



September 16, 2021

Truckee Tahoe Airport District
Board of Directors

Subject: 2021 Pavement Maintenance/Management Plan – Updates and Clarifications

During the August 10, 2021 Board of Directors meeting, the 2021 Pavement Maintenance/Management Plan was presented to the Board. There were a series of items that were asked to be clarified or addressed in more detail. This memo addresses these questions as well as provides further background information on some of the concepts.

1. Page 2-6 of the report stated “For this evaluation it was assumed that 90 percent of the traffic uses Runway 11-29 and 10 percent uses Runway 2-20. Of the 90 percent that use Runway 11-29, 90 percent land and take off on Runway 29 and only 10 percent use Runway 11. Of the 10 percent that use Runway 2-20, 80 percent land and take off on Runway 20 and only 20 percent land and take off on Runway 2. This traffic distribution is changing now that the aircraft control tower has been operating at the airport and more traffic is starting to utilize Runway 2-20. The shift in traffic has been accounted for in the updated traffic forecast data.”
 - a. There was a question as to whether this was correct and if it reflects the actual runway usage data.
 - b. This breakdown of runway usage is based on the data provided from airport staff for jet traffic. The Piston and Turboprop usage is different and is properly reflected in the Traffic Indexes used for the PMMP. The report has been updated to add the word “jet” to the description of the noted traffic distributions on page 2-6.
 - c. Forecast annual operations in Tables 2-2 and D1 have been updated slightly to better reflect the June 2021 Mead & Hunt Turbine Regression Method Forecast. The number of operations of a few traffic groups were updated, but it did not change any pavement life calculations or rehabilitation schedules.
2. Chapter 3 – PCN and Pavement Load Bearing Capacity Discussion.
 - a. This chapter and reporting of the Pavement Classification Number (PCN) is required for a PMMP that is FAA funded. It is not required to be included in the report and analysis for this PMMP as this report is District funded, but it is information that FAA will require for future projects and on the 5010 and Airport Layout Plan to report the existing strength of the airport’s pavements.

- b. The calculated bearing capacity reported for each individual pavement segment is based on 1,200 departures per year of an aircraft with the weight and gear configuration listed, the subgrade strength, and the pavement section material strengths and thicknesses. The weakest portion of a pavement complex is the controlling element. Truckee does not have 1,200 departures per year of the heavier jet aircraft. With smaller numbers of departures, the bearing capacity of a particular pavement may be higher than that shown in Table 3-1 which was based on 1,200 annual departures. The Board asked for the current Bearing Capacities of each pavement complex at the airport. This calculation has been performed based on the weakest section of each runway along with the forecast traffic and weights of all aircraft currently using the airport as follows:

Legend: 50 S, 80 D = 50,000 lb. aircraft Single Gear, 80,000 lb. aircraft Dual Gear

- i. Runway 11-29
1. 32 S, 42 D (based on 1,200 annual departure calculation, as noted in Table 3-1)
 2. 50 S, 80 D (based on current traffic using the runway, also matches 2011 & 2014 PMMP) – Represented by a PCN of 20 F/C/Y/T.
- ii. Runway 2-20
1. 25 S, 30 D (based on 1,200 annual departure calculation, as noted in Table 3-1)
 2. 35 S, 50 D (based on current traffic using the runway, also matches 2011 & 2014 PMMP) – Represented by a PCN of 13 F/C/Y/T.
- iii. Recommended to use bearing capacity limits of 50/80 (PCN 20 F/C/Y/T) for Runway 11-29 & 35/50 (PCN 13 F/C/Y/T) for Runway 2-20.
- c. The PCN shown in the report is derived from the bearing capacity of the weakest portion of the pavement complex in conjunction with the tables in Appendix F in Advisory Circular 150/5335-5C. This explained in Chapter 3 of the PMMP.
- d. It should be noted that Appendix E of AC 150/5335-5C includes section E.1.2 regarding reporting allowable gross weights. The last sentence of this section notes “Local experience can be considered to report a lower weight, but higher weights are not recommended.” Based on this notation, it is justified to identify these entire pavement complexes with a lower bearing capacity in order to protect the pavements based on local conditions, even though the individual pavement sections might show a calculated bearing capacity greater than the 50/80 for Runway 11-29 or greater than 35/50 for Runway 2-20. Local conditions at Truckee create significant damage to pavements that many airports do not experience. These local conditions include large daily temperature swings, freeze/thaw cycles, snow and ice cycles, snow removal operations, etc. These must be accounted for and provide justification to maintain the current bearing capacities for the pavements even if the calculated bearing capacity might be higher in the future due to a pavement reconstruction or new pavement construction.
- e. When a pavement is reconstructed the bearing capacity of that pavement would need to be recalculated. It should be noted that when pavements at the Truckee Tahoe Airport are reconstructed under future federally funded projects, the calculated bearing capacity will increase. If a project is federally funded, the pavement design must conform to the minimum standards in the latest version of Advisory Circular 150/5320-6. This advisory

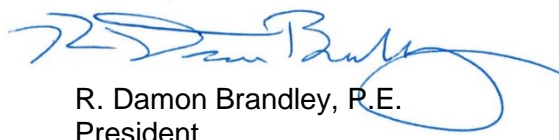
circular sets forth the pavement section design requirements and includes minimum pavement section layer thickness requirements. The existing subgrade has a CBR of 7 (see Chapter 2 of the PMMP) which currently requires a minimum pavement section of: 6" of Aggregate Subbase Course, 6" of Aggregate Base Course, and 3" or 4" of Asphalt Surface Course. This means that the minimum thickness of pavement section on top of the subgrade for any reconstructed section or new pavement section will be 15" to 16". This is thicker than the existing total pavement section of 12" on the east end of Runway 11-29 and the majority of Runway 2-20. Based on the pavement design requiring a thicker pavement section than the existing section, the calculated bearing capacity will increase, but it is still recommended and justified to maintain the existing bearing capacities based on the local conditions at the Truckee Tahoe Airport.

3. Page 4-12. The Board noted that Runway 11-29 only has 11 years of life left using 100,000 lb. aircraft. Staff indicated that 100,000 lb. aircraft rarely if ever use the runway. There was a question as to whether this table was inaccurate.
 - a. The table on this page shows the remaining life of all pavement sections using the traffic indexes indicated in the report.
 - b. Runway 11-29 (East Portion) does only have 11 years of life left per the forecast traffic. The analysis does not use 100,000 lb. aircraft, it is using the fleet mix provided. Note that the MTOW is listed for some aircraft using the airport, but the report does indicate that these aircraft typically cannot operate at their MTOW due to runway length, density altitude, city pairs, and bearing capacity limitations. The pavement life has been calculated to minimize the risk that there not be an earlier than anticipated failure of a pavement. Maximum aircraft loading used in the analysis is 80,000 lbs.
4. Page 5-2 of the report references Chapter 3 and load limits. The Board had questions on this reference. See the clarifications regarding Chapter 3 and load limits in this memo as well as updates to the PMMP.

The PMMP has been updated to incorporate the changes and clarifications indicated in this memo. Sections of the report that have been updated are:

1. Table of Contents – Updated page numbers according to changes made
2. Page 2-6 – Updated traffic distribution description to indicate "jet" traffic.
3. Table 2-2 – Updated traffic indexes and operations to match June 2021 Forecasts.
4. Chapter 3 – Updated entire chapter per PCN and load bearing clarifications noted in this memo.
5. Appendix D – Updated traffic distribution description to indicate "jet" traffic.
6. Table D1 – Updated traffic indexes and operations to match June 2021 Forecasts.

Very truly yours,



R. Damon Brandley, P.E.
President