GIS for Utility Network Management and Analysis Training Course

16 - 20 Nov 2026

Cape town

4600 € (Per Person)

Ref: #CAD8414_271415

Course Introduction / Overview:

This intensive training course provides a comprehensive exploration of Geographic Information Systems (GIS) specifically tailored for the complex demands of utility network management. In an era where infrastructure resilience and operational efficiency are paramount, GIS has evolved from a simple mapping tool into the central nervous system for electric, gas, water, and telecommunications utilities. This course moves beyond basic theory to deliver practical, actionable skills for modeling, analyzing, and managing intricate network infrastructure. As the renowned geographer Michael F. Goodchild emphasized, spatial thinking is critical, and this course instills that mindset by focusing on how location intelligence drives better decision-making in utility operations. Participants will learn to build and maintain robust geodatabases, perform critical network traces for outage and leak detection, and integrate GIS into the broader asset management lifecycle. BIG BEN Training Center has designed this program to equip professionals with the ability to transform raw spatial data into strategic insights, ensuring safer, more reliable, and cost-effective utility services. The curriculum is grounded in industry best practices, reflecting concepts discussed in seminal works like "Geographic Information Science and Systems", to prepare attendees for the real-world challenges of modern utility management.

Target Audience / This training course is suitable for:

- GIS Analysts and Specialists.
- Utility Engineers (Electrical, Civil, Mechanical).
- Network Planners and Designers.
- Asset Management Professionals.
- Operations and Maintenance Managers.
- Field Technicians and Supervisors.
- IT and Data Management Staff in the utility sector.
- Public Works Directors and Staff.
- Regulatory Compliance Officers.

Target Sectors and Industries:

- Electric Power Generation, Transmission, and Distribution.
- Water and Wastewater Management.
- Natural Gas and Oil Pipeline Distribution.
- Telecommunications and Fiber Optic Networks.
- Municipal and Government Public Works Agencies.
- Renewable Energy Infrastructure Management.
- Environmental and Engineering Consulting Firms.

Target Organizations Departments:

- Engineering and Planning.
- Operations and Maintenance.
- Asset Management.
- Information Technology (IT) and GIS.
- Regulatory Compliance and Safety.
- Customer Service and Outage Management.
- Network Control and SCADA Operations.
- Field Services and Crew Dispatch.

Course Offerings:

By the end of this course, the participants will have able to:

- Develop and manage accurate GIS data models for complex utility networks.
- Perform advanced network tracing to identify sources, isolate issues, and manage outages.
- Integrate GIS with the complete lifecycle of utility asset management.
- Implement quality control procedures to ensure high-fidelity spatial data.
- Deploy mobile GIS solutions to streamline field data collection and maintenance tasks.
- Analyze network connectivity and topology to ensure system integrity.
- Generate insightful reports and visualizations for strategic decision-making.
- Understand the integration points between GIS and other enterprise systems like OMS and SCADA.
- Apply spatial analysis for network optimization and predictive maintenance planning.

Course Methodology:

The training methodology at BIG BEN Training Center is designed to be immersive, practical, and highly interactive, ensuring that participants not only learn the theory but can confidently apply it. This course blends expert-led instruction with extensive hands-on exercises using realistic utility network datasets. We believe in learning by doing, so a significant portion of the training is dedicated to lab sessions where participants will model networks, perform traces, and solve common operational problems. The learning environment encourages active participation through group discussions, collaborative problem-solving activities, and case study analyses drawn from real-world utility challenges. This approach allows participants to see how GIS principles are applied to scenarios like leak detection in a water network or fault isolation in an electrical grid. Our instructors facilitate a dynamic learning environment, providing continuous feedback and fostering a peer-to-peer learning network. The methodology focuses on building strategic thinking skills alongside technical proficiency, preparing participants to implement effective GIS solutions within their own organizations.

Course Agenda (Course Units):

Unit One: Foundations of GIS in Utility Management

- Introduction to Geographic Information Systems (GIS) and their core components.
- The unique challenges of managing linear and complex utility networks.
- Overview of key utility sectors: electric, gas, water, and telecom.
- Understanding spatial data models for utilities.
- Comparing geometric networks with the modern utility network model.
- The role of coordinate systems and projections in network accuracy.
- Introduction to GIS software for utility management.

Unit Two: Building and Managing the Utility Network Geodatabase

- Principles of effective geodatabase design for utility assets.
- Techniques for data acquisition, including field collection and digitization.
- Data quality control and validation procedures.
- Establishing network connectivity and topology rules.
- Defining asset groups, asset types, and attribute domains.
- Managing network features like junctions, edges, and containment.
- Strategies for data migration from legacy systems.

Unit Three: Core Utility Network Analysis and Tracing

- Fundamentals of network tracing for operational intelligence.
- Performing upstream, downstream, and isolation traces.
- Simulating valve isolation and outage scenarios.
- Identifying connected and disconnected parts of the network.
- Applying network analysis for leak detection and pressure zone management.
- Using network diagrams for schematic views of the utility system.
- Automating common analysis tasks with models and scripts.

Unit Four: GIS for Asset Management and Field Operations

- Integrating GIS into the asset lifecycle management process.
- Planning and executing inspection and maintenance workflows.
- Deploying mobile GIS applications for field crews.
- Real-time data collection and synchronization from the field.
- Integrating GIS with Outage Management Systems (OMS) and SCADA.
- Generating reports and dashboards for operational awareness.
- Managing vegetation and right-of-way encroachments using spatial data.

Unit Five: Advanced Applications and the Future of Utility GIS

- Introduction to 3D visualization and digital twins for utility infrastructure.
- Applying predictive analytics for asset failure and maintenance scheduling.
- Real-time network monitoring and sensor data integration.
- Best practices for enterprise-level GIS implementation and governance.
- Exploring the role of AI and machine learning in network analysis.
- Ensuring data security and compliance in utility GIS.
- Capstone project: Designing a GIS workflow for a common utility problem.

FAQ:

Qualifications required for registering to this course?

There are no requirements.

How long is each daily session, and what is the total number of training hours for the course?

This training course spans five days, with daily sessions ranging between 4 to 5 hours, including breaks and interactive activities, bringing the total duration to 20 - 25 training hours.

Something to think about:

As utility networks become increasingly interconnected and integrated with IoT sensors, how does the role of a GIS professional evolve from a data manager to a real-time strategic decision-maker?

What unique qualities does this course offer compared to other courses?

This course distinguishes itself by focusing on the strategic application of GIS rather than just the technical execution of software commands. While many courses teach which buttons to click, we emphasize the "why" behind the process, enabling participants to design and implement robust, scalable GIS solutions that address core business challenges in the utility sector. Our curriculum is built around a holistic understanding of the utility lifecycle, from asset installation and maintenance to outage response and long-term capital planning. We move beyond basic mapping to explore how GIS serves as an integration platform, connecting field operations with control room decisions and corporate strategy. The course content is forward-looking, dedicating significant time to emerging concepts like digital twins, predictive analytics, and real-time data integration, which are transforming the industry. By focusing on practical problem-solving through realistic case studies and a capstone project, we ensure that participants leave not just with new skills, but with the critical thinking ability to apply those skills effectively to improve safety, reliability, and efficiency within their own organizations.