Introduction

The built world enterprise is a student-run organization at Michigan Technological University. The Airport Management and Planning Team (AMPT) works within the enterprise to competently complete the Airport Cooperative Research Program (ACRP) project. The ACRP is designed to engage students from across the country in addressing challenges faced by modern airports. Challenge areas are summarized across several broad categories, including Airport Management and Planning. The AMPT team is addressing the challenge of increased ground congestion within airports, specifically looking at causes of congestion related to passengers arriving and departing the airport.

Background

Design Challenge

The challenge is to design a sustainable and reasonably feasible solution to alleviate traffic congestion, whether from ground transport or movement of passengers at major airports around the world. This is especially important as the commercial aviation industry continues to grow annually, creating more demand for air travel, and the need for airports to be able to accommodate more passengers efficiently.

Congestion is a challenge for the passenger because it causes delays and results in a stressful environment.

Materials and Methods

Interaction with Professionals

William Sprinkle, Professor Emeritus who specializes in research of transportation planning and design, was the team's main contact for information on congestion issues at airports. According to him, some of the most prominent issues are the operational and management of ground transportation at airports, as well as the lack of efficient ground traffic systems to efficiently move passengers at airports.

Example of a Traditional Boarding Pass

American Airlines' traditional boarding pass is a redacted example of a boarding pass.

Final Design

After considering both cost and pedagogical correctness, the solution chosen was to redesign the boarding pass. After the standard format of a boarding pass was redesigned to create a more minimalistic presentation that would make it easier for passengers to find crucial information at a glance and eliminate congestion and delay associated with miscommunication.

The goals associated with redesigning the pass are:

- Clearly communicate vital information
- To function across language barriers
- To coordinate with signage

Outcomes desired include reduced congestion by preventing missed flights, reducing challenges with locating gates or other locations, and provide alternate resources to find information (e.g., QR Codes).

Key Factors and Considerations

Deadlocks of the previous solutions lead to bedazzling the problem as a specific area.

Specific topics researched in-depth include:
- Curtains
  - Baggage Facilities
  - Satellite Terminals
  - Automated People Movers (APMs)
- Consolidated Rental Car Facilities (CORCFs)
- Autonomous Vehicles

Literature Review

The main factors of congestion are outside space, dull times, navigation/terminal layout, signage, chaos in and baggage services, as the demand for air traffic continues to increase, airport facilities for these are strained to handle the number of passengers.

Conclusions

The redesign of the boarding pass is a simple solution to a multifaceted problem of congestion.

The process does not necessarily represent a unique solution on its own. The purpose is to develop a method to more clearly communicate information to passengers, likely in a way that can be implemented for other applications like OTA's or APIs. Systems that would generally cover first-class passengers.

If updating the boarding passes proved effective in improving passenger understanding of a formal airport operation, they could be implemented in the future as a way to facilitate education of new passengers.