

Aviation Activity Forecasts

1. Purpose, Goals, and Process

This chapter contains forecast of aviation activity at the Salem Municipal Airport (SLE). These forecasts will form the basis of Master Plan (Plan) elements, including demand-driven airport facility improvements, environmental evaluation, business and financial planning, and land use compatibility planning.

SLE features cargo, military, and general aviation (GA) activity, and supported scheduled commercial passenger airline service until 2008. It is anticipated that scheduled commercial passenger airline service will return to SLE within the forecast period. These users require facilities for safe and efficient operations. The design and development of these facilities is correlated with aviation activity forecasts. These forecasts will help plan improvements, enable the Airport to obtain funding, prepare a budget, and manage resources.



This chapter forecasts the following activities: passenger enplanements, aircraft operations, based aircraft, and air cargo volume. Methods of forecasting are applied to each activity, and the results are compared with the Federal Aviation Administration (FAA) Terminal Area Forecast (TAF) to select preferred forecasts.

The forecasts are based on historical activity from 2003 to 2008, when data is available. Other time periods were considered, but this time period reflects the establishment of scheduled commercial passenger airline service, and how growth trends were impacted by the rising price of aviation fuel, new security procedures, and economic recession.

1.1 Methodologies

Forecast methodologies consider historical trends for SLE, FAA forecasts for national trends, trends pertaining to historical and future socioeconomic activity. Activity levels generated by each methodology are presented in the following sections. The preferred methodology is selected at the end of each section.

1.1.1 Base Year

The base year for the forecasts is 2008, to keep the forecasts consistent with Master Plan Update Phase I (MPU-I). Although the base year is 2008, forecasts generated with supplemental data use 2009 and 2010 versions when available to reflect current information. The forecast period is 20 years, with reporting periods at five-year intervals for 2013, 2018, 2023, and 2028. Preferred forecasts are extended 50 years to provide a long-term forecast for SLE.

1.1.2 Compound Annual Growth Rate

Compound annual growth rate (CAGR) forecasting utilizes historical data to establish the growth rate for future years. CAGR is determined by the first and last years in the historical period, and the length of time between these years. CAGR is not affected by anomalies within the historical data, unless they occur during the first or last year. Future values are determined by applying the CAGR to a base level of activity and projecting levels for the desired number of years.

1.1.3 2009 FAA Terminal Area Forecast

The FAA Terminal Area Forecast (TAF) is an annual publication that outlines the FAA's future expectations for airports in the National Plan of Integrated Airport Systems. The 2009 TAF serves as the baseline for forecasting methodologies. Data from the 2009 TAF generates the growth rates and ratios used to forecast future aviation activity indicators. Forecasts are compared with the 2009 TAF, and the FAA generally requires preferred forecasts to be within ten percent of the TAF for the five-year and ten-year reporting periods. The 2009 TAF is used to analyze historical correlation between aviation activity indicators and the independent variables in the forecast methodologies.

1.1.4 FAA Aerospace Forecast

The FAA Aerospace Forecast is an annual publication that outlines the FAA's expectations for the future of the national airspace system. The FAA Aerospace Forecast considers national activity, instead of activity at specific airports which is forecasted by the TAF. This plan utilizes the FAA Aerospace Forecast 2010-2030 (Aerospace Forecast) to develop the Market Share, and Trend by National Activity Indicator.

SLE's market share corresponds to the percentage SLE contributes to the national total of an activity indicator, found by dividing SLE's level of a given activity by the national total for that year. Data from 2003 to 2008 are averaged to determine SLE's average market share. The Aerospace Forecast projects the activity indicator, and the expected national total is multiplied by SLE's market share percentage to determine future SLE activity.

Trend by National Activity Indicator forecasts use CAGRs in the Aerospace Forecast to project SLE's future activity. This forecast does not take into account historical activity at SLE, and instead rely on FAA projections of future national trends.

1.1.5 Socioeconomic Trends

Socioeconomic trends forecasts compare data from the Salem Metropolitan Statistical Area (Salem MSA), which consists of Marion and Polk counties, to aviation activity levels at SLE. Data for the socioeconomic indicators from 2008 are used to establish a ratio, which is applied to forecasted levels for the socioeconomic indicators (provided by the economic forecasting firm Woods & Poole) to determine aviation activity levels. This method utilizes the population and per capita income to develop Passenger Enplanement, GA Operations, Based Aircraft, and Air Cargo forecasts. Gross regional product is used to develop Air Cargo forecasts.

Socioeconomic forecasting for per capita income establishes a ratio between an aviation activity level and a dollar of average per capita income in the Salem MSA.

Socioeconomic forecasting for population establishes a ratio between the level of aviation activity and the number of people living in the Salem MSA. The level of aviation activity is divided by the population of the Salem MSA, which establishes the ratio of the aviation activity level per person.

Socioeconomic forecasting for gross regional product establishes a ratio between the level of aviation activity and the dollar value of goods produced in the Salem MSA.

1.1.6 Method Selection

The preferred forecast is selected based on analysis of the variables that went into the forecasts. Past and future behavior of these variables is compared to national and local trends. This analysis helps determine if the variables used during forecasting are appropriate for the conditions at SLE and nationwide.

Correlation between the variables is also analyzed. A correlation analysis produces a number called a correlation coefficient. This number is between -1 and 1. A correlation coefficient of -1 indicates strongly correlated variables that are decreasing in value. A correlation coefficient of 1 indicates strongly correlated variables that are increasing in value. A correlation coefficient of 0 indicates that the two variables are not likely correlated with one another. The correlation coefficient scale is presented in

Table 3-1.

Table 3-1 Correlation Coefficient Scale				
-1 to >-.7	-.7 < to <-.5	-.5 to .5	.5 < to <.7	.7 to 1
Strong	Moderate	Low	Moderate	Strong

Correlation does not indicate causation; a high correlation coefficient does not prove that the behavior of one variable directly impacts the behavior of another. Correlation does indicate that the variables may be related, or may be caused by a similar third variable. An example of this is per capita income and population within an area increasing because of a high-paying employer located in the area. Income and population are both increasing and would show strong correlation, but the reason both are increasing is the presence of the employer, the third variable.

1.2 Review of Previous Forecasts

Two previous forecasts and one air service report are reviewed to provide a basis for comparison. The Oregon Department of Aviation (ODA) Oregon Aviation Plan (2007 OAP) Plan was published in 2007. The previous Airport Master Plan Update was published in 1997 (MPU-1997). The forecasts are compared to 2008 aviation activity indicator records.

1.2.1 Oregon Department of Aviation Oregon Aviation Plan

The 2007 OAP has a base year of 2005, and forecasted aviation activity to 2025. 2007 OAP anticipated a 2.8 percent CAGR for passenger enplanements, a 2.1 percent CAGR for aircraft operations, and a 1.1 percent CAGR for based aircraft. Using these CAGRs, 2008 forecast values from 2007 OAP can be compared to actual 2008 values. The comparison between 2007 OAP and actual values is presented in **Table 3-2**.

Forecast	Passenger Enplanements	Aircraft Operations	Based Aircraft
2007 OAP	40,729	51,808	239
2009 TAF	29,773	65,107	216
Difference	36.8%	-20.4%	10.8%

Source: 2009 TAF, USDOT, ODA

2007 OAP anticipated greater growth in enplanements and based aircraft than 2008 records indicate; however 2007 OAP did not anticipate that aircraft operations at SLE would grow so quickly.

1.2.2 1997 Airport Master Plan Update

MPU-1997 has a base year of 1995, and forecasted aviation activity to 2015. MPU-1997 anticipated a 1.2 percent CAGR for aircraft operations, and a 1.4 percent CAGR for based aircraft. MPU-1997 did not forecast enplanements. Using these CAGRs, 2008 forecasts values from MPU-1997 can be compared to actual 2008 values. The comparison between MPU-1997 and actual values are presented in **Table 3-3**.

Forecast	Aircraft Operations	Based Aircraft
MPU-1997	71,780	223
2009 TAF	64,107	216
Difference	10.2%	3.2%

Source: 2009 TAF, MPU-1997

MPU-1997 anticipated that aircraft operations and based aircraft would grow at a greater rate than actual.

1.2.3 2007 Northwest Regional Air Service Initiative

The Northwest Regional Air Service Initiative (NWRASI) analyzed the true market for scheduled commercial passenger airline service at SLE and 11 other airports. The NWRASI provides information for enplanement forecasts, and scheduled commercial passenger aircraft operations forecasts.

2. Passenger Enplanements

A *passenger enplanement* (enplanement) represents the act of a passenger boarding an aircraft. Enplanement figures are collected by the U.S. Department of Transportation (USDOT), for passengers on flights operated by scheduled commercial passenger airlines, and by non-scheduled charter flights operated by aircraft with more than 30 seats.

In 2011, national trends indicate that airlines are offering fewer flights per day on larger aircraft than before to control expenses. Concerns over the price of oil are echoed throughout airline growth projections. This concern and increased attention to maintaining profitability as the U.S. recovers from the 2008 economic recession have slowed airline expansion plans in many parts of the country. Enplanement forecasts are expected to be conservative at SLE, and across the country.

As indicated in **Chapter 1**, SLE had scheduled commercial passenger airline service between 1991 and 1998, then again from 2007 to 2008. The absence of scheduled commercial passenger airline service between 1999 and 2006 limits the data available to generate growth rate forecasts, and socioeconomic ratios. Enplanement forecasts consider historical enplanement levels from 2007 to 2008, which are the two most recent, consecutive years with scheduled commercial passenger airline service. Historical enplanements are presented in **Table 3-4**.

Year	Enplanements
2006	0
2007	12,921
2008	14,834
CAGR	15%

Source: USDOT

It is anticipated that scheduled commercial passenger airline service will return to SLE during the forecast period; however it is not possible to identify the airlines, aircraft, and destinations. Should U.S. airlines maintain profitability experienced in 2010, they may investigate new routes or reestablish routes that were discontinued as a result of the 2008 national economic recession. Enplanement forecasts generated as part of this Plan anticipate that growth in the local and national economy will stimulate the demand for air service at SLE, and encourage scheduled commercial passenger airlines to begin operation during the forecast period.

The FAA categorizes enplanements as *air carrier* and *commuter*. *Air carrier* enplanements are those that occur on aircraft with more than 60 seats, and *commuter* enplanements are those that occur on aircraft with 60 or fewer seats. USDOT data shows 100 percent of enplanements at SLE occurred on *commuter* aircraft in 2007 and 2008. For this reason, Plan enplanement forecasts do not distinguish between *air carrier* and *commuter* enplanements until the preferred enplanement forecast is selected in **Section 2.7**.

2.1 2009 TAF

The 2009 TAF forecasts no growth for enplanements, and anticipates that enplanements will decline to 38 percent of 2008 levels. The enplanement forecast from the 2009 TAF is presented in **Table 3-5**.

Year	Enplanements
2008	14,834
2013	5,673
2018	5,673
2023	5,673
2028	5,673
CAGR	-4.7%

Source: 2009 TAF, USDOT

In the 2009 TAF forecast, SLE would likely see limited scheduled commercial passenger airline service by an airline operating smaller aircraft than the 50 seat Bombardier CRJ-500's use by Delta Airlines at SLE between 2007 and 2008. 5,673 enplanements is comparable to a 9-seat aircraft operating an average of 2.4 departures per week at a 70 percent load factor. In 2010, this type of aircraft operated in the Pacific Northwest connecting smaller communities to Seattle and Portland.

The TAF is not the preferred enplanement forecast. The enplanement forecast comparison is presented in **Section 2.7**.

2.2 Growth Rate

The Growth Rate Forecast carries forward the 15 percent CAGR experienced by SLE between 2007 and 2008. The Growth Rate Forecast generates the highest enplanement numbers of the enplanement forecasts considered. The Growth Rate Forecast is presented in **Table 3-6**.

Year	Enplanements
2008	14,834
2013	29,585
2018	59,004
2023	117,677
2028	234,694
CAGR	15%

Source: USDOT

The 15 percent CAGR can be justified by the size of SLE's true market, but further analysis is necessary before the Growth Rate Forecast can be adopted. Growth rate over two years is not sufficient to project 20 years of activity. Trends observed by the Growth Rate Forecast are expanded in the Master Plan Forecast, in **Section 2.6**. The Growth Rate Forecast is not the preferred enplanement forecast. The enplanement forecast comparison is presented in **Section 2.7**.

2.3 Population

The Population Forecast anticipates that population growth in the Salem MSA will increase the number of enplanements. The average enplanements per capita ratio was 0.04 between 2007 and 2008. This ratio has been applied to forecasts for the population of the Salem MSA. The Population Forecast is presented in **Table 3-7**.

Table 3-7: Population Enplanements		
Year	Salem MSA Population	Enplanements
2008	391,680	14,834
2013	417,132	14,900
2018	443,353	15,900
2023	469,942	16,800
2028	491,528	17,600
CAGR	1.1%	0.9%

Source: 2009 TAF, Woods & Poole
Operations per Capita Ratio: 0.04

The Population Forecast is not the preferred enplanement forecast. The Enplanement Forecast selection and preference is presented in **Section 2.7**.

2.4 Per Capita Income

SLE averaged 0.5 enplanements per dollar of average per capita income in the Salem MSA. The per capita income of the Salem MSA is anticipated to grow at a CAGR 0.6 percent through to 2028. The Per Capita Income Forecast is presented in **Table 3-8**.

Table 3-8: Per Capita Income Enplanements		
Year	Per Capita Income	Enplanements
2008	\$26,981	14,834
2013	\$27,451	14,100
2018	\$28,975	14,900
2023	\$30,770	15,800
2028	\$32,367	16,600
CAGR	0.9%	0.6%

Source: 2009 TAF, Woods & Poole
Enplanements per Dollar of PCI Ratio: 0.5
Currency in 2004 Dollars

Per capita income is an indicator of the economic health and stability of a community. In terms of forecasting enplanements, the Salem MSA's forecasted growth in per capita income suggests that the region will see growth in higher paying jobs, which will cause the average per capita income to tend upwards.

Higher paying jobs can be an indicator of increased disposable income in the Salem MSA, which may increase the demand for vacation and leisure travel. **Chapter 1** indicates that the fastest growing job segments in the Salem MSA include *Management* and *Professional and Technical Services*. These industries tend to involve high levels of business travel, which will further stimulate demand for scheduled commercial passenger airline service.

The Per Capita Income Forecast is not the preferred enplanement forecast. The Enplanement Forecast selection and preference is presented in **Section 2.7**.

2.5 Market Share

SLE averaged 40.6 enplanements per million national domestic enplanements between 2007 and 2008. This ratio is multiplied by the U.S. domestic enplanement forecast from the Aerospace Forecast to determine SLE's enplanements. The Market Share Forecast is presented in **Table 3-9**.

Year	U.S. Enplanements (Millions)	Enplanements
2008	681.3	14,834
2013	687.3	14,000
2018	777.4	15,800
2023	884.7	18,000
2028	997.9	20,300
CAGR	1.9%	1.6%

Source: FAA

The Aerospace Forecast anticipates that national domestic enplanements will grow at a CAGR of 1.6 percent through 2028. Growth in domestic enplanements is a result of economic recovery and scheduled commercial passenger airline expansion. The Market Share Forecast anticipates that this growth and recovery will be experienced in the Salem MSA, stimulating the demand for scheduled commercial passenger airline service.

The Market Share Forecast is not the preferred enplanement forecast. The Enplanement Forecast selection and preference is presented in **Section 2.7**.

2.6 Master Plan Forecasts

Two Master Plan enplanement forecasts are presented, based on the NWRASI. The NWRASI calculated SLE's true market, the number of potential passengers near the Airport, to be 2,451,941 passengers, and indicated that Seattle and San Francisco were the most economically viable markets for scheduled commercial passenger airline service. The true market of SLE, as identified in the NWRASI, supports enplanement growth beyond what historical trends indicate. The Master Plan forecasts generate enplanement projections by assigning load factors (the number of seats occupied versus the number of seats available) and flight frequencies to economically viable markets.

Aggressive and conservative Master Plan enplanement forecasts are generated. Enplanement levels generated by the Master Plan enplanement forecasts identify three types of scheduled commercial passenger airlines that may serve SLE: *commuter airlines* connecting to commercial hubs in the Pacific Northwest, *regional airlines* connecting to airline hubs, and *niche market low cost carriers (NMLCC)*, connecting to leisure destinations.

Commuter carrier Seaport Airlines began scheduled commercial airline service to SLE in 2011 using 9-seat Pilatus PC-12 aircraft. *Commuter airlines* using 9-seat aircraft can efficiently operate at SLE using existing facilities, while larger aircraft used by *regional airlines* and *NMLCCs* may require a longer runway. MPU-I provided justification for a longer runway, which is expected to be implemented in the near-term, so that larger aircraft will be able to operate at SLE during the forecast period.

The underlying methodology and scenarios of the Master Plan forecasts are explained in the following sections.

2.6.1 Master Plan—Aggressive Forecast

The Master Plan—Aggressive Forecast is presented in **Table 3-10**.

Year	Enplanements
2008	14,834
2013	19,900
2018	58,700
2023	96,900
2028	167,300
CAGR	13%

Source: 2009 TAF

The Master Plan—Aggressive Forecast projects *NMLCC* airlines will initiate service at SLE by 2013. *commuter airlines* will continue to offer similar service to what began in 2011, targeting business travelers by offering multiple daily frequencies on small aircraft. *NMLCC*'s generally operate few flights per week with large aircraft. This allows *NMLCCs* to operate with high load factors. The enplanement forecast for 2013 projects that a *commuter airline* will offer four flights per day on a nine-seat aircraft with a load factor of 60 percent. This generates 7,900 *commuter* enplanements. A *NMLCC* will operate two departures per week on a 150-seat aircraft, with a load factor of 80 percent. This generates 12,000 *NMLCC* enplanements.

Successful scheduled commercial passenger airline service may encourage competition. In 2018, *Commuter airline* enplanements will remain at 7,900, with 4 daily flights on a nine-seat aircraft and a 60 percent load factor. The Master Plan—Aggressive Forecast projects that a *regional airline* will return to SLE by 2018, operating two flights per day on a 50-seat aircraft, with a load factor of 70 percent. The new service generates 25,600 *regional airline* enplanements. Building on success, a *NMLCC* may add an additional destination on a 150-seat aircraft. Load factors for the two destinations remain at 80 percent, which generates 25,200 *NMLCC* enplanements on four weekly flights.

By 2023, the Master Plan—Aggressive Forecast projects that *commuter airline* operations will remain at four flights per day on nine-seat aircraft, but load factor will increase to 65 percent. The increased load factor generates 8,600 *commuter airline* enplanements. *Regional airline* operations are projected to expand to a second destination at two flights per day, maintaining 70 percent load factors on 50-seat aircraft. The additional destination generates 51,100 *regional airline* enplanements. *NMLCC* operations are projected to expand to three destinations, while maintaining two weekly flights to each on 150-seat aircraft with an 80 percent load factor. The additional destination generates 37,200 *NMLCC* enplanements.

By 2028, *commuter airlines* will transition from nine-seat aircraft to 50-seat aircraft, maintaining four daily flights and a 70 percent load factor. The increased aircraft size generates 51,100 *commuter airline* enplanements. *Regional airlines* will maintain two destinations, but increase flight frequency to three times daily to each destination. *Regional airlines* will continue to use 50-seat aircraft, with a load factor of 70 percent. The increase in flight frequencies generates 76,600 *regional airline* enplanements.

NMLCCs are often hesitant to provide too many seats in a market in the interest of keeping load factors high. The Master Plan—Aggressive Forecast projects that *NMLCCs* will continue to provide two flights per week to three destinations, using 150-seat aircraft. Load factors are projected to increase to 85 percent without the introduction of additional seats to satisfy demand. The increased load factor generates 39,600 *NMLCC* enplanements.

The Master Plan—Aggressive Forecast is not the preferred enplanement forecast. The Enplanement Forecast selection and preference is presented in **Section 2.7**.

2.6.2 Master Plan—Conservative Forecast

The Master Plan—Conservative Forecast is presented in **Table 3-11**.

Year	Enplanements
2008	14,834
2013	5,000
2018	17,000
2023	40,000
2028	46,000
CAGR	5.8%

Source: 2009 TAF

The Master Plan—Conservative Forecast projects that the *commuter* airlines will continue to serve SLE in 2013 with three flights per day on 9-seat aircraft, with a load factor of 60 percent. This generates 5,000 *commuter* enplanements. 2013 enplanements are lower than 2008 enplanements because the air carrier and aircraft size have changed. Enplanement levels are forecasted to meet and exceed 2008 enplanement levels by 2018.

Successful scheduled *commuter* airline service may encourage a new airline to enter the market by 2018. *Commuter airline* enplanements are expected to remain at 5,000, with three daily flights on a nine-seat aircraft and a 60 percent load factor. The Master Plan—Conservative Forecast projects that a *NMLCC* airline will initiate service at SLE by 2018, operating two flights per day on a 150-seat aircraft, with a load factor of 80 percent. The new service generates 12,000 *NMLCC* enplanements.

The Master Plan—Conservative Forecast projects that *commuter airline* operations will remain at three flights per day on nine-seat aircraft in 2023, with 5,000 forecasted enplanements. Continued success of *commuter* and *NMLCC* airlines may result in a *regional airline* initiating operations at SLE by 2023. *Regional airline* operations are projected to consist of two flights per day to one destination on a 50-seat aircraft with a load factor of 65 percent. *Regional airline* activity produces 23,000 enplanements. *NMLCC* activity remains at two weekly departures on 150-seat aircraft with an 80 percent load factor, generating 12,000 enplanements.

By 2028, *commuter airlines* will transition two daily departures from 30-seat aircraft to 50-seat aircraft, and load factor will increase to 65 percent. The two remaining daily departures will use 30-seat aircraft at a 60 percent load factor. This will produce 36,874 enplanements. *Regional airlines* will maintain two destinations and two flights per day at an average load factor of 65 percent, which is expected to produce 34,326 enplanements. *NMLCC* activity remains at two weekly departures, generating 12,000 enplanements.

The Master Plan—Conservative Forecast is the preferred enplanement forecast. The Enplanement Forecast selection and preference is presented in **Section 2.7**.

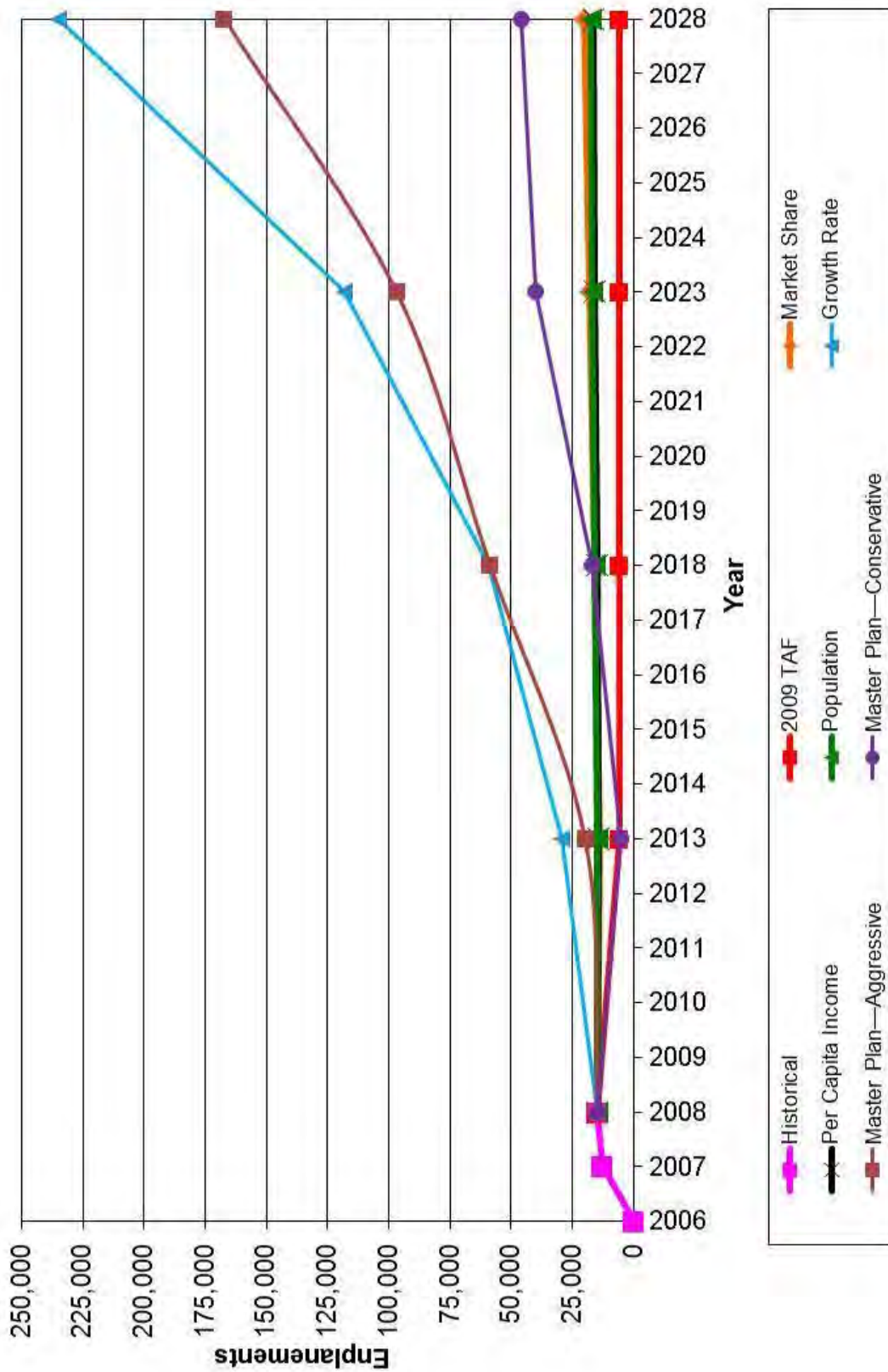
2.7 Method Comparison and Preference

Enplanement forecasts are presented in **Table 3-12**, and shown in **Exhibit 3-1**.

Year	2009 TAF	Growth Rate	Population	Per Capita Income	Market Share	Master Plan—Aggressive	Master Plan—Conservative
2008	14,834	14,834	14,834	14,834	14,834	14,834	14,834
2013	5,673	29,600	14,900	14,100	14,000	19,900	5,000
2018	5,673	59,100	15,900	14,900	15,800	58,700	17,000
2023	5,673	118,000	16,800	15,800	18,000	96,900	40,000
2028	5,673	235,000	17,600	16,600	20,300	167,300	46,000
CAGR	-4.7%	15%	0.9%	0.6%	1.6%	13%	5.8%

Source: 2009 TAF, USDOT, Woods & Poole

Exhibit 3-1: Enplanement Forecast Comparison



The 2009 TAF, Growth Rate, Population, Per Capita Income, Market Share, Master Plan—Aggressive, and Master Plan—Conservative forecasts are reasonable projections for future enplanements at SLE.

The Population, Per Capita Income, and Market Share represent the mid-growth scenarios for enplanements at SLE. Due to the absence of enplanements between 1999 and 2006, correlation between the independent variables in these forecasts and historical enplanements is limited. Enplanement history correlated most strongly with SLE's market share with a 0.6 correlation coefficient, which indicates a positive correlation as national domestic enplanements increase, so do enplanements at SLE. The mid-growth forecasts are considered, but rejected in favor of a forecast that takes into account the Salem MSA's potential to attract air service as described by the NWRASI.

The Growth Rate, Master Plan—Aggressive, and Master Plan—Conservative forecasts represent the high-growth scenarios. The Growth Rate Forecast generated the highest enplanement numbers of the enplanement forecasts, but it is not selected as the preferred forecast. The Growth Rate Forecast does not provide enough historical contexts to be considered the preferred forecasting method. Other historically based forecasts are driven by variables with more than two years of historical records. The Growth Rate Forecast is considered when analyzing air service potential and generating the Master Plan Forecast.

The Master Plan—Aggressive, Master Plan—Conservative, and 2009 TAF Forecasts are considered for the preferred forecast. The growth rates projected by the Master Plan forecasts are supported by the true market analysis in the NWRASI. The 2007 OAP enplanement forecast projected a CAGR of 2.8 percent for SLE from 2005 to 2025, which would produce 111,500 enplanements in 2028. The Master Plan-Aggressive forecasts exceed the 2007 OAP, but are closer to the 2007 OAP projection than the mid-growth scenarios. The Master Plan forecasts does not project enplanements based on past trends.

The Master Plan—Conservative Forecast projects slower enplanement growth than the Master Plan—Aggressive forecast because it accounts for the existing and forecasted conservative nature of the scheduled commercial passenger airline industry. The Master Plan—Aggressive forecast is supported by the NWRASI, but it is expected that the Master Plan—Conservative Forecast better reflects airline optimism for network expansion. Unlike trend-based forecasting methodologies that assume no change in facilities, the Master Plan—Conservative Forecast includes proposed runway and airport facility improvements that are expected to attract interest of passenger airlines.

The Master Plan—Aggressive and Master Plan—Conservative forecasts are projections of what could happen if scheduled commercial passenger airline service returns and grows at SLE; however due to the absence of historical supporting data, they are not the preferred enplanement forecasts.

The 2009 TAF forecasts low growth, but given what information is known about existing scheduled commercial passenger airline service potential at SLE, it is the preferred forecast. The 2009 TAF forecast reflects the fleet and frequency types of airlines that have been inquiring about offering scheduled commercial passenger airline service to SLE, including operators of 9-seat aircraft conducting short-haul flights to larger metropolitan areas in the Pacific Northwest.

3. Aircraft Operations

An aircraft operation (operation) is a take-off, landing, missed approach, or a touch-and-go. Operations are classified as *local*, where the aircraft stays in the vicinity of the airport, and *itinerant*, where the aircraft take off from or lands at another airport. The Operations Forecast includes *commercial operations*, conducted by scheduled commercial passenger airline or scheduled commercial cargo airlines, *GA operations*, conducted on a non-scheduled, or for-hire basis, and *military operations*, which are those conducted under the authority of the U.S. Department of Defense.

3.1 Scheduled Commercial Operations

Scheduled commercial operations include scheduled commercial passenger airline operations, and scheduled commercial air cargo airline operations. Non-scheduled, or on-demand flights are considered GA operations, forecasted in **Section 3.2**.

3.1.1 Commercial Operations

SLE had scheduled commercial passenger airline operations from 2007 until 2008, and has existing scheduled commercial air cargo operations. It is anticipated that scheduled commercial passenger airline operations will return to SLE during the 20-year planning period, and scheduled commercial air cargo operations will continue. Scheduled commercial operations are based on the number provided by the 2009 TAF. The Scheduled Commercial Operations Forecast is presented in **Table 3-13**.

TAF		2008	2013	2018	2023	2028
Classification	Typical Aircraft					
Air Taxi	Pilatus PC-12	1,702	1,875	2,123	2,401	2,715
Air Carrier	Boeing MD-83	20	17	17	17	17
Total Operations		1,722	1,902	2,140	1,418	2,732

Source: FAA

3.2 GA Operations

GA operations represented 90 percent of the 65,107 operations at SLE in 2008. It is anticipated that GA will remain the primary source of aircraft operations at SLE for the 20-year planning period. The GA operations forecasts build upon the operations forecast produced during MPU-I. The MPU-I forecast provides a detailed look at operations by critical aircraft, but does not include smaller aircraft that make up a large portion of SLE's operations. Historical itinerant and local GA operations are presented in **Table 3-16**.

Year	Itinerant	Local	Operations
2003	28,825	15,014	43,839
2004	26,217	13,907	40,124
2005	29,184	14,294	43,478
2006	30,661	26,519	57,180
2007	35,282	55,985	91,267
2008	27,322	31,046	58,368
CAGR	-1.1%	16%	5.9%

Source: 2009 TAF

Growth in GA operations between 2003 and 2008 can be attributed to growth in local operations. 2007 saw GA operations increase by 34,087 due to a helicopter pilot training center at SLE. The helicopter pilot training center went out of business in 2008, and operations returned to a more moderate growth rate. The CAGR between 2003 and 2008 is 5.9 percent.

GA operations forecast methodologies include those based on historical performance (Growth Rate, Operations per Based Aircraft), those based on socioeconomic forecasts (Per Capita Income, Population), and those based on national FAA forecasts (TAF, Market Share, Aerospace Forecast).

3.2.1 GA Operations—MPU-I

The MPU-I Forecast included activity projections for the critical design aircraft at SLE, which are business jets with an airport reference code of C-II. These aircraft are the most demanding aircraft that operate at SLE, and were used to evaluate the need for a runway extension at the Airport. Critical design aircraft operations forecasts generated in MPU-I are included in the following GA operations forecasts. The MPU-I Critical design Aircraft Operations Forecast is included in **Table 3-17**.

Year	Large Aircraft with a MTOW up to and including 60,000 Pounds		Large Aircraft with a MTOW Greater than 60,000 Pounds	Operations
	75% of Fleet	Remaining 25% of Fleet		
2008	1,358	272	52	1,682
2013	1,460	288	54	1,802
2018	1,664	306	62	2,032
2028	2,112	344	76	2,532
CAGR	2.2%	1.2%	1.9%	2.1%

Source: MPU-I

3.2.2 GA Operations—2009 TAF

The 2009 TAF forecasts growth in GA operations. The type of GA operations shifts in the 2009 TAF, going from a higher number of local operations to similar itinerant and local operations. The 2009 TAF is presented in **Table 3-18**.

Year	Itinerant	Local	Operations
2008	27,322	31,046	58,368
2013	25,703	25,300	51,003
2018	27,704	27,403	55,107
2023	29,860	29,680	59,540
2028	32,184	32,147	64,331
CAGR	0.8%	0.2%	0.5%

Source: 2009 TAF

The TAF is not the preferred GA operations forecast. The GA Operations Forecast selection and preference is presented in **Section 3.2.9**.

3.2.3 GA Operations—Growth Rate

The Growth Rate Forecast carries forward the historical growth rates of local and itinerant operations. The Growth Rate Forecast is presented in **Table 3-19**.

Year	Itinerant	Local	Operations
2008	27,322	31,046	58,368
2013	26,000	65,000	91,000
2018	25,000	133,000	158,000
2023	24,000	275,000	299,000
2028	23,000	568,000	591,000
CAGR	-0.9%	16%	12.3%

Source: 2009 TAF

The Growth Rate Forecast produces a high number of local operations because the application of local GA operations historical 16 percent CAGR. This rate of growth and the number of aircraft operations are unsustainable.

The Growth Rate Forecast has been eliminated from further consideration.

3.2.4 GA Operations—Operations per Based Aircraft

The Operations per Based Aircraft (OPBA) Forecast correlates GA operations to the number of based aircraft at SLE. The OPBA ratio is found by dividing annual GA operations by the number of based aircraft at SLE. SLE had an average of 253.1 OPBA between 2003 and 2008. This ratio uses the preferred based aircraft forecast, found in **Section 4.8**, to forecast GA operations. The OPBA Forecast is presented in **Table 3-20**.

Year	Based Aircraft	Operations
2008	216	58,368
2013	240	61,000
2018	250	64,000
2023	260	66,000
2028	270	69,000
CAGR	1.1%	0.8%

Source: 2009 TAF

OPBA Ratio: 253.1

The OPBA Forecast anticipates a 0.8 percent CAGR in GA operations between 2008 and 2028. GA operations grow more slowly than the preferred based aircraft forecast because the OPBA ratio is skewed by a high number of GA operations in 2007, the result of a spike caused by flight training. Flight training declined after 2008 due to the national economic recession.

The OPBA Forecast is not the preferred GA operations forecast. The GA Operations Forecast selection and preference is presented in **Section 3.2.9**.

3.2.5 GA Operations—Population

The Population Forecast correlates GA operations with the population of the Salem MSA. The Population Forecast is a result of the GA operations per capita ratio, which is found by dividing the number of GA operations by the population of the Salem MSA. The operations per capita ratio was 0.2 between 2003 and 2008. This ratio is multiplied by Salem MSA population forecasts from to forecast the number of GA operations. The Population Forecast is presented in **Table 3-21**.

Year	Salem MSA Population	Operations
2008	391,680	58,368
2013	417,132	62,000
2018	443,353	66,000
2023	469,942	70,000
2028	491,528	73,000
CAGR	1.1%	1.1%

Source: 2009 TAF, Woods & Poole

GA operations per Capita Ratio: 0.2

The Population Forecast anticipates a 1.1 percent CAGR in GA operations between 2008 and 2028. The Population Forecast does not imply that new residents in the Salem MSA will increase the number of GA operations, but population growth is generally indicative of economic growth, which may increase GA operations.

The Population Forecast is not the preferred GA operations forecast. The GA Operations Forecast selection and preference is presented in **Section 3.2.9**.

3.2.6 GA Operations—Per Capita Income

The Per Capita Income (PCI) Forecast correlates GA operations with PCI in the Salem MSA. The PCI ratio was an average of 2.1 between 2003 and 2008. The PCI Forecast is presented in **Table 3-22**.

Year	Per Capita Income	Operations
2008	\$26,981	58,368
2013	\$27,451	57,000
2018	\$28,975	60,000
2023	\$30,770	64,000
2028	\$32,367	67,000
CAGR	0.9%	0.7%

Source: 2009 TAF, Woods & Poole

Operations per Dollar of PCI Ratio: 2.1

Currency in 2004 Dollars

The PCI Forecast anticipates that GA operations at SLE will grow at a CAGR of 0.7 percent between 2008 and 2028. Comparing growth in GA operations to growth in PCI does not imply that increased disposable income as a result of an increased in PCI will be spent on GA activity. Instead, the PCI Forecast anticipates that the increase in PCI relates to economic growth, which may increase GA operations.

The PCI Forecast is not the preferred GA operations forecast. The GA Operations Forecast selection and preference is presented in **Section 3.2.9**.

3.2.7 GA Operations—Market Share

The Market Share Forecast correlates GA operations at SLE with national GA operations from the Aerospace Forecast. SLE's market share was an average of 1.7 GA operations per 1,000 national GA operations between 2003 and 2008. The Market Share Forecast is presented in **Table 3-23**.

Year	National GA Operations (Thousands)	Operations
2008	31,688.0	58,368
2013	28,120.2	47,000
2018	29,954.4	50,000
2023	31,945.4	54,000
2028	34,140.3	57,000
CAGR	0.37%	-0.12%

Source: FAA

Average Market Share: 1.7/1,000

The Market Share Forecast anticipates a decline in GA operations at SLE between 2008 and 2013, then growth. Unlike in the Aerospace Forecast, 2028 GA operations at SLE do not exceed 2008 GA operations. The market share ratio was skewed by the spike SLE's low market share between 2003 and 2006, which averaged 1.2 GA operations per 1,000 national GA operations between 2003 and 2005. SLE's market share between 2006 and 2008 was 2.1 GA operations per 1,000 national GA operations.

The Market Share Forecast is not the preferred GA operations forecast. The GA Operations Forecast selection and preference is presented in **Section 3.2.9**.

3.2.8 GA Operations—Aerospace Forecast

The Aerospace Forecast is not impacted by historical trends at SLE, and instead forecasts based on FAA forecasts. The Aerospace Forecast anticipates that national itinerant GA operations will grow at a CAGR of 1.3 percent between 2010 and 2020, and at a CAGR of 1.1 percent between 2020 and 2030. The Aerospace Forecast anticipates that national local GA operations will grow at a CAGR of 1.2 percent between 2010 and 2020, and at a CAGR of 1.1 percent between 2020 and 2030. The CAGRs are applied to SLE's 2008 base year to forecast GA operations. The Aerospace Forecast is presented in **Table 3-24**.

Table 3-24: GA Operations—Aerospace Forecast			
Year	Itinerant	Local	Operations
2008	27,322	31,046	58,368
2013	30,000	33,000	63,000
2018	32,000	35,000	67,000
2023	33,000	37,000	70,000
2028	35,000	39,000	74,000
CAGR	1.2%	1.2%	1.1%

Source: FAA

The Aerospace Forecast anticipates that the recovery of national GA operations will be led by itinerant operations. It is anticipated that many GA operations will be conducted by business travelers whose needs cannot be met by commercial aviation. The Aerospace Forecast anticipates that total GA operations will increase at a CAGR of 1.1 percent between 2008 and 2028. Local GA operations will remain the dominant category despite the higher growth rate of itinerant GA operation between 2010 and 2020.

The Aerospace Forecast is the preferred GA operations forecast. The GA Operations Forecast selection and preference is presented in **Section 3.2.9**.

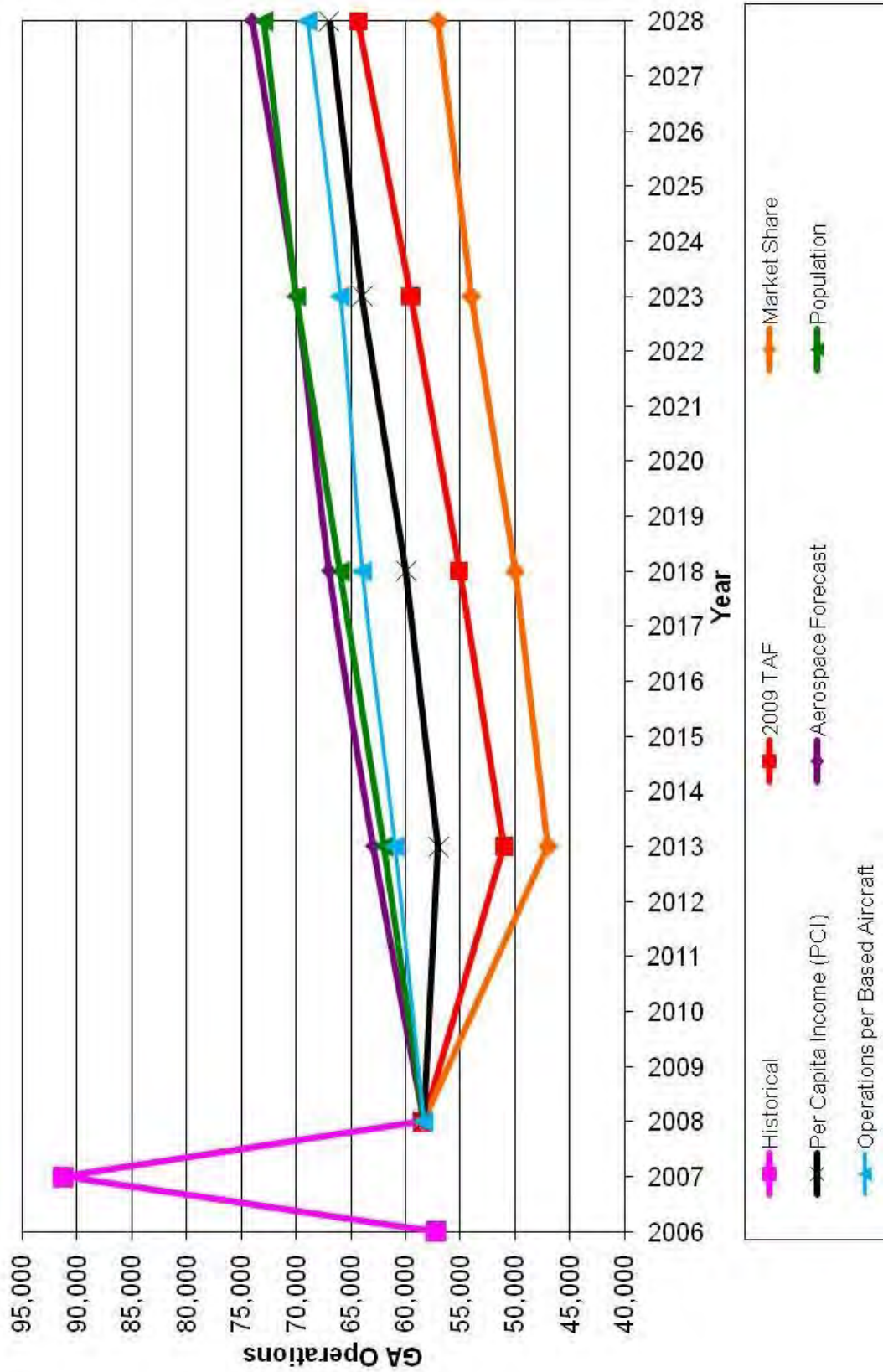
3.2.9 GA Operations—Method Comparison and Preference

The Growth Rate and Market Share Forecasts have been removed from further consideration. The remaining GA operations forecasts are presented in **Table 3-25**, and shown in **Exhibit 3-2**.

Year	TAF	OPBA	Population	PCI	Market Share	Aerospace
2008	58,368	58,368	58,368	58,368	58,368	58,368
2013	51,003	61,000	62,000	57,000	47,000	63,000
2018	55,107	64,000	66,000	60,000	50,000	67,000
2023	59,540	66,000	70,000	64,000	54,000	70,000
2028	64,331	69,000	73,000	67,000	57,000	74,000
CAGR	0.5%	0.8%	1.1%	0.7%	-0.1%	1.1%

Source: 2009 TAF, FAA, Woods & Poole

Exhibit 3-2: GA Operations Forecast Comparison



The Growth Rate Forecast represents the high-growth scenario and is eliminated from further consideration. The OPBA, Population, PCI, and Aerospace forecasts represent the mid-growth scenarios, and are retained for further analysis. The TAF and Market Share Forecasts anticipate an initial decline in GA operations. The TAF returns to growth by 2028 but the Market Share Forecast does not exceed 2008 GA operations levels during the 20-year forecast period. The TAF and Market Share forecasts are the low-growth scenarios, and are not the preferred forecast.

The two historical variables that create the OPBA forecasts, (GA operations and based aircraft), have a correlation coefficient of -0.4. This is not a strong correlation coefficient, indicating that there are likely other variables that have a greater impact on GA operations than the number of based aircraft at SLE. GA operations at SLE were highly influenced by the presence of flight training, as seen by the spike in local operations in 2007. This spike further distorts the OPBA ratio. For these reasons, the OPBA Forecast is not the preferred forecast.

Growth in the population of the Salem MSA and growth in GA operations at SLE have a correlation coefficient of 0.7, which is considered high. This suggests that growth in the population of the Salem MSA and growth in GA operations have been related historically, but it does not indicate that population growth causes growth in GA operations.

The variables in the PCI Forecast, (PCI and GA operations), have a correlation coefficient of 0.3, which is considered low. The likely cause of this is that the PCI of the Salem MSA and GA operations have alternated between growth and decline at different years from one another. Although both variables show growth between 2003 and 2008, GA operations grew consistently during this period while PCI fluctuated.

The Aerospace Forecast does not consider historical GA operations, and instead analyzes growth in other sectors of the U.S. economy to project the future of GA operations in the U.S. The Aerospace Forecast has national perspective that is insensitive to local factors influencing GA operations. In the case of SLE, the growth expected in the population and PCI socioeconomic variables support the findings of the Aerospace Forecast.

The Preferred GA Operations Forecast is the Aerospace Forecast. Although the Population Forecast shows strong correlation with GA operations, it is unlikely that growth in population alone will generate more GA operations. The Aerospace Forecast represents the FAA's projection of national GA operations, which takes into account growth in several areas of the U.S. economy. Socioeconomic forecasts for the Salem MSA reflect similar growth, which supports the Aerospace Forecast.

Compared to the preferred forecast, the 2007 OAP growth rate for GA operations at SLE was 2.1 percent. By 2028, the 2007 OAP GA Operations Forecast forecasts 69,940 GA operations.

3.3 Military Operations

Decisions made by the U.S. Department of Defense drive military operations, not socioeconomic activities. Military operations plans are not public information; therefore the TAF is used at the preferred forecast for military operations. The Military Operations Forecast is presented in **Table 3-26**.

Year	Itinerant Military	Local Military	Total Military
2008	3,404	1,633	5,037
2013	1,773	606	2,379
2018	1,773	606	2,379
2023	1,773	606	2,379
2028	1,773	606	2,379
CAGR	-3.2%	-4.8%	3.7%

Source: 2009 TAF

3.4 Preferred Operations Forecast

The preferred operations forecasts are combined, and presented in the same format at the TAF. The TAF does not have a category for scheduled cargo operations, so scheduled cargo operations are combined with itinerant commuter operations. The Preferred Operations Forecast is presented in **Table 3-27**.

Year	Itinerant Air Carrier	Itinerant Air Taxi	Itinerant GA	Itinerant Military	Local GA	Local Military	Total
2008	20	1,702	27,322	3,404	31,046	1,633	65,127
2013	17	1,875	30,000	1,773	33,000	606	67,271
2018	17	2,123	32,000	1,773	35,000	606	71,519
2023	17	2,401	33,000	1,773	37,000	606	74,797
2028	17	2,715	35,000	1,773	39,000	606	79,111
CAGR	-0.8%	2.4%	1.2%	-3.2%	1.2%	-4.8%	1.0%

4. Based Aircraft

Based aircraft represent those that hangar and tie-down at SLE. Based aircraft counts come from the 2009 TAF and MPU-I. The TAF categorizes base aircraft as *single-engine*, *multi-engine*, *jet*, *helicopter*, and *other*. *Single-* and *multi-engine* aircraft include propeller-driven turbine and piston aircraft, *jet* aircraft include those with turbine jet engines, *helicopter* includes rotorcraft, and *other* includes gliders and hot air balloons. 2003 to 2007 based aircraft counts come from the 2009 TAF. 2008 based aircraft counts come from MPU-I. Historical based aircraft are presented in **Table 3-28**.

Year	Single-Engine	Multi-Engine	Jet	Helicopter	Other	Total
2003	160	18	3	4	23	208
2004	178	23	4	4	23	232
2005	178	23	4	4	23	232
2006	178	23	4	4	23	232
2007	152	21	9	10	20	212
2008	153	21	12	11	19	216
CAGR	0.7%	3.1%	32%	22%	-3.8%	0.8%

Source: 2009 TAF, MPU-I

The fastest growing based aircraft categories are *jet* and *helicopter* traffic. *Single-* and *multi-engine* aircraft show moderate growth, and *other* aircraft have declined at 3.8 percent since 2003.

In 2008, *single-engine* represented 70.8 percent of the SLE fleet, *multi-engine* represented 9.7 percent, *jet* represented 5.6 percent, *helicopters* represented 5.1 percent, and *other* represented 8.8 percent. These proportions are maintained for the forecast methods with the exception of the 2009 TAF and Aerospace Forecast.

4.2 2009 TAF

The 2009 TAF forecasts growth in based aircraft. *Helicopter* and *Other* aircraft have the highest CAGRs at 1.2 percent, and *Jet* aircraft decline before returning to 2008 levels in 2028, resulting in no growth. The 2009 TAF is presented in **Table 3-29**.

Year	Single-Engine	Multi-Engine	Jet	Helicopter	Other	Total
2008	153	21	12	11	19	216
2013	160	20	9	11	21	221
2018	171	21	10	14	22	238
2023	181	22	11	14	23	251
2028	191	23	12	14	24	264
CAGR	1.1%	0.5%	0%	1.2%	1.2%	1%

Source: 2009 TAF, MPU-I

The TAF is not the preferred based aircraft forecast. The Based Aircraft Forecast selection and preference is presented in **Section 4.8**.

4.3 Growth Rate

The Growth Rate Forecasts carries forward the historical growth rates of the based aircraft categories. The Growth Rate Forecast is presented in **Table 3-30**.

Year	Single-Engine	Multi-Engine	Jet	Helicopter	Other	Total
2008	153	21	12	11	19	216
2013	146	25	48	30	16	265
2018	140	29	192	83	13	457
2023	134	33	768	229	11	1,175
2028	128	39	3,072	629	9	3,877
CAGR	-0.9%	3.1%	32%	22%	-3.8%	16%

Source: 2009 TAF, MPU-I

The Growth Rate Forecast produces high *jet* and *helicopter* forecasts. Total based aircraft grow by 16 percent, and total based aircraft reach 3,877 in the forecast period, which is 1.4 percent of the U.S. GA fleet for 2028, according to the Aerospace Forecast. This growth is seen as unsustainable for a 20-year forecast period.

The Growth Rate Forecast is not the preferred forecast, and is dismissed from further consideration.

4.4 Population

The Population Forecast anticipates that based aircraft will increase with the population of the Salem MSA. The Population Forecast is a result of the based aircraft per 1,000 residents ratio, found by dividing the number of based aircraft by every 1,000 people living in the Salem MSA. Between 2003 and 2008, the average ratio was 0.6 based aircraft per 1,000 residents of the Salem MSA. This ratio is multiplied by Salem MSA population forecasts from Woods & Poole to forecast the number of based aircraft. The Population Forecast is presented in **Table 3-31**.

Year	Single-Engine	Multi-Engine	Jet	Helicopter	Other	Total
2008	153	21	12	11	19	216
2013	191	26	15	14	24	270
2018	205	28	16	15	26	290
2023	213	29	17	15	26	300
2028	227	31	18	16	28	320
CAGR	2%	2%	2%	2%	2%	2%

Source: 2009 TAF, MPU-I, Woods & Poole

Based Aircraft per 1,000 residents ratio: 0.6

The Population Forecast anticipates a 2 percent CAGR in based aircraft between 2008 and 2028. The historical correlation coefficient between the Salem MSA population and SLE based aircraft is -.2, which is considered low. Based aircraft at SLE have been decreasing since 2004, while population has been growing.

The Population Forecast is not the preferred based aircraft forecast. The Based Aircraft Forecast selection and preference is presented in **Section 4.8**.

4.5 Per Capita Income

The Per Capita Income (PCI) Forecast anticipates that based aircraft will increase with the PCI in the Salem MSA. The PCI Forecast is a result of the based aircraft per 1,000 dollars of PCI in the Salem MSA, which was an average of 8.6 between 2003 and 2008. The PCI Forecast is presented in **Table 3-32**.

Year	Single-Engine	Multi-Engine	Jet	Helicopter	Other	Total
2008	153	21	12	11	19	216
2013	156	21	12	11	19	220
2018	170	23	13	12	21	240
2023	177	24	14	13	22	250
2028	184	25	14	13	23	260
CAGR	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%

Source: 2009 TAF, MPU-I, Woods & Poole

Based Aircraft per \$1,000 of PCI ratio: 8.6

The PCI forecast anticipates a 0.9 percent CAGR in based aircraft between 2008 and 2028. The historical correlation coefficient between the Salem MSA PCI and SLE based aircraft is -0.6, which is considered moderate. Based aircraft at SLE have been decreasing since 2004, while PCI has been growing.

The PCI Forecast is not the preferred based aircraft forecast. The Based Aircraft Forecast selection and preference is presented in **Section 4.8**.

4.6 Market Share

The Market Share Forecast anticipates that based aircraft at SLE will maintain a fixed share of national based aircraft fleet. SLE's market share was an average of 1.7 GA operations per 1,000 national GA operations between 2003 and 2008. The Market Share Forecast is presented in **Table 3-33**.

Year	Single-Engine	Multi-Engine	Jet	Helicopter	Other	Total
2008	153	21	12	11	19	216
2013	170	23	13	12	21	240
2018	177	24	14	13	22	250
2023	184	25	14	13	23	260
2028	191	26	15	14	24	270
CAGR	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%

Source: FAA, MPU-I

The Market Share Forecast anticipates a 1.1 percent CAGR between 2008 and 2028. The historical correlation coefficient between the SLE based aircraft fleet and the national GA fleet was 0.4, which is considered low. The national GA fleet decreased in 2005 and 2008 versus the previous year, and SLE's based aircraft fleet has been decreasing since 2005.

The Market Share Forecast is the preferred based aircraft forecast. The Based Aircraft Forecast selection and preference is presented in **Section 4.8**.

4.7 Aerospace Forecast

The Aerospace Forecast is not impacted by historical trends at SLE, and instead forecasts based on FAA forecasts. Growth rates for each aircraft category are presented for two intervals: 2010 to 2020, and 2020 to 2030. The Aerospace Forecast applies the FAA growth rates to the based aircraft fleet at SLE. The Aerospace Forecast is presented in **Table 3-34**.

Year	Single-Engine	Multi-Engine	Jet	Helicopter	Other	Total
2008	153	21	12	11	19	216
2013	156	21	15	13	19	224
2018	160	22	18	15	19	234
2023	172	22	22	17	19	252
2028	179	22	27	19	19	267
CAGR	0.8%	0.3%	4.2%	2.8%	-0.1%	1.1%

Source: FAA, MPU-I

The Aerospace forecast anticipates that *jet* aircraft will see the highest rate of growth. This is supported by anticipation that business travel will be the fastest GA sector to recover from the 2008 economic recession. *Helicopters* are also expected to be bolstered by the demand for business travel. Recreational aircraft in the *other* category expect a modest decline nationwide. *Single-* and *multi-engine* aircraft are expected to grow more quickly between 2020 and 2030 than between 2010 and 2020.

The Aerospace Forecast is not the preferred based aircraft forecast. The Based Aircraft Forecast selection and preference is presented in **Section 4.8**.

4.8 Method Comparison and Preference

The Growth Rate forecast has been removed from further consideration. The remaining based aircraft forecasts are presented in **Table 3-35**, and shown in **Exhibit 3-3**.

Year	2009 TAF	Population	PCI	Market Share	Aerospace
2008	216	216	216	216	216
2013	221	270	220	240	224
2018	238	290	240	250	234
2023	251	300	250	260	252
2028	264	320	260	270	267
CAGR	1%	2%	0.9%	1.1%	1.1%

Exhibit 3-3: Based Aircraft Forecast Comparison



The Growth Rate Forecast represents the high-growth scenario and is eliminated from further consideration. The Population Forecast represents the mid-growth scenario, and the other forecasts represent the low-growth scenarios. The mid- and low-growth scenarios are considered for the preferred forecast.

Growth in the population of the Salem MSA and growth in SLE's based aircraft fleet have a historical correlation coefficient of -0.2, which is considered low. This suggests that fluctuation in the population of the Salem MSA and SLE's based aircraft fleet are not impacted by the same variables, and are not likely related. The forecasted growth in local population indicates that the Salem MSA may see growth in other economic indicators which may increase the demand for private aircraft; however, the correlation coefficient suggests that demand will not be purely based on population.

Growth in PCI and growth in SLE's based aircraft fleet have a correlation coefficient of -0.6, which is considered moderate. Both PCI and based aircraft have fluctuated between growth and decline, but not during the same year. Between 2003 and 2008, when PCI changed, the number of based aircraft changed in a similar manner one to two years later. This indicates that these variables may be related, either directly, or through a third variable. A decline in average PCI indicates a loss of high-paying jobs, or the addition of lower-paying jobs. If the decline in PCI is caused by the loss of high-paying jobs, economic conditions may have forced aircraft owners to sell their aircraft or relocate to another airport.

The variables of the Market Share Forecast have a correlation coefficient of 0.4, which is considered low. The national GA fleet has been growing annually since 2003 while SLE saw a decline in the number of based aircraft in 2006. Although SLE has been regaining market share, the 2006 decline has reduced the average carried forward in the Market Share Forecast. Although the minor decline reduced SLE's average Market Share, the Market Share Forecast is still trending up.

The Aerospace Forecast analyzes each aircraft category as opposed to the fleet as a whole. The Aerospace Forecast reflects FAA expectations that business GA, led by *jet* and *helicopter* traffic, will recover more quickly than the remaining categories of GA. The Aerospace Forecast is unaffected by fluctuations in SLE's GA fleet, which impact the remaining forecasts. The Aerospace Forecast does not take into account SLE's market share, which is an indicator of local and national competition for based aircraft.

The Market Share Forecast is the Preferred Based Aircraft Forecast. The Market Share Forecast considers what percentage of the GA fleet SLE will capture in relation to competing airports, while taking into account FAA forecasts pertaining to the future of the national GA fleet. The 1.1 percent CAGR of the Market Share Forecast matches the 2007 OAP based aircraft forecast for SLE.

5. Air Cargo

Air cargo transports goods and mail to Salem. FedEx, with flights operated by Empire Airlines, is SLE's scheduled cargo carrier with a dedicated cargo facility at the Airport. The facility processes freight and mail. Charter cargo carrier Ameriflight carries air cargo as needed for UPS. Charter cargo carriers are not required to report cargo volume to the USDOT. The FAA classifies air cargo as *mail* or *freight*, and tracks cargo volume in pounds. Mail is transported in an arrangement between the U.S. Postal Service and FedEx. Scheduled commercial passenger airlines transport some cargo, but volumes have dropped nationwide due to increased security screening requirements.

Air Cargo volumes between 2003 and 2008 are considered in the forecasting process, and presented in **Table 3-36**.

Year	Pounds Inbound	Pounds Outbound	Pounds
2003	49,840	149,544	199,384
2004	55,229	154,610	209,839
2005	78,034	232,222	310,256
2006	138,838	431,458	570,296
2007	127,205	475,919	603,124
2008	23,190	374,317	397,507
CAGR	-14%	20%	15%

Source: USDOT

Between 2003 and 2008, SLE shipped more cargo than it received. This is partially due to FedEx's route structure where air cargo from smaller Oregon communities is consolidated at SLE before going to FedEx's Portland hub. It is anticipated that cargo volume will be similarly split in the future. Air cargo is forecasted for inbound and outbound volume.

5.1 Air Cargo—Growth Rate

The Growth Rate Forecasts carries forward the historical cargo volume growth rate. The Growth Rate Forecast is presented in **Table 3-37**.

Year	Pounds
2008	397,507
2013	793,000
2018	1,580,000
2023	3,150,000
2028	6,281,000
CAGR	15%

Source: USDOT

The Growth Rate Forecast produces a high volume of air cargo. It is unlikely that the Salem MSA can sustain this type of cargo volume, which would be common at a minor FedEx hub airport.

The Growth rate forecast is not the preferred forecast, and is dismissed from further consideration.

5.2 Air Cargo—Gross Regional Product

The Gross Regional Product (GRP) Forecast anticipates that cargo volume will increase with the GRP of the Salem MSA. The GRP Forecast is a result of the pounds of cargo per million dollars of GRP ratio, which is found by dividing the historical cargo volume by the Salem MSA's GRP, measured in millions of 2004 dollars. Between 2003 and 2008, the average ratio was 33.47 pounds of per million dollars in GRP. This ratio is multiplied by the Salem MSA GRP forecasts from Woods & Poole to forecast cargo volume. This GRP Forecast is presented in **Table 3-38**.

Year	GRP	
	(Millions)	Pounds
2008	\$11,906	397,507
2013	\$12,743	427,000
2018	\$14,162	474,000
2023	\$15,770	528,000
2028	\$17,188	576,000
CAGR	1.9%	1.9%

Source: USDOT, Woods & Poole

Pounds/ million dollars in GRP ratio: 33.47

Currency in 2004 Dollars

The GRP Forecast anticipates a 1.9 percent CAGR in cargo volume between 2008 and 2028. The historical correlation coefficient between the Salem MSA GRP and SLE cargo volume is 0.7, which is considered high. Industry rule of thumb typically associates cargo volume with GRP, as it is a measure of a region's productivity.

The GRP Forecast is the preferred cargo forecast. The Air Cargo Forecast selection and preference is presented in **Section 5.7**.

5.3 Air Cargo—Population

The Population Forecast anticipates that cargo volume will increase with the population of the Salem MSA. The Population Forecast is a result of the pounds of cargo per capita ratio, found by dividing the pounds of air cargo by the population of the Salem MSA. Between 2003 and 2008, the average ratio was 1.007 pounds of cargo per capita. This ratio is multiplied by Salem MSA population forecasts from Woods & Poole to forecast the cargo volume. The Population Forecast is presented in **Table 3-39**.

Year	Population	Pounds
2008	391,680	397,507
2013	417,132	421,000
2018	443,353	447,000
2023	469,942	474,000
2028	491,528	496,000
CAGR	1.1%	1.1%

Source: USDOT, Woods & Poole

Pounds per capita ratio: 1.007

The Population Forecast anticipates a 1.1 percent CAGR in cargo volume between 2008 and 2028. The historical correlation coefficient between the Salem MSA population and cargo volume at SLE is 0.7, which is considered high.

The Population Forecast is not the preferred cargo forecast. The Air Cargo Forecast selection and preference is presented in **Section 5.7**.

5.4 Air Cargo—Per Capita Income

The Per Capita Income (PCI) Forecast anticipates that cargo volume will increase with the average PCI in the Salem MSA. The PCI forecast is a result of the pounds of cargo per dollar of PCI ratio, which was 14.2 between 2003 and 2008. The PCI Forecast is presented in **Table 3-40**.

Year	Per Capita Income	Pounds
2008	\$26,981	397,507
2013	\$27,451	389,000
2018	\$28,975	411,000
2023	\$30,770	436,000
2028	\$32,367	459,000
CAGR	0.9%	0.7%

Source: USDOT, Woods & Poole

Pounds of cargo per dollar of PCI ratio: 14.2

Currency in 2004 Dollars

The PCI Forecast anticipates a 0.7 percent CAGR between 2008 and 2028. The historical correlation coefficient between the Salem MSA PCI and SLE cargo volume is 0.0, which is considered low. Between 2003 and 2008, cargo volume at SLE has been growing while the Salem MSA PCI has been fluctuating.

The PCI Forecast is not the preferred cargo forecast. The Air Cargo Forecast selection and preference is presented in **Section 5.7**.

5.5 Air Cargo—Market Share

The Market Share Forecast anticipates that cargo volume at SLE will maintain a fixed share of national domestic cargo activity, measured in domestic all-freight revenue-ton miles (RTMs) which correspond to one ton of cargo, flown for one mile on an all-freight carrier between two cities in the U.S. Growth in domestic RTMs indicates increased domestic cargo activity. Cargo market share is calculated by dividing the pounds of cargo at SLE by the domestic all-freight RTMs, measured in millions. SLE's market share was 30.5 pounds of cargo per million RTMs. The Market Share Forecast is presented in **Table 3-41**.

Year	Domestic All Freight RTMs (Millions)	Pounds
2008	12,258	397,507
2013	11,232	343,000
2018	12,570	384,000
2023	14,209	434,000
2028	15,974	488,000
CAGR	1.3%	1.0%

Source: FAA, USDOT

Pounds per million RTMs: 30.5

The Market Share Forecast anticipates a 1 percent CAGR between 2008 and 2028. The historical correlation coefficient is 0.3, which is considered low. Cargo volume at SLE increased from 2003 to 2007, then declined in 2008. Domestic all-freight RTMs decreased compared to previous years in 2005, 2006, and 2008.

The Market Share Forecast is not the preferred cargo forecast. The Air Cargo Forecast selection and preference is presented in **Section 5.7**.

5.6 Air Cargo—Boeing Air Cargo

The Boeing Air Cargo Forecast is based on the Boeing Company World Air Cargo Forecast, an annual published forecast of global cargo demand. The most recent edition is the Boeing World Air Cargo Forecast 2010-11 (Boeing Forecast). The Boeing Air Cargo Forecast functions as a market share forecast, dividing the pounds of cargo at SLE by the domestic all-freight RTMs as recorded by Boeing. The Boeing Forecast shows SLE having 21.9 pounds of cargo per million domestic all-freight RTMs. The Boeing Air Cargo Forecast is presented in **Table 3-42**.

Year	Domestic All Freight RTMs (Millions)	Pounds
2008	18,245	397,507
2013	21,048	460,000
2018	24,282	531,000
2023	28,013	613,000
2028	32,318	707,000
CAGR	2.9%	2.9%

Source: Boeing Company, USDOT
Pounds per million RTMs:21.9

The Boeing Air Cargo Forecast anticipates a 2.9 percent CAGR between 2008 and 2028. The correlation coefficient is 0.8, which is considered high.

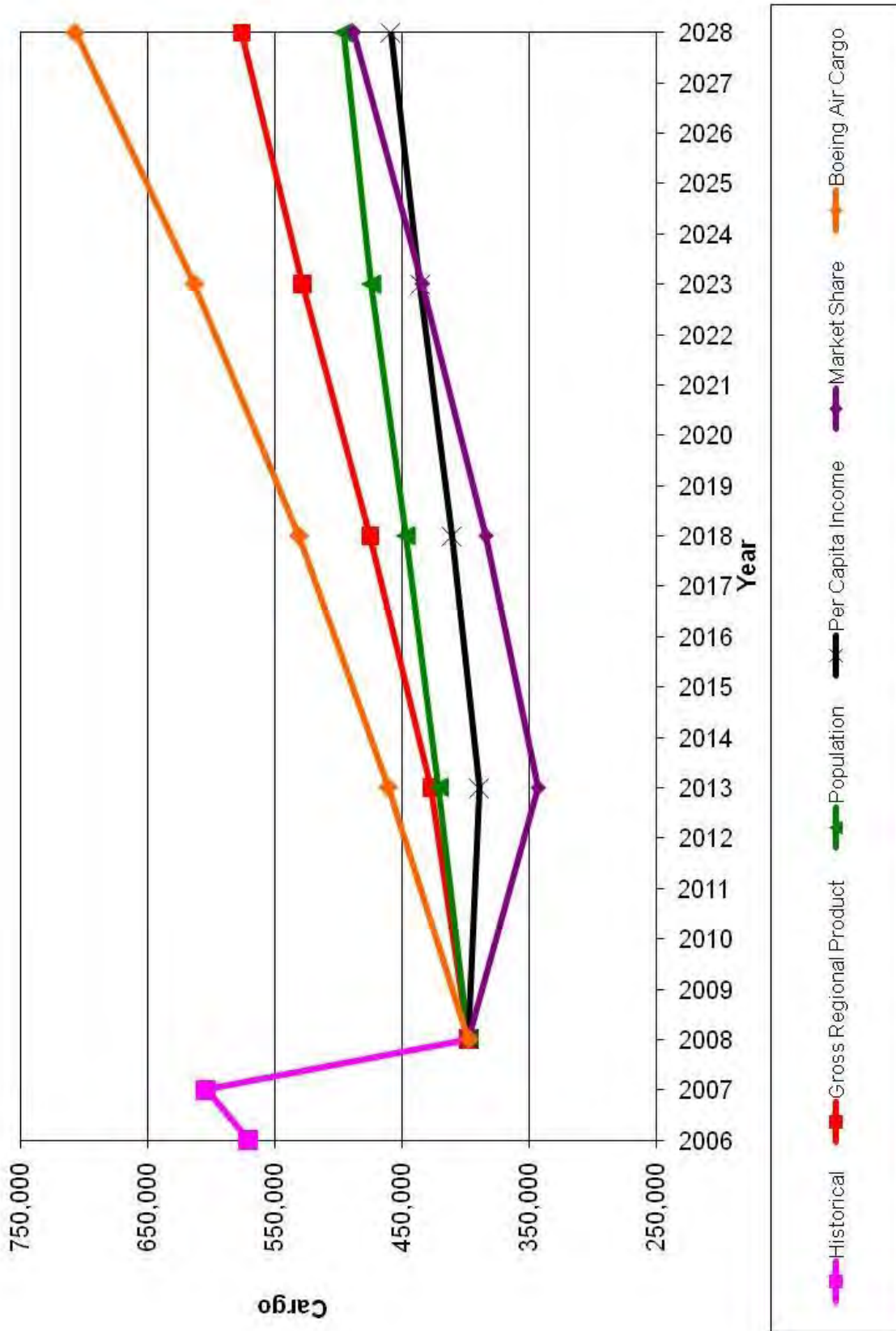
The Boeing Air Cargo Forecast is not the preferred cargo forecast. The Air Cargo Forecast selection and preference is presented in **Section 5.7**.

5.7 Air Cargo—Method Comparison and Preference

The Growth Rate forecast has been removed from further consideration. The remaining air cargo forecasts are presented in **Table 3-43**, and shown in **Exhibit 3-4**.

Year	GRP	Population	PCI	Market Share	Boeing
2008	397,507	397,507	397,507	397,507	397,507
2013	427,000	421,000	389,000	343,000	460,000
2018	474,000	447,000	411,000	384,000	531,000
2023	528,000	474,000	436,000	434,000	613,000
2028	576,000	496,000	459,000	488,000	707,000
CAGR	1.9%	1.1%	0.7%	1.0%	2.9%

Exhibit 3-4: Cargo Forecast Comparison



The Growth Rate Forecast represents the high-growth scenario and is eliminated from further consideration. The GRP Forecast represents the mid-growth scenario, and the remaining forecasts represent the low-growth scenarios. The mid- and low-growth scenarios are considered for the preferred forecast.

The Population Forecast featured a high correlation coefficient, and produced the third highest cargo volume forecast of those considered. The high correlation coefficient indicates that that growth in air cargo volume and growth in the population of the Salem MSA may be related. Analysis of other socioeconomic indicators suggests that the population of the Salem MSA is growing because productivity is growing, suggesting that jobs are available. Increased productivity is supported by the growth in PCI within the Salem MSA. Although population and cargo volume are both growing, growth in productivity and jobs may be driving both variables. GRP is a measure of productivity in the Salem MSA, would be a better socioeconomic variable to forecast cargo volume than population.

The PCI Forecast produced the lowest CAGR between 2008 and 2028, and has a low correlation coefficient. The low growth and poor correlation coefficient suggest that air cargo volume is more of a product of productivity as opposed to the shipping needs of individuals.

The Market Share Forecast declines in 2013 before exceeding 2008 levels in 2023. This decline, combined with a low correlation coefficient, supports choosing air cargo forecasts other than the Market Share Forecast.

Of the forecasts considered, the Boeing Forecast projected the highest volume of air cargo at SLE, and showed the highest correlation coefficient. Although the correlation indicates that growth in air cargo volume at SLE relates to national trends, an area of concern for the Boeing Forecast is that it does not take into account local trends. Although Salem historically keeps up with national trends, correlation between the population and GRP of the Salem MSA suggests that an economic downturn felt in Salem would have a greater impact on air cargo volume, even if the rest of the country's GRP and population continued to grow.

The GRP Forecast is the preferred air cargo forecast. GRP is a measure of an area's productivity, and historically, GRP has correlated well with air cargo volume in the Salem MSA. An industry rule of thumb is to forecast growth in air cargo with regional productivity, and this technique was used in the Aerospace and Boeing forecasts, but on a national level. The GRP forecast is preferred because it takes national forecasting methods, and focuses them on the Salem MSA.

6. Peak Hour Operations

Peak hour aircraft operations are used to identify potential capacity issues that may occur at high activity levels. Peak hour operations represent the busiest hour of the busiest day of the busiest month. Peaking data comes from Salem airport traffic control tower records, with the most recent complete year being 2009. In 2009, the peak month was July, with 11.2 percent of annual operations. The peak day of the peak month had 0.6 percent of annual operations. Peak hour forecasts use 10 percent of the peak day.

Peak hour operations forecasts are presented in **Table 3-44**.

Year	Operations	Peak Month	Peak Day	Peak Hour
2008	64,777	7,300	390	39
2013	67,271	7,600	400	40
2018	71,519	8,100	430	43
2023	74,797	8,400	450	45
2028	79,11	8,900	470	47

Peak hour forecasts are used to assess airfield facilities in **Chapter 4**.

7. Forecast Summary

A summary of the preferred forecasts from each section is presented in **Table 3-45**.

Year	Enplanements	Operations	Based Aircraft	Cargo
Methodology	2009 TAF	Composite	Market Share	GRP
2008	14,834	64,777	216	397,507
2013	5,673	68,044	240	427,000
2018	5,673	72,306	250	474,000
2023	5,673	76,825	260	528,000
2028	5,673	82,388	270	576,000
CAGR	-4.7%	1.2%	1.1%	1.9%

The preferred operations forecasts represent stable growth that is anticipated at SLE. Key elements of the preferred forecast include the return of scheduled commercial passenger airline service at conservative levels of operation, and increasing cargo volumes due to growth in productivity within the Salem MSA. GA traffic is expected to conduct the majority of airport operations, increasing with corporate business travel as the national economy recovers. The preferred forecasts will determine facility requirements at SLE, which will be used to generate airport improvement alternatives. Improvement alternatives will provide users of SLE with the facilities they need for safe, efficient, and reliable operations.