



# SPL Powerlines UK Enhances Multidiscipline Digital Workflows to Develop 447 Kilometers of Overhead Electrified Line

Bentley Applications Helped Improve Collaboration and Enhance Data Quality on a Sprawling Project

## ELECTRIFICATION ACROSS ENGLAND

The Midland Main Line Electrification (MMLE) is a multidiscipline program of works that will increase the capacity of the Midland Main Line in England. In addition to new developments related to capacity and line speed improvement, the program includes electrification of the rail from Bedford to Nottingham, Sheffield, Leicester and Derby, providing a full overhead electrified route from London. SPL Powerlines UK Limited is a leading overhead line electrification designer and installer, with both a Principal Contractors License and a Plant Operators License. They provide turnkey overhead lines equipment capabilities from design through to installation, commissioning and integrated program management solutions.

SPL Powerlines will develop MMLE in phases, with project completion scheduled for 2032. The scope of their work includes the integration of design between existing and proposed infrastructure and delivery partners across the entire program. MMLE is an exceptionally large electrification project, as SPL needs to deliver 447 kilometers of overhead electrified line.

## INTEGRATING ROLES FOR WIDE-RANGING WORK

SPL Powerlines successfully delivered electrification projects through use of a "core assurance model" method. This consisted of workflows that simultaneously integrated through the SPL Powerlines lead design organization (LDO), team building information modeling, and common safety methods delivered through roles dispositioned by the Network Rail Agile Client Eastern initiative. "The core assurance model is designed to be scalable and can be adapted to deliver projects at different project acceleration in a controlled

environment (PACE) stages," said Alisdair Strachan, BIM manager at SPL Powerlines. Additionally, the organization's methodology eliminates the need to set up specific teams for each project.

SPL Powerlines' core assurance model can be easily expanded to accommodate different scopes of work, eliminating the need for duplicating team resources by managing workstreams at a program level wherever possible. The organization wanted to take advantage of cutting-edge technology and find ways to meet project requirements faster and more efficiently than electrification projects have done before. Faced with such a large-scale, complex project, SPL Powerlines determined that MMLE was the perfect opportunity to innovate and incorporate the latest digital design innovations.

## KEEPING STAKEHOLDERS INVOLVED

A long-time user of Bentley technology, SPL Powerlines worked collaboratively with Bentley to take advantage of the latest software advancements. "Bentley's suite of products enabled SPL Powerlines to improve processes and meet project requirements quicker and more efficiently while improving safety and reducing costs through the design and construction phases," said Strachan. The organization began by using ProjectWise to establish a connected data environment and unify all project data. They then went one step further to create a custom data source within the application to efficiently send and receive information to over 20 design organizations, helping to meet the unique requirements and complexities of the project. As a result, all stakeholders could access and update one source of truth for developing design solutions, resulting in value engineering efficiencies being realized and a truly collaborative working environment being created on the project. They also developed an automated

## PROJECT SUMMARY ORGANIZATION

SPL Powerlines UK

## SOLUTION

Rail and Transit

## LOCATION

Hertfordshire, Bedfordshire, Northamptonshire, Leicestershire, Nottinghamshire and Derbyshire, United Kingdom

## PROJECT OBJECTIVES

- ◆ To develop 447 kilometers of overhead rail electrification lines.
- ◆ To integrate existing and proposed infrastructure across the entire program of works to produce an optimized system.

## PROJECT PLAYBOOK

AssetWise®, Bentley Descartes™, Bentley LumenRT™, iTwin® Capture, iTwin Platform, MicroStation®, OpenRail™, ProjectWise®

## FAST FACTS

- ◆ The exceptionally large Midland Main Line Electrification (MMLE) program will be developed in phases through 2032.
- ◆ SPL Powerlines UK Limited, a provider of overhead line equipment and full project lifecycle overhead electrification capabilities, was contracted for the project.
- ◆ SPL wanted to further refine its multidisciplinary digital workflows to help meet the project deadline.

## ROI

- ◆ By adapting ProjectWise with their customized data source, the organization improved project data quality by 50% in just four weeks, with first-time submission success rates rising from 41% to 67%.

“Teams can efficiently manage and access critical data through a SPL Powerlines-managed, Bentley software-driven common data environment. This has delivered tangible benefits for the Midland Main Line Electrification project stakeholders through optimized system design and streamlined information management processes.”

– Elliott Watson, Head of Engineering Services, SPL Powerlines UK

quality assurance tool within ProjectWise, which reduced the time spent checking files manually and increased engagement with the supply chain.

SPL Powerlines used MicroStation, the iTwin Platform, OpenRail, and other Bentley applications to model all aspects of the project and create an iTwin. With MicroStation's built-in geographic coordination system, they integrated location data for all assets. “An iTwin of the federated model was used to provide access to a wider range of users that wouldn't typically have access to the digital design information,” said Strachan. They created animations of the digital twin with Bentley LumenRT and shared it with stakeholders, helping them to collaborate and to identify and resolve any potential conflicts and safety issues in the design phase preventing issues occurring on site.

#### BETTER DATA QUALITY FOR BETTER COMMUNITIES

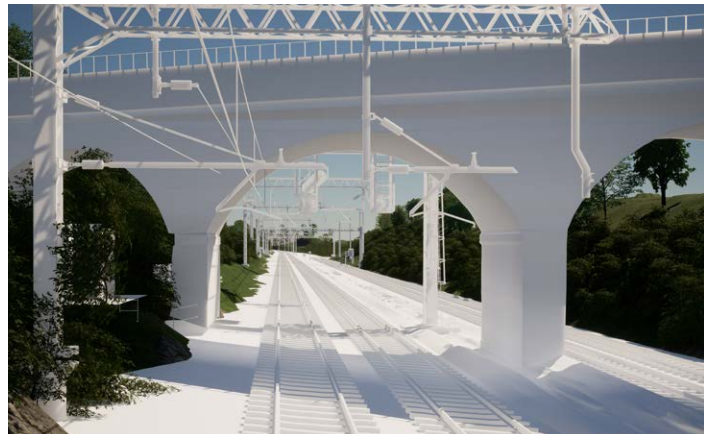
Some projects used multiple applications for their common data environment. But by adapting ProjectWise as a single connected data environment with the addition of SPL Powerlines' customized data source, project data quality

improved by 50% in just four weeks, with first-time submission success rates rising from 41% to 67%. “This not only saves time and resources on rework, but also allows the BIM team to conduct more comprehensive CAD checks, freeing up valuable time to support the supply chain in achieving compliance,” said Strachan. The enhanced focus on quality and collaboration has fostered stronger relationships among stakeholders. With access to reliable, up-to-date information, they can make swift, informed decisions, ensuring smooth design reviews through using the iTwin Platform.

Integrating high-quality drone-captured images gathered from site greatly improved the surveying process. Not only did they reduce risks with fewer site visits being required through implementation of digital walkouts, but the organization also streamlined the project timeline, optimized resource allocation, and minimized the project's environmental impact. SPL Powerlines digital methodology, which leverages Bentley applications, is now being adopted as the industry norm for rail development in Great Britain and has the potential to positively impact projects long into the future.



SPL created a custom data source within ProjectWise to efficiently send and receive information to 20 design organizations, helping to meet the unique requirements of the project.



By adapting ProjectWise with their customized data source, SPL improved project data quality by 50% in just four weeks.