

## Nowcasting of Low-Visibility Procedure States with Ordered Logistic Regression at Vienna International Airport

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Low-visibility conditions have a large impact on aviation safety and economic efficiency of airports and airlines. To support decision makers, we develop a statistical nowcasting tool for the occurrence of capacity-reducing operations related to horizontal and vertical visibility. The innovation is to provide probabilistic forecasts of the bivariate response with a single model.

The probabilities of the bivariate response with its four different low visibility classes are predicted with an ordered logistic regression model based on meteorological point measurements. A benefit of this statistical method is the fast update cycle with low computational costs. The forecasts are tested with a 30 minute forecast interval up to two hours, which is a sufficient time span for tactical planning at Vienna Airport.

The results show that the ordered logistic regression models outperform persistence. Additionally, the forecasts are competitive with the state of the art forecasts provided by human forecasters.