

Air Traffic Management Analysis and Modeling

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Author Note: Mark Gibson is a graduating senior in Industrial and Systems Engineering and will be joining Grant Thornton LLP following his graduation. Stephanie Milazzo is a graduating senior in Industrial and Systems Engineering with a minor in Statistics. Sophia Nguyen is a graduating senior in Industrial and Systems Engineering and will be working for the Department of Defense following her graduation. Roman Tejada is a graduating senior in Industrial and Systems Engineering. Dr. Xi Chen is the team's faculty advisor and the team formally appreciates the feedback and assistance she has provided throughout the project.

Abstract: Although no hard data regarding the issue of runway performance exists, it is currently suspected that airplanes are spending an excessive amount of time taxiing on runways after landing. This reduces the number of airplanes that can land in each time slot, which limits the efficiency of both airlines and airports. As a contractor for the Federal Aviation Administration, it is the job of Northrop Grumman to address this issue. For this reason, the team developed a program which both predicts and optimizes runway exits. The team uses machine learning to predict the exit taken per flight and a shortest path algorithm to determine the optimal exit per flight. As a result of this study, current runway performance is now quantitatively known and the factors affecting runway performance are better understood.

Keywords: Airport ground operations, machine learning, shortest path algorithm