

Article

RETRACTED: Prediction of Urban Air Mobility and Drone Accident Rates and the Role of Urban Management Systems

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Abstract: Urban air mobility (UAM) and drones can significantly improve traffic movement in saturated cities because the skies above them are not frequently used; furthermore, they do not require large-scale infrastructure, like roads and subways do. Thus, UAM vehicles and drones present themselves as new means of transportation in cities. They can be rapidly deployed if their operational safety is secured. However, to date, no precise numerical study has been conducted on the safety of UAM vehicles and drones. In this study, the accident rates of UAM vehicles and drones are predicted based on the accident rates of conventional aircraft. Additionally, control measures for UAM vehicles and drones are presented at a basic level. The results can be summarized as follows: First, in terms of accident rates, for a projected total UAM vehicle flight distance of 650 km and 177,147 h of flight in Seoul in 2035, 0.000221 crashes, 0.45 takeoff/landing accidents, and 0.0011446 deaths are expected. Second, if drones handle 0.5% of the logistics in Seoul in 2035, 38.35 crashes and 7.51 takeoff/landing accidents are projected per year. However, these numbers are plausible only if the infrastructure required for UAM vehicle and drone flights, such as taxiways and flight paths, is built similarly to that for large aircraft. Additionally, UAM vehicles and drones, as with large aircraft, can cause serious damage to facilities and human lives on the ground in the event of a crash. Therefore, thorough response mechanisms for crashes are required even if the crash probability is extremely low. Finally, integration with smart city systems is suggested to monitor UAM vehicle and drone flights and the safety of urban residents. The transportation services of smart cities include emergency dispatch and disaster notification services, which help in immediately notifying the degree of risk to potentially affected urban residents and facilities in the event of a UAM vehicle/drone crash or an emergency. The transportation services of smart cities are also typically equipped with accident handling processes. Therefore, integrating UAM and drone systems into smart city systems is highly recommended.



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([https://creativecommons.org/](https://creativecommons.org/licenses/by/4.0/)<https://creativecommons.org/licenses/by/4.0/>).**Keywords:** urban air mobility; drone; accident rate; urban management system; smart city