

Tech in the city

Using spatial insights





Digital-first governments and organizations operating within innovative environments can benefit from predictive decision-making and effective value-creation as they progress in their transformation journey. Data analytics combined with real estate market information can provide decision support through an integrated view of the city planning and project development lifecycle.

The application of technology in real estate presents unique opportunities for infrastructure, transportation, and resource planning. When multiple layers of data that have been geo-tagged are overlaid on top of each other, the benefits of geospatial analysis increase. New relationships become visible, and new analytical capabilities become possible. The more accurate, varied, and current the geospatial data, the more opportunities there can be for visual and quantitative analytics.

Geocoding city information

Geospatial analytics can provide benefits for any class of property, including buildings, infrastructure, land, and transport facilities. A common data platform can enable the sharing of information on terrain attributes, such as water bodies and existing infrastructure, for creating efficient transport networks. Additionally, the potential for deploying

renewable energy sources, such as solar energy, can be studied using data on building height and rooftop surface characteristics, among other metrics.

For instance, geocoding city information can help answer questions, such as where are the entry points of government facilities in relation to modes of transport or in which districts of a new master planned project would assets maximize accessibility considering the changing demographics?

The benefits of geospatial technology also extend into asset management where an integrated, portfolio-wide view of property information is critical as many budget environments continue to tighten. The use of standardized interfaces to view and analyze information, including extract, transform, and load (ETL) tools and Web Services architecture, can help improve flexibility and usability across the organization.

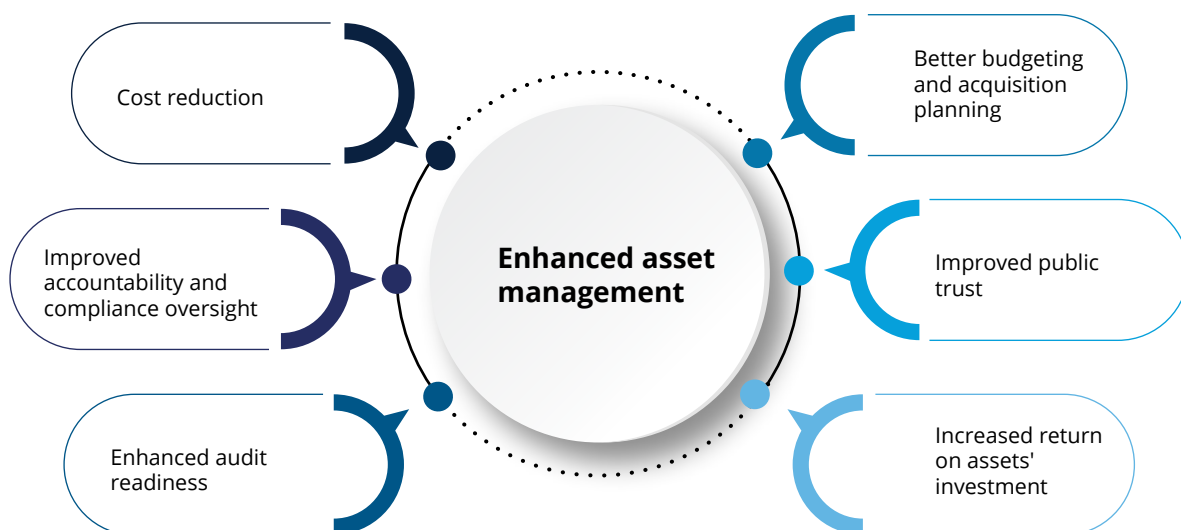
Geospatially enabled asset management

Using geographic information systems (GIS), among other tools, can allow the power of location to be properly utilized for asset management. This location-based framework provides an organizing principle, which helps bring together all aspects of management in one framework.

Integration of GIS, which highlights locational attributes, with Building Information Modeling (BIM), including data on the interior and exterior of the building, assists in managing assets through a digital representation of its attributes. This can help owners meet several objectives related to asset management from construction to delivery, and further into operations stages.

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Figure 1: Enhanced asset management



Source: Deloitte Middle East Real Estate Predictions 2022

Whole-of-government approach

To solve a nation's biggest challenges, the adoption of a geospatial analytics-led governance model can enhance the sharing of information among government entities and provide access to relevant information for residents, students, and the wider public.

An integrated GIS enabled platform can collate geometric and image data from different public agencies, as well as 2D data and information from existing geospatial and non-geospatial platforms. This enables the roll out of initiatives supporting wayfinding, traffic management, efficient infrastructure and building design, and land management - as well as critical capabilities such as sustainable emergency evacuation procedures.



Case studies

Project summary

Name: Virtual Singapore (VSg)

Overview: VSg, (coverage approximately 720 sq km) US\$ 53 million GIS based project aimed at efficient urban planning, improved accessibility, and sustainable development

Key focus areas:

- Sustainable environment
- Transport management
- City planning
- Efficient utilization of natural resources

Key entities/agencies

Government entities

National research foundation

Leading entity

VSg platform (data dissemination) executed by programmes dept.

Singapore Land Authority

3D mapping national project (data collection)

GovTech Singapore

Expertise in information and communications technology (ICT) initiatives and its management

Vendors

Dassault Systèmes

Developed 3D simulation model data is utilized by key sectors/departments

Asset Allocation and Management

Data, collection aerial and terrestrial surveys

Bentley Systems

To capture and convert the survey data in CityGML format



Case studies

Project summary

Name: Brussels Smart City

Overview: A centralized mapping portal 'geo.brussels' set up by a 'GeoBru' committee comprising six government entities that manages the functioning and the coordination of the portal, and allows data exchange between different government agencies in Brussels

Key focus areas:

- Establishing a digital map of the Brussels capital region of approximately 162 sq km
- Improving urban mobility
- Sustainable development

Key entities/agencies

Government entities

The Brussels Regional Informatics Centre (BRIC)

Leading entity

An ICT partner with the focus on computer, telematics and cartographic development across government organizations in the Brussels capital region

Software providers (open source)

Geo.brussels

GeoNode

GeoNetwork

GeoServer

Note: CityGML (City Geography Markup Language) exchange form

Source: Deloitte; Virtual Singapore (nrf.gov.sg); Smartcity.brussels

Supporting sustainability initiatives

The adoption of geospatial technologies can be extended to support sustainability initiatives as well. By accessing detailed information about building surface materials and land cover, urban planners can form insights related to noise propagation or setting up accurate solar panel roof angles.

Potential benefits include:

- Identification and monitoring of environmental quality (air, groundwater, and marine water)
- Reduction in carbon footprint by removing the need for paper use by governments and citizens
- Reduction in the risk of adverse environmental impacts by improved monitoring of hazardous materials

Value creation

Both public and private entities in the Middle East stand to benefit from harnessing the value of geo-tagged data to unlock innovation, drive growth and transformation, and improve competitiveness. The opportunities that exist in the Middle East region are difficult to match in terms of scale and complexity as a number of projects are in early development or planning stages.

To thrive in this disruptive environment, harnessing the exponential power of spatial insights can help transform the data analysis process from the start. Key decision makers stand to gain an advantage in city building activities by early-stage adoption of cohesive data analytics to drive real, tangible outcomes. ●

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