

Investigation into the current state of the Visibility Nowcast

Executive Summary

This report details the progress made in analysing the Visibility Nowcast product developed and operated at the Met Office. The goal is to understand the outputs of this product and analyse their reliability at forecasting visibility and fog – ultimately deciding whether the product requires shutting down or developing further. The analysis focuses on 3 airport locations: Heathrow,

Gatwick and Manchester. The probability of fog nowcast is compared to 1 year of METAR and SPECI observation of fog (visibility lower than 1000m) and the visibility nowcast is compared against 1 year of SYNOP observations. The main findings so far are that both the fog probability and visibility nowcast are unreliable in terms of forecasting accuracy. They both lean pessimistic generally – over forecasting fog (fog probability) and forecasting lower visibility than was observed at most times. A machine learning model solution is therefore being developed to produce SYNOPS observed visibility values based on available UKV model data. A bias corrected machine learning method was approached originally, but with time constraints on nowcast data release, a fully machine learned visibility is now being developed. This model is trained on 1 year of UKV data to predict SYNOP values based on UKV weather variables. In regard to the project's original goal (deciding whether to shut down or further develop a visibility capability) – this report finds development of further capabilities to be a worthwhile pursuit and the machine learning opportunities valuable currently.