

# Identifying Substantial Changes for AIP projects using RF and SVM

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## ABSTRACT

The budget for the Airport Improvement Program (AIP) in FY21 is \$3.35 billion. AIP's contractual guidelines and policies are outlined in Federal Aviation Administration (FAA) 5100.38D. Substantial contractual changes within AIP projects are likely to create risks that can greatly impact cost, time, and quality. To implement improved change management, identification and evaluation of contractual change are essential. Thus, there is a need to create an automated model to identify and evaluate contractual changes in AIP projects. This paper fills this knowledge gap. Using 876 contractual changes made to FAA 5100.38D, the authors utilized an interrelated multi-step methodology. Firstly, the data is prepared and the changes in the FAA 5100.38D are manually adapted. Secondly, the data is manipulated using NLP techniques. Thirdly, before building the Machine Learning (ML) models, the data is preprocessed. Finally, hyperparameter tuned Random Forest (RF) and Support Vector Machine (SVM) ML models are developed to predict contractual substantial changes, and the optimal model is selected and evaluated. Results show that RF presented the optimal hyperparameter tuned model with an AUC value of 0.928. Ultimately, this research presents an AIP decision support tool that predicts substantial contractual changes effectively and efficiently, and thus proactively provides risk assessment for AIP projects.