OCTOBER 2023

Eugene F. Kranz Toledo Express
Airport Master Plan Update
Aviation Activity Forecast

RS&H

Aviation Activity Forecast

Volume No. 5.0
April 2023
Eugene F. Kranz Toledo Express Airport
Swanton, Ohio
RS&H No.: 1018-1858-012

Prepared by RS&H, Inc. at the
direction of the Toledo-Lucas
County Port Authority

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CHAPTER 2

AVIATION ACTIVITY FORECAST

1.1 INTRODUCTION

To properly plan for future development needs of the airport, an understanding of the potential for growth through passenger, operational, and cargo activity forecasts must be properly formulated. This chapter will discuss the projected activity levels (PAL) for each planning component (passenger, aircraft movements, and cargo) expected within the given 20-year planning period as well as the methodology behind the forecast analysis. The forecast analysis concludes with an activity demand projection that is used to develop the airport facility requirements to meet future needs. The forecast will be presented in five- and ten-year increments beginning with the base year of 2021 outward to 2026, 2031, and 2041.

1.2 HISTORICAL AVIATION ACTIVITY REVIEW

This section provides detail of the historical aviation activity at Eugene F. Kranz Toledo Express Airport (TOL) including passenger enplanement activity, aircraft operations, based aircraft reported annually, and cargo activity.

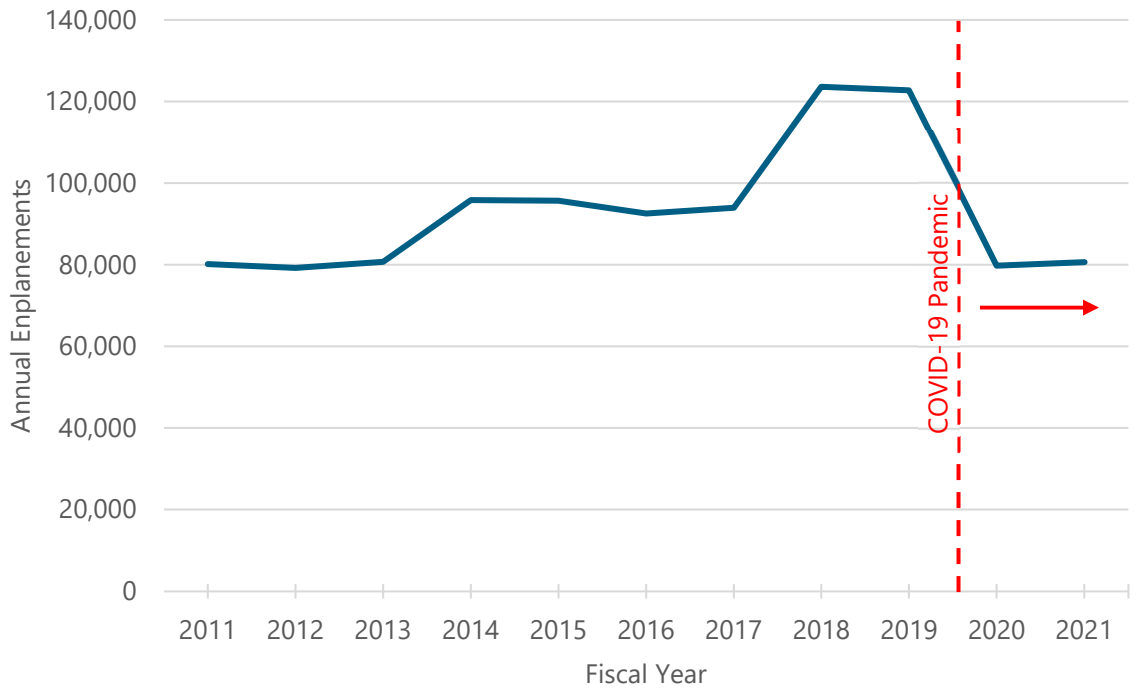
1.2.1 Historical Passenger Enplanements

Commercial passenger service at TOL has not been immune to market changes in the airline industry or economic impacts on aviation as a whole. The 1980s and 1990s saw the greatest throughput of passenger activity in the airport's history with 1997 reaching peak enplanement (boarding passengers leaving TOL) numbers at nearly 680,000 annual passengers. During peak years, commercial service at TOL was largely provided by commercial aircraft operated by Eastern Airlines, Trans World Airlines, United Airlines, USAir, and others that primarily operated Boeing 727 and 737 aircraft. Simultaneously, commuter airlines flying either independently or under the name of the larger legacy carriers (American, Delta, United) such as AirTran, Northwest Airlink, Delta Connection, American Eagle, and Continental Express operated frequently at the airport. These commuter airlines provide quick connections to larger hubs airports within the region or destination airports with less airspace congestion. Commuter aircraft such as the Bombardier CRJ-200 and Embraer ERJ-145 with 50-seat capacity were used which require increased frequency in flights to meet the same passenger loads as larger aircraft.

In the late 1990s to early 2000s, changing business models in the airline industry trended toward larger legacy carriers acquiring smaller commuter airlines and consolidating routes to improve network efficiency. With these changes, hub airports such as nearby Detroit Metropolitan Wayne County Airport (DTW) and Cleveland Hopkins International Airport (CLE) became more popular offering direct flights and, as a result, the Toledo Metropolitan Statistical Area (MSA) began to see a leakage of passenger traffic to these airports. In 2011, TOL experienced its lowest passenger traffic (81,000 total enplanements) as well as experiencing the departure of Delta Air Lines. This left Allegiant Air and American Eagle as the only airlines providing commercial service at TOL.

In December of 2012, Allegiant Air added Punta Gorda as the airline's third destination from TOL to bring the total routes available to five (Chicago O'Hare and Charlotte via American Eagle and Orlando, St. Petersburg, and Punta Gorda through Allegiant). With five destinations the airport started to see a recovery in passenger traffic numbers beginning in 2013 from just over 81,000 enplanements to nearly 123,000 total enplanements in 2019. The steady rise in passenger traffic since 2013 is shown in **Figure 2-1**.

FIGURE 2-1
TOL HISTORICAL ENPLANEMENTS



Source: RS&H Analysis, 2022

The onset of the COVID-19 global pandemic halted aviation travel worldwide, including the enplanement growth TOL had experience through 2019. The Centers for Disease Control and Prevention (CDC) officially published the presence of the COVID-19 pandemic in the continental United States in early 2020. In attempt to control the outbreak, most organizations, businesses, and public service entities and institutions closed with employees, customers, and students alike working from home or in some remote capacity while the nation encouraged social distancing. Consequently, aviation activity, namely commercial service, experienced either massive reductions in operations/flights or cancelled service altogether. Certain airports saw as great as an immediate 90 percent reduction in passenger traffic, with TOL seeing a 47 percent drop from 2019 to 2020. The summer of 2021 began to see the lifting of travel bans which encouraged the return of air travel in small increments.

During the pandemic, American Airlines consolidated their destinations from TOL removing Charlotte and leaving Chicago O'Hare (ORD) as their last remaining destination. Capitalizing on increased leisure demand, in March of 2022 Allegiant announced a fourth, seasonal destination to Phoenix-Mesa Airport (AZA). Shortly after, in June of 2022 the last remaining American Eagle destination to ORD was announced to be discontinued after September with American Airlines pulling out of TOL entirely. The reduction and eventual departure of American Airlines from TOL was not unique as many comparable air carrier markets lost service in response to the ongoing pilot shortage currently affecting both mainline and regional carriers.

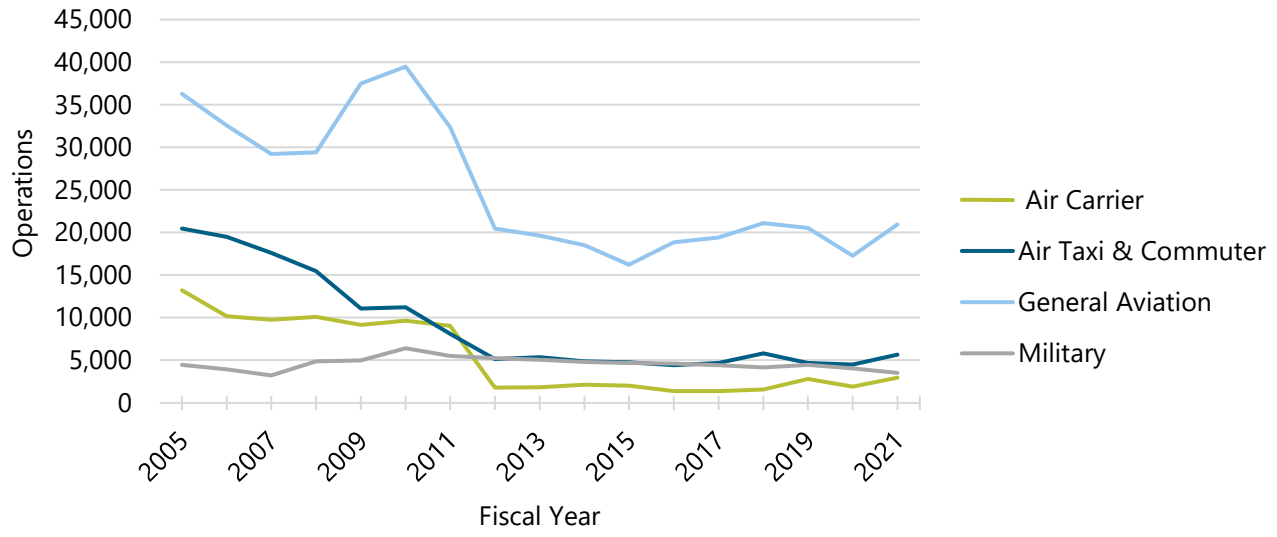
1.2.2 Historical Aircraft Operations

Aircraft operations at airports are classified as either a takeoff or a landing with a routine flight counting as two operations (one for arrival and one for departure). The FAA Air Traffic Control Towers (ATCT), or contracted controllers, records aircraft operations at towered airports while operational counts at non-FAA facilities are estimated. All aircraft operations at TOL are recorded by FAA ATCT personnel and the facility is fully staffed 24 hours a day, 365 days a year. These operations are recorded in one of the following four categories:

- Air Carrier: Aircraft operations with seating capacity of more than 60 seats or a cargo capacity of greater than 18,000 pounds are classified as Air Carrier operations. Air Carrier operations also include those carrying passengers or cargo for hire or compensation.
- Air Taxi/Commuter: Aircraft with 60 or fewer seats that transport regional passengers on scheduled (commuter) or non-scheduled (air taxi) commercial flights or a cargo payload capacity of 18,000 pounds or less.
- General Aviation (GA): Represents all civil aviation aircraft activity not classified as commercial that is not classified as either air carrier or air taxi/commuter.
- Military: Include all classes of U.S. military or federal government aircraft.

In general, aircraft operations at TOL have slightly declined over the last decade with large decreases occurring to both air carrier and itinerant (aircraft arriving from outside local airspace) GA traffic (see **Figure 2-2**). As detailed in the previous section, commercial activity at TOL had been slowly declining since the late 1990s due in large part to the restructuring of the modern-day airline business model that saw numerous air carrier and commuter airlines absorbed by legacy carriers and their less profitable services dropped. After a steep drop off in 2012 following the departure of Delta Air Lines, TOL continued to see a slow decline in operations until a slight recovery in 2019 one year prior to the COVID-19 pandemic that negatively impacted air carrier activity in 2020. Local air taxi services provided through the Fixed-Base Operators (FBO) have been able to sustain a yearly operations baseline near the 5,000/per annum mark.

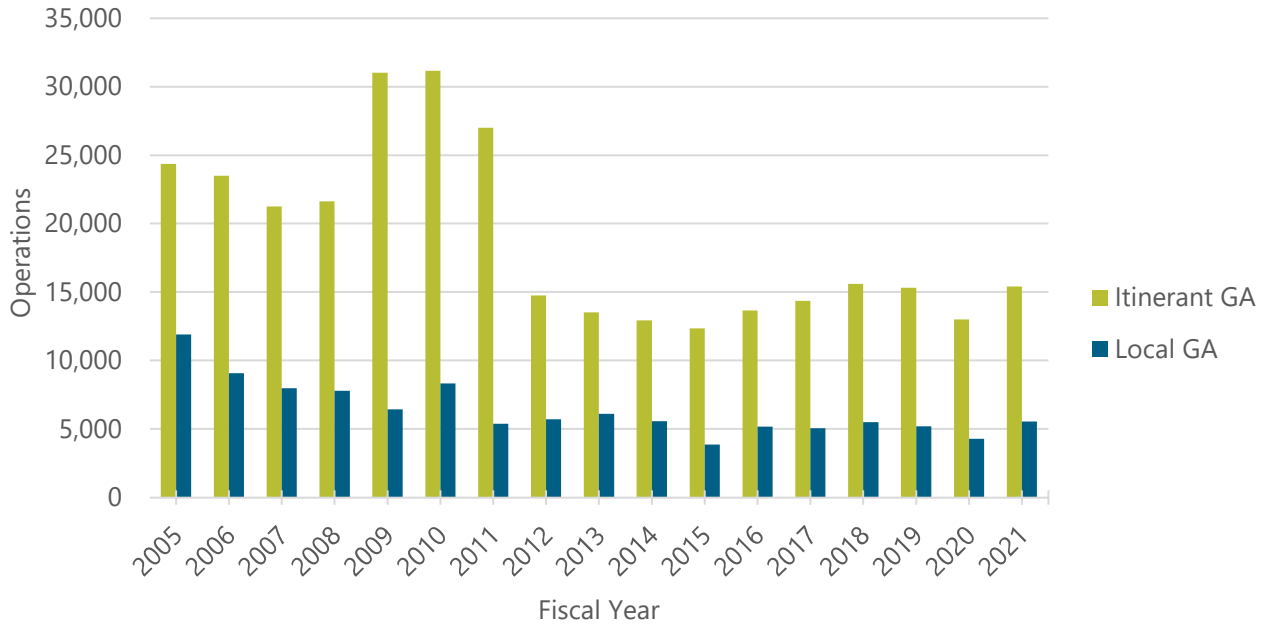
FIGURE 2-2
TAF HISTORICAL OPERATIONS



Source: FAA 2022 Terminal Area Forecast; Compiled by RS&H, 2022

General Aviation and Military operations are further broken down into either local or itinerant operations. Local operations represent aircraft operating in the traffic pattern or within line of sight of the tower, aircraft known to be departing and arriving from flight in local practice areas, or aircraft executing practice instrument approaches at the airport. Itinerant operations represent all operations not deemed local. Essential this is civil or military aircraft traveling from one airport to another[1]. **Figure 2-3** details historical itinerant and local GA operations.

FIGURE 2-3
TOL HISTORICAL GA OPERATIONS



Source: FAA 2022 Terminal Area Forecast; Compiled by RS&H, 2022

During the 10-year historical period dating back to 2011, the TAF shows itinerant GA activity at TOL has varied between 12,500 and 15,500 operations per year. Local GA traffic has seen the most consistent numbers in the airport's recent history. This activity is expected to continue as the based aircraft counts at the airport have similarly held steady. This directly correlates to aircraft operating in local airspace with the same origin and destination.

Military operations at TOL are the result of funding levels available to the local branch of the Ohio Air National Guard (OANG), the 180th Fighter Wing, and are not associated with airfield facilities or aviation market fluctuations. Additionally, dependent on the type of exercise or activity, operations of the OANG may be counted as either itinerant or local, and when combined, have seen a gradual decline in total operations from 5,479 in 2011 to 4,436 in 2019. Similar to commercial service, impacts of the COVID-19 pandemic on military operations are recognized as one factor which contributed to the accelerated decrease in combined operations in 2020.

[1] FAA Terminal Area Forecast Narrative Report, Fiscal Years 2021-2045 Update

1.2.2.1 Instrument Operations

There are several ways aircraft operations are captured beyond what is reflected in the TAF. One of the primary traffic count systems utilized is the Traffic Flow Management System Count, or TFMSC. The TFMSC captures aircraft operations that fly under Instrument Flight Procedures (IFR) with a published flight plan. The majority of all commercial (passenger and cargo) and corporate business jet operators publish IFR flight plans. As such, TFMSC data is regarded as a reliable source to gauge aircraft activity at airports. However, general aviation operators flying under Visual Flight Rules (VFR) and potentially military air traffic are not captured within the data.

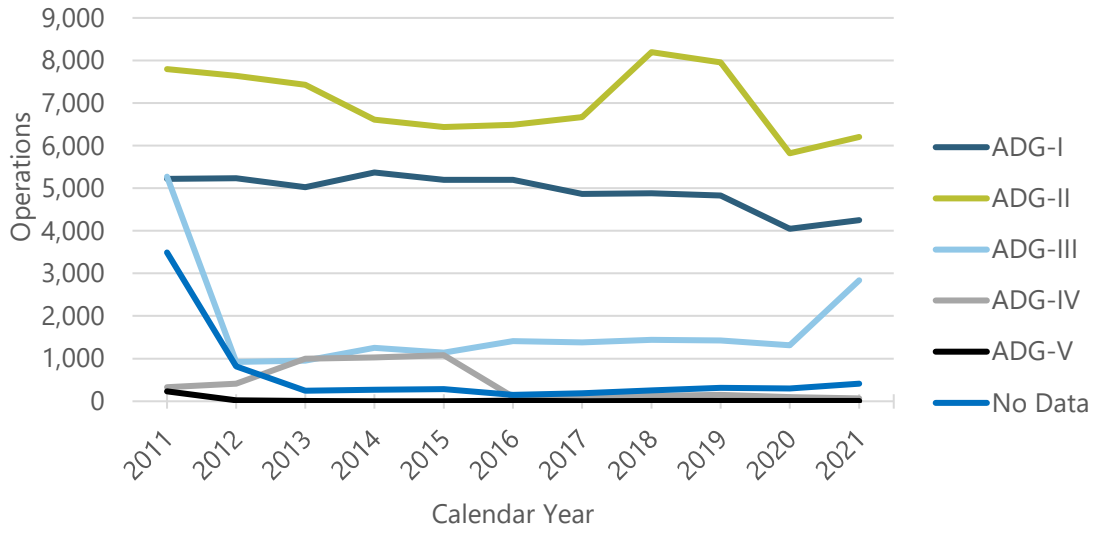
Data recorded in the TFMSC is particularly beneficial for analysis and capacity planning as design specifications associated with each aircraft operation is provided, including Aircraft Approach Category (AAC), Airplane Design Group (ADG), Taxiway Design Group (TDG), and aircraft type. The data can be sorted to reveal trends in aviation activity of each design category which can be used to validate operational thresholds an airport must maintain by compliance and capacity standards. Table 2-1 and **Figure 2-1** below depict the historical TFMSC data gathered for TOL from 2010 to 2021 organized by ADG. ADG-I and ADG-II aircraft are typically representative of GA and military activity at TOL while ADG-III and above aircraft are typically representative of commercial activity.

TABLE 2-1
HISTORICAL TFMSC BY AIRCRAFT DESIGN GROUP (ADG)

Year	ADG-I	ADG-II	ADG-III	ADG-IV	ADG-V	No Data	Total
2011	5,221	7,801	5,275	329	234	3,498	22,358
2012	5,232	7,640	923	408	16	817	15,036
2013	5,021	7,433	951	994	2	242	14,643
2014	5,373	6,613	1,250	1,030	0	264	14,530
2015	5,195	6,438	1,140	1,083	0	286	14,142
2016	5,195	6,487	1,413	101	9	152	13,357
2017	4,868	6,673	1,381	106	0	181	13,209
2018	4,881	8,197	1,438	125	2	250	14,893
2019	4,829	7,957	1,422	145	7	316	14,676
2020	4,048	5,827	1,309	94	4	299	11,581
2021	4,251	6,206	2,840	69	2	412	13,780

Sources: Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM), compiled by RS&H, October 2022

FIGURE 2-4
TFSMC ACTIVITY BY ADG



Source: RS&H Analysis, October 2022

As the intent of the TFMSC is to reliably capture IFR operations, it is not a source for reliable VFR operation data. Within the TFMSC there are a few potential avenues of data errors for the IFR operations captured: 1) records may be incomplete when one end of the flight is missing, 2) data may exclude flights that do not enter "enroute airspace" (where they'd be captured by the NAS) or other low-altitude flights, and 3) cancellation of IFR flight plans mid-flight may also be excluded as destination data would be missing. Despite these potential sources of incomplete reporting, the published TFMSC is generally regarded as 95 percent accurate in the recording of IFR operations at national airports. [2]

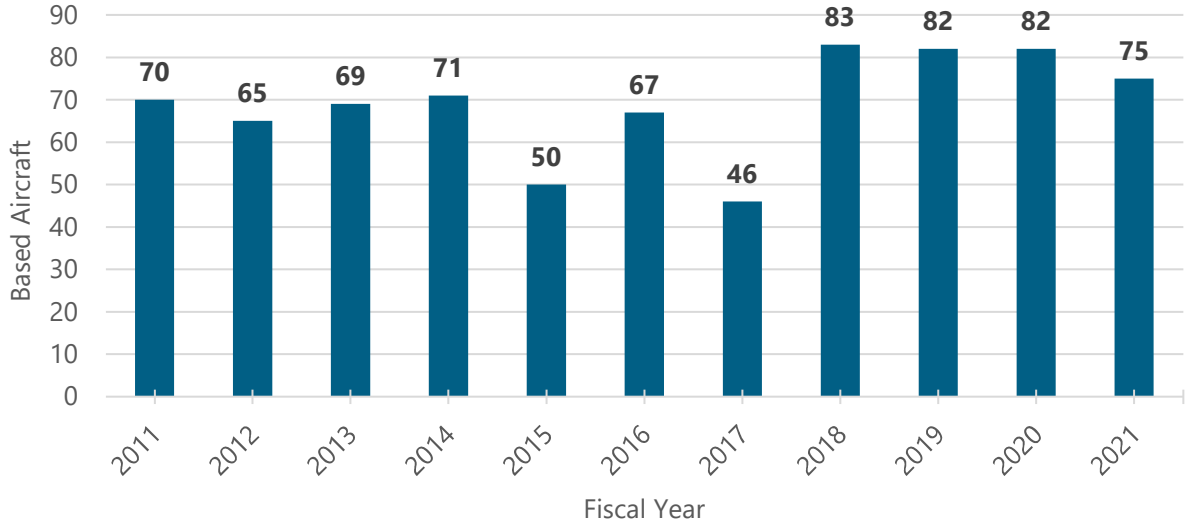
1.2.3 Based Aircraft

The FAA requires airport sponsors to keep a record of all aircraft that are based at the airport. According to the FAA, a based aircraft is an aircraft that is "operational and airworthy" and is based at the airport the majority of the year[3]. The FAA TAF publishes a historical record of based aircraft at each airport as reported by each airport sponsor; the based aircraft record for TOL is shown in **Figure 2-5**. As shown, the number of based aircraft at TOL generally varied between 65 and 83 aircraft with two outlier years of 2015 and 2017, which were well below this trend at 50, and 46, respectively. It is believed the outliers were reported without the inclusion of the based aircraft of the OANG and thus are not believed to be truly representative of the aircraft inventory at the airport during those years. In 2022 the OANG had 21 aircraft based at TOL and had not seen a change in based aircraft in years, presumed to date back before the historical period analyzed.

[2] Source: Aviation System Performance Metrics (ASPM), TFMSC, https://aspm.faa.gov/aspmhelp/index/TFMSC.html

[3] Source: *Frequently Asked Questions*, https://basedaircraft.com/. "Majority of the year" is assumed at 51 percent of the year.

FIGURE 2-5
TOL HISTORICAL BASED AIRCRAFT



Source: FAA 2022 Terminal Area Forecast; Compiled by RS&H, 2023

Since calendar year 2019 the airport was reported to have maintained 82 based aircraft (as shown in the 2022 TAF published in March of 2023). However, at the time of the update to the Master Plan, airport records (2021 latest update) indicate a total of 77 based aircraft at TOL, included the OANG. **Table 2-2** shows the based aircraft breakdown by aircraft type.

TABLE 2-2
TOL BASED AIRCRAFT (2022)

Based Aircraft Totals	
Single-Engine Piston	25
Multi-Engine Piston	8
Turboprop	5
Turbojet	16
Total Fixed Wing	**53**
Helicopters	3
Gliders	0
Military	21
Ultra-Light	0
Total Based Aircraft	**77**

Source: Airport Records, 2022; Compiled by RS&H, October 2022

1.2.4 Air Cargo Operations

With Runway 7-25 surpassing 10,000 feet in length and the availability of over 75 acres of concrete aircraft parking apron to the south, TOL is well suited to accommodate nearly any size aircraft currently in operation. BAX Global (later acquired by DB Schenker Logistics) maintained a cargo hub at TOL beginning in 1991 and consistently surpassed 400,000 tons of landed cargo weight. The airline fleet consisted primarily of Douglas DC-8 aircraft for transport, occupying the south cargo apron at TOL, and greatly expanding the existing facility during its tenure. This included the expansion of the former 40-acre concrete aircraft parking apron to the

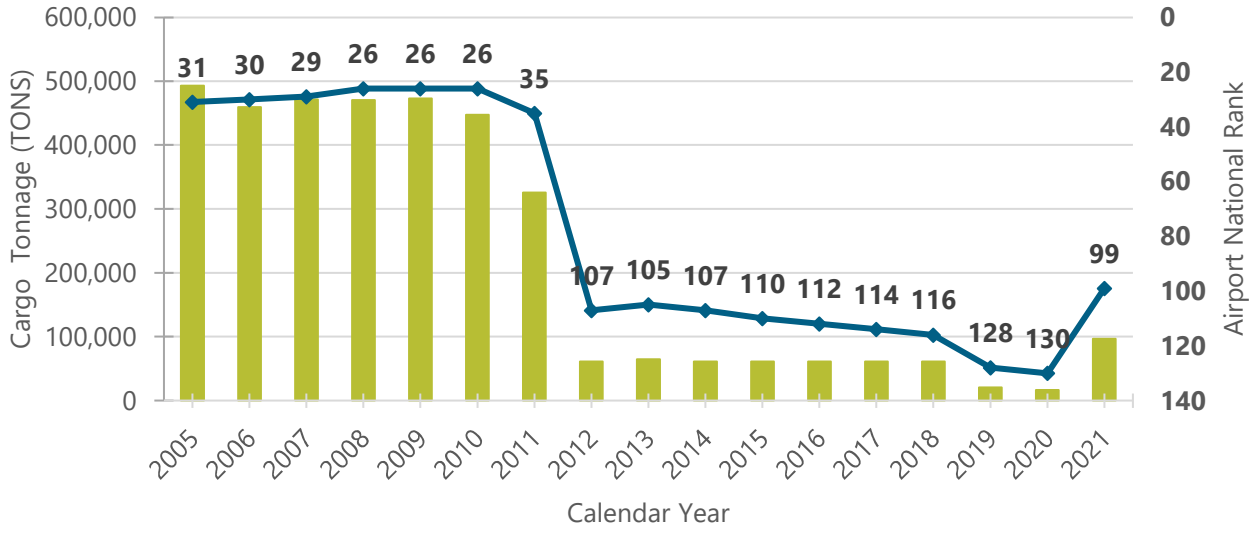
present 75-acre apron. However, in 2011, DB Schenker reduced aviation operations, and subsequently closed the TOL hub, contributing to the largest decline in aviation activity at the airport since its inception.

Following the departure of BAX Global, annual cargo landed weight at the airport dropped over 85 percent but held consistently at that threshold until 2019 through the continued operation of ancillary cargo operators either based at TOL or operating through an on-site FBO. InterJet West and Sierra West (based in El Paso, Texas) both have cargo operations based at TOL and conduct operations with Boeing 727-200 and 737-300 aircraft. Aeronaves TSM and Amerijet International similarly operate consistently at TOL through the local FBO Grand Aire, Inc. Aeronaves TSM is a Mexico-based operator that operates CRJ-200 (freighter converted), McDonnell Douglas MD-80/90, and Douglas DC-9 aircraft, while Amerijet International similarly operates the Douglas DC-9. Several other operators conduct non regular operations at TOL utilizing similar-sized aircraft. A reduction in operations frequency from the local cargo operators created another reduction in annual cargo tonnage in 2019.

In March of 2021, Amazon Air, operated by Sun County Airlines, began operating at TOL with four daily operations of Boeing 737-300s. Amazon's operation is located on the eastern-most portion of the former BAX Global ramp.

Beginning in early calendar year 2020, the onset of the COVID-19 pandemic severely crippled the aviation industry as restrictions blocked all but essential travel. While passenger traffic saw the largest impact, cargo activity similarly saw a large decline in normal operations and the decline that began in 2019 was further exaggerated through calendar year 2020 and early 2021. Travel and business logistics restrictions were largely lifted mid-2021 and, coupled with the return of commercial cargo operations in Amazon Air, a large rebound in landed cargo weight occurred in 2021 once again surpassing the 100-million-pound landed weight cargo entitlement threshold that had not been reached since 2018. **Figure 2-6** depicts the historical cargo landed weight data since 2007 when BAX Global had its highest annual cargo tonnage volumes while operating at TOL.

FIGURE 2-6
TOL HISTORICAL CARGO VOLUME



Source: www.faa.gov, Data Passenger Boarding (Enplanement) and All-Cargo Data for U.S. Airports - Previous Years; Compiled by RS&H, 2022

1.3 FACTORS AFFECTING AVIATION DEMAND

The qualitative and quantitative factors that influence future aviation activity at the airport are discussed in this section. These factors were considered in developing the aviation activity forecasts for TOL.

1.3.1 Airport Service Area

TOL is located about 15 miles west of downtown Toledo and about 10 miles south of the Michigan-Ohio border. Approximately 65 miles northwest of TOL is Detroit Metropolitan Wayne County Airport (DTW), the closest commercial service airport to TOL serving a large number of airlines, and a hub for Delta Air Lines. James M. Cox Dayton International Airport (DAY) and Fort Wayne International Airport (FWA) are the next closest at nearly 95 miles to the south and west, respectively. **Table 2-3** details commercial service airports within the region, their respective NPIAS role, and the airlines that serve each.

TABLE 2-3
TOL MSA NEIGHBORING AIRPORTS

Identifier	Airport	City	State	Distance From TOL (miles)	Airlines	NPIAS Role
CAK	Akron/Canton Regional	North Canton	OH	156	Allegiant, American, Breeze, Spirit, United	Non-Hub
FNT	Bishop International	Flint	MI	107	Allegiant, American, United	Non-Hub
LAN	Capital Region International	Lansing	MI	113	American, Avelo, Delta	Non-Hub
CLE	Cleveland Hopkins International	Cleveland	OH	97	Air Canada, Alaska, American, Delta, Frontier, JetBlue, Southwest, Spirit, United	Medium Hub
DTW	Detroit Metropolitan Wayne County	Romulus	MI	64	Air Canada, Air France, Alaska, American, Delta, Frontier, JetBlue, Lufthansa, Royal Jordanian, Southwest, Spirit, United	Large Hub
FWA	Fort Wayne International	Fort Wayne	IN	95	Allegiant, American, Delta, United	Non-Hub
DAY	James M. Cox Dayton International	Dayton	OH	94	Allegiant, American, Delta, United	Small Hub
CMH	John Glenn International	Columbus	OH	148	Air Canada, Alaska, American, Breeze, Delta, Frontier, Southwest, Spirit, United	Medium Hub
AZO	Kalamazoo/Battle Creek	Kalamazoo	MI	133	American, Delta	Non-Hub
LCK	Rickenbacker International	Columbus	OH	156	Allegiant	Non-Hub

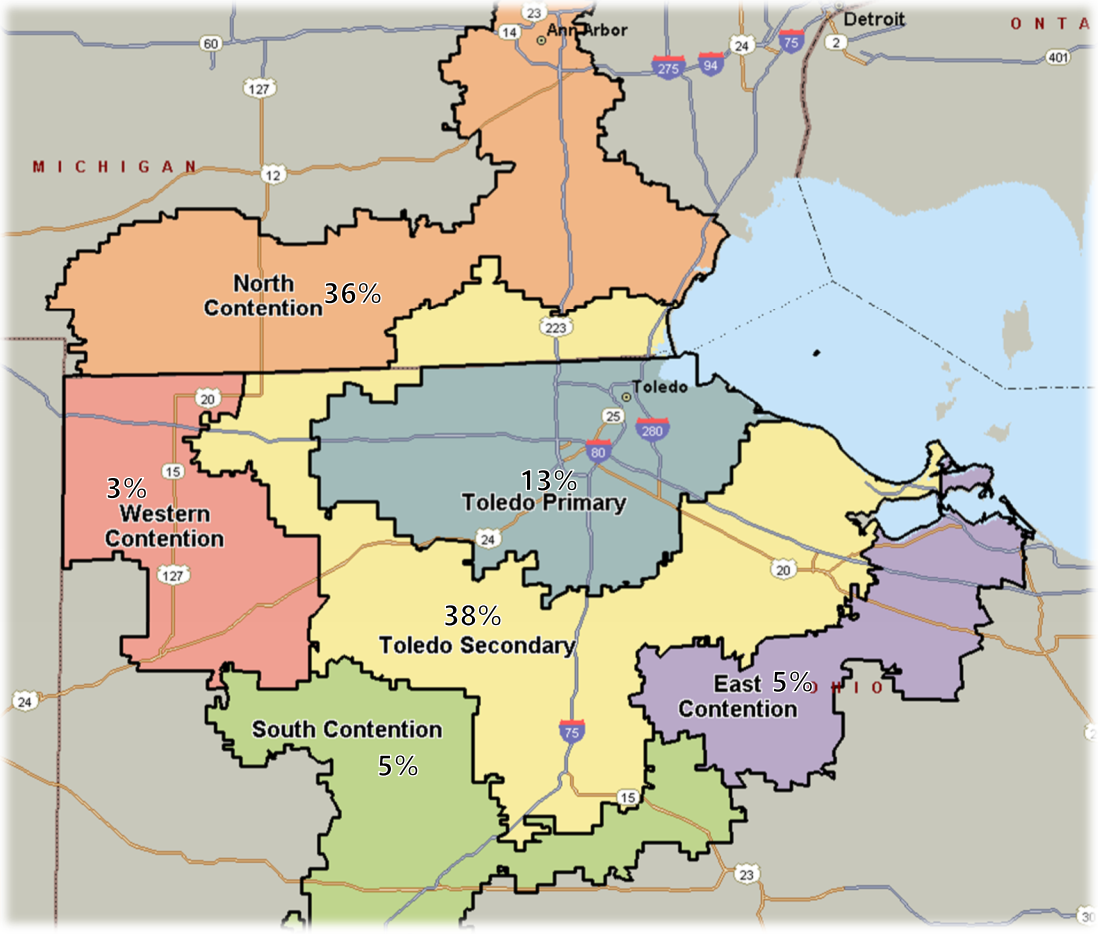
Source: FAA 5010, Airnav.com, Google Maps, operations data from 12-month period ending 31 December 2018

Ailevon Pacific Aviation Consulting (Ailevon) conducted an aviation market study in 2021 to analyze the airport's service area, market leakage, and potential opportunities to increase passenger catchment within the service area. Based on data gathered from the Airlines Reporting Corporation (ARC), Ailevon divided the catchment area of TOL into six catchment areas, or "territories," that are defined by ARC booking patterns for

TOL as well as what is determined a natural catchment area for the airport."[4] **Figure 2-7** depicts the six territories as they were analyzed for TOL. **Table 2-4** shows each of the territories and the respective Ohio or Michigan counties that fall within each.

- Toledo Primary: Covers the City of Toledo and the Metropolitan Service Area of the airport. Generates 38 percent of total ARC bookings. Includes Fulton, Lucas, Ottawa, Henry, and Wood counties in Ohio as well as Lenewee and Monroe counties in Michigan.
- North Contention: Entirely within Michigan, generates 36 percent of total traffic. Includes Branch, Hillsdale, Lenewee, Monroe, and Washtenaw counties.
- Toledo Secondary: Generates 13 percent of total traffic. Includes Williams, Fulton, Ottawa, Henry, Wood, Sandusky, Putnam, Hancock, and Seneca counties.
- Remaining Contention Territories: Generate little traffic and we will see that is due both to low populations and low propensity to travel.
    - West Contention (3 percent): Fulton, Defiance, Paulding, and Putnam counties.
    - East Contention (5 percent): Wood, Sandusky, Erie, Hancock, Seneca, Huron, Wyandot, and Crawford counties.
    - South Contention (5 percent): Paulding, Putnam, Hancock, Allen, Hardin, and Wyandot counties.

FIGURE 2-7
TOL MARKET STUDY TERRITORIES



Source: ARC Data Set YE 2Q2018; Ailevon Pacific Aviation Consulting, 2021

[4] Source: ARC Data Set YE 2Q2018; Ailevon Pacific Consulting analysis

TABLE 2-4
MARKET STUDY TERRITORIES AND COUNTIES

State	County	2021 Aviation Market Study Territory					
		Toledo Primary	Toledo Secondary	North Contention	West Contention	East Contention	South Contention
Ohio	Williams		X				
Ohio	Fulton	X	X		X		
Ohio	Lucas	X					
Ohio	Ottawa	X	X				
Ohio	Defiance				X		
Ohio	Henry	X	X				
Ohio	Wood	X	X			X	
Ohio	Sandusky		X			X	
Ohio	Erie					X	
Ohio	Paulding				X		X
Ohio	Putnam		X		X		X
Ohio	Hancock		X			X	X
Ohio	Seneca		X			X	
Ohio	Huron					X	
Ohio	Allen						X
Ohio	Hardin						X
Ohio	Wyandot					X	X
Ohio	Crawford					X	
Michigan	Branch			X			
Michigan	Hillsdale			X			
Michigan	Lenewee	X		X			
Michigan	Monroe	X		X			
Michigan	Washtenaw			X			

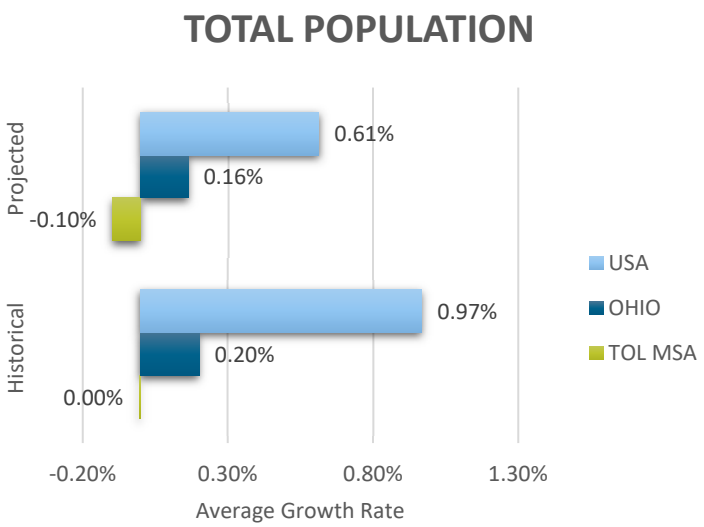
Source: ARC Data Set YE 2Q2018; Ailevon Pacific Aviation Consulting, 2021

1.3.2 Local Socioeconomic Trends

Potential for growth in commercial and general aviation operations can often be quantified when compared with relevant local, state, and national socioeconomic indicator trends. For example, as regional manufacturing expands, so does employment associated with the growth in industry as well as the attraction of supporting commercial services. Similarly, establishing headquarters, national businesses, healthcare, and/or educational facilities can further drive the growth of population, jobs, and employment, and raise the associated income of the market area. The presence of business and industry provides the baseline for air service with growth in population, employment, income, and manufactured goods all potentially leading to expanding air commerce.

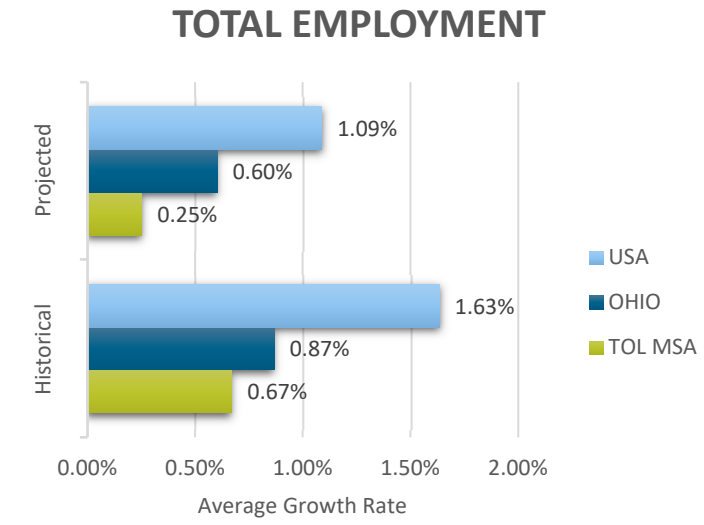
The 2022 Woods and Poole data were used to provide forecasted information on population, employment, personal income per capita (PIPC), and gross regional product in the local region, statewide and nationally. For the purpose of this document, the Metropolitan Service Area (MSA) that includes the three immediate counties within proximity to the airport and the City of Toledo is termed the "Toledo MSA." These three counties include Fulton, Lucas, and Wood counties.

The following figures summarize the Woods and Poole demographic information examined:



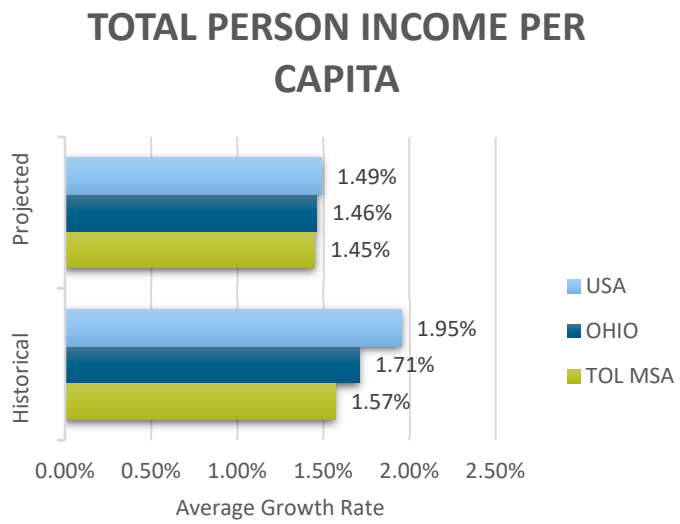
Source: 2022 Woods & Poole Economic Data and Demographic Forecast.
RS&H Analysis, 2022

- **Historical and forecasted population growth:** During the 1970-2021 historical period, the nationwide growth rate averaged 0.61 percent increase with the state growth rate showing a slower average growth of 0.16 percent increase. The growth rate of the Toledo MSA however has ebbed and flowed significantly over the historical period and averages a neutral growth rate of zero percent in 2022. The forecast period, 2022 through 2050, shows an anticipated decline in the population of the Toledo MSA, averaging an annual 0.1 percent reduction in population. This negative growth rate for the Toledo MSA is a direct contrast to that of the anticipated growth the State of Ohio and the United States as both anticipate accelerated growth.



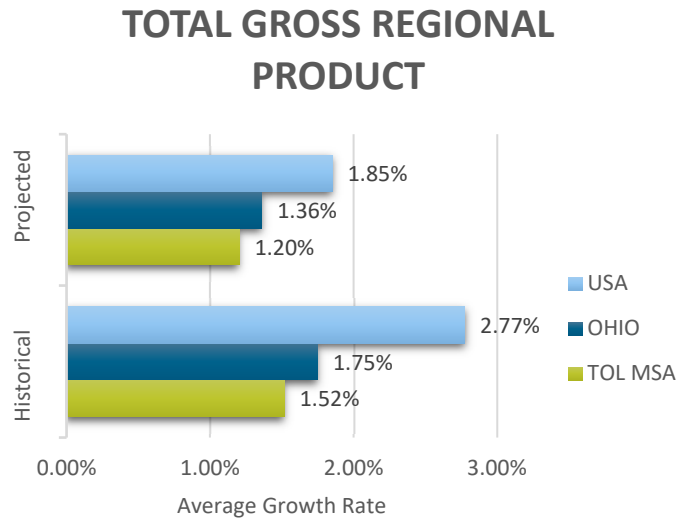
Source: 2022 Woods & Poole Economic Data and Demographic Forecast.
RS&H Analysis, 2022

- **Historical and forecasted total employment:** The Toledo MSA has shown consistent growth in total employment over the historical period albeit behind the stronger growth rates state and nationwide employment has experienced. All three study areas project a slower growth rate over the forecasted period for total employment. When compared with historical percentages, employment within the Toledo MSA falls behind anticipated state and national growth levels at 42 percent anticipated state and 23 percent anticipated nation growth levels (compared to 77 percent historical state and 41 historical nation percentages).



Source: 2022 Woods & Poole Economic Data and Demographic Forecast.
RS&H Analysis, 2022

- **Historical and forecasted Personal Income Per Capita (PIPC):** The forecasted growth rate for the Toledo MSA nearly parallels the anticipated state and national levels between 1.45 and 1.49 percent. When compared to growth over the historical period the State of Ohio and United States both show a quicker deceleration than anticipated for the Toledo MSA.



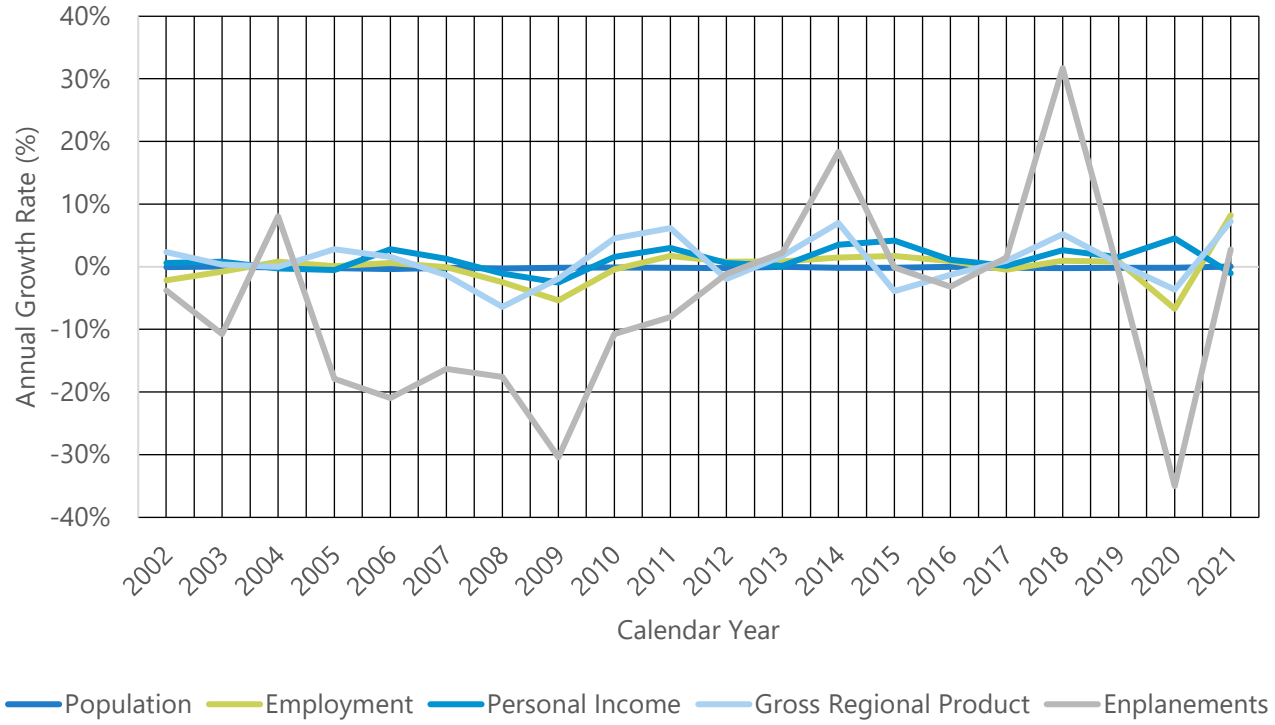
Source: 2022 Woods & Poole Economic Data and Demographic Forecast.
RS&H Analysis, 2022

- **Historical and forecasted gross regional product:** Similar to the analysis of growth over PIPC historical and forecasted periods, gross regional production within the Toledo MSA is expected to slow over the forecast period but at a reduced rate than the comparable state and nation levels.

A regression analysis was conducted utilizing the above metrics in comparison with historical passenger traffic at TOL in attempt to identify a correlation between fluctuations in airline activity and one or multiple socio-economic indicators. Additionally, variables were introduced in the analysis to represent changes in the economy and environment that were outside the predictability of socioeconomic reasoning but were still expected to have impact on airline traffic. Two such factors included the late 2007-2009 economic recession and the COVID-19 pandemic (2020-2021), each negatively impacting air travel during and lasting for years after their peak. Numerous iterations of each socioeconomic factor paired with aviation and economic trends yielded no statistical correlation between the peaks and valleys of aviation activity and any of the metrics used (see **Figure 2-8**). As a result, the historical and forecasted socioeconomic trends of the Toledo MSA are not

anticipated to be reliable benchmarks for the forecast of aviation activity for TOL. Instead, aviation industry and market trends are anticipated to have the strongest impact on the TOL forecast of aviation activity.

FIGURE 2-8
HISTORICAL MSA ECONOMIC AND PASSENGER TRENDS



Source: 2022 Woods & Poole Economic Data and Demographic Forecast; RS&H Analysis, 2022

1.3.3 Commercial Passenger Market Analysis

In 2021, Ailevon completed a market analysis for the TLCPA which examined the passenger airline industry and how TOL is positioned locally and as compared to peer airports. The study included metrics related to peer non-hub airports that share a similar MSA population size, regional location, and proximity to a hub airport. Additionally, leakage metrics specific to TOL were examined to gauge potential demand. Peer markets analyzed include Flint Bishop International Airport in Flint Michigan (FNT), Wilkes-Barre/Scranton International Airport in Scranton Pennsylvania (AVP), Lehigh Valley International Airport in Allentown Pennsylvania (ABE), Akron-Canton Airport in Canton Ohio (CAK), and Capital Region International Airport in Lansing Michigan (LAN), as listed in **Table 2-5**.

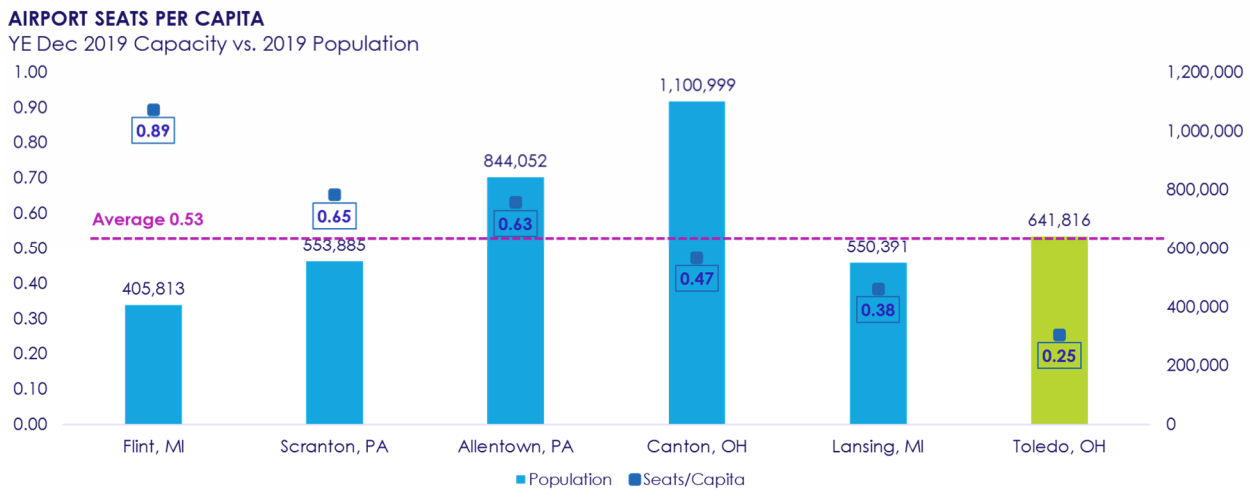
TABLE 2-5
PEER AIRPORTS

Airport	MSA	Closest Larger Airport	Larger Airport Hub Size	Distance to Larger Airport
Flint (FNT)	405,813	DTW	Large	73 miles
Lansing (LAN)	550,391	DTW	Large	93 miles
Scranton (AVP)	553,885	EWR	Large	122 miles
Toledo (TOL)	641,816	DTW	Large	62 miles
Allentown (ABE)	844,052	EWR/PHL	Large	78 miles/72 miles
Akron/Canton (CAK)	1,100,999	CLE	Medium	54 miles

Source: Ailevon Pacific Aviation Consulting Analysis, 2022

As shown in **Figure 2-9**, in 2019, before the COVID-19 pandemic impacted airports, TOL had the lowest number of seats per capita at 0.25. [5] That is low despite TOL seeing seat growth up 58 percent between 2014 and 2019. The reasoning behind the seats per capita the lowest among peer airports analyzed is TOL currently has 100 percent leakage for aviation markets outside of the Allegiant ultra-low-cost service. When TOL used to offer greater range of service, pricing and travel times were found to be consistent through TOL as were expected through nearby DTW, but public perception of nonstop being faster saw leakage that eventually withdrew these services from TOL altogether. As a result, TOL is currently limited to the ULCC market with no capacity for legacy service. The peer airport comparison, however, validates that TOL may be ripe for increased air service akin to its peer airports that also sit close to and compete with or complement large or medium hub airports within close proximity.

FIGURE 2-9
PEER AIRPORT COMPARISON

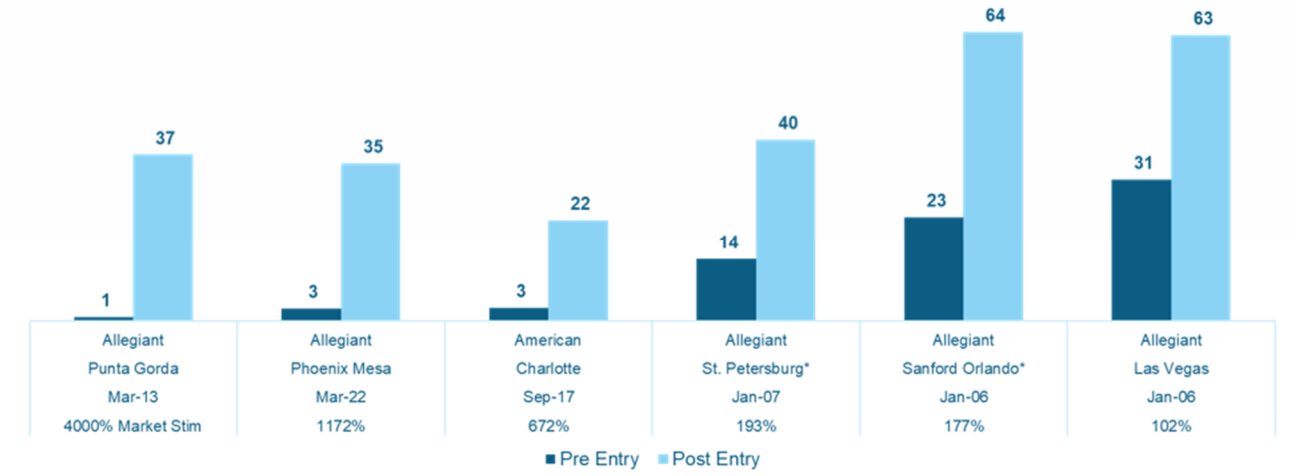


Source: Ailevon Pacific Aviation Consulting Analysis, 2022

[5] Toledo Market Assessment Study, Ailevon Pacific Consulting, 2021

Roughly 90 percent of the passengers in the primary catchment area for TOL use another airport for air service. Approximately 88 percent of the traffic leaked from the TOL primary catchment territory, and 73 percent from the secondary territory use DTW. The primary and secondary catchment area leakage alone equates to roughly 600 passengers daily each way (PDEW). **Figure 2-11** depicts the average daily leakage correlated with each TOL catchment area. Historically, when a new market began service at TOL demand has increased anywhere from 102 percent to 4,000 percent in the market (see **Figure 2-10**).

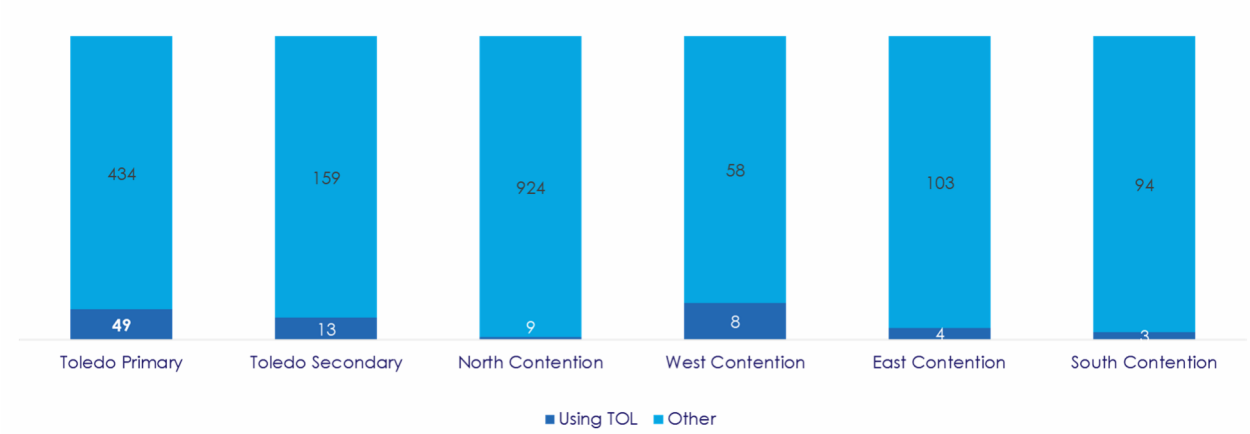
FIGURE 2-10
HISTORICAL NEW MARKET ENTRY AT TOL



Source: Ailevon Pacific Aviation Consulting Analysis, 2022

Assuming the entrance of a new market would yield a modest 15 percent decrease in leakage from TOL's catchment area would result in an additional 179,000 annual passengers, or roughly 90,000 enplanements at TOL.[6] In 2018 and 2019, TOL annual enplanement levels reached just over 120,000. If TOL saw a 15 percent decrease in leakage at that time, the airport would have accommodated roughly 210,000 annual enplanements, which directly correlates with the medium growth scenario described in the following section, **Section 1.4**.

FIGURE 2-11
AVERAGE DAILY LEAKAGE PER CATCHMENT TERRITORY

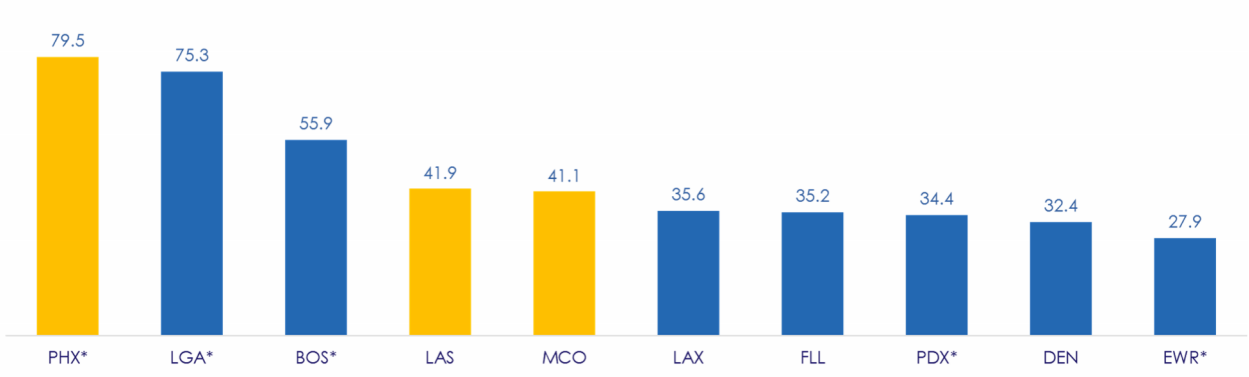


Source: Ailevon Pacific Aviation Consulting Analysis, 2022

[6] Toledo Market Assessment Study, Ailevon Pacific Consulting, 2021

In examining the market leakage from TOL, the Ailevon market analysis identified the top leaking markets that passengers within the TOL catchment area are traveling to. As shown in **Figure 2-12** and detailed in **Table 2-6**, three of the top five of those markets were leisure markets including PHX, LAS, and MCO. These markets support potential new legacy services as well as potential new ULCC services at TOL. Other markets such as DEN and DFW were identified as those that could appeal to ULCC and/or legacy carriers. The data is based on 2018 when American Airlines was providing service to ORD and CLT from TOL. The CLT route was proving to capture more passenger traffic than the ORD route despite the service being less than two years old.

FIGURE 2-12
TOP 10 LEAKING MARKETS BY PDEW



Source: Ailevon Pacific Aviation Consulting Analysis, 2022
* ARC shows a high market size which due to the low PDEW may be subject to error

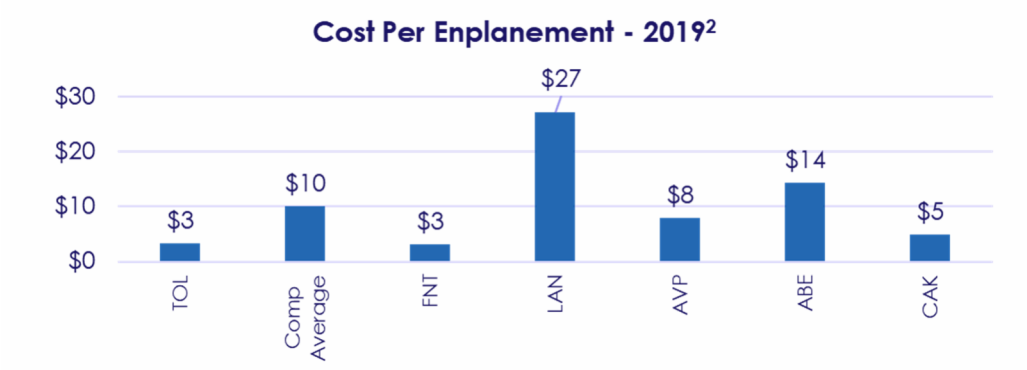
TABLE 2-6
TOP 15 TOL MARKETS AND NON-DIRECTIONAL LEAKED TRAFFIC

True PDEW Rank	PDEW Rank	Destination	PDEW	Capture Rate	Est True PDEW	Leaked PDEW
1	6	PHX*	2.9	3.5%	82.4	79.5
2	29	LGA*	1.5	2.0%	76.8	75.3
3	33	BOS*	1.3	2.3%	57.2	55.9
4	7	MCO	2.8	6.4%	43.9	41.1
5	31	LAS	1.3	3.1%	43.3	41.9
6	4	LAX	3.3	8.5%	39.0	35.6
7	27	FLL	1.6	4.4%	36.8	35.2
8	2	ORD	16.9	47.8%	35.3	18.5
9	49	PDX*	0.9	2.5%	35.2	34.4
10	23	DEN	1.7	5.0%	34.1	32.4
11	3	DFW	3.9	13.5%	29.3	25.4
12	38	EWR*	1.2	4.0%	29.0	27.9
13	1	CLT	19.6	71.9%	27.2	7.6
14	9	SFO	2.7	10.1%	26.5	23.8
15	11	IAH	2.4	9.2%	26.3	23.8

Source: Ailevon Pacific Aviation Consulting Analysis, ARC Data Set YE 2Q2018, Diio MI, DOT
Note: PDEWs leaking are estimates for the entire nondirectional market, not just the TOL origin
*DOT and ARC data are quite small numerically and thus subject to possible high probability of error

As part of Ailevon's study, a financial review was conducted of TOL operating expenses and revenues. That analysis validated that TOL is projected to remain a cost competitive airport for airlines to operate out of. The success of Allegiant and the fact that TOL ranks high within a comparison of all their markets by revenue is testament to this fact. **Figure 2-13** below details a comparison of cost per enplanement (CPE) between TOL and peer airports.

FIGURE 2-13
COST PER ENPLANEMENT COMPARISON



Source: Ailevon Pacific Aviation Consulting Analysis, 2022
2) Passenger airline aeronautical revenue divided by enplanement total. Comp average is weighted.

The fact that TOL is a cost-competitive option for passenger airlines combined with the enplanement potential that exists if even a small amount of leakage is captured supports the probable likelihood of enplanement growth at TOL through the planning period. If the airport were to team with an economic development organization like JobsOhio or obtain government grant monies to front a revenue guarantee to attract new service, a large chunk of this leakage could be retained. Furthermore, continued airport marketing efforts and promoting the importance of "flying local" within the community can not only increase destinations of existing service (and possibly an Allegiant base), but also can attract new service through a showing of strong community support. The fact that peer airports that share close proximity to large hubs have attracted greater air service (by seats) is testament that TOL has room to grow. These factors were included in the scenario-based analysis of enplanement potential described in the following section.

1.4 COMMERCIAL PASSENGER FORECAST

As noted previously in this chapter, it was determined that no good statistical correlation could be found with the historical ebbs and flows of commercial passenger activity at TOL as these appear to be more closely related to the availability of aircraft seats. Availability of aircraft seats at TOL was heavily impacted by changes in the airline industry and the way the legacy carriers (United, Delta, American Airlines, and old airlines they acquired) structured routes within the Midwest non-hub airports as opposed to socioeconomic influences. In addition, at the time of this writing, major disruptions in previous trends in regional and ultra-low-cost carriers (ULCC) have been seen nationwide, and prior trends related to ULCC no longer apply.

The aviation industry today is grappling with a severe pilot shortage related to several combined factors including, early pilot retirement related to the COVID-19 pandemic, less military pilot pipelines, and increased costs for private pilot training and aircraft operation. The domestic passenger industry in the U.S. has seen

recovery to near or at 2019 levels, but with less pilots in the system. Thus, airlines are pulling pilots from smaller regional aircraft to ensure their larger mainline aircraft continue service. This is primarily due to the fact that smaller regional aircraft, such as the 50-seat EMB-145 American Airlines used to serve TOL do not yield as much revenue as a mainline aircraft with over 100 seats. This industry trend has impacted many non-hub airports across the U.S., including TOL.

In 2022, American Airlines service by American Eagle between TOL and Chicago O'Hare International Airport (ORD) was discontinued, despite having consistent load factors in the low to mid-80 percent range in 2021. It is not expected that American Airlines would have pulled out of TOL if there was no pilot shortage, and it can be conceived the CLT-TOL route would also still be in service as that route was proving successful. While regional flying has experienced reductions, ULCCs such as Allegiant and new entrants such as AVELO and Breeze have been increasing flying and their overall footprint across the nation. The ULCCs are capturing pent up leisure demand coming out of the pandemic and finding opportunities to capture unmet demand left by regional carriers reducing seats or pulling out of markets. Today, Allegiant has a strong presence at TOL proven by the fact that, as of 2021, TOL ranked 27 out of 124 of Allegiant's markets by revenue[7]. This metric is indicative that Allegiant or other ULCC carriers may increase service at TOL in the future.

Considering these industry related factors, where airline resources available dictate changes in legacy routes and ULCCs are capitalizing on unmet demand at small airports across the country, a bottom-up, scenario-based approach was used to determine a range of potential enplanement growth.

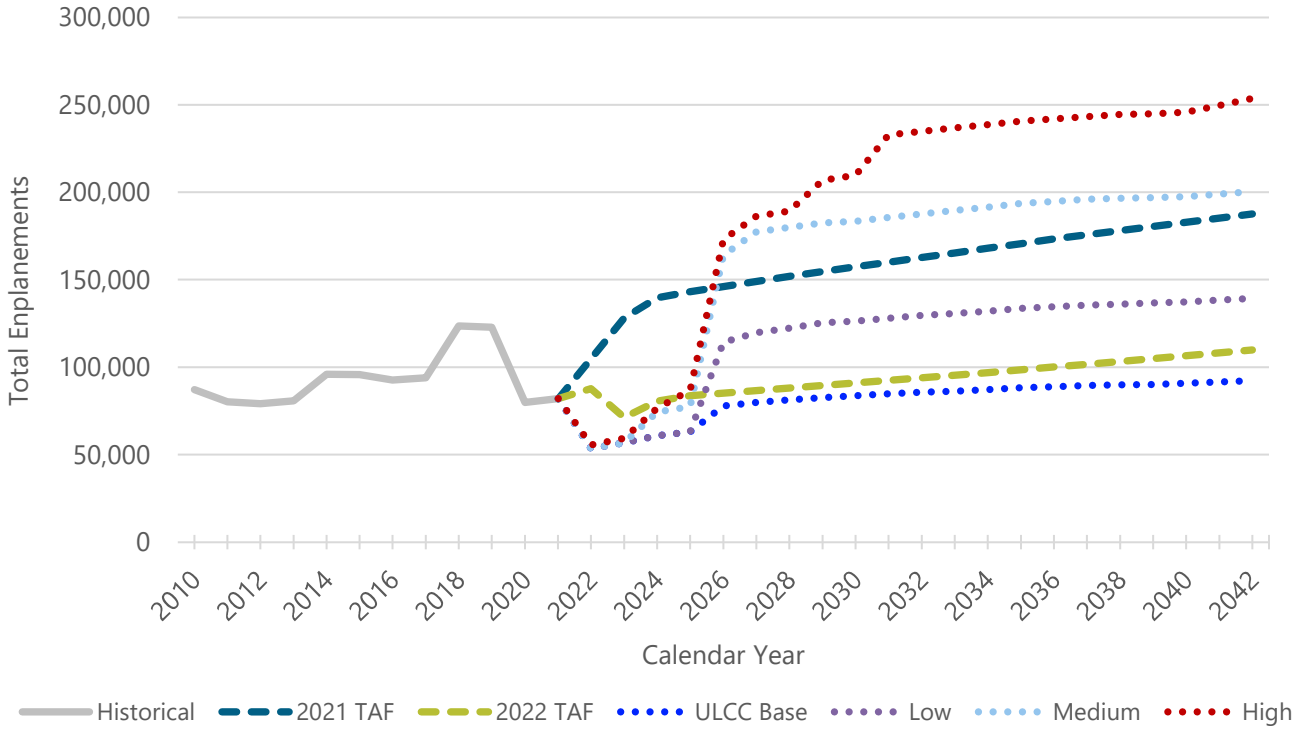
1.4.1 Enplanement Scenarios and FAA TAF Validation

The TLCPA contracted Ailevon to complete an aviation market study and commercial service forecast in 2021. The forecast model provided by Ailevon established low, medium, and high cases of commercial passenger activity growth over the planning period, built largely around the growth of ULCC's at the airport such as Allegiant, and incremental increases in legacy service. The scenarios were adjusted for this study to account for the departure of legacy carrier service from TOL as planned for September of 2022, and with anticipation of regaining legacy service, at some level, by 2025. That assumption that legacy service will return in 2025 is based on the efforts airlines are working on today to fill their pilot pipelines and return to airports where load factors were high enough to provide an adequate financial rate of return on their operations. A new base scenario was established to reflect modest growth in of the existing ULCC service without the return of legacy carrier commercial service.

Figure 2-14 depicts the base, low, medium, and high enplanement scenarios. Additionally, the figure shows the 2021 FAA TAF enplanement forecast that was used for primary comparison as well as the updated 2022 FAA TAF that was published after the completion of the original forecasting effort but is included for further comparison. The TAF enplanement forecasts fall near the middle of the range of forecasted potential demand identified by the Ailevon scenarios.

[7] Eugene F Kranz Toledo Express Airport Study, Q2 2021, Ailevon Pacific Aviation Consulting, 2021

FIGURE 2-14
ENPLANEMENT SCENARIO FORECASTS



Sources: FAA 2022 TAF; Ailevon Pacific Aviation Consulting Analysis, 2022; RS&H Analysis, 2022

As noted, the Ailevon scenarios were developed using a bottom-up approach, meaning that specific assumptions of new routes and new carrier entrants were added based on Ailevon's air service analyses. The air service analyses took into consideration leakage of origin and destination (O&D) passengers within the TOL catchment area and peer airport comparisons. For the purposes of this master plan study, new airline entrants and existing airlines new routes are generalized as "new markets." **Table 2-7** details the assumptions for legacy service and ULCC service that were included in each scenario.

TABLE 2-7
TOL AVIATION MARKET STUDY FORECAST ASSUMPTIONS

Type of Service	ULCC Base Scenario	Low Scenario	Medium Scenario	High Scenario
Legacy	No Service	Legacy returns with one market in 2025.	Legacy returns with two markets in 2025.	Legacy returns with two markets in 2025. A new market is added in 2030
ULCC	Maintains current service with one new market by 2026.	Maintains current service with one new market by 2026.	Maintains current service with one new market by 2024 and two new markets by 2025.	Maintains current service with one new market by 2024, two new markets by 2025, and two new markets by 2030.

Source: Ailevon Pacific Aviation Consulting Analysis, 2022

In comparison of the two TAF data sets, the 2021 FAA TAF assumed a much quicker return to pre-COVID activity levels than is expected given the anticipated change in the aviation market and service at TOL. Furthermore, the 2022 FAA TAF featured too low a projection across the planning horizon, not accounting for the anticipated return of legacy service within the planning period. The Low scenario, the most conservative of growth scenarios anticipating return of legacy carrier service, sits roughly in the middle of the FY2021 and FY2022 TAFs and details a reasonable representation of anticipated enplanement growth through the planning period. AS the ULCC Base scenario and the 2022 TAF are built on the same methodology of only continued ULCC service and growth at TOL, both projections are relatively close across the planning horizon. The enplanement demand levels associated with the ULCC Base forecast for each planning year in comparison with each TAF are detailed below in **Table 2-8.**

TABLE 2-8
PREFERRED FORECAST – FAA TAF COMPARISON

Description	Year	ULCC Base Forecast	2021 TAF	% Diff. (Base/2021)	2022 TAF	% Diff. (Base/2022)
Base Year	2021	**81,969**	80,611	1.7%	81,969	0.0%
Base Year +5 Years	2026	**77,765**	146,002	-46.7%	85,103	-8.6%
Base Year +10 Years	2031	**84,697**	160,032	-47.1%	92,498	-8.4%
Base Year +15 Years	2036	**88,822**	173,288	-48.7%	100,044	-11.2%
Base Year +20 Years	2041	**91,569**	185,218	-50.6%	108,207	-15.4%

Source: FAA 2021 TAF (March 2022) and 2022 TAF (February 2023); RS&H Analysis, 2023

1.5 AIR CARGO OPERATIONS AND TONNAGE FORECASTS

As detailed in the historical analysis, air cargo volumes at TOL have experienced a wide range of variability. With the departure of BAX Global in 2012, the airport saw a drop in annual cargo landed weight surpassing 70 percent, but the arrival of Amazon Air saw a 438 percent year-over-year increase in 2021.

With the inconsistency in historical cargo activity at TOL, it is unpractical to reliably identify a historical trend for forecasting. To account for the lack of future planning input from current cargo operators at TOL, several new forecasting scenarios (based on aviation market and industry trends) were created to establish a reasonable forecast scenario for TOL. Local aviation market trends are based on the growth of aviation cargo activity of airports within the study region while national industry trends relate to the World Air Forecast prepared by the Boeing Company.

1.5.1 National Industry Trends Forecast

In 2020, the Boeing Company published the latest installment of their triennial World Air Cargo Forecast (WACF) that covers the forecast period of calendar year 2020-2039. In the WACF, Boeing analyzes worldwide cargo activity trends, as well as continental and intercontinental study areas. In their report, Boeing analyzes the impact of the COVID-19 pandemic on the industry and anticipated recovery to pre-2019 figures, and details low, medium, and high forecast growth scenarios for the planning period. [8]

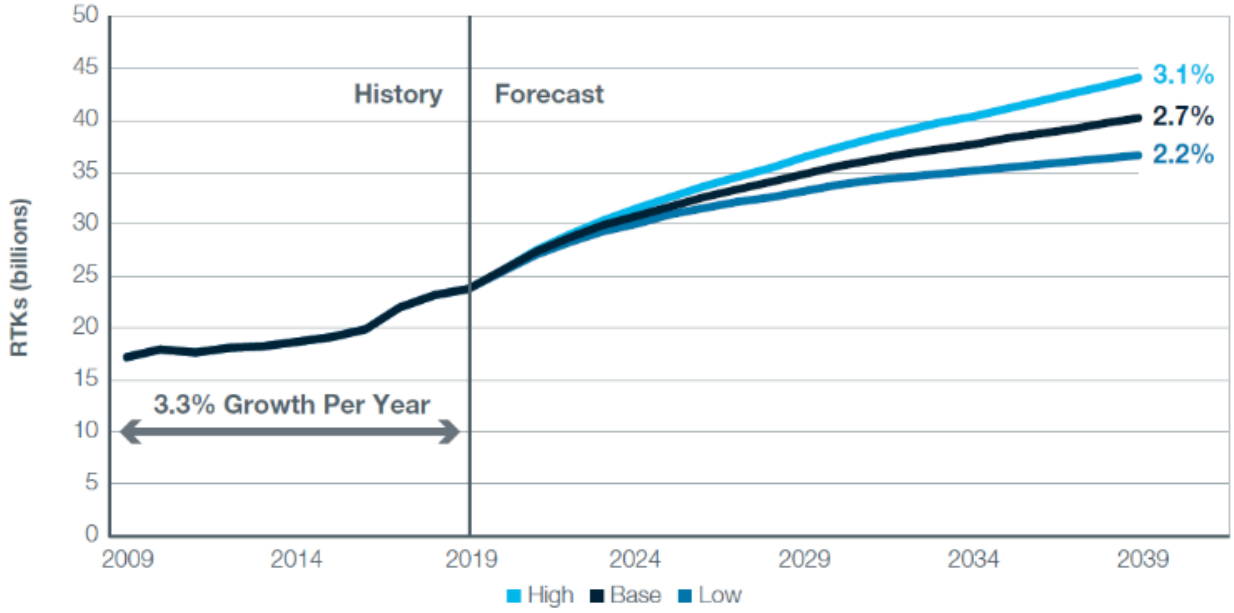
[8] Source: 2020-2039 World Air Cargo Forecast, Boeing Company, 2020

1.5.1.1 North America Regional Forecast

As detailed in the WACF, air cargo moving to, from, and within the United States and Canada accounts for 9.8 percent of the world's air cargo traffic in revenue ton-kilometers and 14.5 percent of tonnage.

The metric used in the WACF for cargo volume throughput is the revenue ton-kilometer (RTV) which represents one metric ton of revenue load carried one kilometer. Within the North America Regional Forecast, the forecast for domestic air cargo traffic within the United States is anticipated to grow at an average annual rate of 3.9 percent in the first ten years and level off in the last ten years for an average annual forecast period rate of 2.7 percent (see **Figure 2-15**). As the majority of cargo activity at TOL is anticipated to remain within the U.S., these two growth scenarios (constant 2.7 percent and variable beginning with 3.9 percent) were taken from the WACF and used as a comparison metric in the cargo forecast for TOL.

FIGURE 2-15
BOEING WACF DOMESTIC CARGO FORECAST

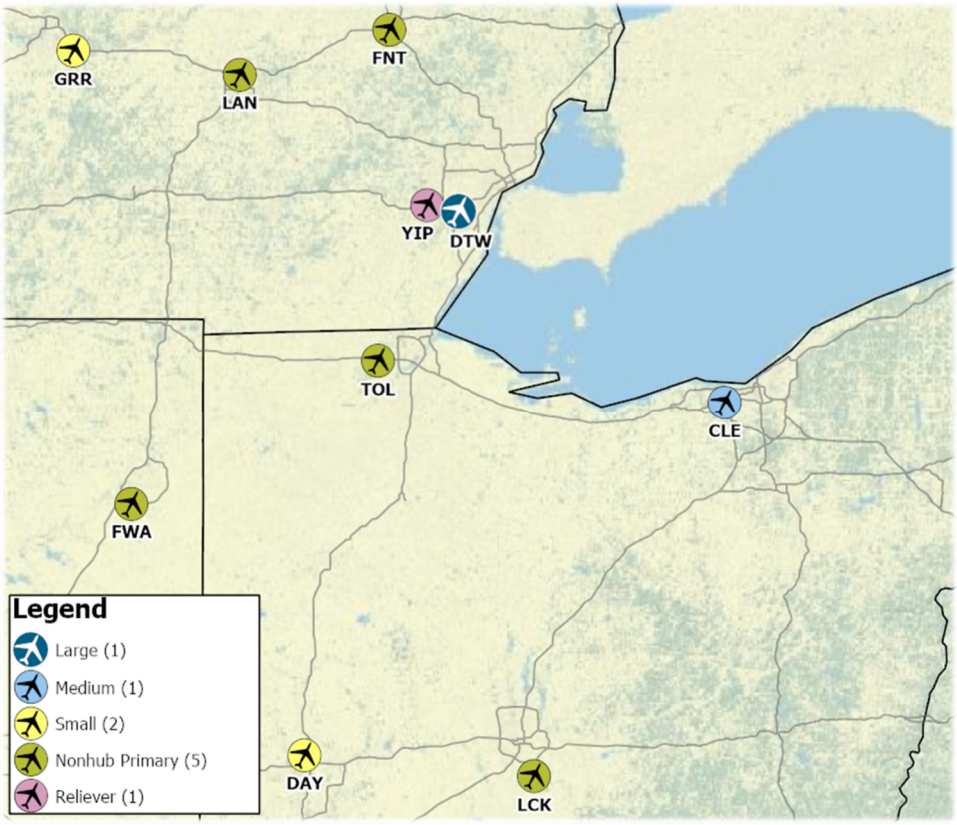


Source: 2020 World Air Cargo Forecast, The Boeing Company

1.5.2 Local Market Trend Forecasts

As much of the cargo passing through TOL either begins or ends its journey within the Toledo MSA, growth of air cargo activity at TOL is anticipated to largely match that of the greater region and the neighboring cities, service areas, and airports. **Figure 2-16** shows the regional airports and their proximity to TOL that feature comparable cargo activity to TOL that were used in the market comparison. **Figure 2-17** depicts the historical cargo landed weight at each of these airports within the region as well as the historical compounded annual growth rate (CAGR) of cargo at each.

FIGURE 2-16
NEIGHBORING CARGO AIRPORTS

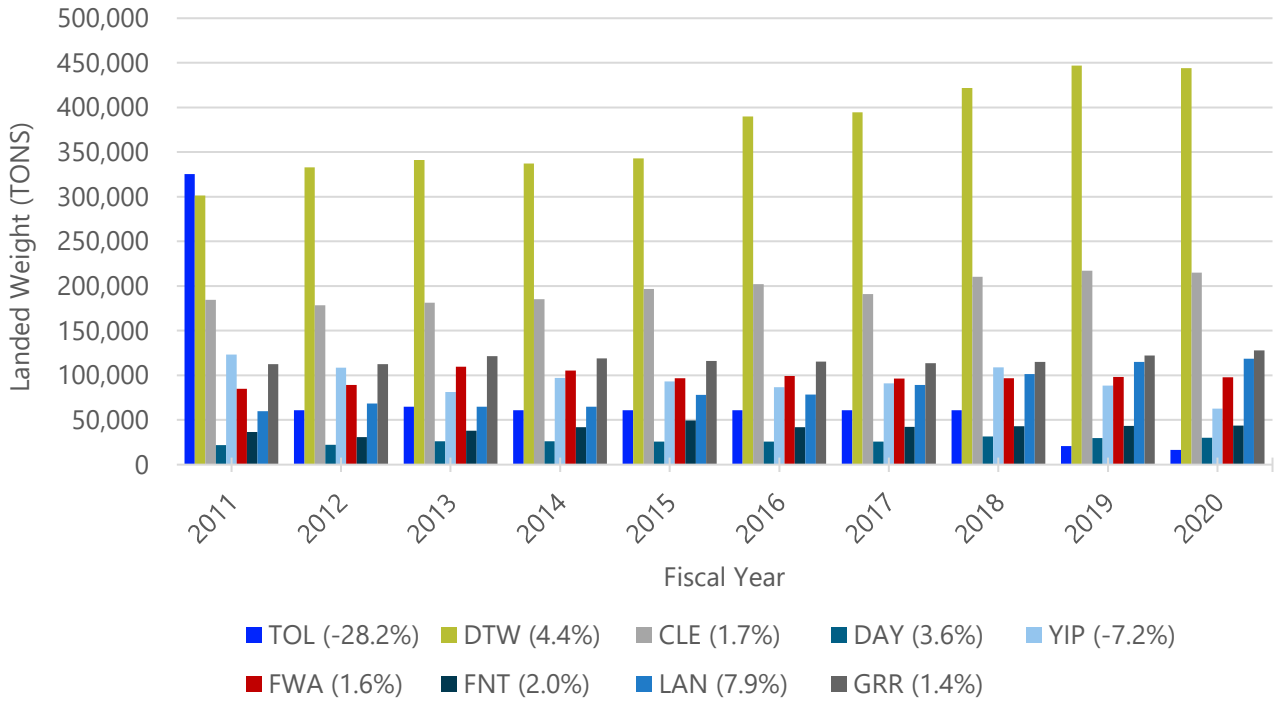


Source: RS&H Analysis, 2022

A review of all airports that transport cargo within the study area includes Rickenbacker International Airport (LCK) and Cincinnati/Northern Kentucky International Airport (CVG) that represent two cargo operations that in our analysis do not serve the same regional function as TOL. LCK accommodates international operations and CVG is a hub for Amazon Air and DHL. As such, the analysis excludes LCK and CVG historical cargo data.

An analysis of historic cargo volumes at airports within the study region yields an average compounded annual growth rate of 2.8 percent. This CAGR was used to develop the "Medium" forecast scenario as it accurately reflects historical growth of cargo at airports within the region with cargo operations and demands comparable to TOL.

FIGURE 2-17
HISTORICAL REGIONAL CARGO ACTIVITY



Source: www.faa.gov, Data Passenger Boarding (Enplanement) and All-Cargo Data for U.S. Airports - Previous Years; Compiled by RS&H, 2022

A high growth forecast scenario was created based on an assumption for Amazon's growth and new operators coming to TOL within the planning period. Upon their arrival in 2021, Amazon Air indicated the likelihood of up gauging the aircraft size prior to increasing frequency. Currently Sun Country operates two 737-800s per day on behalf of Amazon at TOL. If an up-gauge was to occur, it is anticipated one of Amazon's other subsidiaries that operates 767-300s would replace the current operation. This increase in aircraft size is forecasted as a possibility by 2026. Furthermore, the availability of space and infrastructure at the airport coupled with less congested airspace and the airport's proximity to interstate highways provides potential to attract a new operator with a schedule similar to that of Amazon by 2031. The high growth forecast assumed that operators would double their frequency in 2036.

1.5.2.1 Air Cargo Forecast Summary

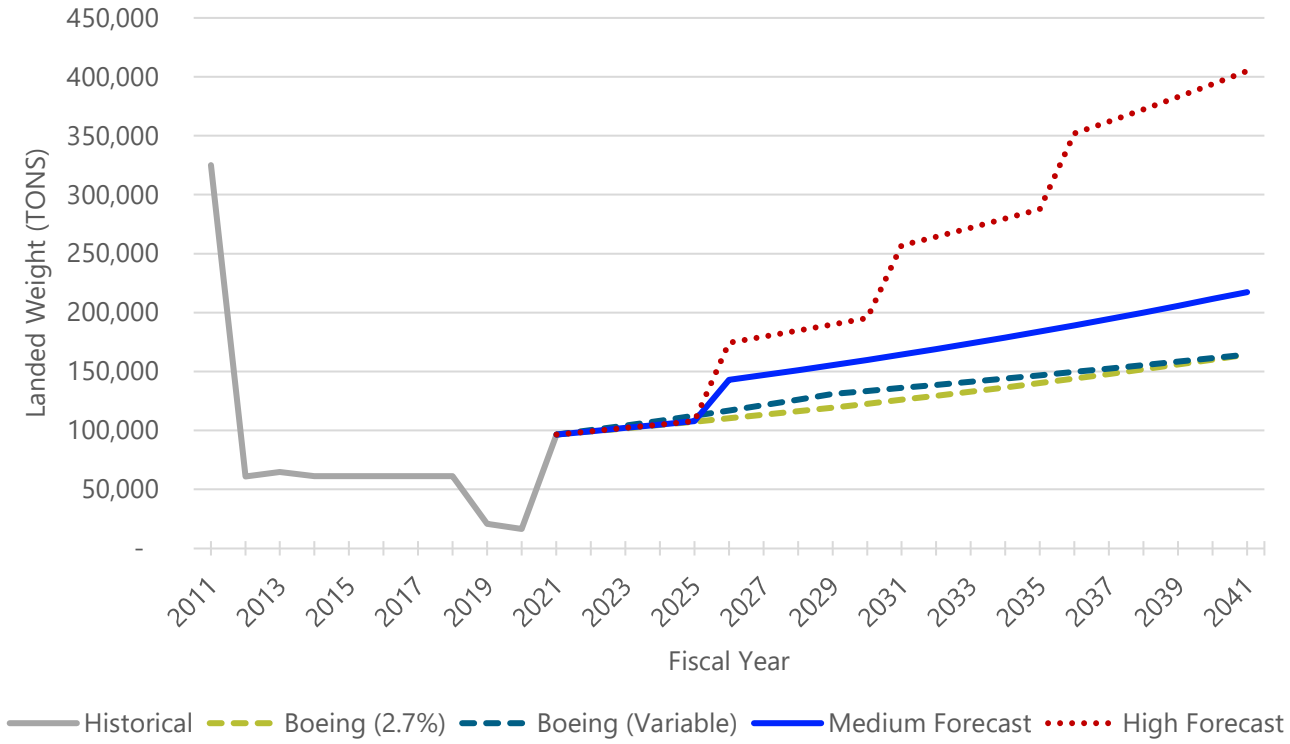
Combining the market and industry forecasts illustrates the range of potential growth of cargo activity at TOL while also providing metrics for comparison against other industry and market trends. **Table 2-9** below details the anticipated cargo volumes for TOL under each of the market and industry forecast scenarios over the planning period with each growth scenario further illustrated in **Figure 2-18**.

TABLE 2-9
AIR CARGO ACTIVITY FORECAST

Calendar Year	Landed Weight (TONS)			
	National Industry Trends		Local Market Trends	
	Boeing Forecast	Boeing Forecast (Variable)	Medium Forecast	High Forecast
2022	99,086	100,244	99,228	99,228
2023	101,761	104,153	102,053	102,053
2024	104,509	108,215	104,959	104,959
2025	107,331	112,436	107,947	107,947
2026	110,229	116,821	142,776	174,531
2027	113,205	121,377	146,841	179,500
2028	116,261	126,110	151,022	184,611
2029	119,400	131,029	155,322	189,867
2030	122,624	133,528	159,744	195,273
2031	125,935	136,076	164,292	257,042
2032	129,335	138,672	168,970	264,361
2033	132,827	141,317	173,781	271,888
2034	136,414	144,013	178,728	279,629
2035	140,097	146,760	183,817	287,590
2036	143,879	149,560	189,051	351,989
2037	147,764	152,413	194,433	362,010
2038	151,754	155,321	199,969	372,318
2039	155,851	158,284	205,663	382,918
2040	160,059	161,304	211,518	393,821
2041	164,381	164,381	217,541	405,033
CAGR	2.7%	2.7%	4.15%	7.44%

Source: RS&H Analysis, 2022

FIGURE 2-18
TOL AIR CARGO VOLUME FORECAST



Source: RS&H Analysis, 2022

Given the availability of facilities already in place at TOL as well as proximity to the national highway network, it is anticipated air cargo operations will continue to grow at the airport. Preliminary discussions with operators currently based on TOL reinforce this anticipated growth and as such, the medium forecast scenario illustrated above is carried forward as the "base" forecast for air cargo activity at TOL.

1.6 BASED AIRCRAFT FORECAST

The 2022 FAA TAF forecasted TOL had and would continue to have 82 based aircraft throughout the twenty year planning period. It is common that the FAA TAF holds constant the number of based aircraft last reported via a FAA 5010 Airport Master Record report. At the time of this writing, the airport maintained a based aircraft record that was not consistent with TAF records. In 2022, airport records showed 56 civil-based aircraft and 21 military-based aircraft for a total of 77. That number of based aircraft was used as the baseline for the based aircraft forecast.

Several classical forecasting techniques, such as a socio-economic regression model, were attempted while forecasting based aircraft and aircraft operations at TOL. However, no suitable model was found. Therefore, the local socio-economic trends were not considered as viable indicators for forecasting. For TOL, the FAA Aerospace Forecast was determined as the best indicator of future levels for use in forecasting based aircraft.

The FAA Aerospace Forecast (FY 2022 – FY 2042) is a comprehensive 20-year forecast of both commercial and general aviation (GA) activity. For the purposes of this chapter, only GA fleet data was analyzed.

As detailed in **Table 2-10**, the total number of general aviation aircraft within the U.S. is projected to increase over the next 20 years annually by 0.1 percent. Turboprop, turbojet, rotorcraft, experimental, and light sport aircraft are projected to spur growth in the general aviation sector through the next 20 years while single- and multi-engine piston fleets are expected to decrease. Aging aircraft fleets, unfavorable pilot demographics, increasing aircraft ownership costs, and the lack of available lower cost alternatives are accelerating the decline of piston aircraft. The number of turbine-powered GA aircraft is expected to grow by nearly 12,000 between 2022-2042 while the number of light-sport aircraft is forecast to roughly double by 2040. The report also shows that the GA sector, which was not as negatively affected by the pandemic as the airlines, is expected to recover to its pre-pandemic operational numbers much faster than other sectors of aviation.

TABLE 2-10
FAA AEROSPACE FORECAST

Year	Single-Engine Piston	Multi-Engine Piston	Turboprop	Turbojet	Rotorcraft	Experimental	Light Sport	Total GA Fleet
Historical								
2010	139,519	15,900	9,369	11,484	10,102	24,784	6,528	223,370
2015	127,887	13,254	9,712	13,440	10,506	27,922	2,369	210,031
2018	130,179	12,861	9,925	14,596	9,989	27,531	2,554	211,749
2019	128,926	12,470	10,242	14,888	10,198	27,449	2,675	210,981
2020	124,059	11,947	10,317	15,316	9,746	26,367	2,570	204,140
2021E	123,105	11,865	10,275	15,755	9,820	27,000	2,765	204,405
Forecast								
2022	122,020	11,795	10,250	16,230	9,955	27,495	2,905	204,590
2027	116,225	11,490	10,245	18,830	10,675	29,455	3,600	204,925
2032	110,560	11,285	10,460	21,535	11,585	30,985	4,295	205,195
2037	105,565	11,135	10,780	24,290	12,540	32,460	4,985	206,280
2042	101,860	11,055	11,455	27,000	13,530	33,785	5,655	208,905
Avg Annual Growth								
2010-21	-1.1%	-2.6%	0.8%	2.9%	-0.3%	0.8%	-7.5%	-0.8%
2021-22	-0.9%	-0.6%	-0.2%	3.0%	1.4%	1.8%	5.1%	0.1%
2022-32	-1.0%	-0.4%	0.2%	2.9%	1.5%	1.2%	4.0%	0.0%
2022-42	-0.9%	-0.3%	0.6%	2.6%	1.5%	1.0%	3.4%	0.1%

Source: FAA Aerospace Forecast Fiscal Years 2021-2041
Note an active aircraft is one that has a current registration and was flown at least one hour during the calendar year.

A share analysis using the FAA Aerospace Forecast was conducted to generate a based aircraft forecast at TOL. **Table 2-11** details the growth forecast of each based aircraft type at TOL over the 20-year forecast period. As shown, the number of non-military-based turbojet aircraft is anticipated to increase by eleven over the forecast period, which correlates with the 2.6 percent growth forecasted for the national fleet of turbojets in the United States. The Ohio Air National Guard's 21 based military jet aircraft at TOL were held constant. When combining the military and private turbojet aircraft, overall turbojet growth equates to 1.3 percent annually at TOL.

Turboprop aircraft were also forecast to grow in line with the Aerospace Forecast estimate of 0.6 percent annually. That equates to approximately 1 new turboprop aircraft at TOL by the end of the planning period.

While the Aerospace Forecast anticipates a steady national decline in the fleet of piston-powered aircraft, the based piston aircraft at TOL are not anticipated to follow that trend as aircraft storage for piston aircraft is at capacity. The number of based piston-powered aircraft were held constant throughout the forecast period under the assumption that hangars for small piston aircraft will continue to be used but the demand for new hangars will primarily follow an increase in based turboprop or turbojet aircraft. Thus, the based aircraft count for single- and multi-engine piston aircraft is estimated to hold constant though the planning period.

TABLE 2-11
BASED AIRCRAFT FORECAST

Year	Single Engine Piston	Multi-Engine Piston	Turboprop	Turbojet	Helicopter	Military	Total
2021	25	8	5	15	3	21	77
Forecast							
2026	25	8	5	17	3	21	79
2031	25	8	5	19	3	21	81
2036	25	8	5	21	3	21	84
2041	25	8	6	24	3	21	87
CAGR (2020-2040)	0.0%	0.0%	0.6%	1.3%	0.0%		0.8%

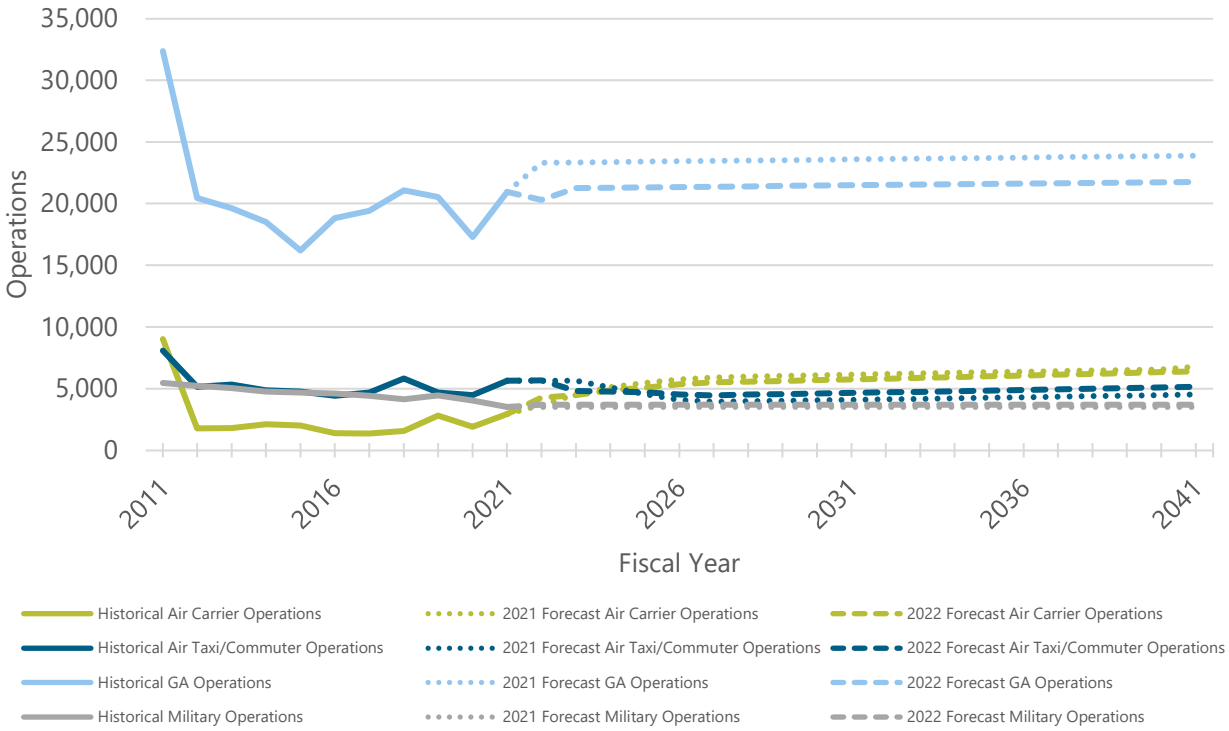
Source: FAA Aerospace Forecast Fiscal Years 2021-2041, Airport Records; RS&H Analysis, 2022

1.7 OPERATIONS FORECASTS

The 2021 TAF data was used for comparison while formulating forecasting methodology for aircraft operations. Additionally, the 2022 TAF, published after the completion and initial submission of the aviation forecast was used as an additional comparison metric.

The lingering impact of the COVID-19 pandemic is still a large part of the TAF forecast process as the aviation industry as a whole has not yet recovered to pre-2019 numbers. Analysis of the 2021 and 2022 TAF data revealed two different recovery scenarios for TOL, in particular the forecasts for the air carrier and general aviation operations. The 2021 TAF assumed full recovery for commercial operations but slow growth over the forecast period, methodology that held true through ensuing year as validated in the close correlation of 2022 TAF projections. Conversely, the 2021 TAF assumed full recovery and slow growth to pre-2019 numbers in the planning period for GA operations while the 2022 TAF anticipated another drop in GA operations and delayed recovery. **Figure 2-19** compares the two TAF data sets used for comparison.

FIGURE 2-19
FAA 2021/2022 TAF COMPARISON



Source: FAA 2021 TAF, FAA 2022 TAF; Compiled by RS&H, 2022

1.7.1 Itinerant Operations Forecast

Operations are considered itinerant when they are performed by an aircraft, either IFR or VFR, and land at an airport arriving from outside the airport area or depart from an airport and leave the local airspace. This will typically include the majority of operations at an airport with all commercial, as well as a portion of GA and military operations regarded as itinerant. The forecasting of itinerant operations is largely dependent on market and industry trends within the nation as well as the role the airport serves within the NAS.

1.7.1.1 Commercial Service

Commercial air service at TOL is comprised of passenger traffic and cargo transportation. Passenger traffic is accommodated through airlines operating in the main terminal, the majority of cargo operations are accommodated on the south airfield ramp, and various passenger charters and cargo flights are handled by any one of the airport's three Fixed Base Operators (FBO). Itinerant commercial operations are further broken into two categories, air carrier and air taxi/commuter. Each category is recorded in the FAA Operations Network (OPSNET) reports in accordance with the following definitions:

- ***Air Carrier***: *Aircraft with seating capacity of more than 60 seats or a maximum payload capacity of more than 18,000 pounds, carrying passengers or cargo for hire or compensation. This includes US and foreign-flagged carriers.*
- ***Air Taxi/Commuter***: *Aircraft designed to have a maximum seating capacity of 60 seats or less or a maximum payload capacity of 18,000 pounds or less, carrying passengers or cargo for hire or compensation.*[9]

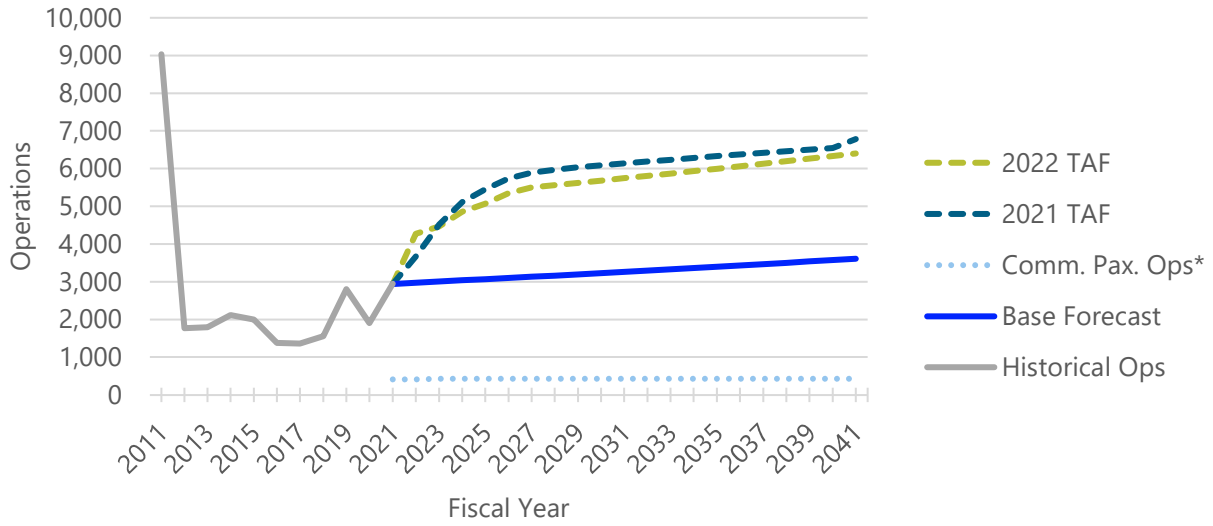
[9] OPSNET Reports, Definitions and Variables, https://aspm.faa.gov/aspmhelp/index/OPSNET_Reports__Definitions_of_Variables.html

Emerging from the impact the COVID-19 pandemic had on the aviation industry, TOL saw a return and slight increase (5%) in air carrier itinerant operations in 2021 (2,945 operations) from before the pandemic in 2019 (2,804 operations). This quick rebound supports two forecasting assumptions made for TOL:

1. The quick return to pre-COVID numbers for itinerant air carrier activity is not typical of national commercial passenger trends, therefore these operations at TOL were not dependent on Allegiant Air commercial passenger service. Note American Airlines commercial passenger service would fall under air taxi/commuter due to the size of aircraft used.
2. The steep recovery projected in both the FY2021 and FY2022 TAFs through 2027 is believed characteristic of national trends still rebounding from COVID-19 impacts and not specific to TOL that has largely recovered.

The first assumption is further verified as the baseline projection for Allegiant Air is 410 operations in 2022, which is only about 14 percent of the total itinerant air carrier operations. The remaining 86 percent of these operations include cargo and charter activity that has held relatively constant and strong at TOL and controls the forecasting approach. In discussion with airport staff and key stakeholders, the TLCPA is continuing to work with the airlines to improve commercial passenger services and therefore commercial operations are anticipated to continue growth, as are cargo services. As a result, a Base Forecast scenario was created that utilizes the same CAGR (1.01%) as the 2021 TAF model beginning in year 1 (2022) of the forecast period. **Figure 2-20** depicts the Base Forecast in relation to the two TAF data sets for air carrier itinerant operations as well as commercial passenger operations relative to the overall Base Forecast if held constant.

FIGURE 2-20
ITINERANT AIR CARRIER FORECAST



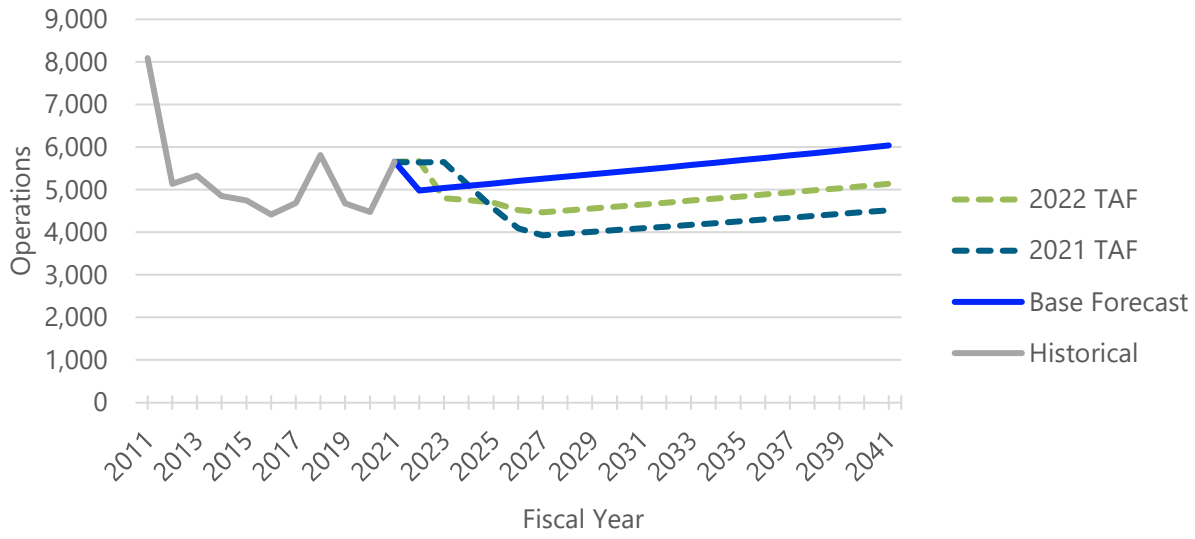
*Commercial Passenger Operations held constant across planning period
Sources: FAA 2021 TAF, FAA 2022 TAF; RS&H Analysis, 2022

Similar to the air carrier analysis, the two forecasting assumptions also hold true for the air taxi/commuter forecast regarding the accuracy of the TAF to the operation at TOL as well as COVID impacts on recovery in air service.

Consistent with the forecast for air carrier operations, the passenger service provided by legacy carriers represented only a small percentage of total air taxi/commuter operations with the majority made up of cargo and charter activity. In calendar year 2021, approximately 730 operations of the total 5,650 air taxi/commuter operations were conducted by American Eagle, a 12.9 percent share.

Both the FY2021 and FY 2022 TAF assumed an approximate 1.0 percent CAGR for air taxi/commuter itinerant operations at TOL in the middle and long-term planning periods. Utilizing the same CAGR as the TAF, a new Base Forecast was created showing the drop in operations (2022) attributed to the loss of legacy service. **Figure 2-21** depicts the Base Forecast for air taxi/commuter itinerant operations in comparison with the two TAF data sets.

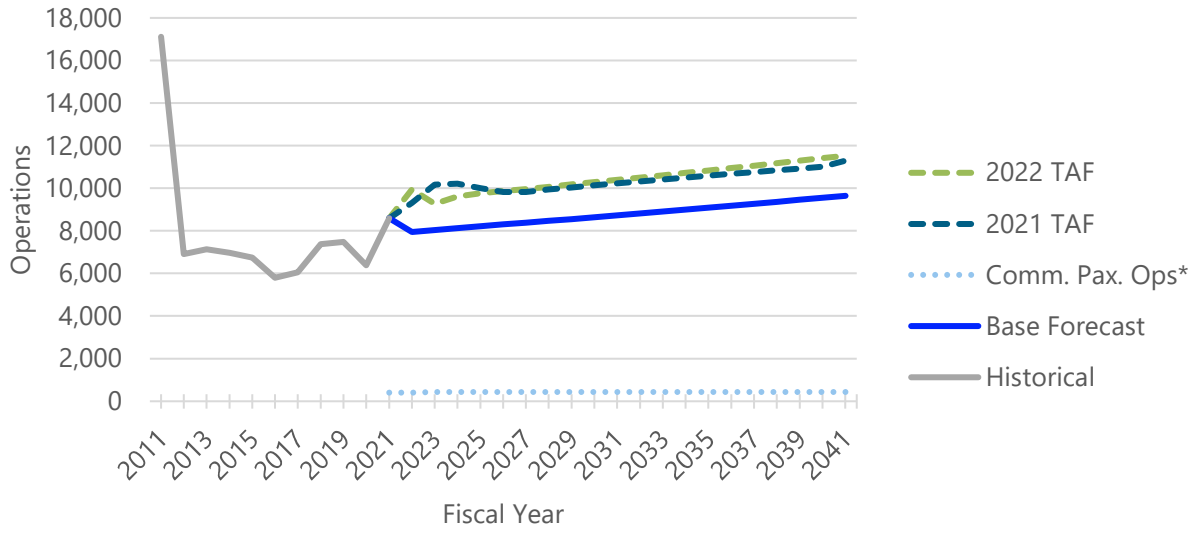
FIGURE 2-21
ITINERANT AIR TAXI/COMMUTER FORECAST



Sources: FAA 2021 TAF, FAA 2022 TAF; RS&H Analysis, 2022

Total commercial itinerant operations, the combination of air carrier and air taxi/commuter services, can be found in **Figure 2-22**. As shown and previously described commercial passenger service at TOL historically provided by either legacy carriers (American Eagle) or Ultra-Low Cost Carriers (Allegiant) only comprises a small percentage of the total commercial operations at the airport. Thus, impacts to passenger traffic through challenges like the COVID-19 pandemic or airline industry changes have a reduced affect at TOL when compared with other primary airports.

FIGURE 2-22
TOTAL COMMERCIAL ITINERANT OPERATIONS FORECAST



*Commercial Passenger Operations held constant across planning period
Sources: FAA 2021 TAF, FAA 2022 TAF; RS&H Analysis, 2022

Table 2-12 compares commercial operations of the Base Forecast with the 2021 and 2022 FAA TAF data sets over the forecast period.

TABLE 2-12
COMMERCIAL OPERATIONS TAF COMPARISON

Description	Year	Base Case Forecast	2021 TAF	% Diff. (Base/2021)	2022 TAF	% Diff. (Base/2022)
Base Year	2021	**8,595**	8,595	0.0%	8,595	0.0%
Base Year +5 Years	2026	**8,298**	9,827	-18.4%	9,865	-18.9%
Base Year +10 Years	2031	**8,726**	10,229	-17.2%	10,393	-19.1%
Base Year +15 Years	2036	**9,175**	10,673	-16.3%	10,945	-19.3%
Base Year +20 Years	2041	**9,648**	11,300	-17.1%	11,535	-19.6%

Source: FAA 2021 TAF (March 2022) and 2022 TAF (February 2023); RS&H Analysis, 2023

1.7.1.2 General Aviation

Multiple companies in the Toledo MSA base aircraft at TOL with many of the existing tenants also looking to expand their operations. This growth coupled with the level of service provided by three FBOs at the airport are anticipated to continue the trend of consistent growth in itinerant general aviation operations (2.4 percent CAGR since 2016 totaling 15,398 operations in 2021). While an independent metric is not able to be established with all proposed expansion still hypothetical, the FY2021 TAF maintains a 0.5 percent CAGR for these operations. That growth rate was found to be conservative yet consistent with anticipated activity levels in discussions with airport staff.

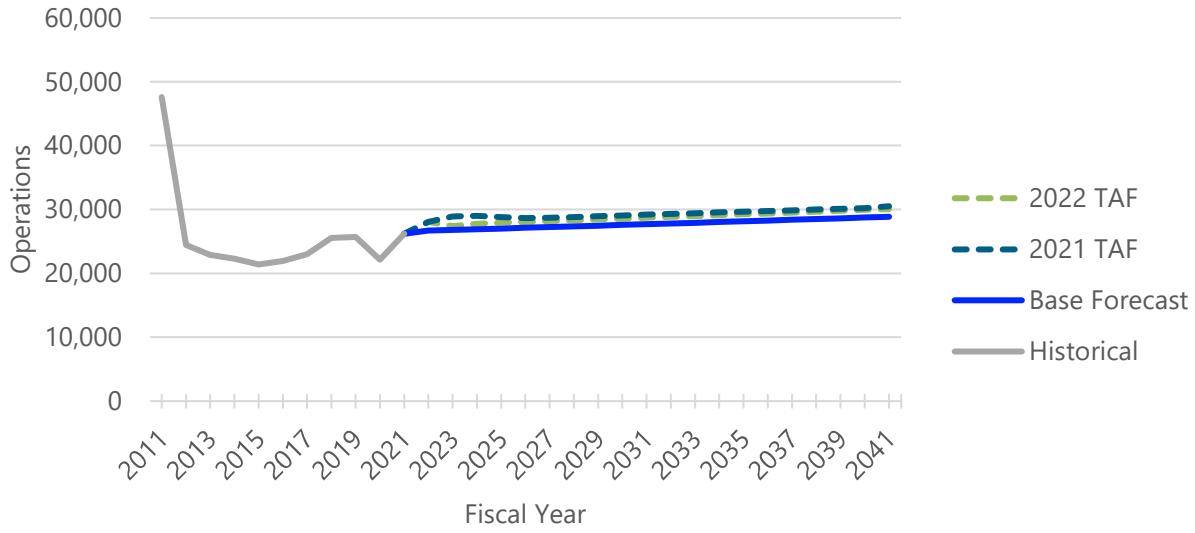
1.7.1.3 Military

The itinerant military aircraft that operate out of TOL represented only 8.4 percent of 26,201 total itinerant operations as identified within the FY2021 TAF. This forecast does not make any changes to the number of military operations but instead, as is customary practice, will hold the existing count of 2,208 operations for itinerant military operations constant from 2022-2041.

1.7.1.4 Itinerant Operations Summary

Figure 2-23 depicts the combination of commercial, GA, and military itinerant operations in comparison with both TAFs. The Base Forecast sits just below but closely compares with the both the 2021 TAF and 2022 TAF data sets largely due to the consistency of aircraft operations outside of commercial service through the COVID-19 pandemic.

FIGURE 2-23
TOTAL ITINERANT OPERATIONS FORECAST



Source: FAA 2021 TAF (March 2022) and 2022 TAF (February 2023); RS&H Analysis, 2023

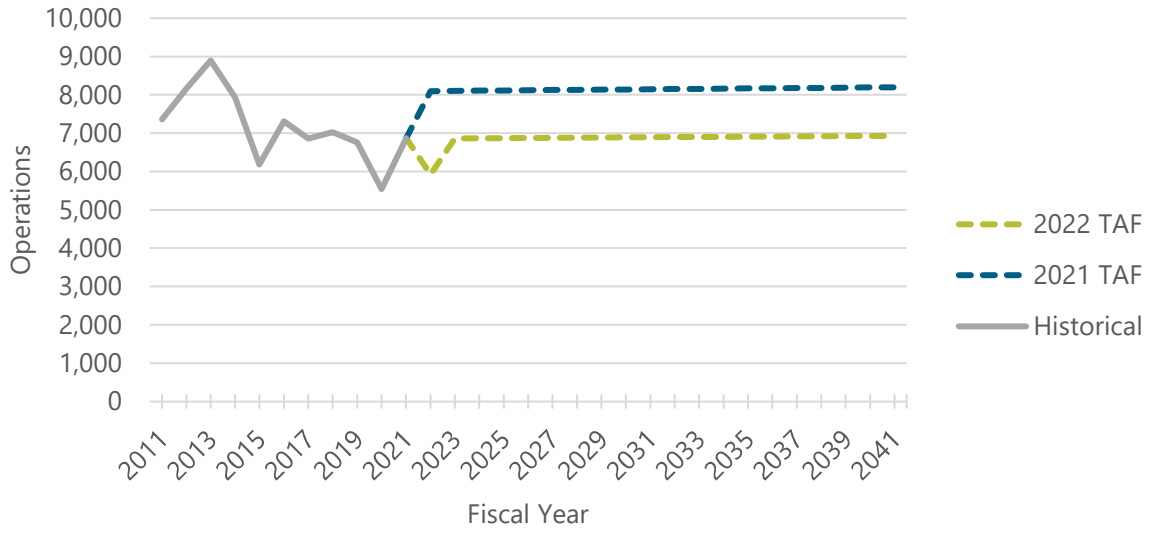
1.7.2 Local Operations Forecast

Local Operations account for any aircraft that remains in the local traffic pattern, executes simulated instrument approaches or low passes at the airport, and operations to or from the same airport within a designated practice area within a 20-mile radius of the tower[10]. Operations in this category often include flight training (GA), routine practice exercises (GA or military), and some recreational flights. Local operations tend to stay consistent as they are based at the airport though factors such as the addition or departure of a flight school or of military operations can have heavy impact on overall operations. Socioeconomic factors can also have an impact, such as rising or falling PIPC can have a positive or negative impact on flight training programs and recreational flying that, in turn, impact local operations. This particular case may be visible in the anticipated drop between years 2021 and 2023 in the 2022 TAF as the public continues to recover from the COVID-19 pandemic and reduces non-essential spending on things such as flight training and recreational flying.

[10] OPSNET Reports, Definitions and Variables, https://aspm.faa.gov/aspmhelp/index/OPSNET_Reports__Definitions_of_Variables.html

The local general aviation and military aircraft that operate out of TOL represent 16.8 percent and 4.0 percent (respectively) of the total 33,069 airport operations as identified within the FY2022 TAF.
As economic trends tend to better dictate the growth of local operations, this forecast does not make any changes to the number of general aviation local operations projected on the FY2021 TAF. Also as is a customary practice, the existing count of 1,314 local military operations will be held constant from 2022-2041. **Figure 2-24** depicts the anticipated forecast for local operations across the planning horizon.

FIGURE 2-24
TOTAL LOCAL OPERATIONS FORECAST



Source: FAA 2021 TAF (March 2022) and 2022 TAF (February 2023); RS&H Analysis, 2023

1.7.3 Operations Forecast Summary

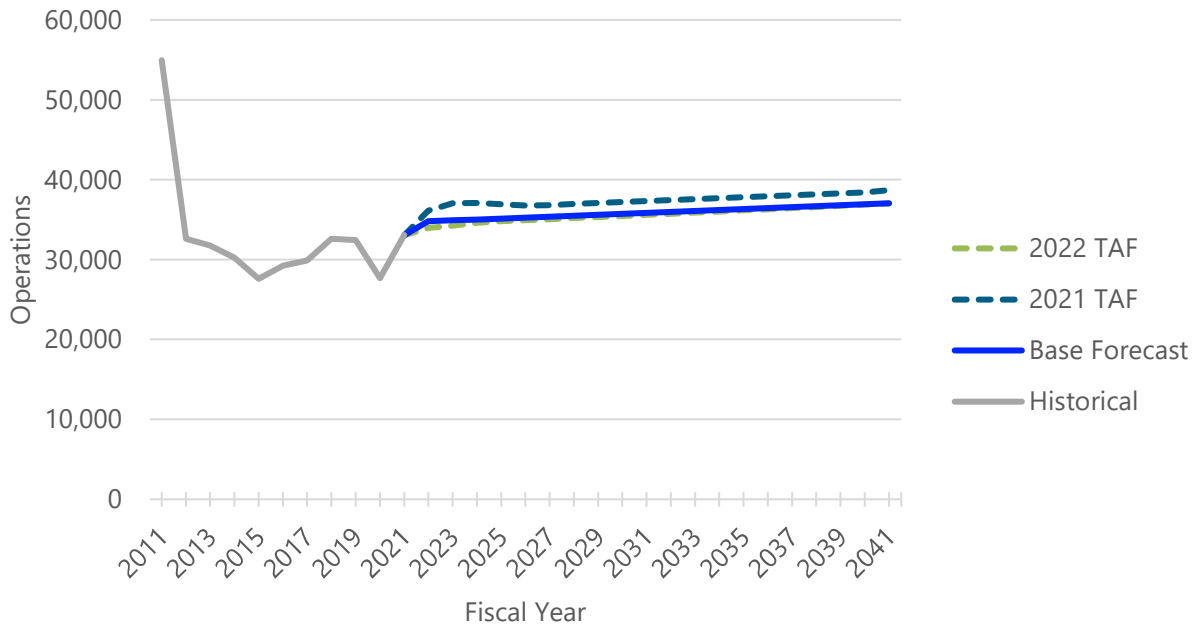
Comparison of the Base Forecast for aviation operations with the 2021 TAF and 2022 TAF shows close correlation. Whereas both TAFs assume a more generic growth rate in the early planning period as was prevalent in the commercial operations forecast section, the Base Forecast revises these to reflect the light contribution of commercial passenger activity and consistent cargo and charter activity more accurately. Beyond the 5-year planning period, the CAGR values of the each forecast scenario begin to converge, see **Table 2-13** for the CAGR comparison of Base and FAA forecasts as shown in **Figure 2-25**.

TABLE 2-13
TOTAL ANNUAL OPERATIONS FORECAST CAGR COMPARISON

CAGR	Base Forecast	2021 TAF	2022 TAF
2022-2026	0.331%	0.441%	0.703%
2022-2031	0.329%	0.362%	0.523%
2022-2036	0.331%	0.347%	0.474%
2022-2041	0.334%	0.363%	0.454%

Source: FAA 2021 TAF (March 2022) and 2022 TAF (February 2023); RS&H Analysis, 2023

FIGURE 2-25
TOTAL ANNUAL OPERATIONS FORECAST



Source: FAA 2021 TAF (March 2022) and 2022 TAF (February 2023); RS&H Analysis, 2023

Further comparison of the Total Operations Forecast per the requirements of FAA AC 150/5070-6B are found in **Table 2-14**. Close correlation has the base forecast sitting between the two comparison TAFs.

TABLE 2-14
TOTAL OPERATIONS TAF COMPARISON

Description	Year	Base Case Forecast	2021 TAF	% Diff. (Base/2021)	2022 TAF	% Diff. (Base/2022)
Base Year	2021	**33,069**	33,069	0.0%	33,069	0.0%
Base Year +5 Years	2026	**35,980**	36,779	-4.3%	34,925	0.9%
Base Year +10 Years	2031	**36,596**	37,333	-4.2%	35,593	0.7%
Base Year +15 Years	2036	**37,236**	37,930	-4.1%	36,285	0.4%
Base Year +20 Years	2041	**37,903**	38,711	-4.5%	37,015	0.1%

Source: FAA 2021 TAF (March 2022) and 2022 TAF (February 2023); RS&H Analysis, 2023

1.8 CRITICAL AIRCRAFT

The FAA requires the identification of the existing and future critical aircraft for airport planning purposes. The critical aircraft is the most demanding aircraft, or grouping of aircraft, using the airport regularly. Regular use is specifically defined in AC 150/5000-17, *Critical Aircraft and Regular Use Determination*, as 500 total annual operations, not counting touch-and-go landings.

Three parameters are used to classify the critical aircraft: Aircraft Approach Category (AAC), Airplane Design Group (ADG), and Taxiway Design Group (TDG). The AAC, depicted by a letter, relates to aircraft landing speeds. The ADG, depicted by a Roman numeral, relates to airplane wingspan and tail height.

The TDG, classified by number, relates to the outer-to-outer main gear width and the distance between the cockpit and main gear. These parameters serve as the basis of the design and construction of airport infrastructure.

The 2007 Airport Master Plan was the last study that evaluated critical aircraft at TOL. At that time, critical aircraft were identified in a less structured way than is now required per AC 150/5000-17. As noted in **Table 2-15**, and identified on the 2007 Airport Layout Plan (ALP), the critical aircraft for Runway 7-25 and Runway 16-34 was a McDonald Douglas DC-8-73F, which is a D-IV-4 aircraft. The existing and future critical aircraft identified in 2007 were related to BAX Global and other cargo operations at TOL. Since that time, BAX Global is no longer operating and the cargo aircraft using TOL has changed.

TABLE 2-15
2007 AIRPORT LAYOUT PLAN CRITICAL AIRCRAFT

	Aircraft	AAC	ADG	TDG
Runway 7-25				
Existing Critical Aircraft	DC-8-73F	D	IV	4
Future Critical Aircraft	B747-8F	D	VI	5
Runway 16-34				
Existing Critical Aircraft	DC-8-73F	D	IV	4
Future Critical Aircraft	B767-300F	D	IV	5

Sources: RS&H Analysis, 2022

Per AC 150/5000-17, *Critical Aircraft and Regular Use Determination*, each runway should have a specific critical aircraft designated based on documented aeronautical activity. The following subsections detail the critical aircraft analysis for Runway 7-25 and Runway 16-34.

1.8.1 Runway 7-25 Critical Aircraft

Runway 7-25 is the primary runway at TOL. The current critical aircraft at TOL was determined via examination of FAA offload data and FAA TFMSC data. As shown in **Table 2-16**, it was determined the critical aircraft for Runway 7-25 is currently the Boeing 737-800, which is a D-III-3 aircraft. Operations of that aircraft were recorded in 2021 FAA offload data as having 1,096 operations. The B737-800 is predominantly used by Amazon Air as well as some charters and other cargo operations that fluctuate throughout the year. It is the most demanding aircraft found to have 500 or more annual operations at TOL.

The Boeing 767-300ER, a D-IV-5 aircraft is identified as the future critical aircraft for Runway 7-25, as noted in **Table 2-16**. The 767-200/300 aircraft variants are a staple for the current air cargo industry and are one of the two primary aircraft (along with the Boeing 737-800) Amazon Air, a current operator at TOL, utilizes. The 767 fleet, operated either by Amazon Air or any of their partnering airlines, is comprised of multiple 767-200ER or 767-300ER (D-IV) conversions to freighter capable configurations. Many of these conversions feature winglets, a clear distinction between the factory 767-300F (C-IV) and the 767-200ER/300ER conversions (D-IV).

If Amazon increases their operation at TOL, discussion with the airline staff indicates a likelihood of "upgauging" their aircraft (trading larger aircraft for increased capacity as opposed to increased 737-800 operations) to the B767. Upgauging one of the two services Amazon currently has through TOL alone would exceed the 500 annual operations threshold. It is also critical to consider that 767 traffic was noted in FAA TFMSC data to have conducted more than 500 annual operations in 2012, 2013, 2014, and 2015, which are all years post the exit of BAX Global. Staff at Grand Aire confirmed they continue to service freight operations by non-Amazon B767 aircraft today. Considering the Airport's robust air cargo infrastructure, it is likely the critical aircraft will return to a D-IV within the planning period. It is recommended that the future critical aircraft be considered for all design standard purposes within the Facility Requirements analysis of this study.

TABLE 2-16
RUNWAY 7-25 EXISTING AND FUTURE CRITICAL AIRCRAFT

	Aircraft	AAC	ADG	TDG
Runway 7-25				
Existing Critical Aircraft	B737-800	D	III	3
Future Critical Aircraft	B767-300ER w/winglets	D	IV	5

Source: RS&H Analysis, 2022

1.8.2 Runway 16-34 Critical Aircraft

Runway 16-34 is the crosswind runway at TOL. As noted, the 2007 ALP identified the DC-8-73F, a D-IV-4 aircraft as the critical aircraft for this runway. The FAA defined the critical aircraft differently at the time of the 2007 ALP assignment than is done today per AC 150/5000-17, *Critical Aircraft and Regular Use Determination,* which was published in 2017. During the time the 2007 ALP was developed, it was common to assign a critical aircraft to the whole airport. Thus, because TOL was home to BAX Global' s large cargo hub and accommodated many D-IV operations, it was rational for Runway 16-34 to be assigned a D-IV critical aircraft.

Today, AC 150/5000-17 requires a critical aircraft be determined for each runway based on the most demanding aircraft completing 500 annual operations. FAA Offload data was examined to determine the fleet of aircraft using the runway. FAA Offload data (inclusive of operations by aircraft type) does not provide 100 percent capture of aircraft operations as only flights under IFR are recorded with an aircraft type associated with a flight track. For Runway 16-34, which serves as the airport's crosswind runway, these factors create a void in the data as the majority of operations on this runway are estimated to be conducted as VFR operations. This fact explains why the 2021 FAA Offload data collected for this study included only 148 annual operations on Runway 16-34.

Of those operations captured within FAA Offload data, roughly 9 percent of the aircraft were B-II aircraft, with the rest being A-I aircraft. FAA ATCT staff validated that the crosswind runway at TOL primarily serves GA operators of small piston aircraft during crosswind conditions, and sometimes operators that may use the runway when inbound from the south and want to shorten their flight.

The number of aircraft, and their type, flying VFR on Runway 16-34 is unknown. Considering input from FAA ATCT staff, and through examination of all operations captured in the FAA Offload data, it is estimated that the most demanding aircraft conducting 500 annual operations or more on Runway 16-34 is an A-I-1A aircraft similar to the Cessna 172 Skyhawk. That aircraft was chosen as the representative existing critical aircraft for airfield geometry related purposes, as noted in **Table 2-17**.

The FAA Offload data shows B-II-2 aircraft, such as the Beechcraft Super King Air, Cessna Citation, and Bombardier Challenger use the runway today, albeit not at or above the 500 annual operations threshold. As such, the future critical aircraft was identified as B-II-2, with the Beechcraft Super King Air chosen as the representative aircraft. Planning for B-II-2 is prudent to ensure flexibility if new operators use the runway frequently, and/or wind patterns shift demanding more AAC B aircraft use the runway in crosswind conditions. Note the primary runway currently provides adequate wind coverage for B category and above aircraft. Runway 16-34 is needed to meet wind coverage requirments in Instrument Meteorological (IMC) Conditions for A category aircraft. This is further described in the following Facility Requirements chapter.

TABLE 2-17
RUNWAY 16-34 EXISTING AND FUTURE CRITICAL AIRCRAFT

	Aircraft	AAC	ADG	TDG
Runway 16-34				
Existing Critical Aircraft	Cessna 172 Skyhawk	A	I	1A
Future Critical Aircraft	Beechcraft Super King Air	B	II	2

1.9 FORECAST SUMMARY

Table 2-18 presents a summary listing of the aviation demand forecasts at TOL. These projections are used in the following chapters of the Master Plan to assess the capacity of existing facilities and determine facility expansions or improvements needed to satisfy future activity levels.

1.9.1 Planning Activity Levels

Since airport activity levels are heavily influenced by unanticipated economic events, or other significant events and changes to communities or the aviation industry such as the COVID-19 pandemic, the planning facility expansions or required upgrades based on specific years can be challenging. Therefore, it is generally accepted that the planning and construction of a new facility be initiated only when specific activity levels have been reached that necessitate the improvement, rather than being initiated based on reaching a calendar date.

Ultimately, these milestones are instrumental as they equate to planning activity levels (PAL)s and act as triggers for various types of airport development or improvements depending on the forthcoming facility requirements. A PAL could occur sooner or later than the year associated with that level of activity in this document. For planning purposes, the subsequent three PALs (PAL 1, PAL 2, and PAL 3) correspond to the base case forecast years (Base Year +10 years, Base Year +15 years, and Base Year +20 years).

Figure 2-26 shows the process of making facility improvements based on reaching PALs and how they are incorporated into the growth projected in a forecast.

FIGURE 2-26
PLANNING ACTIVITY LEVELS DESCRIPTION

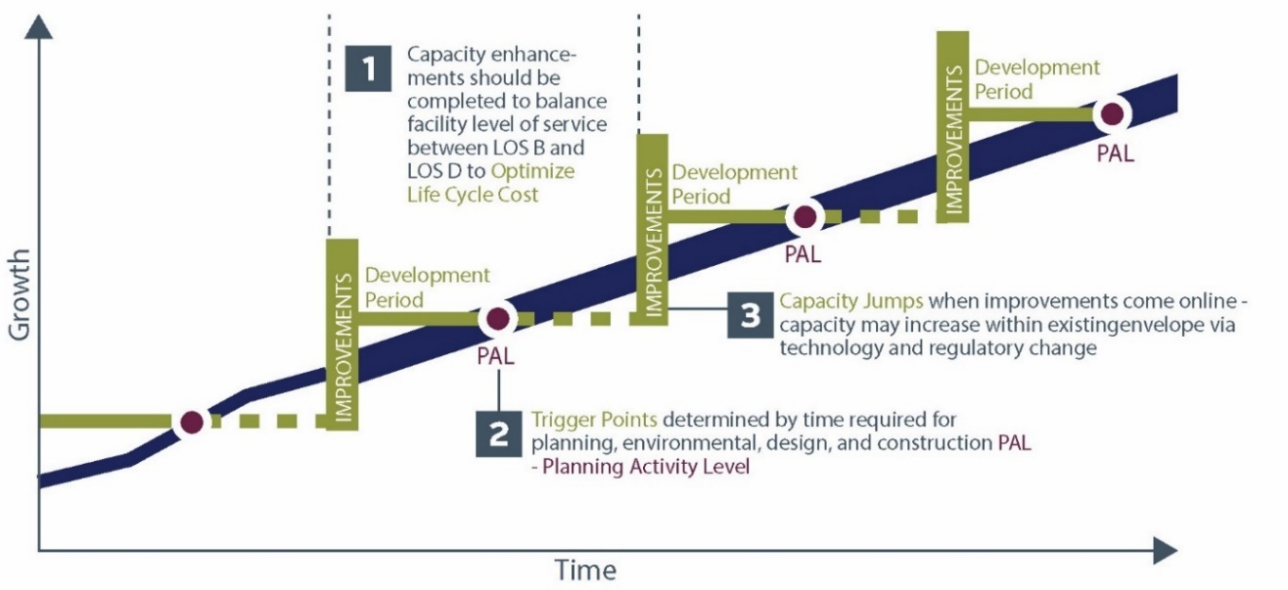


TABLE 2-18
SUMMARIZATION AND DOCUMENTATION OF FORECAST

	Base Yr. Level	Base Yr. +1yr.	Base Yr. +5yrs.	Base Yr. +10yrs.	Base Yr. +15yrs.	Base Yr. +20yrs.	Base Yr. to +1	Base Yr. to +5	Base Yr. to +10	Base Yr. to +15	Base Yr. to +20
Passenger Enplanements											
Air Carrier	46,034	53,509	77,765	84,697	88,822	91,569	34.72%	5.13%	3.33%	8.36%	11.71%
Commuter	35,935					No Service					
TOTAL ENPLANEMENTS	81,969	53,509	77,765	84,697	88,822	91,569	34.72%	5.13%	3.33%	8.36%	11.71%
Operations											
Itinerant											
Air Carrier	2,945	2,975	3,099	3,261	3,431	3,611	1.02%	5.23%	10.73%	16.50%	22.61%
Air Taxi/Commuter	5,650	4,981	5,199	5,465	5,744	6,037	11.84%	7.98%	3.27%	1.66%	6.85%
Total Commercial Operations	8,595	7,956	8,298	8,726	9,175	9,648	7.43%	3.46%	1.52%	6.75%	12.25%
General aviation	15,398	16,524	16,624	16,750	16,877	17,005	7.31%	7.96%	8.78%	9.61%	10.44%
Military	2,208	2,208	2,208	2,208	2,208	2,208	0.00%	0.00%	0.00%	0.00%	0.00%
Local											
General aviation	5,554	6,785	6,806	6,832	6,858	6,884	22.16%	22.54%	23.01%	23.48%	23.95%
Military	1,314	1,314	1,314	1,314	1,314	1,314	0.00%	0.00%	0.00%	0.00%	0.00%
TOTAL OPERATIONS	**33,069**	**34,787**	**35,250**	**35,830**	**36,432**	**37,059**	**5.20%**	**6.60%**	**8.35%**		**12.07%**
Based Aircraft											
Single-Engine Piston	25	25	25	25	25	25	0.00%	0.00%	0.00%	0.00%	0.00%
Multi-Engine Piston	8	8	8	8	8	8	0.00%	0.00%	0.00%	0.00%	0.00%
Turboprop	5	5	5	5	5	5	0.00%	0.00%	0.00%	0.00%	0.00%
Turbojet	15	15	17	19	21	24	0.00%	10.62%	25.50%	42.38%	61.53%
Helicopter	3	3	3	3	3	3	0.00%	2.34%	5.34%	8.42%	11.60%
Other	21	21	21	21	21	21	0.00%	0.00%	0.00%	0.00%	0.00%
TOTAL	**77**	**77**	**79**	**81**	**84**	**87**	**0.00%**	**2.16%**	**5.18%**	**8.58%**	**12.44%**

Source: RS&H Analysis, 2022