
The Benefits of Intelligent Digital Design

for Overhead and
Underground Infrastructure

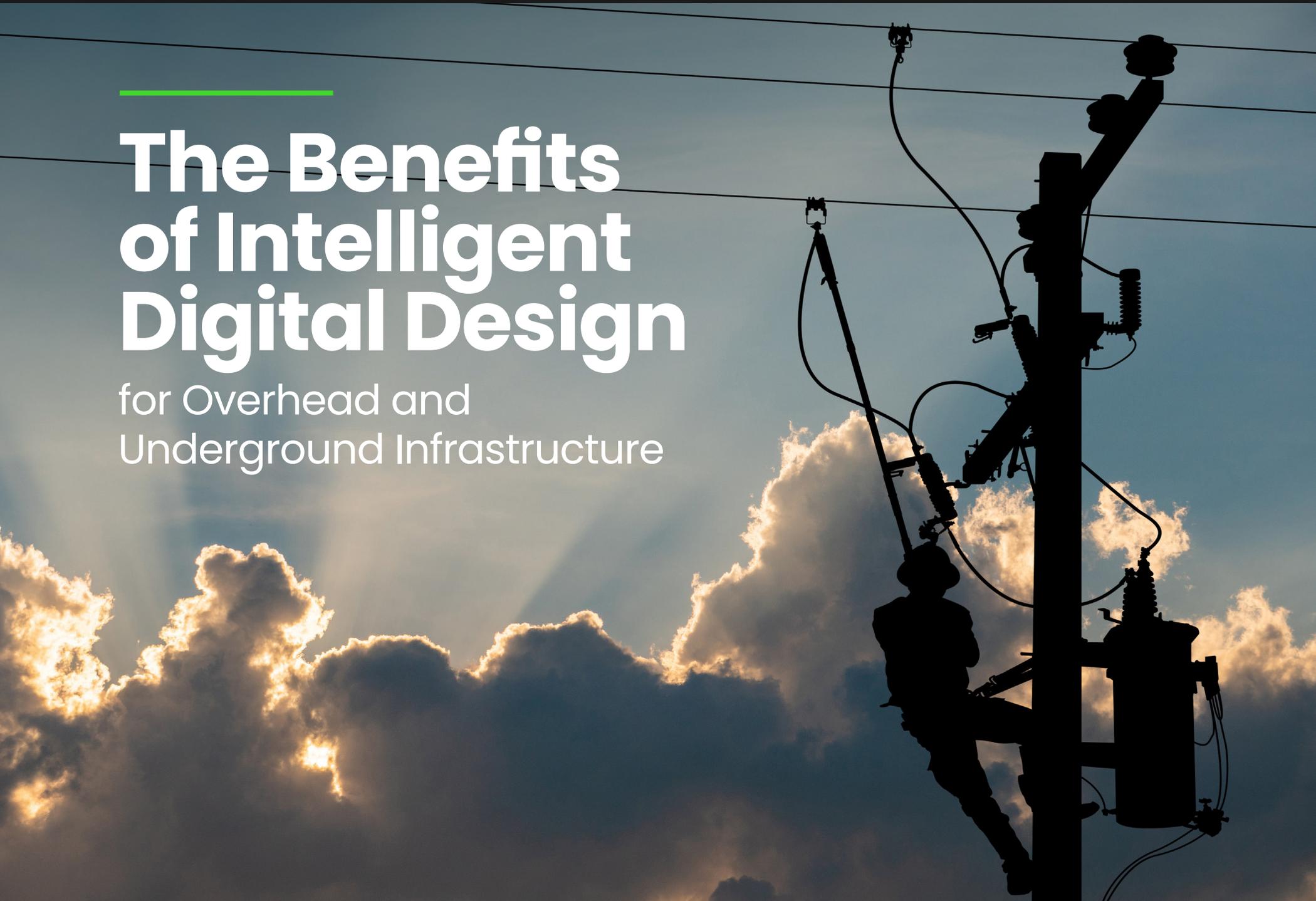
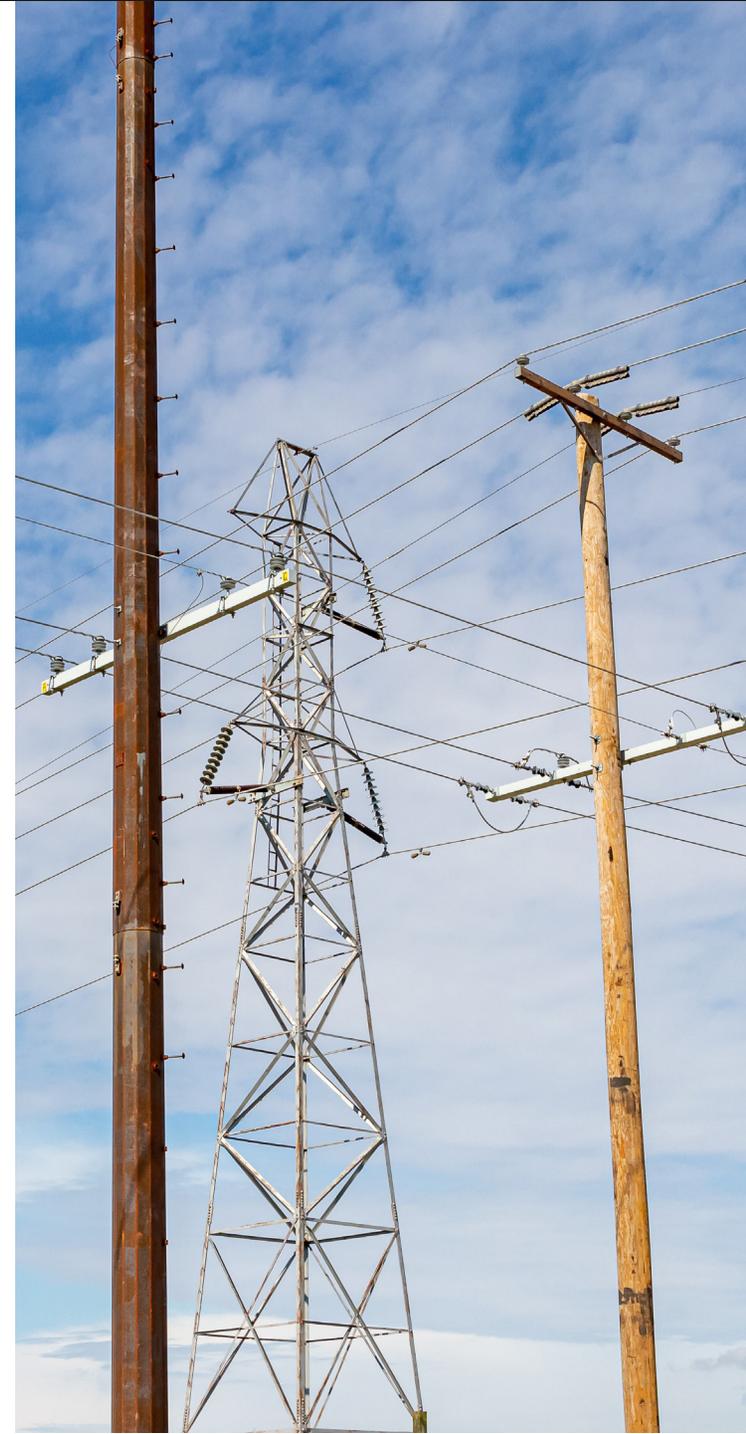


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The Benefits of Intelligent Digital Design for Overhead and Underground Infrastructure

Utilities are under increasing pressure from all sides – the need to plan for extreme weather conditions, a complex grid, aging infrastructure, and changing policies and regulations – along with maintaining safe and reliable day-to-day operations. They are asked to do more without added resources – sometimes with reduced resources – causing utilities to re-evaluate their design applications and related technologies. Cost, reliability challenges, resource shortages, and other industry factors are leading to a shift towards more modern, integrated, and interoperable solutions. It is now more important than ever to accelerate the design process in a unified environment, eliminating overdesign, reducing costs, and simplifying workflows.



Industry Challenges for Utilities

Utilities face demands that are creating a huge strain on the process of designing and building the grid. It is important to recognize the depth and impact of these challenges.



Storms

Extreme weather conditions are escalating outages at an alarming rate. Being prepared for significant storms requires better decision-making and strategic investments for a more resilient grid.



Aging Infrastructure

Regular pole inspections are essential. Engineers must identify assets that are no longer viable due to mechanical damage, decay, or other condition-related issues. But too often, data from these inspections is selectively used or discarded altogether.



Regulatory Oversight

Regulatory organizations are concerned with everyone's safety, from utility workers to the general public. As a result, oversight is increasing industry-wide, elevating the need for comprehensive asset management policies, deep data retention, detailed reporting, and defensible engineering practices.

Industry Challenges for Utilities

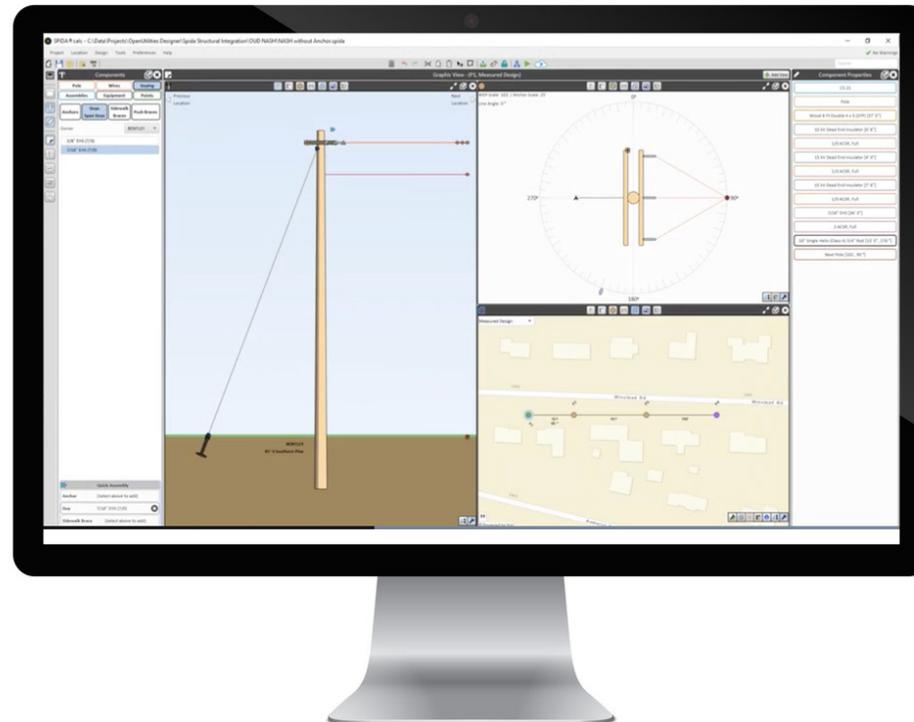
- ◆ **Increased Communication Infrastructure:** People are increasingly dependent on access to high-speed internet for everyday tasks at home and work. The race to provide access to remote and underserved areas is governed by a set of complex and changing policies and regulations. To deliver, it is crucial to have a management platform that is quick to deploy, flexible, and powerful.
- ◆ **Resiliency Measures:** The next generation of the grid is coming fast, and utilities are making tactical investments to ensure that their assets have the structural integrity to support current and future technologies.
- ◆ **Aging Workforce:** The most experienced utility workers are part of an aging workforce. The growing “silver tsunami” of retirees will leave knowledge gaps and an increasingly overstretched workforce. These industry trends do not resolve themselves, and they require a knowledgeable, work-ready team to prepare for the future.
- ◆ **Siloed and Fragmented Data:** Data is often stored and managed in multiple systems and applications, making it difficult to access and analyze. As organizations generate more data from a wider variety of sources, they face greater difficulty in gathering and analyzing data effectively without errors. Accessing all data from a single source eliminates these challenges.



Adopting Digitalization for Distribution Assets

Many companies are still using outdated technology that is up to 40 years old for distribution design drawings. There are more efficient ways of getting the job done.

Digital design can streamline and accelerate the design process in a unified 3D environment. It eliminates overdesign, reduces costs, and simplifies design workflows. Plus, digital design can enhance the reliability, resilience, and adaptability of the grid by creating a connected, integrated, and informed set of capabilities. This process results in the efficient and effective design of a distribution system. Engineers can use past designs and insights to plan for grid renewal.



Transitioning to Intelligent Digital Design

Four Key Benefits of Intelligent Digital Design

Intelligent digital design offers the next step in design technology with a comprehensive suite of applications and workflows that deliver significant benefits across the entire project lifecycle.

KEY ONE: Comprehensive Digital Design and Analysis

Accelerate your design process with a complete solution that efficiently scales with your project size, enables you to analyze your designs quickly, and improves operations with network analysis.

- ◆ Scale your design complexities up or down based on project needs, identify at-risk and non-code compliant structures, store and retain project documents, and view and share the entire team's data within your own application.
- ◆ Quickly create geospatial-enabled 2D and 3D models and lay out brownfield and greenfield designs by using preconfigured standards, intuitive drag-and-drop functionality, and industry-specific business rules to visualize precise, high-quality designs.
- ◆ Refine and streamline your designs by calculating cost in real time and modifying an entire pole line design at once.
- ◆ Utilize a powerful finite element analysis engine, analyze designs using traditional linear analysis or advanced geometric nonlinear analysis methods, automate real-time clearance evaluations of at-pole, to-ground, and wire-to-wire clearances based on configurable clearance rules, and analyze and report leaks for one area or the entire network.
- ◆ View upstream/downstream and shortest/multiple/redundant path traces for flow, conduit, and cathodic protection networks.
- ◆ Easily create buffers, overlays, joins, thematic maps, dynamic labels, reports, and queries.

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KEY TWO: Integrated Modeling and Documentation Workflows

Enhance the design process by pairing all available design inputs with simplified and configurable design approval and process workflows.

- ◆ Collaborate, review, and approve designs with internal and external stakeholders while ensuring adherence to utility standards.
- ◆ Built-in workflow management capabilities enable you to assign, track, and manage work while avoiding delays.
- ◆ Easily identify non-compliant structures in different designs and automate remediation with issue management workflows.
- ◆ Optimize efficiencies in the design process by automating updates to work management and GIS, eliminating the manual backlog.
- ◆ Automate construction print sheet creation.
- ◆ Retain joint use contracts and communications.



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KEY THREE: Open, Connected, and Integrated Workflows and Collaboration

The integration of additional systems required for project completion enables streamlined workflows and unmatched collaboration, which results in quicker delivery and lower costs.

- ◆ Access your new and legacy distribution design data in one place, ensuring consistency and transparency throughout your organization.
- ◆ Utilize enterprise interoperability, ensuring that the design outputs can automatically be shared with work management and GIS systems.



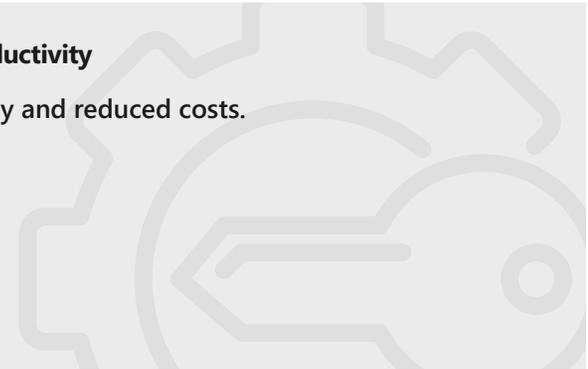
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KEY FOUR: Integration with Industry-leading Applications Reduces Costs and Increases Productivity

Streamline projects and workflows with unparalleled collaboration, leading to faster delivery and reduced costs.

- ◆ Use automation to perform tasks.
- ◆ Create efficient, connected workflows for all stakeholders.
- ◆ Improve efficiency and available insights for users and stakeholders.
- ◆ Enable informed design decisions with effective stakeholder engagement.
- ◆ Prepare designs that can be constructed as designed, reducing variances.



Moving to a Modern Integrated Workflow

Digital design is becoming the standard for many utility infrastructure projects. Integrated workflows offer significant advantages over non-digital design in terms of accuracy, efficiency, collaboration, communication, and meeting deadlines.



A Better Distribution Design Solution

Bentley's electric distribution design (EDD) solution enables streamlined digital design for overhead and underground electric distribution systems. Whether you work for an electric utility, an engineering firm, or as a consultant, this solution enables you to accurately design, analyze, and document the development of new and existing overhead and underground infrastructure. It uses automated processes, intuitive code-compliant design, powerful analysis, and multisystem integrations.



Before and After EDD Comparison

Before EDD

New designs initiated via email, file share/intranet system involving multiple emails and attachments

Work order in queue without version control and visibility into the entire project

Design using paper and physical models making it more difficult to share and collaborate on designs

Manually review design, changes, and approvals without being able to easily track updates

Perform structural analysis and save to an internal system; use separate systems for design and analysis

Share and archive physical copies that need to be managed and stored

Recreate design in GIS with manual input, with manual data transfer from one system to another

Ready for Construction

After EDD

New designs initiated in the EDD solution

Work order in a queue with version control and visibility into the entire project

Design in a connected environment with drag-and-drop functionality using pre-loaded utility standards

Automated review process, featuring queues for feedback, changes, reviews, and approvals

Perform structural analysis and save in a secure, shared environment

Model project with a 3D model automatically generated

Send design to GIS eliminating manual data transfer, and move to “ready for construction” in one step

Count on Bentley's Experience to Streamline Your Utility Designs

For four decades, Bentley has served engineers and other professionals responsible for designing, constructing, and operating sustainable infrastructure. With this background and expertise, the company has come to understand the needs of the energy and utilities industry and the importance of grid reliability and resilience. Bentley's electric distribution design solution helps organizations leverage digital design for a more efficient approval process while ensuring a more resilient and cost-effective grid.

Learn more about optimizing your grid design

Learn More

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