WATER INFRASTRUCTURE MANAGEMENT
INTERGRAPH’S WATER INFRASTRUCTURE MANAGEMENT SOLUTION

MUNICIPAL AND PRIVATE WATER

and wastewater distribution systems worldwide rely on accurate databases to help manage everything from water mains and pipelines to sewers. A geospatially powered network is crucial in helping to keep the water flowing, whether it’s allowing you to manage an ongoing project or pinpoint a leak or other disruption along the pipeline.

Intergraph®’s Water Infrastructure Management solution supports all the details of a municipal or private water and wastewater distribution system. With it, you can plan expansions; conduct engineering analysis; design work orders; and manage mapping, asset, and maintenance records. Its geospatial network asset database, containing the distribution assets of the system, accommodates all system features, such as water mains and sewers, storage reservoirs, pumps, pipelines, valves, and meters.
Utilities are asset-intensive businesses, with a high percentage of the total corporate assets represented by large and expensive water and wastewater distribution systems. The majority of the utility workforce is involved in the planning, design, construction, and maintenance of these assets. Intergraph’s Water Infrastructure Management solution can help you improve design and asset management productivity by more than 50 percent. More importantly, it helps engineers, planners, designers, dispatchers, accountants, and crews do a better job of leveraging and managing the facilities – and serving customers.

**KEY APPLICATIONS**

Intergraph’s geospatially powered solutions set the industry standard, encompassing all the tools you need to manage water and wastewater distribution systems. Intergraph’s Water Infrastructure Management solution flawlessly manages the long-term transactions typical of the planning, analysis, design, and mapping of both transmission and distribution processes, while preserving data integrity and overall system performance among hundreds of thousands of simultaneous users. System applications support the workflows of the entire infrastructure, including design and operations management, field automation, and enterprise imaging distribution and management.

**Water Distribution Design and Asset Management**

This interactive graphic and database application enables the installation, modification, abandonment, or removal of water and wastewater distribution facilities in the asset repository. This application provides you with the ability to input various features of the water and wastewater distribution system, including storage reservoirs, pumps, pipelines, water mains, and meter connections, as well as landbase and street networks. The data model supports a fully connected water network model that is traceable for other application purposes, and you can use it to construct, maintain, and operate the water distribution system.

**Water Alignment Sheet Generation**

With this application, you can generate a water main or pipeline profile engineering drawing in elevation format, also known as an alignment sheet drawing. It includes graphic delimiters and tabular data describing the pipeline and indicating changes in material or coatings, or other attributes along the line.

**Water Distribution Leak/Survey Management**

Intergraph’s Water Distribution/Leak Survey Management application provides you with a data store for leak survey data collected for piping sections. Using the leak history, together with material types and age of pipe, the application provides replacement prioritization of pipe sections.

**Water Distribution Cathodic Protection/Corrosion Management**

This application allows you to trace sections of the metal piping network to design electrical insulation points for sections of the metallic network.
Anglian Water Services Ltd., part of AWG Plc in the United Kingdom, implemented Intergraph’s solution for the next generation of their core water infrastructure management system. Anglian Water sees geographic information as one of the cornerstones of its information infrastructure and recognizes that flexible integration with other core systems is essential. Intergraph provided a version of the water infrastructure management suite, designed specifically for the UK market, which will be at the heart of the solution. Intergraph’s utility experts have created this solution using their extensive understanding of water company requirements and by embracing industry best practices.

“We expect Intergraph’s Water Infrastructure Management solution to enhance decision support by increasing data exploitation throughout the business,” said Kevin Brown, asset data centre manager, Anglian Water Services. “Intergraph technology brings flexibility to support and enhance our business and IT strategies. The new system will provide a consistent view of our data and apply appropriate software tools at all access points – empowering employees to make decisions that improve operations and customer service.”
(protection zones), create electrically isolated zones, and locate and manage sacrificial anodes placed to electrically protect each network zone from corrosion.

**Landbase Management**
Intergraph’s Landbase Management application supports the background landbase used for various utility infrastructure mapping and design tasks. It typically includes geospatial data, such as edge of roadways, street centerlines, and street names. It may also include company easements and right-of-ways as maintained by the utility company real estate department. When you use aerial photography or commercially available landbases for background land information, this application manages that information for you as well.

**Enterprise Image Management and Distribution**
Water and wastewater distribution and transmission personnel use imagery to help them understand the location and characteristics of the physical network and facilitate a variety of activities. Using Intergraph technology, you can have direct access to all imagery available throughout the enterprise through a modular client-server system that enables users to store, manage, and access multiple types of imagery and terrain data – no matter where they are in the workflow. Imagery needed for planning, design, construction, and maintenance is available in seconds, not hours or days.

**Water and Wastewater Emergency Area Isolation**
Intergraph’s Water and Wastewater Emergency Area Isolation application allows you to quickly identify the infrastructure asset in the event of a network break and helps determine appropriate repairs. Emergency area isolation requires a quick determination and geographic location of the minimum set of flow-control devices, such as valves. Tracing the network upstream, downstream, or in both directions, you can determine and display the nearest flow-control devices. If these assets are not accessible or have become inoperable, you can extend the trace to locate the next set of flow control devices.

**Water and Wastewater Hydraulic Analysis**
This application exports the network information you need for hydraulic analysis of a water or wastewater network. Hydraulic analysis is useful when you design or modify a water or wastewater network, and also provides an understanding of the characteristics of the existing network. You can conduct a pressure drop-and-flow analysis and determine the adequacy of the system to support new or existing customers.

After you extract connected network information from the model, along with pertinent attributes such as material type and pipe diameter, you can pass it to a third-party hydraulic modeling application.

**Mobile Workforce Management**
Mobile Workforce Management (MWFM) supports dispatch, scheduling, and mobile computing solutions for all types of field work – planned and unplanned, short-term and long-term. Productized interfaces, intranet access, and decision-support tools for reporting are integral components. This map-driven, mobile workforce application provides you with full dispatching and crew management capabilities, including
appointment and workload scheduling, assignment optimization, and CIS integration.

MWFM supports mobile devices for field personnel and in vehicles. Technicians receive work automatically and update the status of work on mobile data terminals. Full-blown mapping and configuration functions provide capabilities such as street-level routing, street and facility queries, and even in-vehicle navigation. The system is highly configurable, eliminating the need for custom programming.

Field Automation
With advances in communications and more compact and rugged hardware, there is a growing trend by organizations to mobilize access to critical business applications.

Intergraph’s Field Automation application uniquely integrates mobile mapping and back office IT systems on one platform. It includes an optional MWFM application for short-cycle work scheduling and management to improve productivity of field personnel. Intergraph’s rich functionality includes navigation, analysis, vehicle tracking and routing, job creation and management, and access to real-time status of crews and jobs. The application is designed to work in a connected or a disconnected mode – with the ability to store and forward information – allowing crews the flexibility to work inside and outside of wireless coverage. Field service personnel can accept multiple types of work orders, view up-to-date facility maps, turn redlines into almost immediate database updates, and communicate instantly with the back office. Field personnel can accomplish more work through immediate and efficient communication, data update, and use
KNOXVILLE UTILITIES BOARD, KNOXVILLE, TENNESSEE, USA

Knoxville Utilities Board (KUB) is one of the largest full-service regional utilities in the United States, serving approximately 400,000 water, wastewater, electric, and gas customers and covering 800 square miles. KUB wanted a consolidated operations center to manage service orders and outages for its multi-utility infrastructure.

KUB implemented Intergraph’s MWFM applications. Providing a seamless environment for dispatch, MWFM, scheduling, crew management, and outage management, Intergraph’s solution helps KUB fulfill its vision of a consolidated operations environment from which to make informed decisions related to trouble and service-order work for water, wastewater, and its other services. Doug Miller, coordinator of systems operations and project manager for KUB, said, “Intergraph’s response to our scripted demo and the ability to use our existing GIS data publishing process and connectivity greatly influenced KUB’s selection of Intergraph and its outage and workforce management suite.”
of the most current enterprise data. The Field Automation application supports additional activities, such as field design, field inspection, and facility maintenance.

**Business Intelligence and Intergraph’s Enterprise Web Portal**

Utilities need access to not only the infrastructure information, but also the ability to integrate geospatial information with a variety of other data types to support decision-making and reporting requirements, both internally and externally.

Today, this is defined as business intelligence. Intergraph’s Business Intelligence solutions provide your employees, customers, and the public with fast and easy access to integrated data within a geospatial context. Because Web technology has evolved from a means of posting static company information to become a powerful business platform, Intergraph’s Enterprise Web Portal has emerged as the principal interface for delivering business intelligence and other customized content to executives, employees, and customers in a user-friendly format. It provides real-time access to multiple data stores, both on the Internet and on internal servers, and direct access to the communications infrastructure data and landbase information. It can also include current information on inspections, service interruptions, and any number of reports needed by employees or customers. Intergraph’s Enterprise Web Portal is also an executive dashboard used for reporting, spatial analysis, and decision support functions, and is access-controlled according to your intended audience.

The solution is a truly vendor-independent analysis tool, as it works with data from a variety of sources, including:

- Intergraph’s infrastructure management systems
- Data formats from traditional geographic information system (GIS) vendors
- Commercial database formats from Oracle, Microsoft®, and others
- Design files from computer-aided design packages
- Data in OGIS (openGIS) format, Web Services, and more

The idea behind Intergraph’s Business Intelligence solutions is straightforward – provide real-time access to disparate data sources online and equip you with geospatial query, analysis, and visualization tools. With these tools, you can interrogate, analyze, assess, and formulate decisions in support of core business objectives, such as emergency management, critical infrastructure protection, economic development, and more. Any user equipped with a standard Web browser can accomplish these tasks and more with no GIS training.
INTERGRAPH SOLUTIONS SUPPORT WATER AND WASTEWATER DISTRIBUTION SYSTEMS
EXTENDED APPLICATIONS

Spatial Data Infrastructure Compliance
Intergraph offers the ability for utilities to collaborate and distribute information to the public using spatial data infrastructures (SDIs). Intergraph leverages International Standards Organization (ISO) and Open Geospatial Consortium (OGC®) standards for geospatial data and services. The SDI enables collaboration from both desktop and Web clients. Capabilities include:

- **Metadata maintenance** – As data is prepared for distribution, metadata catalogs are generated or updated to provide background information about the geospatial data.
- **Geospatial data publishing** – You can publish geospatial data using the Web and make it available to the enterprise for decision support and integration with various business systems, to other government organizations, or to the public. Some analysis capabilities are available as well.
- **Web services for data and metadata distribution** – Datasets and metadata catalogs are made available within government enterprises, to other government units, or to the public.

**Web services access** – This provides access to Web services, which serve data and/or metadata on different types of clients. This includes desktop connectivity, Web portal connectivity, and others. Web services access includes catalog access (known as discovery) and data services access.

Asset Management Interfaces
Many organizations employ asset management systems to maintain inventories of water, wastewater, and stormwater systems. Intergraph’s Asset Management Interfaces allow you to easily see the location of assets and answer geospatial queries in conjunction with asset queries for job planning and decision-support activities.

Work Management Interfaces
This application gives you interfaces to work management systems, allowing you to facilitate job management integration with geospatial data models. Using these interfaces, you can generate maps, network status/conditions, and other information related to the network model to assist in completing the work.

“We selected Intergraph’s software because they could provide a comprehensive, modern geospatial environment for all business activities.”

Kevin Brown
Asset Data Centre Manager
Anglian Water Services
ABOUT INTERGRAPH

Intergraph is the leading global provider of engineering and geospatial software that enables customers to visualize complex data. Businesses and governments in more than 60 countries rely on Intergraph’s industry-specific software to organize vast amounts of data into understandable visual representations and actionable intelligence. Intergraph’s software and services empower customers to build and operate more efficient plants and ships, create intelligent maps, and protect critical infrastructure and millions of people around the world.

Intergraph operates through two divisions: Process, Power & Marine (PP&M) and Security, Government & Infrastructure (SG&I). Intergraph PP&M provides enterprise engineering software for the design, construction, and operation of plants, ships, and offshore facilities. Intergraph SG&I provides geospatially powered solutions to the defense and intelligence, public safety and security, government, transportation, photogrammetry, utilities, and communications industries.

For more information, visit www.intergraph.com.