Slide 1: Title Slide

"Good morning/afternoon everyone. Today, I will be presenting the research paper on the 'Impacts on Airport Elevator Systems When Exposed to Disruptive Events: A Discrete Event Simulation Approach.' This paper explores how temporary failures in elevator systems at airports impact operational areas, specifically the waiting and circulation zones around elevators, and proposes a simulation-based approach to evaluate these impacts."

Slide 2: Objective of the Paper

"The primary objective of this research is to evaluate how disruptive events, such as temporary elevator system failures, influence the surrounding operational areas in airports, particularly the waiting and circulation zones. The paper challenges the existing analytical design standards which don't account for such disruptions and emphasizes the importance of using simulation-based methods to understand passenger flow, bottlenecks, and the overall efficiency of airport systems."

Slide 3: Resources Used - Simulation Software

"The simulation in this study used ArcPORT®, a simulation tool specifically designed for modeling airport terminal dynamics and operations. It allowed for the replication of real-world processes through Discrete Event Simulation (DES), making it possible to evaluate various disruption scenarios and their effects on airport systems."

The image on the slide shows a 3D simulation of an airport terminal, with passengers moving towards the departure gate.

Slide 4: Resources Used - Passenger Flow Data

"The study utilized simulated data based on the operations of a Boeing 737-800, which accommodates 165 passengers. This passenger flow data was used to replicate peak arrival times and how passengers behave within the terminal, ensuring a realistic simulation of airport operations during these periods."

This image on the slide shows a Boeing 737-800 seating layout, which represents the passenger distribution on the aircraft. This slide also includes a graph illustrating passenger influx at a security checkpoint at Zurich Airport, with peaks showing the flow of passengers during peak times, simulating passenger movements during high-traffic periods.

Slide 5: Resources Used - Elevator Specifications

"Additionally, the study incorporated technical parameters of the elevator system, such as its dimensions, speed, acceleration, and deceleration. These were sourced from a standard elevator catalog to ensure that the simulation accurately modeled the elevator's real-world behavior under normal and disrupted conditions."

As you can see, the image on the left is a snippet of the elevator catalog, the technical parameters include the elevator's age, rated load, rated speed, traction ratio, and other mechanical specifications.

"Pedestrian dynamics were another important aspect of the simulation. Walking speeds and behavior data, based on studies by Young (1999) and Zhou and Chen (2020), were included to simulate realistic passenger movement within the terminal and evaluate the space needed for passengers during peak periods or disruptions."

On the right, we have a bar graph showing the walking speed by age based on different data collection methods. The graph compares speeds for children, young adults, adults, middle-aged individuals, and seniors, with data collected using various techniques like videographic methods, manual counts, mixed methods, and detection systems. This helps in understanding pedestrian behavior and dynamics, crucial for modeling passenger movement in the airport terminal.

Slide 6: Resources Used - Design Guidelines

"In this slide, we see the design guidelines from the IATA's Airport Development Reference Manual, which serves as a benchmark for Level of Service (LoS) standards. According to IATA, the recommended space for an optimal LoS in arrival halls is 1 m^2 per passenger. This is the baseline for planning and designing airport circulation areas."

The image on this slide presents a performance metrics chart that helps assess different airport scenarios. It illustrates four distinct scenarios for optimizing airport operations:

Scenario 0: Stochastic (represents random or unpredictable elements in the system)
Scenario 1: Optimized Guidance (focuses on improving passenger guidance)
Scenario 2: Minimizing Service Time (aims to reduce service time for passengers)
Scenario 3: Minimizing Waiting Time (focuses on reducing passenger waiting time)

Slide 7: Algorithm/Simulation/Modeling Used

"The image here shows a 3D simulation of the airport terminal layout, with passengers moving between different sections. This simulation models the arrivals hall, the baggage claim floor, and the two elevators that connect these floors. The goal was to replicate real-world passenger dynamics within the terminal using Discrete Event Simulation (DES). The model configuration in the simulation enables us to visualize how passenger flow would behave under normal and disrupted conditions, which is crucial for understanding how elevator failures could impact the airport."

Slide 8: Algorithm/Simulation/Modeling Used

"This diagram represents a flowchart of the passenger flow simulation. It shows the stages passengers go through, from check-in to arrival, with the assumption that all passengers use the elevators for their transit. The flow chart includes various steps, such as online check-in, baggage drop, and security checks, with different groups (G1, G2) representing passenger movements. This simulation helps track how passenger influx and disembarkation, based on flight schedules and passenger data, create peak periods and congestion at certain times."