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Using Drone and Lidar in BIM of Infrastructure

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Abstract

Drones equipped with LiDAR are transforming BIM workflows for infrastructure projects by seamlessly bridging the gap between physical sites and digital models. These UAVs capture millimeter-accurate 3D point clouds of highways, bridges, and utilities, which are directly integrated into BIM platforms like Autodesk Civil 3D or Bentley OpenRoads to create dynamic digital twins. This enables real-time design validation, clash detection, and construction monitoring while ensuring as-built models remain updated throughout the asset lifecycle. By automating data collection and reducing human error, drone-LiDAR enhances BIM's efficiency, allowing engineers to detect pavement degradation, earthwork discrepancies, and structural issues early—ultimately saving costs, improving safety, and supporting predictive maintenance in smart infrastructure management.