

# Line Up and Wait (LUAW) Overview

INFO ONLY – ANALYSIS ONGOING

## Key Findings

Potential consequences of extended time in LUAW during mixed-use operations:

- Go around
- Tight spacing or simultaneous occupancy
- Late s-turn

Certain mixed-use runways are more prone to tight LUAW clearances (see Figure 1).

General increase in undesired events (missed approach and simultaneous occupancy rate) as the time between LUAW and start of roll increases (see Figure 2).

The MITRE Corporation (MITRE) used controller-pilot voice data to examine LUAW and takeoff clearance instructions. This was done to explore sites where LUAW is frequently employed during mixed-use operations and the time interval between LUAW and takeoff clearance.

The analysis considered airports equipped with Airport Surface Detection Equipment, Model X (ASDE-X) or Airport Surface Surveillance Capability (ASSC), which are necessary to identify the start of roll. It also considered mixed-use flight pairs, where a departure is followed by an arrival to the same runway. The study period spanned January 2021–February 2024.

## Next Steps

- Extend analysis to include LUAW assessments at airports with intersecting runway configurations.
- Explore using along-track distance to measure arrival distance to runway instead of direct distance.
- Develop a model that can assess the risk associated with a LUAW clearance during mixed-use operations using inputs such as arrival location, approach speed, and departure location relative to the runway.
- Perform deep dives into specific events.

### Primary Hazard:<sup>†</sup>

AIRPROX/TCAS Alert/Loss of Separation/Near Midair Collisions/Midair Collisions (MAC)

**Phases of Flight:** Takeoff, Climb, Approach, Go Around, Landing

**Likelihood:**<sup>‡</sup> Frequent

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For more information, please contact [asias@mitre.org](mailto:asias@mitre.org).

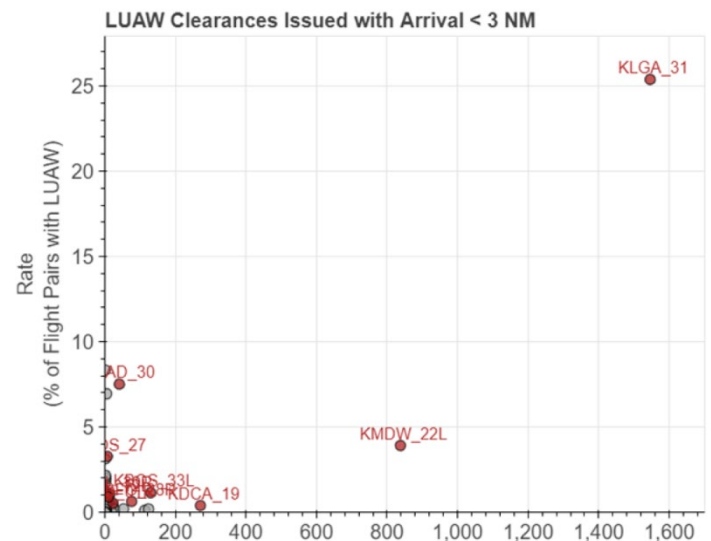


Figure 1. LUAW Clearances Issues with Arrival < 3 Nautical Miles (nmi)

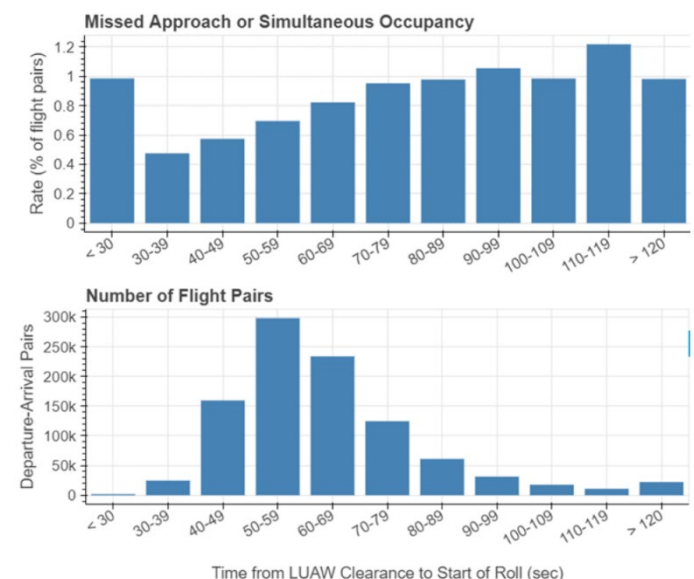


Figure 2: Impact of Lengthy Time to Roll during Mixed Use Operations

<sup>†</sup> See Commercial Aviation Safety Team (CAST) /International Civil Aviation Organization (ICAO) Common Taxonomy Team (CICTT) Aviation Occurrence Categories, May 2021 (4.8).

<sup>‡</sup> See FAA Order 8040.4C, September 2023.