,327.7
2018	470,178	411,584	235,617	18,238.1	7,612.2
2019	541,506	417,613	242,176	19,005.4	7,810.2
2020	246,826	425,106	241,629	19,258.1	7,895.5
2021	464,711	437,882	253,613	20,639.7	8,964.5
2022	541,936	454,390	259,995	20,767.8	9,299.4
2023	657,292	467,337	263,188	20,836.0	9,295.5
WOODS & POOLE SOCIOECONOMIC VARIABLE FORECASTS					
2028	NA	494,474	286,596	23,189.6	2,407.8
2033	NA	528,951	312,982	26,271.2	2,739.7
2043	NA	598,140	368,352	33,385.0	3,501.2
SINGLE-VARIABLE REGRESSION ENPLANEMENT PROJECTIONS (2004-2019, 2023)					
	Time-Series	**vs. Population**	**vs. Employment**	**vs. Real GRP**	**vs. Food/Beverage Sales**
r-value	0.8480	0.9031	0.9027	0.9015	0.9102
2028	623,828	655,004	674,440	674,095	706,565
2033	690,777	723,917	763,512	787,387	804,627
2043	824,673	862,214	950,425	1,048,923	1,029,625
MULTI-VARIABLE REGRESSION ENPLANMENT PROJECTIONS (2004-2019, 2023)					
	vs. Population/ GRP	**vs. Employment/ GRP**	**vs. Population/ Food/Beverage Sales**	**vs. Employment/ Food/Beverage Sales**	**Four Variables**
r-value	0.9093	0.9056	0.9150	0.9194	0.9248
2028	667,915	676,282	678,326	700,562	678,440
2033	759,162	777,194	760,677	797,375	743,717
2043	958,657	999,922	938,948	1,011,819	866,578

The previous forecasts and the time-series and preferred regression analysis projections were then examined for reasonableness by comparing the resultant market share of U.S. domestic enplanements and the travel propensity factor (TPF) of each scenario. Each scenario is presented in **Table 2H** for comparison.

TABLE 2H | Market Share and TPF Enplanement Forecast Scenarios

Year	ILM Enplaned	U.S. Domestic Enplaned (millions)	ILM Market Share	Wilmington MSA Population	Travel Propensity Factor (TPF)
ACTUAL					
2004	280,051	627.20	0.0447%	305,825	0.916
2005	340,181	669.50	0.0508%	318,743	1.067
2006	313,093	668.42	0.0468%	332,210	0.942
2007	393,299	690.06	0.0570%	342,528	1.148
2008	401,204	680.73	0.0589%	351,517	1.141
2009	401,529	630.78	0.0637%	357,591	1.123
2010	409,400	631.50	0.0648%	363,780	1.125
2011	396,987	646.53	0.0614%	366,860	1.082
2012	392,938	649.74	0.0605%	369,844	1.062
2013	397,827	650.53	0.0612%	375,248	1.060
2014	379,323	664.87	0.0571%	380,338	0.997
2015	389,629	691.76	0.0563%	386,796	1.007
2016	414,749	719.73	0.0576%	395,043	1.050
2017	424,009	737.69	0.0575%	402,995	1.052
2018	470,178	774.34	0.0607%	411,584	1.142
2019	541,506	806.15	0.0672%	417,613	1.297
2020	246,826	460.58	0.0536%	425,106	0.581
2021	464,711	507.10	0.0916%	437,882	1.061
2022	541,936	736.31	0.0736%	454,390	1.193
2023	657,292	737.17	0.0892%	467,337	1.406
PROJECTIONS					
Time-Series Projection					
2023	623,828	867.40	0.0719%	494,474	1.262
2033	690,777	997.46	0.0693%	528,951	1.306
2043	824,673	1,363.91	0.0605%	598,140	1.379
ILM Parking Study Enplaned Passenger Forecast (October 2023)					
2023	818,000	867.40	0.0943%	494,474	1.654
2033	917,000	997.46	0.0919%	528,951	1.734
2043	1,146,000	1,363.91	0.0840%	598,140	1.916
2023 FAA *Terminal Area Forecast* (January 2024)					
2023	747,827	867.40	0.0862%	494,474	1.512
2033	823,150	997.46	0.0825%	528,951	1.556
2043	993,281	1,363.91	0.0728%	598,140	1.661
Regression Analysis vs. Food/Beverage Store & Service Retail Sales (2012 $)					
2023	706,565	867.40	0.0815%	494,474	1.429
2033	804,627	997.46	0.0807%	528,951	1.521
2043	1,029,625	1,363.91	0.0755%	598,140	1.721
Recommended Annual Enplanement Forecast					
2023	800,000	867.40	0.0922%	494,474	1.618
2033	880,000	997.46	0.0882%	528,951	1.664
2043	1,070,000	1,363.91	0.0785%	598,140	1.789

The time-series projection is very conservative; the short-term projection is lower than the 2023 actual enplanements. The airport's market share of U.S. enplanements would decline throughout the planning period to a percentage lower than last experienced during the flat growth period in the previous decade. The projection would also result in a TPF that would remain lower than the 2023 ratio.

The parking study and TAF forecasts were outlined earlier. The parking study was based on a three-year forecast by the NHCAA that estimated growth at the 2.3 percent annual rate of the 2022 TAF. The updated 2023 TAF projected a lower CAGR of 1.92 percent from 2023 through 2043 and beyond. Both forecasts result in the TPF growing consistently through the 20-year period. The parking study projects an increase in the market share of U.S. enplanements in the short term and a gradual decline over the long term. The 2023 TAF projects a steady decline in the market share over the entire forecast period.

The preferred regression analysis is lower than both the parking study and TAF forecasts over the first 10 years. Over the long term, the regression projection exceeds the TAF by 3.7 percent; however, it would still be lower than the parking study forecast by 10.1 percent. As with the TAF, the TPF resulting from the regression projection would gradually increase, but the market share would decline; however, it would remain above the market share prior to the pandemic.

While passengers grew by over 21 percent between 2019 and 2023, the number of flights declined by 1.9 percent. The airport experienced a significant change in aircraft seating capacity, growing from an average of 72.8 seats per departure to 93.6. This provided a net increase in available seats of 40 percent. The average nonstop flight grew from 316 miles in 2019 to 415 miles in 2023. The increase in available flights and longer nonstop flights represented a significant increase in service for the airport from the pre- to post-COVID-19 periods. As the airlines serving ILM continue to upgauge aircraft, the airport remains in consideration for service by other airlines. Considering the three major mainline airlines already present (along with Avelo airlines since 2022 and Sun Country beginning in 2023), potential remains to attract other discount airlines.

The short-term forecast by the NHCAA anticipates that enplanements would grow to 770,000 in 2026, which would be a 17.1 percent increase over 2023 for a CAGR of 5.4 percent. The record level of enplanements in 2023 was 21.3 percent higher than the record set the previous year. The first two months of 2024 indicate that the strong growth period has not subsided with enplanements, which were up 8.7 percent over the same period in 2023.

For those reasons, a mid-range forecast was selected, beginning with the three-year growth forecast by the NHCAA and growing at the 1.92 percent CAGR projected by the 2023 TAF. This would result in 800,000 enplanements in 2028, 880,000 in 2033, and 1.07 million in 2043. **Exhibit 2D** graphically presents each of the forecast scenarios in **Table 2H**, along with the recommended forecast that reflects a mid range of the scenarios.

AIRLINE OPERATIONS FORECAST

The commercial service aircraft fleet mix defines several key parameters in airport planning, including critical aircraft (for pavement design and ramp geometry), terminal complex layout, and maximum stage length capabilities (which affect runway length evaluations). A projection of the fleet mix for Wilmington International Airport has been developed by reviewing equipment used by the carriers that have served the airport over the years.

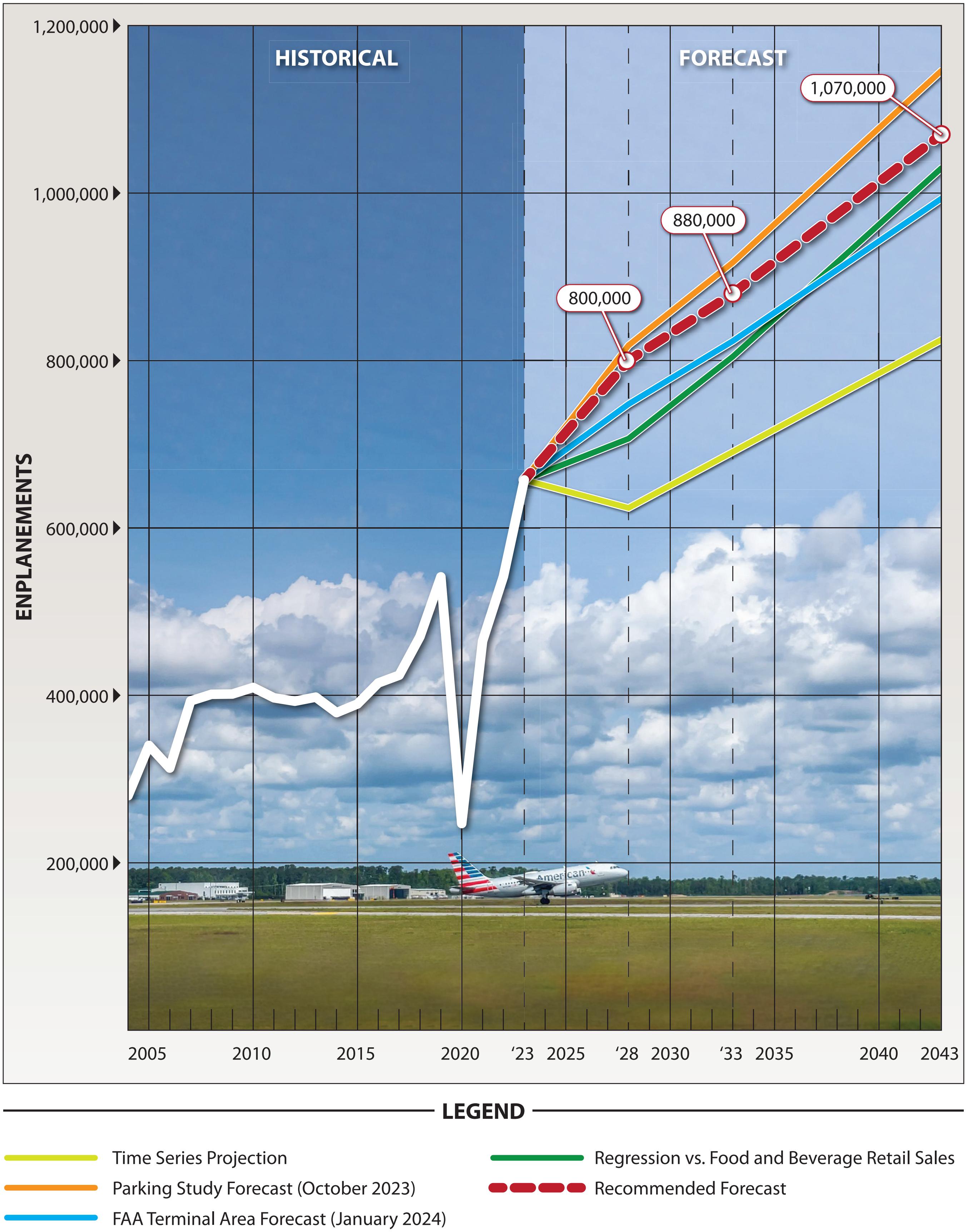


Exhibit 2D
ENPLANEMENT FORECAST

Changes in equipment, airframes, and engines have always had a significant impact on airlines and airport planning. There are many ongoing programs by the aircraft manufacturers to improve performance characteristics; these programs continue to focus on improvements in fuel efficiency. Regional jets also became a larger factor as airlines looked for ways to reduce costs. Many airlines replaced larger commercial jets – as well as commuter turboprops on smaller emerging routes – with regional jets. Regional jet aircraft eventually became available with as few as 37 seats and as many as 100 seats. This bridged a long-existing gap in seating capacity, making regional jets the aircraft of choice at nonhub and many small hub airports.

In the United States, the use of regional jets was met with resistance from the pilot unions. Scope clauses were written into union contracts with the major airlines that placed restrictions on regional aircraft that may be flown by the airline's regional affiliates. The unions believed that limiting the regional airlines' passenger capacity through the number and size of aircraft would protect union jobs.

United, Delta, and American Airlines have varying scope clauses. The greatest limitation has been restricting affiliates to no more than 76 seats and 86,000 pounds maximum takeoff weight. This led the regional jet manufacturers, such as Embraer and Bombardier, to reconfigure 90-seat regional jets to just 76 (or even 70) seats to meet the scope clauses.

In addition, most next-generation regional aircraft, such as the Embraer E2-Jet and the Mitsubishi MRJ series, exceed the 76-seat, 86,000-pound limits. This essentially prohibits these aircraft from being utilized in the fleets of regional airlines in United States. In fact, Mitsubishi terminated its regional jet program in 2023 due to the uncertainty of the regional jet market size.

The scope clauses are generally more liberal for 50-seat and smaller aircraft. Unfortunately, the 50-seat and smaller regional jets, as well as 10- to 50-seat turboprops, are no longer being manufactured. United Airlines has begun operating a replacement 50-seat regional jet, the CRJ-550, with one of its regional affiliates, GoJet. The aircraft was developed by Bombardier from its 70-seat CRJ700 and is specifically designed to work around scope clauses. The aircraft is equipped with 10 first class seats, 20 economy-plus seats, and 20 economy seats. The first of these aircraft were put into use in late 2019 between Chicago O'Hare International Airport (ORD) and small hub airports 100 to 700 nautical miles from ORD.

The future of aircraft serving nonhub and small hub airports will remain at the mercy of the major airlines' negotiations with their unions. The following section examines the fleet mix of scheduled airline operations at Wilmington International Airport and forecasts what may be expected over the next 20 years.

SCHEDULED AIRLINE OPERATIONS AND FLEET MIX

Table 2J presents the fleet mix by seat capacity of the scheduled airlines at ILM since 2018. In 2018, 83.5 percent of the airport's fleet mix consisted of regional jets. Just under half (49.3 percent) were 50-seat jets. The mix grew just slightly larger the next year as enplanements increased by 15 percent. Much of this increase was accommodated by a 10 percent increase in flights, as well as the load factor increasing three percent.

TABLE 2J | Scheduled Airline Fleet Mix and Operations Forecast

FLEET MIX		ACTUAL			
Seat Capacity	**Typical Aircraft**	**2018**	**2019**	**2022**	**2023**
200+	B757-300; B767-300; A330	0.0%	0.0%	0.0%	0.0%
175-199	B737-800; B757-200; A321	0.0%	0.0%	0.5%	4.6%
155-174	B737-800; A320	0.0%	3.8%	0.3%	1.1%
135-154	B737-700; A320	5.3%	3.3%	5.3%	12.0%
115-134	B737-700; A319	11.2%	8.9%	9.7%	7.9%
95-114	B717-200; A220; ERJ 190	0.0%	0.1%	5.5%	7.0%
80-94	Q400; ERJ 190-E2*	0.0%	0.0%	0.0%	0.0%
70-79	CRJ 900; ERJ 175	31.5%	32.8%	42.0%	45.9%
60-69	CRJ 700; ERJ 170	2.7%	1.4%	16.9%	11.8%
40-59	CRJ 200; ERJ 140,145	49.3%	49.8%	19.8%	9.8%
Total		**100.0%**	**100.0%**	**100.0%**	**100.0%**
Average Seats per Departure		72.1	72.8	80.0	93.6
Boarding Load Factor		79.1%	82.1%	80.0%	78.9%
Enplanements per Departure		57.1	59.8	64.5	93.6
Annual Enplanements		470,178	541,936	541,353	657,292
Annual Departures		8,240	9,069	8,399	8,900
Annual Operations		16,480	18,138	16,798	17,800

FLEET MIX		FORECAST		
Seat Capacity	**Typical Aircraft**	**2028**	**2033**	**2043**
200+	B757-300; B767-300; A330	0.0%	0.0%	0.5%
175-199	B737-800; B757-200; A321	5.0%	6.0%	8.5%
155-174	B737-800; A320	2.0%	3.0%	5.0%
135-154	B737-700; A320	13.5%	15.0%	17.0%
115-134	B737-700; A319	10.5%	12.0%	13.0%
95-114	B717-200; A220; ERJ 190	8.0%	10.0%	20.0%
80-94	Q400; ERJ 190-E2*	0.0%	0.0%	0.0%
70-79	CRJ 900; ERJ 175	48.0%	45.0%	36.0%
60-69	CRJ 700; ERJ 170	14.0%	9.0%	0.0%
40-59	CRJ 200; ERJ 140,145	0.0%	0.0%	0.0%
Total		**100.0%**	**100.0%**	**100.0%**
Average Seats per Departure		100.8	105.2	116.9
Boarding Load Factor		81.0%	82.0%	84.0%
Enplanements per Departure		81.7	86.3	98.2
Annual Enplanements		800,000	880,000	1,070,000
Annual Departures		9,800	10,200	10,900
Annual Operations		19,600	20,400	21,800

*Current scope clauses between mainline carriers and pilot unions effectively prevent the economic viability of jet aircraft in this seating class.

Following the sharp decline in passenger traffic during the COVID-19 pandemic, enplanements reached 2019 levels in 2022; however, there was a significant shift in the fleet mix as 50-seat regional jets fell from nearly half of the ILM fleet mix to less than 20 percent. Most of the 30 percent fleet shift was into larger regional jets. The remainder moved into larger aircraft flown by the traditional mainline carriers and the new entrant, Avelo Airlines. This raised the average number of seats per departure from 72.8 to 80.5. As a result, airline departures were 7.4 percent fewer in 2022 than in 2019.

In 2023, the percentage of 50-seat regional jets in the ILM fleet mix was halved from the previous year; however, this time, aircraft with more than 95 seats grew to comprise nearly a full third of all flights. In one year, the seats per departure jumped from 80.5 to 93.6. While enplanements in 2023 were 21 percent higher than in 2019, seats per departure were up 28.5 percent. As a result, flights in 2023 were just slightly fewer than in 2019.

The boarding load factor (BLF) is defined as the ratio of passengers boarding aircraft compared to the seating capacity of the aircraft. The BLF at ILM has remained relatively stable before and after the pandemic. In the future, boarding load factors can be expected to grow only slightly to around 84 percent by 2043.

The lower half of the table presents the fleet mix and operations forecast for scheduled flights. As discussed, the regional carriers have been transitioning away from 50-seat aircraft, which are no longer being manufactured. The remaining aircraft are being dedicated to smaller markets, including those in the FAA's Essential Air Service (EAS) program, which subsidizes flights. As a result, 50-seat aircraft are forecast to leave the ILM market in the next five years.

Regional jets of 70 seats or fewer are forecast to no longer serve ILM by the end of the 20-year forecast period. The percentage of 95+-seat aircraft will continue to increase, resulting in further growth in the average seats per departure. With the BLF remaining at 81 to 84 percent, the average enplanements per departure will also continue to grow. While scheduled passengers grow by 63 percent over the 20-year period, flights will increase by 22 percent.

AIRLINE PEAK ACTIVITY FORECASTS

The airport planning needs are related to levels of activity during certain periods of time. The key periods used for planning are:

- **Peak Month** – the calendar month when peak aircraft operations occur;
- **Design Day** – the average day in the peak month; at nonhub and small hub airports like ILM, this is typically the average weekday, as weekends often have reduced flights; and
- **Design Hour** – the peak hour within the design day.

It is important to note that only the peak month is an absolute peak within a given year. All other peak periods will be exceeded at various times during the year; however, they represent reasonable planning standards that can be applied without overbuilding or becoming too restrictive.

Excluding the pandemic years of 2020 and 2021, the peak month for enplanements occurred in July during nine of the 12 years between 2010 and 2023. The average for the 12 years was 9.9 percent; 2023 was the highest at 11.0 percent. Three of the four most recent non-pandemic years have averaged 10.2 percent during the peak month. The latter percentage is applied to the forecast years.

The design day enplanement level for the peak month is essentially the average weekday enplanements of the peak month. Based on the daily flight schedule during the peak month of 2019 and the actual number of flights for the month, the design day enplanements were determined as 3.44 percent of the peak month enplanements.

The design hour enplanement estimate is based on the airline schedule during the peak month and the seats available during the peak hour. In July of 2023, the hourly peak for seat capacity typically occurred during the 2:00 p.m. hour. Approximately 20 percent of the daily seat capacity departed during that hour. The same percentage was applied to the design day to determine the design hour. As enplanements and flights increase in the future, the design hour percentage can be expected to decrease slightly. **Table 2K** outlines the peak period airline passengers and operations forecasts.

TABLE 2K | Peak Airline Activity

	2023	2028	2033	2043
AIRLINE ENPLANEMENTS				
Annual Enplanements	657,292	800,000	880,000	1,070,000
Peak Month Enplanements	72,150	81,600	89,800	109,100
Design Day Enplanements	2,327	2,630	2,900	3,520
Design Hour Enplanements	465	513	551	634
AIRLINE OPERATIONS				
Annual Operations	17,800	19,600	20,400	21,800
Peak Month Operations	1,864	1,980	2,060	2,200
Design Day Operations	64	68	71	76
Design Hour Operations	9	9	10	11
Design Hour Departures	5	5	6	7

AIR CARGO FORECASTS

Air cargo activity has historically tracked gross domestic product (GDP), but it can also be affected by fuel prices, real yields, globalization, and trade. Ongoing trends that continue to affect the air cargo market post-COVID-19 include the rise of e-commerce, security regulations by the FAA and Transport Security Administration (TSA), maturation of the domestic express market, a shift from air transportation to other modes (especially truck), use of all-cargo carriers (e.g., FedEx) by the U.S. Postal Service to transport mail, and the increased use of mail substitutes (e-mail and cloud-based services).

Unlike passenger traffic, domestic air cargo volumes increased during the pandemic as COVID-19 restrictions caused an increase in e-commerce sales and shipments. Domestic cargo revenue ton-miles (RTMs) are forecast by the FAA to increase at an annual average of 2.0 percent over the next 20 years. The all-cargo share of the market will continue in the 93 percent range through 2043.

The FAA forecast for RTMs was based on several specific assumptions exclusive to the air cargo industry. First, security restrictions will remain in place. Second, most of the shift from air to ground transportation has occurred. Finally, long-term cargo activity is tied to economic growth.

Regional Cargo Market

Regular air cargo services at ILM are supplied by feeder airlines. Martinaire Aviation carries freight for UPS with Cessna 208B aircraft and Mountain Air Cargo carries freight for FedEx using ATR-42 and -72 aircraft. Both airlines transport cargo to their respective large commercial air cargo carriers, which both operate out of Raleigh-Durham International Airport (RDU). Other coastal commercial service airports in the region, including MYR and OAJ, have similar cargo service to larger hub airports located further inland.

Table 2L presents air cargo tonnage by the all-cargo carriers at ILM since 2010. In general, the total amount of air cargo handled has declined from 1,903 tons in 2017 to 1,344 tons in 2023. There has also been a noticeable shift in the ratio of enplaned versus deplaned cargo. From 2010 to 2018, enplaned cargo averaged 40 percent of the cargo total. Since 2019, enplaned cargo has averaged 52 percent of the cargo total.

The period from 2010 through 2017 generally showed slight growth (15 percent) in deplaned cargo, while enplaned cargo tons remained relatively steady. The following two years, deplaned cargo declined sharply (43 percent). During the pandemic, deplaned cargo recovered only slightly, while enplaned cargo increased nearly 43 percent in two years. Following the pandemic, 2023 total tonnage (enplaned and deplaned) declined to the lowest levels of the 14-year period.

TABLE 2L | Air Cargo Forecasts – Wilmington International Airport

Year	Enplaned Tons	Deplaned Tons	Total Cargo Tons	U.S. Domestic Million RTMs	Market Share %
2010	801.3	1,029.6	1,830.9	11,305.7	0.0000162%
2011	716.8	1,043.0	1,759.8	10,601.5	0.0000166%
2012	745.6	1,071.3	1,817.0	10,837.7	0.0000168%
2013	619.4	1,030.0	1,649.3	10,968.9	0.0000150%
2014	687.4	1,029.5	1,716.8	11,235.6	0.0000153%
2015	751.0	1,098.9	1,849.9	11,635.7	0.0000159%
2016	682.1	1,150.3	1,832.3	11,998.4	0.0000153%
2017	721.3	1,181.9	1,903.2	13,061.7	0.0000146%
2018	682.6	1,000.9	1,683.5	14,181.7	0.0000119%
2019	631.4	674.2	1,305.6	14,736.9	0.000089%
2020	729.6	701.8	1,431.4	16,663.0	0.000086%
2021	900.7	746.6	1,647.3	18,554.8	0.000089%
2022	829.2	688.6	1,517.8	18,376.1	0.000083%
2023	696.6	647.1	1,343.7	18,345.0	0.0000073%
CONSTANT MARKET SHARE					
2028	889.4	821.0	1,710.3	20,403.7	0.0000084%
2033	984.3	908.6	1,892.9	22,582.2	0.0000084%
2043	1,230.2	1,135.6	2,365.8	28,223.2	0.0000084%
GRP GROWTH RATE (2.4%)					
2020	777.7	717.9	1,495.5	20,403.7	0.000073%
2025	791.7	730.8	1,522.4	22,582.2	0.000067%
2035	888.1	819.8	1,707.9	28,223.2	0.000061%
RECOMMENDED FORECAST					
2020	832.0	768.0	1,600.0	20,403.7	0.000078%
2025	884.0	816.0	1,700.0	22,582.2	0.000075%
2035	1040.0	960.0	2,000.0	28,223.2	0.000071%

Air Cargo Forecast

Neither time-series nor regression analyses versus socioeconomic variables provided any reasonable correlations with ILM cargo. **Table 2L** presents a constant market share projection that is intended to show potential growth at a rate comparable to the FAA forecast for U.S. domestic cargo RTMs.

The decline in deplaned freight beginning in 2018 appears to coincide with Amazon starting up its own air freight service, which is currently known as Amazon Air. It is likely this shifted much of Amazon's air freight from the other express freight companies to its own regional hub in Charlotte, to then be trucked to destinations within the region. While ILM enplaned cargo increased slightly during the pandemic, deplaned cargo remained relatively flat, which also suggests the impact of Amazon flying its own orders to a regional hub for ground delivery.

Given the location of the greater Wilmington metro area within a two-hour drive time from the FedEx and UPS regional air hub in Raleigh – as well as the Amazon Air hub in Charlotte, within an approximately three-hour drive time – the likelihood of significant growth in express freight traffic at ILM is low. Future cargo demand could change with growth in area businesses that require direct air shipping. The ILM business park and the foreign trade zone (FTZ) within which it lies may attract that demand in the future.

For comparison, a second projection was developed in concert with the projected growth in the Wilmington MSA real GRP. The CAGR for real GRP over the next 20 years is 2.4 percent. As presented in **Table 2L**, the market share of U.S domestic revenue tons would continue to decline over the planning period.

The recommended forecast for planning purposes is one that lies in the middle range of these two projections. This forecast is also shown in the table.

All-Cargo Operations and Fleet Mix

As previously mentioned, Wilmington International Airport is currently served by cargo feeder carriers contracted by FedEx and UPS. Mountain Air Cargo operates ATR-42 and -72 twin-engine turboprops under contract with FedEx. Martinaire utilizes the single-engine Cessna 208 Caravan turboprop for its contract with UPS.

Mountain Air Cargo typically operates five landings per week and has averaged 257 landings annually in the last five years. Martinaire typically has four landings per week and has averaged 201 annual landings in the past five years.

The forecast cargo tonnage can be accommodated by the current level of operations and similar-sized aircraft fleet mix; therefore, air cargo operations are forecast to average 900 annual operations through 2043.

OTHER COMMERCIAL OPERATIONS

The airport traffic control tower (ATCT) counts commercial flights operating under Title 14 Code of Federal Regulations (CFR) Part 121 (regularly scheduled carrier) or Part 135 as either air carrier or air taxi aircraft. Typically, commercial aircraft with 60 seats or more are counted as air carrier aircraft, and aircraft with fewer than 60 seats are counted as air taxi aircraft. All-cargo flights are also included. While the scheduled and non-scheduled (charter) airline flights are included in one of the two counts, depending on aircraft size, so are smaller for-hire flights that do not utilize the terminal. Some operations by aircraft that are operated under fractional ownership programs are also counted as air taxi operations. Because the airline and cargo operations have been forecast, this section reviews the growth potential for the "other commercial" operations.

Table 2M estimates the other commercial operations since 2010. These were determined by subtracting the airline operations (passenger and all-cargo) from the ATCT count of air carrier and air taxi operations. After the Great Recession, operations declined from 2010 (3,768 operations) through 2015 (1,507 operations). This was the same period during which airline enplanements were also declining slightly at ILM.

TABLE 2M | Other Commercial Operations Forecast

Year	Other Commercial Operations
2010	3,768
2011	3,085
2012	2,988
2013	2,411
2014	1,942
2015	1,507
2016	1,695
2017	2,417
2018	2,499
2019	3,584
2020	3,168
2021	5,824
2022	5,672
2023	6,669
Forecast	
2028	7,700
2033	8,500
2043	10,400

Over the next four years, the other commercial operations essentially grew back to the 2010 level. Unlike airline flights, the other commercial operations did not significantly decline in 2020 and totaled 3,158. Operations then jumped 84 percent in one year to 5,824. The pandemic likely sustained – and ultimately grew – the demand for small private charters at ILM.

The *FAA Aerospace Forecast – FY 2023-2043* projects commercial operations at FAA and contract towered airports to grow 2.0 percent annually over its forecast period, while itinerant general aviation operations are projected to grow at just 0.5 percent annually.

Since the other commercial operations are conducted primarily by the same types of aircraft used in general aviation and air taxi activity, the FAA aerospace forecast for general aviation and air taxi hours flown was examined. Over the 20-year period, piston fixed-wing aircraft hours are projected to decline at a CAGR of -0.73 percent. In contrast, turboprop hours flown are projected to grow by 0.93 percent and jet aircraft hours by 2.76 percent.

In 2023, the other commercial operations fleet mix was comprised of 75.4 percent jet, 13.0 percent turboprop, and 11.6 percent piston aircraft. The FAA growth rates for hours flown were applied respectively to each aircraft type to project the other commercial operations at ILM and generate the forecast shown in **Table 2M**. This resulted in a CAGR of 2.24 percent over the forecast period.

GENERAL AVIATION FORECASTS

General aviation (GA) encompasses all portions of civil aviation, except commercial service and military operations. To determine the types and sizes of facilities that should be planned to accommodate general aviation activity at ILM, certain elements of this activity must be forecast. These indicators of general aviation demand include based aircraft, aircraft fleet mix, and annual operations.

NATIONAL GENERAL AVIATION TRENDS

The long-term outlook for general aviation is promising, as growth at the high end of the segment offsets continuing retirements at the traditional low end. The active general aviation fleet is forecast to remain relatively stable between 2023 and 2043, increasing by just 0.2 percent. While steady growth in both GDP and corporate profits results in continued growth of the turbine and rotorcraft fleets, the largest segment of the fleet – fixed-wing piston aircraft – continues to shrink over the forecast period.

The FAA forecasts the fleet mix and hours flown for single-engine piston (SEP) aircraft; multi-engine piston (MEP) aircraft; turboprops; business jets; piston and turbine helicopters; and light sport, experimental, and other aircraft (e.g., gliders and balloons). The FAA forecasts active aircraft, not total aircraft. An active aircraft is one that is flown at least one hour during the year. From 2010 through 2013, the FAA undertook an effort to have all aircraft owners re-register their aircraft. This effort resulted in a 10.5 percent decrease in the number of active general aviation aircraft, mostly in the piston category. **Table 2N** shows the primary general aviation demand indicators, as forecast by the FAA.

TABLE 2N | FAA General Aviation Forecast

Demand Indicator	2023	2043	CAGR
General Aviation Fleet			
Total Fixed-Wing Piston	136,290	118,975	-0.7%
Total Fixed-Wing Turbine	26,645	39,740	2.0%
Total Helicopters	10,320	13,870	1.5%
Total Other (experimental, light sport, etc.)	35,840	43,810	1.0%
Total GA Fleet	**209,095**	**216,395**	**0.2%**
General Aviation Operations			
Local	14,801,816	16,622,293	0.6%
Itinerant	15,077,947	16,704,132	0.5%
Total General Aviation Operations	**29,879,763**	**33,326,425**	**0.5%**
CAGR = compound annual growth rate (2023-2043)			

Source: FAA Aerospace Forecast – FY 2023-2043

General Aviation Fleet Mix

For 2023, the FAA estimates there are 136,290 piston-powered fixed-wing aircraft in the national fleet. That number is forecast to decline by 0.7 percent by 2043, resulting in 118,975 aircraft. This includes a decline of 0.7 percent in SEP aircraft and a decline of 0.2 percent in MEP aircraft.

Total turbine aircraft are forecast to grow at an annual rate of 2.0 percent through 2043. The FAA estimates there are 26,645 fixed-wing turbine-powered aircraft in the national fleet in 2023 and there will be 39,740 by 2043. Turboprops are forecast to grow by 0.8 percent annually, while business jets are projected to grow by 2.7 percent annually through 2043.

Total helicopters are projected to grow by 1.5 percent annually in the forecast period. There are an estimated 10,320 total helicopters in the national fleet in 2023, and that number is expected to grow to a total of 13,870 by 2043. This includes annual growth rates of 0.5 percent for piston helicopters and 1.8 percent for turbine helicopters.

The FAA also forecasts experimental aircraft, light sport aircraft (LSA), and others. Combined, there are an estimated 35,840 other aircraft in 2023 that are forecast to grow to 43,810 by 2043, for an annual growth rate of 1.0 percent.

General Aviation Operations

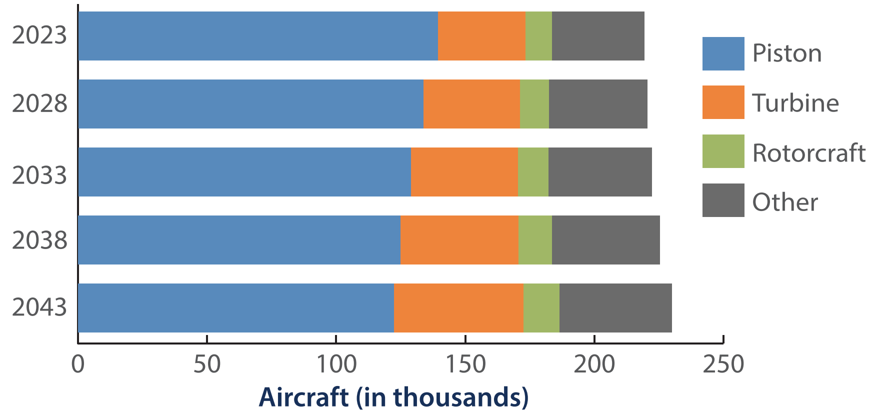
Additionally, the FAA forecasts total operations based on activity at control towers across the United States. Operations are categorized as air carrier, air taxi/commuter, general aviation, and military. While the fleet size remains relatively level, the number of general aviation operations at towered airports is projected to increase from 29.9 million in 2023 to 33.3 million in 2043, with an average increase of 0.5 percent per year as growth in turbine, rotorcraft, and experimental hours offsets a decline in fixed-wing piston hours. This includes annual growth rates of 0.6 percent for local general aviation operations and 0.5 percent for itinerant general aviation operations. **Exhibit 2E** presents the historical and forecast U.S. active general aviation aircraft and operations.

General Aviation Aircraft Shipments and Revenue

On an annual basis, the General Aviation Manufacturers Association (GAMA) publishes an aviation industry outlook that documents past and current trends and provides an assessment of the future condition of the general aviation industry. **Table 2P** presents historical data related to general aviation aircraft shipments.

Worldwide shipments of general aviation airplanes increased in 2022, with a total of 2,818 units delivered around the globe, compared to 2,646 units in 2021 – the second year in a row to experience an increase after the drop during 2020, when only 2,408 units were delivered. Worldwide general aviation billings were the highest in 2014. In 2022, an increase in new aircraft shipments generated more than $22 billion, compared to $21.6 billion in the previous year. North America continues to be the largest market for general aviation aircraft and leads in the manufacturing of piston, turboprop, and jet aircraft. The Asia-Pacific region is the second largest market for piston-powered aircraft, while Latin America is the second leading in the turboprop market and Europe leads in business jet deliveries.

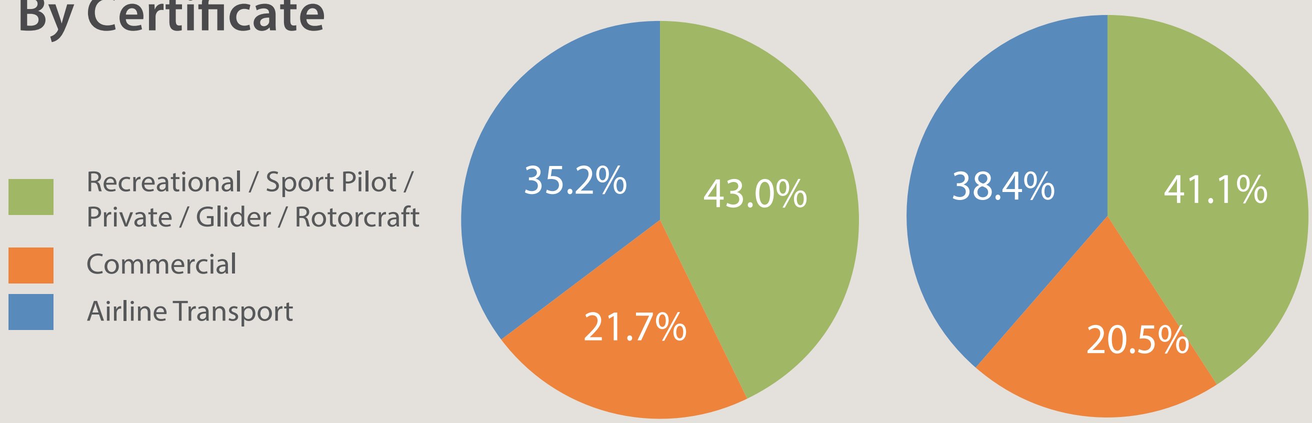
U.S. Active General Aviation Aircraft



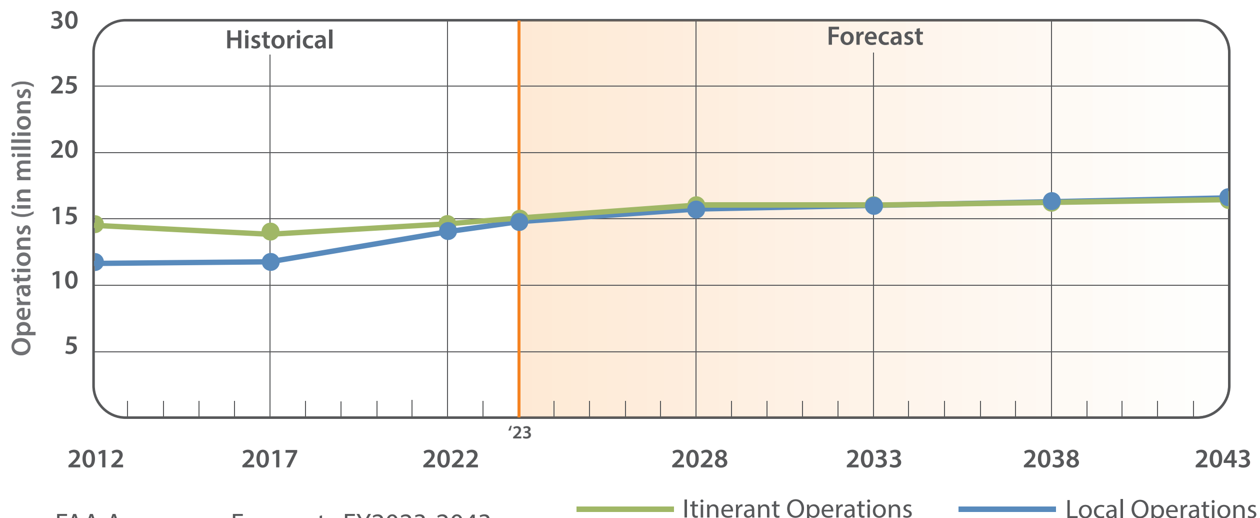
Active Pilots By Certificate

2023
Total Active Pilots: **482,025***

2043
Total Active Pilots: **510,670***



U.S. General Aviation Operations



Source: FAA Aerospace Forecasts FY2023-2043

TABLE 2P | Annual General Aviation Airplane Shipments

Manufactured Worldwide and Factory Net Billings						
Year	**Total**	**SEP**	**MEP**	**TP**	**J**	**Net Billings ($ million)**
2002	2,677	1,591	130	280	676	11,778
2003	2,686	1,825	71	272	518	9,998
2004	2,962	1,999	52	319	592	12,093
2005	3,590	2,326	139	375	750	15,156
2006	4,054	2,513	242	412	887	18,815
2007	4,277	2,417	258	465	1,137	21,837
2008	3,974	1,943	176	538	1,317	24,846
2009	2,283	893	70	446	874	19,474
2010	2,024	781	108	368	767	19,715
2011	2,120	761	137	526	696	19,042
2012	2,164	817	91	584	672	18,895
2013	2,353	908	122	645	678	23,450
2014	2,454	986	143	603	722	24,499
2015	2,331	946	110	557	718	24,129
2016	2,268	890	129	582	667	21,092
2017	2,324	936	149	563	676	20,197
2018	2,441	952	185	601	703	20,515
2019	2,658	1,111	213	525	809	23,515
2020	2,408	1,164	157	443	644	20,048
2021	2,646	1,261	148	527	710	21,603
2022	2,818	1,366	158	582	712	22,866

SEP = single-engine piston
MEP = multi-engine piston
TP = turboprop
J = jet

Source: General Aviation Manufacturers Association (GAMA) 2022 Annual Report

Business Jets | Business jet deliveries increased from 710 units in 2021 to 712 units in 2022. The North American market accounted for 67.6 percent of business jet deliveries, which is a 1.7 percent increase in market share compared to 2021.

Turboprops | Turboprop shipments increased from 527 in 2021 to 582 in 2022. North America's market share of turboprop aircraft increased by 3.1 percent in the last year. The Europe, Middle East and Africa, and Asia-Pacific market shares decreased, while the Latin America market share increased.

Pistons | In 2022, piston airplane shipments increased to 1,524 units from 1,409 units in the prior year. North America's market share of piston aircraft deliveries rose 1.2 percent from the year 2021. The Europe, Latin America, and Middle East and Africa regions experienced a positive rate in market shares during the past year, while the Asia-Pacific market saw a decline.

U.S. PILOT POPULATION

There were 476,346 active pilots certificated by the FAA at the end of 2022 and 482,025 active pilots are projected in 2023. All pilot categories – except private and recreational-only certificates – are expected to continue to increase for the forecast length. Excluding student pilots, the number of active pilots is projected to increase by about 28,645 (up 0.3 percent annually) between 2023 and 2043. The airline transport pilot (ATP) category is forecast to increase by 26,200 (up 0.7 percent annually). Sport pilots are predicted to increase by 2.5 percent and commercial pilots will remain steady over the forecast period, while private pilot certificates are projected to decrease at an average annual rate of 0.2 percent through 2043. The FAA has currently suspended the student pilot forecast.

BASED AIRCRAFT

The number of based aircraft is the most basic indicator of general aviation demand. By first developing a forecast of based aircraft for the airport, other demand indicators can be projected. The process of developing forecasts of based aircraft begins with an analysis of aircraft ownership in the primary general aviation service area through a review of historical aircraft registrations. An initial forecast of nationwide registered aircraft is developed and will be used as one data point to arrive at a based aircraft forecast for the airport.

Documentation of the historical number of based aircraft at the airport has been somewhat intermittent. Historical records for based aircraft include the previous master plan, which was completed in 2005, and the FAA's TAF. The based aircraft count reported in the current TAF is 111 aircraft. According to the most recent airport master record (FAA Form 5010), ILM's current based aircraft count includes 67 single-engine aircraft, 11 multi-engine aircraft (including piston and turboprops), 21 jets, and eight helicopters, for a total count of 107 aircraft. The current based aircraft count, which was conducted by airport staff as part of this study, is higher than recent figures reported by the FAA TAF and the figures from the FAA Form 5010. For the purposes of this study, a based aircraft count of 118 will be utilized as the baseline figure.

Based Aircraft Service Area

The initial step in determining the general aviation based aircraft demand for an airport is to define its generalized service area. The service area is defined primarily by evaluating the locations of competing airports, their capabilities, their services, and their relative attraction and convenience. In determining the based aircraft demand for an airport, it is necessary to identify the role of the airport, as well as the specific areas of aviation demand the airport is intended to serve.

As previously discussed, the service area for an airport is a geographic region from which an airport can be expected to attract the largest share of its activity. The definition of the service area can be used to identify other factors, such as socioeconomic and demographic trends, which influence aviation demand at an airport. Aviation demand will also be impacted by the proximity and strength of aviation services offered at competing airports, as well as the local and regional surface transportation network. As such, a general aviation based aircraft service area is also evaluated and established in this analysis.

As in any business enterprise, the more attractive the facility is in terms of services and capabilities, the more competitive it will be in the market. If an airport's attractiveness increases in relation to nearby airports, so will the size of its service area. If facilities and services are adequate and/or competitive, some level of aviation activity might be attracted to an airport from more distant locales.

As a rule, an airport's based aircraft service area typically extends for approximately 30 nautical miles (nm). There are two public-use airports within the 30-mile range of ILM, both of which are included within the NPIAS. Neither of these regional airports can compare to ILM's available facilities and amenities, particularly for those that would attract turbine operators, which typically require more than 5,000 feet of available runway length. **Table 2Q** provides a summary of the NPIAS airports within 30 nautical miles of ILM.

TABLE 2Q | NPIAS Airports Within 30 Nautical Miles of ILM

Airport	Distance from ILM	NPIAS Service Level	Based Aircraft	Annual Operations	Longest Runway (feet)	Lowest Visibility Minimums
Wilmington International Airport (ILM)	**-**	**P**	**118**	**87,662**	**8,016**	**1/2-mile**
Cape Fear Regional Jetport (SUT)	22.1 nm SSW	GA	76	77,000	5,055	1-mile
Wallace-Pender Airport (ACZ)	27.3 nm N	GA	27	16,900	4,153	1-mile

P = primary
GA = general aviation
nm = nautical miles

Sources: National Plan of Integrated Airport Systems, 2023-2027; Airport Master Record; airnav.com

An airport's ability to attract based aircraft is an important factor when defining the service area; proximity is a consideration for most aircraft owners. Aircraft owners typically choose to base at airports that are close to their homes or businesses. **Exhibit 2F** depicts a 10-, 20-, and 30-nautical mile radius from ILM, which extends beyond New Hanover County and includes the entirety of Pender County, as well as the majority of Brunswick County. Registered aircraft in the region and some aircraft based at ILM (only those that included registration information, which totaled 42 based aircraft) are also shown on the exhibit. It should be noted that many of the current ILM based aircraft N-numbers are undisclosed and are therefore not identified specifically on the exhibit as ILM based aircraft; however, it is still possible for the undisclosed aircraft to show as regionally registered aircraft. New Hanover County generally represents the largest concentration of based and registered aircraft in the region. In total, there are 334 aircraft registered within a 30-nm radius of ILM, giving ILM a 35 percent market share of aircraft registrations in that range. For these reasons, the primary service area of ILM is the Wilmington MSA, for the purposes of this study. The Wilmington MSA includes the counties of New Hanover, Brunswick, and Pender. Surrounding counties – including Onslow, Duplin, Sampson, Balden, and Columbus Counties, which are served by the smaller general aviation airports – could be considered secondary service areas.

The second demand segment to consider is itinerant operations. These are operations that are performed by aircraft that arrive from outside the airport area and land at ILM or depart ILM for another airport. In most cases, pilots will use airports nearer to their intended destinations; however, this is dependent on the airport's ability to accommodate the aircraft operator in terms of the facilities and services available. As a result, airports with better facilities and services are more likely to attract a larger portion of the region's itinerant operations.

ILM's facilities and available services and amenities – particularly in regard to the two existing full-service fixed base operators (FBOs) located on the airport, as well as current and future potential flight schools – make ILM a highly attractive airport for both itinerant and local general aviation operators.

FAA Registered and ILM Based Aircraft		
Distance from ILM	FAA Registered Aircraft	ILM Based Aircraft
0-10 nm	176	32
10-20 nm	68	2
20-30 nm	90	0
Total	**334**	**34***

Total ILM Based Aircraft: 118 - Total count includes undisclosed N-numbers and aircraft located >30 nm from ILM

LEGEND

- Wilmington International Airport
- NPIAS Airport
- ILM Based Aircraft
- FAA Registered Aircraft
- Nautical Mile Radius

Source: ESRI Basemap Imagery (2023). FAA Registered Aircraft Database, ILM.

BASED AIRCRAFT FORECASTS

Forecasts of based aircraft may directly influence needed facilities and the applicable design standards. The needed facilities may include hangars, aprons, taxilanes, etc. The applicable design standards may include separation distances and object-clearing surfaces. The sizes and types of based aircraft are also an important consideration. The addition of numerous small aircraft may have no effect on design standards, while the addition of a few larger business jets can have a substantial impact on applicable design standards.

Because of the numerous variables known to influence aviation demand, several separate forecasts of based aircraft are developed. Each forecast is examined for reasonableness and any outliers are discarded or given less weight. The remaining forecasts will collectively create a planning envelope. A single planning forecast is then selected for use in developing facility needs for the airport. The selected forecast of based aircraft can be one of the several forecasts developed or a blend of the forecasts.

Registered Aircraft

Aircraft ownership trends for the primary service area (the Wilmington MSA) typically dictate based aircraft trends for an airport. **Table 2R** presents the history of registered aircraft in the service area from 2013 through 2023. These figures are derived from the FAA aircraft registration database that categorizes registered aircraft by county, based on the zip code of the registered aircraft. Although this information generally provides a correlation to based aircraft, it is not uncommon for some aircraft to be registered in the service area but based at an airport outside the service area, or vice versa.

TABLE 2R | Registered Aircraft Fleet Mix in the Wilmington MSA

Year	SEP	MEP	TP	Jet	H	Other*	UAV	Total
2013	219	21	10	11	11	5	0	277
2014	207	19	9	10	10	4	0	259
2015	220	19	9	12	12	4	0	276
2016	221	21	10	12	15	5	6	290
2017	224	22	10	13	16	5	7	297
2018	213	18	9	15	13	2	7	277
2019	220	20	8	16	10	4	4	282
2020	222	18	10	16	10	4	4	284
2021	222	24	13	14	12	6	4	295
2022	235	24	13	18	12	5	1	308
2023	263	21	12	20	11	4	2	333
10-Year % Change	**20.09%**	**0.00%**	**20.00%**	**81.82%**	**0.00%**	**-20.00%**	**-**	**20.22%**
Compound Annual Growth Rate (CAGR) from 2013 to 2023:								**1.69%**

SEP = single-engine piston
MEP = multi-engine piston
TP = turboprop
H = helicopter
UAV = unmanned aerial vehicle
*Other includes gliders, ultralights, experimental aircraft, and electric aircraft

Sources: FAA Aircraft Registry Database; FAA Census of U.S. Civil Aircraft

Over the 10-year period, aircraft registrations in the service area have grown from 277 in 2013 to 333 in 2023. The fleet mix breakout shows that single-piston aircraft, which still account for the most registered aircraft, have grown by the largest total number of aircraft. The multi-engine piston category has remained relatively steady. Jet aircraft have experienced the largest percentage growth; jets grew from 11 aircraft in 2013 to 20 in 2023, accounting for an 81.82 percent change. Unmanned aerial vehicles (UAV/drones) were not included as a separate category until 2015; there were six registered drones in 2016 and the number has fluctuated over the period from 2016-2023, ending with two drones registered in 2023. Understanding registered aircraft trends in the service area provides information that can be used to make new based aircraft projections, as well as forecast the fleet mix of aircraft. Overall, registered aircraft within the Wilmington MSA have experienced a growth rate of 1.69 percent CAGR since 2013.

Trend Line/Historical Growth Rate Projection

According to based aircraft records, ILM's count has varied from a high of 153 in 2008 to the current count of 118. It is difficult to assess a true historical trend, as consistent records have not been kept and the TAF must be utilized to analyze historical based aircraft. According to the TAF and airport based aircraft records, ILM's count has steadily grown in the last five years from 105 in 2019 to 118 in 2023 (2.36 percent CAGR). Assuming ILM maintains this growth rate over the course of the forecast period, the forecast yields a based aircraft count of 188 by 2043.

TAF Growth Rate

The FAA's TAF report of based aircraft at ILM is slightly lower than what current records show (111 for the TAF and 118 for airport records). Adjusting for the baseline difference and applying the FAA TAF CAGR through 2043 of 2.72 percent results in an adjusted TAF projection of 202 based aircraft for ILM.

Socioeconomic Growth Projections

Based aircraft growth is often related to the population and economic activity of the service area. For this reason, based aircraft projections tied to projected growth in population, employment, and GRP for the service area were also prepared. Through 2043, population in the service area is projected to grow at a CAGR of 1.24 percent; employment is projected to have a CAGR of 1.70 percent; and GRP is projected to have a CAGR of 2.39 percent. Applying these CAGRs results in 151 based aircraft for population, 165 for employment, and 189 for GRP by 2043.

Regression Analysis

Several forecasts were prepared utilizing historical based aircraft data and the regression model. Correlations were examined utilizing independent variables, including population, employment, GRP, and U.S. active aircraft, as well as a time series regression. The regression that produced the best correlation was the time series regression, which had an r^2 value of 0.552. As described previously, correlation values over 0.90 indicate good predictive reliability. Since none of the based aircraft regressions produced a correlation value over 0.90, the regression forecasts have been excluded from consideration.

Selected Based Aircraft Forecast

Selecting a based aircraft forecast is ultimately based on the judgement of the forecast analyst. A selected forecast should be reasonable and based on a sound methodology. The methodology presented in this analysis first examines the history of aircraft ownership in the Wilmington MSA, the primary based aircraft service area. New forecasts considered the FAA TAF, maintaining ILM's five-year growth rate, and growth rates based on key socioeconomic indicators (population, employment, and GRP). These five projections are summarized in **Table 2S**.

TABLE 2S | Based Aircraft Forecast Summary

Projection	2023	2028	2033	2043	CAGR 2023-2043
ILM 2024 TAF	111	130	150	190	2.72%
5-Year Growth Rate	**118**	133	149	188	2.36%
ILM TAF Growth Rate		135	154	202	2.72%
Population Growth Rate		126	133	151	1.24%
Employment Growth Rate		128	140	165	1.70%
GRP Growth Rate		**133**	**149**	**189**	**2.39%**

Boldface indicates selected forecast.
CAGR = compound annual growth rate

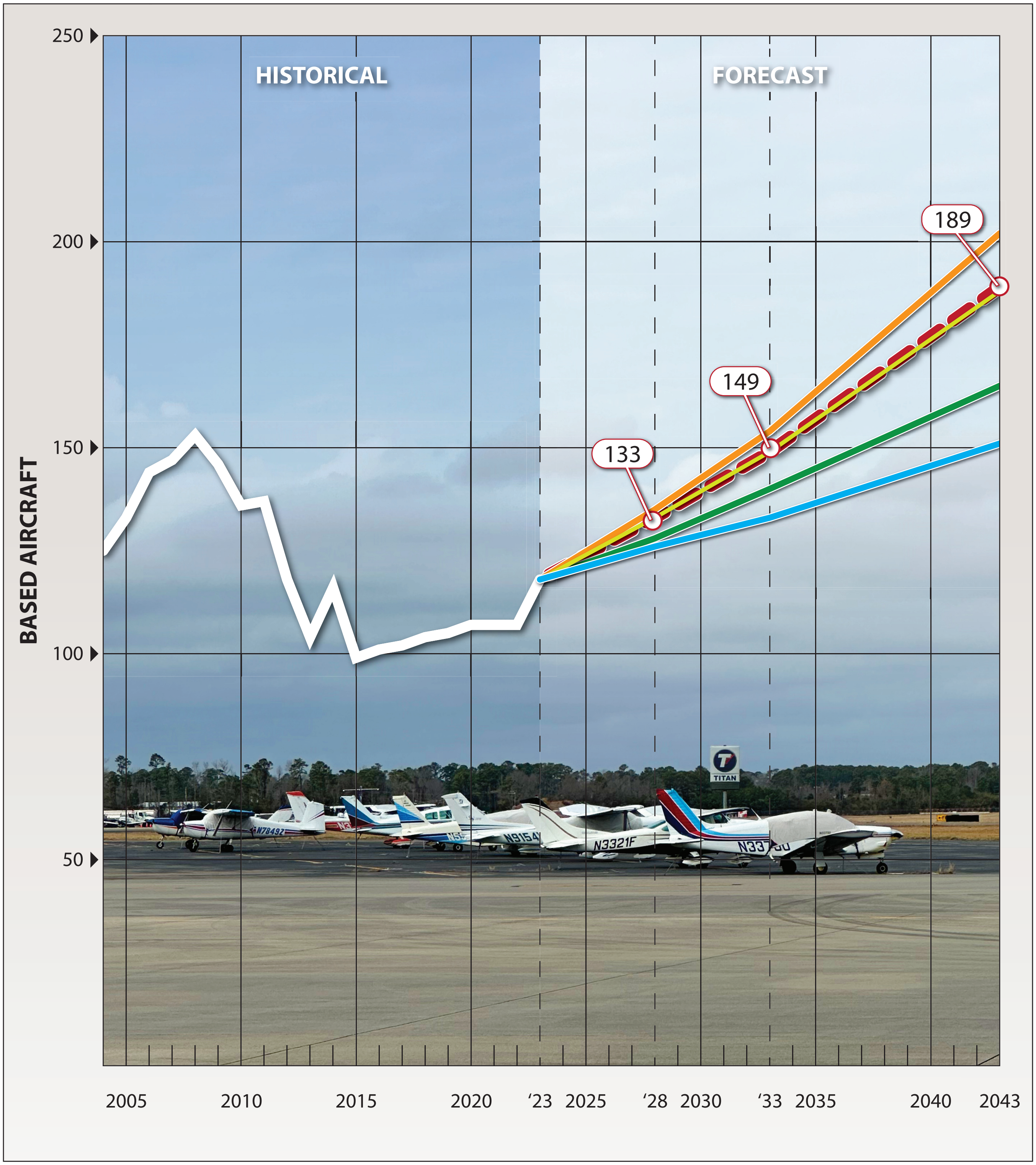
Sources: ILM TAF, May 2021; Coffman Associates analysis

Future aircraft basing at the airport will depend on several factors, including the state of the economy, fuel costs, available facilities, competing airports, and hangar development potential. Forecasts assume a reasonably stable and growing economy, as well as reasonable development of airport facilities necessary to accommodate aviation demand.

Consideration must also be given to the current and future aviation conditions at the airport. ILM provides an array of general aviation services and will continue to be favored by aviation operators due to its location and available facilities. It is important to note that a significant flight training program is in the process of beginning its operation at ILM, which will introduce new based aircraft.

The potential for available hangar space is not the only factor in future based aircraft levels. Economic conditions within the service area are also projected to increase at strong rates, which will support aviation and based aircraft growth. The GRP growth rate projection has been selected as the preferred forecast. The selected forecast is reasonably optimistic and assumes that ILM based aircraft will keep pace with the GRP of the Wilmington MSA and that continued employment growth in the local area will drive demand for more based aircraft. It should be noted that the selected forecast shows comparable growth to the current FAA TAF.

Exhibit 2G (on the following page) presents the five based aircraft forecasts that comprise the planning envelope.



LEGEND

- Five-Year Based Aircraft Growth Rate (2.36%)
- ILM TAF Growth Rate (2.72%)
- Population Growth Rate (1.24%)
- Employment Growth Rate (1.70%)
- GRP Growth Rate (2.39%) - ***Selected Forecast***

Exhibit 2G
BASED AIRCRAFT FORECASTS

BASED AIRCRAFT FLEET MIX FORECAST

It is important to understand the current and projected based aircraft fleet mix at an airport to ensure the planning of proper facilities. For example, the addition of one or several larger turboprop or business jet aircraft to the airfield can have a significant impact on the separation requirements and the various obstacle clearing surfaces.

The current based aircraft fleet mix consists of 74 single-engine piston aircraft, 12 multi-engine (piston and turboprop) aircraft, 23 jets, and nine helicopters. ILM should continue to have a diverse fleet mix, including small single-engine pistons, turbine-powered aircraft, and helicopters. The forecasted growth trends in the ILM based aircraft fleet mix take FAA projections of the national general aviation fleet mix into consideration. **Table 2T** presents the forecast fleet mix for based aircraft at ILM.

TABLE 2T | Based Aircraft Fleet Mix

Aircraft Type	2023	Percent	2028	Percent	2033	Percent	2043	Percent
SEP	74	62.71%	82	61.50%	87	58.50%	104	55.00%
Multi-Engine (Piston/Turbine)	12	10.17%	15	11.00%	17	11.50%	24	12.50%
Jet	23	19.49%	26	19.50%	31	20.50%	42	22.00%
Helicopter	9	7.63%	11	8.00%	14	9.50%	20	10.50%
Total	**118**	**100.00%**	**133**	**100.00%**	**149**	**100.00%**	**189**	**100.00%**

SEP = single-engine piston

Sources: FAA Based Aircraft Registry; Coffman Associates analysis

GENERAL AVIATION OPERATIONS FORECAST

General aviation operations include a wide range of activity, from recreational use and flight training to business and corporate uses. General aviation operations are further classified as local and itinerant. A local operation is a takeoff or landing performed by an aircraft that operates within sight of an airport or executes simulated approaches or touch-and-go operations at an airport. Local operations are generally characterized by training activity. Itinerant operations are those performed by aircraft with a specific origin or destination away from an airport. Typically, itinerant operations increase with business and commercial use because business aircraft are used primarily to transport passengers from one location to another.

Several methods have been employed to develop a reasonable planning envelope. The following sections present several new operations forecasts. Counts from the ILM ATCT were utilized in this analysis.

Historical Growth Rate Projections

For the period of 2019-2023, ILM's ATCT indicates CAGRs of 5.07 percent for itinerant general aviation operations and 16.68 percent for local general aviation operations. Assuming these rates remain constant over the forecast period results in 2043 operations projections of 89,100 (itinerant general aviation) and 439,000 (local general aviation). The high growth rates shown in these projections are a result of strong operational growth in recent years, particularly in the local general aviation segment. Given that the growth rates presented under this forecast are likely unsustainable, the five-year historical growth rate forecast will not be considered further.

Market Share Projections

Market share analysis compares known historical and forecast data points to arrive at a trend for the unknown variable (ILM operations). The results of each market share projection are presented in **Table 2U**. The first forecast considers the current market share of general aviation (itinerant and local) operations at the airport as compared to the FAA national forecast for operations at towered airports.

TABLE 2U | General Aviation Operations Market Share Projections

	General Aviation Itinerant			General Aviation Local		
Year	**ILM**	**U.S.**	**ILM Market %**	**ILM**	**U.S.**	**ILM Market %**
2014	20,093	13,942,761	0.144%	3,016	11,679,412	0.026%
2015	20,276	13,856,535	0.146%	5,047	11,679,293	0.043%
2016	21,972	13,930,865	0.158%	5,640	11,629,923	0.048%
2017	24,009	13,933,523	0.172%	7,807	11,842,865	0.066%
2018	25,905	14,067,161	0.184%	8,097	12,510,742	0.065%
2019	25,855	14,385,032	0.180%	9,283	13,295,230	0.070%
2020	25,425	12,333,442	0.206%	13,103	12,366,299	0.106%
2021	29,403	14,108,432	0.208%	13,468	13,452,474	0.100%
2022	30,671	14,561,684	0.211%	14,077	14,295,966	0.098%
2023	33,113	14,581,046	0.227%	20,074	15,269,476	0.131%
Constant Market Share – Low Range						
2028	36,500	16,068,000	0.227%	20,700	15,768,000	0.131%
2033	37,000	16,274,000	0.227%	21,100	16,043,000	0.131%
2043	37,900	16,704,000	0.227%	21,900	16,622,000	0.131%
CAGR	**0.68%**			**0.44%**		
Increasing Market Share – Mid Range						
2028	37,000	16,068,000	0.230%	23,400	15,768,000	0.149%
2033	38,400	16,274,000	0.236%	26,600	16,043,000	0.166%
2043	41,800	16,704,000	0.250%	33,200	16,622,000	0.200%
CAGR	**1.17%**			**2.55%**		
Increasing Market Share – High Range						
2028	47,500	16,068,000	0.295%	27,400	15,768,000	0.174%
2033	59,200	16,274,000	0.364%	34,600	16,043,000	0.216%
2043	83,500	16,704,000	0.500%	49,900	16,622,000	0.300%
CAGR	**4.73%**			**4.66%**		

CAGR = compound annual growth rate

Sources: U.S. Operations: FAA Aerospace Forecast, 2023-2043; Historical ILM Operations: ILM ATCT counts; ILM Projections: Coffman Associates analysis

In 2023, ILM accounted for 0.227 percent of U.S. itinerant general aviation operations and 0.131 percent of U.S. local general aviation operations. By carrying these current percentages forward through the planning horizon, a constant market share forecast emerges that results in 37,900 itinerant and 21,900 local operations by 2043. The constant market share is considered a low range projection, as historical data indicate that ILM's market share has grown for each operational category over the past 10 years.

To reflect historical trends, a mid-range increasing market share projection was prepared. The mid-range projection takes ILM's 2043 market share of itinerant general aviation operations to 0.250 percent. ILM's 2043 market share of local general aviation operations is taken to 0.200 percent. This forecast results in 41,800 itinerant operations and 33,200 local operations by 2043. The results of these mid-range projections are also shown in **Table 2U**.

High range increasing market share projections were also prepared, which consider the potential for operations to grow well beyond the current market share of U.S. general aviation operations. The resulting projections take ILM's 2043 market shares to 0.500 percent (itinerant general aviation) and 0.300 percent (local general aviation), yielding a forecast of 83,500 itinerant general aviation and 49,900 local general aviation operations, respectively. The results of the high range projections are shown in **Table 2U**.

Statewide TAF Growth Rate Forecast

FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems (NPIAS)*, provides a method for estimating future operations at airports by applying the statewide TAF growth rate. While this method is typically used for non-towered airports, it is useful for checking the reasonableness of other forecasts and can be the selected forecast if determined to be the most reasonable. For all NPIAS airports in North Carolina, the FAA projects an annual growth rate of 0.12 percent for itinerant general aviation operations and 0.15 percent for local general aviation operations in the state. Utilizing these growth rates to form projections takes ILM's 2043 operations to 33,900 (itinerant general aviation) and 20,700 (local general aviation).

Regression Analysis

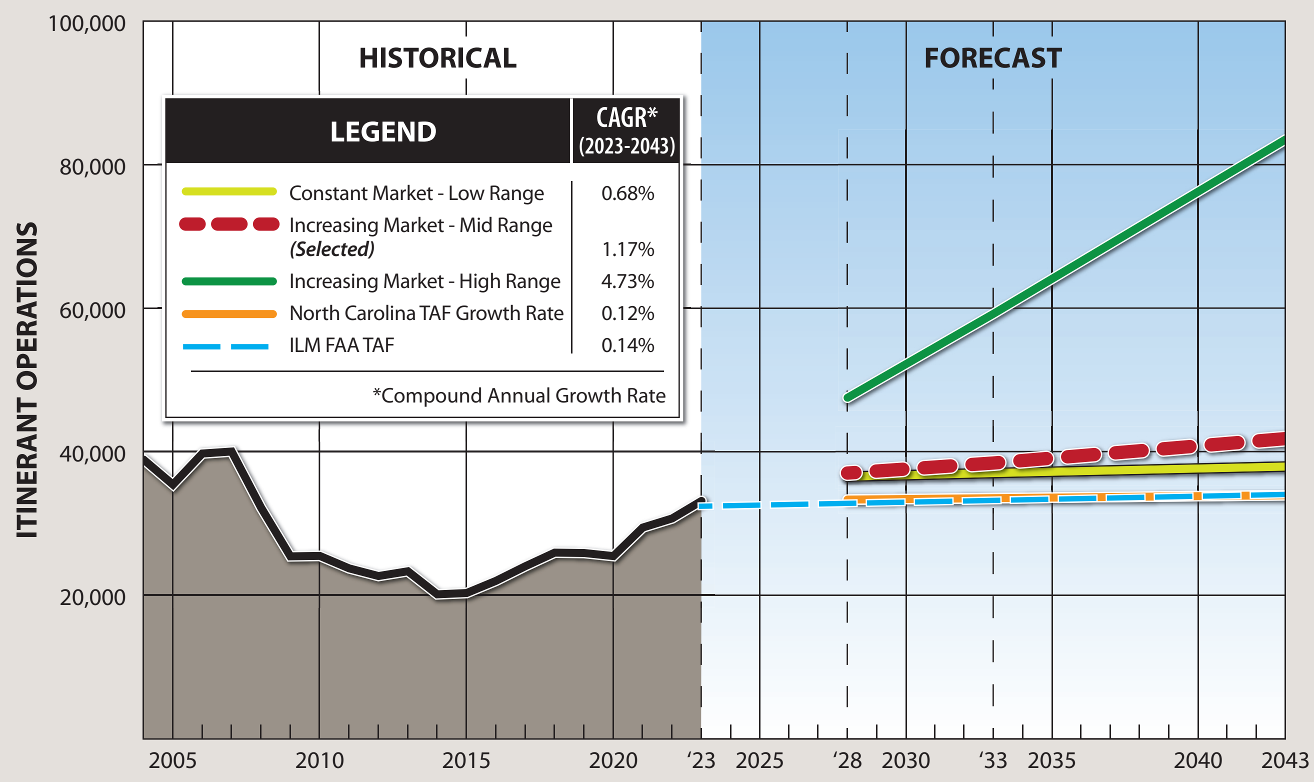
Several forecasts were prepared utilizing historical operations data and the regression model. Independent variables examined included national general aviation operations, population, employment, GRP, and time series regressions. The regression that produced the best correlation used variables of U.S. general aviation local operations and ILM local general aviation operations, which had an r^2 value of 0.830. As described previously, correlation values over 0.90 indicate good predictive reliability. Because none of the regressions produced a correlation value over 0.90, the regression forecasts have been excluded from consideration.

General Aviation Operations Forecast Summary

Table 2V summarizes the projections prepared for itinerant and local general aviation operations at ILM. Operations at ILM have historically experienced some fluctuation but have had an overall growing trend. Although the COVID-19 pandemic has had a major impact on the economy (and thus on aviation), ILM has experienced strong operational growth since 2020, particularly in local general aviation operations.

The selected forecasts take a realistic approach to growth and anticipate moderate operations growth levels over the planning period. Historical trends indicate ILM's market share of operations is increasing and there is no reason to expect that trend to change in the future. A new flight training operation is anticipated to start activity at ILM in the short term, which will boost local general aviation operations. As discussed in the based aircraft section, there is strong demand for new based aircraft at ILM – including small aircraft up to large corporate aircraft – which would support itinerant general aviation operations. For these reasons, the mid range increasing market share projections of local and itinerant general aviation operations have been selected. These projections are higher than the FAA TAF projections for ILM, but still within a reasonable range considering the development potential of the airport. **Exhibit 2H** graphically represents the operations projections that comprise the planning envelope.

ITINERANT GENERAL AVIATION OPERATIONS FORECASTS



LOCAL GENERAL AVIATION OPERATIONS FORECASTS

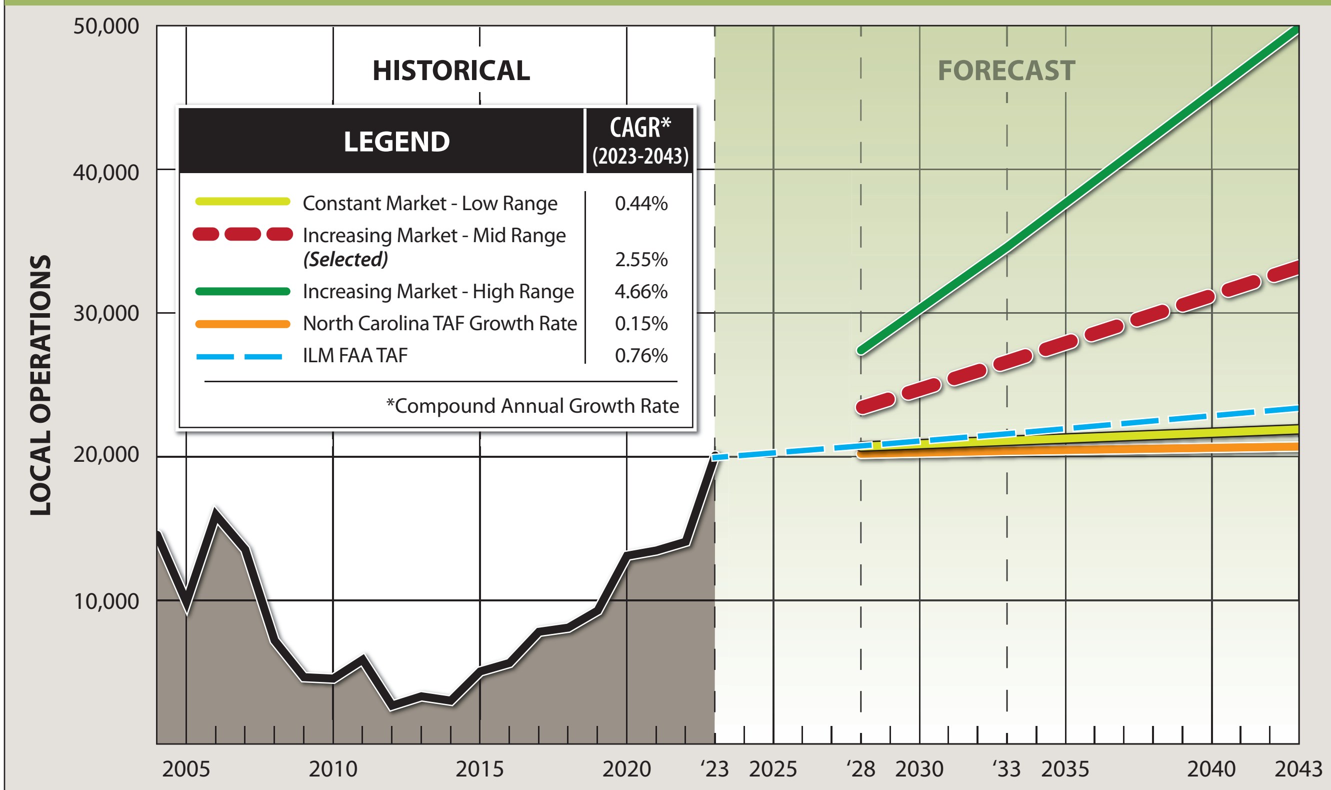


Exhibit 2H
GENERAL AVIATION OPERATIONS FORECASTS

TABLE 2V | General Aviation Operations Forecast Summary

Projection	2023	2028	2033	2043	CAGR 2023-2043
Itinerant General Aviation					
Constant Market - Low Range	**33,113**	36,500	37,000	37,900	0.68%
Increasing Market - Mid Range		**37,000**	**38,400**	**41,800**	**1.17%**
Increasing Market - High Range		47,500	59,200	83,500	4.73%
North Carolina TAF Growth Rate		33,300	33,500	33,900	0.12%
ILM FAA TAF	32,372	32,776	33,186	34,021	0.14%
Local General Aviation					
Constant Market - Low Range	**20,074**	20,700	21,100	21,900	0.44%
Increasing Market - Mid Range		**23,400**	**26,600**	**33,200**	**2.55%**
Increasing Market - High Range		27,400	34,600	49,900	4.66%
North Carolina TAF Growth Rate		20,200	20,400	20,700	0.15%
ILM FAA TAF	19,935	20,745	21,588	23,379	0.76%

Boldface indicates selected forecast.
CAGR = compound annual growth rate

Source: Coffman Associates analysis

Military Operations Forecast

Military aircraft can and do utilize civilian airports across the country. ILM frequently experiences activity by military aircraft. Forecasts of military activity are inherently difficult to predict because of the national security nature of their operations and the fact that their missions can change without notice; thus, it is typical for the FAA to use a flatline forecast for military operations. In 2023, the ATCT reported 5,968 itinerant military operations and 3,078 local military operations. For ILM, the FAA TAF projects itinerant and local military operations to remain static at 6,110 and 3,129, respectively, over the forecast period. These TAF estimates are also utilized for the operations forecast for the purposes of this study.

TOTAL OPERATIONS FORECAST SUMMARY

Table 2W presents a summary of the selected operations forecasts. The summary includes the airline segment (commercial aircraft with seating capacities of 60 or more), air cargo, other air taxi (commercial aircraft with 59 or fewer passenger seats), general aviation (any non-commercial/non-military operation), and military operations.

TABLE 2W| Total Operations Forecast Summary

	Itinerant						Local			
Year	Airline	Air Cargo	Other Air Taxi	General Aviation	Military	Total	General Aviation	Military	Total	Total Operations
2023	17,800	960	6,669	33,113	5,968	64,510	20,074	3,078	23,152	87,662
2028	19,600	900	7,700	37,000	6,110	71,310	23,400	3,129	26,529	97,839
2033	20,400	900	8,500	38,400	6,110	74,310	26,600	3,129	29,729	104,039
2043	21,800	900	10,400	41,800	6,110	81,010	33,200	3,129	36,329	117,339
CAGR	**1.02%**	**-0.32%**	**2.25%**	**1.17%**	**0.12%**	**1.15%**	**2.55%**	**0.08%**	**2.28%**	**1.47%**

CAGR = compound annual growth rate

Sources: Base year counts from ILM ATCT; forecasts from Coffman Associates analysis

TOTAL OPERATIONS PEAKING CHARACTERISTICS

Similar to the process for identifying peaking characteristics for commercial passenger activity, the same peaking characteristics have been evaluated for total airport operations. Tower operations data provide an understanding of the peak operational periods for the airport. Over the last four years, the peak month has averaged 9.5 percent of annual operations. The design day is the peak month average divided by the number of days in the peak month. The busy day during the average week of the peak month was 136.8 percent more than the design day. The design hour averaged 5.0 percent of design day operations. **Table 2X** summarizes the combined peaking operational characteristics for the airport.

TABLE 2X | Peaking Characteristics

Peak Period	2023	2028	2033	2043
Annual Operations	87,662	97,839	104,039	117,339
Peak Month	8,312	9,277	9,865	11,126
Busy Day	373	417	443	501
Design Day	273	305	324	366
Design Hour	14	15	16	18

Source: Coffman Associates analysis

FORECAST SUMMARY

This chapter has outlined the various activity levels that might reasonably be anticipated over the planning period. **Exhibit 2J** presents a summary of the aviation forecasts prepared in this chapter. The base year for these forecasts is 2023, with a 20-year planning horizon to 2043. The primary aviation demand indicators are based aircraft and operations. Passenger enplanements are forecast to increase from 657,292 in 2023 to 1,070,000 by 2043 (2.47 percent CAGR). Based aircraft are forecast to increase from 118 in 2023 to 189 by 2043 (2.38 percent CAGR). Total operations are forecast to increase from 87,662 in 2023 to 117,339 by 2043 (1.47 percent CAGR).

Projections of aviation demand will be influenced by unforeseen factors and events in the future; therefore, it is not reasonable to assume that future demand will follow the exact projection line, but forecasts of aviation demand tend to fall within the planning envelope over time. The forecasts developed for this study are considered reasonable for planning purposes. The need for additional facilities will be based on these forecasts; however, if demand does not materialize as projected, implementation of facility construction can be slowed. Likewise, if demand exceeds these forecasts, facility construction can be accelerated.

FORECAST COMPARISON TO THE TAF

The FAA reviews the forecasts presented in this aviation planning study for comparison to the *Terminal Area Forecast*. The forecasts are considered consistent with the TAF if they meet the following criteria:

- Forecasts differ by less than 10 percent in the five-year forecast period and less than 15 percent in the 10-year forecast period;
- Forecasts do not affect the timing or scale of an airport project; and
- Forecasts do not affect the role of the airport, as defined in the current version of FAA Order 5090.3, *Field Formulation of the National Plan of Integrated Airport Systems (NPIAS).*

	BASE	FORECAST		
	2023	**2028**	**2033**	**2043**
ENPLANEMENTS				
	657,292	**800,000**	**880,000**	**1,070,000**
OPERATIONS				
Itinerant				
Airline	17,800	19,600	20,400	21,800
Air Cargo	960	900	900	900
Other Air Taxi	6,669	7,700	8,500	10,400
General Aviation	33,113	37,000	38,400	41,800
Military	5,968	6,110	6,110	6,110
Subtotal	**64,510**	**71,310**	**74,310**	**81,010**
Local				
General Aviation	20,074	23,400	26,600	33,200
Military	3,078	3,129	3,129	3,129
Subtotal	**23,152**	**26,529**	**29,729**	**36,329**
Total Operations	**87,662**	**97,839**	**104,039**	**117,339**
PEAKING				
Peak Month	8,312	9,277	9,865	11,126
Busy Day	373	417	443	501
Design Day	273	305	324	366
Design Hour	14	15	16	18
Peak Hour	33	36	39	44
BASED AIRCRAFT				
Single-Engine Piston	74	82	87	104
Multi-Engine (Piston and Turboprop)	12	15	17	24
Jet	23	26	31	42
Helicopter	9	11	14	20
Total Based Aircraft	**118**	**133**	**149**	**189**

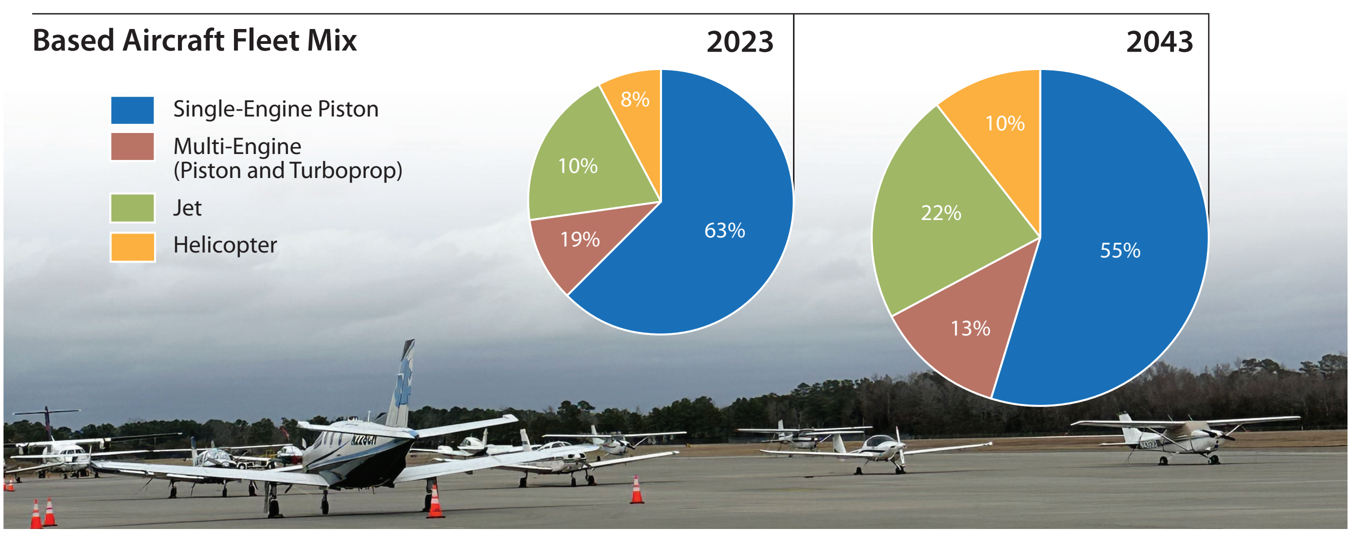


Exhibit 2J
FORECAST SUMMARY

If the forecasts exceed these parameters, they may be sent to FAA Headquarters in Washington, D.C., for further review. **Table 2Y** presents the direct comparison of the master planning forecasts with the TAF that was published in January 2024.

TABLE 2Y | Forecast Comparison to the *Terminal Area Forecast*

	BASE YEAR	FORECAST		
	2023	2028	2033	2043
Enplanements				
Airport Forecast	657,292	800,000	880,000	1,070,000
2024 ILM TAF	642,067	747,827	823,150	993,281
% Difference	2.3%	6.7%	6.7%	7.4%
Operations				
Airport Forecast	87,662	97,839	104,039	117,339
2024 ILM TAF	86,750	90,980	94,340	101,600
% Difference	1.0%	7.3%	9.8%	14.4%
Based Aircraft				
Airport Forecast	118	133	149	189
2024 ILM TAF	111	130	150	190
% Difference	6.1%	2.3%	0.7%	0.5%

TAF = *Terminal Area Forecast* (January 2024)

The base year data for passenger enplanements differ by more than two percent due to the TAF not reflecting actual enplanement counts for 2023. Based on the discussion in the enplanement projections section, there is considerable support for ILM to steadily grow its enplanement levels over the next 20 years. As a result, the forecast prepared for this study is nearly seven percent different from the TAF in the five- and 10-year periods, and over seven percent different from the TAF by 2043.

Similarly, total operations forecasted in the master plan track ahead of the TAF by 7.3 percent by 2028, 9.8 percent by 2033, and 14.4 percent by 2043. This is largely due to the anticipated growth of the commercial operations (including other air taxi) segment, as well as general aviation itinerant and local operations. By 2043, the TAF projects an increase of only 14,850 total operations, while the forecasts prepared for this study project an increase of 29,677, which provides for greater operational range and potential for growth.

The base year data for based aircraft differ by 6.1 percent; however, the selected based aircraft forecast follows the TAF very closely in the forecast years of this study. By 2043, there is only a 0.5 percent difference between the TAF and the selected forecast. Overall, the enplanement, operations, and based aircraft forecasts prepared for this study remain within TAF tolerances in the five- and 10-year planning horizons.

AIRCRAFT/AIRPORT/RUNWAY CLASSIFICATION

The FAA has established several aircraft classification systems that group aircraft types based on their performance (approach speed during landing operations) and design characteristics (wingspan and landing gear configuration). These classification systems are used to determine the appropriate airport design standards for specific airport elements, such as runways, taxiways, taxilanes, and aprons.

AIRCRAFT CLASSIFICATION

The selection of appropriate FAA design standards for the development and location of airport facilities is based primarily on the characteristics of the aircraft that are currently using, or are expected to use, an airport. The *critical design aircraft* is used to define the design parameters for an airport. The design aircraft may be a single aircraft type or a group of aircraft with similar characteristics. The design aircraft is classified by three parameters: aircraft approach category (AAC), airplane design group (ADG), and taxiway design group (TDG). FAA AC 150/5300-13A, *Airport Design*, describes the following airplane classification systems, the parameters of which are presented on **Exhibit 2K**.

Aircraft Approach Category (AAC): The AAC is a grouping of aircraft based on a reference landing speed (V_{REF}), if specified, or if V_{REF} is not specified, 1.3 times the stall speed (V_{SO}) at the maximum certified landing weight. V_{REF}, V_{SO}, and the maximum certified landing weight are those values established for the aircraft by the certification authority of the country of registry (the FAA in the United States).

The AAC refers to the approach speed of an aircraft in landing configuration and is depicted by a letter (A through E). The higher the approach speed (operational characteristic), the more restrictive the applicable design standards. The AAC generally applies to runways and runway-related facilities, such as runway width, runway safety area (RSA), runway object free area (ROFA), runway protection zone (RPZ), and separation standards.

Airplane Design Group (ADG): The ADG is depicted by a Roman numeral (I through VI) and is a classification of aircraft that relates to aircraft wingspan or tail height (physical characteristics). When the aircraft wingspan and tail height fall in different groups, the higher (more restrictive) group is used. The ADG influences design standards for taxiway safety area (TSA), taxiway object free area (TOFA), taxilane object free area, apron wingtip clearance, and various separation distances.

Taxiway Design Group (TDG): The TDG is a classification of airplanes based on certain undercarriage dimensions of the aircraft. Both outer-to-outer main gear width (MGW) and cockpit-to-main gear (CMG) distances are used in the classification of an aircraft. The TDG is depicted by an alphanumeric system: 1A, 1B, 2, 3, 4, 5, 6, and 7. The taxiway design elements determined by the application of the TDG include the taxiway width, taxiway edge safety margin, taxiway shoulder width, taxiway fillet design and dimensions, and (in some cases) the separation distance between parallel taxiways/taxilanes. Other taxiway elements – such as the taxiway safety area (TSA), taxiway object free area (TOFA), taxiway/taxilane separation to parallel taxiway/taxilanes or fixed or movable objects, and taxiway/taxilane wingtip clearances – are determined solely based on the wingspan (ADG) of the design aircraft utilizing those surfaces. It is appropriate for taxiways to be planned and built to different TDG standards, based on expected use.

Exhibit 2L summarizes the classification of the most common aircraft in operation today. Generally, recreational and business piston and turboprop aircraft will fall in AAC A and B, and ADG I and II. Business jets typically fall in AAC B and C, while the larger commercial aircraft will fall in AAC C and D.

AIRCRAFT APPROACH CATEGORY (AAC)

Category	Approach Speed
A	less than 91 knots
B	91 knots or more but less than 121 knots
C	121 knots or more but less than 141 knots
D	141 knots or more but less than 166 knots
E	166 knots or more

AIRPLANE DESIGN GROUP (ADG)

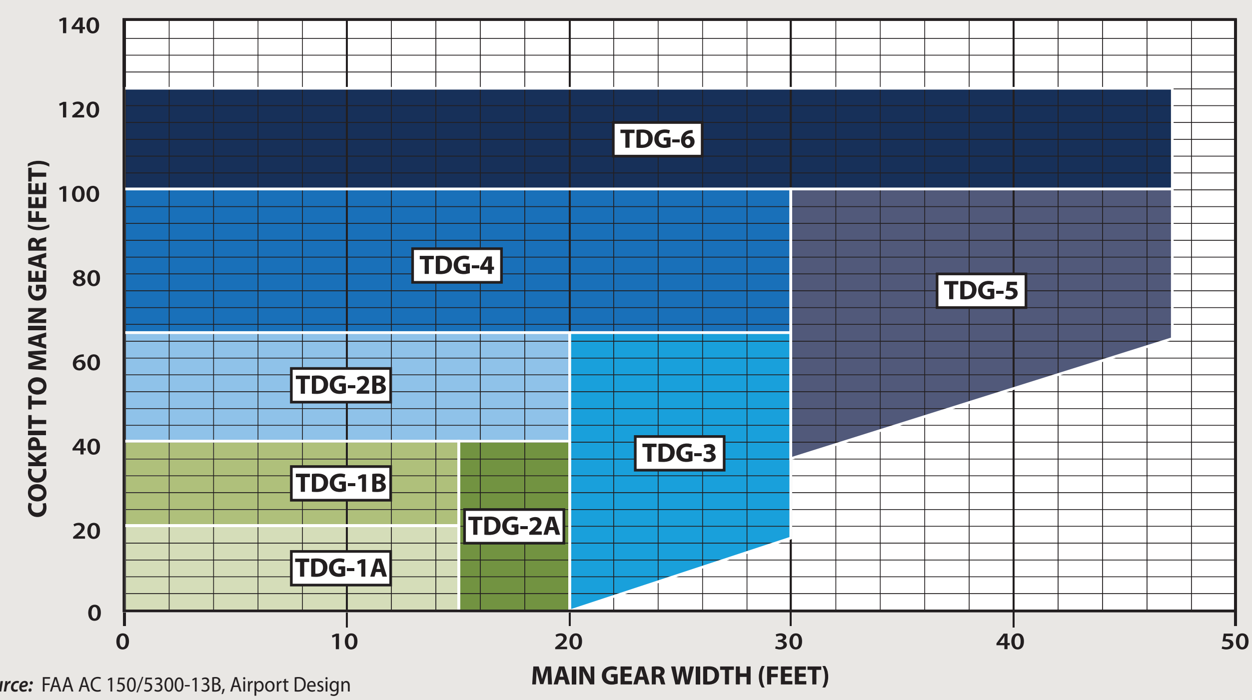
Group #	Tail Height (ft)	Wingspan (ft)
I	<20	<49
II	20-<30	49-<79
III	30-<45	79-<118
IV	45-<60	118-<171
V	60-<66	171-<214
VI	66-<80	214-<262

VISIBILITY MINIMUMS

RVR* (ft)	Flight Visibility Category (statute miles)
VIS	3-mile or greater visibility minimums
5,000	Not lower than 1-mile
4,000	Lower than 1-mile but not lower than ¾-mile
2,400	Lower than ¾-mile but not lower than ½-mile
1,600	Lower than ½-mile but not lower than ¼-mile
1,200	Lower than ¼-mile

***RVR**: Runway Visual Range

TAXIWAY DESIGN GROUP (TDG)



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

Exhibit 2K
AIRCRAFT CLASSIFICATION PARAMETERS

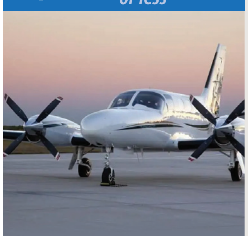
A-I

Aircraft	TDG
• Beech Bonanza	1A
• **Cessna 150**, 172	**1A**
• Piper Comanche, Seneca	1A

B-I

Aircraft	TDG
• Eclipse 500	1A
• Beech Baron 55/58	1A
• **Beech King Air 100**	**1A**
• Cessna 421	2A
• Cessna Citation M2 (525)	1A
• Cessna Citation 1(500)	1A
• Embraer Phenom 100	1A

A/B-II *12,500 lbs. or less*

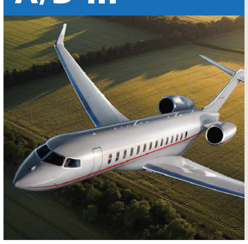


Aircraft	TDG
• Beech Super King Air 200	2A
• Beech King Air 90	1A
• **Cessna 441 Conquest**	**1A**
• Cessna Citation CJ2	2A
• Pilatus PC-12	2

B-II *over 12,500 lbs.*

Aircraft	TDG
• Beech Super King Air 350	2A
• Cessna Citation CJ3(525B)	2A
• **Cessna Citation CJ4 (525C)**	**1B**
• Cessna Citation Latitude	1B
• Embraer Phenom 300	1B
• Falcon 20	1B
• Pilatus PC-24	2A

A/B-III



Aircraft	TDG
• Bombardier Dash 8	3
• **Bombardier Global 7500**	**2B**
• Falcon 7X, 8X	2A

C/D-I

Aircraft	TDG
• **Lear** 35, 40, **45**, 55, 60XR	**1B**
• F-16	1A

C/D-II

Aircraft	TDG
• Challenger 600/604	1B
• Cessna Citation III, VI,VII, X	1B
• Embraer Legacy 135/140	2B
• **Gulfstream IV** (D-II)	**2A**
• Gulfstream G280	1B
• Lear 70, 75	1B
• Falcon 50, 900, 2000	2A
• Hawker 800XP, 4000	1B

C/D-III *less than 150,000 lbs.*

Aircraft	TDG
• Gulfstream V	2B
• **Gulfstream** 550, 600, **650**	**2B**
• Global 5000, 6000	2B

C/D-III *over 150,000 lbs.*

Aircraft	TDG
• **Airbus** A319, **A320**, A321	3
• Boeing 737-800, 900	3
• MD-83, 88	4

C/D-IV

Aircraft	TDG
• Airbus A300	5
• Boeing 757-200	4
• **Boeing 767**-300, 400	**5**
• MD-11	6

C/D-V

Aircraft	TDG
• Airbus A330-200, 300	5
• Airbus A340-500, 600	6
• Boeing 747-100 - 400	5
• Boeing 777-300	6
• **Boeing 787-8**, 9	**5**

E-I

Aircraft	TDG
• **F-15**	**1B**

Note: Aircraft pictured is identified in **bold** type.

Exhibit 2L
AIRPORT REFERENCE CODES

AIRPORT AND RUNWAY CLASSIFICATIONS

Airport and runway classifications, along with the aircraft classifications defined previously, are used to determine the appropriate FAA design standards to which the airfield facilities should be designed and built.

Runway Design Code (RDC): The RDC is a code that signifies the design standards to which the runway should be built. The RDC is based on planned development and has no operational component.

The AAC, ADG, and runway visual range (RVR) are combined to form the RDC of a runway. The RDC provides the information needed to determine certain design standards that apply. The first component, depicted by a letter, is the AAC and relates to aircraft approach speeds (operational characteristic). The second component, depicted by a Roman numeral, is the ADG and relates to either the aircraft wingspan or tail height (physical characteristic), whichever is more restrictive. The third component relates to the available instrument approach visibility minimums, expressed by RVR values in feet of 1,200 (1/8-mile), 1,600 (1/4-mile), 2,400 (1/2-mile), 4,000 (3/4-mile), and 5,000 (1-mile). The RVR values approximate standard visibility minimums for instrument approaches to the runways. A runway designed for visual approaches only will use "VIS" in place of a numerical value for the RVR.

Approach Reference Code (APRC): The APRC is a code that signifies the current operational capabilities of a runway and associated parallel taxiway regarding landing operations. Like the RDC, the APRC is comprised of the same three components: AAC, ADG, and RVR. The APRC describes the current operational capabilities of a runway under meteorological conditions in which no special operating procedures are necessary, as opposed to the RDC, which is based on planned development with no operational component. The APRC for a runway is established based on the minimum runway-to-taxiway centerline separation.

Departure Reference Code (DPRC): The DPRC is a code that signifies the current operational capabilities of a runway and associated parallel taxiway regarding takeoff operations. The DPRC represents those aircraft that can take off from a runway while any aircraft are present on adjacent taxiways, under meteorological conditions with no special operating conditions. The DPRC is like the APRC but is composed of only the AAC and ADG. A runway may have more than one DPRC, depending on the parallel taxiway separation distance.

Airport Reference Code (ARC): The ARC is an airport designation that signifies the airport's highest runway design code (RDC) minus the third component (visibility) of the RDC. The ARC is used for planning and design only and does not limit the aircraft that may be able to operate safely at an airport. The current airport layout plan (ALP) for ILM identifies the ARC as C-III.

CRITICAL DESIGN AIRCRAFT

The selection of appropriate FAA design standards for the development and location of airport facilities is based primarily on the characteristics of the aircraft that are currently using, or are expected to use, the airport. The critical design aircraft is used to define the design parameters for an airport. The design aircraft may be a single aircraft type or a group of aircraft with similar characteristics defined by the three parameters: AAC, ADG, and TDG.

The first consideration is the safe operation of aircraft that are likely to use an airport. Any operation of an aircraft that exceeds the design criteria of an airport may result in a lower safety margin; however, it is not the usual practice to base the design of an airport on an aircraft that uses the airport infrequently.

The design aircraft is defined as the most demanding aircraft type, or grouping of aircraft with similar characteristics, that makes regular use of the airport. Regular use is 500 annual operations, excluding touch-and-go operations. Planning for future aircraft use is of importance because the design standards are used to plan separation distances between facilities. These future standards must be considered now to ensure that short-term development does not preclude the reasonable long-range potential needs of the airport.

According to FAA AC 150/5300-13A, *Airport Design*, "airport designs based only on existing aircraft can severely limit the ability to expand the airport to meet future requirements for larger, more demanding aircraft. Airport designs that are based on large aircraft never likely to be served by the airport are not economical." Selection of the current and future critical design aircraft must be realistic in nature and supported by current data and realistic projections.

For airports like ILM that accommodate a significant number of military operations, it is important to account for the impact of these aircraft on facility planning; however, according to FAA AC 150/5000-17, *Critical Aircraft and Regular Use Determination*, planned projects based on the needs of military aircraft are not eligible for FAA funding (both Airport Improvement Program [AIP] and passenger facility charge [PFC] funding). In these cases, a critical design aircraft for AIP or PFC eligibility can be identified separately from a critical design aircraft for airfield facility planning.

AIRPORT DESIGN AIRCRAFT

There are three elements for classifying the airport design aircraft: AAC, ADG, and TDG. The AAC and ADG are examined first, followed by the TDG.

Existing Critical Design Aircraft

Exhibit 2M presents the Traffic Flow Management System Counts (TFMSC) operational mix at the airport for turboprops and jets since 2014. It should be noted that TFMSC data do not indicate runway usage; however, based on a historical understanding of airport operations, it is generally understood that Runway 6-24 serves as the primary runway and accommodates approximately 70 percent of all operations, including commercial and military aircraft. Runway 17-35 serves as a crosswind runway for commercial, military, and general aviation aircraft.

According to the TFMSC data, operations at ILM within AAC D and ADG V have exceeded the 500 operations threshold regularly since 2019, including 2020, in which there was a decline in operations due to the COVID-19 pandemic; however, several military aircraft that are classified within ARC D-I accounted for 258 AAC D operations. Removing AAC D military aircraft from the count results in 1,790 civilian AAC D operations in 2023. AAC D civilian aircraft – including aircraft such as the Gulfstream 450, 500, and 600, as well as the Boeing 737-800 and 737-900 – have exceeded the threshold of 500 annual operations since 2014.

ADG V operations at ILM are conducted almost entirely by the Boeing P-8 Poseidon, which accounted for 490 operations in 2023. When military aircraft are removed from the ADG V category, civilian ADG V operations have remained close to zero over the past 10 years. ADG III civilian aircraft – including the Bombardier CRJ900/1000, Embraer EMB 170/175/190, and Airbus A319/320/321 – have historically exceeded the threshold of 500 annual operations. In 2023, civilian and military ADG III aircraft conducted over 15,900 operations.

ILM's primary runway current critical design civilian aircraft is represented by the Boeing 737-800 and 737-900, which are AAC D and ADG III aircraft and conducted a total of 990 operations in 2023.

The crosswind runway, Runway 17-35, has historically been planned to meet ARC C-III design standards, which coincides with historical planning for the primary runway. It is important for ILM to maintain the crosswind runway to commercial service design standards to ensure safe operations during higher crosswind conditions and provide a level of redundancy to the airfield. Additionally, historical analysis has indicated that the crosswind runway is utilized approximately 30 percent of the time; therefore, Runway 17-35 should also be designed to ARC D-III design standards.

As previously mentioned, it is also important to consider military aircraft in facility planning; however, military aircraft cannot be used to justify AIP or PFC funding for projects. **For facility planning purposes only, the existing critical design aircraft for the primary and crosswind runway is a combination of the AAC D aircraft and the Boeing P-8 Poseidon (ADG V). It is anticipated that this planning-only classification will apply to the future condition, as well.**

Ultimate Critical Design Aircraft

It is not unusual for an airport to transition from one critical aircraft to another. **Table 2Z** presents the forecast operational fleet mix for jets and turboprops by AAC and ADG. In 2023, there were 35,674 turboprop and jet operations, of which 57 percent (20,368) were by aircraft in AAC C and six percent (2,048) were by aircraft in AAC D. The total operations fleet mix forecast was previously presented on **Exhibit 2M**. Operations by turboprops and jets in ACC C and D are forecast to maintain their current percentage of the whole (57 percent for ACC C and six percent for ACC D). Because activity by these types of aircraft is projected to grow over the next 20 years, the total number of operations in AAC C and D is also projected to grow.

ARC	Aircraft	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
A-I	Beech Turbine Duke	0	0	0	2	2	0	4	4	4	0
	Cirrus Vision Jet	0	0	0	0	4	52	48	90	130	190
	Eclipse 400/500	68	64	144	132	84	62	38	42	32	14
	Epic Dynasty	14	28	8	0	2	0	2	6	4	6
	Kodiak Quest	0	0	6	2	4	8	0	0	0	2
	Lancair Evolution/Legacy	0	2	4	2	4	0	0	0	6	4
	Piper Malibu/Meridian	256	224	242	190	202	196	348	418	490	528
	Socata TBM 7/850/900	146	174	366	566	628	446	444	686	656	652
	Total	**484**	**492**	**770**	**894**	**930**	**764**	**884**	**1,246**	**1,322**	**1,396**
A-II	CASA Aviocar	0	12	4	0	8	8	10	6	0	2
	Cessna Caravan	886	928	934	980	740	440	456	460	434	438
	De Havilland Twin Otter	20	16	8	20	8	10	14	20	22	32
	Pilatus PC-12	830	506	590	728	662	642	584	712	634	604
	Total	**1,736**	**1,462**	**1,536**	**1,728**	**1,418**	**1,100**	**1,064**	**1,198**	**1,090**	**1,076**
B-I	Aero Commander 680	0	0	2	0	0	0	0	0	0	0
	Beech 99 Airliner	0	2	0	0	2	0	0	0	0	0
	Beechjet 400	482	430	416	436	438	448	378	560	468	406
	Cessna 425 Corsair	14	22	16	24	20	4	20	18	16	18
	Cessna 526 Jet Trainer	0	0	0	6	0	0	0	0	0	0
	Citation CJ1	424	358	466	588	760	708	436	486	482	386
	Citation I/SP	38	44	72	58	48	34	34	48	34	56
	Citation M2	0	0	0	4	16	28	32	60	94	134
	Citation Mustang	68	98	158	146	124	108	62	86	110	148
	Falcon 10	44	18	12	22	18	20	24	6	20	30
	Hawker 1000	10	10	12	2	8	8	4	8	10	4
	Honda Jet	0	4	2	10	82	182	200	450	486	304
	King Air 90/100	592	632	318	376	550	370	192	254	244	134
	L-39 Albatross	8	6	0	0	0	0	0	0	0	2
	Mitsubishi MU-2	16	38	66	54	36	18	4	8	10	44
	Phenom 100	100	128	116	52	70	70	48	112	198	264
	Piaggio Avanti	102	72	88	40	34	36	14	30	38	34
	Piper Cheyenne	166	110	58	92	104	74	20	12	54	50
	Premier 1	166	168	128	122	194	86	70	90	86	64
	Rockwell Sabre 40/60	8	2	12	4	6	0	4	8	8	0
	T-6 Texan	26	24	18	28	34	18	4	66	42	46
	Total	**2,264**	**2,166**	**1,960**	**2,064**	**2,544**	**2,212**	**1,546**	**2,302**	**2,400**	**2,124**
B-II	Aero Commander 690	20	26	16	14	12	8	0	0	0	2
	BAe Jetstream	2	0	0	0	0	0	0	0	0	0
	Beech 1900	0	0	0	4	0	0	2	0	4	12
	Cessna Conquest	10	6	16	16	6	12	12	14	34	56
	Citation CJ2/CJ3/CJ4	620	712	646	668	728	714	798	1,202	1,564	1,486
	Citation II/SP/Latitude	282	232	300	846	1,024	1,142	792	596	670	596
	Citation Longitude	0	0	0	0	0	2	10	22	44	70
	Citation V/Sovereign	852	840	942	714	534	556	390	578	774	676
	Citation X	158	144	154	120	100	86	98	146	220	162
	Citation XLS	582	672	714	840	776	730	530	808	826	946

ARC	Aircraft	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
B-II	Dornier 328	140	120	100	80	14	16	4	8	12	10
	Embraer EMB-110/120	0	2	28	4	14	0	2	6	6	4
	Falcon 20/50	104	130	112	92	122	106	78	112	130	126
	Falcon 2000	250	338	556	606	570	550	386	628	604	654
	Falcon 900	270	276	204	284	250	288	180	290	96	264
	Hawker 4000	16	10	8	8	12	4	8	8	16	18
	King Air 200/300/350	1,330	1,578	1,676	2,018	2,016	1,886	1,590	2,090	2,014	1,832
	King Air F90	20	18	10	6	10	10	2	12	40	32
	Phenom 300	130	194	236	336	372	584	530	840	836	722
	Pilatus PC-24	0	0	0	0	8	16	46	72	216	196
	Saab 340	6	6	8	4	6	2	0	2	2	0
	Shorts 330/360	2	2	0	0	2	0	0	0	0	0
	Shorts C-23	0	0	0	0	0	0	0	0	0	0
	Swearingen merlin	26	12	12	10	18	8	6	12	12	10
	Total	**4,820**	**5,318**	**5,738**	**6,670**	**6,594**	**6,720**	**5,464**	**7,446**	**8,120**	**7,874**
B-III	Aerospatiale ATR 42/72	518	520	522	520	520	524	522	526	534	548
	Bombardier Global 5000	14	8	14	16	10	14	16	12	14	8
	Bombardier Global 7500	0	0	0	0	0	0	0	4	0	10
	Bombardier Global Express	18	32	30	48	40	18	8	60	80	30
	C-2 Greyhound	40	44	54	66	84	60	70	106	54	38
	CASA 235	16	12	10	6	10	2	2	10	10	20
	Convair CV Series	0	4	0	0	0	0	0	0	0	0
	De Havilland Dash 8 Series	428	392	12	4	6	10	8	0	12	2
	Falcon 7X/8X	20	18	8	10	16	2	0	12	4	26
	Fokker F-27	0	0	0	0	0	0	0	0	0	0
	Grumman E-2 Hawkeye	122	100	150	142	168	238	216	192	116	100
	Saab 2000	0	4	0	2	0	0	0	0	0	2
	Total	**1,176**	**1,134**	**800**	**814**	**854**	**868**	**842**	**922**	**824**	**784**
C-I	A-4 Skyhawk	0	0	0	0	2	0	0	0	0	0
	AV-8B Harrier	394	294	108	226	192	200	136	102	80	32
	BAe HS 125 Series	2	4	2	4	2	0	2	0	0	0
	BAe Systems Hawk	2	0	0	2	6	0	0	2	4	14
	Learjet 20 Series	8	0	0	2	12	4	0	0	0	0
	Learjet 31	90	180	224	236	194	230	86	100	110	70
	Learjet 40 Series	222	154	142	158	108	98	118	206	192	198
	Learjet 50 Series	34	24	22	28	24	34	28	30	28	44
	Learjet 60 Series	154	154	118	170	120	108	66	178	192	110
	Rockwell Sabre 75	6	2	0	0	0	0	0	0	0	0
	Westwind II	20	22	12	2	2	2	4	2	4	2
	Total	**932**	**834**	**628**	**828**	**662**	**676**	**440**	**620**	**610**	**470**
C-II	A-6 Intruder	16	10	4	12	2	2	0	0	0	0
	Bombardier CRJ 100/200/700	6,958	6,924	5,006	3,608	5,574	5,926	2,566	2,808	3,258	1,560
	Challenger 300	182	218	238	308	386	452	442	620	692	730
	Challenger 600/604	72	112	146	152	128	76	80	124	142	132
	Citation III/VI	132	98	110	106	68	62	44	86	138	62
	Embraer 500/450 Legacy	0	0	4	30	84	134	138	644	734	602

Exhibit 2M
HISTORICAL JET AND TURBOPROP OPERATIONS

ARC	Aircraft	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
C-II	Embraer ERJ-135/140/145	490	50	328	2190	2,848	3,378	1,818	1,530	1,624	1,502
	Fairchild A-10	0	2	0	0	0	0	0	0	0	0
	Gulfstream 100/150	118	88	98	74	66	116	82	194	168	186
	Gulfstream 280	6	10	16	12	30	34	32	42	56	78
	Gulfstream G-III	32	12	10	16	14	4	2	0	0	0
	Hawker 800 (Formerly Bae-125-800)	276	324	330	290	350	298	244	386	462	344
	Learjet 70 Series	0	36	34	48	86	86	64	98	96	94
	Total	8,282	7,884	6,324	6,846	9,636	10,568	5,512	6,532	7,370	5,290
C-III	Airbus A319/320/321	838	640	1,548	1,718	1,972	2,346	928	1,626	2,192	3,180
	BAe 146	0	0	0	0	0	0	2	0	0	0
	Boeing 717/727	90	78	234	60	0	22	10	476	914	1,236
	Boeing 737 (200 thru 700 series)	40	76	82	106	86	128	220	96	320	482
	Bombardier CRJ 900/1000	3,202	4,146	4,060	4,844	4,352	4,200	3,974	5,984	4,156	4,612
	Bombardier CS100	0	0	0	0	0	2	0	0	0	0
	C-27J Spartan	4	22	20	46	54	30	32	28	14	18
	De Havilland Dash 8 Q-400	2	0	0	0	0	0	0	0	0	0
	Embraer EMB 170/175/190	1,024	686	1,728	290	602	1,714	1,526	2,628	4,026	4,306
	Mcdonnell Douglas DC-9	2	0	2	4	2	0	0	4	0	0
	Mcdonnell Douglas MD-81/82/87/90	0	0	0	0	2	0	0	0	0	0
	P-3 Orion	20	20	20	28	22	16	26	26	16	10
	Total	5,222	5,668	7,694	7,096	7,092	8,458	6,718	10,868	11,638	13,844
C-IV	Airbus A300/310	0	0	0	0	0	0	0	0	0	0
	Boeing 707	20	18	0	0	6	6	4	4	2	0
	Boeing 757-200	62	74	88	96	56	76	60	50	16	18
	Boeing 767-200/300	6	6	2	0	0	0	0	2	8	10
	Boeing C-17	12	8	28	10	24	32	62	32	48	26
	Boeing E-3 Sentry	0	0	0	0	0	2	0	0	0	0
	Boeing E-6 Mercury	0	0	0	2	0	0	0	0	2	0
	C-t130 Hercules	182	212	192	256	216	152	266	338	198	220
	Total	282	318	310	364	302	268	392	426	274	274
C-V	Airbus A330-200/300 Series	0	0	0	0	0	0	0	0	0	0
	Boeing 777-200	4	0	0	0	0	0	0	0	0	0
	Boeing 787-8/9/10	0	0	0	0	0	0	0	2	0	0
	Boeing P-8 Poseidon	74	142	154	290	350	620	622	544	558	490
	Total	78	142	154	290	350	620	622	546	558	490
D-I	F/A-18 Hornet	6	2	6	4	30	20	48	950	222	218
	F-15 Eagle	4	10	8	4	14	6	14	26	16	14
	F-22 Raptor	0	0	0	2	0	0	0	0	2	0
	Learjet 35/36	252	322	296	310	288	238	130	206	228	226
	T-38 Talon	2	2	6	28	4	14	4	10	0	26
	Total	264	336	316	348	336	278	196	1,192	468	484
D-II	Gulfstream 200	330	214	172	34	34	14	18	34	52	40
	Gulfstream 450	160	268	246	254	260	248	184	300	368	246
	Gulfstream G-IV	0	0	0	0	0	0	0	0	0	0
	Total	490	482	418	288	294	262	202	334	420	286

ARC	Aircraft	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
D-III	Boeing 737 800/900	10	6	10	16	24	498	130	26	192	990
	Gulfstream 500/600	138	138	152	176	192	200	174	306	328	288
	Mcdonnell Douglas MD-83/88	418	504	518	646	680	18	0	0	0	0
	Total	566	648	680	838	896	716	304	332	520	1,278
D-IV	Mcdonnell Douglas DC-8/10	0	0	0	0	0	2	0	0	6	0
	Total	0	0	0	0	0	2	0	0	6	0
D-V	Boeing 747 All Series	2	0	4	0	0	0	2	0	0	0
	Total	2	0	4	0	0	0	2	0	0	0
E-I	F-16 Falcon/Viper	0	0	4	2	0	2	2	0	4	4
	Total	0	0	4	2	0	2	2	0	4	4

AIRPORT REFERENCE CODE (ARC) SUMMARY

ARC	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
A-I	484	492	770	894	930	764	884	1,246	1,322	1,396
A-II	1,736	1,462	1,536	1,728	1,418	1,100	1,064	1,198	1,090	1,076
B-I	2,264	2,166	1,960	2,064	2,544	2,212	1,546	2,302	2,400	2,124
B-II	4,820	5,318	5,738	6,670	6,594	6,720	5,464	7,446	8,120	7,874
B-III	1,176	1,134	800	814	854	868	842	922	824	784
C-I	932	834	628	828	662	676	440	620	610	470
C-II	8,282	7,884	6,324	6,846	9,636	10,568	5,512	6,532	7,370	5,290
C-III	5,222	5,668	7,694	7,096	7,092	8,458	6,718	10,868	11,638	13,844
C-IV	282	318	310	364	302	268	392	426	274	274
C-V	78	142	154	290	350	620	622	546	558	490
D-I	264	336	316	348	336	278	196	1,192	468	484
D-II	490	482	418	288	294	262	202	334	420	286
D-III	566	648	680	838	896	716	304	332	520	1,278
D-IV	0	0	0	0	0	2	0	0	6	0
D-V	2	0	4	0	0	0	2	0	0	0
E-I	0	0	4	2	0	2	2	0	4	4
Total	26,598	26,884	27,336	29,070	31,908	33,514	24,190	33,964	35,624	35,674

APPROACH CATEGORY

AAC	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
A	2,220	1,954	2,306	2,622	2,348	1,864	1,948	2,444	2,412	2,472
B	8,260	8,618	8,498	9,548	9,992	9,800	7,852	10,670	11,344	10,782
C	14,796	14,846	15,110	15,424	18,042	20,590	13,684	18,992	20,450	20,368
D	1,322	1,466	1,418	1,474	1,526	1,258	704	1,858	1,414	2,048
E	0	0	4	2	0	2	2	0	4	4
Total	26,598	26,884	27,336	29,070	31,908	33,514	24,190	33,964	35,624	35,674

DESIGN GROUP

ADG	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
I	3,944	3,828	3,678	4,136	4,472	3,932	3,068	5,360	4,804	4478
II	15,328	15,146	14,016	15,532	17,942	18,650	12,242	15,510	17,000	14,526
III	6,964	7,450	9,174	8,748	8,842	10,042	7,864	12,122	12,982	15,906
IV	282	318	310	364	302	270	392	426	280	274
V	80	142	158	290	350	620	624	546	558	490
Total	26,598	26,884	27,336	29,070	31,908	33,514	24,190	33,964	35,624	35,674

Exhibit 2M (continued)
HISTORICAL JET AND TURBOPROP OPERATIONS

TABLE 2Z | Jet and Turboprop Operations Forecast by Design Category

	HISTORICAL JET & TURBOPROP OPERATIONS[1]		FORECAST JET & TURBOPROP OPERATIONS[1]			FORECAST MIX PERCENT		
Design Categories	2023	Percent	Short Term	Inter. Term	Long Term	Short Term %	Inter. Term %	Long Term %
AAC A	2,472	7%	2,644	2,800	3,139	7%	7%	7%
AAC B	10,782	30%	11,332	11,999	13,452	30%	30%	30%
AAC C	20,368	57%	21,531	22,797	25,559	57%	57%	57%
AAC D	2,048	6%	2,266	2,400	2,690	6%	6%	6%
AAC E	4	0%	-	-	-	0%	0%	0%
Total	**35,674**	**100%**	**37,773**	**39,995**	**44,840**	**100%**	**100%**	**100%**
ADG I	4,478	13%	4,533	4,799	5,381	12%	12%	12%
ADG II	14,526	41%	15,487	16,398	18,385	41%	41%	41%
ADG III	15,906	45%	16,998	17,998	20,178	45%	45%	45%
ADG IV	274	0.77%	291	308	345	0.77%	0.77%	0.77%
ADG V	490	1.37%	517	548	614	1.37%	1.37%	1.37%
Total	**35,674**	**100%**	**37,773**	**39,995**	**44,840**	**100%**	**100%**	**100%**

AAC = aircraft approach category
ADG = airplane design group

Source: [1] Traffic Flow Management System Count (TFMSC) FAA activity database

The commercial enplanement sections of this chapter discuss the possibility of the fleet mix transitioning to include aircraft with larger seating capacities, up to and including the Airbus A319/A320 and the Boeing 737 series, both of which are within the ARC C/D-III classification.

The ultimate civilian critical design aircraft for the primary and crosswind runways at ILM should consider the possibility of each of these aircraft (Airbus A319/320 and Boeing 737-800/900) in its future design; however, the Boeing 737-800/900 is the most demanding civilian aircraft that conducted over 500 annual operations in 2023. As such, the Boeing 737-800/900 is considered the existing and ultimate critical design aircraft for the purposes of this study.

APPROACH AND DEPARTURE REFERENCE CODES

The approach and departure reference codes (APRC and DPRC) describe the current operational capabilities of each runway and the adjacent parallel taxiways when no special operating procedures are necessary. Essentially, the APRC and DPRC describe the current conditions at an airport in runway classification terms when considering the parallel taxiway.

Taxiway B for Runway 6-24 is located 500 feet from the runway (centerline to centerline) at the nearest point. The runway is equipped with instrument landing system (ILS) approaches down to ½-mile visibility, resulting in an APRC of D/V/2400 and D/VI/2400 and a DPRC of D/VI.

Runway 17-35 is separated from quasi-parallel Taxiway A by approximately 400 feet at its nearest point and has published instrument approaches with ½-mile visibility minimums; therefore, its APRC is D/IV/2400 and D/V/2400 and its DPRC is D/IV and D/V.

CRITICAL AIRCRAFT SUMMARY

Table 2AA summarizes the current and future runway classifications.

TABLE 2AA | Airport and Runway Classifications

	Runway 6-24 (Existing/Ultimate)	Runway 17-35 (Existing/Ultimate)	Runway 6-24/17-35 (Existing/Ultimate) – For Planning Purposes (Includes Military)
Airport Reference Code (ARC)	D-III	D-III	D-V
Critical Aircraft (Typ.)	Boeing 737-800/900	Boeing 737-800/900	Boeing P-8 Poseidon
Runway Design Code (RDC)	D-III-2400	D-III-2400	D-V-2400
Taxiway Design Group (TDG)	TDG 3	TDG 3	TDG 3
Approach Reference Code (APRC)	D/V/2400 D/VI/2400	D/IV/2400 D/V/2400	-
Departure Reference Code (DPRC)	D/VI	D/IV D/V	-

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

SUMMARY

This chapter has outlined the various activity levels that might reasonably be anticipated over the planning period, as well as the critical design aircraft for the airport. Enplanements are forecasted to grow from 657,292 in 2023 to 1,070,000 by 2043, based aircraft are forecast to grow from 118 in 2023 to 189 by 2043, and total operations are forecasted to grow from 87,662 in 2023 to 117,339 by 2043. The projected growth is driven by the FAA's positive outlook for commercial and general aviation activity, as well as positive outlooks for new passenger service at ILM and socioeconomic growth (population, employment, and income/GRP) projected for the Wilmington MSA. Recent growth trends specific to ILM also factor into the projected growth.

The critical design aircraft for the airport was determined by examining the FAA TFMSC database of flight plans. The current civilian critical design aircraft is described as an ARC D-III and is represented by the Boeing 737-800 and 737-900, which are commercial service jets operated by the airlines. The future critical design aircraft is expected to remain represented by commercial aircraft, such as the Airbus A320 and Boeing 737 series (ARC C/D-III). Military aircraft are considered separately from civilian aircraft and include the Boeing P-8 Poseidon (ARC D-V), which could be considered the critical design aircraft. It should be noted that AIP funding and PFC funding are not available for projects related to military aircraft.