

Precision: Walkability Assessment with GenAI and LiDAR

Team 7

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Abstract

This study evaluates walkability around the DART Mockingbird Station by integrating LiDAR-based environmental indicators with GenAI-derived perceptual assessments. Using 650 Google Street View panoramas, generative AI quantified four experiential dimensions, openness, greenness, walkability, and thermal comfort, while LiDAR data provided objective measures such as SVF, tree canopy, UTCI, and pedestrian network quality. Results show strong agreement along the main commercial corridor where shade, active frontages, and pedestrian facilities align. However, mismatches emerge in residential areas and parking environments, where physical conditions may be suitable but still perceived as visually unpleasant or unsafe. Conversely, visually pleasant streets sometimes lack formal pedestrian infrastructure. By highlighting convergence and divergence between physical metrics and human-perceived comfort, this study demonstrates the value of combining perception-based AI with geospatial analysis to achieve more accurate and human-centered walkability assessments for transit-oriented development in hot-climate cities.