

Boundary Searching of Unmanned Aircraft System Operations Near Airports A Data-Driven Analysis of Airspace Utilization

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Abstract—The demand for UAS operations is increasing in recent years, as well as the traffic volume of civil aviation. The operations of both traffic modules are based on the utilization of airspace resources. Currently Unmanned Aircraft Systems (UAS) are not allowed to operate close to airports, where potential conflicts between UAS and manned aircraft happens. This rule is constraining the application of UAS. Therefore, it is necessary to study the current airspace utilization pattern near airports, before the boundary determination of UAS operation to allow the UAS accessing airspace safely without conflicts. In this paper, a data-driven analysis on historical trajectories below 10,000 feet at Changi Airport in Singapore was carried out. Trajectory data have been clustered to recognize the utilization patterns of airspace. Discussions on the boundary of UAS operation were presented based on both current airspace utilization patterns and the estimated capacity together with predictions of traffic demand in 2025. As this is the first research study to present the initial concept, more operational and other factors should be considered in the future study for the generation of potential boundary of UAS operations.