Locana

TEAM2100 Leverages Enterprise GIS for Data-Driven Asset Management

Government infrastructure project improves the management of 350 kilometres of flood defences in London and the Thames Estuary

Customer

The iconic River Thames has witnessed more than its share of historical events. Julius Caesar crossed the river in 54 B.C. Beside the Thames at Runnymede, 25 barons forced King John to sign the Magna Carta on June 15, 1215. Oxford University began on the river's north bank. And dozens of kings and queens were born, lived, and died along the river at the castles of Hampton Court, Placentia, and Windsor.

In the U.K., preserving the river and ensuring the safety of millions living along its shores remains a priority. Indeed, the U.K. Environment Agency (E.A.) created the Thames Estuary 2100 Plan to set a long-term approach to managing tidal flood risk. The E.A. then established the Thames Estuary Asset Management 2100 Programme (TEAM2100) to implement the first ten years of the strategy, tasked with managing flood defences along 350 kilometres of the river and its estuary. These flood defences along 350km of the river and its estuary comprise walls, embankments, the iconic Thames Barrier, and more than 700 additional structures, such as floodgates, outfalls, and pumps.

With a long and successful track record of managing megaprojects, lead delivery partner Jacobs, along with construction partner Balfour Beatty, has taken a holistic approach. It includes driving innovation at every stage of the asset

lifecycle to protect London better now and in the future. This means strategic investment in high-risk flood defences and enhanced prediction of asset deterioration for optimising intervention strategies before failures occur. And enterprise GIS is playing a paramount role.

Jacobs leveraged its geospatial partner Locana to develop an enterprise GIS platform which offers easy access to a wealth of information. The solution connects systems and provides high-end data management, analytics, and data visualization, breaking down silos and enabling the successful execution of programme functions. Ultimately, the GIS solution helps drive project efficiency, collaboration, and advanced decision support. It ensures improved management of flood defences with the greatest value to the E.A. and the public.

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We absolutely appreciate the value of the platform. It's been transformational in how we view information, how teams use and manipulate it, and how inspectors or officers on site are physically able to use mobile GIS."

ED UDEN
Deputy Programme Director, E.A
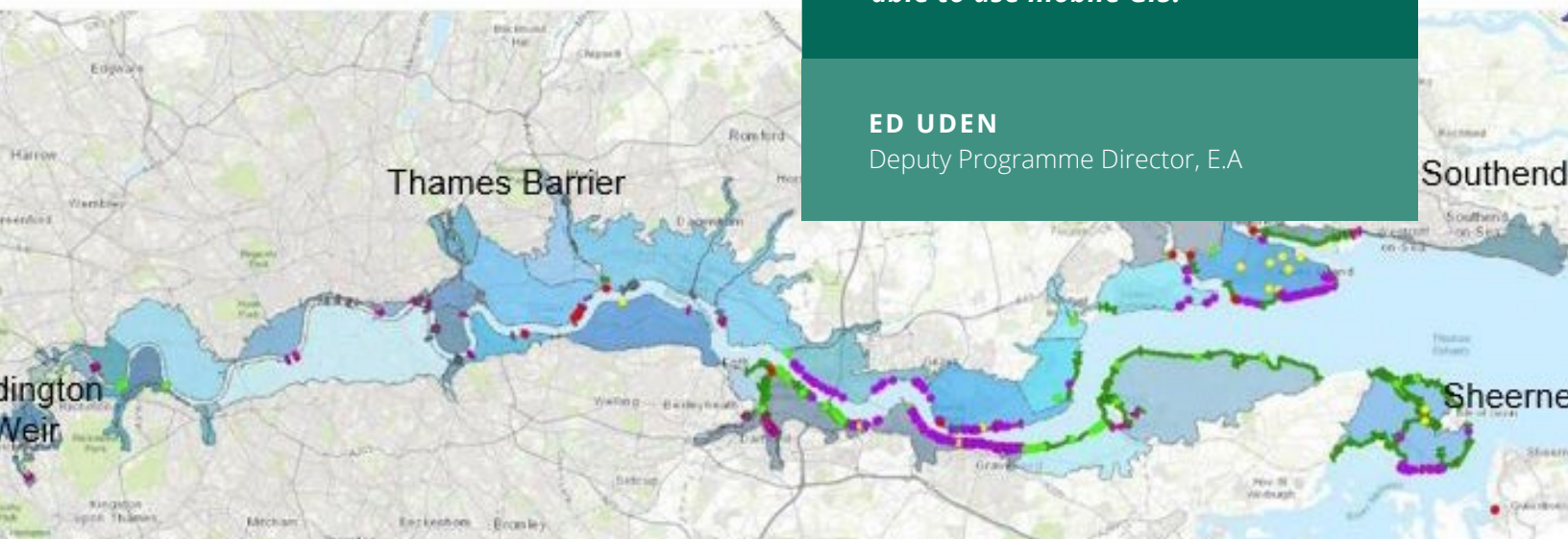
Problem

TEAM2100, which also comprises Balfour Beatty as construction partner, is the largest single E.A. flood risk programme in the U.K.'s history, a government infrastructure plan involving eight major tidal barriers, 290 outfalls, 350 frontage gates, and more than 100 pumping stations. This equates to managing thousands of assets, each with hundreds if not thousands of related data components.

Early in the project, TEAM2100 experienced an onslaught of data, which included large amounts of legacy information, infrastructure assessments, and information generated as part of new projects. Data management became difficult using a collection of spreadsheets, databases, engineering drawings, and software. In addition, the size and scope of the programme, with many projects going on at any time, meant deploying disparate systems which lacked complete integration. This led to data issues, including redundancy, latency, incompleteness, and low confidence.

Project leaders at Jacobs and Locana recognized the potential to use location as a critical factor for connecting, organising, and visualising data. Enterprise GIS provides a natural integration point for multiple systems, enabling users to consume data from different sources for analysis and visualisation in one platform. And pulling asset data and related information into a location-based format—a map—makes it easy to find and view the necessary information.

CHALLENGES

1 Increasing volumes of disparate data

2 Disconnected systems, software, and databases

3 Asset planning and field operations

4 Project monitoring and forecasts

5 Lack of visibility and coordination

> *The core problem involved taking a massive amount of information and making it easier to use. How do we find the information that matters and use GIS to leverage it for decision making? The solution includes making information visual and accessible using maps."*

ANDREW PEARSON
TEAM2100 Programme Manager, Jacobs

Solution

Working in collaboration with lead partner Jacobs, Locana developed the enterprise GIS platform known as Estuary Eye (E.E.). Locana designed the platform using ArcGIS software from Esri, including Esri's Web AppBuilder for web applications and Survey123 and Field Maps for mobile capabilities. The solution integrates multiple systems, including Oracle's P6 and Bentley's ProjectWise engineering software, into a seamless web-based GIS solution, providing a single source of truth for users across the programme.

E.E. enhances the asset management lifecycle, from planning to scheduling, construction, operation, and maintenance by delivering timely, accurate, and complete information. This provides data-driven insights to restore and refine over 4,000 assets in the river and estuary.

With over 400 users, E.E. supplies a rich array of real-time data. It holds over eight terabytes of information accessible through 400 map layers, including over 200,000 photos, survey data and elevation profiles, georeferenced drone video, and more. In addition, the platform contains open-source technology for viewing large LiDAR datasets using a web browser. It helps with land referencing for public and private entities, map-based communication, and outreach to the public.

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> *We've gone from a basic level of data management to what we currently have, which is really user friendly and holds a massive amount of information. It includes maps, photos, video, lidar information, and anything else a project team might want."*

ED UDEN
Deputy Programme Director, E.A.
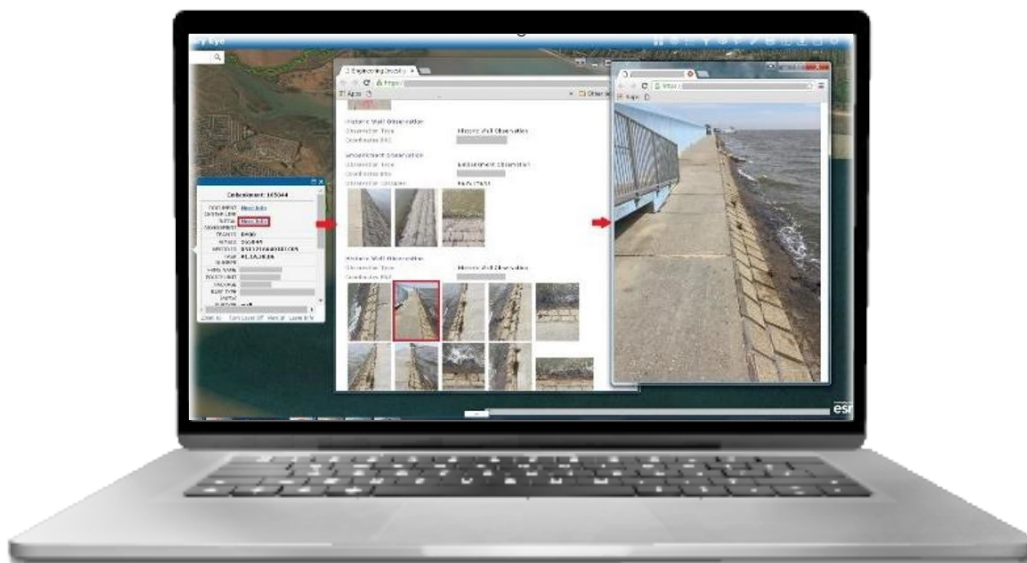
Results

The E.E. provides real results to personnel across the programme. Project managers and asset management staff use high-quality data to make more informed decisions, identify issues and opportunities, and better plan work. Using location intelligence and maps, they can perform robust analysis which informs predictive maintenance and reduces the risk of asset failures.

E.E. helps accelerate construction projects by quickly providing engineers with topographical survey data from various sources and time periods. They can perform visual inspections using a wealth of geo-tagged photos and georeferenced videos, as well as record asset defects while in the office as well as from the site.

From government officials to landowners and the public, stakeholder engagement is improved by making maps and location intelligence available using intuitive web-based GIS applications such as E.E. Users can view 3D models to understand what a potential site looks like and how it might affect their land.

At its core, E.E. helps in all phases of asset management. This includes analysing assets within their geographic context, how they interface with neighbouring assets, what they are made of, their condition, and whether opportunities exist to take advantage of a single site visit versus going back to the site repeatedly. Teams go to an area with mobile GIS applications built on Esri's Survey123 and Field Maps to capture information about the assets. The data is then submitted from the field and instantly viewable in E.E. by engineers or analysts in other locations.

This integrated information, available through a single GIS viewer, informs decision-making across the programme, ranging from engineering to project scheduling and longer-term asset management. Senior leadership can take a macro-level view for long-term asset programming and forecasting, filtering data as needed to plan 18 and 24 months ahead. They can view variables such as where current projects exist and where future assignments will occur.

BENEFITS

1 Improved information management

2 Optimised asset management

3 Enhanced project planning, scheduling, and delivery

4 Accurate environmental and heritage monitoring

5 Increased stakeholder engagement

Future

Eight years into the ten-year programme, TEAM2100 is now delivering its ninth annual plan. Locana will continue to provide enterprise GIS services through the end of the programme, building on the success of Estuary Eye. In addition, it will support Jacobs and the E.A. to drive innovation and efficiencies across the programme.

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> *This gives us a platform for the next period. We have a good, accessible baseline dataset to understand asset conditions. The future could include taking information directly from asset management teams to leadership and others, ensuring delivery excellence for years to come."*
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> **ED UDEN**
> Deputy Programme Director, , E.A.

Locana

Learn more about how you can deliver safe and reliable operations with integrated GIS for field workers.

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