Innovative Airport Visual Aids

The proposed tool suggested in this research leverages technology to supplement and augment existing airport diagrams and increase situational awareness for pilots and ground operations workers. Traditionally, airport diagrams are used to familiarize pilots and other personnel with an airport's layout and geometry. While these diagrams meet basic needs and provide one frame of reference, they do not provide pilots and airport ground crews with a visual representation of each airfield’s unique characteristics. Creating a more robust visual aid will fill this gap and potentially improve airport safety and training.

Runway Incursion

The Federal Aviation Administration (FAA) defines a runway incursion as, "any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and take-off of aircraft" (Federal Aviation Administration, 2017c). FAA categorizes incursions based on cause, resulting in the following three incident types:

- Pilots deviation (PD): runway incursion caused by pilot error that violates any Federal Aviation Regulation, such as entry onto runway without ATC authorization.
- Operational incident (OI): runway incursion caused by air traffic controller (ATC) error that violates the required minimum separation between two or more aircraft or between an aircraft and an obstacle.
- Vehicle/pedestrian deviation (V/PD): runway incursion caused by unauthorized entry of vehicles or pedestrians onto the runway movement areas, such as ground vehicle entry onto runway without ATC authorization.

Since October 2001, there have been 6,288 runway incursions at general aviation (GA) airports, with a majority of these incursions classified as PD or V/PD (Federal Aviation Administration, 2017b). Nearly two-thirds of GA incursions are a result of pilot error.

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