



March 11, 2022

Truckee Tahoe Airport District
Board of Directors

Subject: 2021 PMMP – Pavement Wear and Tear Analysis

During the presentation of the PMMP at the December 2021 Truckee Tahoe Airport District Board Meeting, it was requested to determine the “wear and tear” along with an associated cost per operation for aircraft in various weight categories such as MTOW’s of 50k, 60k, 70k, 80k, 90k, 100k, and 110k. Per this request the following analysis and data has been produced from the data collected during the development of the PMMP.

The analysis performed for the PMMP previously determined the remaining life in years of each pavement section based on the forecast traffic. The additional analysis performed for this request has determined how much “wear and tear” occur on each of these pavements by each aircraft.

The percentage of structural pavement life used by each operation of each size of aircraft for Runway 11-29, Taxiway A, and Apron A2 (Apron in front of terminal building) has been calculated. The percentage of the pavement life that is used up by each aircraft operation is as follows:

Aircraft MTOW (lbs)	% Pavement Life Used Per 1 Operation		
	Runway 11-29	Taxiway A	Apron A2 (Terminal)
50,000	0.00262%	0.00084%	0.01745%
60,000	0.00449%	0.00144%	0.03006%
70,000	0.00673%	0.00218%	0.04461%
80,000	0.00993%	0.00320%	0.06577%
90,000	0.01255%	0.00414%	0.08231%
100,000	0.01683%	0.00549%	0.11045%
110,000	0.02215%	0.00723%	0.14604%

The cost analysis has been based on how much pavement life is used, how much the reconstruction of that pavement would cost after it fails, and how many operations occur on that piece of pavement per aircraft that visits the airport (runway would see 2 operations, taxiway 1 operation, and apron 2 operations each time an aircraft arrived/departed the airport):

(% life used) x (#ops per aircraft visit) x (cost for reconstruction) = (total cost per aircraft that would need to be collected to reconstruct all the pavements when they fail).

This equates to a very high cost per aircraft ranging from \$1,400 for the 50k MTOW to \$11,000 for the 110k MTOW, but if the reasonable assumption is made that FAA will participate in 90% of the reconstruction cost, that leaves only 10% of the calculated cost per aircraft visit so that the airport can recoup the money that the District would ultimately spend to reconstruct all the pavements that the aircraft uses.

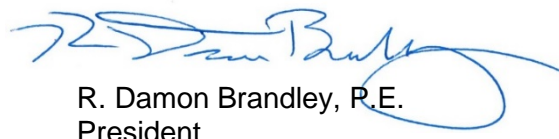
Assuming that you only charge what is necessary to recoup the 10% match that the Airport would have to fund, this would equate to fees as follows:

Aircraft MTOW (lbs)	Cost per Aircraft Visit to Recoup 10% Match	Cost per 1,000 lbs of MTOW
50,000	\$ 139	\$ 2.78
60,000	\$ 239	\$ 3.98
70,000	\$ 356	\$ 5.09
80,000	\$ 524	\$ 6.55
90,000	\$ 659	\$ 7.32
100,000	\$ 884	\$ 8.84
110,000	\$ 1,167	\$ 10.61

Assumptions for Analysis:

1. Landing Fee charges calculated based on recouping 10% of the total pavement reconstruction costs, assumes 90% would be FAA funded.
2. Calculation is based on only these aircraft using the airport ("wear and tear on the pavements"), additional wear and tear from other aircraft in the forecast traffic is not factored into the calculation.
3. When an aircraft of this size comes to the airport it will use the following pavements:
 - a. Runway 11-29: 2 operations (arrival and take-off)
 - b. Taxiway A: 1 full length operation (arrives using west portion of Taxiway A to the apron, departs using east portion of Taxiway A, therefore only one real operation. OR reverse the direction, either way only 1 full length operation)
 - c. Terminal Apron A2: 2 operations (taxis in and then taxis back out)
4. % Pavement life used per operation for the Runway, Taxiway, and Apron has been calculated based on the weakest portion of each pavement section based on the 2020 PMMP test data with each size of aircraft indicated.
5. Calculations are based on each aircraft operating at MTOW.
6. Reconstruction costs are based on reconstruction of the full length and width of each pavement section (7,000' x 100' runway, 7,000' x 50' parallel taxiway + cross taxiways + Runups)

Very truly yours,



R. Damon Brandley, P.E.
President