esri UK

Case study

Location-enabled Digital Twins to accelerate Digital Transformation

Skanska

Skanska UK, one of the UK's leading contractors, is driving digital transformation of the Construction sector by leveraging its construction expertise alongside advancements in digital technologies. Integrating the power of GIS (Geographic Information Systems) with numerous digital systems such as Building Information Modelling (BIM), Skanska UK is deploying Esri's ArcGIS technology and BIM outputs to develop a smart, collaborative, agnostic, geospatial twin which, in return, is transforming project delivery and delivering economic, social and environmental value.

The Challenge

- Develop a geospatial twin to support interorganisational collaboration and drive construction project efficiencies, while delivering business benefits across the board.

The Benefits

- Competitive advantage
- Improved digital efficiency
- Enhanced health and safety
- Accelerated project delivery

The Challenge

Access to data of the right quality and at the right time, in a format that is trusted by all parties, is increasingly recognised as a critical enabler of digital transformation across the construction sector. How can we use data to break the silos, enhance cross-organisational collaboration and transform the customer experience, while playing a central role in the shift towards a low-carbon economy? All the while adhering to a high level of ethics and the most rigorous application of the best health and safety processes and procedures to ensure best quality during the construction and operation of built assets, from project delivery to beyond.

Skanska UK, one of the world's largest construction companies, has always taken great pride in integrating construction intelligence with innovative technologies. A leader in the GIS space, Skanska believes that adoption of geospatial technologies is vital in accelerating decision-making, while underpinning collaboration and process improvements, even more notable in an industry often seen as resistant to change.

Integration with BIM aims to improve cross-disciplinary collaboration throughout the entire project cycle, from the tender stage and planning and design, pre-construction and construction, through to project handover and O&M. As each stage has its own challenges, Skanska UK is implementing a holistic digital strategy to improve decision making by providing accessible and trusted information to all project stakeholders through geospatial digital twins.

The Solution

Skanska UK is integrating Esri GIS technology (ArcGIS Enterprise) and BIM outputs to develop a smart, agnostic, cloud-based, geospatial twin, by connecting multiple Common Data Environments (CDEs) and workflows. The entire ArcGIS Enterprise stack is used including dynamic apps which support the visualisation of geospatial Digital Twins, 3D virtual representations of built – and natural – environments.

By following a geospatial approach different types of data and systems are connected to create a single view that can be accessed throughout the entire project life cycle. Data capture and integration is enhanced, improving real-time visualisations providing advanced analysis and automation of future predictions. The system fully supports information and collaboration both internally and externally, across multiple organisations, breaking down barriers and empowering cross disciplinary collaboration and decision making.

George Floros, Head of GIS highlights: "Digital technologies are here to empower the construction teams. The adoption of GIS has been a team effort and result of a collaborative and inclusive approach between project delivery, technical and commercial teams."

Integrating GIS and BIM is revolutionising the different stages of the project lifecycle. At the tender stage, for example, ArcGIS Enterprise is used to consume numerous data formats

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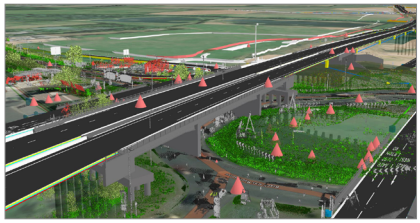
> “Skanska’s leading, innovative and inclusive culture inspires innovation and utilisation of GIS as part of a lifecycle Digital Twin strategy, demonstrating our customer-centric focus and capability to lead the Digital Transformation of the construction industry”
>
> Georgios Floros, Head of GIS, Skanska UK



CDM in ArcGIS Online, example of GIS 3D scene

and make the information accessible across entire teams. ArcGIS Story Maps is used to communicate plans with local communities, inviting input through interactive engagement tools.

At the outset of any project, Construction Design Management (CDM) hazards are captured within ArcGIS Online enabling numerous stakeholders to collaborate over the identified hazards. The design team can raise a CDM hazard which is reviewed by the designer and contractor before being handed over to the construction and, eventually, Operations & Maintenance (O&M) teams. The construction team incorporates CDM hazards into site briefings and, at the project end, CDM hazards can be closed out before the final hand-over to O&M.

During construction, GIS is used to track and report construction progress, by integrating with BIM and quality information. This connected, geospatial ecosystem streamlines collaboration between operations, quality, planning and project management teams. Georeferenced field construction data and reality capture information such as point clouds and meshes, are automatically uploaded on dedicated project GIS web applications, boosting productivity, empowering engagement and accelerating decision-making.

The Benefits

Time Savings

Accessible, up-to-date information, automated digital workflows and the removal of silo working due to connected systems have led to times savings up to 40% during the project lifecycle. Working with virtual representations of multiple components supports proactive asset management, freeing up resources to work on other aspects of any given project.

Cost savings

Entire project lifecycles are enjoying improved digital productivity and saving millions through data and systems integration, as well as enabling a streamlined, more efficient, digital way of working. Time and money are saved from the team’s ability to iteratively model changes, test how components or systems function and troubleshoot malfunctions, inexpensively, in a virtual world.

Enhanced Health, Safety & Quality

Health and Safety hazards are captured within the 3D GIS-BIM portal, flagging up early hazard detection enabling a more collaborative, standardised approach among stakeholders. Multiple parties can focus on proactive rather than reactive construction hazard strategies. Learnings are consistently shared as identified hazards are handed over to the construction stage and then to the handover stage, creating additional efficiencies from collecting the information once and using it multiple times.

Accelerated Project Delivery Through Collaboration

Automated geocentric digital processes using GIS to connect data, disciplines and people are helping to release significant business benefits and expedite the construction process. Simon Lawn, Construction Manager explains: “Anyone who uses the platform will immediately understand the huge potential that is being unlocked. These are exciting times with the platform having the potential to bring together design, construction, temporary works, utilities, stakeholder, customer, commercial, planning and others into one arena.”

Learn more at: esriuk.com

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