Chapter 3 Forecast of Aviation Demand

3.1 Introduction

Southwest Florida International Airport (RSW) has experienced strong historic growth trends, including a record-breaking year in 2019 when record passenger enplanements were recorded in every month of the year. In 2019, RSW enplanements surpassed the 5 million passenger mark for the first time. During the preparation of this forecast, the COVID-19 pandemic was occurring, and is still ongoing as this project progresses. As a result, additional forecasting activity was conducted and used as a comparison for consideration in advancing this recommend set of forecasts to be used to plan the next 20 years and beyond for RSW. This is discussed in detail later in this chapter.

RSW serves a five-county trade area that includes Lee County where the airport is located, as well as Charlotte, Collier, Glades, and Hendry counties. The RSW Trade Area has experienced significant growth in recent years, which has stimulated increasing demand for Airport services. Despite COVID-19, continued growth is expected in the RSW trade area for the foreseeable future.

The peak season at RSW runs from late winter through spring - the degree of seasonality at RSW is considered non-traditional because seasonal fluctuations in passenger volumes are much more pronounced than at most U.S. airports. This pattern has become increasingly amplified in recent years. RSW’s terminal facilities have become stressed as passenger volumes continue to increase, particularly during peak travel periods.

Given this context, a current set of passenger projections and updated comprehensive planning approach for RSW are needed to support the airport’s sustained growth and quality of passenger experience. This forecasting effort builds upon previous studies and uses a variety of forecasting methods to project future annual enplanement passenger levels and aircraft operations for the 2020-2040 timeframe. An analysis of aircraft operations and commercial fleet mix is incorporated as well as analyzing peak month and peak month average day levels based upon a preferred forecast identified for the 2020-2040 timeframe.

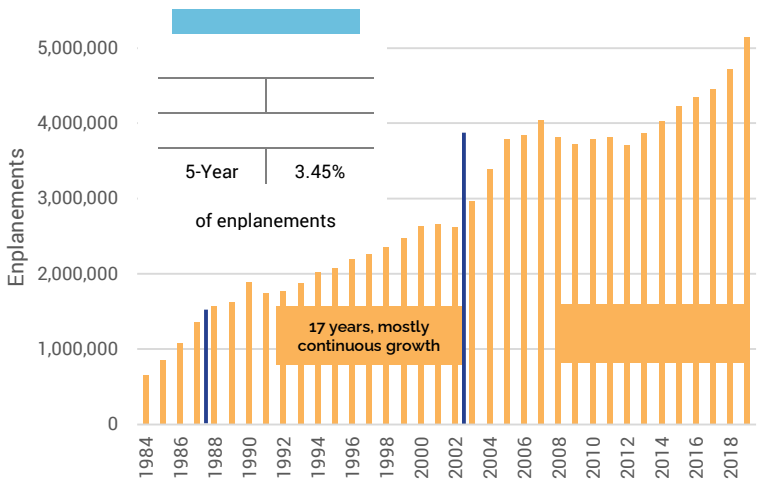
To round out the forecasting effort, a review and forecast for air cargo operations is detailed, along with the estimated general aviation and military operations as reported by the FAA Terminal Area Forecast.

This chapter summarizes the detailed forecasting effort for this master plan update. Additional details can be found in the Appendix of the Master Plan Update.

3.2 Historical Activity and Context

Enplanement passenger trends at RSW are shown in Figure 3-1. In 2019, RSW passenger traffic was at record levels with over 5 million enplanements. This growth has been significant and since 1986 when RSW first exceeded 1 million enplanements, growth has continued to over 2 million enplanements in 1994, 3 million enplanements in 2004, 4 million in 2007, and now 5 million in 2019. Reaching the mark of five million enplanements was delayed by the great recession of 2008-2009, which temporarily slowed growth before increasing again steadily after 2013.

Figure 3-1 - Historical Enplanements & Average Annual Growth (AAG) Rates

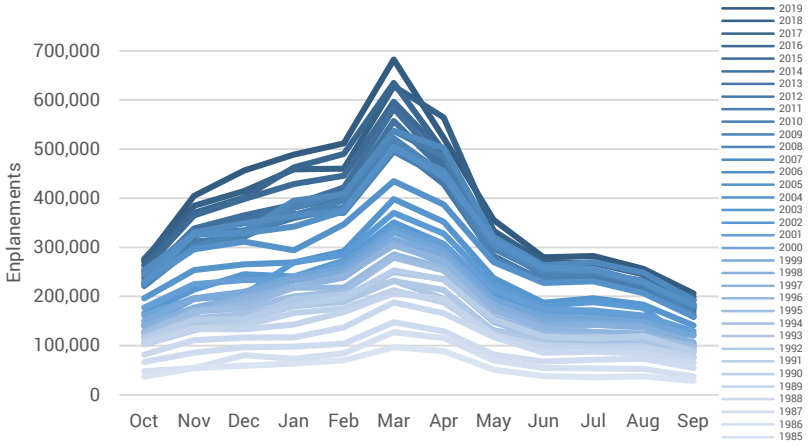


Source: Lee County Port Authority and C&S Engineers, Inc.

Figure 3-2 shows the historical monthly distribution of RSW enplanements over the course of the fiscal year. It should be noted that the 20-year historical average annual growth rate is 4.55%, the same timeframe being considered in this Master Plan. Further, the average of the 5- and 10-year historical growth rates combined is 3%. The peak season running from January-April is significant, and has become increasingly amplified in recent years. RSW's distribution of annual enplanements is considered non-traditional because it exhibits much greater seasonal fluctuation in enplanements than most U.S. airports. This pattern is caused by an influx of seasonal residents and tourism activity in the region from late winter through the spring months.

March is the peak month at RSW. The most recent five-year (2015-2019) average percentage of annual enplanements for March is 14.3%, and the most recent 20-year (2000-2019) average percentage is 13.7%. The four-month January-April peak season period represents 46.9% of RSW's annual enplanement volume for the five-year average (2015-2019) timeframe and 45.8% for the twenty-year average (2000-2019) timeframe.

Figure 3-2 - Historical Monthly Enplanements Distributed by Monthly %



Historical Peak % of Annual Enplanements	
March 20-Year Avg.	13.70%
March 5-Year Avg.	14.30%
Jan-Apr 20-Year Avg.	45.80%
Jan-Apr 5-Year Avg.	46.90%

Source: Lee County Port Authority and C&S Engineers, Inc.

3.3 Forecasts of Activity

A number of forecasting methodologies were used to develop planning-level enplanement and commercial operations projections for RSW over the 2020-2040 timeframe. The projection scenarios were based on the FAA's TAF (2019) for RSW, a variety of industry resources and airport-specific records, and demographic data. Projections based on demographic data assumed the five-county catchment area consisting of Lee, Charlotte, Collier, Glades, and Hendry Counties.

Taken together, the set of planning-level projections allows an understanding of how RSW's enplanements and operations are related to key factors associated with passenger demand - while considering airline strategy based on observed practices at the Airport. These projections are later compared to the FAA's current TAF (2020 released in May 2021) for RSW and shape the recommendation of a preferred forecast. Each methodology used to derive RSW passenger projections is listed below and further described in the forecast appendix documents (Appendix F).

- **FAA Terminal Area Forecast (TAF)** - The TAF is the official FAA forecast for aviation activity at U.S. airports in the NPIAS.
- **FAA Aerospace Forecast, Fiscal Years 2019-2038** - The Aerospace Forecast is a comprehensive industry forecast used to inform the TAF projections at the national level.
- **Market Share Analysis** - Generally speaking, this method calculates an individual or group's historical share of a larger population, then uses that share to project the future share of the larger forecasted population.
- **Regression Analysis** - Regression is statistical method that measures demonstrated historical relationships between a dependent variable (enplanements or operations) and independent socioeconomic variables including population, per-capita personal income (PCPI) and employment in the five-county RSW market catchment area.
- **Trend Analysis** - This method uses historical activity at RSW to project future enplanement or operations levels. Generally, this methodology uses the most-recent 10-years for the analysis, or historical averages.

Various scenarios for RSW enplanements and commercial operations from 2020-2040 are included in the following summary of results. These scenarios represent a broad range of the perspectives and factors considered under the various projection methodologies, illustrating a range of outcomes based on these considerations.

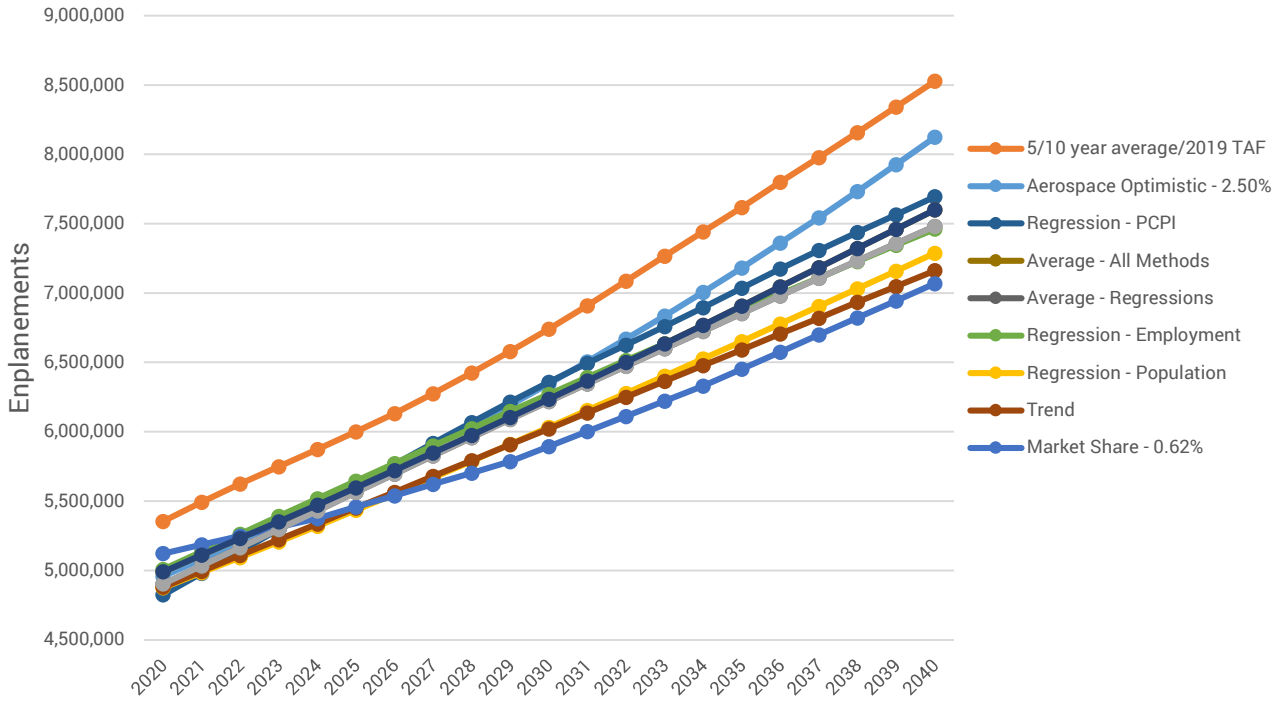
Passengers

Nine projection scenarios for RSW enplanements from 2020-2040 are included in the following summary and discussion of results. These scenarios represent a broad range of the perspectives and factors considered under the various projection methodologies, illustrating a range of outcomes based on these considerations. Additional scenarios representing the average of all methods included in the summary, and the average of regression-based projections, have also been included. In viewing the Summary of RSW Annual Enplanement Forecasts (Figure 3-3), several observations can be made.

- For 2040, enplanement forecasts range from 7,068,992 (Market Share) to 8,528,457 (5/10-year average/2019 TAF), a difference of 1,459,465 enplanements.
- The average forecast for all 2040 projections is 7,601,479.

- Starting with 2020, RSW has a planning platform level of approximately ten million passengers.
- Looking into the short to mid-term period (5-10 years), it seems likely to expect a temporary slowdown in the economy that moderates the rate of growth at RSW, 2021 year to date activity is showing the contrary to this and is currently very robust.

Figure 3-3 – Annual Enplanements Forecast Summary, 2020-2040



Source: Federal Aviation Administration, Woods & Poole, C&S Engineers Inc.

Note: 2020-2040 forecast values were calculated according to each methodology utilized. Actual 2019 enplanements were 5,026,000 with 2020 values calculated independently to provide variation in 2020 "starting point" values under each forecast methodology.

Based on the analyses conducted under this effort, the 5/10-year average/2019 TAF is recommended as the preferred forecast for RSW. The TAF is based on a robust demand model accounting for a wide variety of national, regional, and industry considerations, and is directly in alignment with the 5/10-year historical average growth rate. This methodology provides the highest 2020-2040 enplanement projections from among the set of forecasting methodologies evaluated. Note that RSW's 20-year average annual growth rate of 4.55% would yield nearly 10 million enplanements or 20 million annual air passengers if carried through 2040. The 5/10-year average/2019 TAF has an average annual growth rate of 3.0%, which is just less than the midpoint between the 20-year average growth of 4.55% and the trend analysis average growth rate of 2.1%. As a planning practice, it is beneficial to project future facility needs based upon a conservative (generally higher) forecast in order to allow for flexibility as needs may evolve under future conditions. And the alignment of the 5/10-year average historical growth rate and the 2019 TAF makes for prudent planning activity levels in this master plan effort. This preferred enplanement forecast is within 4% to 7% of the 2020 TAF (published May 2021) through the 2040 planning period.

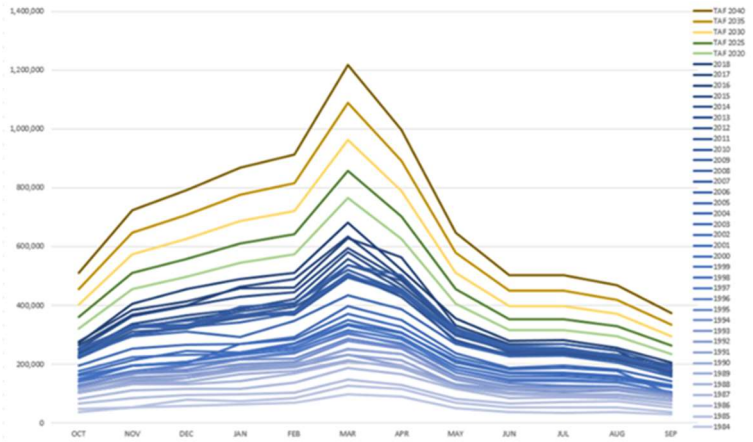
Table 3-1 provides preferred forecast enplanement values at five-year intervals over the 2025-2040 timeframe, and Figure 3-4 illustrates a monthly distribution of forecast enplanements based on the five-year historic trend.

Table 3-1 Annual Enplanements, Preferred Forecast

Year	Enplanements
2025	5,999,546
2030	6,739,935
2035	7,618,025
2040	8,528,457

Source: C&S Engineers, Inc.

Figure 3-4 – Preferred Enplanement Forecast Monthly Distribution



Source: C&S Engineers Inc.

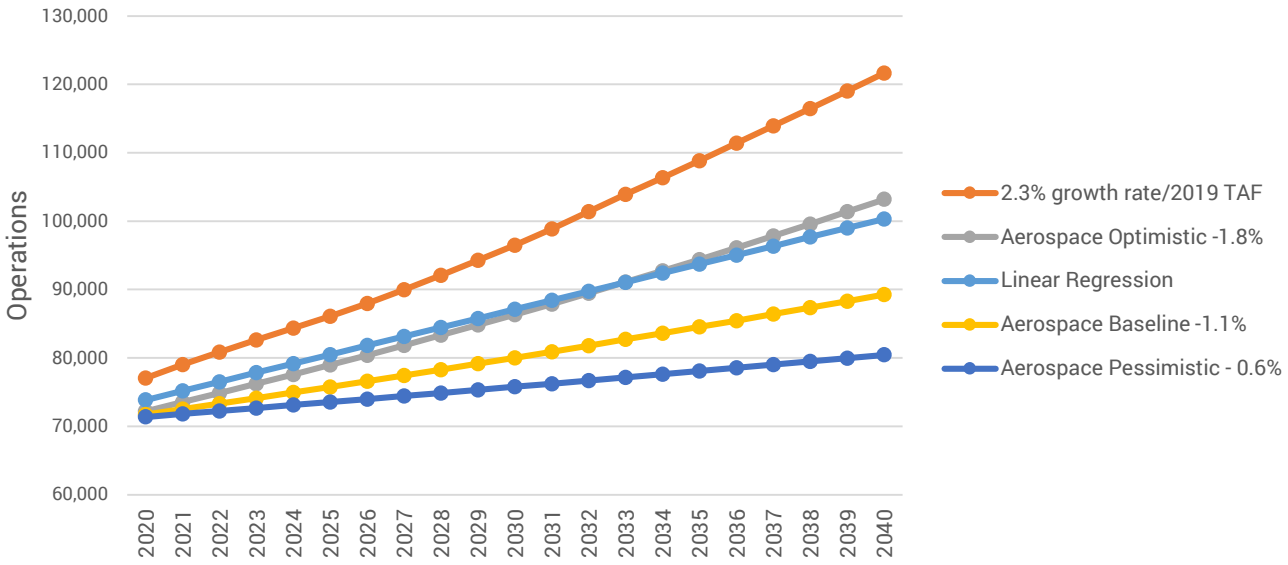
Commercial Operations

Commercial operations are forecasted for the 20-year planning horizon and used to develop design day flight schedules for peak periods at five-year intervals through 2040. Like the enplanement forecast, several forecast methods were considered for the commercial passenger operations over the 20-year planning horizon at RSW. A comparison was made of annual commercial operation estimates derived from different forecasting methodologies:

- FAA Terminal Area Forecast - The 2019 TAF has itinerant air carrier operations increasing from 77,060 operations in 2020 to 121,655 operations in 2040, an average annual growth rate of 2.3%.
- FAA Aerospace Forecast, 2019-2038 - The three annual growth rates representing Baseline, Optimistic, and Pessimistic were applied and extended through 2040 using a constant rate. At 1.1% annual growth, the Baseline estimates 89,268 operations in 2040. The Optimistic forecast of 1.8% annual growth estimates 103,187 operations in 2040 while the Pessimistic forecast of 0.6% annual growth estimates 80,441 operations in 2040.
- Linear regression - A forecast based on itinerant air carrier operations from 1990 to 2019 estimates 100,317 operations in 2040, an average annual growth rate of 1.54%.

A summary of the commercial operations forecasts is depicted in Figure 3-5. While the 2019 TAF is a more aggressive operations forecast than the Optimistic Aerospace Forecast, it represents the strong growth that RSW continues to experience. The operations forecast will also be based on the TAF just as the enplanement forecast. This is also consistent and within -1% to 2% of the 2020 TAF (published May 2021) through the 2040 planning period.

Figure 3-5 – Annual Commercial Operations Forecast Summary, 2020-2040



Source: Federal Aviation Administration, TransSolutions.

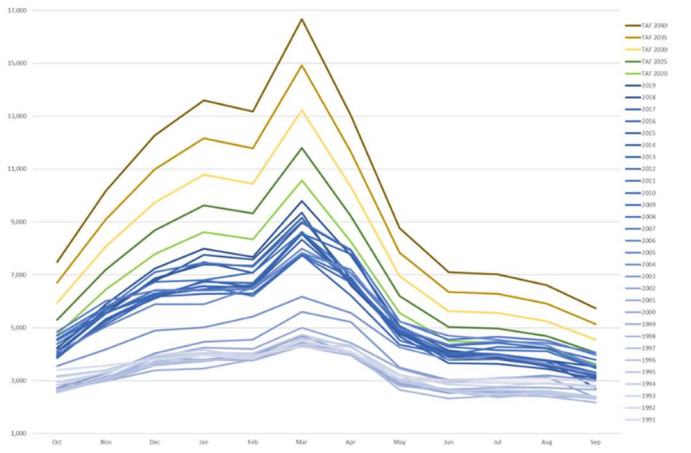
Table 3-2 provides the 2019 TAF commercial operations values at five-year intervals over the 2020-2040 timeframe, and Figure 3-6 illustrates the monthly air carrier operations through 2040.

Table 3-2 Annual Commercial Operations, Preferred Forecast

Year	Operations
2025	86,103
2030	96,493
2035	108,845
2040	121,655

Source: TransSolutions

Figure 3-6 – Preferred Operations Forecast Monthly Distribution



Source: TransSolutions

Peak Periods

Airline activity is subject to peak-period movements - as described previously, RSW experiences extreme seasonal fluctuations in passenger enplanements and commercial operations between peak and off-peak months. The monthly distribution of enplanements at RSW follows a non-traditional, highly pronounced seasonal pattern with strong peak demand in the late winter through spring months. This unique degree of seasonal fluctuation poses a challenge for facility planning and design, as future facilities must be scaled to accommodate peak demand while balancing the reduced needs during off-peak months.

Design Month Average Day and Peak Month Average Day Peak Day projections were analyzed for RSW at five-year intervals over the 2020-2040 planning timeframe. Because RSW has unique peaking characteristics, the second busiest month of April was also analyzed. These values are used in planning to estimate the size, configuration, and features of terminal buildings and other airport facilities.

Historically speaking, April at RSW represents a traditional peak month with 11.7% of the annual enplanements, and March represents the Airport's true Peak Month with 14.3% of annual enplanements.

Because of a continuing trend in recent years of March continuing to get busier, a monthly trend analysis was conducted. The results show April staying relatively flat at 11.6% over the period and generally representative of December, January, and February. For the Peak Month of March though, it shows a continuing trend from 14.7% in 2020 to 15.6% in 2040. See Table 3-3 for the results of the monthly trend analysis and the recommended distribution percentages to be used for further peaking analysis.

Table 3-3 Monthly Distribution Trends - % Enplanements

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2020	10.5%	10.9%	14.7%	11.6%	7.4%	5.7%	5.6%	5.2%	4.1%	5.8%	8.5%	9.9%
2025	10.8%	11.3%	15.0%	11.6%	7.2%	5.5%	5.4%	5.0%	3.9%	5.7%	8.5%	10.3%
2030	11.1%	11.5%	15.2%	11.6%	7.0%	5.3%	5.2%	4.9%	3.8%	5.6%	8.5%	10.6%
2035	11.2%	11.7%	15.4%	11.6%	6.9%	5.2%	5.0%	4.8%	3.6%	5.5%	8.5%	10.9%
2040	11.4%	11.9%	15.6%	11.6%	6.8%	5.1%	4.9%	4.7%	3.5%	5.4%	8.5%	11.1%

Source: C&S Engineers, Inc.

Typically, Design Day Flight Schedules (DDFS) are determined by identifying an average day in the peak month for the Airport. RSW's peak month is clearly March. To develop the DDFS, the OAG for March 2020 was used as the base schedule. After evaluation, the average day chosen for March was Friday, March 13. Additionally, the non-daily international operations were included in the base schedule. The base monthly OAG schedules were grown to match the TAF operations and enplanement forecasts for each forecast year. Converting the enplanement forecast into commercial flight operations results in the annual, monthly, and design day operations.

The peak month average day (March) should be utilized for facility planning. This recommendation is summarized in Table 3-4 below.

Table 3-4 Recommended Peak Month Average Day (March)

Year	Peak Month Enplanements	Peak Month Average Day Enplanements	Peak Month Average Day Operations	Peak Month Peak Hour Enplanements	Peak Month Peak Hour Departures
2025	898,700	28,990	381	3,131	20
2030	1,026,528	33,114	427	3,576	22
2035	1,175,535	37,920	481	4,095	25
2040	1,329,986	42,903	538	4,633	28

Source:: C&S Engineers, Inc., TransSolutions

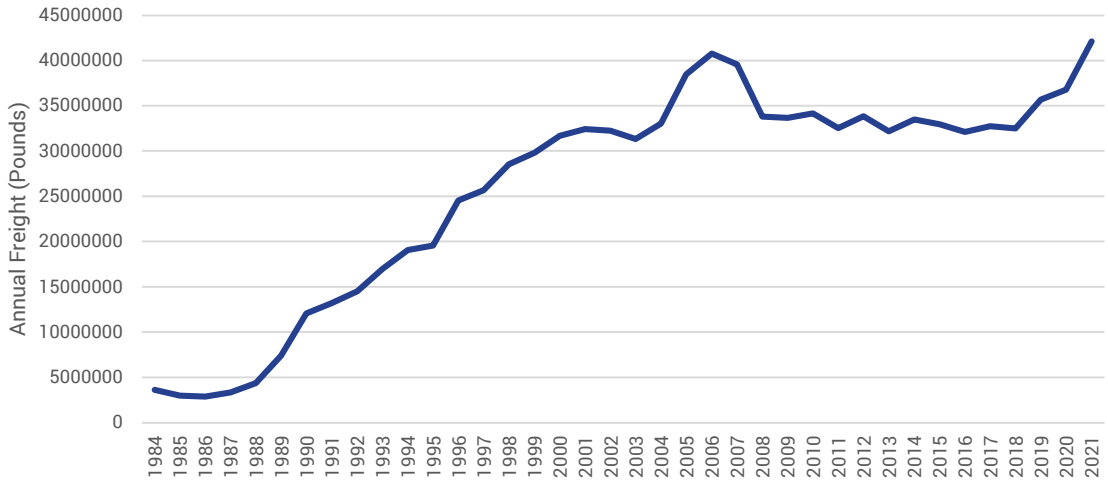
Cargo, General Aviation and Military

Annual operations forecasts were developed for air cargo, as well as incorporating estimated general aviation and military activity from the 2019 FAA TAF.

Cargo

Freight is carried at RSW by passenger carriers as belly cargo, and by cargo carriers FedEx (FX) and UPS (5X). For a number of years prior to 2018, cargo carriers carried less than 85% of the freight at RSW, while German carrier Air Berlin regularly carried more than 10% of the total freight as belly cargo. After Air Berlin ceased operations during the last quarter of 2017; however, the share of freight carried annually by cargo carriers increased to 95% in 2018 and has remained above 96% since. As illustrated in Figure 3-7, prior to 2021, the total amount of freight carried annually by all carriers at RSW peaked from 2006 to 2008, exceeding 38 million pounds during each of those three years. From 2008 through 2018, freight carried was down from the peak to an average of 33 million pounds per year before rebounding in 2019. From January through June 2021, freight carried was just over 20 million pounds and is projected to exceed 42 million pounds for the full year based on the percentage of annual freight historically carried at RSW during the first six months.

Figure 3-7 - Total Annual Freight Carried (1984 – 2020, 2021 Projected)



Source: Lee County Port Authority

Cargo operations forecasts were developed for the future planning years 2025, 2030, 2035, and 2040. The forecasts were developed by leveraging historical RSW freight data and FAA forecasts to initially develop forecasts of freight for years

2022 - 2040. The cargo carrier operations forecast then were developed by determining the number of operations needed to carry the forecasted freight, based on the cargo carriers' average freight carried per operation.

Table 3-5 summarizes the forecast of cargo carrier operations developed using each of the five forecasting approaches for the four future planning activity levels. Note that each forecast includes 188 operations by Western Global.

Table 3-5 Cargo Carrier Operations Forecast

Forecasting Approach	Avg. Annual Growth Rate	2021	2025	2030	2035	2040
Linear Regression (25 Year)	0.9%	1,726	1,785	1,859	1,934	2,008
FAA Aerospace 2021 Forecast	1.6%	1,726	1,833	1,977	2,119	2,269
FAA Aerospace 2020 Forecast	**1.9%**	**1,726**	**1,852**	**2,025**	**2,197**	**2,384**
Boeing 2020 Forecast	2.7%	1,726	1,980	2,349	2,576	2,758
Linear Regression (15 Year)	3.2%	1,726	1,997	2,339	2,682	3,024

SOURCE: TransSolutions

The forecast of cargo carrier operations developed using the FAA Aerospace 2020 forecast, which projects an average annual growth rate of 1.9% in operations through 2040, is recommended for use by LCPA for airport planning. Strong near-term, pre-COVID growth in freight suggests that RSW is on track to sustain a period of longer-term, consistent freight growth. The FAA Aerospace 2020 forecast projects moderate growth over time, while accounting for possible fluctuations in demand for cargo carrier services during the 20-year forecast period.

General Aviation and Military

As reported in the August 2021 *Technical Memorandum* dated August 24, 2021 (Appendix F), the general aviation and military forecast were derived from the 2019 TAF as the preferred forecast. General aviation and military operations from this preferred forecast are shown in Table 3-6 below.

Table 3-6 Forecasted General Aviation and Military Annual Operations

Year	General Aviation	Military
2025	7,429	1,146
2030	7,434	1,146
2035	7,439	1,146
2040	7,444	1,146

SOURCE: FAA 2019 TAF / Air Carrier, Air Taxi, GA, Military Operations

3.4 Comparison to FAA TAF

A number of key elements from the May 2020 *Passenger and Operations Forecast for Southwest Florida International Airport* (Appendix F) analysis are based on the FAA 2019 TAF, which was released early in 2020 and predates the COVID-19 pandemic. The 2019 TAF was identified as the Preferred Forecast for terminal area planning purposes, and peak period forecasts and design day flight schedules were based on 2019 TAF projections.

In the year since the RSW Passenger and Operations Forecast was prepared, the COVID-19 pandemic has caused severe disruption to the aviation industry worldwide. While major pandemic-related impacts continue at the time of this master plan update, signs of recovery appear to be taking hold in the United States and rates of air travel are trending upward.

In May 2021, the FAA released the 2020 TAF for RSW, which reflects the impacts of COVID-related air travel disruption and includes a multi-year recovery period before Airport traffic again reaches pre-pandemic levels. Additional analysis was conducted (Appendix F) summarizing key points from the 2020 TAF for RSW and discussing the updated forecast in the context of previous 2019 TAF "Preferred Forecast" levels as well as current trends and relevant observations.

COVID-19

As previously noted, in early 2020 the worldwide COVID-19 pandemic shut down most non-essential businesses including the vast majority of airport activity. With the uncertainty of the novel coronavirus and the quarantine protocols for airport users, it has been difficult to ascertain the exact trajectory of the industry. While many of the data sources used in this forecast report reflect long-term trend forecasts, there continues to be uncertainty surrounding the virus and the impacts it could have for the short-term.

As stated in the FAA Aerospace Forecast FY2020-2040, Forecast Uncertainties, page 64, "If the increase in infections is brought under control relatively quickly, producer supply chains suffer little damage, and worker output and productivity are only slightly depressed, then a one-quarter decline followed by a one-quarter rebound in aviation activity might be a reasonable outcome. In that case, it could be that the consequence to annual numbers is quite subdued. On the other hand, of course, a less optimistic outcome could occur, resulting in longer term impacts to the industry."

A recent decrease in activity levels at RSW can be linked to impacts of the COVID-19 pandemic, but also noted is a fairly strong recovery in 2021 to date through August 2021. With the fluctuation of aviation activity due to these unforeseen industry changes and still some unknowns, the forecasts developed will be translated into Planning Activity Levels (PALs) to tie development to actual activity levels rather than specific timeframes (i.e., years).

A *CRP 76: Addressing Uncertainty about Future Airport Activity Levels in Airport Decision Making* discusses flexible airport planning in uncertainty, and trigger points allow the Airport to more closely match development needs to exact traffic levels. By planning airport development around PALs, phases of construction/airfield development are based on triggering events and not necessarily based on a specific timeframe. Similarly, airfield development phases are implemented based on actual activity levels and not a specific period in time. This is a more realistic approach for planning demand-driven airport development due to the forecast uncertainties discussed above.

The forecast by PALs are used in future chapters of the Airport Master Plan to determine growth triggers for certain facility requirements and development criteria. In this case, the following are referenced:

- 2025 = PAL1;
- 2030 = PAL2;
- 2035 = PAL3; and
- 2040 = PAL4.

Trends and Observations

Despite being impacted by the extremely challenging business climate from Spring 2020 through the present, RSW has fared better than most peer airports and the overall U.S. air travel industry. After bottoming out at enplanement reductions of 94% and 80% in April and May 2020 relative to 2019 levels, enplanements remained in the approximate range of 40-60% below previous-year levels for the remainder of FY 2020 and into the first few months of FY 2021. As previously noted, RSW's average growth rate over the last 20-years was 4.55% through 2019. Overall, FY 2020 RSW enplanements were 30% below 2019 levels. Operations did not drop as much as passengers during most of 2020, indicating that load factors or passengers per aircraft were significantly reduced from pre-COVID 19 levels.

Signs of a strong recovery are apparent at RSW with an upward trajectory in recorded enplanements through the first several months of FY 2021. The airport recorded more than 594,000 enplanements in April 2021, which is just 1% less than the pre-pandemic level from April 2019, and continued with all-time passenger records in May, June, July and August 2021. In addition, 12 new air service routes have been announced this year, some of which include west coast service to Seattle, San Francisco, and Los Angeles. Commercial operations have recovered even more rapidly than enplanements at RSW as April 2021 operations exceeded the April 2019 level by a 15% margin. If FY 2021 operations follow a typical percent distribution by month, RSW operations could exceed pre-pandemic 2019 levels in the current year.

Looking ahead to the near future, RSW leads the nation's commercial airports in added seat capacity since before the pandemic. The airlines have added more than 3 million seats for Summer 2021 compared to Summer 2019 - this represents a capacity increase of 57.8% over what currently stands as the record year for RSW.

The observed and anticipated near-term growth in traffic at RSW is largely attributed to its position as a leisure market with expanding appeal to domestic travelers in a time of pandemic recovery; however continued population and industry growth are also expected to support increased air travel demand in the longer term.

In summary, RSW's pandemic-era performance and early recovery stand out among commercial airports nationally. Current trends in passenger enplanements and operations indicate that a strong recovery is underway, and continued growth is expected. RSW is on track to outperform 2020 TAF projections which assume a multi-year recovery period.

Comparison

With signs of strong current and near-term growth suggesting that - assuming no further disruptive events - RSW is already on track to exceed 2020 TAF projections and continue its long-term growth trends. Based on the information provided in recent trends and observations, there is no apparent need to reconsider use of the 2019 TAF as the Preferred Forecast for Airport planning including this Airport Master Plan Update. The updated 2020 TAF incorporates information

gained over the course of 2020 and uses new methods to set an anticipated recovery timeframe, but these assumptions involve a degree of uncertainty related to future events and behaviors. RSW holds a unique and favorable market position, and is likely to continue to outperform national trends through the recovery era and potentially beyond. Tables 3-7 and Table 3-8 provide a comparison of the 2019 and 2020 TAF forecasts for enplanements, and operations, respectively.

Table 3-7 Comparison of Forecast Enplanements, Preferred and 2020 TAF

Year	Preferred Forecast	TAF 2020	% Change, TAF 2020 to Preferred
2025/PAL1	5,999,546	5,555,174	7%
2030/PAL2	6,739,935	6,446,853	4%
2035/PAL3	7,618,025	7,270,909	5%
2040/PAL4	8,528,457	8,052,256	6%

SOURCE: C&S Engineers, Inc. and FAA Terminal Area Forecast (TAF), published May 2021

Table 3-8 Comparison of Total Operations, Preferred and 2020 TAF

Year	Preferred Forecast	TAF 2020	% Change, TAF 2020 to Preferred
2025/PAL1	99,066	99,770	(1%)
2030/PAL2	109,685	111,635	(2%)
2035/PAL3	122,278	122,394	(0.1%)
2040/PAL4	135,339	132,581	2%

SOURCE: C&S Engineers, Inc. and FAA Terminal Area Forecast (TAF), published May 2021

As a matter of sound planning practice and because the two forecasts are within 10% of each other, it is appropriate for the airport to continue its use of the May 2020 report and associated technical memorandums (Appendix F) that identifies a preferred forecast consistent with the 2019 TAF growth rates, peak period forecasts, and design day flight schedules (DDFS) for facility and master planning.