AIRSPACE IMPACT AND AIRCRAFT FEASIBILITY ASSESSMENT UPDATE

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Aspen Pitkin County Airport (KASE)

EXECUTIVE SUMMARY

The Aspen-Pitkin County Airport (ASE) Airspace Impact and Aircraft Feasibility Assessment Update evaluates potential impacts to flight procedures and aircraft operations that could occur following the improvements to RWY 15/33 at the Aspen-Pitkin Airport (ASE). Runway improvements include the relocation of the runway 80 feet to the West, achievement of standard RSA for 737 and A320 size aircraft with increased paved runway width, increased wingspan limitation to 118 feet, and increased bearing strength improvements.

The report examines potential changes to existing flight procedures (departures and approaches), changes in airport arrival and departure capacity and changes in the flight operations engineering aircraft feasibility. Further, a detailed evaluation was conducted to determine the feasibility of specific aircraft operations either on a scheduled basis or a charter basis at ASE.

Beyond the feasibility of new narrowbody aircraft to operate at the airport, the potential impacts to flight procedures and arrival/departure capacity following the runway relocation were found to be minimal.

While many aircraft will likely still be unfeasible for even charter operations following the runway improvements, the A319-115 (operated by American Airlines), the EMB-175LR with Enhanced Winglets and supporting CAFM (operated by Compass and Envoy under American Airlines), the CRJ-700 and CS-100 (A210) appear to be feasible for scheduled operations. Of those aircraft, the CRJ-700 is feasible for scheduled operations on the airfield as currently configured. The EMB-175LR EWR appears capable of commencing operations into ASE in advance of the runway relocation. However, it should be noted that EMB175LR EWR operations are limited by stage length and climatic conditions.

Based on the departure and payload range analysis, the 737-8 MAX could be suitable for scheduled operations. However, feasibility relies upon updating existing approach procedures to accommodate approach category (CAT) D operations. If no new approach procedures or SMS risk mitigations materialize to permit a CAT D aircraft to operate on CAT C approaches, then the 737-8 MAX may either be downgraded to charter feasibility or be considered non-feasible following the runway relocation.

1 PURPOSE OF THIS ANALYSIS

The information contained in this report is intended to describe flight operations procedures and aircraft operational changes that are expected to occur following the enhancement of runway safety features on RWY 15/33 at the Aspen-Pitkin Airport (ASE).

This analysis is provided in support of the Air Service Update regarding runway 15/33 enhancements and builds on two previous technical memorandums, prepared by Lean, during the planning phase initially conducted in 2014. The original memorandums created at that time are included as appendices of this report.

For the purposes of this analysis the runway 15/33 enhancements addressed in this analysis are specifically focused on the relocation of the runway 80ft to the West, achievement of standard RSA for 737 and A320 size aircraft with increased paved runway width, increased wingspan limitation to 118ft and increased bearing strength improvements.

This report examines aircraft operations changes related to the runway relocation including changes to existing flight procedures (departures and approaches), changes in airport arrival and departure capacity and changes in the flight operations engineering aircraft feasibility. The latter portion of this analysis seeks to determine the feasibility of specific aircraft operations either on a scheduled basis or a charter basis with the intention of informing other portions of the Air Service Update and future designs.

2 SUMMARY

Changes to overall aircraft operations following the runway relocation will involve the feasibility of scheduled and charter operation of larger aircraft flying into ASE including the Airbus A319, Boeing 737-700, 737-800, 737-7MAX, 737-8MAX, A320NEO, E-175LR and CS-100 (A220-100) aircraft. The analysis in this report also revealed that recent enhancements to specific subvariants of the E-175LR, with enhanced winglet technology, will potentially permit the aircraft to begin serving ASE prior to the runway relocation.

Destinations served from ASE will continue to vary by month, aircraft, and air carrier, but the overall enhancements to the runway width, wingspan limitation and bearing strength will permit near year-round non-stop service to most North American hub cities where one or more of the feasible aircraft operate. The economic and scheduling implications of potential service were not addressed in this analysis.

Beyond the feasibility of new narrowbody aircraft, the potential impacts to flight procedures and arrival/departure capacity following the runway relocation were found to be minimal. Limitations on air traffic capacity will not be significantly improved following the relocation, although it is hoped that improvements to ramp and taxiway geometries may help to alleviate potential ground congestion which can exacerbate airborne delays associated with typical opposite direction operation of aircraft arriving on runway 15 and departing on runway 33.

The most immediate need identified in this report is to update existing approach procedures or assist potential aircraft operators to utilize Special LOC/DME RWY 15 approach procedure to accommodate approach category (CAT) D operations in support of potential 737-8 MAX flight operations. These procedures, which currently do not exist at the airport, should be requested at the outset of the design phase so that public or public special procedures are created for all CAT D aircraft operators to maintain feasible aircraft operations following the runway safety enhancements.

Overall Aircraft Feasibility Following Runway 15/33 Relocation

Aircraft	Overall	Departure	Arrival	SMS	Payload Range	Level of Analysis	Notes
737-700ERW	**Charter**	**Scheduled**	**Charter**	**Charter**	**Scheduled**	**Complete (2014)**	**Higher Thrust Models May Be Capable of Scheduled Service**
737-8 MAX	**Scheduled**	**Scheduled**	**Charter**	**Charter**	**Scheduled**	**Complete**	**Category D Minimums on Approach Will Be Required**
737-9 MAX	Not Feasible	Not Analyzed	Not Feasible	Not Analyzed	Not Analyzed	Arrival	Category D Minimums on Approach Will Be Required
737-900	Not Feasible	Not Analyzed	Not Feasible	Not Analyzed	Not Analyzed	Arrival	Category D Minimums on Approach Will Be Required
A319-112	**Charter**	**Scheduled**	**Charter**	**Charter**	**Scheduled**	**Complete (2014)**	
A319-115 Sharklets	**Scheduled**	**Scheduled**	**Charter**	**Scheduled**	**Scheduled**	**Complete**	
A320	Not Feasible	Not Feasible	Not Analyzed	Not Analyzed	Not Analyzed	Departure	Higher Thrust Models May Be Capable of Scheduled Service
A320NEO	**Scheduled**	**Scheduled**	**Charter**	**Scheduled**	**Scheduled**	**Extrapolation of A319**	
A321	Not Feasible	Not Feasible	Not Feasible	Not Analyzed	Not Analyzed	Departure and Arrival	Category D Minimums on Approach Will Be Required
A321NEO	Not Feasible	Not Feasible	Not Feasible	Not Analyzed	Not Analyzed	Departure and Arrival	Category D Minimums on Approach Will Be Required
CRJ-700	**Scheduled**	**Scheduled**	**Scheduled**	**Scheduled**	**Scheduled**	**Interview**	**Aircraft Can Feasibly Operate Prior to Runway Relocation**
CS-100 (A210)	**Scheduled**	**Scheduled**	**Charter**	**Scheduled**	**Scheduled**	**Complete**	
E170	Not Feasible	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Interview	Insufficient Performance at Density Altitude
E175LR EWT	**Scheduled**	**Scheduled**	**Charter**	**Scheduled**	**Scheduled**	**Complete**	**Aircraft Can Feasibly Operate Prior to Runway Relocation**
E190	Not Feasible	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Interview	Insufficient Performance at Density Altitude
E195	Not Feasible	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Interview	Insufficient Performance at Density Altitude

Table 1 Overall Aircraft Feasibility of Aircraft Following Runway Relocation

3 ACKNOWLEDGMENTS

The authors of this feasibility assessment would like to thank all the individuals, organizations and entities that offered their assistance in the assembly of this report. This includes members of the FAA Western Flight Procedures Team, FAA All Weather Operations Group, FAA Flight Safety Team, FAA Air Traffic Control Center in Denver, FAA Air Traffic Control Tower members in Aspen, AOPA, NBAA, Skywest Airlines, Delta Air Lines, American Airlines, United Airlines and the Aspen-Pitkin Airport Staff.

In addition to the previously mentioned contributors, Lean would also like to identify the extraordinary technical assistance provided by Jay Leitner, and the entire Operations Engineering team at American Airlines. Jay was able to provide flight operations engineering analysis regarding the CRJ700, A319, E175LR and B737-8MAX associated with the existing and future approach and departure considerations for both mainline American Airline operations and the Envoy operation. Jay and the team and American also graciously offered to share their results as a direct appendix in this report in the hopes that it can help to further justify the importance of the proposed runway enhancements for current and future American Airlines service to the Aspen-Pitkin County Airport.

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6 TERMINAL AREA INFORMATION USED IN THIS ANALYSIS

This section summarizes the information that was collected and evaluated as part of the comprehensive analysis for determining the potential impacts to airspace and aircraft feasibility resulting from the runway relocation. The terminal area information summarized in this section pertains to three focus areas:

- **Aeronautical and geospatial data, which is evaluated to determine whether the critical information required for safe operation of aircraft is appropriate.**
- **Historical weather data, which is used to analyze aircraft performance under temperature limitations; winds and runway usage preferences/capabilities; air pressure correction and fluctuation at high elevation; wet runway conditions; ceiling and visibility considerations which may affect operations of arriving aircraft; and the likelihood of anti-ice usage.**
- **Airspace and air traffic flow, which is evaluated to determine whether the air traffic procedures permit safe operations.**

6.1 AERONAUTICAL AND GEOSPATIAL INFORMATION

Aeronautical and geospatial data is the critical information required for safe operation of aircraft and includes airport configuration, aids to navigation (NAVAIDs), lighting, flight procedures, airspace boundaries, obstacles and terrain. An analysis of aeronautical and geospatial data is necessary to determine whether there are impacts to that would affect flight operations procedures and the feasibility of aircraft expected to operate following the runway relocation and related safety enhancements.

6.1.1 Methods

The aeronautical and geospatial collection and deconfliction methods used to perform the updated airspace impact and aircraft feasibility assessment are consistent with the description provided in the June 2014 Flight Procedures Study – Appendix E. As a result, only changes to the analysis method and data since the last report are described.

6.1.2 Runway Information

There were no significant changes to the runway information considered by the planning/aircraft feasibility assessment for the 80ft shift to the west when compared to the data used in 2014.

6.1.3 NAVAID, Waypoint, Fix and Lighting Information

Lean utilized aeronautical data downloaded from the FAA's National Flight Data Center System (NFDC) along with detailed NAVAID and lighting data from the AVNIS portal. The currency of NAVAID, waypoint and fix information is based on May 2018.

6.1.4 Flight Procedures

Information related to the most recent flight procedures at ASE was collected from FAA CIFP, AIRNAV, FAA Western Flight Procedures Team Representatives and outreach with specific operators who use/maintain private approach and departure procedures. All data was formatted into an enhanced version of a Digital Aeronautical Flight Information File (DAFIF) for processing in both TARGETS and GPD.

6.1.5 Airspace Boundaries

There are no fundamental changes to the class D/E airspace boundaries that have occurred since the 2014 analysis. The addition of a new type of radar is currently in progress and will potentially enhance the overall capacity of the airport. This is discussed in more detail in section 9 of this analysis.

6.1.6 Obstacle Information

The 2012 Vertically Guided Approach Survey (published in 2013) was utilized for close-in obstacles. An updated FAA Digital Obstacle File (DOF) from May 2018 was also assessed.

In addition to obstacle sources in the immediate vicinity of ASE, updated obstacle surveys obtained for the terminal area surrounding Eagle (KEGE) and Riffle (RIL) were also included.

A review of obstacles from pending construction notices in the OE/AAA system were also reviewed and included in the workspace if considered permanent.

6.1.7 Terrain Information

Digital terrain information was used in accordance with FAA procedure design and aircraft operator methods.

The terrain dataset used for this analysis is based on the latest USGS NED 30m resolution data set, with a 20m horizontal uncertainty applied for PBN procedure design purposes.

The primary dataset was downloaded through the USGS web portal and then converted to a DTED2 format for incorporation into the procedure design software. Terrain analysis in the instrument procedure design systems used by LEAN are all raster based, and not contour based, therefore no contour generation was performed.

Due to the presence of high precision VGA survey information for Runway 15/33 at ASE, terrain exclusion areas were created to avoid any issues which can arise between differences in the coarsely defined NED 30m tiles and the precisely defined runway thresholds and physical ends.

6.2 Historical Weather Data

The combination of the high altitude, mountainous terrain, and quickly changing weather conditions result in specific and unique challenges for operators at ASE and require careful consideration in planning for both the weight and fuel carried by an aircraft as well as the time of departure or arrival. Historical weather data is analyzed in this section to understand how the long-range payload planning of operators could be impacted by these unique conditions at ASE. To determine the potential feasibility of aircraft operations and impacts from changes to instrument procedures at ASE, a comprehensive analysis of flight operations based historical weather analysis (as a baseline for modeling) was performed.

Since the previous airspace impact and aircraft feasibility assessment performed in 2014, additional weather data has been collected and was analyzed for this update. This includes additional data points over the past 4 years as well as two enhanced analysis methods which are described below in the following subsections.

Key findings from the historical weather data analysis are summarized below:

- **Higher temperatures in the summer months are likely to result in adverse aircraft performance impacts that would influence payload range and available seats in the market.**
- **It is reasonable to expect that scheduled and charter aircraft operators may either utilize higher performing aircraft midday or reduce the overall range of operations at ASE during the summer months.**
- **Runway preference results reveal that flights scheduled to depart in the early morning or evening would anticipate some form of tailwind penalty and aircraft arriving throughout the day would also expect a tailwind penalty.**
- **Stronger crosswinds in the springtime may deter operators from landing or departing from ASE and result in an increased likelihood for delays or cancellations.**
- **Between March and June, operators will most likely have to account for higher than standard pressure altitudes that could decrease available payload on both takeoff and landing.**
- **Air pressure fluctuation in October and November is significant enough that certain operators may consider taking some form of low pressure correction into consideration when considering long range payload planning.**
- **Conditions in the springtime may dictate substitutions or cancellations rather than payload reductions or delays for aircraft that are subject to 8,000 ft pressure altitude takeoff and landing limitations. Aircraft such as the EMB-175LR or CS-100 (A220-100) would be affected.**
- **Operators are likely to consider wet runway conditions November through April for the purpose of long range payload planning.**
- **Visual Meteorological Conditions (VMC) are likely more than half the time with generally high periods of VMC in the summer time.**
- **Based on the analysis of the localizer approach, there is high likelihood that the airport may be closed to arriving flights between December through May.**

- **While there are periods where ceiling and visibility conditions may prevent aircraft from landing at ASE, the likelihood of being able to operate aircraft departures remains high, with nearly 100 percent likelihood during June through September and approximately 80 percent or better likelihood throughout the remainder of the year.**
- **There is a relatively high likelihood of anti-ice application from December until April, and aircraft performance considerations in the winter and spring would potentially include operating with at least engine anti-ice on.**

6.2.1 Methods

Historical weather information was collected from the National Climactic Data Center (NCDC) Climate Data Online (CDO) servers for ASE over a 10 year historical period. The data collected was originally reported from the on airport ASOS in the form of METARs consisting of both routine, hourly, and special conditions, off hourly, weather observations.

To express historical weather observations as meaningful monthly, and hourly, descriptive statistics, a process of time weighting must be accomplished. The process of time weighting observations involves accounting for "brief" weather observations (less than one hour) that occur during some portion of an hour as either expressing a likelihood of occurrence during an hour, without asserting that something observed over a few minutes would be considered to occur throughout an entire hour.

During standard weather conditions, this analysis method closely matches routine hourly observations reflective of typical daytime heating/cooling and any non-substantial changes in overall weather patterns. During inclement weather conditions, observational frequency increases and represents a new weather condition, albeit occurring over a shorter time period. With proper adaptation of time weighting, the effects of thunderstorms are more accurately reflected as potential occurrences, while steady state winds or temperatures are accounted for with greater likelihood.

The time weighting method, which has proven to be a more accurate reflection of historical operational results, was not used during the 2014 assessment and is now introduced into this update to provide better clarity with potential scheduled aircraft considerations especially for low visibility situations, gusts, crosswinds and runway surface conditions.

Results are presented in tabular format with data divided by local time (rows) and months of the year (columns). The local time presentation takes current and historical daylight savings into consideration. Local time cells (on the far left column) that have a grey cell shading indicate hours of the day when the airport is typically closed to all operations.

6.2.2 Temperature

Historical temperature information, referred to as an Outside Air Temperature (OAT) is presented for three likelihoods: 15 percent, 50 percent and 85 percent.

The 50 percent likelihood OAT is the mean temperature experienced at ASE. Most aircraft operators, and procedure designers, consider the mean temperature to be a good indicator of day-to-day operations. However, few aircraft operators utilize the mean temperature when determining forecast payload range, seat availability or baro-VNAV limitations.

In Table 2 50 percent Likelihood OAT (Degrees C) - Mean Temperature at ASE the average temperature results are color coded according to representative aircraft performance considerations. Green values represent hours of the month in which no adverse performance impacts from temperature are expected. White cells represent hours in which minor to moderate impacts may be expected, while yellow cells reflect hours when moderate to significant performance impacts are expected from the temperature alone. The actual impact on performance varies by aircraft, but is presented here for reference purposes only.

From the 50percent likelihood OAT, it is apparent that certain hours during the months of June, July and August will expose flight operations to aircraft performance related impacts. This is slightly lower than previous assessments indicating that there may have been a generic cooling of temperatures at ASE over the previousfour years when compared to the time period 10 – 14 years ago.

50% Likelihood OAT (Degrees C)

Local Time	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00:00	-10.6	-6.7	-2.2	1.1	4.4	9.4	12.2	11.1	8.3	1.7	-3.3	-9.4
01:00	-10.6	-7.8	-2.8	0.6	3.9	8.9	11.7	10.6	7.2	1.1	-3.3	-10
02:00	-11.1	-7.8	-3.3	0	3.9	8.3	11.1	10	6.7	1.1	-3.9	-10
03:00	-11.7	-7.8	-3.3	0	2.8	7.8	10.6	9.4	6.7	0.6	-4.4	-9.4
04:00	-11.7	-8.3	-3.9	-0.6	2.8	7.2	10	9.4	6.1	0	-4.4	-9.4
05:00	-12.2	-8.9	-3.9	-0.8	3.9	9.4	11.1	9.4	5.6	0	-4.4	-9.4
06:00	-11.7	-7.8	-3.3	1.1	6.7	12.8	13.9	12.2	7.2	0	-2.8	-9.7
07:00	-8.6	-5.6	-0.6	3.9	9.4	15.6	16.7	15	11.7	3.9	0	-6.7
08:00	-5.6	-3.3	1.1	6.7	12.2	18.9	20	17.8	14.4	7.2	2.8	-5
09:00	-3.9	-1.7	3.3	8.9	14.4	21.1	22.2	21.1	17.2	10	5	-2.8
10:00	-1.7	0	5	10	15	22.8	24.4	22.8	19.4	12.2	6.7	-1.7
11:00	-1.05	1.7	6.7	10.6	15.6	23.3	25.6	23.6	20.6	13.9	7.8	-0.6
12:00	0	2	7.2	10.6	15.6	23.9	25.6	23.9	20.6	14.4	8.3	0
13:00	0	2.2	7.8	11.1	16.1	23.9	25.85	23.9	21.1	14.4	7.8	0
14:00	-0.6	1.7	7.8	11.1	16.1	23.9	25.6	24.4	21.1	15	6.7	-1.1
15:00	-3.3	0.6	6.7	11.1	15.6	23.3	25	23.6	20.85	13.9	2.8	-3.3
16:00	-5	-1.7	5.6	10.6	15	22.8	24.4	22.5	20	11.7	1.1	-5
17:00	-6.1	-2.8	3.9	9.4	13.9	22.2	22.8	21.1	16.7	8.3	0	-6.1
18:00	-7	-3.9	2.8	7.2	11.7	18.9	20	17.8	13.3	6.1	-0.85	-6.1
19:00	-7.8	-4.4	1.1	5	10	15.6	17.2	15	11.7	5	-1.7	-7.2
20:00	-8.3	-5.3	0	3.9	8.3	13.3	15.6	14.4	10.6	3.9	-1.7	-7.2
21:00	-8.9	-6	-0.6	3.3	6.7	12.8	14.4	13.3	9.4	3.05	-2.2	-8.3
22:00	-9.4	-5.6	-1.1	2.2	6.1	11.7	13.9	12.2	8.9	2.2	-2.8	-8.3
23:00	-6.7	-2.2	1.7	5	10.6	13.3	11.7	8.3	1.7	-3.3	-8.3	-15

Table 2 50percent Likelihood OAT (Degrees C) - Mean Temperature at ASE

To compliment the 50 percent likelihood OAT, the 85 percent likelihood OAT represents the highest temperatures that scheduled and charter aircraft operators are likely to consider for aircraft performance impacts that would influence payload range and available seats in the market. These temperatures are not the highest values that the airport could, or will, experience, but they instead represent values that are similar to or higher than the Average Daily Maximum.

In Table 3 the 85 percent OAT results have been color coded, using the same reference aircraft performance scale that was applied to the 50 percent likelihood analysis. In this table, the range of performance impacting temperatures increases slightly from June through August to now include September as well.

85% Likelihood OAT (Degrees C)

Local Time	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00:00	-4.64	-1.1	2.8	6.1	8.9	13.3	15.6	14.4	11.7	7.2	1.1	-2.65
01:00	-5	-1.1	2.2	5.6	8.3	13.3	14.4	13.9	11.7	6.7	1.1	-2.32
02:00	-4.97	-1.7	2.025	5	7.8	12.2	13.9	13.3	11.1	5.75	0.6	-2.8
03:00	-5	-1.825	1.7	5	7.2	12.2	13.3	12.8	10.6	5.6	0	-2.2
04:00	-5.6	-1.7	1.1	4.4	6.7	11.7	12.8	12.2	10	5.51	0	-1.7
05:00	-5	-2.2	1.1	3.9	6.16	10.6	12.2	11.7	9.58	5	0	-2.2
06:00	-5.9	-2.8	0.7	3.9	7.2	12.2	12.8	11.7	10	4.4	-0.6	-3.3
07:00	-5	-1.7	1.64	6.1	10.6	15.6	15.6	14.4	11.05	5	1.7	-3.3
08:00	-3.9	0.6	4.4	9.28	13.9	18.3	18.9	17.2	13.9	8.9	4.73	-1.7
09:00	-2.12	2.8	7.2	12.2	16.7	21.7	22.2	20.6	17.2	12.2	7.8	0.6
10:00	0.6	4.4	9.375	13.9	18.3	24.4	24.4	23.3	20.6	15.6	10.6	2.8
11:00	1.7	6.07	11.025	15	19.4	26.1	26.7	25.6	22.8	17.2	12.2	3.9
12:00	3.255	6.7	11.7	15.6	20	26.9	27.8	26.7	23.9	18.3	13.3	5
13:00	3.9	7.2	12.8	16.095	20.6	27.77	28.3	26.7	24.4	18.9	13.9	5.6
14:00	3.9	7.2	13.3	16.25	20.6	27.8	28.3	27.2	24.4	19.4	13.3	5.6
15:00	3.045	7	12.8	16.1	20.6	27.8	28.3	27.2	24.4	19.4	12.8	3.9
16:00	1	6.1	12.8	16.1	20.39	27.2	27.8	26.925	24.225	18.9	9.4	1.1
17:00	-1	3.3	11.7	16.03	20	26.7	27.2	26.1	23.3	16.1	6.85	0
18:00	-1.7	2.2	8.9	14.4	18.9	25.6	26.1	23.9	20	13.3	5	-0.6
19:00	-1.7	1.1	7.2	11.7	16.46	22.2	22.8	20.6	17.2	11.1	3.9	-0.6
20:00	-2.8	0.6	5.6	9.4	13.9	18.9	19.4	18.3	14.4	10	2.8	-1.7
21:00	-3.3	0	4.4	8.3	11.7	16.7	18.3	16.7	13.9	8.3	2.2	-2.8
22:00	-3.9	-0.6	3.9	7.2	10.6	16.1	17.2	16.1	12.8	7.8	1.7	-2.8
23:00	-4.06	-0.6	3.9	6.7	10	15	16.1	15	12.2	7.2	1.1	-2.32

Table 3 85 percent Likelihood OAT (Degrees C) - Planning Temperature

The 15 percent likelihood OAT is the cold temperature planning value used by procedure designers and aircraft operators when considering cold weather temperature limitations that might require special engine start procedures, FMS/FMC start procedures, BARO-VNAV approach limitations or other cold weather operations considerations.

In Table 4 cells with hours represented by purple are those which are most at risk of creating cold weather challenges. Blue cells have some operational risk while white cells pose no risk.

From this analysis, the hours of operation which aircraft operators and procedure developers would consider to be challenging would only occur either when the airport is closed (23:00 to 06:00) during December and January. All other hours and months are not likely to present a cold weather limitation to flight operations.

15% Likelihood OAT (Degrees C)

Local Time	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00:00	-15.6	-12.93	-7.2	-2.26	1.7	6.775	11.1	9.4	5	-1.7	-8.3	-15.6
01:00	-16.61	-13.9	-8.3	-2.8	0.925	6.1	10	8.9	4.4	-2.2	-8.3	-15.48
02:00	-16.7	-14.4	-8.69	-3.3	0	5.6	9.4	8.3	3.9	-2.2	-9.2	-15.6
03:00	-17.2	-14.4	-8.9	-3.9	0	5	8.9	7.8	3.3	-2.8	-9.4	-16.1
04:00	-17.8	-14.67	-9.4	-3.9	-0.6	4.4	8.3	7.2	2.8	-3.3	-10	-15.6
05:00	-17.26	-15.27	-9.4	-4.4	-0.06	3.9	7.8	6.7	2.62	-3.9	-10	-15.6
06:00	-18.075	-15.48	-10	-5	0	6.1	8.9	6.7	2.2	-3.9	-10.18	-16.7
07:00	-17.2	-13.9	-8.9	-3.9	2.8	8.9	11.7	10	3.36	-3.9	-8.3	-16.31
08:00	-14.4	-10.6	-6.1	-1.7	4.4	11.7	14.4	12.2	8.3	-0.6	-5.875	-13.9
09:00	-11.7	-8	-3.3	0	6.7	14.4	17.2	15	10.6	1.7	-3.3	-11.1
10:00	-9.4	-6.1	-1.7	1.1	8.175	16.1	19.4	17.2	12.8	3.9	-1.7	-8.9
11:00	-7.8	-4.4	0	2.2	8.3	17.2	21.1	18.9	14.4	5.6	-0.21	-7.8
12:00	-6.7	-3.3	0.6	2.8	9.325	17.56	21.7	19.4	15.6	6.7	0.6	-6.7
13:00	-5.6	-2.93	1.1	3.3	9.4	18.3	21.7	19.4	15.6	8.3	0.6	-6.1
14:00	-5	-3.3	1.7	4.4	9.4	18.175	21.1	18.9	16.1	7.8	0.57	-6.7
15:00	-6.1	-3	1.1	4.36	8.3	18.9	20	19.25	16.1	7.8	-0.6	-7.2
16:00	-8.69	-4.4	0.9	4.4	8.3	18.3	18.9	18.9	15.21	7.2	-2.2	-9.4
17:00	-10.39	-6.79	0	4.25	7.8	17.8	18.3	17.8	14.4	5.6	-3.9	-11.1
18:00	-11.1	-7.8	-1.7	2.8	7.2	16.1	16.7	16.7	12.2	3.3	-5	-12.71
19:00	-11.7	-8.9	-2.8	1.1	6.34	14.4	15.6	14.4	10	1.49	-6.1	-12.8
20:00	-13	-10.6	-3.9	0	4.4	11.7	14.4	12.8	8.3	0.6	-6.7	-13.9
21:00	-13.9	-11.1	-5	-0.6	3.9	10	13.3	11.7	7.8	-0.03	-7.2	-14.4
22:00	-14.4	-11.85	-6.1	-1.1	2.8	8.9	12.8	11.1	6.7	-0.6	-7.2	-14.46
23:00	-14.91	-12.2	-6.7	-1.7	2.2	7.8	11.7	10	5.65	-1.37	-7.8	-15

Table 4 15 percent Likelihood OAT (Degrees C) - Cold Weather Altimeter Correction Planning Temperature

When comparing the 15 percent, 50 percent and 85 percent likelihood OAT, the previous 10 years of data suggests a distribution of temperatures around the mean with a slight skew towards temperatures that are below the mean. Experienced operators will potentially detect this and consider behaving more aggressively in available seat forecasting, permitting more seats to be available for over-sale, when temperature based limits on aircraft performance are the overall limit to payload range.

It is also reasonable to expect that, from the 85 percent likelihood OAT, most scheduled and charter aircraft operators will attempt to either utilize higher performing aircraft in the midday time period in the summer months or reduce the overall range of operations departing and arriving to and from ASE during the summer months. This could be a period which regional aircraft operations become increasingly feasible for scheduled operations because of the close proximity of several hubs of significance at relatively short range like SLC, PHX and DEN.

6.2.3 Winds and Runway Usage

Because ASE is considered a one way in, one way out, airport for most aircraft operations, the prevailing wind directions take on increased significance for identifying aircraft performance limitations and periods when the airport may be closed to takeoff and landing.

For this report, the wind and gust intensity was broken into components that are measured along the extended centerline (headwind and tailwind) or perpendicular to the extended centerline (crosswind). Variable wind directions, winds reported as occurring between a range of headings of a historical measurement, that result in any form of tailwind are considered as a tailwind. All variable wind speeds, and gusts, are considered to be steady state for the duration of the observation at the highest recorded value.

Once the wind components are determined for each historical weather observation, and time weighted to match the analyzed hours in the day, two sets of descriptive statistics are tabulated with respect to each runway direction: runway preference and runway capability.

Runway preference is a measure of the likelihood that an operator or air traffic would prefer to use the runway during a given hour/month. This is depicted in chart format by a numerical percentage, representing the likelihood of the condition occurring and a corresponding color code representing an operational implication.

Runway preference is usually analyzed with no tailwind component and limited crosswind components to enable pilots to land and takeoff into the wind for improved performance and reduced ground speeds. In single runway airports, like ASE, the crosswinds are considered as a part of the runway preference to help identify periods when pilots may prefer not to utilize either direction of the runway.

Runway preference is not a measure of operating limitations, but rather a general indication of which direction an airport would typically operate if traffic were light and no other factors influenced traffic. At ASE, runway preference provides insight into periods when aircraft operators would ideally land or takeoff from the airport. Green cells are those in which pilots would prefer to takeoff from runway 33, or land on runway 15, and are indicated by values in excess of 75 percent. Values between 50 percent - 75 percent, in white cells, indicate hours of a month in which pilots would not be as likely to prefer to takeoff from runway 33, or land on runway 15, while any value less than 50 percent likelihood (represented by yellow and orange cells) are situations in which pilots may plan for additional time in a holding pattern near the airport, take delays at the origin or cancel the flight.

The runway 15 preference is shown in Table 5 and the runway 33 preference is shown in Table 6. From this analysis, we can see that the likelihood for arrival operations to have the highest chance of success, during the normal operating hours of the airport, would be throughout the year from 06:00 – 08:00 and again from 20:00 – 23:00. At all other times of the year, landing on runway 15 will present flight crews with either some form of tailwind or crosswind to resolve which may result in a missed approach, diversion, delay or flight cancellation.

From 08:00 – 20:00, the runway 33 preference indicates that departures would be favored over arrivals along with the occasional landing from small general aviation (GA) aircraft, turboprops and business jets that are capable of executing a circling approach.

Likelihood of Runway 15 Preference (Headwind >= 0 Kts, Crosswind <= 20 Kts)

Local Time	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00:00	87%	85%	86%	81%	89%	97%	93%	96%	95%	90%	84%	86%
01:00	89%	85%	85%	81%	90%	94%	95%	94%	94%	89%	88%	86%
02:00	85%	86%	85%	79%	90%	93%	95%	94%	92%	89%	87%	87%
03:00	87%	88%	86%	80%	88%	95%	98%	95%	94%	89%	87%	86%
04:00	88%	89%	87%	82%	90%	95%	96%	96%	93%	90%	89%	85%
05:00	89%	87%	88%	81%	88%	92%	96%	96%	94%	88%	87%	83%
06:00	87%	87%	84%	79%	86%	96%	96%	97%	92%	89%	86%	82%
07:00	86%	84%	86%	75%	79%	83%	87%	93%	94%	87%	87%	84%
08:00	87%	81%	79%	65%	64%	55%	70%	80%	86%	87%	82%	80%
09:00	77%	64%	58%	52%	35%	25%	33%	47%	57%	70%	55%	70%
10:00	54%	39%	35%	34%	31%	22%	19%	22%	27%	39%	34%	52%
11:00	27%	25%	22%	35%	31%	22%	16%	18%	22%	24%	25%	35%
12:00	21%	20%	26%	33%	36%	30%	19%	20%	23%	20%	22%	26%
13:00	14%	24%	24%	32%	40%	31%	23%	25%	26%	21%	22%	25%
14:00	23%	23%	28%	36%	40%	34%	25%	28%	23%	22%	20%	26%
15:00	31%	29%	28%	34%	42%	32%	34%	36%	32%	23%	30%	41%
16:00	61%	38%	31%	35%	44%	35%	34%	37%	30%	27%	70%	69%
17:00	78%	64%	41%	44%	47%	43%	43%	40%	35%	40%	78%	80%
18:00	81%	75%	57%	46%	50%	44%	55%	55%	60%	70%	86%	81%
19:00	85%	79%	75%	61%	64%	61%	72%	82%	90%	85%	86%	86%
20:00	86%	80%	81%	71%	82%	89%	91%	94%	95%	90%	86%	83%
21:00	84%	84%	84%	82%	88%	94%	95%	97%	95%	91%	86%	85%
22:00	85%	86%	87%	80%	91%	95%	93%	93%	94%	91%	84%	85%
23:00	85%	85%	87%	82%	91%	95%	96%	94%	94%	91%	85%	82%

Table 5 Runway 15 Preference

Likelihood of Runway 33 Preferred (Headwind >= 0 Kts, Crosswind <= 20 Kts)

Local Time	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00:00	37%	39%	30%	36%	24%	11%	17%	17%	18%	27%	34%	41%
01:00	35%	35%	32%	41%	28%	13%	20%	20%	21%	31%	32%	39%
02:00	35%	36%	33%	42%	33%	17%	21%	21%	22%	30%	32%	38%
03:00	38%	36%	30%	44%	30%	16%	24%	22%	24%	32%	35%	43%
04:00	36%	38%	30%	41%	33%	20%	23%	26%	23%	33%	35%	41%
05:00	40%	37%	30%	46%	32%	29%	27%	23%	28%	36%	39%	44%
06:00	38%	40%	34%	48%	44%	40%	38%	30%	29%	40%	40%	48%
07:00	40%	44%	41%	63%	66%	63%	65%	65%	45%	40%	46%	45%
08:00	54%	64%	65%	71%	78%	88%	86%	82%	72%	66%	70%	62%
09:00	76%	81%	81%	77%	77%	88%	94%	94%	88%	78%	82%	81%
10:00	90%	89%	86%	78%	75%	84%	95%	95%	88%	87%	90%	89%
11:00	93%	89%	86%	73%	75%	82%	92%	91%	86%	87%	90%	93%
12:00	95%	91%	83%	75%	72%	78%	87%	90%	84%	86%	89%	93%
13:00	95%	89%	81%	72%	69%	75%	83%	83%	82%	85%	90%	91%
14:00	94%	89%	83%	71%	67%	73%	82%	81%	82%	87%	89%	92%
15:00	93%	85%	79%	73%	66%	75%	74%	74%	76%	84%	87%	86%
16:00	69%	86%	81%	72%	65%	72%	73%	71%	76%	82%	56%	59%
17:00	44%	59%	73%	66%	63%	69%	66%	64%	74%	78%	34%	43%
18:00	39%	46%	63%	65%	61%	69%	58%	60%	62%	47%	27%	42%
19:00	39%	43%	40%	55%	52%	59%	47%	32%	22%	27%	26%	39%
20:00	39%	41%	32%	46%	30%	20%	18%	14%	14%	21%	29%	40%
21:00	38%	41%	29%	34%	22%	11%	12%	9%	12%	22%	28%	39%
22:00	36%	38%	28%	34%	25%	10%	13%	12%	12%	23%	32%	38%
23:00	39%	38%	31%	39%	24%	10%	13%	14%	16%	25%	33%	42%

Table 6 Runway 33 Preference

From an aircraft performance perspective, the runway preference results reveal that flights scheduled to depart in the early morning or evening would anticipate some form of tailwind penalty and aircraft arriving throughout the day would expect a tailwind penalty as well. The extent of the penalty would be dependent on each air carrier and their tolerance for potential oversell, delays and cancellations.

The runway capability analysis is presented in this report to reveal time periods when a runway can likely be used for landing or takeoff operations, with or without a performance penalty. This analysis is created by combining the typical tailwind limitations for aircraft serving the airport, usually 10kts but sometimes as high as 15kts, along with typical crosswind limitations, usually 30kts but sometimes higher depending on flight crew training and other risk mitigations associated with the flight procedures and aircraft performance.

Runway capability tables share the same color coded presentation as runway preference tables, but rarely result in yellow or orange cells emerge due to the wider tolerance of wind conditions generating high likelihoods of usage.

Runway capability charts are important in determining the hours of the day in which approach and departure procedure effectiveness is considered and periods in which the airport is closed due to winds. Approach and departure effectiveness utilizes the runway capability to represent periods when the procedure can/will be usable to operators. For instance, if runway 15 was only likely to be capable of use 67 percent of the time at 13:00 in June, then any approach procedures serving runway 15 can only be considered beneficial to the airport 67 percent of the time due to winds alone.

The runway 15 capability (Table 7) analysis shows that the airport is not frequently closed due to wind conditions alone. However, in previous analysis, when the likelihood of runway capability falls below 90 percent, operators tend to plan for alternative runways, delays or diversions. When analyzing ASE, and anticipating the opposite direction operation limitations, we would anticipate that operators arriving into ASE between 11:00 and 17:00 will frequently consider additional fuel or block time to accommodate the likelihood of holding or diversions.

It is also important to note that in the months of April and May, neither runway 15 or 33 has over 85 percent capability during the midday. This is because the crosswind component measured at the airport has, over the past 10 years, presented situation when the crosswinds were potentially above 30kts. Under those conditions, many aircraft operators would not likely attempt to land or depart from ASE resulting in an increased likelihood to delays or cancellations.

Likelihood of Runway 15 Capable (Headwind >= -10 Kts, Crosswind <= 30 Kts)

Local Time	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00:00	98%	98%	98%	98%	99%	99%	99%	99%	100%	98%	96%	99%
01:00	99%	97%	98%	98%	99%	99%	99%	99%	100%	98%	98%	99%
02:00	99%	99%	98%	98%	99%	99%	99%	98%	100%	98%	98%	98%
03:00	99%	99%	97%	98%	99%	99%	99%	99%	99%	99%	97%	98%
04:00	99%	99%	98%	98%	99%	100%	99%	99%	99%	98%	98%	99%
05:00	99%	99%	97%	98%	99%	100%	99%	99%	99%	98%	98%	98%
06:00	99%	99%	97%	97%	99%	100%	99%	99%	100%	99%	98%	99%
07:00	99%	99%	99%	97%	99%	99%	99%	100%	100%	99%	99%	99%
08:00	99%	98%	99%	98%	99%	100%	100%	99%	99%	99%	99%	100%
09:00	99%	98%	98%	96%	96%	98%	100%	99%	99%	98%	98%	99%
10:00	99%	96%	95%	91%	89%	93%	97%	98%	97%	96%	96%	98%
11:00	98%	94%	92%	80%	79%	83%	84%	86%	94%	89%	94%	97%
12:00	96%	92%	86%	81%	74%	72%	74%	71%	75%	83%	89%	96%
13:00	95%	92%	84%	72%	77%	67%	70%	69%	67%	78%	91%	95%
14:00	96%	90%	81%	77%	79%	71%	69%	69%	64%	81%	89%	94%
15:00	98%	92%	81%	72%	78%	69%	77%	79%	72%	80%	94%	97%
16:00	98%	94%	85%	76%	82%	81%	82%	77%	84%	87%	98%	97%
17:00	99%	97%	90%	85%	86%	83%	87%	86%	90%	94%	98%	98%
18:00	98%	98%	96%	91%	92%	90%	95%	95%	96%	98%	97%	98%
19:00	98%	98%	98%	95%	96%	97%	98%	98%	99%	98%	98%	97%
20:00	99%	98%	97%	96%	99%	99%	100%	100%	99%	99%	97%	99%
21:00	98%	97%	98%	98%	99%	99%	99%	99%	99%	99%	98%	98%
22:00	98%	98%	97%	96%	100%	99%	99%	99%	99%	99%	97%	98%
23:00	98%	98%	98%	97%	100%	100%	99%	99%	100%	98%	98%	98%

Table 7 Runway 15 Capability of Supporting Operations

Likelihood of Runway 33 Capable (Headwind >= -10 Kts, Crosswind <= 30 Kts)

Local Time	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00:00	97%	98%	96%	94%	96%	95%	96%	95%	96%	95%	95%	98%
01:00	98%	98%	95%	94%	95%	97%	97%	97%	98%	95%	96%	99%
02:00	99%	98%	96%	95%	96%	97%	97%	97%	97%	95%	96%	98%
03:00	99%	98%	96%	96%	97%	97%	98%	97%	98%	94%	97%	98%
04:00	99%	99%	94%	94%	95%	98%	98%	98%	98%	96%	99%	98%
05:00	98%	99%	96%	95%	96%	98%	99%	98%	98%	96%	98%	99%
06:00	99%	99%	97%	96%	96%	97%	99%	98%	99%	98%	97%	99%
07:00	99%	99%	96%	96%	95%	96%	99%	99%	98%	97%	98%	99%
08:00	99%	97%	95%	92%	92%	97%	100%	99%	99%	97%	96%	99%
09:00	99%	97%	93%	88%	86%	93%	99%	99%	96%	95%	96%	98%
10:00	98%	95%	91%	85%	82%	90%	98%	98%	94%	93%	94%	97%
11:00	96%	94%	91%	82%	84%	90%	97%	97%	93%	93%	94%	96%
12:00	99%	95%	89%	84%	82%	87%	95%	96%	92%	93%	92%	97%
13:00	99%	94%	89%	82%	81%	86%	93%	94%	91%	92%	94%	97%
14:00	98%	95%	89%	80%	81%	86%	92%	94%	89%	93%	95%	96%
15:00	98%	95%	90%	84%	80%	89%	90%	89%	89%	94%	95%	97%
16:00	99%	96%	92%	85%	84%	91%	86%	88%	91%	94%	97%	97%
17:00	99%	96%	92%	86%	83%	88%	84%	86%	91%	93%	98%	98%
18:00	99%	97%	97%	89%	87%	91%	83%	84%	91%	97%	96%	98%
19:00	100%	99%	95%	92%	87%	91%	89%	89%	92%	97%	97%	97%
20:00	99%	99%	95%	96%	90%	90%	86%	90%	94%	97%	98%	99%
21:00	99%	98%	96%	94%	93%	92%	86%	94%	96%	97%	96%	98%
22:00	99%	99%	94%	93%	95%	92%	91%	93%	97%	96%	95%	99%
23:00	99%	98%	96%	94%	95%	94%	93%	96%	95%	96%	96%	99%

Table 8 Runway 33 Capable of Supporting Operations

6.2.4 Pressure

The historical pressure analysis focusses on two key metrics using the local station altimeter corrections that are reported by the ASOS, and that are applied by pilots both in the cockpit and to aircraft performance results: the 50 percent and 15 percent likelihood.

The 50 percent likelihood, like historical temperature results, represents the mean pressure correction (QNH) expressed in terms of inches of Mercury. The values are presented by month, by hour, and color coded to match aircraft performance benefits. Green cells represent mean pressure corrections that are either standard or higher than standard, resulting in lower pressure altitudes for aircraft performance considerations. Yellow cells represent lower than standard pressure corrections which could result in aircraft performance penalties. Orange cells represent significantly lower than standard pressure altitude corrections that could lead to large aircraft performance penalties.

As seen in the 50 percent likelihood QNH Table 9, most of the months/hours of operation at ASE experience standard or higher than standard pressure events yielding beneficial aircraft performance outcomes. However, aircraft operators will not typically use higher than standard pressure corrections when scheduling flights, or planning for available payload to list for sale in a market, waiting instead to take advantage of the small boost on the day of the operation. Instead, operators are typically more concerned about prolonged, or highly likely, periods of lower than standard pressure that must be accounted for. This is best analyzed by using a 15 percent likelihood QNH analysis.

The 15 percent likelihood analysis represents the planning pressure correction, for long range scheduling payload estimation. This is shown in Table 10 using the same color coding as the 50 percent likelihood table. From this analysis two important trends can be observed. The first is that between March and June, the likelihood that the pressure altitude needs to be corrected in a way that will impact aircraft performance is non-trivial. This means that operators will most likely have to account for higher than standard pressure altitudes that could decrease available payload on both takeoff and landing.

The second trend is that the pressure fluctuation in October and November is significant enough that certain operators may consider taking some form of low pressure correction into consideration when considering long range payload planning.

50% Likelihood QNH (inHg)

Local Time	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00:00	30.24	30.08	30.01	29.88	29.89	29.87	29.95	29.97	29.99	30.04	30.13	30.13
01:00	30.24	30.06	30.01	29.89	29.89	29.87	29.95	29.97	29.99	30.03	30.14	30.13
02:00	30.27	30.06	30.00	29.88	29.89	29.86	29.95	29.97	29.99	30.04	30.12	30.15
03:00	30.26	30.07	29.99	29.86	29.89	29.87	29.95	29.97	30.00	30.04	30.14	30.15
04:00	30.29	30.07	29.99	29.87	29.89	29.88	29.97	29.98	30.00	30.05	30.17	30.17
05:00	30.31	30.10	30.03	29.88	29.91	29.91	29.98	29.99	30.01	30.08	30.20	30.19
06:00	30.33	30.11	30.04	29.91	29.92	29.91	30.00	30.02	30.05	30.11	30.23	30.19
07:00	30.32	30.11	30.06	29.92	29.91	29.91	30.00	30.03	30.07	30.13	30.21	30.20
08:00	30.32	30.09	30.05	29.91	29.91	29.90	30.00	30.03	30.06	30.11	30.19	30.19
09:00	30.28	30.09	30.04	29.89	29.88	29.89	29.98	30.01	30.04	30.08	30.17	30.17
10:00	30.25	30.06	30.02	29.88	29.87	29.87	29.96	29.99	30.01	30.05	30.15	30.15
11:00	30.21	30.06	29.99	29.85	29.85	29.85	29.94	29.97	29.98	30.03	30.12	30.11
12:00	30.17	30.02	29.96	29.85	29.85	29.85	29.93	29.95	29.96	30.01	30.09	30.09
13:00	30.16	30.01	29.94	29.83	29.85	29.83	29.91	29.94	29.95	29.99	30.07	30.08
14:00	30.17	30.00	29.93	29.82	29.84	29.84	29.91	29.93	29.93	29.97	30.07	30.08
15:00	30.18	30.01	29.93	29.82	29.84	29.83	29.90	29.92	29.93	29.97	30.08	30.11
16:00	30.23	30.04	29.94	29.82	29.84	29.83	29.90	29.92	29.93	29.98	30.13	30.13
17:00	30.28	30.07	29.95	29.85	29.85	29.83	29.91	29.93	29.94	30.01	30.16	30.20
18:00	30.30	30.09	29.99	29.86	29.85	29.84	29.92	29.94	29.98	30.05	30.19	30.22
19:00	30.32	30.11	30.02	29.87	29.85	29.84	29.93	29.96	30.01	30.09	30.19	30.23
20:00	30.31	30.10	30.03	29.89	29.87	29.86	29.95	29.98	30.02	30.07	30.17	30.22
21:00	30.28	30.10	30.03	29.89	29.88	29.88	29.96	29.98	30.01	30.07	30.16	30.20
22:00	30.27	30.09	30.03	29.89	29.89	29.88	29.95	29.98	30.00	30.06	30.14	30.18
23:00	30.25	30.08	30.01	29.89	29.89	29.87	29.95	29.97	29.99	30.05	30.13	30.15

Table 9 50 percent Likelihood QNH (inHg) - Mean Pressure Correction

15% Likelihood QNH (inHg)

Local Time	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00:00	29.89	29.81	29.75	29.63	29.66	29.72	29.86	29.88	29.84	29.80	29.80	29.82
01:00	29.91	29.80	29.73	29.62	29.66	29.72	29.86	29.87	29.83	29.78	29.81	29.83
02:00	29.93	29.80	29.73	29.62	29.66	29.72	29.85	29.87	29.82	29.78	29.78	29.87
03:00	29.93	29.81	29.72	29.62	29.67	29.71	29.86	29.88	29.82	29.75	29.81	29.87
04:00	29.97	29.80	29.74	29.62	29.68	29.73	29.88	29.89	29.82	29.79	29.85	29.89
05:00	29.97	29.83	29.77	29.64	29.70	29.76	29.90	29.91	29.86	29.80	29.87	29.88
06:00	30.00	29.84	29.78	29.66	29.69	29.77	29.91	29.93	29.89	29.83	29.90	29.91
07:00	29.98	29.83	29.78	29.66	29.70	29.76	29.91	29.94	29.91	29.86	29.89	29.91
08:00	29.99	29.84	29.79	29.66	29.69	29.76	29.92	29.93	29.91	29.84	29.89	29.90
09:00	30.00	29.84	29.74	29.65	29.69	29.75	29.89	29.92	29.90	29.82	29.85	29.88
10:00	29.96	29.82	29.71	29.64	29.66	29.73	29.88	29.90	29.87	29.81	29.83	29.86
11:00	29.91	29.79	29.74	29.63	29.65	29.72	29.86	29.88	29.86	29.80	29.80	29.85
12:00	29.87	29.75	29.72	29.63	29.63	29.72	29.83	29.86	29.84	29.76	29.79	29.82
13:00	29.84	29.77	29.71	29.61	29.64	29.71	29.83	29.85	29.83	29.76	29.76	29.80
14:00	29.85	29.77	29.70	29.62	29.63	29.71	29.82	29.84	29.81	29.73	29.76	29.81
15:00	29.85	29.78	29.70	29.61	29.63	29.70	29.81	29.83	29.80	29.74	29.77	29.82
16:00	29.92	29.78	29.72	29.61	29.64	29.70	29.82	29.83	29.80	29.74	29.80	29.83
17:00	29.95	29.82	29.71	29.62	29.63	29.69	29.82	29.83	29.81	29.78	29.83	29.87
18:00	29.94	29.83	29.76	29.64	29.64	29.69	29.82	29.85	29.84	29.82	29.87	29.90
19:00	29.98	29.86	29.77	29.65	29.65	29.69	29.83	29.87	29.86	29.86	29.88	29.90
20:00	30.00	29.84	29.79	29.66	29.67	29.71	29.85	29.88	29.88	29.84	29.85	29.91
21:00	29.96	29.83	29.79	29.66	29.69	29.72	29.87	29.89	29.87	29.83	29.84	29.88
22:00	29.95	29.81	29.78	29.65	29.68	29.72	29.87	29.88	29.85	29.83	29.82	29.87
23:00	29.93	29.80	29.74	29.63	29.68	29.72	29.86	29.88	29.85	29.82	29.80	29.85

Table 10 15 percent Likelihood QNH (inHg) - Planning Pressure Correction

Aircraft that operate into ASE that are subject to 8,000 ft pressure altitude takeoff and landing limitations will be especially susceptible to the values presented in these two likelihood QNH tables. Because of the high field elevation, 7,830ft on the runway 33 threshold, any local pressure altitude corrections below a QNH of 29.74 inHg will potentially place the aircraft outside of the certified pressure altitude envelope. When this occurs, the aircraft can not execute an approach, nor can it takeoff leading to delays or cancellations.

Based on the analysis presented in the tables, the highest likelihood for this to occur would be in the spring timeframe leading to more complex decisions from scheduled aircraft operators of planes like the EMB-175LR or CS-100 (A220-100) where conditions may dictate substitutions or cancellations rather than payload reductions or delays.

6.2.5 Runway Conditions

The determination of historical runway conditions requires a combination of two time-weighted sources of information. The first is the primary source information, used for all other historical weather data parameters, from the ASOS sensor. Historically, the ASOS has not been the most accurate predictor of runway conditions. The sensor can sense current precipitation, fog, and past snow accumulation, but it is not capable of determining how these events translate into an accurate picture of treated or untreated runway surfaces at any particular time.

Following the implementation of the TALPA ARC recommendations in 2015/16, ASE began utilizing Field Condition NOTAMs (FICONs) which utilized the Runway Condition

Codes (RCC) to report wet and contaminated runway conditions along the runway. These FICONS, when issued by the airport, represent a second source of information available for consideration when determining runway conditions related to aircraft performance and operational feasibility.

By combining the FICONs, and the historical ASOS readings, into a single database through which the time-weighting process can be applied, a new more accurate picture of historical runway condition likelihoods can be presented.

For more information on the analysis of FICONs performed in this report, see Appendix 1 FICONS vs ASOS.

The traditional product of runway condition analysis is a determination of wet conditions on the runway. The combination of sources is presented in Table 11 in terms of a likelihood that the runway will be wet. The table is color coded to show percentages that are significant to aircraft performance considerations. Green cells represent hours when the runway would not likely be considered wet. White cells represent periods when the runway could be wet, but not to an extent that long range payload forecasting would need to reflect it. Yellow cells represent periods where the runway would most likely considered to be wet for long range payload planning purposes.

Likelihood of Wet Runway from FICON Or ASOS

Local Time	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00:00	27%	18%	12%	24%	3%	0%	3%	3%	3%	12%	11%	15%
01:00	26%	24%	11%	24%	5%	0%	6%	2%	0%	12%	9%	17%
02:00	23%	30%	12%	26%	3%	0%	7%	1%	0%	9%	11%	12%
03:00	24%	20%	11%	24%	5%	0%	7%	5%	0%	15%	15%	16%
04:00	23%	17%	12%	24%	2%	0%	3%	0%	3%	13%	13%	19%
05:00	26%	18%	11%	19%	3%	0%	3%	0%	3%	11%	11%	13%
06:00	24%	23%	16%	22%	3%	0%	3%	0%	3%	13%	16%	13%
07:00	26%	30%	12%	22%	4%	0%	3%	2%	3%	20%	17%	14%
08:00	29%	21%	13%	22%	2%	0%	3%	2%	3%	15%	17%	17%
09:00	30%	28%	14%	16%	2%	0%	0%	0%	0%	11%	18%	11%
10:00	31%	27%	11%	16%	4%	0%	0%	0%	7%	6%	18%	14%
11:00	33%	23%	6%	7%	5%	0%	0%	0%	1%	3%	20%	17%
12:00	34%	25%	5%	15%	2%	2%	0%	0%	3%	7%	18%	11%
13:00	21%	22%	7%	19%	0%	4%	6%	14%	4%	0%	15%	11%
14:00	22%	19%	11%	9%	5%	7%	9%	3%	7%	7%	11%	8%
15:00	19%	21%	8%	11%	6%	0%	17%	1%	12%	9%	13%	10%
16:00	18%	13%	10%	12%	8%	1%	17%	9%	12%	5%	10%	14%
17:00	17%	16%	13%	17%	5%	1%	11%	8%	3%	4%	12%	15%
18:00	18%	13%	13%	13%	10%	5%	21%	12%	8%	5%	10%	21%
19:00	13%	20%	15%	17%	4%	0%	9%	9%	11%	5%	9%	19%
20:00	19%	19%	14%	19%	6%	0%	9%	11%	4%	7%	13%	16%
21:00	17%	23%	13%	21%	7%	0%	0%	7%	12%	7%	11%	21%
22:00	21%	17%	9%	20%	1%	0%	3%	0%	19%	7%	12%	19%
23:00	27%	19%	13%	29%	2%	0%	3%	3%	10%	8%	12%	20%

Table 11 Likelihood of Wet Runway As Reported by Either FICON or ASOS

The wet runway analysis depicts an intuitive picture of wet runway surface conditions representing the likelihood of snow/rain events from November through April with the possibility of afternoon pop up rain/thunderstorms in July, August and September.

While it was anticipated that adding in FICONs, along with a general refresh of historical weather data from the 2014 analysis would yield minor differences, there is a substantial increase in the likelihood of wet runway conditions in the winter months. This is considered to be a more accurate representation.

In addition to the increased accuracy of a simple wet determination, additional runway conditions can be assessed based on the RCC code published in the preceding 2 years of FICON data.

RCC values are generally published in a FICON for each 1/3rd of the runway length. However, aircraft operators seldom make the distinction between sections of the runway that have different conditions yielding a consideration that the lowest RCC for any 1/3rd of the runway will be considered as a uniform value across the entire length.

With that consideration in mind, Table 12, Table 13 and Table 14 were created to represent the likelihood of an RCC of 5 (akin to wet runway conditions) and RCC of 3 (akin to thin layers of slush or snow accumulation) and an RCC of 1 (akin to ice). The historical likelihood of RCC 3 and 1 indicates that for the previous 2 years, ASE has worked hard to keep the runway clean of contamination during snow events resulting in RCC values of 5 rather than anything worse. This means that wet runway likelihoods identified in Table 12 are also good indicators of periods when air carriers would consider the runway at ASE to be wet for payload forecasting purposes.

It should be noted that there are periods where no FICON was issued, but the ASOS indicated a precipitation event. For further evidence of this phenomenon, please see Appendix 1. The most apparent reason for this discrepancy is that the airport may not have any operational requirement to report RCC values during time periods of the year when snow events would not be anticipated, between May and September. Therefore, the most accurate determination of the likelihood of wet runway conditions was determined to be a combination of ASOS and FICON based results rather than just the FICON RCC values as shown in Table 11

Likelihood of RCC 5

Local Time	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00:00	10%	16%	11%	17%	0%	0%	0%	0%	0%	8%	5%	9%
01:00	12%	19%	9%	14%	0%	0%	0%	0%	0%	7%	6%	11%
02:00	10%	17%	8%	13%	0%	0%	0%	0%	0%	7%	9%	7%
03:00	12%	14%	10%	17%	0%	0%	0%	0%	0%	8%	6%	10%
04:00	11%	14%	11%	13%	0%	0%	0%	0%	0%	7%	8%	12%
05:00	11%	13%	9%	11%	0%	0%	0%	0%	0%	7%	7%	7%
06:00	16%	17%	13%	16%	0%	0%	0%	0%	0%	10%	9%	7%
07:00	23%	26%	12%	19%	0%	0%	0%	0%	0%	16%	12%	13%
08:00	26%	20%	13%	20%	0%	0%	0%	0%	0%	13%	14%	13%
09:00	27%	25%	14%	13%	0%	0%	0%	0%	0%	11%	15%	10%
10:00	31%	24%	11%	13%	0%	0%	0%	0%	0%	6%	15%	11%
11:00	33%	23%	5%	5%	0%	0%	0%	0%	0%	3%	19%	11%
12:00	29%	19%	3%	7%	0%	0%	0%	0%	0%	5%	17%	8%
13:00	16%	13%	5%	8%	0%	0%	0%	0%	0%	0%	15%	9%
14:00	16%	12%	10%	1%	0%	0%	0%	0%	0%	0%	8%	8%
15:00	16%	16%	7%	5%	0%	0%	0%	0%	0%	6%	12%	8%
16:00	12%	11%	5%	1%	0%	0%	0%	0%	0%	5%	9%	11%
17:00	11%	12%	9%	7%	0%	0%	0%	0%	0%	3%	11%	11%
18:00	12%	6%	9%	10%	0%	0%	0%	0%	0%	5%	8%	17%
19:00	12%	16%	12%	11%	0%	0%	0%	0%	0%	5%	8%	17%
20:00	14%	15%	14%	15%	0%	0%	0%	0%	0%	5%	11%	13%
21:00	16%	19%	12%	17%	0%	0%	0%	0%	1%	6%	9%	20%
22:00	16%	14%	9%	16%	0%	0%	0%	0%	5%	4%	11%	13%
23:00	11%	17%	9%	16%	0%	0%	0%	0%	3%	5%	8%	15%

Table 12 Likelihood of FICON Reporting an RCC of 5 or better

Likelihood of RCC 3

Local Time

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00:00	10%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	5%
01:00	8%	0%	0%	0%	0%	0%	0%	0%	0%	3%	1%	6%
02:00	8%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	4%
03:00	8%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	5%
04:00	8%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	5%
05:00	8%	0%	0%	0%	0%	0%	0%	0%	0%	3%	2%	4%
06:00	5%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	4%
07:00	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%
08:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
09:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%
11:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
14:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
15:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
16:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
17:00	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
18:00	4%	2%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
19:00	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
20:00	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
22:00	5%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	3%
23:00	10%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	2%

Table 13 Likelihood of FICON Reporting an RCC of 3 or Better

Likelihood of RCC 1

Local Time

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
01:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
02:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
03:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
04:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
05:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
06:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%
07:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
08:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
09:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
10:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
11:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
12:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
14:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
15:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
16:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
17:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
18:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
19:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
20:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Table 14 Likelihood of FICON Reporting an RCC of 1 or Better

6.2.6 Ceiling and Visibility

When assessing both the feasibility of aircraft operations, and the impact to approach and departure procedures following the runway relocation, it is critical to have an accurate historical weather based picture of both runway usage (based on winds in section 5.2.3) and on the anticipated ceiling and visibility at the airport during operational hours.

Historical weather data was analyzed for combinations of ceilings, which are cloud layers that obscure the runway from sight above the airport, and visibility, which is the obscuration of the runway across a distance. Each combination of ceilings and visibility are then classified into a likelihood of one satisfying an operational state, an approach procedure or departure procedures. By combining the minimums into this type of analysis a more accurate picture of conditions at the airport can be applied to the capacity assessment analysis, in section 9, and all other impact and feasibility assessments in this report.

Due to the challenging nature of the approach and departure operations at ASE, the historical ceiling and visibility combinations were broken down into 3 meaningful combinations: VMC, LOC Special and Departure.

The VMC, or Visual Meteorological Conditions, at ASE are not the standard 1,000ft ceilings and 3 miles of visibility that pilots would encounter at normal airports. At ASE, the VMC conditions are considered to be 6,000ft and 10 miles. These conditions also correspond to air traffic's ability to operate ASE under the Wrap opposite direction operations, which is described in more detail in section 5.3. The likelihood of ASE operating in those VMC conditions, or better, is expressed in Table 15. From this table the airport apparently operates in VMC conditions over 50 percent of the time with generally high periods of VMC in the summer time.

Likelihood of VMC (Ceilings = 6,000ft, Vis = 10 Miles)

Local Time	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00:00	44%	39%	54%	50%	61%	78%	65%	62%	67%	64%	57%	39%
01:00	43%	40%	51%	46%	58%	78%	68%	66%	70%	60%	60%	37%
02:00	42%	39%	50%	46%	59%	77%	71%	69%	66%	64%	56%	38%
03:00	41%	40%	49%	46%	60%	82%	73%	69%	68%	60%	56%	38%
04:00	41%	40%	49%	47%	58%	81%	72%	70%	66%	61%	55%	36%
05:00	43%	39%	50%	46%	61%	84%	74%	70%	63%	59%	57%	36%
06:00	49%	43%	57%	55%	65%	88%	86%	80%	75%	65%	65%	42%
07:00	57%	48%	65%	57%	66%	89%	84%	82%	78%	72%	68%	48%
08:00	61%	51%	67%	57%	69%	89%	89%	81%	76%	74%	71%	50%
09:00	62%	53%	66%	61%	70%	90%	88%	80%	76%	73%	69%	53%
10:00	62%	52%	67%	59%	67%	86%	85%	80%	75%	72%	71%	55%
11:00	61%	54%	68%	60%	61%	83%	83%	78%	73%	70%	67%	55%
12:00	60%	55%	65%	57%	55%	81%	78%	73%	71%	68%	69%	56%
13:00	61%	50%	65%	56%	56%	77%	69%	61%	69%	67%	66%	54%
14:00	56%	50%	62%	51%	52%	78%	67%	62%	68%	66%	71%	55%
15:00	57%	52%	63%	51%	52%	77%	66%	62%	71%	66%	68%	54%
16:00	55%	49%	63%	51%	51%	75%	63%	63%	69%	68%	69%	53%
17:00	52%	51%	61%	54%	56%	75%	60%	63%	69%	68%	66%	48%
18:00	49%	42%	61%	53%	57%	79%	66%	66%	71%	66%	65%	45%
19:00	49%	40%	58%	52%	63%	79%	66%	68%	69%	64%	63%	45%
20:00	48%	41%	55%	47%	58%	78%	66%	64%	64%	68%	61%	48%
21:00	44%	41%	48%	46%	62%	71%	62%	59%	64%	66%	60%	43%
22:00	40%	40%	51%	47%	59%	74%	66%	60%	64%	67%	55%	41%
23:00	40%	40%	51%	43%	60%	78%	66%	62%	67%	62%	57%	38%

Table 15 Likelihood of ASE Operating in VMC (6,000ft - 10 Miles)

The second set of ceiling and visibility conditions to consider are those associated with the localizer approach reserved for special authorization, referred to as the LOC Special. This procedure, which has the lowest publicly available minimums, requires a ceiling of 1,000ft and 2 ¾ miles of visibility. The historical likelihood of encountering those minimums, or better, is expressed in Table 16.

One of the more noteworthy aspects about the historical likelihood of the airport operating at or above LOC Special minimums is that there is only a small increase in likelihood of the airport operating under these conditions when compared to VMC. However, because this approach represents the lowest possible approach minimums at the airport, it also reveals the relatively high likelihood that the airport may be closed to arriving flights between December through May.

Likelihood of Current LOC Special (Ceilings = 1,000ft, Vis = 2 - 3/4 Miles)

Local Time	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00:00	45%	41%	54%	51%	63%	81%	73%	69%	72%	66%	58%	41%
01:00	44%	40%	51%	47%	60%	83%	73%	70%	73%	62%	62%	39%
02:00	43%	39%	50%	47%	62%	83%	75%	74%	70%	66%	56%	39%
03:00	43%	41%	50%	47%	62%	85%	78%	74%	73%	61%	57%	40%
04:00	42%	40%	50%	47%	60%	84%	77%	75%	69%	63%	57%	39%
05:00	43%	41%	51%	46%	65%	89%	78%	75%	68%	61%	58%	39%
06:00	51%	44%	59%	56%	67%	90%	89%	84%	76%	66%	65%	45%
07:00	59%	50%	66%	58%	68%	90%	88%	85%	80%	73%	68%	51%
08:00	61%	54%	68%	59%	74%	90%	91%	84%	78%	75%	72%	54%
09:00	63%	56%	67%	62%	73%	92%	90%	84%	77%	75%	70%	56%
10:00	63%	53%	68%	60%	69%	87%	87%	83%	76%	73%	72%	57%
11:00	61%	55%	68%	60%	65%	85%	86%	80%	76%	72%	68%	56%
12:00	61%	56%	65%	58%	59%	83%	81%	77%	73%	69%	69%	58%
13:00	61%	51%	65%	57%	58%	81%	73%	67%	73%	70%	68%	55%
14:00	56%	50%	64%	54%	57%	82%	72%	70%	72%	68%	71%	55%
15:00	59%	53%	64%	54%	55%	80%	70%	70%	76%	68%	69%	55%
16:00	56%	51%	64%	53%	55%	80%	69%	70%	73%	69%	72%	55%
17:00	52%	52%	63%	56%	59%	80%	68%	70%	73%	69%	67%	52%
18:00	50%	44%	62%	56%	61%	83%	71%	73%	76%	67%	67%	47%
19:00	50%	41%	59%	54%	65%	86%	70%	75%	75%	65%	64%	49%
20:00	49%	43%	58%	48%	62%	81%	73%	69%	71%	69%	62%	51%
21:00	45%	43%	50%	49%	66%	76%	68%	67%	69%	67%	61%	45%
22:00	42%	41%	52%	49%	62%	77%	71%	69%	69%	68%	57%	44%
23:00	41%	42%	52%	45%	62%	81%	73%	68%	72%	64%	59%	41%

Table 16 Likelihood of ASE Operating At or Above LOC Special Minimums (1,000ft - 2 3/4 miles)

The final set of ceiling and visibility conditions to consider are those associated with departures from ASE. While the departure minimums are usually specific to operator approvals from the FAA, a general set of conditions that could be used by most aircraft operators would be a ceiling of 400ft and a visibility of 1 mile (taken from the current departure procedure minimums). The results of this combination are shown in Table 17.

This analysis reveals that while there are periods where aircraft may not be able to arrive into ASE, the likelihood of being able to operate aircraft departures out of ASE remains high, with near 100 percent likelihood during June through September and approximately 80 percent or better likelihood throughout the remainder of the year.

Likelihood of Departure Mins (Ceilings = 400ft, Vis = 1 Miles)

Local Time	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00:00	78%	79%	84%	79%	88%	99%	99%	98%	97%	89%	83%	75%
01:00	77%	76%	83%	75%	87%	98%	98%	97%	97%	87%	85%	78%
02:00	78%	74%	84%	74%	87%	97%	99%	96%	98%	88%	83%	76%
03:00	76%	75%	83%	74%	87%	97%	99%	97%	97%	86%	83%	75%
04:00	75%	74%	83%	76%	88%	97%	97%	96%	96%	88%	81%	77%
05:00	75%	76%	84%	76%	87%	98%	98%	96%	96%	86%	83%	76%
06:00	74%	74%	79%	75%	85%	98%	99%	97%	96%	87%	81%	71%
07:00	72%	74%	83%	78%	86%	98%	99%	98%	96%	86%	83%	73%
08:00	75%	75%	83%	77%	88%	98%	100%	98%	96%	88%	86%	74%
09:00	79%	77%	81%	80%	88%	98%	100%	98%	96%	88%	83%	76%
10:00	79%	76%	84%	79%	87%	98%	98%	99%	95%	89%	87%	79%
11:00	81%	78%	84%	78%	88%	98%	97%	98%	97%	89%	85%	79%
12:00	81%	77%	85%	81%	87%	97%	98%	99%	97%	88%	85%	80%
13:00	82%	77%	87%	82%	90%	97%	97%	97%	95%	90%	84%	77%
14:00	79%	78%	86%	84%	89%	97%	99%	99%	97%	91%	89%	79%
15:00	81%	78%	85%	84%	87%	98%	99%	98%	97%	89%	87%	79%
16:00	80%	76%	85%	85%	88%	98%	99%	98%	97%	92%	88%	79%
17:00	79%	78%	84%	83%	88%	98%	99%	97%	98%	89%	88%	79%
18:00	79%	80%	85%	81%	87%	98%	98%	98%	99%	88%	88%	75%
19:00	78%	77%	86%	83%	90%	98%	99%	98%	98%	90%	87%	79%
20:00	77%	78%	85%	81%	90%	98%	99%	99%	96%	92%	85%	76%
21:00	77%	78%	86%	81%	90%	98%	99%	98%	96%	93%	86%	77%
22:00	76%	77%	85%	80%	88%	98%	98%	98%	95%	89%	85%	77%
23:00	78%	77%	82%	79%	90%	97%	98%	97%	96%	88%	86%	76%

Table 17 Likelihood of Operating Under Departure Minimums (400ft - 1 mile)

6.2.7 Likelihood of Anti-Ice Usage

The potential for aircraft operators to have to utilize partial, or total, onboard anti-icing systems can be expressed as a likelihood by hour and month based on historical weather conditions when moisture is present in the air and the outside air temperature is at or below 10C. By combining the previous analysis of wet runway operations, the possibility of low visibility conditions along the takeoff and landing procedure and an outside air temperature on the field at or below 10C, a conservative analysis can be expressed as a likelihood that operators would have to consider anti-ice penalties.

The results are color coded to correspond to different applications of anti-ice system penalties. Green cells represent very low, to no, likelihood of using anti-ice. White cells represent a typical expectation of anti-ice usage, but would not likely impact any long range payload planning considerations. Yellow cells represent a more significant likelihood of anti-ice usage which would very likely be considered for takeoff performance considerations and, potentially, for landing performance limitations.

The results of the analysis are presented in Table 18. Once the OAT increases, May through October, the likelihood of operators considering anti-ice application is all but eliminated. It is also apparent from this table, and perhaps not unexpected, to see the relatively high likelihood of anti-ice application from December until April. It is therefore anticipated that aircraft performance considerations in the winter and spring would potentially consider at least engine anti-ice as being active.

Likelihood of Anti-Ice Usage

Local Time	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00:00	10%	10%	7%	13%	4%	0%	0%	0%	1%	3%	12%	9%
01:00	10%	14%	10%	21%	4%	1%	0%	1%	1%	3%	7%	9%
02:00	9%	9%	10%	19%	3%	2%	0%	0%	0%	1%	4%	11%
03:00	11%	12%	7%	7%	5%	1%	0%	0%	0%	4%	9%	13%
04:00	12%	8%	11%	15%	6%	1%	0%	0%	0%	2%	12%	11%
05:00	14%	13%	13%	13%	7%	1%	0%	0%	1%	4%	16%	12%
06:00	13%	12%	14%	17%	10%	1%	0%	1%	2%	5%	9%	11%
07:00	15%	16%	13%	18%	5%	1%	0%	0%	2%	6%	9%	13%
08:00	17%	20%	15%	17%	4%	1%	0%	1%	1%	4%	7%	15%
09:00	19%	16%	11%	16%	5%	0%	0%	0%	2%	4%	8%	18%
10:00	17%	12%	15%	18%	6%	1%	0%	0%	1%	6%	8%	20%
11:00	14%	14%	9%	19%	7%	2%	0%	0%	1%	4%	7%	16%
12:00	14%	20%	17%	17%	7%	1%	0%	0%	1%	5%	7%	17%
13:00	13%	22%	15%	13%	5%	2%	0%	0%	2%	5%	9%	16%
14:00	12%	30%	20%	19%	7%	2%	0%	0%	2%	8%	7%	13%
15:00	14%	19%	19%	14%	8%	2%	0%	0%	2%	7%	12%	19%
16:00	16%	20%	12%	17%	6%	2%	0%	0%	1%	6%	9%	16%
17:00	12%	21%	16%	22%	5%	0%	0%	0%	0%	7%	9%	11%
18:00	11%	16%	13%	21%	9%	1%	0%	1%	1%	8%	7%	14%
19:00	15%	14%	11%	20%	7%	0%	0%	0%	1%	8%	7%	11%
20:00	13%	12%	10%	19%	7%	1%	0%	0%	2%	5%	9%	12%
21:00	9%	16%	12%	18%	5%	0%	0%	0%	2%	4%	6%	18%
22:00	12%	19%	17%	19%	6%	1%	0%	0%	2%	4%	6%	14%
23:00	12%	10%	9%	17%	7%	2%	0%	0%	3%	7%	7%	13%

Table 18 Likelihood of Anti-Ice Usage for Planning Purposes

It should be noted that aircraft have different levels of anti-ice usage onboard an aircraft. Aircraft departing ASE during the potential for Anti-Ice usage will most likely have received a de-ice treatment and will only need to consider the application of engine anti-ice as opposed to both wing and engine anti-ice system bleeds. For aircraft arriving into ASE, the need to consider wing anti-ice will depend on operator and manufacturer policy coupled with pilot inspection.

6.3 AIRSPACE AND AIR TRAFFIC FLOW[1]

Aspen/Pitkin County Airport (ASE) possesses a unique and complex flight environment. The mountainous terrain surrounding the Airport requires arriving and departing aircraft to operate in opposite direction of each other. Over 90 percent of landing aircraft use Runway 15 and 95 percent of departing aircraft use Runway 33. The LINDZ8 Standard Instrument Departure (SID) combined with local air traffic procedures for Opposite Direction Operations allow for the safe flow of traffic in and out of Aspen Airport. These procedures are locally known as the “Westbound in front of” and the “Wrap.” There

[1] Text from this sections text and images were taken from FAA LTA-ASE-3

are no significant impacts to airspace or air traffic flow relative to the aircraft expected to operate at ASE following the runway shift.

6.3.1 Westbound In Front Of

The "Westbound in front of" procedure utilizes Tower Applied Visual Separation and will be used when there is adequate spacing on the final approach path to allow a Runway 33 departure to become airborne, climb through 9100' MSL, and make the left turn to 273 degrees per to the LINDZ SID prior to the arrival aircraft reaching a point 5-7 miles from Runway 15. Depending on the arrival aircraft speed and anticipated departure aircraft performance, the controller will issue a takeoff clearance and traffic information in time for the Runway 33 departure to start rolling prior to the Runway 15 arrival reaching a point approximately 10 miles from the airport. When Tower Applied Visual Separation is not possible, this distance will be increased to 12 miles or more. Flight crews should promptly depart, climb through 9100' and execute the left turn to heading 273 degrees per the LINDZ SID in an expeditious manner to facilitate this air traffic separation procedure. Normal separation from other Instrument Flight Rules (IFR) aircraft will be ensured as soon as the departure aircraft crosses the final approach course, westbound on a 273 degree heading.

6.3.2 The Wrap

The "Wrap" procedure will be used when a Runway 15 arrival aircraft is closer to the runway. Tower Applied Visual Separation will be utilized during this procedure, requiring Visual Meteorological Conditions (VMC) to be present to conduct the "Wrap" procedure. The Tower controller will issue a line-up-and-wait clearance (LUAW) to the departure aircraft for Runway 33, then issue a takeoff clearance and traffic information in time for the departure aircraft to begin rolling prior to the opposite direction arrival reaching a point 5 miles from Runway 15. Once airborne, the departing aircraft immediately turns right to a 343 heading per the LINDZ SID, offsetting east of the arriving aircraft's final approach path. When properly timed and executed, the arriving and departing aircraft will safely pass approximately 1-2 miles north of the Runway.

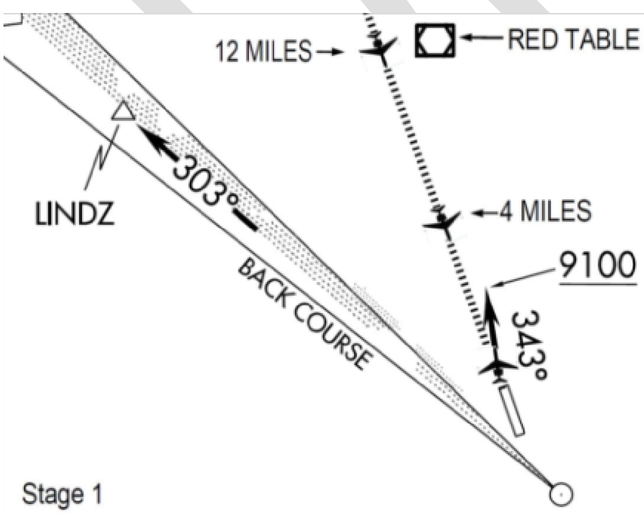


Figure 1 Opposite Direction Operation - Stage 1

In Figure 1Departure aircraft was issued a takeoff clearance in LUAW, when the first arrival aircraft was on approximately a 5 ½ mile final. Crew promptly complied with the takeoff clearance, then immediately turned right to a 343 heading per the LINDZ SID.

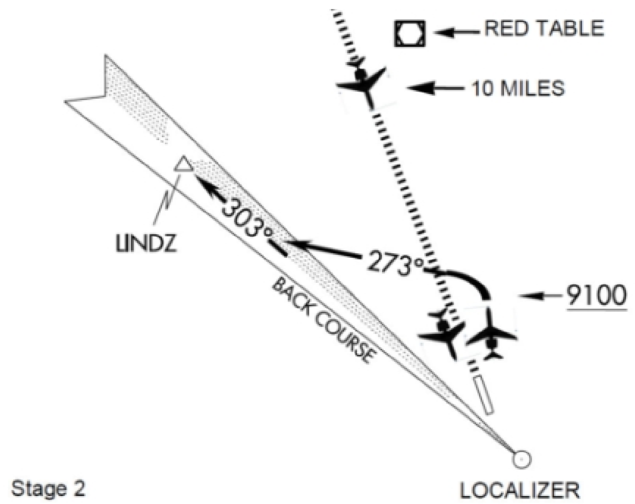


Figure 2 Opposite Direction Operation - Stage 2

In Figure 2 Departure aircraft and first arrival aircraft pass approximately 1-2 miles north of the Runway. The departing aircraft climb through 9,100' MSL and promptly turns left to a 273 heading "West bound in front of" the second arrival aircraft, now on a 7-10 mile final.

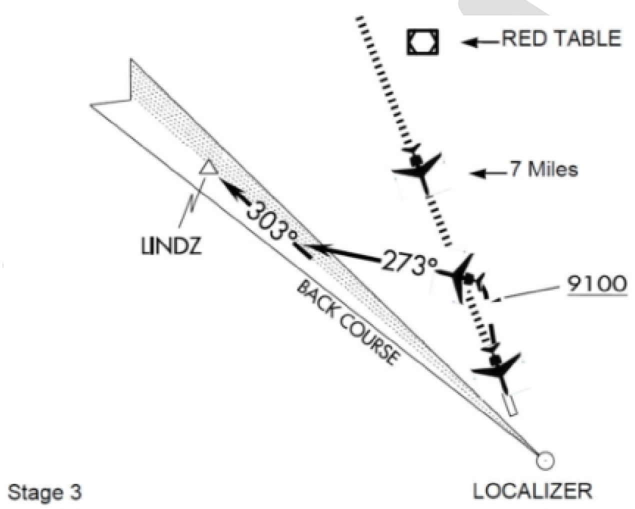


Figure 3 Opposite Direction Operation - Stage 3

In Figure 3 Departure aircraft crossed the Runway 15 final approach path in front of the second arrival aircraft. Tower Applied Visual Separation now ends and normal IFR separation begins.

7 EXISTING FLIGHT PROCEDURES AND IMPACT ASSESSMENT

The airspace impact assessment presented in this section was performed for two purposes:

1. To analyze the current approach and departure procedures to determine whether there are any possible impacts to the existing flight procedures that could result from relocating runway 15/33 and its associated NAVAIDs 80 ft. to the west. While this analysis was first performed in the summer of 2014 as a part

of the planning phase of safety enhancements at ASE, there have been several minor updates to procedures and obstacles at the airport, which has resulted in the need to update the previous assessment.

2. To identify critical aspects of the flight procedures that need to be considered for the aircraft feasibility portion of this report. This is of particular importance for the analysis of approach, landing and possible missed approach performance limitations from larger wingspan (and approach category) aircraft following the runway relocation.

7.1 METHODS

7.1.1 Procedure Design and Evaluation

As mentioned previously in the report, only the existing flight procedures at ASE are analyzed in this section; no consideration for new procedures that could be proposed by the FAA or other air carriers in the future is included in the analysis.

Lean used the same methods first expressed in the 2014 airspace impact assessment. This involves performing baseline assessments of the existing procedures using geospatially deconflicted runway, NAVAID, waypoint, obstacle and terrain information. The baseline assessment establishes a consistent flight procedure model upon which potential changes, like the runway relocation, can be measured. Frequently, the baseline assessment reveals criteria deviations applied by the FAA, or 3rd parties, that would otherwise not be apparent to pilots, air traffic professionals and the airport. In the event that significant deviations between the baseline model and the public procedures exist, interviews with FAA Flight Procedures and Flight Standards representatives are conducted to either incorporate additional waivers or to identify aspects of the flight procedures that are waiting to be updated. The latter is identified as a pending change that will occur regardless of any runway or NAVAID changes discussed in this report.

Once the baseline procedures have been recreated to a stable point, any obstacle, runway, NAVAID, or FAA criteria changes are applied to match the expected end state addressed in the EA. The two resulting sets of procedures are compared and only those impacts associated with the 80 ft shift are carried forward into the impact assessment.

7.1.1.1 Global Procedure Designer (GPD)

Lean utilized GPD version 5.2, developed by MDA, for the updated flight procedure review and airspace impact assessments. This latest version of GPD contains most of the latest conventional United States Standard for Terminal Instrument Procedures (TERPS) and Area Navigation (RNAV) criteria used by both the National Geospatial Intelligence Agency (NGA) and the Unites States Air Force (USAF) for procedure design and assessment at US airports and USAF bases. GPD is used to both design new procedures and evaluate existing procedures through an interactive method of creating procedures and clearing deviations to criteria until only those criteria deviations (waivers) that remain are acceptable either by historical precedent or for design purposes.

7.1.1.2 TARGETS

Lean utilized TARGETS ver 5.4.1.1 to analyze proposed RNP-AR procedures in use by specific operators currently serving the airport, or planning to serve the airport following the runway relocation. TARGETS was also used to analyze departure procedures used by specific operators. No TERPS or Performance Based Navigation (PBN) criteria results were used from TARGETs for the generation of this report.

7.1.1.3 Geospatial Deconfliction

No additional geospatial deconfliction was necessary over the previous work that was performed in the support of the 2014 airspace impact and aircraft feasibility assessment.

7.2 DEPARTURE PROCEDURES

7.2.1 LINDZ NINE Departure

The LINDZ NINE departure (Figure 4) is a conventional navigation, Standard Instrument Departure procedure for use on Runway 33 only. This is the most commonly used Departure procedure utilized by airport traffic control (ATC) and requested by operators. Aircraft that utilize this SID are expected to comply with standard departure procedures by climbing on runway heading to 400ft HAR before turning to a magnetic heading of 343. Once the aircraft reaches 9100ft, the aircraft will initiate a turn to the west on a heading of 273° until intercepting the Pitkin (I-PKN) Localizer Directional Aid (LDA) back course (normal sensing) outbound to the LINDZ intersection. From there the aircraft can fly in one of several different predefined directions or accept radar vectors from Denver ARTCC (ZDV).

The current ceilings and visibility of 400ft HAR and 1 mile are predicated on visually avoiding terrain and obstructions in the initial diverse departure area. Continued obstacle clearance beyond the initial climb area is dependent on the aircraft maintaining a climb gradient (CG) of 465ft/nm to 10000ft. This climb rate ensures obstacle clearance and ensures that aircraft reach the 9100ft turning point prior to encountering higher terrain in the departure OCS.

LINDZ NINE Departure from runway 33 summary:

- **Navigation Method:** Conventional
- **Current CG:** 465ft /nm to 10,000ft
- **Reason for CG:** Obstacle Driven
- **Criteria Application:** The Standard initial climb area (ICA) is a straight portion based on a standard 200 ft/nm climb rate to 400 ft agl. This equates to a 2 NM ICA. Increasing the climb rate to 465ft/nm would provide an ICA of .86 NM. This allows for a reduction of the straight area and turn as quickly as possible. A CG over 500 ft/nm requires approval from flight standards.

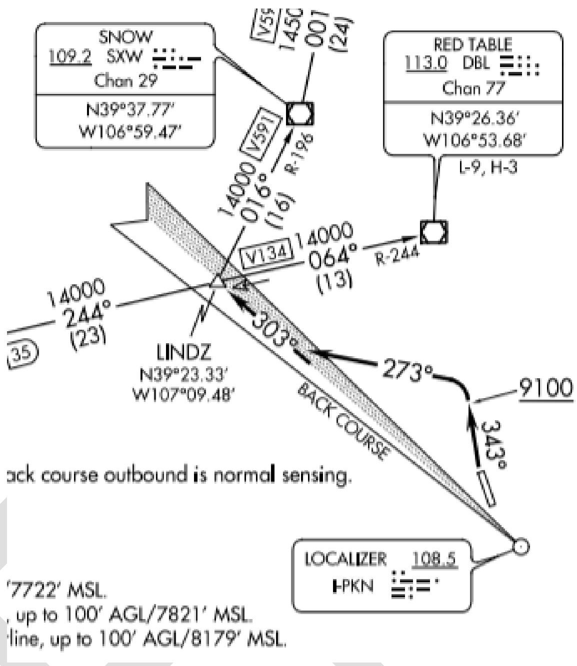
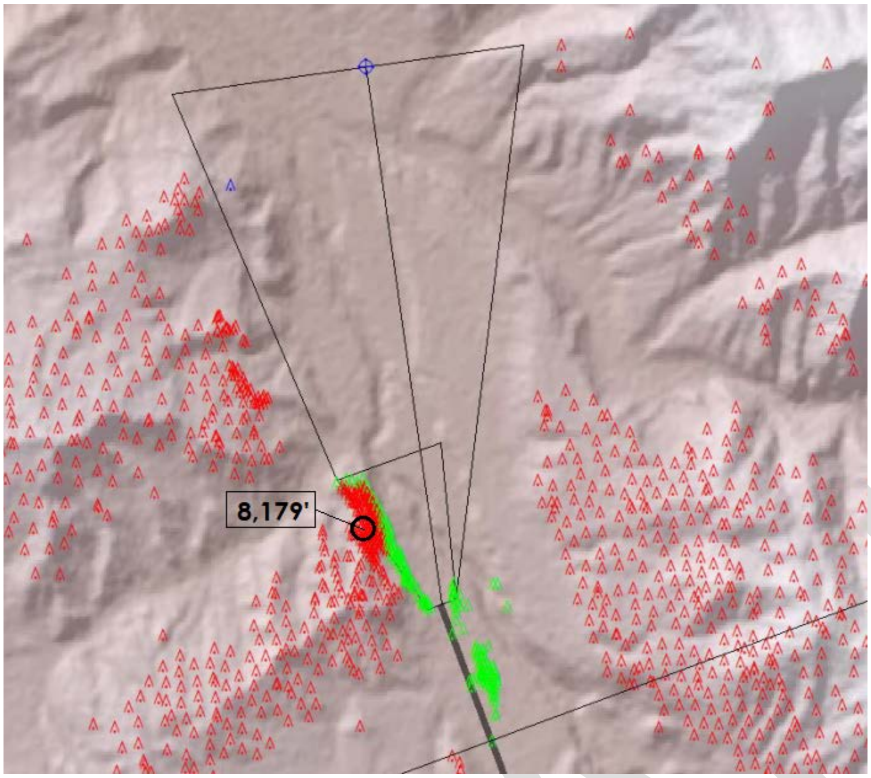


Figure 4 Image of Current LINDZ Departure

- **ICA Obstacles:** The ICA is a straight portion of the departure segment which allows the aircraft to climb to a minimum height of above 400 AGL above the runway threshold before turning. Penetrating obstacles in the extended Initial Climb Area ICA (to 3SM) dictate the ceiling and visibility requirements to allow aircraft to see and avoid obstructions.

An analysis of low close-in obstacles was performed for the current runway end 33 and is illustrated in Figure 5. The straight portion of the ICA clips the most eastern edge of the shale bluff directly to the north of the departure threshold. These obstacles represent the driving factor for ceiling and visibility requirements.



Obstacle Key:

Green – Low Close-in obstacles

Yellow – 200 to 300 ft/nm CG

required to clear

Red – 300+ ft/nm CG required to clear

Controlling Obstacle outside ICA

Type: **TREE**

Location: **N39 16 18.54 W106 53 55.15**

Height: **8179' MSL**

Figure 5 RWY 33 LINDZ 9 Low Close-In Obstacle Detection Area

7.2.1.1 LINDZ NINE Criteria Deviations

The segment from the end of the Climb to Altitude (CA) leg to intercept the I-PKN LDA is not possible to build using standard departure procedure (DP) criteria due to the distance between fixes being less than the turn radius at the prescribed airspeed. The original procedure was hand drawn to accommodate these deviations. Utilizing partial segments Lean was able to rebuild this and verify any new obstacles within the turn area.

7.2.2 Impact to LINDZ NINE Following 80ft Runway Shift

To determine the obstacle impacts of the new runway configuration, the LINDZ NINE procedure was applied to the new threshold locations. The Low Close-in obstacles within the initial climb area are picked up closer to the departure end of the runway. These consist of terrain points on the Shale Bluff directly North of the runway threshold. Despite requiring a higher climb gradient to clear due to being closer to the runway, the test did not result in any visibility or ceiling adjustments. Past the visual segment, obstacles along the route could result in a possible climb gradient increase of 0-20'. As long the use of some of the non-standard leg lengths and turn anticipation rules are applied the changes will be minor.

LINDZ NINE Obstacle Summary:

LINDZ NINE ICA OBSTACLES

Existing RWY		2018 Assessment		80' RWY Shift	
Obstacle	**MSL**	**Obstacle**	**MSL**	**Obstacle**	**MSL**
Tree	8,179 Ft	Tree	8209	Terrain	7,680'

Table 19 Summary of LINDZ NINE ICA Obstacles Before and After Runway Shift

7.2.3 PITKIN FOUR RNAV Departure

The PITKIN FOUR RNAV departure is a GPS based, RNAV 1.0, SID procedure for use on Runway 33 only. Aircraft utilizing this SID are expected to disregard standard departure procedures and proceed directly to the first fly-by waypoint at ADINY, which is approximately 2.3nm from the departure end of the runway (DER) of Runway 33 along the extended runway centerline. Aircraft must be at or above 8320ft by the time they cross ADINY which requires an unpublished climb gradient of approximately 276ft/nm (based on the precise location of ADINY). From ADINY, the aircraft will continue north up the Roaring Fork River valley to the BOYET.

The PITKIN FOUR RNAV departure procedure is a RNAV alternative to the LINDZ NINE departure; however, PITKIN FOUR doesn't have the benefit of conventional positive course guidance instead utilizing the larger RNAV-1 obstacle accountability areas.

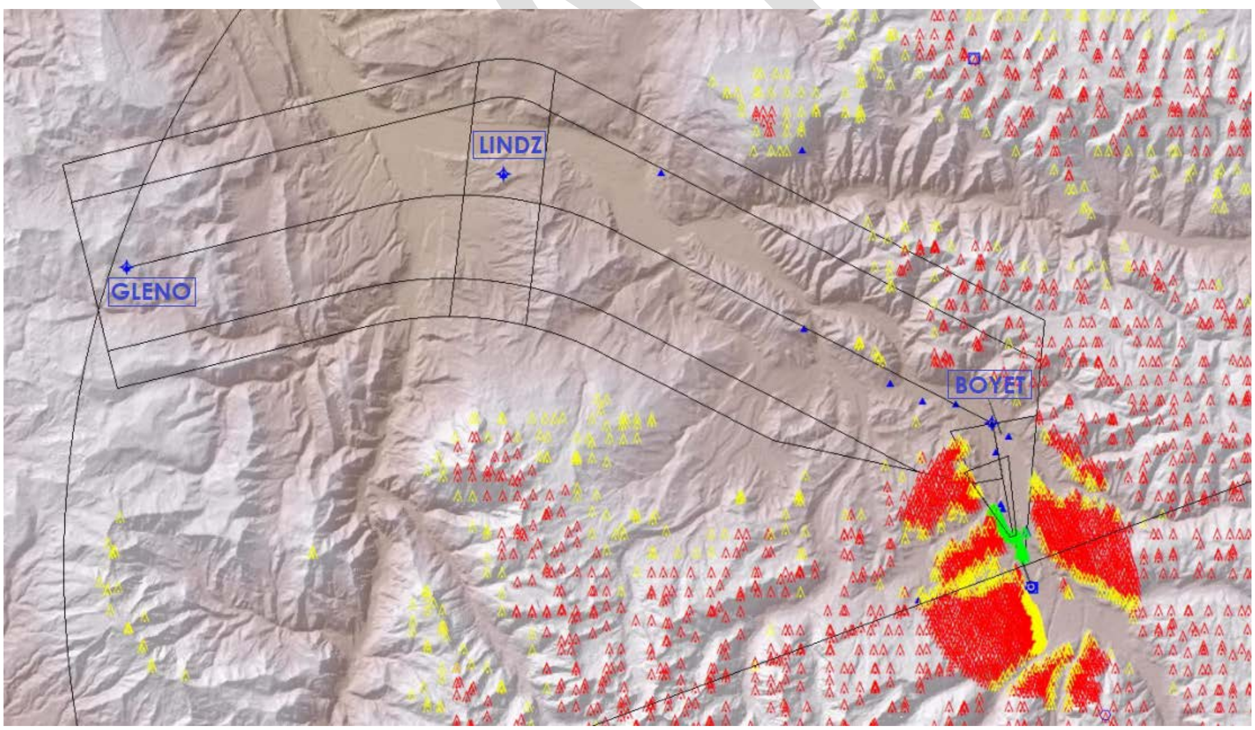


Figure 6 PITKIN FOUR Departure Obstacle Assessment Areas

In the depiction above, the green obstacles indicate Low Close-in obstacles, which set the visibility and ceiling requirements. The yellow obstacles indicate a CG of 200 ft/nm or more and the red obstacles indicate a CG of 300 ft/nm or more to clear.

Summary of PITKIN FOUR RNAV departure from runway 33:

- **Navigation Method:** RNAV
- **Current CG:** 500’ /nm to 16,000
- **Reason for CG:** Obstacle Driven
- **Criteria Application:** Compared to conventional, RNAV DPs require an initial climb to 500’ HAR. RNAV departures whose ICA ends with a fly by fix may require extra distance added based on aircraft speed. For instance, the first fix on the PITKN4 is ADINY, using a 500ft/nm CG the ICA will be 1 NM (this is different than the conventional navigation departure ICA specification).

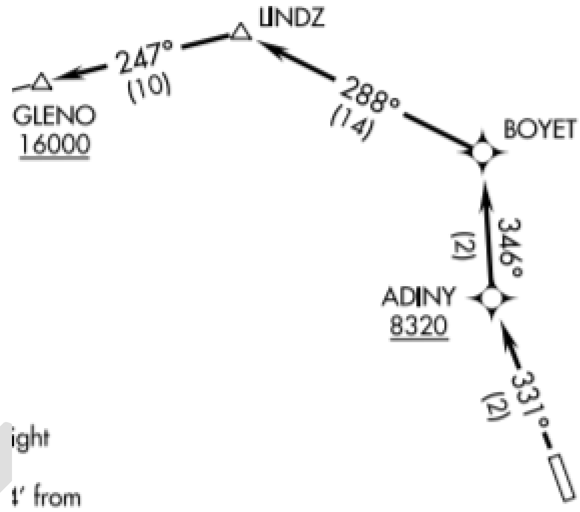


Figure 7 Current PITKIN FOUR RNAV Departure

- **Obstacles:** Penetrating obstacles in the extended ICA (to 3SM) will dictate ceiling and visibility requirements in order for pilots to see and avoid obstructions

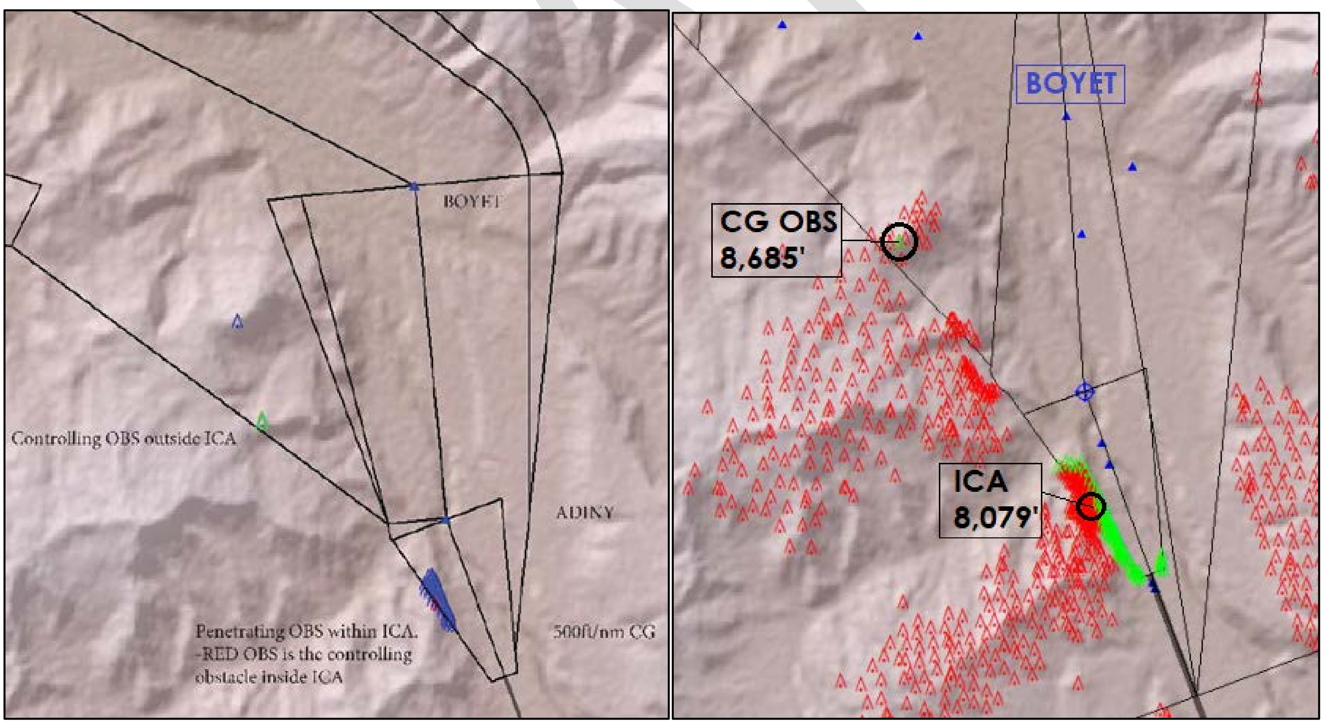


Figure 8 Low Close-In Obstacle Detection Areas Along PITKIN FOUR RNAV Departure

Obstacle Key:
Green – Low Close-in obstacles
Yellow – 200 to 300 ft/nm CG required to clear
Red – 300+ ft/nm CG required to clear

7.2.4 PITKIN FOUR RNAV Current Deviations

The PITKIN FOUR RNAV departure procedure as currently designed utilizes slightly modified criteria due to the short leg lengths between waypoints. The segment length between ADINY to BOYET is 2.0nm. In order to comply with standard criteria, the length of the segment must be at least 4.80nm based on the airspeed. This results in non-standard turn anticipation that prevents the procedure from being accurately modeled.

Several new obstacles were detected but they only drove slight increases in the climb gradient required for obstacles outside of the Initial Climb Area (ICA).

7.2.5 PITKIN FOUR RNAV Impacts Following 80ft Runway Shift

To determine the obstacle impacts of the new runway configuration, the PITKIN FOUR RNAV procedure was applied to the new threshold locations. The Low Close-in obstacles within the initial climb area are picked up closer to the departure end of the runway. These consist of terrain points on the Shale Bluff directly North of the runway threshold. Despite requiring a higher climb gradient to clear due to being closer to the runway, the test did not result in any visibility or ceiling adjustments. Past the visual segment, obstacles along the route could result in a possible climb gradient increase of 0-20'. As long the use of some of the non-standard leg lengths and turn anticipation rules are applied the changes will be minor.

Figure 9 PITKIN FOUR Standard Obstacle Detection Challenges

PITKIN FOUR RNAV ICA OBSTACLES

Existing RWY		2018 Assessment		80' RWY Shift	
Obstacle	**MSL**	**Obstacle**	**MSL**	**Obstacle**	**MSL**
Tree	8,179 Ft	Tree	8,079'	Terrain	7,680'

Table 20 PITKIN FOUR RNAV ICA Obstacles Before and After Runway Shift

7.2.6 SARDD THREE Departure

The SARDD THREE departure is a conventional navigation, Obstacle Departure Procedure (ODP) for use on Runway 33 only. Aircraft that utilize this ODP are expected to comply with standard departure procedures by climbing on runway heading to 400ft HAR before turning to a magnetic heading of 343°. Once the aircraft reaches 9100ft, the aircraft will initiate a turn to the west on a heading of 273°until intercepting the I-PKN Localizer backcourse outbound to the LINDZ intersection. From there the aircraft must climb in a holding pattern until cleared on course by Denver ARTCC (ZDV) or until reaching the minimum en-route altitude (MEA) for the intended route of flight.

The current ceilings and visibility of 400ft HAR and 1 mile are predicated on visually avoiding terrain and obstructions in the initial diverse departure area. Continued obstacle clearance beyond the initial climb area is dependent on the aircraft maintaining 460ft/nm to 14000ft. This climb rate ensures obstacle clearance and ensures that aircraft reach the 9100ft turning point prior to encountering higher terrain in the departure OCS. The higher termination altitude on this procedure, when compared to the LINDZ NINE procedure, ensures that aircraft will enter the climb in hold at the GLENO waypoint at an appropriate altitude.

As the ODP for ASE, this procedure and its weather minimums/climb gradient requirement, represent the minimum requirements for departing aircraft under instrument meteorological conditions. If an operator cannot meet the minimum performance requirements defined in the SARDD THREE departure procedure, then they must depart under visual conditions.

7.2.7 Impact to SARDD THREE Following 80ft Runway Shift

The SARDD THREE ODP has the same initial flight path as the LINDZ EIGHT and as a result shares the same impact as the LINDZ NINE departure.

7.2.8 ASPEN SEVEN Departure

The ASPEN SEVEN departure is a conventional navigation, SID procedure for Runway 33 only. Aircraft that utilize the SID are expected to comply with standard departure procedures by climbing on runway heading to 400ft HAR before turning to a magnetic heading of 348. Once the aircraft reaches 1 6000ft, or earlier if the aircraft appears on radar sooner, the pilot will receive vectors from Denver ARTCC (ZDV).

The current ceilings and visibility of 400ft HAR and 1 mile are predicated by visually avoiding terrain and obstructions in the initial diverse departure area. Continued obstacle clearance beyond the initial climb area is dependent on the aircraft maintaining 650ft/nm to 13000ft. For ATC vectoring purposes, aircraft are required to maintain 840ft/nm to 16000ft.

When communications are lost, this procedure has a lost communications alternate departure route based on the SARDD DP. The ASPEN SEVEN departure procedure vectors aircraft over the White River National Forest towards the Red Table Omni-Directional Range (Red Table VOR) ground station using a 650 ft/nm CG to 13,000ft and a 840 ft/nm CG to 16,000ft. Most operators do not use this procedure given the steep terrain challenges associated with it and because it is not preferred for engine failure planning.

7.2.9 ASPEN SEVEN Departure Impact Following 80ft Runway Relocation

The ASPEN SEVEN procedure is performance limiting due to the terrain it traverses and not the low close-in obstacles. Therefore, it was not duplicated due to the known route based obstacle limitations that will not change as a result of the 80' RWY Shift.

7.2.10 COZY ONE Departure

COZY ONE is a visual flight rules (VFR) departure procedure follows the same path as the LINDZ NINE Departure. It is most commonly used in conjunction with the Aspen ATC WRAP procedure to allow departing aircraft to visually identify the incoming aircraft on final approach and wrap behind when past the aircraft. The departing aircraft is required to sidestep to the right of the runway as soon as practical and fly a heading of 343 degrees. The tower will call the left turn to heading 273 degrees when the incoming aircraft has safely passed. The procedure then follows the standard LINZ routing on the I-PKN LDA Backcourse to the LINDZ intersection. The primary difference between COZY ONE and LINDZ NINE departures is that the tower coordinates the left turn as opposed to a turn at altitude of 9,100ft.

7.2.11 COZY ONE Departure Impact Following 80ft Runway Shift

Since the COZY ONE departure is not limited by IFR obstacle clearances and closely aligns with the LINDZ NINE, it was not assessed for obstacle changes. No impacts to the procedure are expected as a result of the 80ft runway shift.

7.2.12 GLENO TWO Departure

The GLENO TWO departure procedure is an RNAV procedure that is limited to use during visual meteorological conditions. The procedure is nearly identical to the LINDZ NINE and COZY ONE procedure tracks, but uses RNAV waypoints as references to ensure that flight crew members successfully initiate the initial turn to heading 343 and then execute the left turn to heading 273 in an area which minimizes potential obstacle and terrain clearance considerations. Because the procedure was created for a particular operator, it has the particular advantage of accommodating either option of all engines operating or one engine inoperative (OEI) conditions for the operator.

7.2.13 GLENO TWO Departure Impact Following 80ft Runway Shift

Since the GLENO TWO departure is not limited by IFR obstacle clearances and closely aligns with the LINDZ NINE, it was not assessed for obstacle changes. Any minor changes to the procedure that would be required to accommodate the initial heading of 343 off of the runway end would be a relatively simple modification to the procedure and no impacts to the procedure are expected as a result of the 80ft runway relocation to the west.

7.3 APPROACH PROCEDURES

The evaluation of approach procedures presented in the following subsections details the existing approach configurations and the impacts caused by the 80ft runway shift and associated criteria deviations.

7.3.1 Localizer (LOC) Approach Procedures

Figure 10 Image of RWY 15 From CEYAG MAP

The two most commonly used procedures at ASE are categorized as ground-based localizer procedures (see Figure 10 for view of ASE localizer). For operators who have additional training and authorization the use of a Public Special Procedure is available providing the lowest minimums.

The most notable difference between these two procedures is the descent gradient and missed approach paths which result in lower terrain clearances for the special procedure. Figure 11 depicts the difference in the vertical descent angle between the LOC and Special Procedure.

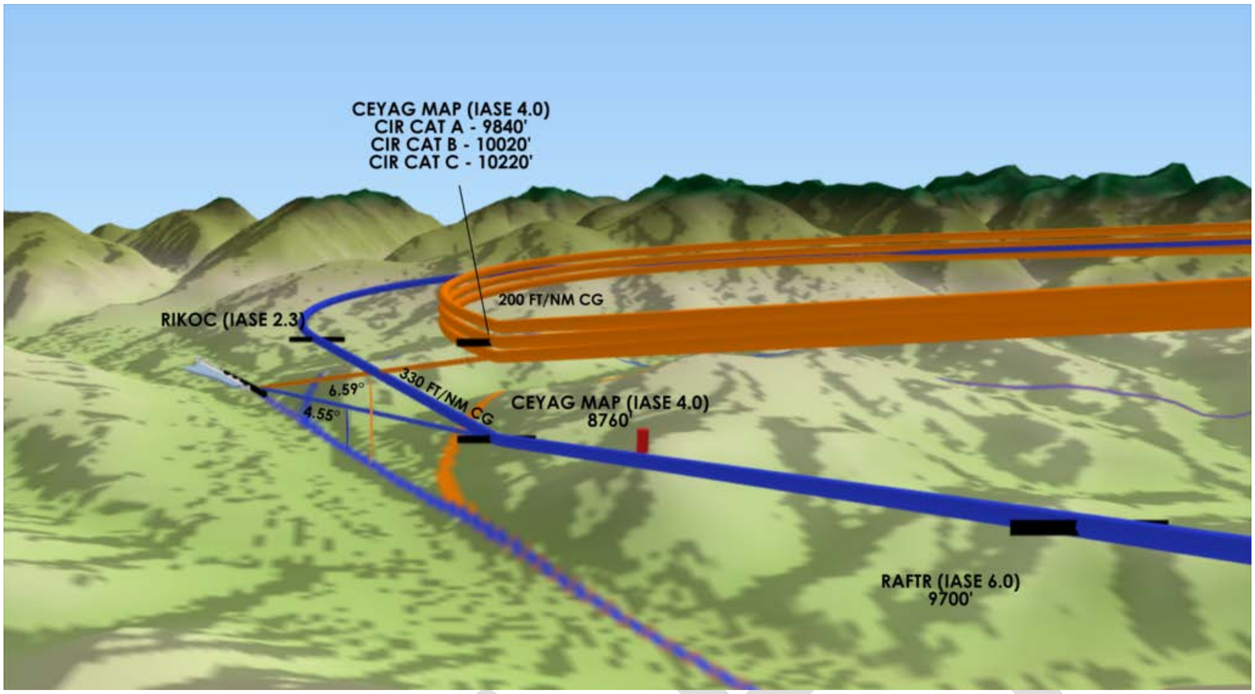


Figure 11 Standard LOC vs LOC Special Vertical Profile

7.3.1.1 LOC DME-E Approach

The LOC DME-E approach is a public, conventional navigation, circling only instrument flight procedure for runways 15 and 33 originating either at the Red Table VOR (DBL) or an IASE LOC/DME fix called AJAXX at D19.1. The approach course follows the I-ASE LOC course along the extended centerline of the runway. The approach begins at an altitude of 13400ft and utilizes several step-down fixes in the intermediate segment to ultimately reach the MDA.

LOC DME-E Approach to Runway 15 Summary:

- **Type:** Convention Non-Precision - LOC with (DME) based approach up to CAT C
- **Best Minimums:** CAT C: 10220-3 (2400-3)
- **Navaids Used:** Red Table VOR (IAF) Aspen Localizer & DME (I-ASE), Pitkin Localizer Direction Aid (I-PKN)
- **Last Revised:** AMDT #1B – Sept 20th. 2012
- **Flight Inspection:** Satisfactory check with no comments.
- **Design Notes:** Circling lines of minima only. Requires reliance on I-PKN back course intercept. Descent Gradient of 6.59 degrees leads to possibility of an unstabilized approach.

7.3.1.2 LOC DME-E Approach Impact Following the 80ft Runway Shift

If no changes to the existing approach are applied, there would be no expected impacts due to its high minimum descent altitude (MDA) of 2400-3. If new circling radius criteria (TERPS CHG 21) is applied the following approach minimums could apply: CAT A 9680-3/1843, CAT B: 10,302-3/2,483, CAT C: 10,840-3/3,003

7.3.1.3 Special LOC/DME RWY 15 Approach

The Special LOC/DME RWY 15 approach is one of the most accessible approaches used at ASE due to its low approach minimums and reduced descent gradient. This approach is used by the air carriers as well as more than 60 business and GA operators. Due to the reliance on this approach in low visibility scenarios, Lean performed an extensive analysis of the criteria deviations utilized in the approach and what impacts may occur. This analysis is provided in Appendix 2.

7.3.1.4 Special LOC/DME RWY 15 Approach Impact Following the 80ft Runway Shift

The relocation of the runway is anticipated to have a small impact on existing straight-in minimums for the Special LOC/DME RWY 15 approach, increasing the ceilings by 20ft and potentially increasing the visibility by ¼ mile. This would result in CAT C minimums of 1,020 ft and 3 miles.

The likelihood that the runway/airport would be available to operators under this condition is shown in Table 21. By comparing this table, to Table 16, it is apparent that there will be no change to the likelihood that operators can access the airport following the runway relocation and update to the Special LOC/DME RWY 15 Approach.

Likelihood of Current LOC Special (Ceilings = 1,020ft, Vis = 3 Miles)

Local Time	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00:00	45%	41%	54%	51%	63%	81%	73%	69%	72%	66%	58%	41%
01:00	44%	40%	51%	47%	60%	83%	73%	70%	73%	62%	62%	39%
02:00	43%	39%	50%	47%	62%	83%	75%	74%	70%	66%	56%	39%
03:00	43%	41%	50%	47%	62%	85%	78%	74%	73%	61%	57%	40%
04:00	42%	40%	50%	47%	60%	84%	77%	75%	69%	63%	57%	39%
05:00	43%	41%	51%	46%	65%	89%	78%	75%	68%	61%	58%	39%
06:00	51%	44%	59%	56%	67%	90%	89%	84%	76%	66%	65%	45%
07:00	59%	50%	66%	58%	68%	90%	88%	85%	80%	73%	68%	51%
08:00	61%	54%	68%	59%	74%	90%	91%	84%	78%	75%	72%	54%
09:00	63%	56%	67%	62%	73%	92%	90%	84%	77%	75%	70%	56%
10:00	63%	53%	68%	60%	69%	87%	87%	83%	76%	73%	72%	57%
11:00	61%	55%	68%	60%	65%	85%	86%	80%	76%	72%	68%	56%
12:00	61%	56%	65%	58%	59%	83%	81%	77%	73%	69%	69%	58%
13:00	61%	51%	65%	57%	58%	81%	73%	67%	73%	70%	68%	55%
14:00	56%	50%	64%	54%	57%	82%	72%	70%	72%	68%	71%	55%
15:00	59%	53%	64%	54%	55%	80%	70%	70%	76%	68%	69%	55%
16:00	56%	51%	64%	53%	55%	80%	69%	70%	73%	69%	72%	55%
17:00	52%	52%	63%	56%	59%	80%	68%	70%	73%	69%	67%	52%
18:00	50%	44%	62%	56%	61%	83%	71%	73%	76%	67%	67%	47%
19:00	50%	41%	59%	54%	65%	86%	70%	75%	75%	65%	64%	49%
20:00	49%	43%	58%	48%	62%	81%	73%	69%	71%	69%	62%	51%
21:00	45%	43%	50%	49%	66%	76%	68%	67%	69%	67%	61%	45%
22:00	42%	41%	52%	49%	62%	77%	71%	69%	69%	68%	57%	44%
23:00	41%	42%	52%	45%	62%	81%	73%	68%	72%	64%	59%	41%

Table 21 Likelihood of Airport Remaining Open to Operators with LOC Special Procedure Following Runway Relocation

7.3.2 Addition of CAT D Minima to the Special LOC/DME Approach to RWY 15

While not an impact to the procedure, note that the Special LOC/DME Approach to Runway 15 is the procedure that is most likely to receive an update following the runway relocation. The update would permit aircraft of an approach category D to fly into ASE. The addition of this line of minima may not require an extensive redesign of the approach procedure, its waypoints or altitudes. However, several additional waivers to existing criteria will need to be applied that enable CAT D operations to utilize the procedure, which may result in minimums that are significantly higher than the straight-in values. Due to the large number of FAA waivers that will be necessary for a CAT D approach to come into existence, no additional effort was utilized to simulate the procedure or the minima. This will need to be revisited with the FAA Western Flight Procedures Team as soon as the relocation project moves into design.

7.3.3 VOR DME-C Approach

The VOR DME-C approach is a public, conventional navigation, circling only instrument procedure to Runways 15 and 33 originating at the Red Table VOR (DBL). The approach course follows a radial on a slaved magnetic bearing of 163° towards the Runway 15 threshold. The approach begins at an altitude of 13700ft and utilizes step-down fixes in both the intermediate and final approach segments.

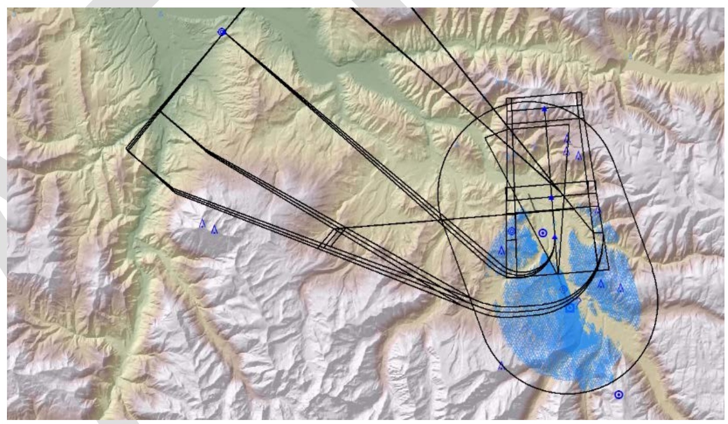


Figure 12 VOR-DME C OCS Areas

VOR DME-C Approach to Runway 15 Summary:

- **Type**: Conventional Non-Precision - VOR with DME based approach up to CAT C
- **Best Minimums**: CAT C: 10220 (2400-3)
- **NAVAIDS Used**: Red Table VOR (IAF), Pitkin Localizer Direction Aid (I-PKN)
- **Last Revised**: AMDT #5 – 9/20/12
- **Flight Inspection**: Satisfactory check with no comments
- **Design Notes**: 9.61 degree descent gradient. Requires reliance on I-PKN Intercept.
- No waivers exist for the public approach

- Visual Descent Point (VDP) not established. VDP is prior to FAF. Obstacles penetrate 20:1 surface.

- Visual Glideslope Indicator (VGSI) and descent angles not coincident

- Approach has circling lines of minima only due to 9.61 degree descent gradient caused by high terrain surrounding airport.

- 100ft vegetation adjustment used per original SIAP

- TERPS 289 applied to tree 39 19 54.00N / 106 54 27.00W

7.3.4 VOR DME-C Approach 80' RWY Shift Impacts:

If no changes to the existing approach are applied, there would be no expected impacts due to its high minimum descent altitude (MDA) of 2400-3.

If new circling radius criteria (TERPS CHG 21) is applied the following approach minimums could apply: CAT A 9680-3/1843, CAT B: 10,302-3/2,483, CAT C: 10,840-3/3,003

7.3.5 RNAV (GPS) - F

The RNAV (GPS) - F approach is a public, RNAV, circling only instrument procedure to runways 15 and 33 originating at the Red Table VOR (DBL). The approach course follows a magnetic heading of 166° towards the Runway 15 threshold. The approach begins at an altitude of 13700ft and utilizes a step-down fix in the intermediate approach segment.

The following information is a summary of the key aspects about the RNAV (GPS) - F Approach to Runway 15:

- **Type**: RNAV, Non-Precision with a circling line of minima applicable to CATS A – C

- **Best Minimums**: CAT C: 10220-3 (2400-3)

- **Navaids Used**: DBL (IF/IAF) & GPS Waypoints

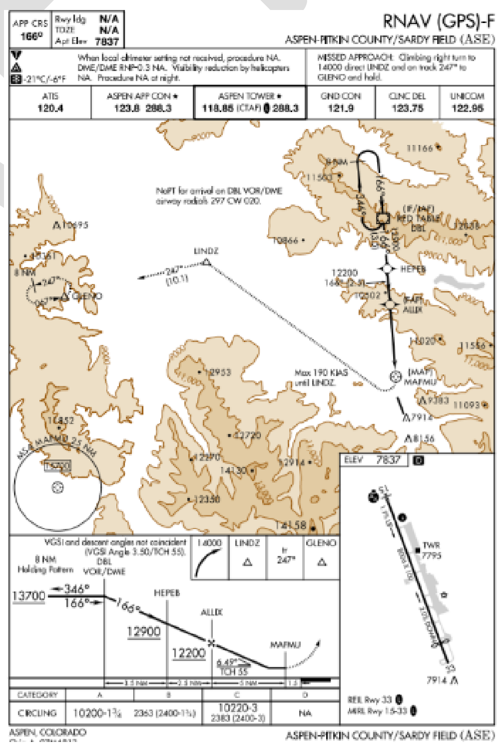


Figure 13 Current RNAV (GPS) -F Approach

- **Last Revised**: AMDT #2 - March 07th, 2013

- **Flight Inspection**: Satisfactory check with no comments

- **Design Notes**: No straight-in lines of minima. Descent Gradient 6.49 degrees.

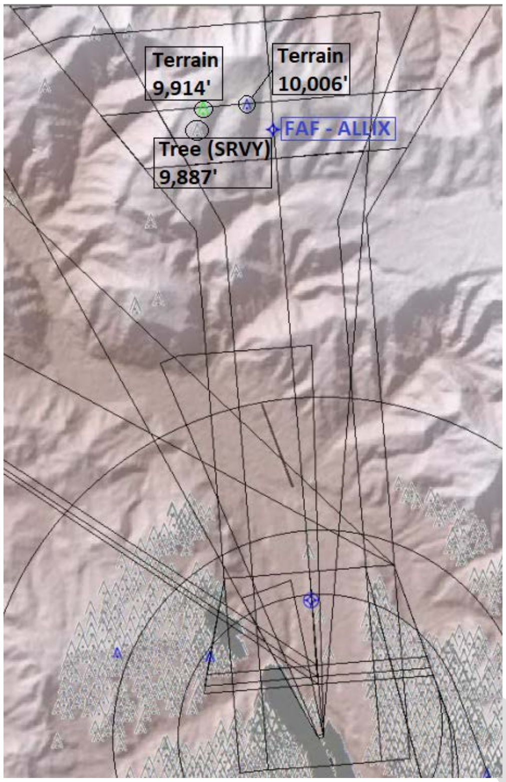


Figure 14 Image of FAS and Initial MAS for RNAV (GPS) -F Approach

Image: RNAV (GPS)-F TERPS Design for re-aligned runway

7.3.6 RNAV (GPS) - F Approach 80' Runway Shift Impacts

If no changes to the existing approach are applied, there would be no expected impacts due to its high MDA of 2400-3. If new circling radius criteria (TERPS CHG 21) is applied the following approach minimums could apply: CAT A 9680-3/1843, CAT B: 10,302-3/2,483, CAT C: 10,840-3/3,003

Controlling Obstacle: Terrain 10,006'

7.3.7 Roaring Fork Visual

There are no anticipated changes to the Roaring Fork Visual that have occurred between the original analysis in 2014 and this update. Therefore, there are currently no anticipated impacts to the Roaring Fork Visual that are anticipated following the runway relocation.

7.3.8 RNAV (GPS) Z RWY 15

The RNAV (GPS) Z RWY 15 approach is a public special, area navigation, straight-in instrument procedure to Runway 15 and circling approach to runways 15 and 33. The approach originates from a Feeder route at the Red Table VOR (DBL), or via several initial legs identified by RNAV fixes from SITWO or LINDZ. The approach follows a similar course as the LOC procedures along the extended centerline of the runway. The approach begins at an altitude of 13000ft and utilizes several LNAV step-down fixes in the final approach segment to ultimately reach a straight-in minimum descent altitude.

RNAV (GPS) -F Approach to Runway 15 summary:

- **Type:** Non-Precision – RNAV Approach with LNAV and circling line of minima
- **Best Minimums:** CAT C: 9280 (1600-3)
- **Navaids Used:** GPS, with I-PKN assistance on missed approach
- **Last Revised:** AMDT #2 – June 8th, 2012
- **Flight Inspection:** Satisfactory check with no comments
- **Design Notes:** Excessive descent gradients on final approach of up to 664ft/nm may be required. Descent Gradient 6.49 degree. 300 ft/nm CG required to 11,000' on Missed approach.

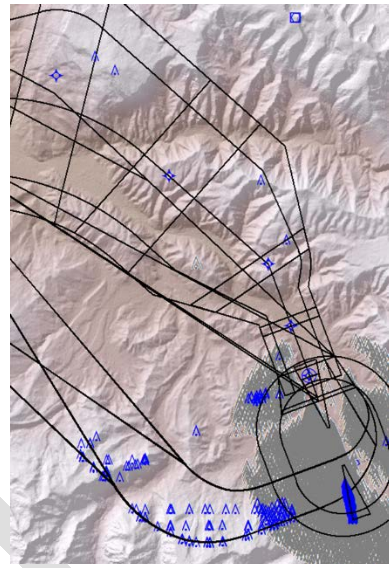


Figure 15 Expanded RANF (GPS) -F OCS

7.3.9 RNAV (GPS) Z RWY 15 80ft Shift Impacts

If no changes to the existing approach waivers are applied, there would be no major impacts. If new circling radius criteria (TERPS CHG 21) is applied the following circling minimums could apply: CAT A 9680-3/1843, CAT B: 10,302-3/2,483, CAT C: 10,840-3/3,003

7.3.10 Private - RNAV (RNP) Y

The continued use of the private – RNAV (RNP) Y was not considered for this update due to the lack of FAA and operator usage of the approach procedure. It is possible that the FAA, or a private operator, may consider the addition of RNAV (RNP) Y procedures as a means to establish CAT D approach minimums in support of larger wingspan narrowbody aircraft. However, no such procedures have been formally proposed to date. Therefore, it is presumed that the existing Private - RNAV (RNP) Y procedure, previously reviewed in 2014, will need to be redone to accommodate the non-standard waivers to criteria and the new LTP following the runway relocation, or abandoned from further use at that time.

7.4 Summary of Flight Procedure Impacts Following Runway Relocation

The analysis performed for this updated report found minor to moderate impacts to the existing instrument and visual flight procedures at the Aspen-Pitkin County/Sardy Airport that will occur following the runway relocation.

The most significant impacts detected were those caused by the currently delayed application of FAA rule changes to circling criteria and the application of a recent VGA obstruction survey data. Both of these delayed implementations are anticipated to be incorporated into any future flight procedure updates after the runway relocation.

However, if no changes were to occur to the runway, it is possible that these two sources of change will be applied to the airport, and its current instrument procedures over the next one to two years.

Any possible impacts on flight procedures related solely to the geometric relocation of the runway, and its supporting NAVAIDs, are relatively minor once the new criteria and obstruction data is accounted for. In addition, no instrument approach or departure procedure analyzed in this assessment would be altered in such a way by the runway relocation that would cause the procedure to either be impractical or unsafe for continued use.

It is expected that the vast majority of operators utilizing the Special procedures will not be impacted by any of the increases in ceilings or visibility minimums resulting from the proposed runway shift. Category C aircraft operators who utilize the public procedures will experience some ceiling increases affecting the MDA as a result of the circling criteria increases but not the 80ft runway relocation.

The proposed relocation options will not alleviate the long-term flight operations issues encountered at ASE, including missed approach climb gradients exceeding 200ft/nm, and a lack of widely used instrument approaches with ceilings below 1000ft Height Above Touchdown Zone or Runway Threshold (HAT). These issues will be exacerbated by the application of new circling criteria and the latest obstruction surveys. Therefore, it is highly recommended that ASE, FAA, air carriers, and general aviation users work together on ground capacity planning and new procedure concepts to alleviate issues caused by opposite direction operations.

It is also recommended that ASE begin working with the FAA Western Flight Procedures Team (WFPT)on any possible additions of CAT D minimums to instrument approach procedures. At this time, it is anticipated that the Special LOC/DME procedure will receive the additional line of minimums and as soon as the relocation project moves into design, it is recommended for design team members to interface with the WFPT to begin the updates to the approach.

7.5 CONVENTIONAL INSTRUMENT APPROACH IMPACT QUICK REFERENCE TABLE:

The following table is a summary of the key features about the existing conventional approach procedures, the changes to those features that may occur following the runway relocation and the impact expressed primarily as a change in the minimums were applicable.

Ground Based Navigation (Conventional Procedures)															
Approach	LOC/DME-E					LOC/DME 15					VOR/DME-C				
Type	Public					Public ***Special***					Public				
RWY Position	Current (2018)		RWY SHIFT 80'			Current (2018)		RWY SHIFT 80'			Current (2018)		RWY SHIFT 80'		
V.D.A.	6.59		6.59			4.55		4.55			9.61		9.61		
C.G. Req						330' /NM to 10,000'		330' /NM to 10,000'							
	Straight-In	**Circling**	**Straight-In No CHG21 Circling apl.**	**Circling (Un-restricted)**	**Circling (NA SW)**	Straight-In	Circling	Straight-In	Circling (Un-restricted)	Circling (NA SW)	Straight-In	Circling	**Straight-In No CHG21 Circling apl.**	Circling (Un-restricted)	Circling (NA SW)
CAT A Mins	N/A	9840-3 (2,100-3)	9840-3 (2,100-3)	9,680-3 (1,900-3)	9,680-3 (2,100-3)	8760-2 3/4 (1000-2 3/4)	9680-3 (1900-3)	8780-3	9,680-3 (1,900-3)	9,680-3 (2,100-3)	N/A	10,200-1 3/4 (2,400-1 3/4)	10,160-1 3/4 (2,400-1 3/4)	9,680-3 (1,900-3)	9,680-3 (2,100-3)
CAT B Mins	N/A	10,020-3 (2,200-3)	9840-3 (2,100-3)	10,280-3 (2,400-3)	10,220-3 (2,400-3)	8760-2 3/4 (1000-2 3/4)	10,320-3 (2500-3)	8780-3	10,280-3 (2,400-3)	10,220-3 (2,400-3)	N/A	10,200-1 3/4 (2,400-1 3/4)	10,160-1 3/4 (2,400-1 3/4)	10,280-3 (2,400-3)	10,220-3 (2,400-3)
CAT C Mins	N/A	10220-3 (2,400-3)	9840-3 (2,100-3)	11,820-3 (4,000-3)	11,280-3 (3,500-3)	8760-2 3/4 (1000-2 3/4)	10,840-3 (3100-3)	8780-3	11,820-3 (4,000-3)	11,280-3 (3,500-3)	N/A	10220-3 (2400-3)	10,160-3 (2400-3)	11,820-3 (4,000-3)	11,280-3 (3,500-3)
Highest Impact			Reference Only	CAT C +1600'	CAT C +1,100'			20'	CAT C +900'	CAT C +400'			Reference Only	CAT C +1600'	CAT C +1,100'
Impact Caused By				New CHG 21 Criteria	New CHG 21 Criteria			RWY Shift / Terrain	New CHG 21 Criteria	New CHG 21 Criteria			RWY Shift / Terrain	New CHG 21 Criteria	New CHG 21 Criteria
Missed Turn	-RIGHT-		-RIGHT-			-RIGHT-		-RIGHT-			-RIGHT-		-RIGHT-		
Night Mins	NA at Night		NA at Night			Yes (PAPI REQ)		Yes (PAPI REQ)			NA at Night		NA at Night		
Special Training REQ?	No		No			Yes - Aircrew & Aircraft Speed Restrictions		Yes - Authroization REQ. Aircrew & Aircraft Speed Restrictions			No		No		

Table 22 Summary of Impacts to Conventional Approach Procedures

7.6 RNAV (GPS) APPROACH IMPACT TABLE

The following table is a summary of the key features about the existing RNAV approach procedures, the changes to those features that may occur following the runway relocation and the impact expressed primarily as a change in the minimums were applicable.

RNAV (GPS) Procedures										
Approach	**RNAV (GPS)-F**					**RNAV (GPS)-Z**				
Type	Public					Public ***Special***				
RWY Position	Current (2018)		RWY SHIFT 80'			Current (2018)		RWY SHIFT 80'		
V.D.A.	6.59		6.59			5.87		5.87		
C.G. Req	N/A		N/A			300'/NM to 11000'		300'/NM to 11,000'		
	Straight-In	**Circling**	**Straight-In No CHG21 Circling apl.**	**Circling (NA SW)**	**Circling (Un-restricted)**	Straight-In	Circling	Straight-In	Circling (Un-restricted)	Circling (NA SW)
CAT A Mins	N/A	10,200-1 3/4 (2,400-1 3/4)	10,600-1 3/4 (2800-1)	10,600-1 3/4 (2800-1)	10,600-1 3/4 (2800-1)	9280-2 (1,600-2)	9540-2 (1,700-2)	9180-1 3/4 (1500-1 3/4)	9,680-3 (1,900-3)	9,680-3 (2,100-3)
CAT B Mins	N/A	10,200-1 3/4 (2,400-1 3/4)	10,600-1 3/4 (2800-1)	10,600-1 3/4 (2800-1)	10,600-1 3/4 (2800-1)	9280-2 (1600-2)	9900-2 (2,100-2)	9180-1 3/4 1500-1 3/4)	10,280-3 (2,400-3)	10,220-3 (2,200-3)
CAT C Mins	N/A	10220-3 (2400-3)	10,600-3 (2800-3)	11,280-3 (3400-3)	11660-3 (3900-3)	9280-3 (1,600-3)	10060-3 (2,200-3)	9180-3 (1500-3)	11,820-3 (4,000-3)	11,280-3 (3,500-3)
Highest Impac			All CAT +400'	CAT C +1,000'	CAT C +1500'			(m)100'	CAT C +1,760'	CAT C +1,220'
Impact Caused By			Ref. Only Updated Terrain/ OBS	New CHG 21 Criteria	New CHG 21 Criteria			RWY Shift / Terrain	New CHG 21 Criteria	New CHG 21 Criteria
Missed Turn	-RIGHT-		-RIGHT-			-RIGHT-		-RIGHT-		
Night Mins	N/A		N/A			Yes (Circling N/A)		Yes (Circling N/A		
Special Training REQ?	No		No			Yes - Aircrew & Aircraft Performance		Yes - Aircrew & Aircraft Performance		

Table 23 Summary of Impacts to RNAV Approach Procedures

8 AIRCRAFT FEASIBILITY

This section describes the flight operations and flight operations engineering considerations associated with the operation of large regional and narrow body aircraft expected to operate at ASE following the runway relocation. The aircraft feasibility assessment is conducted to determine which aircraft would be capable of operating at ASE following the proposed runway relocation, which destinations could be served, the available seats that could be carried, and the potential hazards and risk mitigations that must be considered.

The results from this assessment can be used to better inform potential noise modeling, airspace and ground capacity modeling, design Safety Risk Management (SRM) considerations, and additional outreach to air carriers who operate aircraft types that have been identified as feasible for operations at ASE once the relocation project begins.

Aircraft Feasibility Analysis Key Findings:

- **The A319-115 (operated by American Airlines), the EMB-175LR with Enhanced Winglets and supporting CAFM (operated by Envoy), the CRJ-700, and the CS-100 (A210) appear to be feasible for scheduled operations after the runway relocation.**
- **If CAT D approach procedures can be implemented or SMS mitigation is developed, the 737-8 MAX appears to be feasible for operations at ASE based on the departure and payload range analysis.**
- **Potential impacts to flight procedures and arrival/departure capacity following the runway relocation are expected to be minimal.**

8.1 DETERMINING FEASIBILITY

For the purposes of determining feasibility this report, an aircraft is considered to be feasible if it demonstrates sufficient flight operations and flight operations engineering capabilities for a FAR 121 operator to consider operating at ASE. There are four components that are analyzed to determine the feasibility of an aircraft : Departure, Arrival, Payload Range and Safety Management System (SMS) Considerations. In the following sections, each of these components are analyzed individually, and then summarized in Table 32 at the end of this section to determine whether an aircraft is feasible for scheduled operations, feasible for charter operations, or not feasible for any operations at ASE.

To be considered feasible for scheduled operations, s an aircraft would not be exposed to considerable challenges under each of the four feasibility components, could operate under the anticipated weather conditions with greater than 65 percent likelihood and could generate at least a 75 percent load factor to one or more hub destinations known to be used by the aircraft operator throughout most hours and months of the year. Note, however ,that this level of feasibility may not represent a commercially viable solution for a particular air carrier. However, typical flight operations engineering considerations do account for load factors over 75 percent to represent a meaningful threshold of viability that is considered feasible in a scheduled capacity.

To be considered feasible for charter operations, an aircraft would be capable of generating a 65 percent load factor across some hours and months of the year, and it would have at least a 50 percent likelihood of operating under the anticipated weather conditions; however, it may not have completely satisfactory outcomes in one or more of the four components of the feasibility assessment. This typically means that in order to operate at ASE, additional mitigations may be necessary to reduce the total number of operations, including utilizing selectively highly trained crews, or restricting operations to controlled weather conditions.

It is also important to note that aircraft which are not currently considered feasible by this assessment may become feasible in the future if a condition changes that impacts the results of one or more of four components that are used to assess feasibility.. This is especially true of any limitations to the Departure or Arrival components of feasibility that could be enhanced or updated through independent FAA driven processes not related to the runway relocation. Therefore, any aircraft which are identified as not feasible for operations at ASE in this assessment should be closely re-examined during the design phase of the project to confirm that proper runway, taxiway, and airspace considerations are appropriately addressed.

8.2 Existing Flight Operations Considerations

This feasibility assessment considers the existing flight operations environment at ASE. Flight operations considerations include the category of aircraft operations, and how operators contend with the point of no return (PNR) when landing on Runway 15. Each of these flight operations considerations are described in the following subsections.

8.2.1 Aircraft Operating Categories

There are currently three categories of aircraft operations at ASE : GA, business aviation, and regional aircraft operations.

GA and business jet operators typically utilize a combination of operating regulations and aircraft that can safely operate at ASE. FAR Part 91 regulations (for small, non-commercial aircraft) require that pilots consider runway and generic climb limitations on aircraft performance, which would permit a relatively large number of aircraft to consider operating at ASE. However, Part 91 operations require that the pilots consider performance limitations associated with meeting or exceeding the published FAA departure and approach procedures under (at a minimum) all engines operating conditions. This can be a challenge for many GA and business jet aircraft, especially single engine private aircraft and low thrust/weight ratio multi-engine aircraft.

Generally, these aircraft fly at low enough speeds to be able to maneuver to both Runways 15 and 33, or they operate aircraft with enough excess climb performance to avoid severe limitations that arise from meeting departure climb gradients on runway 33 and missed approach climb gradients, go-around and balked landing considerations on Runway 15.

FAR 91-K (fractional ownership) and 135 (charter) operators flying into ASE have had additional aircraft performance considerations involving OEI performance accountability, similar to FAR 121 (scheduled air carrier) operators. For these operators, they must consider OEI obstacle clearance during the takeoff, which can result in escape routings that vary from the FAA published departure procedures. Operators utilizing Operations Specification (OpSpec)/Management Specification (MSpec) may also choose to request access to utilize the public Special LOC/DME RWY 15 approach. To receive approval from the FAA to use this approach, the operator is required to provide evidence of a OEI missed approach plan and must have a plan in place for flight crews in the event of a go-around/balked landing. These additional limitations further reduce the number of aircraft that can use the approach; therefore, many operators may use one aircraft when the weather conditions will not require the use of the Special LOC/DME RWY 15 approach, and different (more capable) aircraft when the weather is expected to necessitate the Special LOC/DME RWY 15 approach.

Certain FAR 91-K and 135 operators, like NetJets Aviation, have also developed private special procedures that are tailored to their aircraft and pilot training. These procedures take additional aircraft performance considerations into account, including OEI obstacle clearance. But these procedures are limited to only two or three aircraft types (G-450, Global 5000 and Challenger 350). All other fleet types are restricted from operating into ASE under FAR Part 135.

Regional aircraft operations at ASE have operated under FAR Part 135 and 121 and are required to consider OEI obstacle clearance performance limitations on takeoff and consider OEI performance on the missed approach, go-around and balked landing. All regional aircraft operators utilize the Special LOC/DME RWY 15 approach with additional company generated procedures, which enable decision altitudes to handle the possibility of engine failures at different points along the published approach and departure paths. However, for many operators, this has led to the consideration of a PNR.

8.2.2 Point of No Return

A PNR occurs when an aircraft operator executes an approach to a runway and reaches a critical point in the approach where if the aircraft travels any further towards the runway (distance or altitude), the operator will be forced to land the aircraft. At ASE, the PNR is created by the proximity of terrain to the Airport and limited options that permit aircraft to become airborne and turn around to make another attempt at a landing or exit the terminal area. From the FAA perspective, PNRs can exist at many airports because the responsibility for landing an aircraft below the published decision altitude is a flight crew responsibility that is aided by flight operations engineering considerations. Therefore, the use of a PNR, and its location, is dependent on each air carrier and is not something that is created and maintained by the FAA across all operations.

For regional aircraft operators, the PNR and their philosophies about how to handle the PNR dictate the aircraft types considered for operations at the airport and the flight crews that will be trained and kept current under FAR 121.445. For example, Skywest has relied solely on the CRJ-700 series aircraft and only a select portion of their pilot group maintains sufficient training and experience to operate the aircraft into ASE with a PNR. For their operation, the PNR represents the point at which the extraction procedure will not guarantee typical obstacle clearance/separation and may require non-standard visual maneuvering to execute. In other words, Skywest operations with the CRJ-700 don't require the aircraft to land after the PNR, but they do put the aircraft and flight crew in a situation where the normal engineering protections are reduced to a minimum acceptable level. For other regional operators, like Lynx or Republic when they operated the Q400, the aircraft had sufficient aircraft performance to eliminate the PNR with minor restrictions on aircraft performance and limitations on weather minima. For other airlines, however, the presence of a PNR is considered to be a hazard that cannot be mitigated resulting in the decision not to operate aircraft that might otherwise be capable of serving the airport.

8.3 AIRCRAFT CONSIDERED IN THIS ANALYSIS

8.3.1 Overview

The aircraft feasibility assessment focused on five equipment types of aircraft that have not yet flown into ASE, but are likely to be utilized by North American operators given the aircraft performance capabilities, wingspan and approach category. The aircraft included in the analysis are the A319, 737-700, 737-800, ERJ175 and CS-100 (A210-100).

In the 2014 feasibility assessment, the 737-700 and A319 were analyzed in detail and found to be feasible for charter operations into ASE following the runway relocation, but only during specific times of year and hours of the day.

The 737-8 MAX and A319-115 were also included in this feasibility assessment because there are significant performance capabilities available which could enchance their feasibility of operating at ASE. While the 737-8 MAX aircraft represents a broad range of aircraft, which can be expected to be in operation across multiple North American operators, the A319-115 model is only operated by American Airlines and Avianca Airlines in sufficient numbers to be considered for scheduled operations. However, given American Airlines historical interest in providing scheduled service at ASE, through Skywest or Envoy operations, it is appropriate to include their specific subfleet in this feasibility assessment.

The CS-100 aircraft, which has recently been rebranded as the Airbus A210, has not yet entered operations in North America. The results presented in this analysis were generated independently from Bombardier and other air carriers and may be subject to change by the time the runway relocation is completed.

8.3.2 Aircraft Details

The aircraft characteristics of the five aircraft assessed for feasibility are summarized in the following subsections. Terms used in these subsections are summarized below:

"Aircraft" is the manufacturer assigned aircraft designator that the aircraft is referred to in the Type Certificate Data Sheet. This is different from the subfleet name that an air carrier would use, or the ICAO/IATA/FAA air traffic code, but should be unique enough to describe the general engine/airframe combination.

"Engine" is the manufacturer assigned engine designator that the engine is referred to in the Type Certificate Data Sheet. When multiple engines are listed it means that more than one engine type is anticipated to deliver similar feasibility results.

"Static, Sea Level, Takeoff Thrust" is the thrust value produced by the engine on a test stand at sea level, under normal conditions, measured in pounds. This value is presented for reference purposes only and is not the anticipated thrust that would be produced by aircraft at the start of the takeoff roll at ASE.

"Maximum Pressure Altitude for Takeoff and Landing" is the maximum certificated pressure altitude for which the aircraft has aircraft performance information, and is approved, to execute either a takeoff or a full stop landing. The maximum pressure altitude value is presented in this report as a value in feet measured above mean sea level, but is typically calculated from a pressure altimeter. Operators can execute an approach, or missed approach, that commences or finishes at an altitude above this value. But the landing itself must be completed within the pressure altitude listed here.

"Passengers Considered" is the number of passengers that were considered for the feasibility assessment. This value represents both a nominal payload (when multiplied against the PAX weight). However, the number of passengers considered also informs the OWE. Aircraft with considerably higher seating availability than the passengers considered need to consider the possibility of both higher payloads and a higher OWE that may decrease the overall feasibility of the aircraft operating to or from ASE with a meaningful payload.

The "Approach Category" is the FAA defined approach category for the aircraft that related the aircraft target approach speed, at the maximum certified landing weight (MLW) and typical landing flap configuration to a set of approach minimums. CAT C approach minimums are currently the highest speed approach category supported at ASE.

"Wingspan" is a measure of the tip to tip, or winglet to winglet, distance as recorded by the OEM in the airport compatibility manual, reported here in feet and inches. This distance is the same value that could be used for runway and/or taxiway geometry design considerations.

"MRMP" is the maximum certified ramp weight and represents the absolute maximum value that the aircraft can weigh, in pounds. This value represents the weight which the aircraft can be fueled to, and maneuver on the ground under, prior to executing a takeoff.

"MTOW" is the maximum certified takeoff weight and represents the "structural" maximum weight that the aircraft can depart at ignoring all performance related limitations.

"MLW" is the maximum certified landing weight, in pounds, and represents the "structural" maximum weight that the aircraft can be brought to a full stop under if ignoring all performance related limitations.

"MZFW" is the maximum zero fuel weight, in pounds, and represents the structural limit of all items that could be loaded onto an aircraft, other than fuel. This value represents a protection against the design limitations where the wing connects to the fuselage and vice versa. Operators must ensure not to load payload + service items above the MZFW which can sometimes inform the total number of passengers and cargo independently from aircraft performance.

"OWE" represents the operating weight when empty, in pounds, and is considered to be the starting point for aircraft performance and weight and balance considerations. The OWE includes the weight of service items, catering, any service fluids related to the lavatories or beverages, unusable fuel, oil and the flight crew. This value is highly dependent on the air carrier and their service and in cabin configurations. Therefore, the OWE presented in this report is an average value and should not be considered to reflect any particular airplane or operator configuration.

"Fuel capacity" is the total amount of fuel, presented in pounds, available for flight planning considerations.

"FOD-D" is the fuel over destination available for diversion, including any reserves required by the flight planning requirements, presented in pounds. This value is considered to be unavailable for meaningful range calculations because it is planned to be held onboard the aircraft in the event that missed approaches are conducted and/or a diversion to another airport is required. The FOD-D is often subtracted from the Fuel Capacity to compute the range of the aircraft. The FOD-D is also an important factor in determining available payload on the landing as aircraft initiating their first approach into ASE will not yet have consumed much, if any, of their FOD-D.

"North American Operators" is a partial list of operators in North America that currently have aircraft similar to the existing aircraft types operating at ASE. The list does not include any specific references to business jet operators that may operate one or more of the aircraft identified in an executive jet configuration. However, it is anticipated that the executive configuration of any of the aircraft included in this feasibility assessment will have similar or improved feasibility results than what was considered for FAR 121 operations.

The final pieces of information presented in the following sections reveal the noise properties of the aircraft, relative to Annex 16 Volume 1 Chapter 4 ICAO Noise Standards, when operating at the maximum certificated takeoff and landing weight. The values are presented in a table identifying the lateral, flyover, approach and cumulative noise values. The noise information is presented here to help related the aircraft feasibility outcomes of these 5 aircraft to other more detailed noise models used to develop noise exposure models as a part of the EA.

8.3.2.1 A319-115

Figure 16 A319-115 with Sharklets in American Airlines Livery

- Aircraft: Airbus A319-115
- Engine: CFM56-5B7, CFM56-5B7/P, CFM56-5B7/3
- Static, Sea Level, Takeoff Thrust: 27,000 Lb
- Maximum Pressure Altitude for Takeoff and Landing: 14,000ft
- Passengers Considered: 128
- Approach Category: C
- Wingspan: 117ft 6"
- MRMP: 167,331 lbs
- MTOW: 166,449 lbs
- MLW: 137,789 lbs
- MZFW: 128,790 lbs
- OWE: 93,370 lbs
- Fuel Capacity: 42,652 lbs
- FOD-D: 7,000 lbs
- North American Operators
    - American Airlines
    - Avianca

A319-115 Noise Levels				
Chapter 4	Lateral	Flyover	Approach	Cumulative
EPNdB	94.2	84.6	93.7	272.5

Table 24 Summary of Noise Characteristics for A319-115 at Maximum Design Weights

8.3.2.2 B737-700ERW

Figure 17 737-700ERW With Standard Winglets In United Airlines Livery

- Aircraft: Boeing 737-700ERW
- Engine: CFM56-7B24, CFM56-7B24/2, CFM56-7B24/3, CFM56-7B24E
- Static, Sea Level, Takeoff Thrust: 24,200 Lb
- Maximum Pressure Altitude for Takeoff and Landing: 14,000ft
- Passengers Considered: 128
- Approach Category: C
- Wingspan: 117 ft 6“
- MRMP: 155,000 lbs
- MTOW: 154,500 lbs
- MLW: 129,200 lbs
- MZFW: 121,700 lbs
- OWE: 83,000 lbs
- Fuel Capacity: 46,063 lbs
- FOD-D: 7,000 lbs
- North American Operators
    - United Airlines
    - Southwest Airlines
    - Aeromexico
    - WestJet

B737-700ERW Noise				
Chapter 4	Lateral	Flyover	Approach	Cumulative
EPNdB	92.7	84.2	95.7	272.6

8.3.2.3 *Summary of Noise Characteristics for 737-700ERW at Maximum Design Weight B737-8 MAX*

Figure 18 Image of 737-8 MAX in Boeing Livery

- Aircraft: Boeing 737-8 MAX
- Engine: LEAP-1B28
- Static, Sea Level, Takeoff Thrust: 29,317 Lb
- Maximum Pressure Altitude for Takeoff and Landing: 14,000ft
- Passengers Considered: 172
- Approach Category: D
- Wingspan: 117 ft 10“
- MRMP: 181,700 lbs
- MTOW: 181,200 lbs
- MLW: 152,800 lbs
- MZFW: 145,400 lbs
- OWE: 105,100 lbs
- Fuel Capacity: 45,694 lbs
- FOD-D: 7,300 lbs
- North American Operators
    - o American Airlines
    - o Southwest Airlines
    - o Aeromexico
    - o Air Canada
    - o WestJet

B737-8 MAX Noise				
Chapter 4	Lateral	Flyover	Approach	Cumulative
EPNdB	88.5	82.6	94.2	265.3

Table 25 Summary of Noise Characteristics for 737-8 MAX at Maximum Design Weight

8.3.2.4 EMB-175LR + EWT

Figure 19 Image of EMB-175LR with EWT in KLM Livery

- Aircraft: Embraer E175LR EWT
- Engine: CF34-8E
- Static, Sea Level, Takeoff Thrust: 14,200 Lb
- Maximum Pressure Altitude for Takeoff and Landing: 8,000ft[2]
- Passengers Considered: 76
- Approach Category: C
- Wingspan: 93 ft 11"
- MRMP: 85,870 lbs
- MTOW: 85,517 lbs
- MLW: 74,957 lbs
- MZFW: 68,886 lbs
- OWE: 49,850 lbs
- Fuel Capacity: 20,785 lbs
- FOD-D: 5,500 lbs
- North American Operators
    - Envoy[3] (American Airlines)
    - Sky Regional (Air Canada)
    - Skywest (United, American, Delta, Alaska)
    - Republic (United, American, Delta)
    - Compass (Delta, American)
    - Horizon Air (Alaska)

E175LR EWT Noise				
Chapter 4	Lateral	Flyover	Approach	Cumulative
EPNdB	90.4	84.7	95.2	270.3

Table 26 Summary of Noise Characteristics for EMB-175LR with EWR at Maximum Design Weight

[2] Maximum pressure altitude can be increased to 10,000ft but has not yet been utilized by Envoy
[3] Only operator known to have EWT terminal performance calculation capability as of this report's publication

8.3.2.5 CS-100 (A210)

Figure 20 Image of CS-100, Now Airbus A210-100, In Airbus Livery

- Aircraft: Bombardier CS-100, Airbus A210[4]
- Engine: PW1524G
- Static, Sea Level, Takeoff Thrust: 24,200 Lb
- Maximum Pressure Altitude for Takeoff and Landing: 8,000ft[5]
- Passengers Considered: 120
- Approach Category: C
- Wingspan: 115 ft 1“
- MRMP: 135,000 lbs
- MTOW: 134,000 lbs
- MLW: 115,500 lbs
- MZFW: 111,000 lbs
- OWE: 77,650 lbs
- Fuel Capacity: 38,876 lbs
- FOD-D: 4,900 lbs
- North American Operators:
    - Delta Air Lines[6]

CS100 (A210) Noise				
Chapter 4	Lateral	Flyover	Approach	Cumulative
EPNdB	88.0	78.8	91.5	258.3

Table 27 Summary of Current Noise Characteristics for CS-100 (A210-100) at Maximum Design Weight

[4] Following the acquisition of the program by Airbus on 02JUL18, the CS-100 has been rebranded to the A210
[5] Maximum pressure altitude may be increased to 10,000ft following initial service introduction
[6] As of this report, Delta Air Lines has not yet taken delivery of the first CS-100/A210

8.4 AIRCRAFT NOT CONSIDERED IN THIS ANALYSIS

To restrict the scope of the aircraft feasibility analysis to an appropriate level for the air service study, these aircraft types, and categories, were not considered:

- Business Jets
- General Aviation Aircraft
- ATR42/72
- Q400
- CRJ200/700/900
- B737-9
- A320
- A321
- MRJ 70/90
- ERJ 135/145
- EJET 170/190

Of these aircraft, the GA and business jets operating at ASE today are not expected to change following the runway relocation and safety enhancements. The most notable new entrant to the airport will be the Gulfstream G650, which has a wingspan in excess of the current 95ft limitation. Since the G650 is already known to possess the necessary aircraft performance and flight procedure navigation capabilities to operate at ASE, no additional analysis was performed on the feasibility of operations for this aircraft or other business jets/general aviation aircraft; as the results are well understood.

The ATR 42, ATR-72 and Q400 turboprop aircraft were not considered in the feasibility assessment because of their declining numbers in the North American market. During the 2014 feasibility assessment, the Q400 had more frequent operations at ASE and was expected to be a feasible aircraft following the runway relocation. However, the general decline in fleet totals diminished the need to perform any additional feasibility assessments. Therefore, all three of the turboprop aircraft type were eliminated from the feasibility analysis.

The CRJ 200/700/900 series aircraft were not considered in this feasibility assessment given current operations and known capabilities of these aircraft. The CRJ-700 series aircraft is already a regular operator at ASE and will continue to be an option to markets within one-and-a-half to two flight time hours of ASE following the runway relocation. The CRJ-200 and CRJ-900 were previously determined to not be capable of operating at ASE, and were therefore not considered for further analysis in this update.

The Boeing 737-900 and 737-9 MAX aircraft were not considered for the feasibility assessment for two reasons. First, both aircraft models require CAT D approach considerations at speeds that will likely place the aircraft in excess of the waivers associated with the Special LOC/DME RWY 15 approach. Secondly, given the field elevation at ASE, the -900 and -9 MAX variants would both require a considerably longer runway than what will be available following the runway relocation. Therefore, neither of these models is considered to be feasible for operation into ASE following the runway relocation.

The feasibility of the A320 was considered during the previous analysis in 2014. There are currently, several variants of the A320 family that may be capable of operating into ASE with payload range restrictions. While the NEO model of the aircraft will possess higher thrust, there have been recent difficulties with the engines that were targeted for performance enhancements that haven't been resolved, leaving some operators to utilize CEO models instead. Once the NEO models achieve their design reliability, it is anticipated that the A320NEO model would be considered a feasible aircraft for operations at ASE following the runway relocation to an extent similar to the A319-115 and the 737-8 MAX.

The feasibility of the A321 was not analyzed for the same reasons that the B737-900 and B737-9 MAX model were not analyzed. The aircraft is currently a CAT D approach category and does not possess the current (or future under the NEO model) aircraft performance capabilities to routinely utilize the runway length available at ASE following the runway relocation.

The MRJ 70/90 aircraft were not analyzed because there is a lack of available performance information from any North American operators, or the manufacturer, that could be used to determine detailed payload range or approach capabilities. While it may be possible for these aircraft to feasibly operate at ASE following the runway relocation, there is not enough information, or deliveries to North American operators, to assess the feasibility of the aircraft at this time.

The ERJ-135/145 aircraft types were previously evaluated in the 2014 feasibility assessment and found to be inadequate for safe and efficient operations at ASE following the runway relocation. Since 2014, no considerable enhancements to either variant of regional jet have occurred that would enable the aircraft to better serve the airport; therefore, it was not included in this assessment.

Finally, the Embraer E-170, E-190 and E-195 were not considered for this feasibility assessment due to a lack of high altitude performance capabilities that limit the overall takeoff and landing capabilities of these particular models. The E-175LR, which is assessed in this update, has received considerable upgrades to the aerodynamics and performance calculation capabilities that will enable the aircraft to operate at ASE, even before the runway relocation has been completed. In the future, the E2 series of Embraer aircraft may be a feasible aircraft for operations at ASE following the runway relocation; therefore, it is recommended that this series be examined through the design portion of the runway relocation project.

8.5 DEPARTURE FEASIBILITY

The feasibility of departures for FAR 121 operations from ASE is primarily focused on takeoff performance limitations exclusive to runway 33 because Runway 15 is unfavorable for departures given these restrictions:

- Declared distances that are less than the physical pavement (due to RSA restrictions);
- Significant uphill slope;
- Numerous close-in and distant obstacle clearance challenges; and
- No published IFR departure procedures on runway 15.

Additionally, there other air traffic and noise abatement considerations that would prevent air carriers from regular usage of Runway 15 for departures. Therefore, the feasibility of departures for any aircraft at ASE is solely focused on utilization of Runway 33.

8.5.1 Runway and Climb Limited Performance

Departures from Runway 33 are primarily limited by both runway and climb limited performance for all aircraft models.

Due to the very high field elevation at ASE, most aircraft will encounter climb limited performance. Climb limited performance, which does not account for headwind, tailwind, IFR flight procedure gradients or obstacle clearance, is a required performance calculation for FAR Part 25 certificated aircraft, which ensures that flight crews will be able to maintain a nominal CG following an engine failure at the takeoff decision safety speed of V1.

The nominal CG that must be achieved varies by phase of departure and number of engines on the aircraft. For early phases of the departure, the gradient is limited by interrelated parameters including the weight of the aircraft, the flap/slat setting used to liftoff the runway and the speed achieved as the aircraft leaves ground effect. These parameters can be further limited by the length of runway available. For instance, the best CG capabilities are achieved with slight flap deflections and high speeds at liftoff. But at high altitudes where the total thrust from the engines and lift generated by the wings is reduced, the ability to achieve a higher speed at liftoff requires considerable runway length, beyond what would be necessary for higher flap settings and lower takeoff speeds. Therefore, because the runway relocation project will not result in a longer runway, the climb limited challenges will persist and present difficult optimization choices for any aircraft operating at ASE, most often resulting in weight penalties to achieve the nominal CG.

The runway limited performance will also be complicated by both an operator'sdesire to achieve high climb limited performance (using small flap deflections and higher speeds) while balancing high runway slope and tailwind departures.

While the high slope value on the existing runway (and the relocated runway) does not exceed any aircraft certified limitations, it is close to the extent. At 1.99 percent percent downhill, aircraft will benefit from achieving faster liftoff speeds from the relative short runway length. However, this may create challenges for larger aircraft that have difficulty coming to a stop following an aborted takeoff, requiring careful optimizations between flap selection and improved climb performance.

Tailwind conditions may further exacerbate performance optimization challenges and result in additional runway length needs for a given weight and flap setting. When combined with the possibility of wet and/or contaminated runway operations, it is anticipated that certain winter operations may routinely encounter runway performance limitations in excess of the climb limits, or other potential limitations. However, the widening of Runway 15/33 to 150ft will greatly improve the ability for all aircraft to utilize the runway under wet and contaminated conditions because no additional corrections to velocity minimum control speed on the ground VMCG will need to be applied against what is currently considered a “narrow” runway.

Of the five aircraft considered in this assessment, all five will be capable of achieving considerable runway and climb limited takeoff performance during most months and hours of the day. The significant exceptions are anticipated to occur during the summer months, when temperatures begin to approach and pass the thrust break points for all five aircraft. Impacts related to wet runways are not considered to be limiting due to colder temperatures and the overall enhanced stopping capability of an aircraft in wet conditions.

8.5.2 OEI Procedures and Obstacle Clearance/Avoidance

OEI procedures used by FAR 121 operators are anticipated to remain largely the same following the runway relocation.

Current OEI procedures involve maneuvers which closely approximate the COZY and LINDZ departure procedures previously described. It is anticipated that some operators of aircraft evaluated in this feasibility assessment may consider OEI after V1 accountability permitting aircraft to fly all available departure procedures with divergence points that would place an aircraft with OEI along the COZY or LINDZ track. The target altitude/location for OEI after V1 divergence will vary based on aircraft performance and flight crew training, but is anticipated to occur no lower than 9,100ft MSL along the initial 343 heading or near the BOYET waypoint.

Each of the five aircraft considered in this feasibility assessment are capable of utilizing 10 minutes of takeoff thrust, in the event of an engine failure, which will be required to achieve maximum obstacle clearance along procedures which closely align to the FAA published departure procedures.

The obstacle accountability areas used for consideration of OEI obstacle limited performance when departing Runway 33 will be largely based on FAA AC-120-91 Area Analysis Method or Flight Track Method, based on the preferred navigation method for risk mitigation and performance. Regardless of the selection method, all air carriers will attempt to design their OEI paths such that the aircraft successfully initiates the left turn from a heading of 343 to 273 using bank angles of 15 degrees or less, and enables the aircraft to remain inside the valley, south of Triangle Peak. For advanced aircraft operators, like Envoy’s E175LR operation, this will involve the use of engine out SIDs (EOSIDs) with RF legs. For less sophisticated operators, this may involve a combination of FMS/RNAV guidance operated under visual conditions determined by the air carrier.

By utilizing EOSIDs, visual guidance, or a combination of visual and navigation modes, it is anticipated that most operators of the aircraft analyzed in this report will not have any obstacle limited takeoff performance when departing ASE today, or following the runway relocation.

8.5.3 AEO Procedures and Climb Gradient Compliance

FAA published departure procedures from ASE for Runway 33 were presented in detail in Section 6.3. For FAR 121 operations, aircraft operators will be expected to file some form of these departure procedures with their flight plan. But showing compliance with the departure procedure prior to its use is typically managed through flight operations engineering considerations regarding the required CGs and any special navigation methods that must be used.

The process of determining compliance with a departure procedure varies by air carrier. Air carriers that utilize OEI obstacle clearance flight procedures and apply aircraft performance limitations from the procedures to their takeoff are not required to strictly adhere to the limitations imposed by an FAA departure procedure. However, the inability to comply with the published CG, or the desire to utilize a departure procedure at minimums below those published, may result in hazards for either the aircraft operator, air traffic, or both.

At ASE, the lack of separation with terrain represents the highest risk to non-compliance with the published CG on a departure procedure.. This is because traffic separation is handled either visually or through the Opposite Direction Operations, discussed previously in this section. Once an aircraft reaches IFR altitudes, they are expected to contact Denver Center, at which point the published departure procedure could be discontinued.

Of the departure procedures that are available, most aircraft considered in this feasibility assessment, the 737, A319 and CS-100 (A210) should be capable of complying with the published obstacle CG limitations by restricting their takeoff performance to match runway and climb limited OEI conditions. The exception would be the E175LR which will struggle to comply with the departure procedures requiring climb gradient in excess of 500ft/nm. Because, LINDZ 9 departure procedures exist, which require 465ft/nm to 10,000ft, the E175LR is still considered to be feasible for scheduled operations.

8.5.4 Departure Feasibility by Month

The ability for all five aircraft to successfully depart from ASE throughout the year is consistently above the 75 percent threshold for all months and hours. However, the amount of takeoff weight that can be achieved will vary considerably, especially during the summer months given limitations related to higher temperatures, but this does not eliminate any of the five aircraft from being considered feasible for scheduled operation.

When considering operators that will impose visibility limitations associated with the FAA published AEO departure procedures, the feasibility of departures may be limited, according to the values shown in Table 29. From this table, only brief periods in the month of April could result in situations where departure delays might negatively affect the feasibility of scheduled operations. However, because the potential limitation on feasibility is not restricted by performance, and only visibility, scheduled operations with the five aircraft listed in this report are anticipated to operate with delays resulting in padded block time considerations. Therefore, all five analyzed aircraft are considered feasible under the departure feasibility by month analysis.

Low IMC Departures Only Current and After 80ft Shift (16/Hr)

Local Time	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00:00	77%	77%	81%	73%	84%	94%	96%	94%	93%	85%	80%	73%
01:00	77%	75%	80%	70%	82%	95%	96%	95%	95%	84%	82%	78%
02:00	78%	72%	82%	70%	83%	95%	96%	94%	95%	84%	80%	75%
03:00	76%	73%	80%	71%	84%	94%	98%	95%	95%	81%	81%	74%
04:00	74%	73%	79%	72%	84%	96%	96%	96%	94%	85%	80%	76%
05:00	73%	75%	81%	73%	83%	96%	98%	96%	95%	84%	82%	75%
06:00	73%	73%	76%	72%	81%	95%	99%	96%	95%	85%	79%	71%
07:00	72%	73%	79%	74%	82%	95%	98%	97%	94%	84%	81%	72%
08:00	74%	72%	78%	70%	80%	95%	99%	97%	95%	85%	83%	74%
09:00	78%	74%	74%	68%	74%	91%	98%	97%	93%	84%	80%	74%
10:00	78%	71%	75%	64%	70%	89%	97%	97%	89%	82%	81%	77%
11:00	80%	74%	75%	62%	72%	89%	96%	95%	90%	82%	79%	76%
12:00	80%	73%	75%	66%	71%	85%	93%	95%	88%	82%	78%	78%
13:00	81%	72%	76%	66%	72%	84%	91%	92%	86%	83%	79%	74%
14:00	78%	74%	76%	65%	71%	83%	91%	93%	87%	84%	84%	75%
15:00	79%	73%	75%	68%	67%	87%	89%	88%	86%	84%	82%	76%
16:00	80%	72%	78%	71%	72%	89%	85%	87%	88%	86%	85%	76%
17:00	79%	74%	77%	70%	73%	85%	84%	85%	89%	83%	86%	77%
18:00	78%	78%	82%	70%	75%	89%	82%	82%	89%	85%	84%	73%
19:00	77%	76%	82%	76%	77%	89%	88%	88%	90%	87%	84%	76%
20:00	77%	76%	80%	77%	81%	88%	85%	89%	90%	89%	83%	75%
21:00	76%	76%	83%	76%	83%	91%	85%	92%	93%	91%	83%	76%
22:00	75%	76%	80%	73%	82%	90%	90%	92%	92%	86%	81%	76%
23:00	77%	75%	78%	75%	85%	91%	92%	93%	91%	84%	83%	75%

Table 28 Likelihood of ASE Operating At or Above Departure Minimums

8.6 Arrival Feasibility

The feasibility of arrivals into ASE is focused on three distinct aspects: approach, missed approach and landing. For the aircraft evaluated in this feasibility assessment, landing on Runway 15 is the only viable option because none of the aircraft have approach speeds low enough to consider a circling or visual maneuver to land on Runway 33.

8.6.1 Approach

The viability of the target aircraft executing approaches to Runway 15 is considered against the navigational capabilities, approach speed categories and descent angles. Aspects related to non-standard approach elements, such as missed approaches and minima, will be addressed in the following sections. Because all FAR 121 flight operations must file an approach procedure on their IFR flight plan, the feasibility of aircraft approach operations must be considered relative to a published approach procedure. Visual approaches will not be considered as feasible for the purposes of this assessment.

The existing approach procedures at ASE all generally support CAT C operations with waivers applied to certain criteria for terrain clearance during all segments of the approach. However, all approaches, other than the Special LOC/DME RWY 15 approach, require excessive descent gradients that the assessed aircraft could not likely achieve, which would result in instability and missed approaches. The remaining approach procedure, the Special LOC/DME RWY 15, can be executed by the four of the five target aircraft: A319, 737-700ERW, CS-100 (A210) and the E175LR. The 737-8 MAX aircraft is currently considered to be a CAT D for approaches and would not be immediately capable of utilizing the Special LOC/DME RWY 15 approach without additional engineering and FAA oversight.

It should be noted that the reliance on a single approach procedure, which utilizes multiple ground based NAVAIDs, may lead to loss of both scheduled and charter operations under FAR Part 121. While this has been a long-standing limitation at ASE, it is recommended that additional approaches be created that can support CAT C and D narrowbody aircraft following the runway relocation.

8.6.2 Missed Approach, Go-Around and Balked Landing

FAR 121 operators must demonstrate that aircraft utilizing the Special LOC/DME RWY 15 approach have considered the performance limitations associated with the missed approach, go-around and balked landing. While few regulations and industry level guidance exist to inform operators, or the FAA, on how best to handle flight operations engineering assessments for each of these possibilities, the methods of compliance and resulting performance limitations are specific to each aircraft operator and the aircraft.

8.6.2.1 Missed Approach

A missed approach is a maneuver performed by the flight crew when the aircraft must either discontinue use of the existing approach or arrive at the MDA/DA and cannot see the runway to continue the visual portion of the approach and must follow the published missed approach procedure instructions published by the FAA. There are numerous reasons for discontinuing an approach but at ASE, a missed approach is generally related to excessive crosswinds, excessive tailwinds or speed management.

The five aircraft identified in this report can execute an approach and landing procedure with tailwinds between 10 kts and, in operator specific approvals, 15kts. All five aircraft also have varying levels of crosswind capabilities demonstrated between 35 – 50kts on approach.

The amount of crosswind experienced during an approach is not considered a limitation in the same sense as a tailwind. The five aircraft in this report may have operator specific policies which limit crosswinds at ASE between 25 – 30kts for aircraft performance and SMS hazard mitigations. When a flight crew begins the approach with winds at or near these limitations, the likelihood of executing a missed approach increases. As illustrated in Table 7, in section 5.2.3, this condition is limited to the midday hours between April and September.

OEI considerations limit an operator's ability to comply with the published missed approach on the Special LOC/DME RWY 15 approach. Historically, operators have, and are anticipated to continue to, consider whether to show compliance with a OEI along a 3 dimensional surface approximating the missed approach climb gradient to the target altitude, or to apply FAA AC-120-91 obstacle accountability areas for the range of temperatures, winds and weights starting from the missed approach point through the remainder of the procedure. Operators that wish to come up with alternate missed approach instructions, under OEI conditions, may also choose to make slight variations to the navigational guidance. However, it is anticipated that all five aircraft considered in this report can comply with the published missed approach procedure either under AEO or OEI conditions.

8.6.2.2 Go-Around

For the purposes of this assessment, a go-around refers to the non-standard condition when a flight crew decides to break off the landing after the missed approach point/decision altitude, but prior to crossing the threshold of the runway. This phase of flight is not protected by any FAA published flight procedures and requires the operator to consider the flight operations engineering implications of the maneuver and provide alternative flight procedure instructions to the flight crew.

At ASE, the ability to safely execute a go-around is the primary cause of the PNR, leading either to a point where aircraft must commit to land or execute an extraction procedure, which may result in reduced obstacle and terrain separation.

Air carriers have different philosophies regarding the go-around accountability, but for the purposes of this feasibility assessment, the ability to execute a go-around with a PNR is the primary consideration.

Of the five aircraft considered in this report, all aircraft models are considered to be capable of executing a go-around between the missed approach point (CEYAG) and a PNR varying between 1.7NM from the end of the Runway up until the threshold.

The 737-700ERW was previously analyzed in 2014 and found to have weight limitations, resulting in limited seats between April and October due to obstacle clearance during the extraction maneuver. Analysis of the remaining four aircraft revealed that these aircraft would be capable of operating up to the maximum structural landing weight (MLW) by following an emergency extraction maneuver starting at the threshold crossing height (TCH) for Runway 15, which would be effective for all months and hours of operation.

8.6.2.3 Balked Landing

The balked landing maneuver, for the purposes of this assessment, is considered to be one in which the flight crew crosses the threshold of the runway but needs to abort the landing and execute an extraction procedure.

Limited analysis was executed to determine if any of the five aircraft could be maneuvered to a safe extraction procedure in the event of a balked landing. While it is believed that these aircraft can potentially execute the maneuver, the reduced amount of obstacle clearance and high bank angles required to safely perform the extraction result in performance limitations which can not be considered against scheduled or charter service. Interviews with potential air carriers revealed that having the PNR on the threshold of the runway represents an adequate performance mitigation against the possibility and would not consider additional performance limitations to accommodate a fully compliant balked landing and extraction. Therefore, the feasibility of approach operations related to the balked landing is considered to be acceptable for scheduled service for all aircraft throughout the year except the 737-700ERW, which is considered feasible for scheduled service during the winter months, and only feasible for charter operations during the summer months.

8.6.3 Landing

The final component considered in the Approach Feasibility is the ability to bring the aircraft to a full stop on the runway available considering the pre-departure weight limitations and in-flight landing distance assessment. In other words, the general ability to land the aircraft on the runway length available and the planned time of arrival must be evaluated.

Given the single runway operation at ASE, with only Runway 15 usable for approach operations, the runway limited landing performance may be more impactful to the overall approach feasibility than other components previously discussed.

The pre-departure landing weight limitations are governed by the FAR 121.195 requirement to demonstrate the aircraft will land on a suitable runway at the planned time of arrival, assuming that the flight plan is followed, and that the predicted weather conditions are consistent. This pre-departure limitation is based on the landing distance available (LDA), which, will be 7,006ft following the runway relocation.

In addition to the general ability to land the aircraft on the runway available at the planned arrival time, the need to assess whether the aircraft may need to divert to an alternate airport must also be considered. This is determined by analyzing whether the aircraft's weight enables it to land within 60 percentof the available LDA, in still air, and in the event that the runway is wet, it must be shown that the aircraft's stopping distance has an additional 15 percent margin within the 60 percent of the LDA. If this cannot be accomplished at the planned landing weight, then additional fuel necessary to divert to an alternate airport must be included in the flight plan prior to departure.

At ASE, most operators will carry enough fuel to either divert to EGE, or DEN, depending on which airport can better protect passengers in the event that the flight needs to be canceled. The need to divert to an alternate airport not dependent on pre-departure landing weight limitations, but rather the weather minimums and successful execution of the approach procedure. Therefore, in this assessment, the assessed aircraft are considered to already carry the fuel necessary to divert to another airport, and any landing weight limitations (that would be imposed if an operator choose not to carry the fuel necessary to divert to an alternate airport) are not considered in the approach feasibility.

The inflight landing distance assessment requires flight crews to determine the landing performance of the aircraft on the intended arrival runway prior to executing the approach/landing maneuver. The distance the aircraft will need to stop is the basic distance, for the most recent runway and environmental conditions including slope, wind, temperature and surface conditions, with a 15 precent margin. When landing on Runway 15 at ASE, aircraft that experience tailwinds and/or anti-ice usage may discover that the weight of the aircraft will exceed the weight necessary to safely stop within the LDA.

If that occurs, the aircraft must either hold (to burn fuel or wait for conditions to improve), divert to another airport, or declare an emergency and perform an overweight landing. At ASE, the risk of landing overweight is mitigated by using the inflight landing distance assessment as part of the pre-departure check and potentially limiting the payload that an aircraft carries into ASE to increase the likelihood that the aircraft will be at an appropriate landing weight at the time of arrival.

By imposing a landing weight limitation based on anticipated wind, runway conditions and anti-ice usage (in excess of FAR 121.195), certain aircraft operating at ASE may experience landing weight limitations, which are lower than the MLW. This is particularly true for the E175LR and the 737 family of aircraft, both of which use higher approach speeds under tailwind and anti-ice situations. Neither of these aircraft will experience a performance reduction to the point that they can not execute a landing at ASE; but however, feasibility is reduced during certain months and hours when these aircraft are subject to limits on the inbound payload carrying capabilities. These impacts to payload capabilities are addressed in greater detail in section 8.8.3.

8.6.4 Arrival Feasibility by Month

Landing feasibility of the five target aircraft at ASE is summarized in Table 30, which illustrates the likelihood that the weather conditions are better than those available on the Special LOC/DME RWY 15 approach and that winds within the crosswind and tailwind limitations are suitable for the aircraft to attempt an approach. The prolonged stretches of white cells represent hours of the day where the five target aircraft will either experience delays waiting for ideal conditions within the given hour to execute the approach, missed approaches, or diversions leading to increased block times. The yellow cells represent hours where scheduled approach operations will not likely be feasible, but charter operations may be feasible. Green cells all represent hours where the aircraft should be feasible of scheduled or charter approach operations.

Marginal and IMC Large Jets Current and After 80ft Shift (16/Hr)

Local Time	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00:00	45%	41%	54%	51%	63%	81%	73%	69%	72%	66%	58%	41%
01:00	44%	40%	51%	47%	60%	83%	73%	70%	73%	62%	62%	39%
02:00	43%	39%	50%	47%	62%	83%	75%	74%	70%	66%	56%	39%
03:00	43%	41%	49%	46%	62%	85%	78%	74%	73%	61%	57%	40%
04:00	42%	40%	50%	47%	60%	84%	77%	75%	69%	63%	57%	38%
05:00	43%	41%	51%	46%	64%	89%	78%	75%	68%	60%	58%	38%
06:00	51%	44%	58%	55%	67%	90%	89%	84%	76%	66%	65%	44%
07:00	59%	50%	66%	57%	68%	90%	88%	85%	80%	72%	68%	51%
08:00	61%	54%	68%	58%	73%	90%	91%	83%	78%	74%	72%	54%
09:00	63%	55%	66%	60%	70%	88%	89%	84%	76%	73%	69%	56%
10:00	62%	52%	66%	56%	60%	78%	84%	80%	73%	70%	70%	57%
11:00	61%	53%	60%	45%	47%	66%	70%	63%	66%	63%	63%	55%
12:00	60%	52%	56%	43%	41%	53%	53%	47%	45%	53%	59%	56%
13:00	60%	46%	54%	40%	42%	49%	41%	37%	41%	48%	59%	51%
14:00	54%	45%	50%	39%	41%	50%	40%	40%	38%	48%	62%	53%
15:00	58%	47%	52%	36%	41%	46%	45%	45%	44%	46%	65%	55%
16:00	55%	49%	53%	38%	42%	59%	49%	47%	51%	57%	71%	54%
17:00	52%	52%	54%	45%	48%	61%	54%	55%	60%	63%	67%	51%
18:00	50%	43%	60%	49%	53%	72%	65%	68%	71%	66%	67%	47%
19:00	50%	41%	57%	52%	62%	82%	68%	74%	75%	64%	64%	48%
20:00	49%	42%	57%	48%	61%	80%	73%	69%	71%	69%	61%	51%
21:00	45%	42%	50%	49%	65%	76%	68%	67%	69%	66%	61%	44%
22:00	42%	41%	52%	49%	62%	77%	71%	69%	69%	68%	56%	44%
23:00	41%	42%	52%	45%	62%	81%	73%	68%	71%	64%	59%	40%

Table 29 Likelihood of successful arrival operations for target aircraft

Based on these results, there do not appear to be any aircraft approach performance limitations that would eliminate any of the five aircraft from consideration; feasibility of at least near year-round charter operations is likely possible following the runway relocation. If approaches with lower minimums, especially those supporting CAT D operations, could be developed following the runway relocation, then the feasibility of all five aircraft will improve to year-round feasibility of scheduled operations.

8.7 SMS Feasibility

FAR 121, 125 and 135 operators are either required, or strongly encouraged, to engage in some level of SMS application when considering flight operations at airports with difficult landing procedures like ASE. The typical SMS process for operators involves Safety Policy, Safety Assurance, Safety Risk Management, and Safety Promotion. For the purposes of this assessment, Safety Risk Management is the primary component of an overarching SMS and the hazard identification and risk assessment.

During the hazard identification and risk assessment process (HIRA) operators are encouraged to evaluate potential hazards to flight operations and the risk of each potential hazard in terms of the likelihood of occurrence and the severity of the outcome to create risk scores. The risks scores are then evaluated to determine whether mitigation is required to improve the overall risk outcome.

At ASE, several key hazards exist, and will continue to exist following the runway relocation, that will create challenging HIRA outcomes that could impact the feasibility of operations of larger aircraft at ASE.

8.7.1 Point of No Return and Go-Around/Balked Landing Obstacle Clearance

At ASE, the primary hazard that all aircraft operators must consider is the possibility of operating with a PNR and the complimentary OEI and AEO emergency extraction procedures. Additional information on the procedure and performance considerations with the PNR is provided in the Arrival Feasibility section of this assessment.

Currently, only smaller aircraft, or extremely high performing aircraft, have been able to successfully operate scheduled service into ASE without a PNR, including the Bombardier Dash-7, Dash 8-Q400 and the BAE-146-200. The ability to operate without a PNR has only been utilized with extensive flight operations engineering analysis and flight crew training, which resulted in extraction procedures with reduced obstacle and terrain clearance that were still considered adequate for the emergency situation.

At this time, all five assessed aircraft require a PNR varying in location between the CEYAG fixed point (2.6nm from the runway end) a point roughly 1.7nm from the runway end and the threshold of the runway. Regardless of the position of the PNR, all operators must accept the likelihood and severity of the potential need to execute a continued flight operation after crossing the PNR. Mitigation can reduce the risk to an acceptable level for charter or scheduled service and includes significant engineering analysis on the extraction procedure, crew training, simulator training, and potentially customized navigational techniques,.

The risk mitigation necessary for feasible charter and scheduled operations is dependent on the amount of reduced obstacle and terrain separation required during any extraction maneuvers after reaching the PNR. When certain operators are unable to operate an aircraft with a PNR over the threshold of the runway, it is anticipated that only charter operations will occur and is limited to select, highly experienced crew members that can attempt the extraction procedure in a simulator prior to operating at ASE. This was the case for the 737-700 and A319-112 aircraft analyzed in the 2014 feasibility study and may also be true for certain 737-8 MAX operators (other than American Airlines) following the runway relocation.

For aircraft operators that can accommodate a PNR past the threshold of the runway, like the CS-100 (A210), A319-115 and the E175LR, the feasibility of scheduled service with the PNR is high.

8.7.2 Windshear, Tailwinds and Single ASOS

One type of hazard encountered at mountain airports relates to gaps between Automated Surface Observation System (ASOS)/Automated Weather Observation System (AWOS) stations, which can result in ”weather reporting holes”, limiting the effectiveness of applying reported winds to operations in the terminal area.

In areas of rapidly changing terrain, referred to as precipitous terrain, wind direction and intensity will vary as air currents rise and fall to conform to the contours of peaks and valleys. A single ASOS/AWOS wind sensor, located on or near the runway, provides an accurate picture of the winds close to the airport, At ASE, the ASOS is located near the runway, which is within the narrow portion of the valley. However, wind conditions in the valleys surrounding ASE can differ vastly from the direction or intensity of the winds reported at the Airport, especially at altitudes below the peaks and ridgelines.

While flight crews can consider terminal area wind forecasts prior to operating in the area, these forecasts do not provide an accurate representation of the wind direction and intensity conditions that change with the terrain surrounding ASE.

Given the one way in/one way out and PNR operations at ASE, tailwinds can be hazardous and can significantly impact departure and arrival operations. . Flight crews and flight operations engineers must identify potential wind limitations on their anticipated normal and emergency procedures at ASE to account for the inaccuracy of winds reported via the Meteorological Terminal Aviation Routine Weather Report (METAR) and the Automatic Terminal Information service (ATIS).

Traditional techniques for mitigating this risk involve two different, but complimentary paths: procedure design and planning for additional missed approaches. The opportunity to incorporate higher possible wind protections into flight procedures is already considered in FAA flight procedure development. For operator generated flight procedures, and calculated aircraft performance, the opportunity to either pre-incorporate tailwinds into performance calculations and obstacle accountability areas is a potential risk mitigation. This mitigation can be applied to both takeoff and landing, but it may result in limitations to payload range. Planning for additional missed approaches can be addressed by increasing the fuel reserve, which requires operators to carry extra fuel to accommodate additional opportunities for missed approaches that are broken off before the decision altitude associated with runway ceilings and visibilities is reached. While carrying additional fuel mitigates risk, it may reduce payload, and in some extreme cases range.

8.7.3 Utilization of CAT C Minimums for the 737-8 MAX

The Special LOC/DME RWY 15 approach deviates from standard TERPS to permit CAT C aircraft to fly the procedure. The FAA applies these deviations to criteria through the use of waivers that are accompanied by Equivalent Levels of Safety (ELOS). Some of the waivers used for the Special LOC/DME RWY 15 approach require the operator to demonstrate additional operational, training or performance elements to achieve the ELOS, like advanced crew training, simulator training, minimum hours of experience, or balked landing extraction procedures.

There are several waivers to standards that operators are not usually asked to review, which can potentially limit an operator’s ability to perform the Special LOC/DME RWY 15 approach with CAT C aircraft, especially in the missed approach. These limitations will become especially impactful for operators of CAT D aircraft, like the 737, that either apply to use the this approach or request that FAA update the procedure to accommodate CAT D aircraft.

The primary challenge associated with the Special LOC/DME RWY 15 procedure is that the missed approach obstacle evaluation areas utilize a reduced geometric footprint predicated on aircraft not exceeding a DME arc, which is the procedure used to transition from the en-route environment to the instrument approach. Figure 21 illustrates the reduced missed approach obstacle evaluation area at ASE. A range ring around the Red Table VOR was added to highlight the evaluation area. The distance from the last straight segment fixed point (RIKOC) to the start of the Red Table D 13.5 fence point is 1.7nm, which further reduces the standard departure criteria waiver used for the development of the special missed approach. The FAA also provides an alternative missed approach without the CG, that is not affected by the runway shift because of the higher minimums that are associated with it.

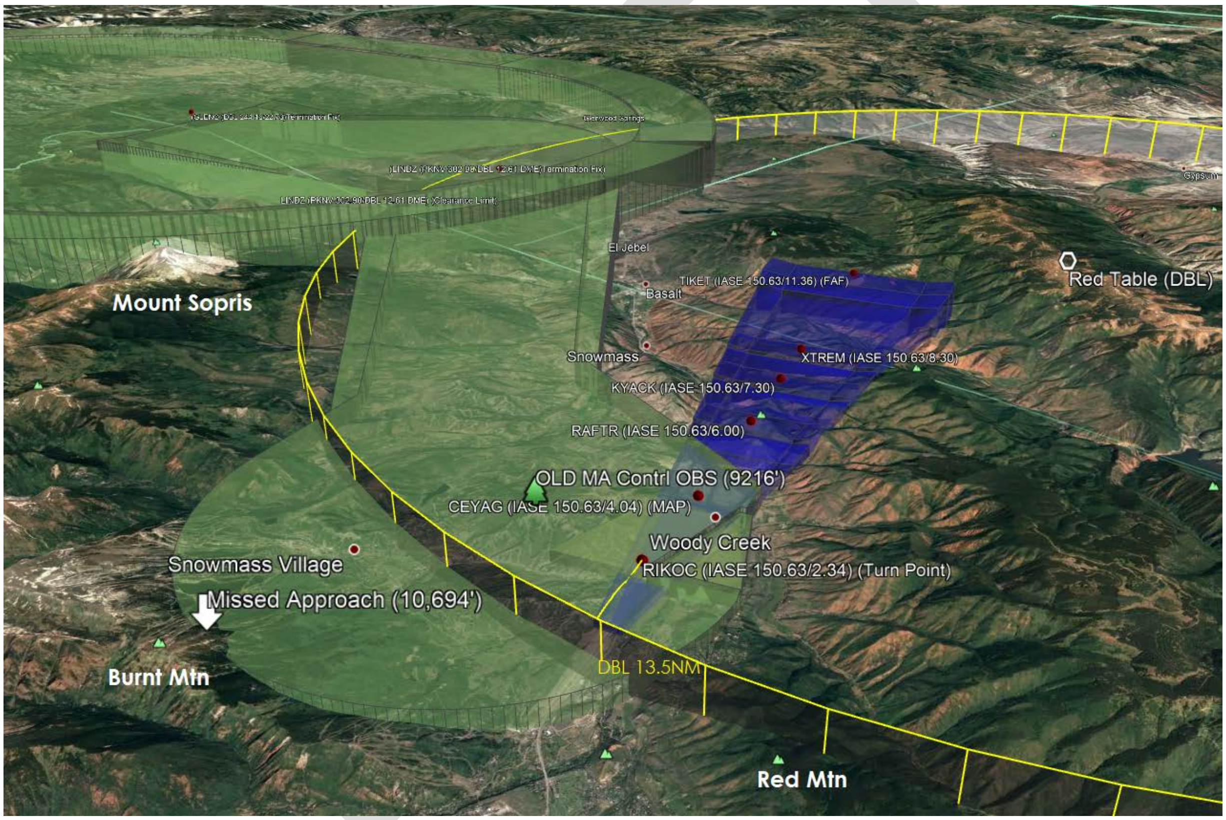


Figure 21 Depiction of Special LOC/DME Missed Approach Areas and DME Arc Limitation To Reduce Required Climb Gradient

Image: The green shaded area represents where the departure criteria with Pilot/Controller Glossary (PCG) VOR guidance is applied. The yellow arc line indicates the Red Table D13.5 crossing restriction. The distance from RIKOC (the beginning of the MA turn) to the DBL 13.5nm arc is 1.7nm.

For CAT D aircraft, like the 737-8 MAX, to remain within this reduced obstacle evaluation area, operators will have to take appropriate aircraft performance and/or navigational risk mitigations to ensure that the plane remains within the target area. This hazard requires mitigation, which can be accomplished through engineering analysis and dual flight management systems (FMS) requirements, a. Additional information regarding the feasibility of the 737-8 Max remaining within the CAT C designed containment area is provided in Appendix 3, American Airlines Feedback.

8.7.4 Summary of SMS Feasibility

Based on the primary hazards identified in this section, the A319-115, CS-100 (A210) and E175LR are considered to be feasible for scheduled operations. While the 737-700, A319-112 and 737-8 MAX are considered to be feasible for charter operations, the approach procedures are currently designed only for CAT C aircraft, and associated hazards, including PNR operations, require mitigation. Approach procedures will require applications for CAT D approach speed aircraft to utilize the procedures. These feasibility results are expected to remain the same following the runway relocation and runway safety enhancements.

8.8 Payload Range Feasibility

The payload range feasibility assessment is focused on the overall ability of aircraft to serve key hub markets with load factors derived from the departure and arrival performance considerations in addition to typical flight planning considerations. For an aircraft to be considered feasible for scheduled service, it must obtain a 75 percent load factor to one or more target markets either across significant portions of a given hour across several months in a year, or across several hours over one or more months. For an aircraft to be considered feasible for charter operations it must achieve a 65 percent load factor to one or more target markets across any months or hours in a year. Target market selection is based on the aircraft and its anticipated operator hubs.

The feasibility thresholds used in this analysis are representative of scheduled air carrier engineering considerations and do not reflect the higher required load factors necessary for low cost and ultra low cost carrier models.

While both arrival and departure operations of the target aircraft at ASE are considered in this feasibility assessment, , the overall limitations on arrivals at ASE are not considered to be route specific.

8.8.1 Methods

The load factor determination for a given market is based on a PAX weight calculation, without consideration for excess cargo. It is calculated by dividing the available payload by route and by the target PAX weight, which is 220lbs per passenger and their bags in this assessment, to determine the passenger capacity. This number is then divided by the l number of seats available on the aircraft. An aircraft that has enough payload availability for all seats to be filled will receive a 100 percent load factor, while an aircraft that can only fill half of its seats will receive a 50 percent load factor.

The available payload is calculated from highspeed performance modules unique to each of the aircraft. All five of the assessed aircraft have “first principles” performance models that were tailored to replicate real world airline operations through cross reference with supplemental flight planning materials provided by the manufacturers. These models are then used to calculate target climb, cruise, descent, approach and diversion fuels against optimal step climb profiles considering historical winds modeled at a 70percent confidence interval.

For routes originating at ASE, the limiting takeoff weights were calculated (by month and hour) based on the historical weather conditions identified in section 6.2 of this report. Calculations were performed using first principles aircraft performance information in the form of a Computerized AFM (CAFM) or Standard Computerized Aircraft Performance Modules (SCAP). The limitations from these calculations were applied to the overall flight planning optimization to determine the maximum payload, fuel required and block time for the route. Potential landing distance limitations at the destination were not considered. Standard FOD-Ds, calculated in accordance with FAA Part 121, Domestic Fuel Reserves and Alternate Planning, were used according to the aircraft model.

For routes originating outside of ASE, and landing at ASE, it was assumed that the aircraft would be capable of achieving the maximum structural takeoff weight and only the calculated landing weights using SCAP and CAFM, which were applied by month and hour to represent potential landing weight limitations. Landing performance considerations accounted for missed approach and emergency extraction procedures, including the possibility of tailwind penalties and engine-anti ice application.

All routes were calculated on the great circle navigation method with varying multipliers, which are referred to as route efficiency factors, and the distances representing the planned flight distances for the aircraft to navigate the existing airway structure.

None of the routes calculated in this analysis considered ETOPS or ETP fuel reserves, international flight planning rules, or terrain clearance/driftdown limitations that might impose additional weight penalties not associated with the terminal departure and arrival operations at ASE.

8.8.2 Outbound City Pair Analysis

Table 31 provides a summary of the target markets/hub airports considered in payload range feasibility assessment and identifies the great circle distance from ASE to the target market, the route efficiency multiplier, the aircraft that were evaluated, and the corresponding detail table for each market.

Low-Cost Carrier cities or Ultra Low-Cost Carrier cities were not considered because of the lack of available information on aircraft performance capabilities in their current fleet types and the increased load factors that would be required for the market to be considered feasible.

Table	Target Market	Great Circle Range (Miles)	Route Efficiency	Aircraft Considered
8.8.2.13	ATL	1304	1.03	319-115, 738MAX, CS-100
8.8.2.1	BOS	1879	1.03	319-115, 738MAX, CS-100
8.8.2.14	CLT	1451	1.03	319-115, 738MAX, CS-100
8.8.2.4	DEN	125	1.1	319-115, 738MAX, CS-100, E175LR
8.8.2.6	DFW/DAL	701	1.05	319-115, 738MAX, CS-100, E175LR
8.8.2.3	DTW	1248	1.03	319-115, 738MAX, CS-100
8.8.2.16	IAD/DCA	1574	1.03	319-115, 738MAX, CS-100
8.8.2.9	IAH/HOU	913	1.03	319-115, 738MAX, CS-100
8.8.2.12	JFK/LGA/EWR	1750	1.03	319-115, 738MAX, CS-100
8.8.2.7	LAX/ONT/SNA/BUR	737	1.03	319-115, 738MAX, CS-100, E175LR
8.8.2.17	MIA/FLL	1796	1.03	319-115, 738MAX, CS-100
8.8.2.10	MSP	802	1.03	319-115, 738MAX, CS-100
8.8.2.2	ORD/MDW	1013	1.03	319-115, 738MAX, CS-100, E175LR
8.8.2.5	PHL	1681	1.03	319-115, 738MAX, CS-100
8.8.2.18	PHX	491	1.05	319-115, 738MAX, CS-100, E175LR
8.8.2.15	SEA	961	1.03	319-115, 738MAX, CS-100
8.8.2.8	SFO/OAK	848	1.03	319-115, 738MAX, CS-100
8.8.2.11	SLC	292	1.1	319-115, 738MAX, CS-100, E175LR

Table 30 City-Pairs and Aircraft Considered

8.8.2.1 Boston (BOS)

ASE to BOS CS-100 (A210) Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to BOS A319-115 Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to BOS B737-8 MAX Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	91%	90%	88%	85%	81%	79%	73%	74%	81%	84%	87%	90%
8:00	90%	89%	88%	85%	80%	77%	69%	72%	80%	84%	87%	90%
9:00	90%	88%	87%	84%	80%	73%	65%	69%	77%	83%	86%	89%
10:00	90%	88%	87%	84%	80%	69%	60%	63%	73%	83%	85%	88%
11:00	89%	88%	87%	84%	77%	65%	56%	59%	70%	81%	85%	88%
12:00	88%	87%	86%	83%	76%	61%	53%	56%	67%	81%	85%	88%
13:00	88%	87%	86%	83%	73%	58%	51%	53%	65%	78%	85%	87%
14:00	88%	87%	85%	83%	72%	57%	48%	52%	63%	77%	84%	87%
15:00	88%	87%	85%	83%	72%	57%	48%	52%	63%	77%	84%	87%
16:00	88%	87%	85%	83%	72%	57%	48%	52%	63%	77%	84%	87%
17:00	88%	87%	86%	83%	73%	58%	51%	53%	65%	78%	85%	87%
18:00	88%	87%	86%	83%	76%	61%	53%	56%	67%	81%	85%	88%
19:00	89%	88%	87%	84%	77%	65%	56%	59%	70%	81%	85%	88%
20:00	90%	88%	87%	84%	80%	69%	60%	63%	73%	83%	85%	88%
21:00	90%	88%	87%	84%	80%	73%	65%	69%	77%	83%	86%	89%
22:00	90%	89%	88%	85%	80%	77%	69%	72%	80%	84%	87%	90%

8.8.2.2 Chicago (ORD/MDW)

ASE to ORD E175LR + EWT Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	92%	89%	87%	83%	78%	75%	71%	72%	78%	82%	87%	92%
8:00	91%	89%	87%	83%	76%	74%	68%	71%	76%	80%	87%	91%
9:00	91%	88%	86%	82%	75%	71%	64%	67%	74%	79%	86%	91%
10:00	89%	87%	86%	80%	75%	68%	62%	63%	71%	78%	84%	89%
11:00	88%	87%	84%	80%	72%	64%	58%	61%	68%	76%	84%	88%
12:00	88%	86%	84%	79%	71%	62%	55%	58%	66%	76%	83%	88%
13:00	87%	86%	83%	79%	70%	59%	53%	55%	64%	74%	83%	88%
14:00	87%	86%	83%	78%	68%	58%	50%	54%	63%	74%	83%	87%
15:00	87%	86%	83%	78%	68%	58%	50%	54%	63%	74%	83%	87%
16:00	87%	86%	83%	78%	68%	58%	50%	54%	63%	74%	83%	87%
17:00	87%	86%	83%	79%	70%	59%	53%	55%	64%	74%	83%	88%
18:00	88%	86%	84%	79%	71%	62%	55%	58%	66%	76%	83%	88%
19:00	88%	87%	84%	80%	72%	64%	58%	61%	68%	76%	84%	88%
20:00	89%	87%	86%	80%	75%	68%	62%	63%	71%	78%	84%	89%
21:00	91%	88%	86%	82%	75%	71%	64%	67%	74%	79%	86%	91%
22:00	91%	89%	87%	83%	76%	74%	68%	71%	76%	80%	87%	91%

ASE to ORD CS-100 (A210) Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to ORD A319-115 Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to ORD B737-8 MAX Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	98%	92%	94%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	95%	88%	91%	99%	100%	100%	100%
9:00	100%	100%	100%	100%	99%	91%	83%	87%	95%	100%	100%	100%
10:00	100%	100%	100%	100%	98%	87%	78%	81%	91%	100%	100%	100%
11:00	100%	100%	100%	100%	95%	82%	73%	76%	88%	100%	100%	100%
12:00	100%	100%	100%	100%	94%	78%	70%	73%	85%	99%	100%	100%
13:00	100%	100%	100%	100%	91%	75%	68%	71%	81%	97%	100%	100%
14:00	100%	100%	100%	100%	90%	74%	66%	70%	80%	95%	100%	100%
15:00	100%	100%	100%	100%	90%	74%	66%	70%	80%	95%	100%	100%
16:00	100%	100%	100%	100%	90%	74%	66%	70%	80%	95%	100%	100%
17:00	100%	100%	100%	100%	91%	75%	68%	71%	81%	97%	100%	100%
18:00	100%	100%	100%	100%	94%	78%	70%	73%	85%	99%	100%	100%
19:00	100%	100%	100%	100%	95%	82%	73%	76%	88%	100%	100%	100%
20:00	100%	100%	100%	100%	98%	87%	78%	81%	91%	100%	100%	100%
21:00	100%	100%	100%	100%	99%	91%	83%	87%	95%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	95%	88%	91%	99%	100%	100%	100%

8.8.2.3 Detroit (DTW)

ASE to DTW CS-100 (A210) Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to DTW A319-115 Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to DTW B737-8 MAX Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	97%	96%	95%	94%	92%	90%	85%	86%	92%	94%	95%	97%
8:00	97%	96%	95%	94%	91%	88%	80%	83%	92%	93%	95%	97%
9:00	96%	96%	95%	94%	91%	84%	76%	80%	88%	93%	95%	96%
10:00	96%	95%	95%	93%	90%	81%	71%	74%	83%	93%	94%	96%
11:00	96%	95%	94%	93%	88%	75%	66%	69%	81%	92%	94%	96%
12:00	96%	95%	94%	93%	86%	72%	64%	67%	78%	92%	94%	96%
13:00	96%	95%	94%	93%	83%	68%	61%	64%	74%	89%	94%	96%
14:00	96%	95%	94%	93%	82%	67%	59%	63%	73%	88%	94%	95%
15:00	96%	95%	94%	93%	82%	67%	59%	63%	73%	88%	94%	96%
16:00	96%	95%	94%	93%	82%	67%	59%	63%	73%	88%	94%	96%
17:00	96%	95%	94%	93%	83%	68%	61%	64%	74%	89%	94%	96%
18:00	96%	95%	94%	93%	86%	72%	64%	67%	78%	92%	94%	96%
19:00	96%	95%	94%	93%	88%	75%	66%	69%	81%	92%	94%	96%
20:00	96%	95%	95%	93%	90%	81%	71%	74%	83%	93%	94%	96%
21:00	96%	96%	95%	94%	91%	84%	76%	80%	88%	93%	95%	96%
22:00	97%	96%	95%	94%	91%	88%	80%	83%	92%	93%	95%	97%

8.8.2.4 *Denver (DEN)*

ASE to DEN E175LR + EWT Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	99%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	95%	97%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	97%	91%	93%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	93%	88%	89%	99%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	91%	86%	88%	96%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	88%	83%	86%	93%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	87%	80%	84%	92%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	87%	80%	84%	92%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	87%	80%	84%	92%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	88%	83%	86%	93%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	91%	86%	88%	96%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	93%	88%	89%	99%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	97%	91%	93%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	95%	97%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	99%	100%	100%	100%	100%	100%

ASE to DEN CS-100 (A210) Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to DEN A319-115 Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to DEN B737-8 MAX Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	96%	99%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	99%	91%	94%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	96%	89%	91%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	92%	86%	88%	99%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	91%	84%	87%	98%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	91%	84%	87%	98%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	91%	84%	87%	98%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	92%	86%	88%	99%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	96%	89%	91%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	99%	91%	94%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	96%	99%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

8.8.2.5 *Philadelphia (PHL)*

ASE to PHL CS-100 (A210) Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to PHL A319-115 Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to PHL B737-8 MAX Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	94%	92%	91%	88%	83%	83%	77%	78%	84%	87%	90%	94%
8:00	93%	92%	91%	88%	83%	80%	73%	76%	84%	87%	90%	93%
9:00	92%	91%	90%	87%	83%	76%	69%	72%	80%	86%	90%	92%
10:00	92%	91%	90%	87%	82%	74%	64%	67%	76%	85%	89%	92%
11:00	92%	90%	89%	86%	81%	67%	59%	62%	73%	85%	89%	91%
12:00	91%	90%	89%	85%	77%	65%	57%	60%	71%	84%	88%	91%
13:00	91%	90%	88%	85%	75%	62%	55%	57%	67%	81%	88%	91%
14:00	91%	90%	88%	85%	74%	60%	52%	56%	66%	80%	88%	90%
15:00	91%	90%	88%	85%	74%	60%	52%	56%	66%	80%	88%	91%
16:00	91%	90%	88%	85%	74%	60%	52%	56%	66%	80%	88%	91%
17:00	91%	90%	88%	85%	75%	62%	55%	57%	67%	81%	88%	91%
18:00	91%	90%	89%	85%	77%	65%	57%	60%	71%	84%	88%	91%
19:00	92%	90%	89%	86%	81%	67%	59%	62%	73%	85%	89%	91%
20:00	92%	91%	90%	87%	82%	74%	64%	67%	76%	85%	89%	92%
21:00	92%	91%	90%	87%	83%	76%	69%	72%	80%	86%	90%	92%
22:00	93%	92%	91%	88%	83%	80%	73%	76%	84%	87%	90%	93%

8.8.2.6 Dallas (DFW/DAL)

ASE to DFW E175LR + EWT Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	99%	95%	89%	86%	82%	83%	88%	92%	97%	100%
8:00	100%	100%	97%	93%	88%	84%	79%	82%	87%	91%	97%	100%
9:00	100%	100%	97%	92%	87%	82%	75%	78%	84%	89%	96%	100%
10:00	100%	99%	96%	92%	87%	78%	71%	74%	82%	88%	96%	100%
11:00	100%	97%	95%	91%	84%	75%	68%	71%	79%	87%	95%	99%
12:00	99%	97%	95%	89%	83%	72%	66%	68%	78%	87%	95%	99%
13:00	99%	97%	95%	89%	82%	70%	63%	66%	75%	84%	93%	99%
14:00	99%	96%	93%	89%	80%	68%	61%	64%	74%	84%	93%	97%
15:00	99%	96%	93%	89%	80%	68%	61%	64%	74%	84%	93%	97%
16:00	99%	96%	93%	89%	80%	68%	61%	64%	74%	84%	93%	97%
17:00	99%	97%	95%	89%	82%	70%	63%	66%	75%	84%	93%	99%
18:00	99%	97%	95%	89%	83%	72%	66%	68%	78%	87%	95%	99%
19:00	100%	97%	95%	91%	84%	75%	68%	71%	79%	87%	95%	99%
20:00	100%	99%	96%	92%	87%	78%	71%	74%	82%	88%	96%	100%
21:00	100%	100%	97%	92%	87%	82%	75%	78%	84%	89%	96%	100%
22:00	100%	100%	97%	93%	88%	84%	79%	82%	87%	91%	97%	100%

ASE to DFW CS-100 (A210) Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to DFW A319-115 Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to DFW B737-8 MAX Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	99%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	95%	98%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	98%	90%	94%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	94%	84%	88%	98%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	88%	79%	83%	95%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	84%	77%	80%	92%	100%	100%	100%
13:00	100%	100%	100%	100%	99%	81%	74%	77%	88%	100%	100%	100%
14:00	100%	100%	100%	100%	97%	80%	72%	76%	87%	100%	100%	100%
15:00	100%	100%	100%	100%	97%	80%	72%	76%	87%	100%	100%	100%
16:00	100%	100%	100%	100%	97%	80%	72%	76%	87%	100%	100%	100%
17:00	100%	100%	100%	100%	99%	81%	74%	77%	88%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	84%	77%	80%	92%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	88%	79%	83%	95%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	94%	84%	88%	98%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	98%	90%	94%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	95%	98%	100%	100%	100%	100%

8.8.2.7 Los Angeles (LAX/ONT/SNA/BUR)

ASE to LAX E175LR + EWT Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	96%	95%	91%	88%	88%	80%	78%	79%	83%	88%	91%	95%
8:00	95%	95%	91%	87%	87%	79%	75%	76%	82%	87%	91%	95%
9:00	95%	93%	89%	87%	86%	76%	71%	74%	79%	86%	89%	93%
10:00	93%	92%	88%	86%	86%	72%	67%	70%	76%	84%	89%	93%
11:00	92%	92%	88%	84%	83%	70%	63%	66%	74%	83%	88%	92%
12:00	92%	91%	87%	84%	82%	67%	61%	63%	71%	82%	88%	91%
13:00	92%	91%	87%	83%	80%	64%	59%	62%	70%	80%	87%	91%
14:00	91%	91%	87%	83%	79%	63%	57%	61%	68%	79%	87%	91%
15:00	91%	91%	87%	83%	79%	63%	57%	61%	68%	79%	87%	91%
16:00	91%	91%	87%	83%	79%	63%	57%	61%	68%	79%	87%	91%
17:00	92%	91%	87%	83%	80%	64%	59%	62%	70%	80%	87%	91%
18:00	92%	91%	87%	84%	82%	67%	61%	63%	71%	82%	88%	91%
19:00	92%	92%	88%	84%	83%	70%	63%	66%	74%	83%	88%	92%
20:00	93%	92%	88%	86%	86%	72%	67%	70%	76%	84%	89%	93%
21:00	95%	93%	89%	87%	86%	76%	71%	74%	79%	86%	89%	93%
22:00	95%	95%	91%	87%	87%	79%	75%	76%	82%	87%	91%	95%

ASE to LAX CS-100 (A210) Estimated Load Factor

Local Hour

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to LAX A319-115 Estimated Load Factor

Local Hour

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to LAX B737-8 MAX Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	97%	98%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	99%	92%	95%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	95%	87%	91%	99%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	91%	82%	85%	95%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	85%	77%	80%	92%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	81%	74%	77%	88%	100%	100%	100%
13:00	100%	100%	100%	100%	98%	78%	72%	74%	85%	100%	100%	100%
14:00	100%	100%	100%	100%	97%	77%	69%	73%	83%	99%	100%	100%
15:00	100%	100%	100%	100%	97%	77%	69%	73%	83%	99%	100%	100%
16:00	100%	100%	100%	100%	97%	77%	69%	73%	83%	99%	100%	100%
17:00	100%	100%	100%	100%	98%	78%	72%	74%	85%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	81%	74%	77%	88%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	85%	77%	80%	92%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	91%	82%	85%	95%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	95%	87%	91%	99%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	99%	92%	95%	100%	100%	100%	100%

8.8.2.8 San Francisco (SFO/OAK/SJC)

ASE to SFO CS-100 (A210) Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to SFO A319-115 Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to SFO B737-8 MAX Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	94%	96%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	97%	90%	93%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	93%	85%	89%	97%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	89%	80%	83%	93%	100%	100%	100%
11:00	100%	100%	100%	100%	97%	84%	75%	78%	90%	100%	100%	100%
12:00	100%	100%	100%	100%	96%	80%	72%	75%	87%	100%	100%	100%
13:00	100%	100%	100%	100%	93%	77%	70%	73%	83%	99%	100%	100%
14:00	100%	100%	100%	100%	92%	76%	68%	72%	82%	97%	100%	100%
15:00	100%	100%	100%	100%	92%	76%	68%	72%	82%	97%	100%	100%
16:00	100%	100%	100%	100%	92%	76%	68%	72%	82%	97%	100%	100%
17:00	100%	100%	100%	100%	93%	77%	70%	73%	83%	99%	100%	100%
18:00	100%	100%	100%	100%	96%	80%	72%	75%	87%	100%	100%	100%
19:00	100%	100%	100%	100%	97%	84%	75%	78%	90%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	89%	80%	83%	93%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	93%	85%	89%	97%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	97%	90%	93%	100%	100%	100%	100%

8.8.2.9 *Houston (IAH/HOU)*

ASE to IAH CS-100 (A210) Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to IAH A319-115 Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to IAH B737-8 MAX Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	97%	98%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	99%	92%	95%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	95%	87%	91%	99%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	91%	82%	85%	95%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	85%	77%	80%	92%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	81%	74%	77%	88%	100%	100%	100%
13:00	100%	100%	100%	100%	98%	78%	72%	74%	85%	100%	100%	100%
14:00	100%	100%	100%	100%	97%	77%	69%	73%	83%	99%	100%	100%
15:00	100%	100%	100%	100%	97%	77%	69%	73%	83%	99%	100%	100%
16:00	100%	100%	100%	100%	97%	77%	69%	73%	83%	99%	100%	100%
17:00	100%	100%	100%	100%	98%	78%	72%	74%	85%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	81%	74%	77%	88%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	85%	77%	80%	92%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	91%	82%	85%	95%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	95%	87%	91%	99%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	99%	92%	95%	100%	100%	100%	100%

8.8.2.10 Minneapolis (MSP)

ASE to MSP CS-100 (A210) Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to MSP A319-115 Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to MSP B737-8 MAX Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	98%	92%	94%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	95%	88%	91%	99%	100%	100%	100%
9:00	100%	100%	100%	100%	99%	91%	83%	87%	95%	100%	100%	100%
10:00	100%	100%	100%	100%	98%	87%	78%	81%	91%	100%	100%	100%
11:00	100%	100%	100%	100%	95%	82%	73%	76%	88%	100%	100%	100%
12:00	100%	100%	100%	100%	94%	78%	70%	73%	85%	99%	100%	100%
13:00	100%	100%	100%	100%	91%	75%	68%	71%	81%	97%	100%	100%
14:00	100%	100%	100%	100%	90%	74%	66%	70%	80%	95%	100%	100%
15:00	100%	100%	100%	100%	90%	74%	66%	70%	80%	95%	100%	100%
16:00	100%	100%	100%	100%	90%	74%	66%	70%	80%	95%	100%	100%
17:00	100%	100%	100%	100%	91%	75%	68%	71%	81%	97%	100%	100%
18:00	100%	100%	100%	100%	94%	78%	70%	73%	85%	99%	100%	100%
19:00	100%	100%	100%	100%	95%	82%	73%	76%	88%	100%	100%	100%
20:00	100%	100%	100%	100%	98%	87%	78%	81%	91%	100%	100%	100%
21:00	100%	100%	100%	100%	99%	91%	83%	87%	95%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	95%	88%	91%	99%	100%	100%	100%

8.8.2.11 Salt Lake City (SLC)

ASE to SLC E175LR + EWT Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	96%	97%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	97%	93%	96%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	95%	89%	92%	97%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	92%	86%	88%	95%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	88%	83%	84%	93%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	86%	80%	83%	91%	100%	100%	100%
13:00	100%	100%	100%	100%	97%	83%	78%	80%	88%	99%	100%	100%
14:00	100%	100%	100%	100%	97%	82%	75%	79%	87%	99%	100%	100%
15:00	100%	100%	100%	100%	97%	82%	75%	79%	87%	99%	100%	100%
16:00	100%	100%	100%	100%	97%	82%	75%	79%	87%	99%	100%	100%
17:00	100%	100%	100%	100%	97%	83%	78%	80%	88%	99%	100%	100%
18:00	100%	100%	100%	100%	100%	86%	80%	83%	91%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	88%	83%	84%	93%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	92%	86%	88%	95%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	95%	89%	92%	97%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	97%	93%	96%	100%	100%	100%	100%

ASE to SLC CS-100 (A210) Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to SLC A319-115 Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to SLC B737-8 MAX Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	97%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	92%	95%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	95%	87%	90%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	92%	85%	87%	99%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	88%	82%	84%	95%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	87%	80%	83%	94%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	87%	80%	83%	94%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	87%	80%	83%	94%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	88%	82%	84%	95%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	92%	85%	87%	99%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	95%	87%	90%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	92%	95%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	97%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

8.8.2.12 New York (JFK/LGA/EWR)

ASE to JFK CS-100 (A210) Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to JFK A319-115 Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to JFK B737-8 MAX Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	92%	91%	89%	87%	82%	81%	76%	77%	83%	86%	89%	92%
8:00	92%	90%	89%	86%	81%	78%	72%	74%	83%	85%	88%	92%
9:00	91%	90%	88%	85%	81%	75%	67%	71%	78%	85%	88%	91%
10:00	91%	90%	88%	85%	80%	72%	63%	66%	75%	84%	88%	91%
11:00	90%	89%	87%	85%	78%	66%	58%	62%	73%	83%	87%	90%
12:00	90%	88%	87%	84%	76%	63%	56%	59%	70%	83%	87%	90%
13:00	90%	88%	87%	84%	74%	60%	53%	56%	66%	80%	87%	90%
14:00	90%	88%	87%	84%	73%	59%	51%	55%	65%	78%	87%	90%
15:00	90%	88%	87%	84%	73%	59%	51%	55%	65%	78%	87%	90%
16:00	90%	88%	87%	84%	73%	59%	51%	55%	65%	78%	87%	90%
17:00	90%	88%	87%	84%	74%	60%	53%	56%	66%	80%	87%	90%
18:00	90%	88%	87%	84%	76%	63%	56%	59%	70%	83%	87%	90%
19:00	90%	89%	87%	85%	78%	66%	58%	62%	73%	83%	87%	90%
20:00	91%	90%	88%	85%	80%	72%	63%	66%	75%	84%	88%	91%
21:00	91%	90%	88%	85%	81%	75%	67%	71%	78%	85%	88%	91%
22:00	92%	90%	89%	86%	81%	78%	72%	74%	83%	85%	88%	92%

8.8.2.13 Atlanta (ATL)

ASE to ATL CS-100 (A210) Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to ATL A319-115 Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to ATL B737-8 MAX Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	99%	97%	95%	90%	89%	82%	84%	91%	93%	96%	99%
8:00	100%	98%	97%	94%	89%	86%	78%	81%	90%	93%	96%	99%
9:00	99%	98%	96%	93%	89%	82%	74%	77%	86%	92%	96%	99%
10:00	99%	98%	96%	93%	88%	78%	69%	73%	82%	92%	95%	98%
11:00	98%	97%	96%	93%	85%	73%	64%	67%	79%	91%	95%	98%
12:00	98%	96%	95%	92%	84%	70%	62%	65%	76%	91%	95%	98%
13:00	98%	96%	95%	92%	81%	67%	60%	62%	73%	88%	95%	98%
14:00	98%	96%	95%	92%	80%	66%	57%	61%	71%	86%	94%	97%
15:00	98%	96%	95%	92%	80%	66%	57%	61%	71%	86%	94%	97%
16:00	98%	96%	95%	92%	80%	66%	57%	61%	71%	86%	94%	97%
17:00	98%	96%	95%	92%	81%	67%	60%	62%	73%	88%	95%	98%
18:00	98%	96%	95%	92%	84%	70%	62%	65%	76%	91%	95%	98%
19:00	98%	97%	96%	93%	85%	73%	64%	67%	79%	91%	95%	98%
20:00	99%	98%	96%	93%	88%	78%	69%	73%	82%	92%	95%	98%
21:00	99%	98%	96%	93%	89%	82%	74%	77%	86%	92%	96%	99%
22:00	100%	98%	97%	94%	89%	86%	78%	81%	90%	93%	96%	99%

8.8.2.14 Charlotte (CLT)

ASE to CLT CS-100 (A210) Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to CLT A319-115 Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to CLT B737-8 MAX Estimated Load Factor

Local Hour

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	99%	98%	96%	94%	89%	88%	81%	83%	90%	92%	95%	98%
8:00	99%	97%	96%	93%	88%	85%	77%	80%	89%	92%	95%	98%
9:00	98%	97%	95%	92%	88%	81%	73%	76%	85%	91%	95%	98%
10:00	98%	97%	95%	92%	87%	77%	68%	72%	81%	91%	94%	97%
11:00	97%	96%	95%	92%	84%	72%	63%	66%	78%	90%	94%	97%
12:00	97%	95%	94%	91%	83%	69%	61%	64%	75%	90%	94%	97%
13:00	97%	95%	94%	91%	80%	66%	59%	61%	72%	87%	94%	97%
14:00	97%	95%	94%	91%	79%	65%	56%	60%	70%	85%	93%	96%
15:00	97%	95%	94%	91%	79%	65%	56%	60%	70%	85%	93%	96%
16:00	97%	95%	94%	91%	79%	65%	56%	60%	70%	85%	93%	96%
17:00	97%	95%	94%	91%	80%	66%	59%	61%	72%	87%	94%	97%
18:00	97%	95%	94%	91%	83%	69%	61%	64%	75%	90%	94%	97%
19:00	97%	96%	95%	92%	84%	72%	63%	66%	78%	90%	94%	97%
20:00	98%	97%	95%	92%	87%	77%	68%	72%	81%	91%	94%	97%
21:00	98%	97%	95%	92%	88%	81%	73%	76%	85%	91%	95%	98%
22:00	99%	97%	96%	93%	88%	85%	77%	80%	89%	92%	95%	98%

8.8.2.15 Seattle (SEA)

ASE to SEA CS-100 (A210) Estimated Load Factor

Local Hour

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to SEA A319-115 Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to SEA B737-8 MAX Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	98%	92%	94%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	95%	88%	91%	99%	100%	100%	100%
9:00	100%	100%	100%	100%	99%	91%	83%	87%	95%	100%	100%	100%
10:00	100%	100%	100%	100%	98%	87%	78%	81%	91%	100%	100%	100%
11:00	100%	100%	100%	100%	95%	82%	73%	76%	88%	100%	100%	100%
12:00	100%	100%	100%	100%	94%	78%	70%	73%	85%	99%	100%	100%
13:00	100%	100%	100%	100%	91%	75%	68%	71%	81%	97%	100%	100%
14:00	100%	100%	100%	100%	90%	74%	66%	70%	80%	95%	100%	100%
15:00	100%	100%	100%	100%	90%	74%	66%	70%	80%	95%	100%	100%
16:00	100%	100%	100%	100%	90%	74%	66%	70%	80%	95%	100%	100%
17:00	100%	100%	100%	100%	91%	75%	68%	71%	81%	97%	100%	100%
18:00	100%	100%	100%	100%	94%	78%	70%	73%	85%	99%	100%	100%
19:00	100%	100%	100%	100%	95%	82%	73%	76%	88%	100%	100%	100%
20:00	100%	100%	100%	100%	98%	87%	78%	81%	91%	100%	100%	100%
21:00	100%	100%	100%	100%	99%	91%	83%	87%	95%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	95%	88%	91%	99%	100%	100%	100%

8.8.2.16 Washington D.C. (IAD/DCA/BWI)

ASE to IAD CS-100 (A210) Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to IAD A319-115 Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to IAD B737-8 MAX Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	95%	94%	92%	90%	85%	84%	78%	80%	86%	90%	92%	95%
8:00	95%	94%	92%	90%	84%	82%	74%	77%	85%	89%	92%	95%
9:00	95%	93%	92%	89%	84%	78%	70%	73%	81%	88%	91%	95%
10:00	94%	93%	91%	89%	84%	74%	65%	69%	77%	87%	91%	94%
11:00	94%	92%	91%	88%	81%	69%	61%	64%	75%	87%	91%	94%
12:00	94%	92%	91%	88%	79%	66%	59%	61%	72%	86%	90%	94%
13:00	93%	92%	91%	88%	77%	63%	56%	59%	69%	83%	90%	93%
14:00	93%	92%	90%	87%	76%	62%	53%	58%	67%	82%	90%	93%
15:00	93%	92%	90%	87%	76%	62%	53%	58%	67%	82%	90%	93%
16:00	93%	92%	90%	87%	76%	62%	53%	58%	67%	82%	90%	93%
17:00	93%	92%	91%	88%	77%	63%	56%	59%	69%	83%	90%	93%
18:00	94%	92%	91%	88%	79%	66%	59%	61%	72%	86%	90%	94%
19:00	94%	92%	91%	88%	81%	69%	61%	64%	75%	87%	91%	94%
20:00	94%	93%	91%	89%	84%	74%	65%	69%	77%	87%	91%	94%
21:00	95%	93%	92%	89%	84%	78%	70%	73%	81%	88%	91%	95%
22:00	95%	94%	92%	90%	84%	82%	74%	77%	85%	89%	92%	95%

8.8.2.17 Miami (MIA/FLL)

ASE to MIA A319-115 Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to MIA CS-100 (A210) Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to MIA B737-8 MAX Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	91%	90%	88%	85%	81%	79%	73%	74%	81%	84%	87%	90%
8:00	90%	89%	88%	85%	80%	77%	69%	72%	80%	84%	87%	90%
9:00	90%	88%	87%	84%	80%	73%	65%	69%	77%	83%	86%	89%
10:00	90%	88%	87%	84%	80%	69%	60%	63%	73%	83%	85%	88%
11:00	89%	88%	87%	84%	77%	65%	56%	59%	70%	81%	85%	88%
12:00	88%	87%	86%	83%	76%	61%	53%	56%	67%	81%	85%	88%
13:00	88%	87%	86%	83%	73%	58%	51%	53%	65%	78%	85%	87%
14:00	88%	87%	85%	83%	72%	57%	48%	52%	63%	77%	84%	87%
15:00	88%	87%	85%	83%	72%	57%	48%	52%	63%	77%	84%	87%
16:00	88%	87%	85%	83%	72%	57%	48%	52%	63%	77%	84%	87%
17:00	88%	87%	86%	83%	73%	58%	51%	53%	65%	78%	85%	87%
18:00	88%	87%	86%	83%	76%	61%	53%	56%	67%	81%	85%	88%
19:00	89%	88%	87%	84%	77%	65%	56%	59%	70%	81%	85%	88%
20:00	90%	88%	87%	84%	80%	69%	60%	63%	73%	83%	85%	88%
21:00	90%	88%	87%	84%	80%	73%	65%	69%	77%	83%	86%	89%
22:00	90%	89%	88%	85%	80%	77%	69%	72%	80%	84%	87%	90%

8.8.2.18 Phoenix (PHX)

ASE to PHX E175LR + EWT Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	97%	92%	88%	89%	93%	99%	100%	100%
8:00	100%	100%	100%	99%	97%	89%	86%	88%	92%	97%	100%	100%
9:00	100%	100%	100%	97%	96%	87%	82%	84%	89%	96%	100%	100%
10:00	100%	100%	100%	97%	95%	84%	78%	80%	87%	95%	100%	100%
11:00	100%	100%	100%	96%	92%	80%	75%	76%	86%	93%	100%	100%
12:00	100%	100%	99%	95%	92%	78%	72%	75%	83%	93%	100%	100%
13:00	100%	100%	99%	95%	89%	75%	70%	72%	80%	91%	99%	100%
14:00	100%	100%	99%	93%	89%	74%	67%	71%	79%	91%	99%	100%
15:00	100%	100%	99%	93%	89%	74%	67%	71%	79%	91%	99%	100%
16:00	100%	100%	99%	93%	89%	74%	67%	71%	79%	91%	99%	100%
17:00	100%	100%	99%	95%	89%	75%	70%	72%	80%	91%	99%	100%
18:00	100%	100%	99%	95%	92%	78%	72%	75%	83%	93%	100%	100%
19:00	100%	100%	100%	96%	92%	80%	75%	76%	86%	93%	100%	100%
20:00	100%	100%	100%	97%	95%	84%	78%	80%	87%	95%	100%	100%
21:00	100%	100%	100%	97%	96%	87%	82%	84%	89%	96%	100%	100%
22:00	100%	100%	100%	99%	97%	89%	86%	88%	92%	97%	100%	100%

ASE to PHX CS-100 (A210) Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to PHX A319-115 Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

ASE to PHX B737-8 MAX Estimated Load Factor

Local Hour	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7:00	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8:00	100%	100%	100%	100%	100%	100%	98%	100%	100%	100%	100%	100%
9:00	100%	100%	100%	100%	100%	100%	93%	97%	100%	100%	100%	100%
10:00	100%	100%	100%	100%	100%	97%	88%	91%	100%	100%	100%	100%
11:00	100%	100%	100%	100%	100%	91%	83%	86%	98%	100%	100%	100%
12:00	100%	100%	100%	100%	100%	88%	81%	83%	95%	100%	100%	100%
13:00	100%	100%	100%	100%	100%	84%	78%	80%	91%	100%	100%	100%
14:00	100%	100%	100%	100%	100%	83%	76%	79%	90%	100%	100%	100%
15:00	100%	100%	100%	100%	100%	83%	76%	79%	90%	100%	100%	100%
16:00	100%	100%	100%	100%	100%	83%	76%	79%	90%	100%	100%	100%
17:00	100%	100%	100%	100%	100%	84%	78%	80%	91%	100%	100%	100%
18:00	100%	100%	100%	100%	100%	88%	81%	83%	95%	100%	100%	100%
19:00	100%	100%	100%	100%	100%	91%	83%	86%	98%	100%	100%	100%
20:00	100%	100%	100%	100%	100%	97%	88%	91%	100%	100%	100%	100%
21:00	100%	100%	100%	100%	100%	100%	93%	97%	100%	100%	100%	100%
22:00	100%	100%	100%	100%	100%	100%	98%	100%	100%	100%	100%	100%

8.8.3 Inbound Payload Capability

Of the aircraft considered, the CS-100 and A319-115 are not anticipated to have any impacts to inbound payload carrying capability under the historical weather conditions and OEI missed approach/extraction procedures addressed in previous sections of this assessment.

The E175LR is anticipated to experience inbound payload restrictions from wet runway operations during tailwind approaches, resulting in load factors that could be restricted to 85percent inbound to ASE. While this is not an inconsequential impact, the limitation of the penalty would only be applied during sporadic rain events (which would not likely be forecasted in terms of seat availability) or during winter months when it is likely that larger equipment types would be operated instead of the E175LR because of seasonal route popularity.

The 737-8 MAX may also experience inbound payload restrictions under wet runway conditions with tailwind operations, which could restrict the load factor to 66 percent. This means that the 737-8 MAX is considered feasible for charter operations, but year round, all hour scheduled operations may not be feasible.

The 2014 aircraft feasibility assessment identified that both the 737-700 and A319-112 aircraft would struggle to consistently generate inbound payloads in excess of 85 percent in the winter months, but inbound payloads would decrease to 50 percent or less in the summer time. This assessment considered a higher PAX weight and FOD-D levels, which contribute to roughly five to ten percent of the load factor penalty. However, the significant impact on summer time inbound payloads to ASE, especially under tailwind conditions, will likely relegate the feasibility of both aircraft to marginal scheduled operations or, more likely, charter operations.

8.9 Upcoming and Potential Flight Operations Considerations

Independent from the runway relocation considerations that will increase the wingspan limitation from the existing 95ft up to 118ft, there are three flight operations considerations that may impact operations at ASE: engine advancements, aircraft performance enhancements, and increased approach speeds. These impacts are evaluated in the following subsections.

8.9.1 Improved Engine Performance

Advancements in engine technology are improving the takeoff and missed approach performance of “existing” aircraft. This is particularly true on the Airbus A319/320/321 and Boeing 737-700/800/900 aircraft types. These enhanced engines, like the CFM LEAP series engines or the Pratt and Whitney Geared Turbo Fan (GTF) series engines, will enabled higher takeoff weights from Runway 33, increased climb capabilities, and decreased noise/emissions. However, the addition of these improved technology engines is often associated other changes to the wing that enable the larger fan and engine housing to be mounted to maximum aerodynamic and ground clearance effect. For the Airbus aircraft, this has been accommodated by the NEO branding. Newer engines for 737 have accompanied the MAX series of aircraft. In some situations, like the Embraer E2 aircraft, the engine upgrades with the aircraft were so substantial that the landing gear and wingspan of the aircraft changed beyond the current certified design. In this assessment, only the 737-8 MAX has been analyzed in detail, but it is very likely that other NEO, MAX or E2 models from Airbus, Boeing and Embraer respectively, will enable additional aircraft types to safely and efficiently operate from ASE following the runway relocation.

8.9.2 Aircraft Performance Enhancements

In addition to engine enhancements, certain aircraft performance enhancements are improving the overall capability of regional jet operations at ASE. For instance, the CRJ-700 and -900 series have been improved with better calculation options and data series foroperators that enable more accurate high-altitude performance calculation capabilities between 8,000ft and 14,000ft. The EMB-175 has also been recently updated with aircraft performance calculation capability that accompanies the Enhanced Winglet Technology (EWT). When the EWT was first available for the aircraft, both as a factory installed option and later as a retrofit, the only enhancements accompanying the aerodynamic update were related to highspeed aircraft performance, namely climb, cruise, descent, and holding. However, these accompanying enhancements are more closely associated with flight planning, and therefore, under less regulatory and flight test oversight. In 2018, Embraer produced a certified update to the Computerized AFM (CAFM) and Standard Computerized Aircraft Performance (SCAP) modules which enable the low speed portion of the aircraft performance to take advantage of the enhancements. This additional calculation capability on aircraft with the EWT now enables the EMB-175 to operate at ASE, where previously the aircraft was not capable of the operation. This updated capability is reflected in this assessment under the E175LR + EWT results.

8.9.3 Increasing Approach Speeds

The third potential enhancement that may impact flight procedures at ASE is related to the gradual increase of approach speeds for aircraft currently serving the Airport and future aircraft. As noted in previous sections, only approach CAT C aircraft can presently operate under the FAA published flight procedures at ASE. This precludes certain business jets, regional jets and narrow body aircraft from operating at ASE. However, due to aircraft performance challenges related to the missed approach and PNR, some aircraft which are certified as CAT C, will utilize a less significant landing and missed approach flap setting in order to maximize available climb capability in the event of a missed, go-around, or balked landing. The reduction in flap extension can also result in an increase to the overall speed of the aircraft, which can push the standard approach and missed approach speeds past CAT C into CAT D. While there is currently no requirement for aircraft operators to consider the increase in minimums required, many operators self-impose the higher approach category minimums as a safety risk mitigation. In the future, as the demands on existing and new entrant aircraft serving ASE increases, it is highly possible that more aircraft will need to consider flying the approaches into ASE at CAT D speeds, leading to the need for approach procedures, minimums, and missed approach gradients to match. This can be addressed through a request to the Instrument Flight Procedures (IFP) Information Gateway, but is best timed to coincide with the runway relocation project entering into the design phase.

9 SUMMARY OF AIRCRAFT FEASIBILITY FOLLOWING RELOCATION

In comparing the 2014 aircraft feasibility results, and the updated feasibility results from this assessment, the challenges related to arrivals, inbound payload, and SMS remain relatively unresolved following the runway safety enhancements and the relocation of Runway 15/33.

While many aircraft will still likely be unfeasible for even charter operations, the A319-115 (operated by American Airlines), the EMB-175LR with Enhanced Winglets and supporting CAFM (operated by Envoy), the CRJ-700 and CS-100 (A210) appear to be feasible for scheduled operations. Of those aircraft, the CRJ-700 is feasible for scheduled operations by default of operating numerous scheduled departures and arrivals at ASE today, and the EMB-175LR EWR appears capable of commencing operations into ASE in advance of the runway relocation.

The remarkable strong performance demonstrated by the A319-115 is anticipated to be available on the A320NEO aircraft models, or at least those models possessing similar thrust to weight ratios. Once more 320NEO aircraft have entered operations, it may be feasible for the design team to consider the detailed feasibility of those aircraft to determine whether additional new operators could be considered to operate at ASE.

Based on the departure and payload range analysis, the 737-8 MAX is suitable for scheduled operations. However, the lack of CAT D approach options is a significant detractor to both the arrival feasibility and, ultimately, the SMS feasibility. If, or when, an operator of the 737-8MAX can overcome this approach category challenge, it is highly likely that the 737-8 MAX will become both a scheduled and charter operator at ASE. However, if no new approach procedures or SMS risk mitigations materialize to permit a CAT D aircraft to operate on CAT C approaches, then the 737-8 MAX may either be downgraded to charter feasibility or be considered non-feasible following the runway relocation.

Table 32 provides a summary of the overall aircraft feasibility components and results.

Overall Aircraft Feasibility Following Runway 15/33 Relocation

Aircraft	Overall	Departure	Arrival	SMS	Payload Range	Level of Analysis	Notes
737-700ERW	**Charter**	**Scheduled**	**Charter**	**Charter**	**Scheduled**	**Complete (2014)**	**Higher Thrust Models May Be Capable of Scheduled Service**
737-8 MAX	**Scheduled**	**Scheduled**	**Charter**	**Charter**	**Scheduled**	**Complete**	**Category D Minimums on Approach Will Be Required**
737-9 MAX	Not Feasible	Not Analyzed	Not Feasible	Not Analyzed	Not Analyzed	Arrival	Category D Minimums on Approach Will Be Required
737-900	Not Feasible	Not Analyzed	Not Feasible	Not Analyzed	Not Analyzed	Arrival	Category D Minimums on Approach Will Be Required
A319-112	**Charter**	**Scheduled**	**Charter**	**Charter**	**Scheduled**	**Complete (2014)**	
A319-115 Sharklets	**Scheduled**	**Scheduled**	**Charter**	**Scheduled**	**Scheduled**	**Complete**	
A320	Not Feasible	Not Feasible	Not Analyzed	Not Analyzed	Not Analyzed	Departure	Higher Thrust Models May Be Capable of Scheduled Service
A320NEO	**Scheduled**	**Scheduled**	**Charter**	**Scheduled**	**Scheduled**	**Extrapolation of A319**	
A321	Not Feasible	Not Feasible	Not Feasible	Not Analyzed	Not Analyzed	Departure and Arrival	Category D Minimums on Approach Will Be Required
A321NEO	Not Feasible	Not Feasible	Not Feasible	Not Analyzed	Not Analyzed	Departure and Arrival	Category D Minimums on Approach Will Be Required
CRJ-700	**Scheduled**	**Scheduled**	**Scheduled**	**Scheduled**	**Scheduled**	**Interview**	**Aircraft Can Feasibly Operate Prior to Runway Relocation**
CS-100 (A210)	**Scheduled**	**Scheduled**	**Charter**	**Scheduled**	**Scheduled**	**Complete**	
E170	Not Feasible	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Interview	Insufficient Performance at Density Altitude
E175LR EWT	**Scheduled**	**Scheduled**	**Charter**	**Scheduled**	**Scheduled**	**Complete**	**Aircraft Can Feasibly Operate Prior to Runway Relocation**
E190	Not Feasible	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Interview	Insufficient Performance at Density Altitude
E195	Not Feasible	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Interview	Insufficient Performance at Density Altitude

Table 31 Summary of Aircraft Feasibility Results

10 APPROACH AND DEPARTURE CAPACITY

This section addresses the estimated arrival and departure capacity obtainable at ASE under specific VFR and IFR conditions before and after the planned runway enhancements and runway relocation.

10.1 METHODS

Typical arrival and departure capacity modeling at an airport involves the implementation of complex airspace models that simulate required air traffic separation, approach speeds, weather conditions, and aircraft performance. While this may soon be a requirement at ASE with the introduction of larger wingspan narrowbody jets identified in the aircraft feasibility analysis, the reality of ASE's opposite direction operation results in an airspace capacity challenge is captured through the experience of air traffic professionals and then modeled against historical weather conditions to determine the likelihood of occurrence during various hours and months of the year.

The following capacities were determined through direct interview with the ASE Air Traffic Control Tower and Denver Center representatives, who provided thoughtful explanations of the current challenges and capacity limitations along with the potential increases that may accompany the radar enhancements, which are being implemented at ASE independently from the runway relocation project.

10.2 CAPACITY

10.2.1 Current Airspace Capacity

The current airspace capacity at ASE can be summarized into three operational states that are determined by weather conditions. The first is the visual meteorological conditions (VMC) condition, which enabled the implementation of the Wrap ODO (described in section 6.3). This procedure can only by used when the ceilings and visibility are greater than 6,000ft and 10 miles. When the Wrap ODO is in use, ASE can currently operate up to 32 operations per hour consisting either entirely of arrivals, entirely of departures, or an even split of 16 arrivals and 16 departures, along a linear distribution. This rate is achieved through reduced/visual separation performed both by air traffic and flight crews.

The second operational state is a wide band of Marginal and Instrument Meteorological Conditions (IMC), which occurs when the weather conditions are less favorable than those necessary for the Wrap. This can occur when the minimums are anywhere between between 6,000ft and 10 miles down to the minimums associated with the current Special LOC/DME RWY 15 approach at1,000ft and 2 ¾ mi (estimated to increase to 1,020 and 3 miles following the runway relocation). Under Marginal and IMC conditions, operators can no longer rely on visual separation and must rely instead on typical ODO separation, which reduces the total capacity at ASE to a linear rate of 16 operations per hour.

Finally, the Low IMC operational state occurs when weather conditions drop below those minimums usable by the Special LOC/DME RWY 15 approach, at which point only departures can be executed at a rate of 16 operations per hour. While this permits aircraft queuing on the ground to successfully free up ramp and taxiway space until ceilings and visibility improve, it can force arriving aircraft to wait in terminal area and enroute hold patterns until arrival procedures can resume, or aircraft are diverted to surrounding airports like RIL, EGE, and even DEN.

The three operating capacities are illustrated in Figure 22, which shows arrivals on the vertical axis and departures on the horizontal axis in fifteen minute intervals (per FAA ATO convention).

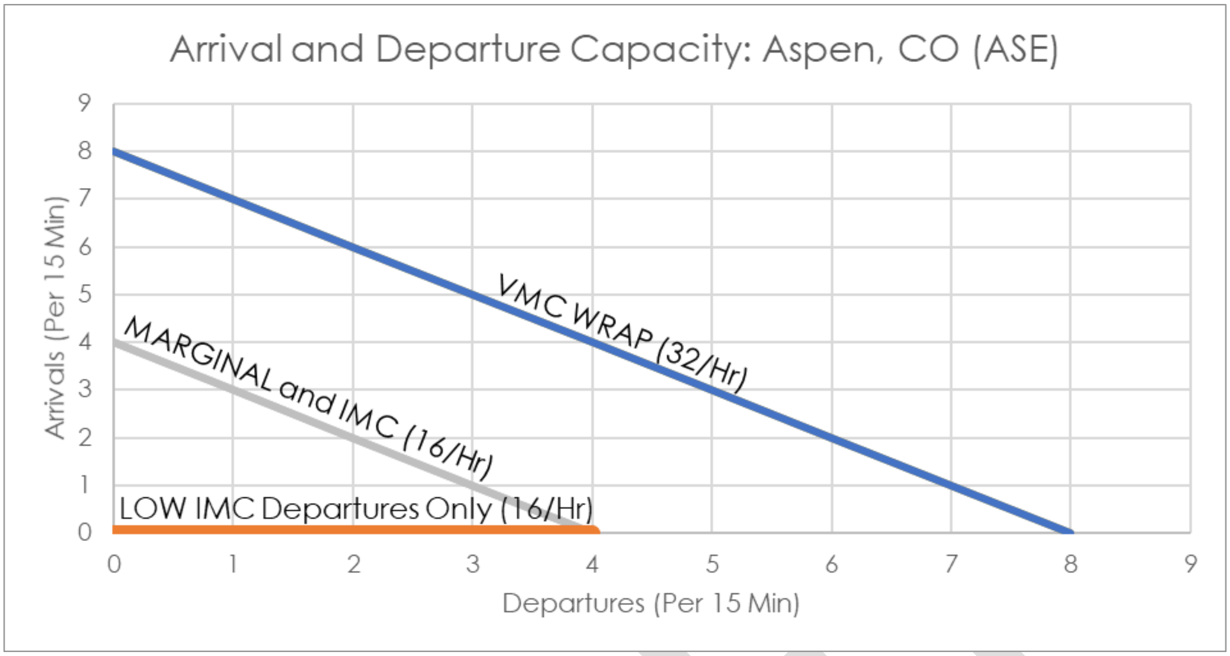


Figure 22 Current Arrival and Departure Capacity

10.2.2 Potential Airspace Enhancement

Following the relocation of the runway and the anticipated radar enhancements, there is an opportunity to increase the Wrap ODO VMC capacity. This could be achieved through longer range "virtual" visibility of aircraft to tower and air traffic personnel. This enhancement would permit tower and air traffic personnel to allow additional aircraft vectoring (navigation service provided to aircraft by ATC) and separation (ATC preventative measure to keep an aircraft outside a minimum distance from another aircraft to reduce the risk of collision) earlier in the approach procedures, yielding the potential for enhanced capacity at 40 operations per hour.

However, at this time, there is no opportunity to enhance the Marginal and IMC or Low IMC capacity following the runway relocation. The relocation is not expected to impact the existing Marginal and IMC or Low IMC capacities.

The updated capacities anticipated following the runway relocation, and radar enhancements, are shown below in Figure 23.

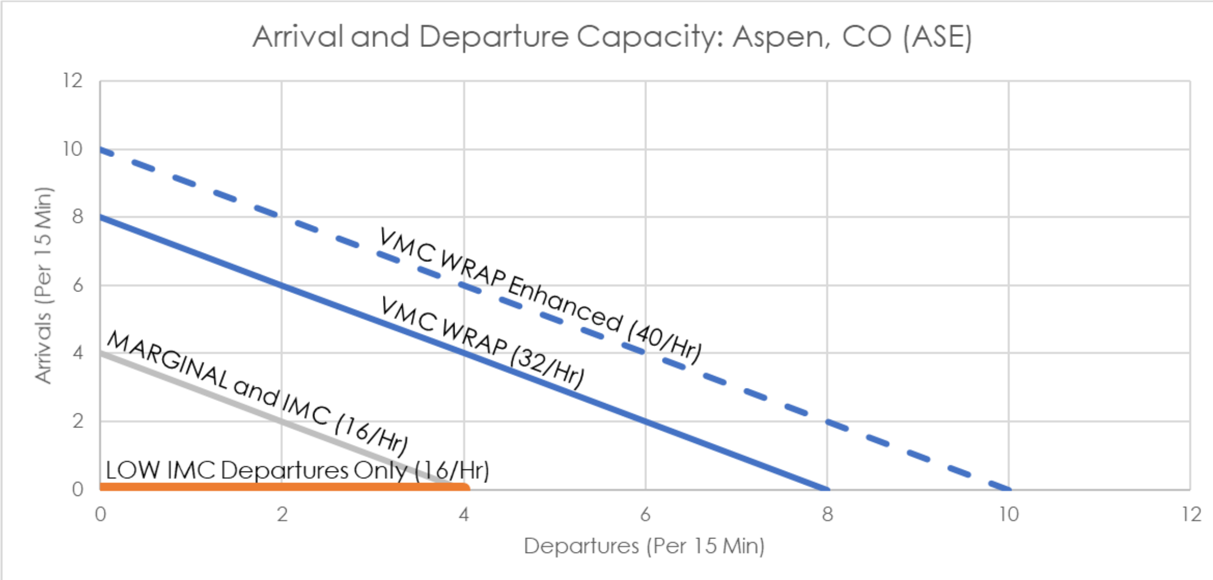


Figure 23 Enhanced/Future Arrival and Departure Capacity

10.3 VMC - WRAP CAPACITY

The likelihood of VMC Wrap ODO being permitted by month and by hour is illustrated in Table 33. These results were derived from the historical environmental conditions.. The highest likelihood of utilizing the Wrap occurs in the summer months at a rate of 32 operations per hour (possibly 40 per hour). However, traffic has historically been the highest during winter months associated with ski season, and ASE has not had high VMC capabilities during the winter months. During the winter months there is only a 50 – 60 percent likelihood of operating under the maximum WRAP capacity.

VMC Wrap Operation Current and After 80ft Shift (32/Hr)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00:00	44%	39%	54%	50%	61%	78%	65%	62%	67%	64%	57%	39%
01:00	43%	40%	51%	46%	58%	78%	68%	66%	70%	60%	60%	37%
02:00	42%	39%	50%	46%	59%	77%	71%	69%	66%	64%	56%	38%
03:00	41%	40%	49%	46%	60%	82%	73%	69%	68%	60%	56%	38%
04:00	41%	40%	49%	47%	58%	81%	72%	70%	66%	61%	55%	36%
05:00	43%	39%	50%	46%	61%	84%	74%	70%	63%	59%	57%	36%
06:00	49%	43%	57%	55%	65%	88%	86%	80%	75%	65%	65%	42%
07:00	57%	48%	65%	57%	66%	89%	84%	82%	78%	72%	68%	48%
08:00	61%	51%	67%	57%	69%	89%	89%	81%	76%	74%	71%	50%
09:00	62%	53%	66%	61%	70%	90%	88%	80%	76%	73%	69%	53%
10:00	62%	52%	67%	59%	67%	86%	85%	80%	75%	72%	71%	55%
11:00	61%	54%	68%	60%	61%	83%	83%	78%	73%	70%	67%	55%
12:00	60%	55%	65%	57%	55%	81%	78%	73%	71%	68%	69%	56%
13:00	61%	50%	65%	56%	56%	77%	69%	61%	69%	67%	66%	54%
14:00	56%	50%	62%	51%	52%	78%	67%	62%	68%	66%	71%	55%
15:00	57%	52%	63%	51%	52%	77%	66%	62%	71%	66%	68%	54%
16:00	55%	49%	63%	51%	51%	75%	63%	63%	69%	68%	69%	53%
17:00	52%	51%	61%	54%	56%	75%	60%	63%	69%	68%	66%	48%
18:00	49%	42%	61%	53%	57%	79%	66%	66%	71%	66%	65%	45%
19:00	49%	40%	58%	52%	63%	79%	66%	68%	69%	64%	63%	45%
20:00	48%	41%	55%	47%	58%	78%	66%	64%	64%	68%	61%	48%
21:00	44%	41%	48%	46%	62%	71%	62%	59%	64%	66%	60%	43%
22:00	40%	40%	51%	47%	59%	74%	66%	60%	64%	67%	55%	41%
23:00	40%	40%	51%	43%	60%	78%	66%	62%	67%	62%	57%	38%

Table 32 Likelihood of ASE Operating Under Wrap ODO Capacity

10.4 Marginal and IMC Capacity

Given the wide range of aircraft performance and approach capabilities at ASE, the capacity analysis must consider the type of aircraft expected to operate at ASE. Aircraft types considered in this analysis consist of GA and Small Business Jets, Advanced Small Jets, and Large Jets.

10.4.1 Capacity of General Aviation and Small Business Jet Aircraft Under Marginal and IMC Conditions

GA and Small Business Jets represent a group of aircraft operators with the following characteristics:

- Capable of standard approaches to Runway 15;
- Capable of circling approaches to Runway 33; and
- Are not capable of the Special LOC/DME RWY 15 approach.

Aircraft in this group include piston, single engine turboprop, multi-engine turboprop and single owner small jets.

For this group of aircraft, Marginal and IMC conditions will be obtained using existing and future circling minimums to analyze feasibility following the runway relocation.

The likelihood of this group of aircraft operating at the rate of 16 operations per hour is expressed in Table 34.

Marginal General Aviation Current and After 80ft Shift (16/Hr)

Local Time	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00:00	44%	39%	54%	50%	61%	79%	65%	62%	68%	64%	57%	39%
01:00	43%	40%	51%	46%	58%	79%	68%	66%	70%	60%	60%	37%
02:00	43%	39%	50%	47%	59%	78%	71%	69%	67%	64%	56%	38%
03:00	41%	40%	49%	46%	60%	83%	73%	69%	68%	60%	56%	38%
04:00	41%	40%	49%	47%	59%	82%	72%	70%	66%	61%	56%	36%
05:00	43%	40%	50%	46%	61%	86%	75%	71%	64%	59%	58%	36%
06:00	50%	43%	57%	55%	66%	88%	86%	80%	75%	65%	65%	42%
07:00	58%	48%	66%	58%	67%	89%	85%	83%	78%	72%	68%	49%
08:00	61%	52%	67%	58%	70%	89%	89%	81%	76%	74%	71%	51%
09:00	62%	54%	67%	62%	72%	91%	89%	81%	77%	74%	70%	54%
10:00	62%	52%	67%	60%	68%	87%	85%	80%	75%	73%	72%	56%
11:00	61%	55%	68%	60%	62%	84%	83%	78%	74%	70%	68%	55%
12:00	61%	56%	65%	57%	57%	81%	78%	74%	72%	68%	69%	57%
13:00	61%	51%	65%	56%	56%	78%	70%	62%	70%	69%	67%	54%
14:00	56%	50%	63%	52%	54%	78%	67%	62%	69%	67%	71%	55%
15:00	57%	52%	64%	52%	53%	77%	67%	63%	72%	66%	68%	54%
16:00	55%	50%	63%	52%	51%	75%	63%	64%	70%	68%	69%	53%
17:00	52%	51%	61%	55%	56%	76%	60%	64%	70%	68%	66%	48%
18:00	49%	43%	61%	53%	57%	79%	66%	66%	72%	66%	65%	45%
19:00	49%	40%	58%	52%	63%	80%	66%	68%	69%	64%	63%	45%
20:00	48%	41%	55%	47%	58%	78%	66%	64%	64%	68%	61%	48%
21:00	44%	41%	48%	46%	62%	71%	62%	59%	64%	66%	60%	43%
22:00	40%	40%	51%	47%	59%	74%	66%	60%	64%	67%	55%	42%
23:00	40%	40%	51%	44%	60%	79%	66%	62%	68%	62%	57%	39%

Table 33 Likelihood of ASE General Aviation Traffic Operating Under Marginal/IMC Capacity

GA and small jet operations will have a similar capability to achieve the 16 operations per hour rate when compared to the likelihood of operating under VMC conditions because of the relatively high minimums required to execute circling approaches currently and after the runway relocation.

If aircraft continue to operate under the hours of the day identified in the chart above at less than roughly 75percent, missed approaches and go-arounds will likely increase and reduce airport capacity to fewer than 16 operations per hour.

10.4.2 Capacity of Advanced Small Jets Under Marginal and IMC Conditions

Advanced Small Business Jets represent a group of aircraft operators with the following characteristics:

- Capable of Special LOC/DME RWY 15 approach; and
- Capable of circling approaches to Runway 33.

For this group of aircraft, Marginal and IMC conditions are obtained using existing and future Special LOC/DME RWY 15approach minimums and existing and future circling minimums to Runway 33 following the runway relocation.

The likelihood of this group of aircraft operating at the 16 operations per hour rate is expressed in Table 35.

Marginal and IMC Advanced Small Jets Current and After 80ft Shift (16/Hr)

Local Time	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00:00	45%	41%	54%	51%	63%	81%	73%	69%	72%	66%	58%	41%
01:00	44%	40%	51%	47%	60%	83%	73%	70%	73%	62%	62%	39%
02:00	43%	39%	50%	47%	62%	83%	75%	74%	70%	66%	56%	39%
03:00	43%	41%	50%	47%	62%	85%	78%	74%	73%	61%	57%	40%
04:00	42%	40%	50%	47%	60%	84%	77%	75%	69%	63%	57%	39%
05:00	43%	41%	51%	46%	65%	89%	78%	75%	68%	61%	58%	39%
06:00	51%	44%	59%	56%	67%	90%	89%	84%	76%	66%	65%	45%
07:00	59%	50%	66%	58%	68%	90%	88%	85%	80%	73%	68%	51%
08:00	61%	54%	68%	59%	74%	90%	91%	84%	78%	75%	72%	54%
09:00	63%	56%	67%	62%	73%	92%	90%	84%	77%	75%	70%	56%
10:00	63%	53%	68%	60%	69%	87%	87%	83%	76%	73%	72%	57%
11:00	61%	55%	68%	60%	65%	85%	86%	80%	76%	72%	68%	56%
12:00	61%	56%	65%	57%	59%	83%	81%	77%	73%	69%	69%	58%
13:00	61%	51%	65%	57%	57%	80%	72%	66%	72%	70%	68%	55%
14:00	56%	50%	64%	54%	57%	81%	71%	67%	71%	68%	71%	55%
15:00	59%	53%	64%	54%	54%	79%	69%	68%	75%	67%	69%	55%
16:00	56%	51%	64%	53%	54%	80%	68%	70%	73%	69%	72%	55%
17:00	52%	52%	63%	56%	58%	80%	67%	69%	73%	69%	67%	52%
18:00	50%	44%	62%	55%	61%	83%	71%	73%	76%	67%	67%	47%
19:00	50%	41%	59%	54%	65%	86%	70%	75%	75%	65%	64%	48%
20:00	49%	43%	58%	48%	62%	81%	73%	69%	71%	69%	62%	51%
21:00	45%	43%	50%	49%	66%	76%	68%	67%	69%	67%	61%	45%
22:00	42%	41%	52%	49%	62%	77%	71%	69%	69%	68%	57%	44%
23:00	41%	42%	52%	45%	62%	81%	73%	68%	71%	64%	59%	41%

Table 34 Likelihood of ASE Advanced Jet (non-121) Operating Under Marginal/IMC Capacity

Similar to GA, the Advanced Small Jet category of operators will have periods throughout the year where the likelihood of missed approaches and go-arounds may diminish the overall ability to maintain even the 16 operations per hour capacity. Following the runway relocation, the main improvement that would increase the likelihood of this group maintaining the operational rate is a result of certain small jets gaining the ability to utilize the Special LOC/DME RWY 15 minimums, which bring aircraft approximately 2000ft lower to the runway before an operator must declare a missed approach. Besides this small change in the Special LOC/DME RWY 15 approach minimums, , no significant changes to the likelihood of operating under a combined arrival and departure capacity of 16 operations per hour are anticipated following the runway relocation.

10.4.3 Capacity of Large Jets Under Marginal and IMC Conditions

Large Jets represent a group of aircraft operators with the following characteristics:

- Capable of Special LOC/DME RWY 15 approach; and
- Not capable of circling approaches to Runway 33.

For this group of aircraft, Marginal and IMC conditions are obtained using only the existing and future special LOC/DME RWY 15 approach minimums. When wind conditions would prevent a landing on Runway 33, the arrival rate is considered to be closed to this group of operations.

The likelihood of this group of aircraft operating at the 16 operations per hour rate is expressed in Table 36.

Marginal and IMC Large Jets Current and After 80ft Shift (16/Hr)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00:00	45%	41%	54%	51%	63%	81%	73%	69%	72%	66%	58%	41%
01:00	44%	40%	51%	47%	60%	83%	73%	70%	73%	62%	62%	39%
02:00	43%	39%	50%	47%	62%	83%	75%	74%	70%	66%	56%	39%
03:00	43%	41%	49%	46%	62%	85%	78%	74%	73%	61%	57%	40%
04:00	42%	40%	50%	47%	60%	84%	77%	75%	69%	63%	57%	38%
05:00	43%	41%	51%	46%	64%	89%	78%	75%	68%	60%	58%	38%
06:00	51%	44%	58%	55%	67%	90%	89%	84%	76%	66%	65%	44%
07:00	59%	50%	66%	57%	68%	90%	88%	85%	80%	72%	68%	51%
08:00	61%	54%	68%	58%	73%	90%	91%	83%	78%	74%	72%	54%
09:00	63%	55%	66%	60%	70%	88%	89%	84%	76%	73%	69%	56%
10:00	62%	52%	66%	56%	60%	78%	84%	80%	73%	70%	70%	57%
11:00	61%	53%	60%	45%	47%	66%	70%	63%	66%	63%	63%	55%
12:00	60%	52%	56%	43%	41%	53%	53%	47%	45%	53%	59%	56%
13:00	60%	46%	54%	40%	42%	49%	41%	37%	41%	48%	59%	51%
14:00	54%	45%	50%	39%	41%	50%	40%	40%	38%	48%	62%	53%
15:00	58%	47%	52%	36%	41%	46%	45%	45%	44%	46%	65%	55%
16:00	55%	49%	53%	38%	42%	59%	49%	47%	51%	57%	71%	54%
17:00	52%	52%	54%	45%	48%	61%	54%	55%	60%	63%	67%	51%
18:00	50%	43%	60%	49%	53%	72%	65%	68%	71%	66%	67%	47%
19:00	50%	41%	57%	52%	62%	82%	68%	74%	75%	64%	64%	48%
20:00	49%	42%	57%	48%	61%	80%	73%	69%	71%	69%	61%	51%
21:00	45%	42%	50%	49%	65%	76%	68%	67%	69%	66%	61%	44%
22:00	42%	41%	52%	49%	62%	77%	71%	69%	69%	68%	56%	44%
23:00	41%	42%	52%	45%	62%	81%	73%	68%	71%	64%	59%	40%

Table 35 Likelihood of Air Carrier and Large Jet Operating Under Marginal/IMC Capacity

The inability of large jets to execute a circle to land maneuver to Runway 33 negatively impacts ability of the airport to utilize the 16 operations per hour capacity for both departures and arrivals between 12:00 and 17:00. This does not mean that large jets would cease operations during these hours, but rather that the airport would likely have to allow other aircraft groups/categories into ASE during this time period in order to maintain an overall capacity of 16 operations per hour. Ift large jets were operating at this time, the overall capacity would be reduced to accommodate the possibility of missed approaches and go-arounds.

There are no anticipated changes to this capacity likelihood following the runway relocation.

10.5 Low IFR Departure Capacity

All aircraft groups are considered to have relatively similar departure minimums at ASE either expressed by the CG requirements on the departure procedure or via company/flight crew policy. Departures are only permitted on Runway 33, and the resulting capacity likelihood is a combination of the following:

- Periods when tailwinds will still permit departures (less than 15 knots); and
- Periods when the ceiling and visibility will be greater than 400ft and 1 mile.

Table 37 summarizes the likelihood that the ASE will continue to operate at the capacity rate of 16 departures per hour .

Low IMC Departures Only Current and After 80ft Shift (16/Hr)

Local Time	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00:00	77%	77%	81%	73%	84%	94%	96%	94%	93%	85%	80%	73%
01:00	77%	75%	80%	70%	82%	95%	96%	95%	95%	84%	82%	78%
02:00	78%	72%	82%	70%	83%	95%	96%	94%	95%	84%	80%	75%
03:00	76%	73%	80%	71%	84%	94%	98%	95%	95%	81%	81%	74%
04:00	74%	73%	79%	72%	84%	96%	96%	96%	94%	85%	80%	76%
05:00	73%	75%	81%	73%	83%	96%	98%	96%	95%	84%	82%	75%
06:00	73%	73%	76%	72%	81%	95%	99%	96%	95%	85%	79%	71%
07:00	72%	73%	79%	74%	82%	95%	98%	97%	94%	84%	81%	72%
08:00	74%	72%	78%	70%	80%	95%	99%	97%	95%	85%	83%	74%
09:00	78%	74%	74%	68%	74%	91%	98%	97%	93%	84%	80%	74%
10:00	78%	71%	75%	64%	70%	89%	97%	97%	89%	82%	81%	77%
11:00	80%	74%	75%	62%	72%	89%	96%	95%	90%	82%	79%	76%
12:00	80%	73%	75%	66%	71%	85%	93%	95%	88%	82%	78%	78%
13:00	81%	72%	76%	66%	72%	84%	91%	92%	86%	83%	79%	74%
14:00	78%	74%	76%	65%	71%	83%	91%	93%	87%	84%	84%	75%
15:00	79%	73%	75%	68%	67%	87%	89%	88%	86%	84%	82%	76%
16:00	80%	72%	78%	71%	72%	89%	85%	87%	88%	86%	85%	76%
17:00	79%	74%	77%	70%	73%	85%	84%	85%	89%	83%	86%	77%
18:00	78%	78%	82%	70%	75%	89%	82%	82%	89%	85%	84%	73%
19:00	77%	76%	82%	76%	77%	89%	88%	88%	90%	87%	84%	76%
20:00	77%	76%	80%	77%	81%	88%	85%	89%	90%	89%	83%	75%
21:00	76%	76%	83%	76%	83%	91%	85%	92%	93%	91%	83%	76%
22:00	75%	76%	80%	73%	82%	90%	90%	92%	92%	86%	81%	76%
23:00	77%	75%	78%	75%	85%	91%	92%	93%	91%	84%	83%	75%

Table 36 Likelihood of Operating Under Departure Capacity

These results demonstrate that departing aircraft are most commonly supported type of operation at ASE, with an average of 80 percent likelihood of operating under the 16 departure per hour capacity rate throughout the year. Periods in the spring where the likelihood of being able to depart falls below 80 percent are categorized by strong winds that limit all aircraft from safely departing in the Runway 33 direction alone.

There is no anticipated change to this capacity analysis following the runway relocation.

10.6 SUMMARY OF IMPACTS TO DEPARTURE AND APPROACH CAPACITY

The relocation of the runway itself will not impact the capacity. Enhancements in radar technology and potential improvements to approach procedures, necessary to potentially accommodate CAT D aircraft operations, may increase the overall airspace capacity slightly. However, currently, the only meaningful improvement to an approach procedure would be to enhance the Wrap, Opposite Direction Operation, which requires visual meteorological conditions of 6,000ft and 10 miles of visibility. The potential improvements to radar technology, which are unrelated to the runway relocation, could increase the overall capacity from a linear rate of 32 operations per hour up to 40 operations per hour. This enhancement could occur with or without the runway safety enhancements and runway relocation.

By comparing the historical weather conditions associated with the higher VMC requirements at ASE, the overall capacity of ASE achieved in the Wrap operation will only occur approximately 50 percent of the time, with the highest likelihood in the summer months and the lowest likelihood during winter and spring, when demand at ASE is often highest. The ability to improve capacity during these periods will be challenging. It would require a significant level of instrument procedure development coupled with a full analysis of Wake Turbulence Re-categorization (Wake RECAT) to safely decrease separation distances. ASE operates under the existing International Civil Aviation Organization (ICAO) wake vortex separation rules based solely upon aircraft weight, which have in some respects become outdated, leading to over-separation in many instances. This, in turn, diminishes airport capacity.

11 APPENDIX 1: ASOS VS FICON

Likelihood of a Wet Runway (Precipitation and Fog)

Local Time	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00:00	9%	4%	3%	11%	3%	0%	3%	3%	3%	5%	5%	3%
01:00	7%	11%	5%	13%	5%	1%	6%	2%	1%	4%	2%	1%
02:00	9%	15%	6%	16%	3%	2%	7%	1%	0%	3%	1%	3%
03:00	4%	9%	5%	9%	5%	0%	7%	5%	0%	6%	8%	4%
04:00	5%	3%	6%	13%	3%	1%	3%	1%	3%	6%	4%	5%
05:00	7%	7%	4%	10%	3%	1%	3%	2%	3%	6%	3%	4%
06:00	4%	9%	5%	8%	5%	1%	3%	1%	3%	3%	5%	4%
07:00	7%	9%	6%	10%	4%	1%	3%	2%	3%	6%	4%	7%
08:00	12%	11%	7%	11%	2%	1%	3%	2%	3%	2%	4%	6%
09:00	11%	10%	7%	9%	3%	1%	0%	1%	2%	3%	5%	8%
10:00	11%	11%	7%	13%	5%	1%	0%	1%	7%	3%	6%	11%
11:00	8%	12%	6%	10%	5%	3%	1%	1%	3%	3%	5%	10%
12:00	12%	12%	11%	12%	7%	3%	3%	3%	3%	5%	6%	12%
13:00	8%	16%	10%	14%	6%	4%	6%	14%	4%	4%	5%	12%
14:00	10%	19%	10%	13%	5%	7%	9%	3%	7%	6%	4%	7%
15:00	8%	14%	12%	12%	6%	5%	17%	3%	12%	7%	7%	9%
16:00	11%	10%	6%	14%	8%	4%	17%	9%	12%	5%	4%	9%
17:00	8%	12%	8%	18%	6%	2%	11%	8%	5%	6%	4%	8%
18:00	5%	7%	7%	15%	10%	5%	21%	12%	8%	7%	3%	6%
19:00	4%	5%	12%	14%	7%	0%	9%	9%	11%	5%	3%	6%
20:00	5%	7%	5%	14%	6%	2%	9%	11%	4%	4%	6%	5%
21:00	3%	8%	5%	10%	7%	1%	3%	7%	11%	3%	3%	9%
22:00	3%	9%	8%	12%	3%	1%	3%	3%	16%	6%	5%	8%
23:00	9%	5%	5%	17%	3%	2%	3%	3%	7%	3%	3%	6%

Table 37 Likelihood of a Wet Runway (Historical ASOS Only)

11.1.1.1 FICON/RCC

Likelihood of ASOS Precipitation Record

Local Time	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00:00	9%	4%	3%	11%	3%	0%	3%	3%	3%	5%	5%	3%
01:00	7%	11%	5%	13%	5%	0%	6%	2%	0%	4%	2%	1%
02:00	9%	15%	6%	16%	3%	0%	7%	1%	0%	3%	1%	3%
03:00	4%	9%	5%	9%	5%	0%	7%	5%	0%	6%	8%	4%
04:00	5%	3%	6%	13%	2%	0%	3%	0%	3%	6%	4%	5%
05:00	7%	7%	4%	10%	3%	0%	3%	0%	3%	6%	3%	4%
06:00	4%	9%	5%	8%	3%	0%	3%	0%	3%	3%	5%	4%
07:00	7%	9%	2%	10%	4%	0%	3%	2%	3%	6%	4%	2%
08:00	12%	9%	3%	11%	2%	0%	3%	2%	3%	2%	4%	6%
09:00	11%	10%	7%	7%	2%	0%	0%	0%	0%	3%	5%	1%
10:00	11%	11%	1%	7%	4%	0%	0%	0%	7%	2%	6%	2%
11:00	6%	12%	3%	4%	5%	0%	0%	0%	1%	1%	5%	6%
12:00	12%	12%	4%	11%	2%	2%	0%	0%	3%	2%	3%	2%
13:00	8%	16%	5%	14%	0%	4%	6%	14%	4%	0%	5%	2%
14:00	10%	14%	8%	8%	5%	7%	9%	3%	7%	6%	4%	2%
15:00	6%	14%	2%	9%	6%	0%	17%	1%	12%	7%	1%	6%
16:00	11%	10%	6%	12%	8%	1%	17%	9%	12%	2%	3%	7%
17:00	8%	12%	8%	14%	5%	1%	11%	8%	3%	1%	4%	8%
18:00	5%	7%	7%	7%	10%	5%	21%	12%	8%	3%	3%	6%
19:00	3%	5%	12%	13%	4%	0%	9%	9%	11%	2%	3%	5%
20:00	5%	7%	5%	14%	6%	0%	9%	11%	4%	2%	6%	5%
21:00	2%	8%	5%	10%	7%	0%	0%	7%	11%	3%	3%	9%
22:00	3%	9%	1%	12%	1%	0%	3%	0%	16%	6%	5%	8%
23:00	9%	5%	4%	17%	2%	0%	3%	3%	7%	2%	3%	6%

Table 38 Likelihood of Wet Runway (ASOS Precip Only)

Likelihood of FICON Record

Local Time

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00:00	20%	16%	11%	17%	0%	0%	0%	0%	0%	10%	7%	14%
01:00	19%	19%	9%	14%	0%	0%	0%	0%	0%	10%	7%	17%
02:00	19%	17%	8%	13%	0%	0%	0%	0%	0%	8%	10%	12%
03:00	20%	14%	10%	17%	0%	0%	0%	0%	0%	10%	8%	15%
04:00	18%	14%	11%	13%	0%	0%	0%	0%	0%	8%	9%	17%
05:00	19%	13%	9%	11%	0%	0%	0%	0%	0%	9%	8%	11%
06:00	21%	17%	13%	17%	0%	0%	0%	0%	0%	11%	13%	11%
07:00	25%	26%	12%	20%	0%	0%	0%	0%	0%	18%	16%	14%
08:00	26%	20%	13%	21%	0%	0%	0%	0%	0%	15%	15%	15%
09:00	27%	25%	14%	15%	0%	0%	0%	0%	0%	11%	15%	11%
10:00	31%	25%	11%	13%	0%	0%	0%	0%	0%	6%	18%	13%
11:00	33%	23%	5%	5%	0%	0%	0%	0%	0%	3%	19%	12%
12:00	29%	19%	3%	7%	0%	0%	0%	0%	0%	5%	17%	9%
13:00	16%	13%	5%	8%	0%	0%	0%	0%	0%	0%	15%	9%
14:00	16%	12%	10%	1%	0%	0%	0%	0%	0%	0%	8%	8%
15:00	16%	16%	7%	5%	0%	0%	0%	0%	0%	6%	12%	8%
16:00	12%	11%	5%	1%	0%	0%	0%	0%	0%	5%	9%	11%
17:00	11%	12%	9%	7%	0%	0%	0%	0%	0%	3%	11%	11%
18:00	16%	7%	9%	10%	0%	0%	0%	0%	0%	5%	9%	17%
19:00	12%	19%	12%	11%	0%	0%	0%	0%	0%	5%	8%	17%
20:00	15%	15%	14%	15%	0%	0%	0%	0%	0%	5%	11%	13%
21:00	16%	19%	12%	17%	0%	0%	0%	0%	1%	6%	9%	21%
22:00	21%	14%	9%	16%	0%	0%	0%	0%	5%	5%	11%	16%
23:00	21%	17%	9%	16%	0%	0%	0%	0%	3%	6%	10%	18%

Table 39 Likelihood of a FICON Being Generated (Any Condition)

Likelihood of ASOS Without a FICON

Local Time	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00:00	6%	2%	0%	7%	3%	0%	3%	3%	3%	2%	4%	1%
01:00	7%	5%	2%	10%	5%	0%	6%	2%	0%	2%	2%	0%
02:00	4%	13%	4%	13%	3%	0%	7%	1%	0%	2%	1%	0%
03:00	4%	7%	1%	8%	5%	0%	7%	5%	0%	6%	8%	1%
04:00	4%	3%	0%	11%	2%	0%	3%	0%	3%	4%	4%	1%
05:00	7%	6%	2%	8%	3%	0%	3%	0%	3%	2%	3%	2%
06:00	3%	6%	3%	5%	3%	0%	3%	0%	3%	2%	3%	1%
07:00	1%	4%	0%	2%	4%	0%	3%	2%	3%	2%	2%	0%
08:00	2%	1%	0%	1%	2%	0%	3%	2%	3%	0%	2%	2%
09:00	4%	2%	0%	2%	2%	0%	0%	0%	0%	1%	3%	1%
10:00	0%	1%	0%	3%	4%	0%	0%	0%	7%	0%	1%	1%
11:00	0%	1%	1%	3%	5%	0%	0%	0%	1%	0%	1%	5%
12:00	6%	6%	2%	8%	2%	2%	0%	0%	3%	2%	1%	2%
13:00	5%	9%	2%	11%	0%	4%	6%	14%	4%	0%	0%	2%
14:00	6%	7%	1%	8%	5%	7%	9%	3%	7%	6%	3%	0%
15:00	3%	5%	0%	6%	6%	0%	17%	1%	12%	3%	1%	1%
16:00	6%	2%	5%	11%	8%	1%	17%	9%	12%	1%	1%	3%
17:00	5%	4%	4%	9%	5%	1%	11%	8%	3%	1%	2%	4%
18:00	2%	6%	4%	3%	10%	5%	21%	12%	8%	0%	2%	4%
19:00	1%	1%	3%	7%	4%	0%	9%	9%	11%	0%	2%	2%
20:00	3%	4%	1%	4%	6%	0%	9%	11%	4%	2%	2%	2%
21:00	1%	5%	1%	4%	7%	0%	0%	7%	11%	2%	2%	1%
22:00	1%	4%	1%	4%	1%	0%	3%	0%	13%	2%	1%	4%
23:00	6%	2%	4%	13%	2%	0%	3%	3%	7%	1%	3%	3%

Table 40 Likelihood of an ASOS Precipitation Event Without an Accompanying FICON

Likelihood of FICON Without an ASOS

Local Time	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
00:00	18%	14%	9%	13%	0%	0%	0%	0%	0%	7%	6%	12%
01:00	19%	13%	7%	11%	0%	0%	0%	0%	0%	8%	7%	16%
02:00	14%	15%	5%	10%	0%	0%	0%	0%	0%	6%	10%	9%
03:00	20%	12%	7%	15%	0%	0%	0%	0%	0%	9%	8%	12%
04:00	18%	14%	6%	12%	0%	0%	0%	0%	0%	7%	9%	14%
05:00	19%	11%	7%	9%	0%	0%	0%	0%	0%	5%	8%	8%
06:00	20%	15%	11%	14%	0%	0%	0%	0%	0%	9%	12%	9%
07:00	19%	21%	9%	12%	0%	0%	0%	0%	0%	13%	13%	13%
08:00	17%	13%	10%	12%	0%	0%	0%	0%	0%	13%	13%	11%
09:00	20%	17%	7%	9%	0%	0%	0%	0%	0%	9%	13%	10%
10:00	20%	16%	10%	9%	0%	0%	0%	0%	0%	4%	13%	12%
11:00	27%	11%	4%	3%	0%	0%	0%	0%	0%	3%	15%	11%
12:00	23%	13%	0%	5%	0%	0%	0%	0%	0%	5%	15%	9%
13:00	13%	6%	2%	5%	0%	0%	0%	0%	0%	0%	10%	9%
14:00	12%	5%	3%	1%	0%	0%	0%	0%	0%	0%	6%	7%
15:00	13%	7%	5%	2%	0%	0%	0%	0%	0%	2%	12%	4%
16:00	7%	3%	4%	1%	0%	0%	0%	0%	0%	3%	7%	7%
17:00	8%	4%	5%	2%	0%	0%	0%	0%	0%	3%	8%	7%
18:00	13%	6%	6%	6%	0%	0%	0%	0%	0%	2%	7%	15%
19:00	9%	16%	3%	4%	0%	0%	0%	0%	0%	4%	6%	14%
20:00	14%	12%	9%	5%	0%	0%	0%	0%	0%	5%	6%	10%
21:00	15%	15%	8%	11%	0%	0%	0%	0%	1%	4%	8%	13%
22:00	19%	8%	9%	8%	0%	0%	0%	0%	2%	1%	7%	12%
23:00	18%	14%	9%	12%	0%	0%	0%	0%	3%	5%	9%	14%

Table 41 Likelihood of a FICON without an Accompanying ASOS Precipitation Record

12 APPENDIX 2 SPECIAL LOC DME APPROACH DETAILED ASSESSMENT

12.1 SPECIAL LOC/DME RWY 15 APPROACH INTERMEDIATE SEGMENT

The intermediate approach segment connects the initial routes to the Final Approach Fix. Due to the segment's location overlying mountainous terrain, modifications to the obstacle accountability were made that required a waiver. These criteria deviations allow for a smaller intermediate segment that picks up fewer obstacles. These deviations consisted of a shorter than normal segment length (4.00 nm instead of the normal 6.00nm) and half width dimensions that mirrored the Final Approach Localizer Splay. Flight Inspection aircraft verified localizer coverage along the entire course to provide safety justification of the waiver.

12.2 SPECIAL LOC/DME RWY 15 APPROACH FINAL SEGMENT

The current LOC/DME RWY 15 Special employs a standard obstacle accountability area which was able to be replicated utilizing the latest criteria. As with the public version of the Localizer Approach, an excessive descent gradient of 517 ft/nm, which exceeds the standard 400 ft/nm maximum. As a result, a waiver was applied for and granted to allow for a straight-in line of minima. The 4.55 degree descent angle continues towards the threshold until it intercepts the 3.50 degree Precision Approach path Indicator (PAPI) which allows for a short portion but shallower descent for landing.

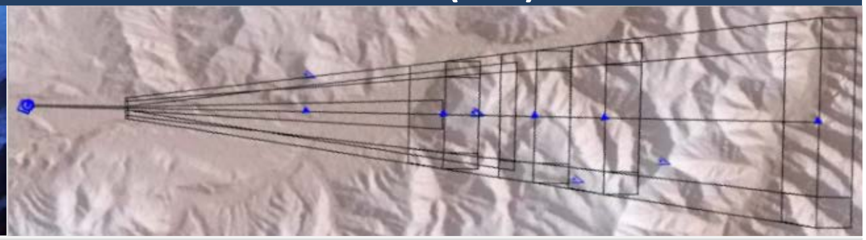
To prevent the excessive climb gradient that causes the public approach to have an excessive vertical descent angle and circling only line of minima, several obstacle clearance mitigations were performed. These include:

1) 100’ Vegetation modifier was utilized to cover tree height on terrain (except for Triangle Peak)
2) An Adverse Area Assumption Obstacle (AAO) was not used
3) The Forest Service has agreed to ensure that the manmade structure height in the portion of the White River National Forest underlying the final approach segment will not exceed 28 ft above ground level

12.3 SPECIAL LOC/DME RWY 15 FINAL APPROACH SEGMENT OBSTACLE ASSESSMENT

Lean performed an extensive review of each stepdown fix within the final approach segment to determine if a runway and localizer shift would introduce new obstacles. A 2D and 3D view of the existing and proposed obstacle penetrations is provided in the table below. The results showed that distant portions of the final approach segment were unaffected while minor changes were observed close-in to the runway.

FINAL APPROACH SEGMENT (FAS)



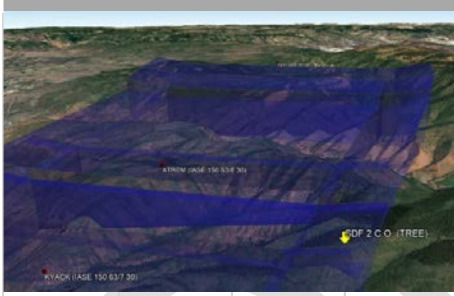
Final Approach Segment Overview

Approach Type:	Localizer w/ DME	**Class:**	*Public Special*	**Supported ACFT Categories:**			A, B, C
Final Approach Fix:	TIKET	**Location:**	I-ASE (151°) D11.4	**Descent Angle:**	4.55°		

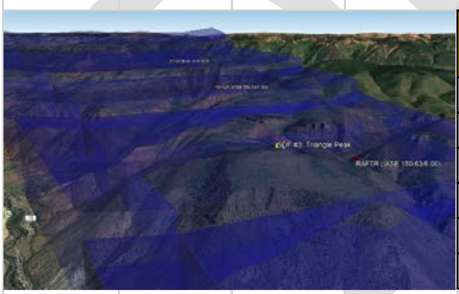
FAS Subsegment Controlling Obstacles

Existing (2018)	Segment Description	80' RWY SHIFT

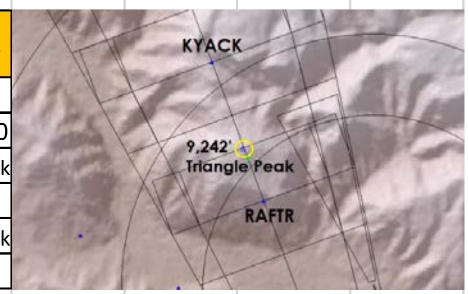
Stepdown 1: FAF to (XTREM)	
Req OBS Clearance:	250'
Segment Altitude:	10,800 ft.
Existing Obstacle:	Tree
Existing OBS Height:	10,123'
New RWY Obstacle	Tree
Existing OBS Height:	10,123'

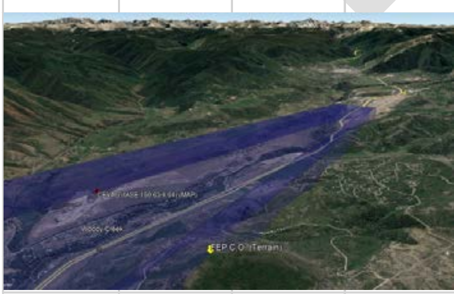


Stepdown 2: XTREM to KYACK	
Req OBS Clearance:	250'
Segment Altitude:	10,300 ft.
Existing Obstacle:	Tree
Existing OBS Height:	9,887'
New Obstacle	Tree
Existing OBS Height:	9,887'

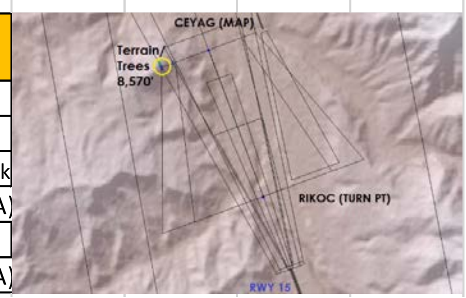


Stepdown 3: KYACK to RAFTR	
Req OBS Clearance:	250'
Segment Altitude:	9,700
Existing Obstacle:	Triangle Pk
Existing OBS Height:	9,242'
New Obstacle:	Triangle Pk
New OBS Height:	9,242'

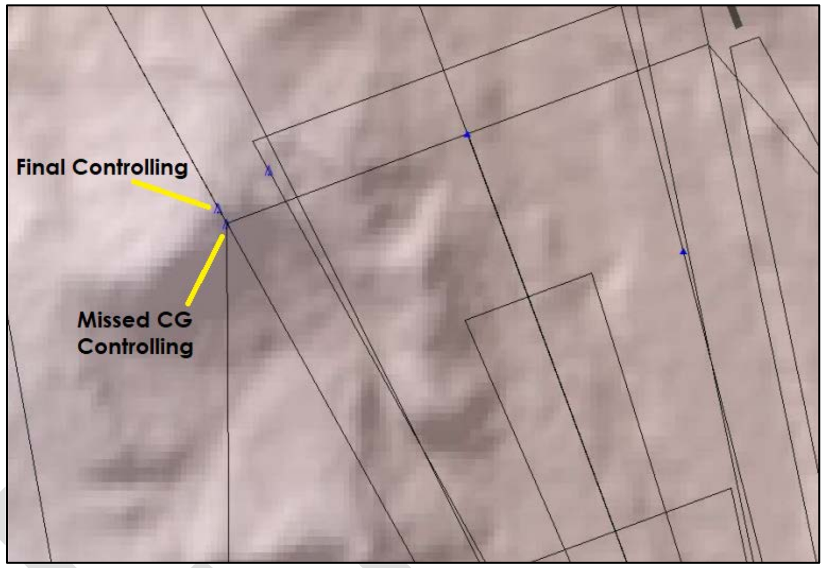




SDF 3 RAFTR to MAP	
Req OBS Clearance:	250'
Segment Altitude:	8,760'
Existing Obstacle:	Triangle Pk
Existing OBS Height:	8,539' (SA)
New Obstacle	Terrain
New OBS Height:	8,570' (SA)



12.3.1 Possible Issues Affecting Final Approach Segment Following Procedure Redesign After 80ft Runway Shift



1) **Terrain Modifiers:** New application of a standard vegetation increment or Adverse Assessment Obstacle in various segments of the Final and Missed Approach Segments could result in an MDA increase of up to 100' or increased climb gradient.
2) **Missed approach Fix:** Current MAP fix placement at IASE D4.03 picks up new obstacles. Shifting missed approach point inward towards runway (ex. I-ASE D4.01) removes the introduction of new obstacles with excessive climb gradients.
3) **Visibility:** During analysis of the LOC/DME Special based on new criteria, Lean was not able to duplicate the existing CAT-C visibility of 2 ¾. Although, movement of Missed Approach Point (MAP) to D3.80 enabled visibility reduction of 2 ½ miles. Due to the existing waivers and visibility precedence it's possible the existing values are carried forward.

12.4 MISSED APPROACH SEGMENT

The FAA developed LOC/DME RW Y15 special procedure has substantial criteria deviations and associated waivers which place it in a special training class requiring strict adherence to instructions to avoid terrain. The current Missed Approach instructions calls for a straight segment flown to the RIKOC Fix at D 2.3 KASE ILS DME. From here the aircraft begins a -RIGHT- turn over Snowmass Village to the LINDZ intersection, then a -LEFT- turn to the GLENO Fix where it climbs in hold. A 330 ft/nm climb gradient coupled with a 190 Knot speed restriction (not exceeding Red Table DME D13.5) allows clearance of all terrain and obstacles at the time of the FAA's assessment. The speed and DME restriction is necessary to avoid clipping mountain Peaks to the South and West such as Burnt Mtn (11,385'), Haystack Mtn (12,206'), and Mount Sopris (12,965'). The missed approach segment is where some of the biggest minimums gains are achieved as a result of nonstandard criteria applied through waivers. Instead of utilizing a normal missed approach obstacle detection area (OAA), the FAA has approved a waiver to utilize the departure criteria OAA (as defined by FAAO 8260.3B) which when combined with VOR guidance is much smaller in size than standard criteria. Without the utilization of these criteria deviations, a much higher final approach segment MDA is required similar to the Public LOC/DME-E.

MISSED APPROACH SEGMENT (MAS)

Overview Details

Approach Type:	Localizer w/ DME	**Class:** *Public Special*		**Supported ACFT Categories:**	A, B, C
Missed Approach Fix:	CEYAG	**Location:**	I-ASE (151°) D4.0	**Climb Gradient**	330 ft/nm to 10,000

Current M.A. Controlling Obstacles

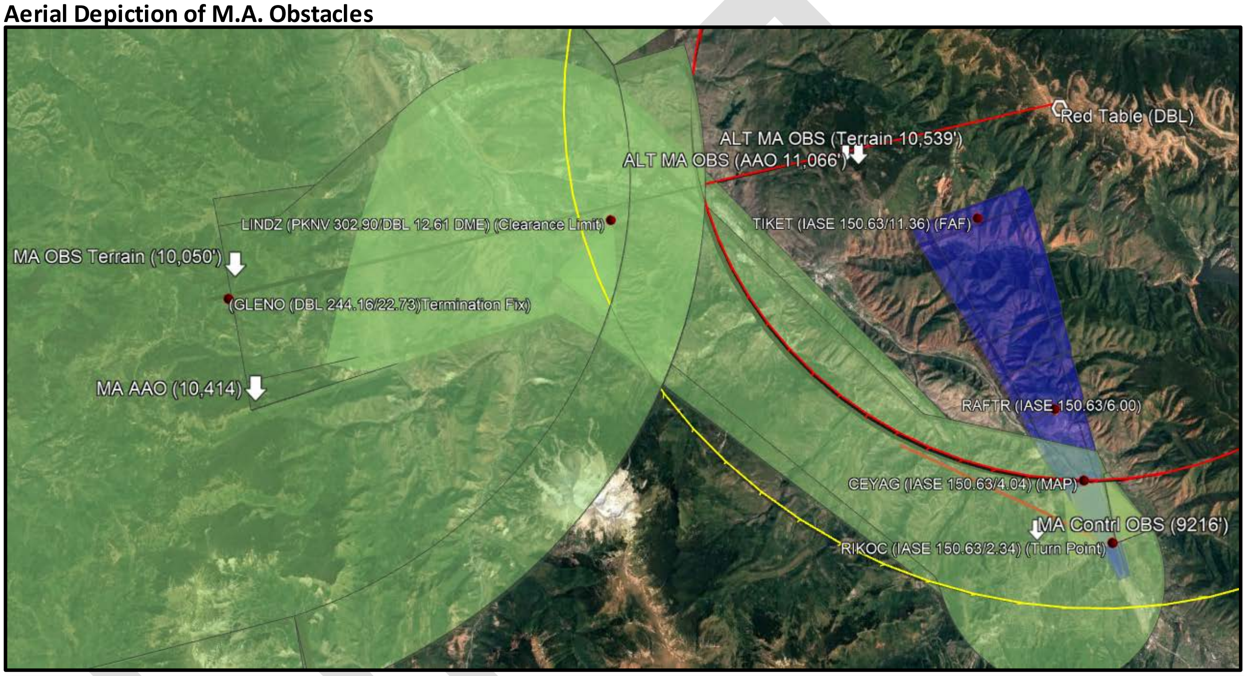
Primary (330' NM CG)

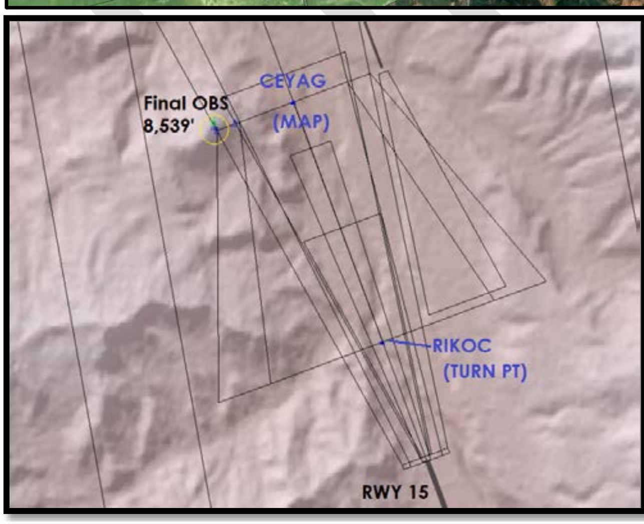
OBS #	Description	Elevation	ALT ADJ/Notes
1	TREE	9,216'	
2	AAO	10,414'	
3	Terrain	10050'	

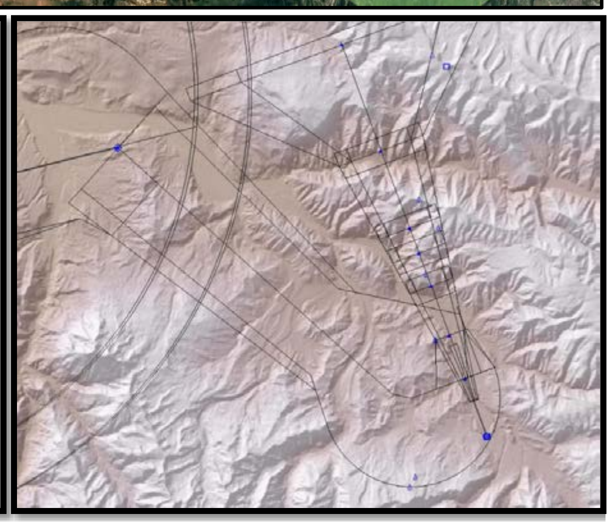
Alternate Path (10 DME ARC -200'/NM CG)

OBS #	Description	Elevation	ALT ADJ/Notes
1	AAO	TBD	
2	AAO	TBD	
3	Terrain	TBD	

Aerial Depiction of M.A. Obstacles





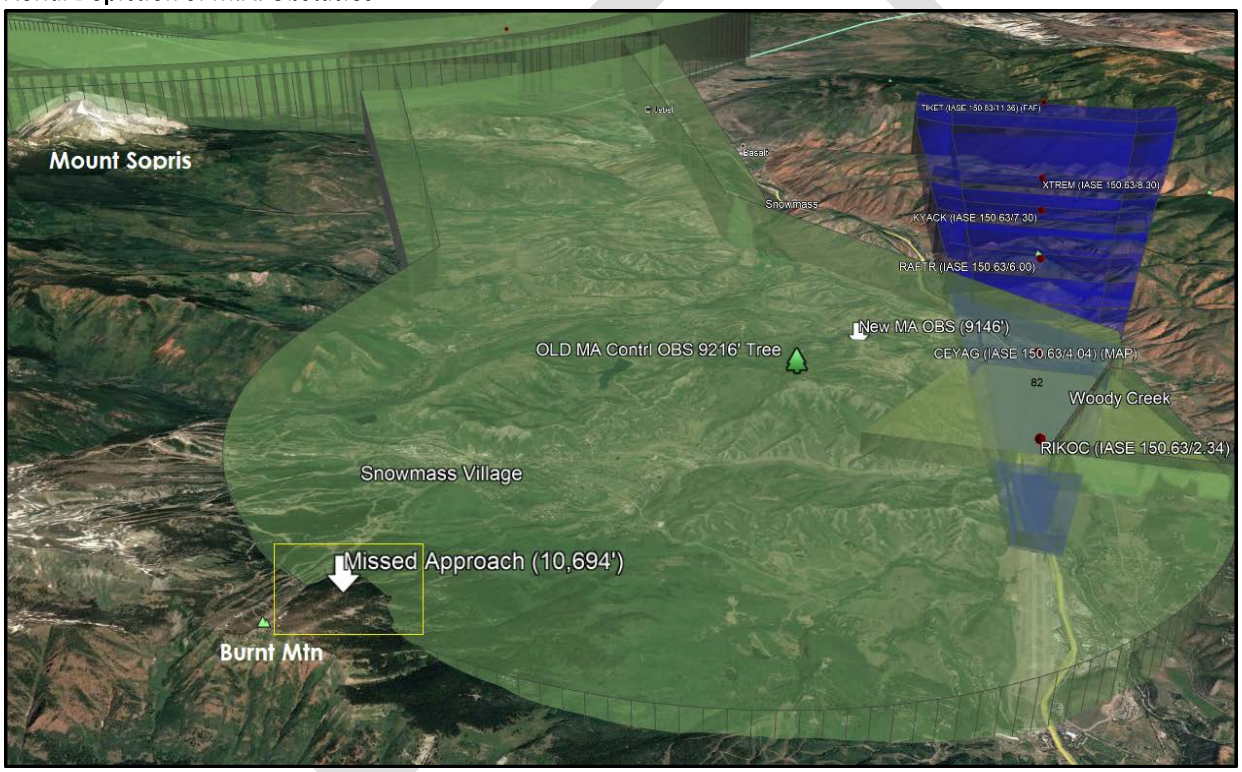


12.4.1.1.1 Missed Approach Following the 80ft Shift

The current missed approach procedure for the special LOC/CME 15 Special utilizes many special criteria deviations, therefore the impacts between the existing procedure and the procedure after the runway was shifted were minor. Given the possible slight increase from introduction of new obstacles on the final approach segment, this lessens the burden of clearing obstacles on the missed via the climb gradient.

MISSED APPROACH SEGMENT (MAS)										
80' RWY Shift Possible New Controlling Obstacles										
Primary (330' NM CG)						Alternate Path (10 DME ARC -200'/NM CG)				
OBS #	Description	Elevation	ALT ADJ			OBS #	Description	Elevation	ALT ADJ	
1	Terrain	9,146				TBD				
2	Terrain	10,694								

Aerial Depiction of M.A. Obstacles



12.4.1.1.2 Operator Acceptance of FAA Waivers on Special LOC/DME Missed Approach

The biggest risks to the missed approach segment would be if the previous criteria waivers and exceptions were not carried over to the new approach. This includes the following:

1) Utilization of Departure criteria with VOR PCG as defined FAAO 8260.3B. (Waiver)
2) Exclusion of obstacles beyond Red Table DME 13.5 (Waiver)
3) Application of ROC & CG as defined in 8260.54A (replaced by 8260.58)

An example of the reduced missed approach obstacle evaluation area is provided in the following graphic. A range ring around the Red Table VOR has been added to help highlight this aspect. There is a distance of 1.7nm from the last straight segment fix (RIKOC) to the start of the Red Table D 13.5 fence. This further reduces the standard departure criteria waiver used for the development of the special missed approach. The FAA also provides an alternative missed approach without the climb gradient, but due to higher minimums is not affected by the runway shift.

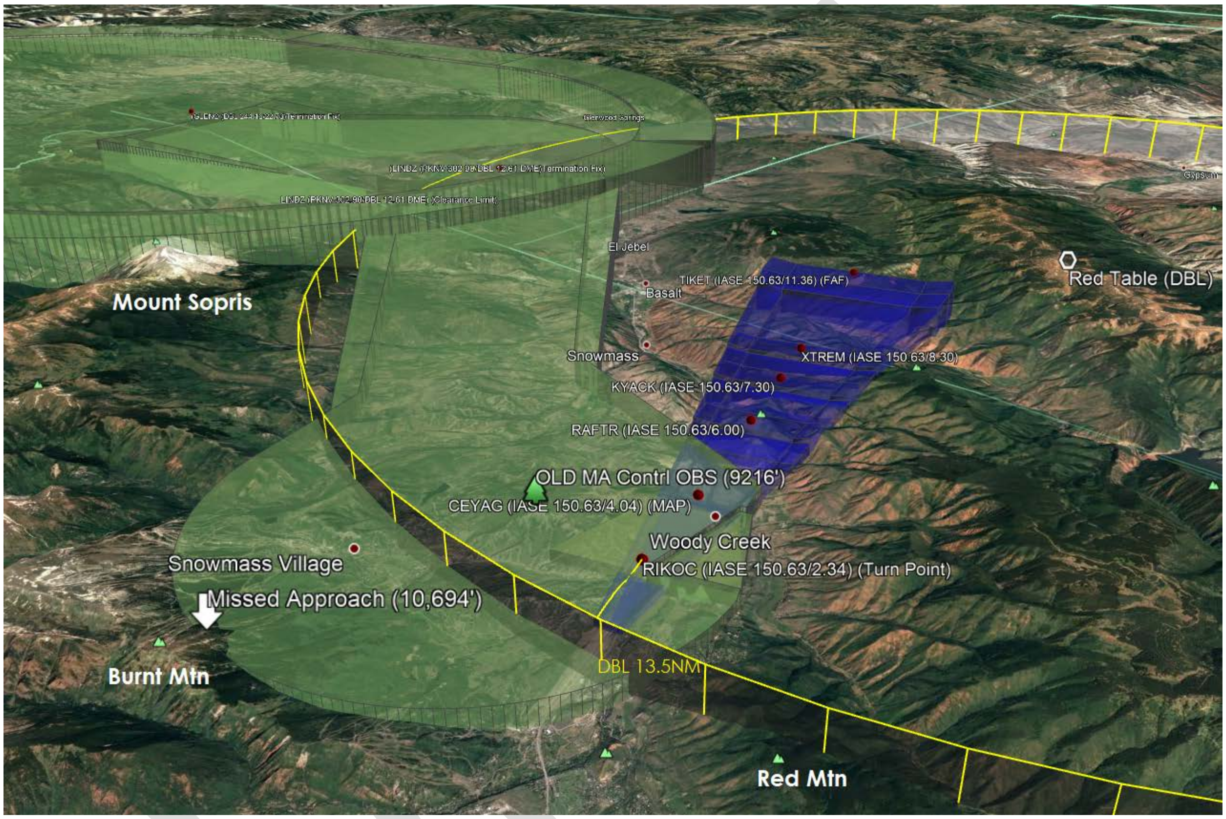
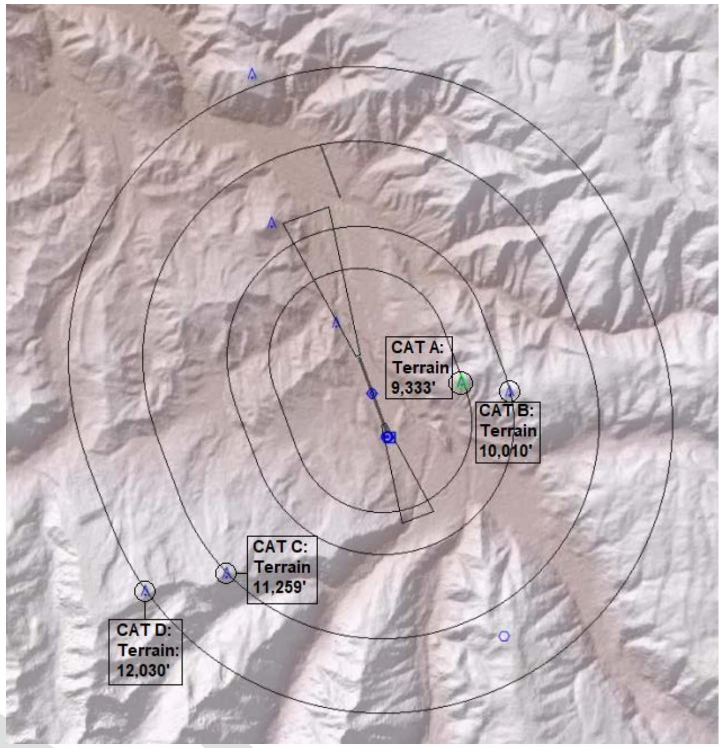


Image: The departure criteria with PCG VOR guidance applied is depicted in the shaded green area. The yellow arc line indicates the Red Table D13.5 crossing restriction. The distance from RIKOC (the beginning of the MA turn) to the DBL 13.5nm arc is 1.7nm.

12.4.1.1.3 Circling Impacts for LOC/DME RWY 15 Special

The impact on the circling approaches is a direct result of the update to the TERPS circling criteria 8260.3B change 21, first implemented in 2009. The LOC/DME Special is one of the only procedures in Aspen which has been updated with the new circling criteria at the time of the analysis. Due to terrain impacts and obstacles from the latest survey, Circling minima could increase to the following:

While the TERPS CHG 21 circling criteria minimums have only been applied to the LOC DME RWY 15 at the time of this report, the 80' RWY Shift range are applicable to the Public LOC, VOR, and RNAV procedures as well. The range of possibilities as presented below in the form of best case or worst case represent that possible differences in design tools and methods for determining the controlling obstacles in the circling area.



	Existing RWY		80' RWY Shift Range	
Circling Category	**Current Public**	**Current Special**	**Best Case**	**Worst Case**
CAT A	9,840-3	9680-3	9600-3	9700-3 (2000-3)
CAT B	10,020-3	10,302-3	10220-3	10,410-3 (2800-3)
CAT C	10,220-3	10,840-3	10960-3 (3100-3)	11,560-3 (3800-3)
CAT D	N/A	N/A	11,970-3	12,430-3 (4600-3)

13 APPENDIX 3 FEEDBACK FROM AMERICAN AIRLINES

May 30, 2018

KASE / ASE: Aspen, CO Future Airport Planning

Overview

Operations Engineering, OE, has been informed of future airport planning that will shift Aspen's runway 80ft to the west. Upon completion of this runway shift the airport will now be open to aircraft with wingspans of up to 118ft. As such AA OE was requested by LEAN Engineering to provide detail of E175 EWT, 319S, and 737-8 MAX operations.

Takeoff

- Departures from runway 15 prohibited

All of the proposed aircraft would utilize an EO SID for departures. This EO SID would depart the airport to the north and west while staying in the valleys. This avoids most high terrain and manmade obstacles. RF turns would be required in order to keep the obstacle accountability area as small as possible.

Outbound Payloads

			ASE-LAX				ASE-PHX				ASE-DFW				ASE-ORD			
EQUIPMENT	SEASON	%	PAX	CARGO	LF%	LIMIT	PAX	CARGO	LF%	LIMIT	PAX	CARGO	LF%	LIMIT	PAX	CARGO	LF%	LIMIT
EMJ/EMB-175L	W	70	71	0	93	PTOW	76	1105	100	PTOW	76	251	100	PTOW	68	0	89	PTOW
EMJ/EMB-175L	P	70	65	0	85	PTOW	74	0	97	PTOW	70	0	92	PTOW	62	0	81	PTOW
EMJ/EMB-175L	S	70	57	0	75	PTOW	65	0	85	PTOW	60	0	78	PTOW	52	0	68	PTOW
EMJ/EMB-175L	F	70	64	0	84	PTOW	73	0	96	PTOW	69	0	90	PTOW	60	0	78	PTOW
A319S/27K	W	70	128	7440	100	MZFW	128	7440	100	MZFW	128	7440	100	MZFW	128	7440	100	MZFW
A319S/27K	P	70	128	7440	100	MZFW	128	7440	100	MZFW	128	7440	100	MZFW	128	7440	100	MZFW
A319S/27K	S	70	128	7440	100	MZFW	128	7440	100	MZFW	128	7440	100	MZFW	128	7440	100	MZFW
A319S/27K	F	70	128	7440	100	MZFW	128	7440	100	MZFW	128	7440	100	MZFW	128	7440	100	MZFW
737-8MAX/28	W	70	172	2560	100	SPACE	172	2560	100	SPACE	172	2560	100	SPACE	172	2560	100	SPACE
737-8MAX/28	P	70	172	2067	100	PTOW	172	2560	100	SPACE	172	2560	100	SPACE	172	910	100	PTOW
737-8MAX/28	S	70	159	0	92	PTOW	168	0	97	PTOW	163	0	94	PTOW	152	0	88	PTOW
737-8MAX/28	F	70	172	1828	100	PTOW	172	2560	100	SPACE	172	2560	100	SPACE	172	574	100	PTOW

The following assumptions were made:

- 70% payload probability
- 3.0% route circuity
- 220Lbs PAX weights
- Standard PRAF (E175: 5500Lbs / 319S: 7000Lbs / 738M: 7300Lbs)

- E175 makes use of static takeoff, alternate forward C.G., and EWT performance

Landing

E175: Flaps 5 landings will be required in order to achieve MLW (dry runway). Flaps full configuration may be needed for wet runway landings when a tailwind greater than 5kts is encountered. Due the necessity of Flaps 2 for missed approach and the emergency extraction procedures Flaps Full may not be an acceptable configuration.

319S: The A319S (27K thrust and sharklets) is able to achieve MLW at all studied conditions.

737-8 MAX: This aircraft becomes severely limited when a tailwind is taken into account on a WET runway.

Inbound Payloads

Due to the unique geography of the Aspen environment we find that landing on runway 15 is the only option for AA / Envoy operations. Historical wind data suggests that runway 15 is the preferred direction for landing. Due to the topography of the area it is common to find shifting winds and even tailwind landings on runway 15. Due to the relative short LDA and the high altitude landing weights will sometimes be limited.

												5Kt Tailwind							
				XXX-ASE (DRY)				XXX-ASE (WET)				XXX-ASE (DRY)				XXX-ASE (WET)			
EQUIPMENT	ORG-DST	SEASON	%	PAX	CARGO	LF%	LIMIT	PAX	CARGO	LF%	LIMIT	PAX	CARGO	LF%	LIMIT	PAX	CARGO	LF%	LIMIT
EMJ/EMB-175L	ASE-LAX	W	70	76	2888	100	MLW	76	2888	100	MLW	76	2888	100	MLW	65	0	85	MLW
EMJ/EMB-175L	ASE-LAX	P	70	76	2888	100	MLW	76	2888	100	MLW	76	2888	100	MLW	65	0	85	MLW
EMJ/EMB-175L	ASE-LAX	S	70	76	2888	100	MLW	76	2888	100	MLW	76	2888	100	MLW	65	0	85	MLW
EMJ/EMB-175L	ASE-LAX	F	70	76	2888	100	MLW	76	2888	100	MLW	76	2888	100	MLW	65	0	85	MLW
A319S/27K	ASE-LAX	W	70	128	7440	100	MZFW	128	7440	100	MZFW	128	7440	100	MZFW	128	7440	100	MZFW
A319S/27K	ASE-LAX	P	70	128	7440	100	MZFW	128	7440	100	MZFW	128	7440	100	MZFW	128	7440	100	MZFW
A319S/27K	ASE-LAX	S	70	128	7440	100	MZFW	128	7440	100	MZFW	128	7440	100	MZFW	128	7440	100	MZFW
A319S/27K	ASE-LAX	F	70	128	7440	100	MZFW	128	7440	100	MZFW	128	7440	100	MZFW	128	7440	100	MZFW
737-8MAX/28	ASE-LAX	W	70	172	2560	100	SPACE	172	2560	100	SPACE	172	2560	100	SPACE	115	0	66	MLW
737-8MAX/28	ASE-LAX	P	70	172	2560	100	SPACE	172	2560	100	SPACE	172	2560	100	SPACE	115	0	66	MLW
737-8MAX/28	ASE-LAX	S	70	172	2560	100	SPACE	172	2560	100	SPACE	172	2560	100	SPACE	115	0	66	MLW
737-8MAX/28	ASE-LAX	F	70	172	2560	100	SPACE	172	2560	100	SPACE	172	2560	100	SPACE	115	0	66	MLW

Approach / Missed Approach

A commit to land point, or point of no return (PNR) must be established due to the surrounding terrain. This commit to land point is CEYAG; do NOT attempt a go-around below the MDA(H) or inside of CEYAG.

LOC/DME RWY 15 Approach (Special)

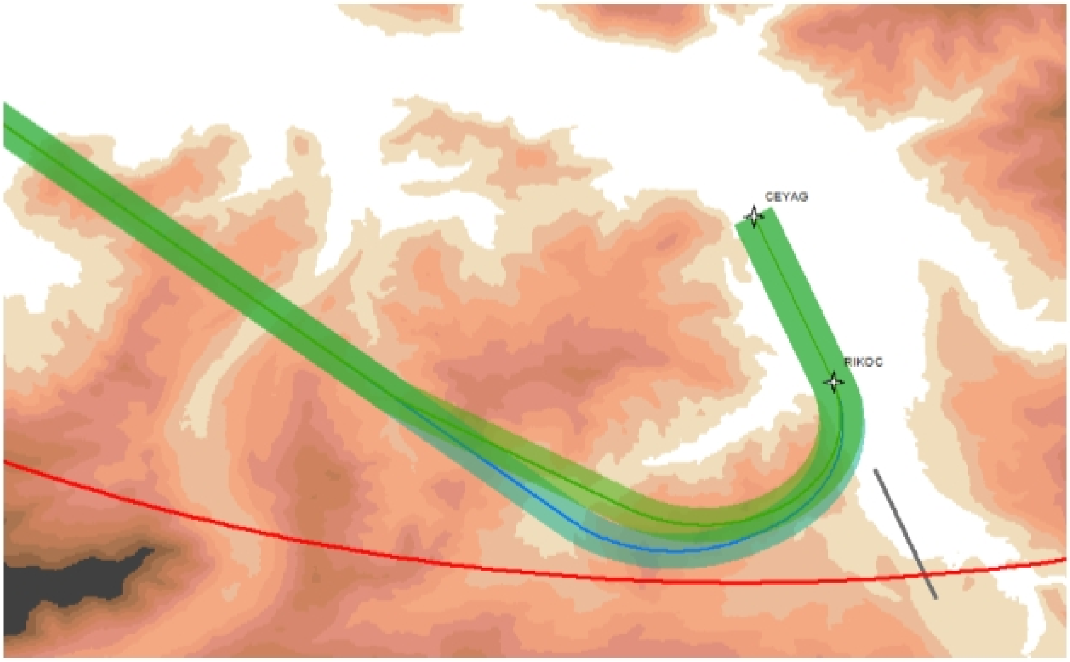
This approach procedure has operations and aircraft requirements that must be proven to the Northwest Mountain Region prior to receiving approval for the approach.

- *"Aircraft must be capable of climbing at least 330' per NM to 10,000' MSL with one engine inoperative or the operator must provide an acceptable engine out extraction plan. The operator must demonstrate aircraft one engine inoperative performance capability, or provide the appropriate documentation to the satisfaction of the POI."*

- To satisfy the requirement the appropriate CAFM's are used to show the gradient capability of the studies fleets

Additionally the LOC/DME missed approach requires the aircraft remain with in the 13.5 NM arc of the DBR VOR/DME.

- Green splay is representative of the 319S go around turn radius
- Blue splay is representative of the E175 and 738M turn radius



Furthermore, AA Operations Engineering is prepared to support an engine out extraction plan. This procedure will be initiated over the runway 15 arrival threshold at 55ft AFL. This emergency OEI procedure only provides sufficient terrain clearance at Max Landing Weight up to approximately 30°C.

RNP Approaches

At this time Envoy's E175's do not have approval for RNP approaches. Even though the aircraft is equipped the op spec has not been applied for nor has any flight crew training been initiated.

Both the 319S and the 738M fleets are RNP capable. It is know there are current RNP AR approaches as well as additional procedures in work. AA requests we be kept informed through the design process of these procedures.

Summary

The Envoy E175 is currently capable of operating at Aspen in its current configuration. Upon completion of the Aspen runway shift the wingspan limitation is set to be increased to 118ft. At that time the E175, 319S, and the 738M will be able to operate to and from Aspen.