GIS Services

www.oneBPG.com | 602.954.2223

EXECUTIVE SUMMARY

BPG Designs' GIS Services

BPG Designs' GIS services aim to empower clients with geospatial intelligence, enabling them to make informed decisions, improve operations, and optimize resource allocation. Whether it's data collection, mapping, analysis, application development, or consulting, BPG Designs provides comprehensive GIS solutions to meet the diverse needs of its clients across industries.

An Introduction to Mobile LiDAR Mapping

LiDAR stands for Light Detection and Ranging. It is an active remote sensing method that uses a laser to measure ranges (variable distances) to the surrounding environment. When the laser is combined with GPS and Inertial Navigation System (INS) data, a precise dimension, shape, and location on Earth is generated in 3D. LiDAR is ideal for a future-proof technology which helps with planning and maintaining the utility industry. Use of LiDAR and imagery benefits multiple groups within the utility industry, including engineering, construction, encroachments, and aerial line maintenance.

Here are some key aspects of BPG Designs' GIS services:

MOBILE LiDAR SCANNING

Mobile LiDAR scans, also known as mobile LiDAR mapping or mobile LiDAR surveying, refer to the process of capturing LiDAR data using a mobile platform such as a vehicle or an airborne system. Unlike static LiDAR scans, where the LiDAR sensor is fixed in a stationary position, mobile LiDAR scans involve moving the LiDAR sensor while capturing data, allowing for efficient data collection over large areas.

Mobile LiDAR scanning offers significant advantages over traditional surveying methods as it allows for rapid data collection over large areas, reduces the need for manual measurements, and provides highly detailed and accurate 3D information. It has numerous applications, including road and highway mapping, urban planning, forestry management, utility mapping, and disaster assessment.

BPG Designs has two Mobile LiDAR Scanners that we deploy across the Southwest region of the United States. We use the data from these scans to produce high quality point clouds, point cloud classifications, point cloud feature extractions, and spatially accurate utility network maps.

LiDAR POINT CLOUD CLASSIFICATION

LiDAR (Light Detection and Ranging) point cloud classification is a process of assigning semantic labels or categories to individual points in a LiDAR point cloud dataset. LiDAR technology uses laser pulses to measure distances and capture the 3D spatial information of the surrounding environment. The resulting data is represented as a collection of points, forming a point cloud.

Point cloud classification is crucial for various applications such as autonomous driving, urban planning, forestry, and environmental monitoring. By assigning semantic labels to points, it becomes possible to distinguish between different objects or terrain types in the scene, enabling further analysis and decision-making.

At BPG Designs we use LiDAR data classification to help our permitting and construction teams deliver high quality results! Through automated and manual classification, LiDAR points are assigned a classification as ground, water, vegetation, buildings, or roadway. These classifications help our design and permitting teams properly identify real world features and ensure our work delivers the best reputation, period!

LiDAR FEATURE EXTRACTION

LiDAR feature extraction is the process of identifying and extracting meaningful features or characteristics from a LiDAR point cloud dataset. LiDAR (Light Detection and Ranging) technology uses laser pulses to capture detailed 3D spatial information of the environment, resulting in a dense point cloud representation of the scanned area. Extracting features from this point cloud is crucial for various applications, including object detection, terrain modeling, urban planning, and autonomous navigation.

At BPG Designs we use feature extraction to produce detailed layouts of utilities and city infrastructures to help our drafting and permitting teams. During the feature extraction process we collect sidewalks, roadways, handholes, manholes, signs, poles, and existing utility infrastructure. Basically, if we can scan it, we can extract it!

UTILITY NETWORK GIS MAPPING

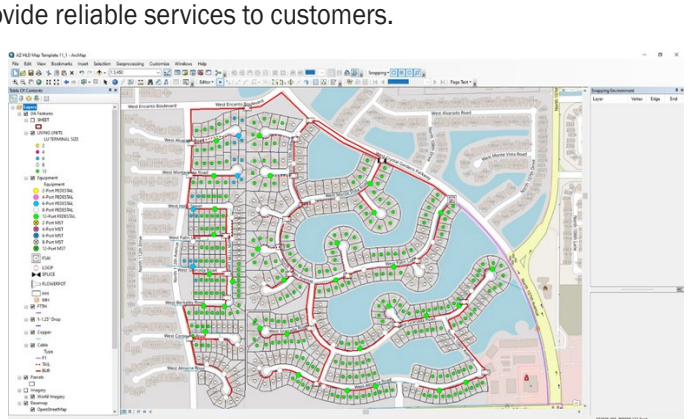
Utility network GIS mapping refers to the process of creating and managing a geographic information system (GIS) representation of utility networks. Utility networks typically include systems such as water, gas, electricity, telecommunications, and wastewater. GIS mapping of utility networks involves capturing, organizing, analyzing, and visualizing spatial and non-spatial data related to these networks, enabling better management and decision-making.

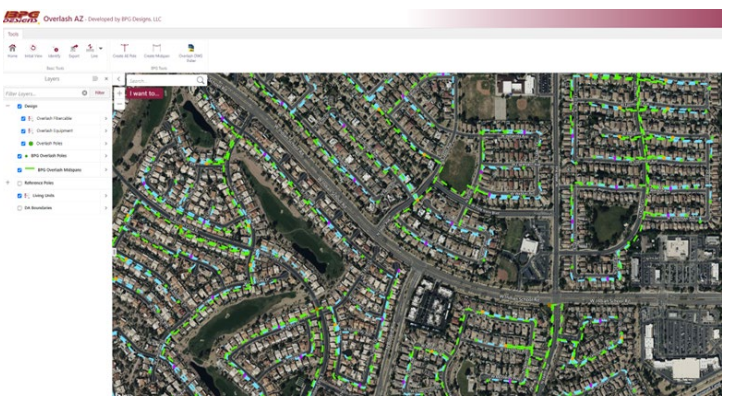
GIS mapping starts with capturing spatial data related to the utility network. This includes collecting accurate and up-to-date information about the network's components, such as pipes, cables, transformers, valves, and meters. Data capture can be done through field surveys, GPS devices, aerial imagery, and other remote sensing techniques. Non-spatial data, such as asset attributes, maintenance records, and operational information, are also captured and associated with the network components.

Once the data is captured, it is organized in a GIS database or system. The database structure is designed to represent the spatial relationships between network components and to store relevant attribute information. The spatial data is typically represented as points, lines, and polygons, representing the locations and extents of the utility network infrastructure.

GIS mapping enables various analyses and visualizations of utility networks. Spatial analysis techniques can be applied to perform network modeling, capacity planning, outage management, and asset management. Visualization tools can display the network infrastructure, highlight critical areas, and provide insights into the network's performance. Interactive maps, charts, and reports can be generated to communicate information effectively to stakeholders.

Utility network GIS mapping is an ongoing process that requires regular updates and maintenance to ensure the accuracy and reliability of the data. It serves as a valuable tool for utilities to effectively manage their networks, improve operational efficiency, and provide reliable services to customers.





MEET BPG AND THE TEAM

BPG offers a spatial GIS-centric, comprehensive yet scalable solution to survey, map and track assets and infrastructure by using a combination of general surveying, mobile LiDAR, static scanners, and UAS's to perform asset management data collection tasks. This includes everything from striping on roadways to above-ground utilities, tree inventories, signs, poles, pole connections, streetlights, traffic cabinets, buildings, and facility footprints (interior and exterior). Let us assist you in building your Smart City.

We also have many years of experience assisting cities with better fiber optics network documentation and tracking to provide risk assessments, predictive analysis, planning, and action-oriented decision-making abilities.

Feel free to contact BPG at info@BPGdesigns.com or contact one of our experts directly with any questions you might have.

ABOUT THE AUTHORS

Andrew Nash - Project Manager

ANash@bpgdesigns.com

Andrew has over 19 years of experience in a multitude of technical environments. He takes pride in his work and enjoys helping people. As a business professional, he has worked in telecommunications, factory assembly, and management as a GIS Technician, Software Developer, and Assistant Store Manager.

He joined the BPG team five years ago. His team values him for his skills in team building, leadership, organization, diligence, and efficiency. He earned his Bacherlor of Science Degree in 2015 from Arizona State University.

Jesse Haagenson - GIS Developer / Analyst

JHaagenson@bpgdesigns.com

Jesse has always had a love of science and working with technology. He grew up in Denver and went to MSU Denver where he obtained undergraduate degrees and certifications in Geology and GIS respectively.

He has worked with GIS technologies for over 15 years across multiple projects and platforms and has worked specifically with LiDAR and Mobile Mapping technologies in the past as well as with BPG. Jesse recently obtained his Masters in Geographical Information Systems from Arizona State University.