**Facilities Management Recycling Web Application**
(Technical Report)

**Analyzing Automation Failures in the Aviation Industry**
(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science

University of Virginia • Charlottesville, Virginia

In Fulfillment of the Requirements for the Degree

Bachelor of Science, School of Engineering

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## Sociotechnical Synthesis

Facilities Management at the University of Virginia is responsible for waste collection from university buildings as well as record keeping of how much waste is produced throughout the year. At the moment, the department uses paper forms to report the volume of waste collected from each facility, and clerks at their office translate the figures into weight units and file the forms into storage cabinets. This process not only utilizes a large amount of paper but can be very slow, lead to clerical errors, and is an unreliable way to store records. The technical project aims to create a web application that will serve as a digital form for data entry along with a database for safe record keeping. It is important to consider the environmental consequences of a paper-reliant office as well as the potential of introducing automation into the repetitive process of waste reporting. By viewing automation as a piece of infrastructure, the desired characteristics of infrastructure described by Star in the *Ethnography of Infrastructure* can be used to analyze the web application for Facilities Management and ensure that it fulfills the criteria for a successful example of infrastructure.

Star's characteristics of infrastructure can also be applied to automation, such as autopilot technology, used in the aviation industry through case studies. The research will focus on events when automation technologies on aircraft have failed leading to crashes or emergency landings. A case study will be performed on each of the incidents to understand the technical issues of the automation failure along with pilot reaction and end result of the incident. The research will attempt to connect the automation failure to one or more of Star's characteristics of infrastructure. The expectation is to be able to find components of automation in aviation that can be improved across the industry by learning from previous mistakes. Both the technical project and the STS research focus on characteristics that make infrastructure. The technical

project will attempt to implement these characteristics into the web application and the STS research will study failures in aviation when these characteristics were not considered.