

## AIRPORT Operations Executive Summary

The number of air passengers have increased dramatically from 0.6 billion to 3.4 billion in the past three decade, posing tremendous challenges to the smooth running of all facets of Airport Operations – such as in handling the increasing amount of air traffic by Air Traffic Controllers, passenger navigation inside terminal buildings, and landside operations among others.

- ✦ Bad weather can severely impair the visibility of airport traffic controllers and their ability to guide air traffic. To improve their visibility during bad weather, synthetic vision systems and satellite technology are proposed.
- ✦ To reduce the long check-in times at airports, the use of technologies such as Biometrics and baggage drops from hotels are proposed.
- ✦ To increase the accuracy and efficiency of the baggage-handling systems, the use of RFID Tag and Robots are proposed.
- ✦ To enhance the current screening methods for prohibited items, they are augmented by the application of behavioral analysis of passengers using motion capture cameras incorporated with Artificial Intelligence (AI) technology.
- ✦ To streamline passenger navigation inside the terminal buildings, passengers are equipped with personalized navigation tools which incorporate technologies such as Augmented Reality (AR), positioning technology, and AI among others.
- ✦ To deal with emerging issues in Airport Safety Operations such as eliminating FOD (Foreign Object Debris) and avoiding drone collisions with aircrafts, innovative technologies such as Drone Detection and Radar and imaging systems are proposed.
- ✦ To resolve airport operational issues such as its inefficiency due to its failure to optimize turnaround and sequencing performance, the concept of Airport Collaborative Decision Making (A-CDM) is introduced to identify the root causes of operational problems.

### Key takeaway:

It was found that the total revenue generated from implementing all the proposed technologies mentioned above was estimated to be about \$1.8 trillion dollars by the next 20 years. The cost to maintain and upgrade these systems was found to be around 130 billion. Therefore, it was found that implementing these technologies **resulted in a 14-fold return on investment.**

Even after accounting for the costs associated with the optimization of airport systems, maintenance, and data handling, it was found that implementing these technologies would **generate an additional revenue of \$22 billion.**

Implementations of the innovative solutions suggested will lead to the development of an all-weather airport while maintaining airport safety operations. It will facilitate seamless travel inside the terminal while preserving the highest standards of security. An effective information sharing platform set by A-CDM will help collaborate and optimize operations across various departments within an airport and eventually improve efficiency.

The proposed solutions and recommendations comes with minor modification in the current operations tools and techniques. The cost benefit analysis and payback period estimated for specific tools like ACDM shows that the implementation can increase profits as well as reduce losses across different departments while the return on investment period can be expected around 3 to 5 years of the execution. It was found that the indoor navigation system installation throughout the airport usually took 3 to 4 weeks accompanied with 2 months of testing and configuration, keeping logistical complexity and costs low.