

From Above and Below: An Integrated Geomatics Demonstration for Smart Urban Development in Saudi Arabia

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SUMMARY

Urban development in rapidly growing cities requires an integrated approach to data collection, analysis, and decision-making. This demonstration will present how Al Qotr, a leading geomatics and smart surveying company in Saudi Arabia, delivers comprehensive urban intelligence by combining multiple cutting-edge technologies into a unified workflow.

The session begins with satellite imagery analysis to establish a macro-scale understanding of land use, urban sprawl, and environmental patterns. High-resolution drone surveys are then employed to capture detailed aerial imagery and terrain models, offering precision data on buildings, infrastructure, and topography. To complement aerial datasets, mobile mapping systems are used to scan entire road networks, while backpack-based mapping solutions enable high-resolution 3D data capture in narrow and informal urban areas that are inaccessible to vehicles.

Beneath the surface, Ground Penetrating Radar (GPR) is deployed to detect, map, and analyze underground utilities, ensuring a complete picture of both visible and hidden urban assets. By integrating surface and subsurface data, Al Qotr develops comprehensive city-scale digital twins that serve as reliable foundations for planning and infrastructure management.

The demonstration will also illustrate how this rich geospatial database supports expropriation management, providing transparent frameworks for property acquisition and compensation. Additionally, socio-economic and financial studies are integrated into the process to ensure that development initiatives are not only technically sound but also socially equitable and economically viable.

By showcasing this workflow, Al Qotr emphasizes how the convergence of remote sensing,

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surveying, geophysics, and socio-economic analysis can enable municipalities, utilities, and development companies to make data-driven, sustainable, and future-ready decisions. The session will be highly relevant for professionals in geomatics, urban planning, smart city development, and infrastructure management, offering a clear example of how to transform raw data into actionable intelligence.

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