Appendix 8

Discarded Forecast Models

Appendix 8
Aurora State Airport - Airport Master Plan

Introduction

This Appendix contains content related to the preliminary forecast models presented in previous drafts of Working Paper No. 1 that are not included in the revised Aviation Activity Forecast (Chapter 3) in Working Paper No. 1 (August 2023). This information provides a record of draft forecast development and includes preliminary models that were presented and discarded during various stages of consultant and FAA reviews.

The August 2023 Working Paper No. 1 includes revised aviation activity forecasts that reflect FAA review comments provided on earlier drafts of Working Paper No. 1, including several review-comment-respond sequences involving FAA staff. A summary of the timeline associated with Working Paper No. 1 is provided below.

Draft Working Paper/Chapter Completed	Date sent to FAA	FAA Contact	Date received comments from FAA	FAA Contact	Notes
PAC Meeting 1 - November 16, 2021					
Working Paper 1	25-Feb-22	Benjamin Mello	3-Mar-22	Benjamin Mello	JLA emailed PAC WP 1 & updated website
PAC Meeting 2 - March 1, 2022 PAC Working Session April 5, 2022 PAC Meeting 3 - May 3, 2022					
Working Paper 1 - Revised	20-May-22	Benjamin Mello	17-Aug-22	Benjamin Mello	Website updated with CWE to FAA WP 1 Memo, PAC letters and responses, and updated WP 1.
Working Paper 1 - Revised	30-Sep-22	Benjamin Mello	N/A	N/A	Sent FAA WP 1 memo with responses to comments. JLA updated the website with the memo.
PAC Working Session November 15, 2022					
Working Paper 1 - Forecast Comments	13-Dec-22	Tim House	25-Jan-23	Tim House	FAA requested that the comments and proposed changes from the memo be incorporated into the draft WP 1.
Working Paper 1 – Revised	14-Feb-23	Tim House	11-Apr-23	Tim House	
Working Paper 1 – Revised	Aug-23	Tim House			

The extended period of FAA forecast review and coordination addressed forecasting methodologies, and a wide range of data issues including availability, reliability, and the practical limitations associated with forecasting activity at general aviation (GA) airports. The FAA forecast review leading to the August 2023 revised Working Paper No. 1 also provided access to internal FAA historical summaries of validated based aircraft count data for Aurora State Airport that were not available in the earlier drafts of Working Paper No. 1. As noted in Chapter 3, these data were subsequently incorporated into the development and evaluation of updated based aircraft forecast models.

The August 2023 update of Working Paper No. 1 includes changes in the recommended forecast models for based aircraft and annual aircraft operations. As noted above, the forecast chapter in the revised working paper represents a significant amount of coordination with FAA staff to arrive at the revised recommended forecast.

Discarded Forecast Models

2021-2041 Aviation Activity Forecasts

BASED AIRCRAFT

Discarded Models

National Aerospace Forecast (Combined Rate) Model – This model applies the *National Aerospace Forecast FY 2021-2041* growth rate for entire fleet to the Airport's baseline based aircraft count, and projected out for the 20-year planning period. The linear projection assumes steady growth that does not change year-over-year during the 20-year forecast. The model projects fleet growth as a whole, not by individual aircraft type. The model results in an average annual growth rate of 0.1%. The model was discarded in favor of a weighted version of the National Aerospace forecast, as it does not account for aircraft fleet mix.

Northwest Mountain Region Federal Contract Tower TAF Model – This model also uses the FAA TAF Query Data subsets for federal contract air traffic control towers described earlier. The model is based on the TAF forecast for the group of airports located in the FAA's Northwest Mountain Region. As with the Oregon contract tower model, the operational similarities of this group of airports provides a broad assessment of activity. This model applies the FAA's Northwest Mountain Region Federal Contract Tower TAF forecast annual growth rates for aircraft classifications to the Airport's baseline based aircraft counts (using the same classifications) over the 20-year period. The model uses the same assumptions as State TAF contract tower models, but uses regional forecast rates. The model results in an average annual growth rate of 1.1%. This model was discarded in favor of the similar and more locally-based state TAF model.

National Federal Contract Tower TAF Model – This model also uses the FAA TAF Query Data subsets for federal contract air traffic control towers. The model is based on the TAF forecast for all similarly grouped airports in the federal contract tower system. As with the other FAA contract tower models, the operational similarities of this group of airports provides a broad assessment of activity. This model applies the FAA's National Federal Contract Tower TAF forecast annual growth rates for aircraft classifications to the Airport's baseline based aircraft counts (using the same classifications) over the 20-year period. The model uses the same assumptions as State TAF contract tower models but uses national TAF forecast rates. The model results in an average annual growth rate of 1.3%. This model was discarded in favor of the similar and more locally-based state TAF model.

Oregon Aviation Plan v6.0 Model – This model applies the OAP v.6.0 statewide growth rate for Oregon's based aircraft fleet to the Airport's baseline based aircraft count and projects out 20 years. The linear projection assumes steady growth that does not change year-over-year during the 20-year forecast. The model results in an average annual growth rate of 1.1%. This model was discarded based on its reliance on historical TAF data and pre-COVID activity assumptions in place when the forecast was created.

Historical Hangar Development Trend Model – This model was developed based on an assessment of the Airport's hangar development trend since the last airport master plan was completed. The evaluation was performed by measuring the total area of on-airport and TTF hangar building footprints in August 2012 and June 2021 as observed in Google Earth imagery. Hangars were measured as whole; non aircraft storage spaces (operations, aircraft maintenance, equipment storage, etc.) located within the structures have not been removed from the measurements. A linear rate (1.7% CAGR) of increase in hangar space was calculated for the nine-year period. Details of the net change in airport hangar area are described in Chapter 2. The rate was applied to baseline based aircraft total and projected out for the 20-year planning period. The model assumes that actual hangar development was demand driven, not speculative and that the buildings constructed as hangars are used for aircraft storage, not general storage. The model result s in an average annual growth rate of 1.7%.

AIRCRAFT OPERATIONS

Discarded Models

Historical Tower Counts Trend – This model uses the full six years (2016-2021) of adjusted ATCT airport operations data available to establish a best-fit linear trend line for the period. The model assumes steady linear growth year-over-year. Itinerant and local splits were based on 2021 operations counts. The model is limited by the short period from which to develop meaningful trend and operational events experienced during the COVID-19 pandemic (e.g., decreased business travel by corporations and increased flight training activity) may be disproportionately reflected in the resulting trend projection. The model results in an average annual growth rate of 3.6%.

The Historical Tower Counts Trend model was discarded, primarily due to the comparatively short period of ATCT data available to develop the projection. Also, as indicated by FAA at the beginning of the COVID-19 pandemic: *"Federal Aviation Administration (FAA) forecast approval will be based in reference to the data and methodologies used and the conclusions at the time the document was prepared. However, consideration must still be given to the significant impacts of COVID-19 on aviation activity. As a result, there is lower than normal confidence in future growth projections."*

Marion County Population Correlation – Socio-economic indicators (population, employment, and gross regional product) for several local defined areas were compared to the Airport's adjusted ATCT operations counts (2016-2021). Ultimately Marion County Population was chosen as the most representative model as the county showed good correlation across the three indicators (population being the highest at R-squared = 0.93) and is the most focused area in which the airport is located. Clackamas County Population was also 0.93, but the airport isn't located in the county and employment correlation was on the low end of the range, so it wasn't chosen over Marion County. PSU PRC population forecast annual growth rates were applied to baseline operation counts for the 20-year period. The model assumes that operations will continue to mirror population growth in Marion County. Itinerant and Local split based on 2021 operations counts. The model results in an average annual growth rate of 2.9%.

This model was discarded due to its reliance on the ATC tower counts to establish the correlated relationship between population and operations. As previously discussed, the short and variable history of the tower count data are not an adequate dataset from which to establish relationships or project trends.

Federal Contract Tower TAF Non-Hub Models – The FAA TAF for non-hub airports with federal contract air traffic control towers provides a reasonable model for projecting annual aircraft operations at Aurora State Airport based on the model's focus on airports with similar facilities and operational characteristics. The TAF models for general aviation operations are primarily based on time-series analysis. The FAA notes that the average decrease in 2020 general aviation operations was significantly less than commercial operations or commercial enplaned passengers. Three models were developed for varying geographic levels (national, regional, and state). Based on the review of each model, the projection for Oregon contract towers was determined to be most applicable for further consideration (see below). The national and regional federal contract tower models, although producing similar growth rates, were discarded in favor of the FAA TAF Contract Tower State (Oregon) Model.

National Aerospace Forecast (Hours Flown) Model – This model applies the "Active General Aviation and Air Taxi Hours Flown" forecast 2021-2041 single growth rate to the Airport's baseline operation counts and projects out 20 years. Aircraft categories were combined into Local and Itinerant totals based on the splits from baseline. The model assumes that the Airport operations will mirror national trends. The model results in an average annual growth rate of 1.0%. This model was discarded since the individual aircraft categories presented in the FAA forecast are not detailed in ATCT activity counts used to develop the baseline aircraft operations total.

Northwest Mountain Region Federal Contract Tower TAF Model – This model applies the FAA's NW-Mountain Region Federal Contract Tower TAF forecast annual growth rates for aircraft classifications to the Airport's baseline operations counts (using the same classifications) over the 20-year period. The model uses the same assumptions as State TAF contract tower models but uses Northwest Mountain Region TAF forecast rates. The model results in an average annual growth rate of 0.5%. This model was discarded in favor of the similar and more locally based state TAF model.

National Federal Contract Tower TAF Model – This model applies the FAA's National Federal Contract Tower TAF forecast annual growth rates for aircraft classifications to the Airport's baseline operations counts (using the same classifications) over the 20-year period. The model uses the same assumptions as State TAF contract tower models but uses national TAF forecast rates. The model results in an average annual growth rate of 0.7%. This model was discarded in favor of the similar and more locally-based state TAF model.

National Aerospace Forecast (Hours Flown) Model – This model applies the "Active General Aviation and Air Taxi Hours Flown" forecast 2021-2041 single growth rate to the Airport's baseline operation counts and projects out 20 years. Aircraft categories were combined into Local and Itinerant totals based on the splits from baseline. The model assumes that the Airport operations will mirror national trends. The model results in an average annual growth rate of 1.0%. This model was discarded since the individual aircraft categories presented in the FAA forecast are not detailed in ATCT activity counts used to develop the baseline aircraft operations total.

Oregon Aviation Plan v6.0 Model – This model applies OAP v.6.0 operations growth rate to the Airport's baseline operations count and projects out 20 years. The linear projection assumes steady growth that does not change year-over-year during the 20-year forecast. The model results in an average annual growth rate of 0.9%. This model was discarded based on its reliance on historical TAF data and pre-COVID-19 activity assumptions in place when the forecast was created.