



RUNWAY INCURSION PREVENTION SYSTEM

Runway Incursions

The aviation industry is the safest mode of transportation today. Our well-trained pilots and air traffic controllers ensure that the aviation industry is withheld to its prize safety standard every day. One problem the industry constantly faces is runway incursions. The Federal Aviation Administration (F.A.A.) defines a runway incursion as "any occurrence in the airport runway environment involving an aircraft, vehicle, person or object on the ground that creates a collision hazard or results in a loss of required separation with an aircraft taking off, intending to take off, landing, or intending to land."(FAA ,2021). The primary factor in runway incursions is general aviation pilot deviation or communication errors with air traffic control (A.T.C.) and the Pilot in Command (P.I.C.). More than 90% of the roughly 210,000 civil aircraft registered in the United States are general aviation aircraft. And of the nation's approximately 600,000 pilots, an estimated 500,000 or more fly general aviation airplanes. (A.O.P.A., 2021) General aviation (G.A.) pilots are 80 percent of all aviation and are responsible for approximately 74 percent of runway incursions during the four years from fiscal year (F.Y.) 2001 through F.Y. 2004. As air transportation increases, so will the amount of planes increase which means safety needs to improve in aviation.

What is R.I.P.S

R.I.P.S. is an application that utilizes augmented reality (A.R.) to help direct pilots to their respective runways, taxiways, and terminals/ramps. The application will ask for the taxiing route then it will give pilots audible instructions in the cockpit, such as when to make turns, what taxiway they're currently on, and how long they must go before their next turn. This operational guidance would mitigate problems and observe the airport's taxiways and runways. This application will work with and enhance the procedures already implemented in ATC and pilot communications

Who is R.I.P.S For

With this app, we envision it being used by many different pilots in the industry's general aviation side, ranging from student pilots to business pilots to recreational pilots. With our app being used, we also expect to see a decrease in runway incursions per year, especially on the G.A. side of aviation.

Mock-up For App



Risk Assessment

Preventing distracted or disoriented pilots/users

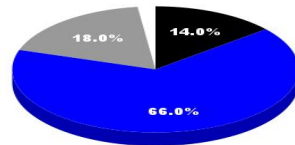
Airport diagrams, and the ability to choose and manage them using R.I.P.S.

Keeping airport diagrams up to date

Taxiing at towered vs non-towered field

- To mitigate distractions pilots/users shall only insert taxi instructions as they are received, not meant to be used during taxi, only before.
- The user will be alerted of directions either visually or orally.
- Upon landing the taxi diagram of the airport you've landed at will pop up and you will be able to access it from that point.
- Airport diagrams will be easily accessed and downloadable. the airport diagrams is available upon opening the app, or may be notified through the phone/tablet notification system.
- R.I.P.S will be getting live NOTAMs to keep airport diagrams up to date.
 - After receiving the NOTAM R.I.P.S will automatically update via the internet and will configure its airport diagrams accordingly.
- Taxiing at non-towered fields will allow the option to select the final destination and R.I.P.S will create the best route to get there.
- Taxiing at towered fields will allow you to turn off automatic route generation, this will prevent R.I.P.S from clashing with ATC's directions..

Main Causes of Runway Incursions

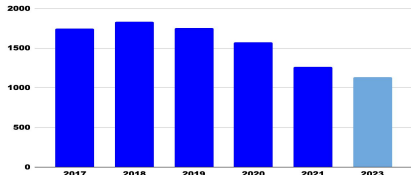


● Operation Incident ● Pilot Deviation ● Vehicle/Pedestrian Deviation ● Other

References

FAA. (2021). Activities, Courses, Seminars & Webinars - ALC_Content - FAA - FAASafetyTeam - FAASafety.gov. Activities, Courses, Seminars & Webinars - ALC_Content - FAA - FAASafetyTeam - FAASafety.gov. Retrieved December 15, 2021, from <https://www.faa.gov>
 Runway Safety. (n.d.). A.O.P.A. Retrieved December 15, 2021, from <https://www.aopa.org/training-and-safety/air-safety-institute/safety-centers/runway-safety>

Runway Incursion Totals



Project Impact

The goal is to greatly reduce the number of incursions globally, with safety as our first priority. The application will be accessible to the public in order to battle the incursions that significantly affect the general aviation community the most, anyone from student pilots trying to navigate a foreign airport on their solo xc, to seasoned aviators that would like to relax the workload on the ground for a bit. It can also act as a learning tool for beginners