U.S. Department
of Transportation
Federal Aviation Administration

Western-Pacific Region
Airports Division

San Francisco Airports District Office
1000 Marina Boulevard, Suite 220
Brisbane, CA 94005-1835

June 19, 2019

Mr. Brian Picken
Airport Manager
Town of Mammoth Lakes
1300 Airport Road
Mammoth Lakes, CA 93546

Dear Mr. Picken,

RE: Mammoth Yosemite Airport Aviation Activity Forecasts, 2019 Addendum

The Federal Aviation Administration (FAA) has completed its evaluation and approves the updated *Mammoth Yosemite Airport Aviation Activity Forecasts Addendum 2019* document for the Mammoth Yosemite Airport (MMH), dated May 15, 2019. This forecast is an update to the forecast approved on April 13, 2017. The San Francisco Airports District Office (SFO ADO) has the following comments about the forecast:

- Concurs with the new design aircraft of a Bombardier CRJ-700, a change from the Bombardier Q400.
- The aviation activity forecast provides adequate justification for near-term and mid-term airport planned development at MMH.
- Concur with the aviation activity forecast methodology. The forecast assumptions presented are considered reasonable. The slight variation reported in the FAA Terminal Area Forecasts (TAF) are acknowledged.

If you have any questions, please contact Katherine Kennedy at 650-827-7611.

Kind Regards,

Laurie Suttmeier
Acting Manager, San Francisco Airports District Office

Mammoth Yosemite Airport
Aviation Activity Forecasts
2019 Addendum

Prepared for the Town of Mammoth Lakes

Mammoth Lakes
CALIFORNIA

Prepared by

Mead & Hunt

May 15, 2019

INTRODUCTION TO ADDENDUM

This update of the forecasts retains the structure of the previous forecasts. Section numbers and headings have been retained. One new section has been added on scheduled charter. Instead of a section number, this section is labeled *New Section 1*. Similarly, a table comparing the design standards for the old and new critical aircraft is titled *New Table A*.

Much of the information in the previous forecasts remains valid. Therefore, this Addendum provides brief notes in each section to identify any changes to that section. All tables in the prior forecasts have been updated and are imbedded in the sections where they were presented previously.

The Town of Mammoth Lakes is aware that Inyo County is actively pursuing Part 139 certification for the Bishop Airport. Regardless of whether Inyo County is successful, the Town remains committed to providing passenger service at its airport through a combination of scheduled airline and scheduled charter flights. These updated forecasts reflect this commitment.

1. INTRODUCTION

The 10-year forecast period now extends to 2028.

2. AIRPORT ROLE

2.1 CURRENT ROLES

The Airport's current roles remain unchanged.

2.2 FUTURE ROLES

The Airport is expected to retain its current roles though the 10-year planning period.

3. HISTORICAL ACTIVITY AT MMH

The general information in the text in this section remains accurate.

Table 1 has been updated through 2018.

3.1 PASSENGER ENPLANEMENTS

Alaska Airlines ended its service to Mammoth in November 2018. All service is now by United Airlines.

Due to the limited amount of lead time, the Air Partners were not able to fully recreate the service previously provided by Alaska Airlines. During the 2018-2019 ski season, United Airlines is providing service from San Francisco (SFO), Los Angles (LAX), and Denver (DEN). DEN and SFO service are once daily during the peak ski season, which is December 18 – March 30 this year, but in the future will typically extend until mid-April (Easter holiday). LAX service is one daily flight year-round. The Air Partners were not able to reestablish the second LAX flight that had served the Airport during the ski season.

As noted in the prior forecast, service from DEN had been tried before; however, that service was once weekly. This limited service was a major constraint for potential visitors and resulted in low load factors. The current service is daily through the ski season. The average load factor for the initial 10 days of service in December 2018 was 43%.

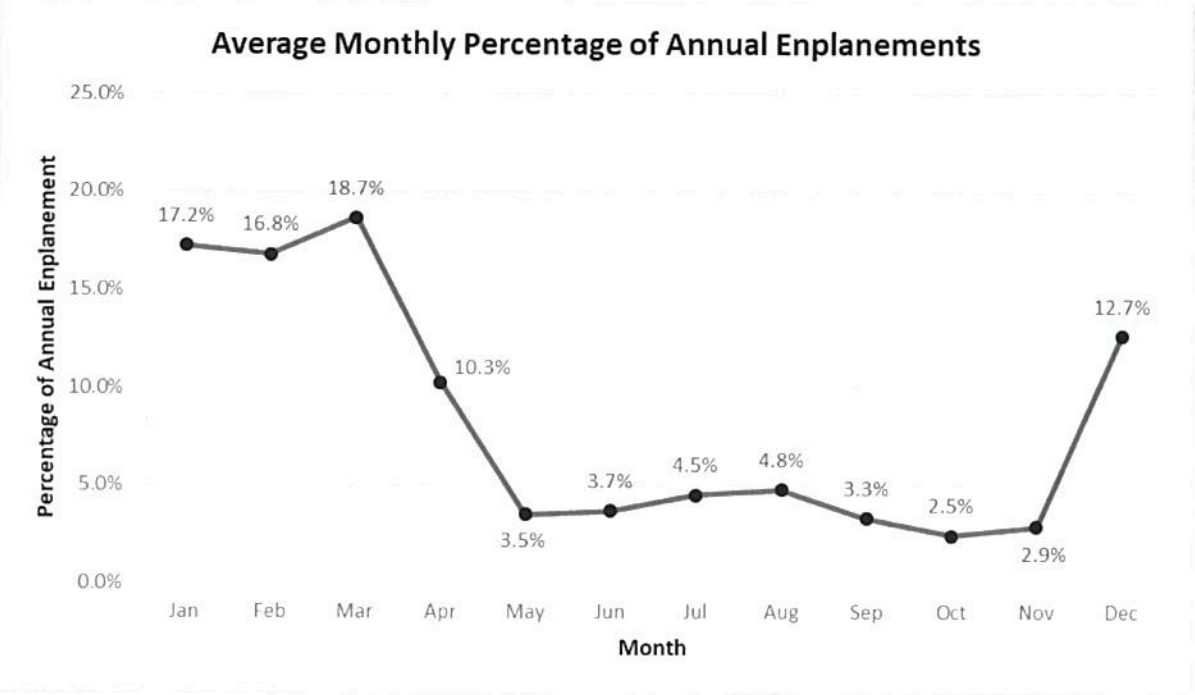
Table 1. Historical Aviation Activity

Passenger Enplanements[3]				Itinerant Operations					Local Operations			Total Operations	Based Aircraft
Fiscal Year	Air Carrier	Commuter	Total	Air Carrier	Air Taxi & Commuter	General Aviation	Military	Total	Civil	Military	Total		
2009	0	6,157	6,157	312	1,628	3,730	31	5,509	1,896	0	1,896	7,599	4
2010	0	19,798	19,798	1,228	1,840	4,296	62	7,426	200	0	200	7,626	4
2011	0	26,196	26,196	1,394	1,824	4,133	38	7,389	202	0	202	7,591	3
2012	0	27,246	27,246	1,564	1,688	3,568	40	6,860	173	0	173	7,033	3
2013	0	30,858	30,858	1,530	1,784	4,108	56	7,478	199	0	199	7,677	7
2014	0	25,892	25,892	1,404	1,514	3,200	24	6,142	148	0	148	6,290	7
2015	0	23,504	23,504	1,234	1,472	3,325	22	6,053	144	0	144	6,197	7
2016	0	22,253	22,253	990	1,634	4,017	32	6,673	143	0	143	6,816	7
2017	0	21,278	21,278	970	2,976	1,514	312	5,772	1,184	0	1,184	6,956	7
2018	0	22,594	22,594	1,050	2,926	1,308	400	5,684	1,060	0	1,060	6,744	7

Source: Passenger enplanements and air carrier operations: Airport records; 2017 Itinerant and local operations: Hot Creek Aviation; all other operations and based aircraft FAA 2018 Terminal Area Forecast.

Notes:
1. 2009 air carrier operations data not available. Operations estimated by assuming same number of passengers per aircraft as 2010.
2. Airline passenger service started in 2009 and was only for part of the year.
3. Enplanement numbers do not include passengers carried on either scheduled or unscheduled charter flights.

Passenger Enplanements



Source: Data provided by the Airport. December 2018 data not included in average. Alaska Airlines ended service to MMH on 11/30.

NEW SECTION 1: SCHEDULED PASSENGER CHARTERS

Scheduled passenger charter flights were inaugurated at the Airport during the 2017-2018 ski season. Service was provided from Bob Hope Airport (BUR) four days per week. This service continued for the 2018-2019 ski season and service from John Wayne-Orange County Airport (SNA) was added. The average load factor for scheduled charter flights in the 2017-2018 ski season was 54.7%. The first four weeks of the 2018-2019 ski season are seeing average load factors of 65%. The Air Partners have indicated that they intend to evaluate the strength of passenger demand by introducing service from other airports in both southern and northern California, such as McClellan-Palomar Airport and Buchanan Field Airport.

The scheduled charter aircraft utilize the general aviation parking apron west of the commercial apron used by scheduled airlines. Special constraints have been placed upon this apron because the airfield does not provide standard clearances for larger aircraft. It would be useful if the configuration of the general aviation apron was considered during design of the proposed commercial apron serving the new passenger terminal.

One means of resolving constraints on larger charter aircraft would be to design the new commercial apron and terminal to accommodate larger charter aircraft. The new commercial apron will be located further from the runway; this will reduce congestion and increase wingtip clearances for taxiing and parked aircraft. This design would require the charter aircraft and their passengers to be segregated from the scheduled airline aircraft and their passengers. Although uncommon, this arrangement has been used at other airports, including Hector International Airport (Fargo, North Dakota) and Grand Junction Regional Airport (Grand Junction, Colorado).

3.2 BASED AIRCRAFT

The current number of based aircraft (7) remains unchanged.

3.3 AIRCRAFT OPERATIONS

3.3.1 General Aviation Operations

The general pattern of general aviation operations has not changed. Table 1 has been updated with data provided by the Airport's fixed base operator and the Airport Manager.

3.3.2 Military Operations

Military operations include helicopters, C-130 operations, and other turbine aircraft. C-130 operations are conducted at the airport for the purpose of pilots obtaining their high-altitude airport operations certificates. C-130 operations are the most frequent at the airport, with helicopters being the second most frequent to use the airport. Airport staff estimate operations to be about 400 annually.

3.3.3 Airline Operations

United Airlines is currently (January 2019) the only airline providing scheduled passenger service. Operations data for 2018 was taken from Airport records.

3.4 AIR CARGO

Text in prior forecast remains correct: no cargo is shipped through the Airport.

4. NATIONAL AVIATION INDUSTRY TRENDS

4.1 PASSENGER ENPLANEMENTS

The 2018 Aerospace Forecast projects that domestic passenger enplanements for all carriers will grow 1.7 percent annually through 2038. This is the same as projected in the 2016 Aerospace Forecast; however, the short-term, 10-year domestic passenger enplanement is projected to grow at 1.6 percent in the 2018 Aerospace Forecast compared to 1.5 percent projected in the 2016 Aerospace Forecast. The combined domestic and international passenger enplanements for all carriers are projected to grow 1.9 percent in the 2018 Aerospace Forecast, the same growth rate projected in the 2016 Aerospace Forecast.

Table 2.
Comparison of Forecast Passenger Enplanement Growth Rates

	Domestic + International Flights	Domestic Flights		
	2018-2038	2018-2028	2028-2038	2018-2038
Mainline Carriers	2.0%	1.6%	1.8%	1.7%
Regional Carriers	1.6%	1.5%	1.8%	1.6%
All Carriers	1.9%	1.6%	1.8%	1.7%

Source: FAA Aerospace Forecast Fiscal Years 2018-2038

4.2 GENERAL AVIATION AIRCRAFT FLEET

The total number of aircraft has increased from the 2016 to 2018 Aerospace Forecasts except for multi-engine piston aircraft. However, the compound annual growth rate (CAGR) for the total fleet has decreased due to the lower CAGR for all aircraft types except Other. The greatest differences in the 20-year CAGR

from 2016 to 2018 Aerospace Forecasts are that of Light Sport (difference of -0.74 percent), Rotorcraft (difference of -0.69 percent), and Experimental (difference of -0.58 percent).

Table 3.
Comparison of Forecast Growth Rates by Aircraft Type

	Total Fleet	Rotorcraft	Fixed Wing					
			Turbine	Multi-Engine Piston	Single-Engine Piston	Light Sport	Experimental	Other
2018*	213,905	11,030	23,585	12,895	130,500	2,705	28,140	5,050
2038	214,090	15,785	35,050	11,845	107,800	5,440	33,105	5,065
CAGR	0.0%	1.8%	2.0%	-0.4%	-1.0%	3.6%	0.8%	0.0%

Source: FAA Aerospace Forecast Fiscal Years 2018-2038 *Estimate from *Aerospace Forecast*
CAGR = Compound Annual Growth Rate

4.3 AIRCRAFT OPERATIONS

The 2018 Aerospace Forecast projects total aircraft operations to increase an average 0.9 percent annually from 2018 to 2038. This is the same growth rate projected in the 2016 Aerospace Forecast. There is a 0.4 percent decrease for Air Carrier operations and a 0.5 percent decrease for Air Taxi/Commuter operations for the 20-year CAGR when comparing the 2018 Aerospace Forecast to the 2016 Aerospace Forecast.

4.4 AIR CARGO VOLUMES

The 2018 Aerospace Forecast projects air cargo revenue ton miles (RTMS) to increase an average 3.8 percent annually from 2018 to 2038. This is 0.2 percent higher than the 3.6 percent 20-year CAGR projected in the 2016 Aerospace Forecast. Overall, both all-cargo and passenger carrier air cargo RTMS 20-year CAGRs have increased in the 2018 Aerospace Forecast compared to the 2016 Aerospace Forecast.

5. FORECASTING METHODOLOGIES

5.1 MARKET SHARE METHODOLOGIES

Description remains correct.

5.2 TIME-SERIES METHODOLOGIES

Description remains correct.

5.3 SOCIOECONOMIC METHODOLOGIES

Description remains correct.

5.4 COMPARISON WITH OTHER AIRPORTS

Description remains correct.

5.5 JUDGEMENTAL FORECASTING

Description remains correct.

6. FORECASTS

6.1 PASSENGER ENPLANEMENTS

6.1.1 Factors Affecting Forecasts

The Airport has now had 10 years of scheduled passenger service. The end of service by Alaska Airlines eliminates the availability of the Required Navigational Performance (RNP) instrument procedures. These procedures were privately developed for Alaska Airlines; they enabled that airline to operate with lower visibility minimums than other airlines or general aviation aircraft. The RNP approaches allowed landings with ceilings as low as 250 feet to both runways. The CRJ-700 aircraft are not equipped to utilize an RNP approach; however, the RNP approaches developed by Alaska Airlines provide a proof of concept in that future air carriers could expect to duplicate.

6.1.2 Methodologies Considered and Rejected

Text remains correct as written.

6.1.3 Selected Forecasting Methodologies

Ten years of enplanement data is now available. Judgmental forecasting includes consideration of the effects of the loss of service by Alaska Airlines and the expansion of service by United Airlines. The effects of introduction of scheduled charter service were considered in enplanement forecasts.

6.1.4 Forecasting Assumptions

Three important changes occurred in 2018 that have resulted in changes to the forecasting assumptions:

- Loss of scheduled service by Alaska Airlines
- Expansion of service by United Airlines, including introduction of daily service from Denver during the ski season
- Scheduled charter service will continue and expand over the next 10 years. For the 2018-2019 ski season, service continues for the second year from Bob Hope Airport (BUR) four days per week. Four weekly flights from John Wayne-Orange County Airport (SNA) were added for the 2018-2019 ski season. Passengers on charter flights are processed through the fixed base operator's facility, not the passenger terminal. Therefore, charter passenger enplanements are not included in the forecast of enplanements.

Because of these changes in the circumstances at the Airport, the pattern of incremental growth will follow three paths:

- Expansion of service from LAX during the ski season.
- Incremental increases in load factors.
- Servicing of the San Diego market solely with scheduled charter flights for four years and then reintroduction of scheduled airline service.

Forecasting assumptions in the prior forecasts are modified as follows:

- **Forecasting Assumption No. 1** – The statements about the existing terminal constraining when flights can be scheduled continues to be correct; however, incremental growth in passenger volumes will be due to both incremental growth in load factors of existing flights, expansion of flights from existing airports, and addition of service from San Diego.
- **Forecasting Assumption No. 2** – This assumption is modified to indicate that there will be a drop in passenger volumes in the first year following loss of service by Alaska Airlines (i.e. 2019). Enplanements will begin growing in 2020 and follow a pattern of slow growth through 2028. The growth will be due to incremental increases in load factors and the addition of scheduled airline service from San Diego in 2023.
- **Forecasting Assumption No. 3** – This assumption states that when the replacement terminal becomes operational, flights are expected to shift to the early evening period due to strong passenger preference. This remains valid.
- **Forecasting Assumption No. 4** – With the elimination of service by Alaska Airlines, this assumption is no longer valid. United Airlines has indicated that it will only provide daily service and will not consider providing flights only four days per week.
- **Forecasting Assumption No. 5** – The general statement that the Air Partners will continue to investigate service from additional airports remains valid. It will use scheduled charter flights to test markets. As anticipated in the prior forecasts, scheduled charter flights from Bob Hope Airport and John Wayne Airport have been introduced for this ski season.
- **Forecasting Assumption No. 6** – This assumption is no longer valid. United Airlines has indicated that it will not provide less than daily service. The strategy of starting with four flights per week and incrementally expanding to daily service cannot be used.
- **Forecasting Assumption No. 7** – This assumption has been modified to state that the only out-of-state service that will occur will be the daily service to Denver during the ski season.
- **Forecasting Assumption No. 8** – The assumption regarding continuation of seasonal service from San Francisco remains valid.

Additional forecasting assumptions have been added:

- **Forecasting Assumption No. 9** – Passenger enplanements for LAX will decrease by one-third in 2019 due to the loss of the second flight during the ski season. This seasonal, second daily flight will be resumed in 2020. The addition of this second flight will result in LAX enplanements returning to 90% of 2018 levels. They will then grow at 1% compounded annual growth rate (CAGR) through the end of the 10-year forecast period.
- **Forecasting Assumption No. 10** – In the first two weeks of service, the DEN flight had an average load factor of 33%. It is expected that this rate will decrease after the peak holiday ski weeks in December and January; therefore, for 2019, an average load factor of 25% has been selected. This is forecast to grow incrementally, reaching 40% in 2028.

- **Forecasting Assumption No. 11 –** The ski season flight from SFO has been served by United since its inception. This is a mature market that will see load factors increase slowly over time. A 1% CAGR has been selected for use in this forecast.
- **Forecasting Assumption No. 12 –** Although SAN had historically been a good ski season market for the Airport, it is not clear that United Airlines will be willing to provide service from this airport in the near term. In this forecast, it is assumed that passengers from the San Diego area will be served by scheduled charter aircraft until 2023. In 2023, scheduled airline service will be reestablished. In the initial year, enplanements will be 60% of the volume in 2018. This is equivalent to a 54% load factor in a 70-passenger CRJ-700. Passenger volumes will then grow by 1% CAGR through the balance of the 10-year forecast period.

6.1.5 Other Forecast Assumptions

Actual Departures – In this forecast it is assumed that the current average of 12% cancellations will continue. It is assumed that the Required Navigation Performance instrument approaches developed by Alaska Airlines will not be reintroduced by United Airlines or another airline serving the Airport in the near future.

Total Seats – It is assumed that all scheduled airline passenger service will be in 70-seat CRJ 700's or similarly sized aircraft throughout the 10-year forecast period.

Load Factor – Although ski season load factors have climbed into the 70% range, year-round average load factors are expected to remain below 50%. This will be lower than in the previous forecast. Several factors will affect the average:

- Load factors for the DEN service are expected to remain lower than for other routes.
- United Airlines will only provide daily service. Alaska Airlines was willing to provide service four times per week. This allowed the Airport to capture the peak demand days. Daily service will result in higher total enplanements but will have a lower average load factors due to the inclusion of low-demand days.
- A portion of the passengers using scheduled charter flights would have used scheduled airline flights.

Summer-Fall Season – This forecast retains the assumption that passenger volumes outside of the ski season will remain static. There are ongoing efforts to develop and market cultural events outside of the ski season; however, the impacts of these efforts are too recent to be used in forecasting trends.

6.1.6 Enplanement Forecasts

The updated enplanement forecasts shifts the base year to fiscal year 2018 and assumes all future service to be flown in 70-passenger CRJ-700 aircraft. Ski-seasons are also assumed to be a consistent 102 days per fiscal year.

The following assumptions were used for each airport when calculating the forecasted enplanements:

- Flights to DEN will have a 25% load factor in 2019.This load factor increases to 40% by 2028.
- There will be one daily flight through the ski season to SFO during the forecast period. Enplanements will grow at 1% CAGR.
- Service to LAX will decrease in 2019 with loss of service by Alaska Airlines. This will reduce, enplanements in 2019 by one-third. The daily year-round service will remain throughout the forecast period. A second daily flight during the ski season will be added in 2020. This will increase LAX enplanements to 90% of the 2019 load factor. Enplanements will grow at 1% CAGR from 2021 to 2028.
- Flights from SAN will not resume until 2023. In this first year of service, passenger volumes will be 60% of 2018 volumes. They will then increase 1% CAGR through the balance of the forecast period.

Table 4.
Passenger Enplanement Forecast

	Year	Enplanements
Base Year	2018	22,594
Forecast Years	2019	15,953
	2020	19,734
	2021	20,020
	2022	20,307
	2023	22,824
	2024	23,138
	2025	23,453
	2026	23,770
	2027	24,067
	2028	24,387

Note: neither scheduled nor unscheduled charter are included in these figures.
Source: Mead & Hunt

6.2 PEAK PASSENGER ACTIVITY

The description of how peak passenger activity is calculated remains correct. The time period has shifted to include 2018 data.

6.2.1 Peak Month Passenger Activity Forecasts

Monthly passenger enplanement data in Table 5 has been updated to extend through 2018. The average percentage of the peak month over the last 5 years (204-2018) is 19.1%. In four of the last eight years, the peak month was March. In three of the last eight years, it was January. The variation is likely due to snow conditions.

In forecasting peak passenger activity, it has been assumed that the peak month will remain at 19.1% of the total. Applying this percentage to the forecasts in Table 4 above yields a peak month enplanement for 2023 of 4,359 and for 2028 of 4,658.

Table 5. Peak Month Enplanements								
Month	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
January	**4,211**	4,336	**5,766**	4,540	4,299	3,928	2,458	**4,144**
February	3,653	4,865	5,657	4,017	3,841	**4,569**	2,738	3,869
March	4,161	**4,897**	5,652	**4,735**	**4,622**	3,659	**4,059**	3,907
April	3,379	3,821	3,025	2,741	1,663	1,341	1,935	2,395
May	1,051	1,061	1,149	1,031	749	629	1,089	810
June	1,165	931	1,117	1,022	975	991	834	920
July	1,189	1,277	1,259	1,330	1,226	1,278	1,223	1,192
August	1,419	1,478	1,378	1,294	1,228	1,306	1,225	1,166
September	1,004	851	1,171	1,002	1,015	718	700	846
October	807	566	579	717	712	538	595	661
November	882	562	799	827	773	810	645	819
December	3,275	2,601	3,306	2,636	2,401	2,486	3,777	1,865
TOTAL	**26,196**	**27,246**	**30,858**	**25,892**	**23,504**	**22,253**	**21,278**	**2,594**
Peak Month % Annual	16.1%	18.0%	18.7%	18.3%	19.7%	20.5%	19.1%	17.8%

6.2.2 Peak Month Average Day Passenger Activity Forecasts

As in the prior forecast, the average day number of passengers on the average day of the peak month will equal 3.2% of the peak month's passengers.

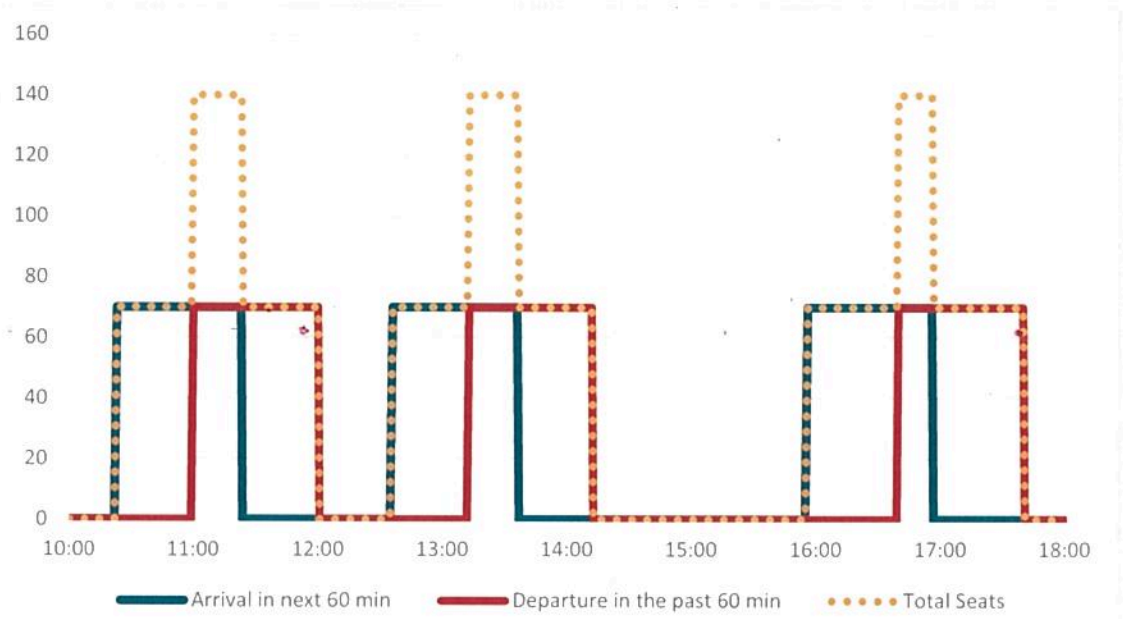
Table 6. Winter-Spring 2018-2019 Peak Day Flight Schedule				
	Time*	**Origin / Destination**	**Aircraft Type**	**Seats**
Arrival	1023	SFO	CRJ 700	70
Departure	1100	SFO	CRJ 700	70
Arrival	1236	DEN	CRJ 700	70
Departure	1312	DEN	CRJ 700	70
Arrival	1556	LAX	CRJ 700	70
Departure	1640	LAX	CRJ 700	70
* Time is expressed as a 24-hour clock. LAX flight times will change between January 7 to February 13, 2019.				
Source: Schedule - Airport				

6.2.3 Peak Hour Passenger Forecast

Figure 2 presents the peak hour seats during the 2018-2019 ski season peak. The peak hour consisted of one arrival and one departure in the 70-seat CRJ 700, or 140 seats. The peak hour is between 3:55 p.m. and 4:55 p.m. (1555 to 1655); however, the current pattern of flights is atypical of the historical pattern. The current schedule lacks a second LAX flight and one from SAN. This is due to the inability to replace Alaska Airline's flights with comparable United Airline flights in the limited lead time available following Alaska Airline's announced elimination of service.

A more typical pattern would be two arrivals and two departures. This was the pattern of flights presented in the prior forecasts. With the CRJ 700 providing service, this would total 280 seats during the peak hour. This volume will be used in forecasting peak hour passengers

Figure 2.
2018-2019 Ski Season Peak Hour Seats



Source: DEO data base

Table 7.
Forecast Peak Hour Passengers

Year	Peak Month Enplanements + Deplanements	Average Day Peak Month Enplanements + Deplanements	Peak Hour Passengers		
			Enplanements	Deplanements	Total
2023	8,833	285	86	81	167
2028	9,284	299	105	98	203

Source: Mead & Hunt

6.3 TERMINAL GATE REQUIREMENTS

The prior forecasts stated:

> The winter schedule has been developed over time to reflect passenger preferences, which show mid-to-late afternoon departures from originating cities with arrivals at Mammoth Yosemite occurring about 5:00 p.m. to 6:00 p.m. generally. The airlines have attempted to schedule arrivals away from this late afternoon period with little success, noting that passengers generally prefer a mid-afternoon departure from the major [California] cities.

This general situation has not changed. The current schedule varies from this pattern due to the necessity of the Air Partners negotiating new routes with United Airlines on short notice. If a second seasonal LAX flight is added for 2019-2020 as anticipated, it is expected to be scheduled for the late afternoon-early evening slot preferred by passengers. Within five years (2023) market forces are expected to shape the flight schedule so that it resembles the historical pattern. The expected reintroduction of the SAN flight by 2023 reinforces the likelihood of the historical pattern of peak use being replicated. Discussions with Airport staff suggest that the desired window for arrivals should be more broadly defined as between 4:00 p.m. and 6:00 p.m.

Two gates are the minimum needed to accommodate short-term (five year) demand. By the end of the 10-year forecast period, three gates will be needed to fully accommodate forecast demand. These gates are in addition to hardstand positions provided to accommodate irregular operations. As noted in the prior forecasts:

> At MMH the most common irregular operations are associated with weather delays. During the winter-spring season weather delays occur regularly. This results in three airline aircraft being parked at the Airport about 20 times per winter-spring season (about 18%) with rarer occurrences when four aircraft are parked at the Airport. In 2013, when the Airport had seven flights on five days a week, it proved difficult to schedule flights to reduce peak hour passengers to the terminal's capacity and there were three or more planes on the ground more frequently.

It is anticipated that by the end of the forecast period the Airport will again have at least three aircraft on the ground at the same time. Due to constraints on the ramp, noted earlier, this would result in inadequate clearance between parked aircraft and movement areas. It would increase the potential of conflicts between aircraft moving on the ramp. Without new facilities, it is anticipated that special markings and airport/aircraft specific operating procedures will be required to maintain Part 139 certification at the Airport.

6.4 BASED AIRCRAFT FORECASTING METHODOLOGY

No increase in the number of based aircraft has occurred. Only piston-powered aircraft continue to be based at the Airport.

6.4.1 Methodologies Considered and Rejected

This text remains relevant; no changes are required.

6.4.2 Methodology Selected

Comparisons with area airports remains the appropriate forecasting method. No additional aircraft are forecast to be based at the Airport during the forecast period.

6.5 AIRCRAFT OPERATIONS

6.5.1 Methodologies Considered and Rejected

The four methodologies considered and rejected in the prior forecasts continue to be inappropriate.

6.5.2 Methodology Selected

Judgmental forecasting remains appropriate for commercial and military operations. Socioeconomic analysis continues to be appropriate for general aviation operations.

6.5.3 Scheduled Passenger Airlines

- Operations by scheduled passenger airlines were based upon the number of annual flights for each route serving the Airport.
- Service from LAX was assumed to grow from the current daily service with the addition of a second flight during the ski season. This would increase the number of flights from 365 to 467 annually.
- SFO flights are forecast to remain constant at 102 flights annually.
- Flights from DEN are assumed to remain constant at 102 flights annually.
- When flights from SAN resume in 2023, they are assumed to remain constant at 58 flights annually (four times a week).
- Each flight consists of one arrival and one departure; this counts as two operations. Therefore, airline operations will total 1,458 in 2023 and remain at that level through 2028.

6.5.4 General Aviation Operations

As in the prior forecast, general aviation operations in this update were developed by utilizing the projected population growth rate for Mono County. The January 2018 projection prepared by the California Department of Finance's Demographic Research Unit provides updated population numbers and growth rate. The previous projection estimated a compound annual growth rate of 0.69% between 2015 to 2035; the updated forecast estimates a 0.37% compound annual growth rate for the same period. Therefore, 0.37% has been used to forecast general aviation operations. Applying this growth rate to the 2018 estimated noncommercial operations (minus military operations) yields:

- 5,753 operations in 2029
- 5,897 operations in 2039

Air taxi operations are forecast to continue to account for 52.4% of total general aviation operations. Itinerant general aviation operations are projected to remain at 26.7% of general aviation operations. Local operations are expected to remain at 20.9% of general aviation operations.

6.5.5 Military Operations

Airport staff estimates that military operations are averaging about 400 per year. The average number of operations is expected to remain at this level though the 10-year forecast period.

6.5.6 Operations Forecasts

Table 8.
Operations Forecast

	Itinerant Operations					Local Operations			Total Operations
Year	Air Carrier	Air Taxi & Commuter	General Aviation	Military	Total	Civil	Military	Total	
2018	1,050	2,926	1,308	400	5,684	1,060	0	1,060	6,744
2023	1,458	3,017	1,535	400	6,410	1,200	0	1,200	7,611
2028	1,458	3,093	1,574	400	6,525	1,231	0	1,231	7,755

6.5.7 Peak Hour Operations Forecasts

The methodology presented in the prior forecasts remains valid. The peak hour will be in the late afternoon or early evening during the ski season. Based on historical patterns, March is likely to see the highest number of operations.

As noted in Section 6.2.2, peak hour airline operations are forecast to reach four by 2023 and remain at that level through 2028.

Based upon information from the Airport's fixed base operator, peak hour general aviation operations have remained at five for the last several years. As shown in Section 6.5.4, total general aviation operations are expected to grow 5% over the next 10 years. This growth is judged to be too small to result in an increase in peak hour general aviation operations by itself; however, scheduled charter flights are expected to grow to from two to five daily during the ski season. Currently two scheduled charter operations occur during the desirable 5:00 p.m. to 6:00 p.m. time slot. These are forecast to overlap with the peak hour airline and other general aviation operations in 2023. The growth in scheduled charter operations is forecast to result in an additional peak hour operation by 2028. Therefore, total peak operations will be 11 in 2023 and 12 in 2028.

6.5.8 IFR Operations Forecasts

Based upon the FAA Traffic Flow Management System Counts (TFMSC) Instrument Flight Rule (IFR) operations averaged 52% of total operation for the last four years (2015-2018). Applying this percentage to the previous forecasts of total operations yields:

- 3,958 IFR operations in 2023
- 4.033 IFR operations in 2028

6.5.9 Cargo Forecasts

The update retains the conclusion that no air cargo will be shipped through the Airport.

7. DESIGN AIRCRAFT

The approved Airport Layout Plan for the Airport designates the Bombardier Q400 as the design aircraft. Alaska Airlines is the principal user of this aircraft. With the loss of service an alternate aircraft needs to be selected.

United Airlines is utilizing the Bombardier CRJ-700 to provide service to the Airport. Based upon the current schedule, there will be about 1,138 operations by this aircraft in 2019. This is well over the 500 annual operations threshold to be designated the design aircraft. Therefore, the CRJ-700 will be designated as the new design aircraft for the Airport.

New Table A below compares the FAA's airfield design standards for the Q400 to those of the CRJ-700. It also shows how the Airport's current facilities compare to these standards.

New Table A Changes in Airfield Design Standards	Prior Standard B-III*	New Standard C-II	Existing Condition	Notes
Runway Design				
Runway Width	100'	100'	100'	
Shoulder Width	20'	10'	12'	
Blast Pad Width	140'	120'	144'	
Blast Pad Length	200'	150'	200'	
Runway Protection				
Runway Safety Area				
Length beyond departure end	600'	1,000'	1,000'	
Length prior to threshold	600'	600'	600'	
Width	300'	500'	475'	1
Runway Object Free Area				
Length beyond runway end	600'	1,000'	1,000'	
Length prior to threshold	600'	600'	600'	
Width	800'	800'	764	2
Runway Obstacle Free Zone				
Length	200'	200'	200'	
Width	400'	400'	400'	
Precision Obstacle Free Zone				
Length	n/a	n/a	n/a	
Width	n/a	n/a	n/a	
Approach Runway Protection Zone				
Length	1,000	1,700	1,700	3
Inner Width	500'	500'	500'	
Outer Width	700'	1,010'	1,010'	
Departure Runway Protection Zone				
Length	1,000'	1,700	1,700	4
Inner Width	500'	500'	500'	
Outer Width	700'	1,010'	1,010'	
Runway Separation				
Runway centerline to:				
Parallel runway centerline	n/a	n/a	n/a	
Holding position	220'	250'	220'	5
Parallel Taxiway/Taxilane centerline	300'	300'	300'	
Aircraft parking area	400'	400'	400	
	TDG-5	TDG-2		
Taxiway Standards				
Taxiway Width	75'	35'	50'	
Shoulder Width	30'	10'	0'	
Taxiway safety area width	118'	79'	118'	
Taxiway object free area width from centerline	93'	65.5	90.5	6

* For historical reasons the Airport is classified B-III. However, the Q400 aircraft is classified by the FAA as C-III.

Notes

1. Grading needed on south side of runway
2. Fence south of runway and hangars north of runway intrude
3. Portions located off airport
4. Portions located off airport
5. Could be relocated
6. Easterly row of hangars are the critical objects

Source: Mead & Hunt

8. SUMMARY

Table 9.
Summary of Forecasts

	2018	2023	2028
Passenger Enplanements *			
Air Carrier	22,594	22,824	24,387
Commuter	0	0	0
TOTAL	23,289	22,824	24,387
Operations			
Itinerant			
Air Carrier	1,050	1,458	1,458
Commuter/Air taxi	2,926	3,017	3,093
Total Commercial Operations	3,993	4,565	4,551
General Aviation	5,684	5,753	5,897
Military	400	400	400
Local			
General Aviation	1,184	1,200	1,231
Military	0	0	0
TOTAL OPERATIONS	7,062	7,611	7,755
Instrument Operations	3,672	3,958	4,033
Peak Hour Operations	6	11	12
Cargo (enplaned + deplaned pounds)	0	0	0
Based Aircraft			
Single Engine (Non-jet)	4	4	4
Multi Engine (Non-jet)	3	3	3
Jet Engine	0	0	0
Helicopter	0	0	0
Other	0	0	0
TOTAL	**7**	**7**	**7**

*Note: enplanement numbers do not include either scheduled or nonscheduled charter.