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Urban air mobility – Emerging opportunities for the weather community

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Urban air mobility (UAM) – the vision of avoiding surface transportation gridlock by speedily traveling across metropolitan areas through the air – is not just a fantasy from the Jetsons, the idea has mobilized the aviation industry. Technologies have advanced to the point where countless manufacturers are investing heavily into developing electrically propelled, vertical takeoff and landing, aerial vehicles (eVTOLs). Initial flight demonstrations have already occurred around the globe in the United Emirates, South Korea, the United States and other places. Substantial research is underway to examine all aspects of UAM, including market potential and business viability, infrastructure requirements, passenger safety and convenience, air traffic management, and public acceptance issues, among others.

This presentation will review urban air mobility and its challenges, which includes weather. In particular, we take a look at the weather challenges in an urban setting and whether today's weather guidance may be good enough to support eVTOL operations in all conditions. Particular challenges include winds and turbulence inside the cityscape and especially around takeoff and landing sites, and the transition of eVTOLs from vertical to horizontal flight. Other challenges include ceiling and visibility, and hazards associated with thunderstorms and wintry/icing conditions. Notable opportunities may come from the envisioned, hundreds of eVTOL flights across metropolitan areas, if those eVTOLs were to carry meteorological sensors that could provide unprecedented weather data in real time to be utilized for monitoring current conditions, validate fine-scale urban weather prediction capabilities, and/or enhance such prediction capabilities through data assimilation.