

## Aspiring for excellence in campus management

# The University of Warwick

### The Challenge

- Improve management of 200-hectare estate
- Centralise and simplify information management processes

### The Benefits

- Effective visualisation of campus information
- Well-informed strategic decision-making
- More efficient maintenance operations
- Improved management of biodiversity
- Progress towards vision of 'Warwick 2030'

The University of Warwick is creating a digital twin of its entire campus that enables staff to clearly visualise everything from buildings and underground services to biodiversity sightings and energy usage. This Digital Campus is now contributing to more efficient maintenance operations, improving strategic decision making and helping the university to achieve a more sustainable future.

### The Challenge

The University of Warwick is already one of the UK's top universities, but in a bold strategy entitled 'Warwick 2030' the organisation sets out its ambition to become one of the most exceptional universities in the world. Its aspirations extend beyond excellence in academic teaching and research to include excellence in estate management as well.

One of the university's key priorities is to develop an energy-efficient, 'green' campus and enhance the biodiversity of its entire 200-hectare site. However, plans to improve estate management were being hampered by siloed data. Critical information on natural and man-made assets, including trees, wildlife species, underground pipes, streetlights and buildings, were held in multiple systems and spreadsheets, making it difficult to visualise opportunities for improving efficiency and sustainability.

### The Solution

With access to Esri's ArcGIS System through a Chest Agreement for the education sector, the University of Warwick began exploring the potential of geographic information system (GIS) technology. It invited Esri UK to lead four workshops at the university, to help it plan its approach, and a clear vision quickly emerged for what is now known internally as the university's Digital Campus.

Using ArcGIS Pro and the Scene Viewer tool, the Estates Team collated, cleansed and geo-referenced data from multiple systems, creating an interactive, digital twin of the entire campus in 2D and 3D. As part of this process, the team consolidated and uplifted 650 layers of data from AutoCAD files. It then integrated BIM models into the Digital Campus to create realistic representations of buildings, and incorporated supplementary data such as each building's energy usage.

One of the university's first applications using the Digital Campus was a mobile GIS solution for surveying over 11,000 trees. Arborists now use ArcGIS Survey123 in conjunction with ArcGIS Field Maps to verify the locations of trees, add more trees and collect data on each tree's size and condition. Consequently, the Estates Team now has a detailed, visual map of trees on the campus, rather than just lines on a spreadsheet.

In a subsequent initiative the university created a Biodiversity Dashboard using ArcGIS Online, combining data previously held in three separate systems as well as newly collected data. This dashboard shows all species sighted across the campus, such as hedgehogs, grass snakes, geese and rare plants, and is used to inform biodiversity improvement projects.

The Business Analytics Team has also used ArcGIS StoryMaps to enrich the university's reports, including its Annual Energy and Carbon Report. The story maps incorporate time sliders, videos and 3D maps alongside traditional text and data to bring what were previously very static business reports to life.

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Brett Plant, Systems and Digital Information Manager, University of Warwick



ArcGIS clearly shows the relationship between tree roots and underground services

The ongoing development of the university’s Digital Campus is being supported by consultants from Esri UK’s Professional Services team. “We’ve done such a lot in a short amount of time,” says Brett Plant, Systems and Digital Information Manager at the University of Warwick. “With Esri UK’s support, we’ve made massive progress, not only in what we have delivered but also in our understanding.”

### The Benefits

#### Effective visualisation of campus information

ArcGIS has given the University of Warwick the ability to centralise and use multiple data sets to visualise and better understand its campus. For example, an interactive 3D campus map clearly shows where solar panels have been installed over time, and how this contributes to the university’s carbon saving targets, building by building.

#### Well-informed strategic decision-making

With clear ArcGIS Dashboards and interactive reports presented in ArcGIS StoryMaps, managers can make well-informed operational and strategic decisions, based on accurate data and a comprehensive understanding of the entire estate. “ArcGIS provides the ability to view lots of information, understand and question campus performance and make quick analyses of situations, which leads to better strategic decisions,” says Jo Bishop, Head of Estates Information and Systems at the University of Warwick.

#### More efficient maintenance operations

While the Digital Campus is still being rolled out to operational staff, the Estates Team anticipates that it will facilitate significant improvements in operational efficiency over time. Already, ArcGIS has been used to model likely tree root spread and pinpoint where roots may be causing damage to underground utility services. This has resulted in faster identification of potential causes of performance issues around the campus.

#### Improved management of biodiversity

The ArcGIS Dashboard for biodiversity is informing the development and implementation of key biodiversity improvement initiatives around the campus. More than this, it is also raising awareness of biodiversity, as the dashboard format is engaging. “Warwick is a huge campus,” observes Plant. “Already, the ArcGIS Dashboard is generating more interest in biodiversity, and we believe it will lead to more reports of wildlife sightings.”

#### Progress towards vision of ‘Warwick 2030’

Having captured the imaginations of senior managers, the university’s Digital Campus will eventually be used extensively for all aspects of campus management, and there are plans to integrate it with other operational systems. Increasingly, it is being used to evidence of progress towards achieving the university’s vision of ‘Warwick 2030’ and creating a more efficient and sustainable university. As Bishop explains, “With ArcGIS, we can clearly see the gap between where we are now and where we want to be – and understand how to close it.”

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