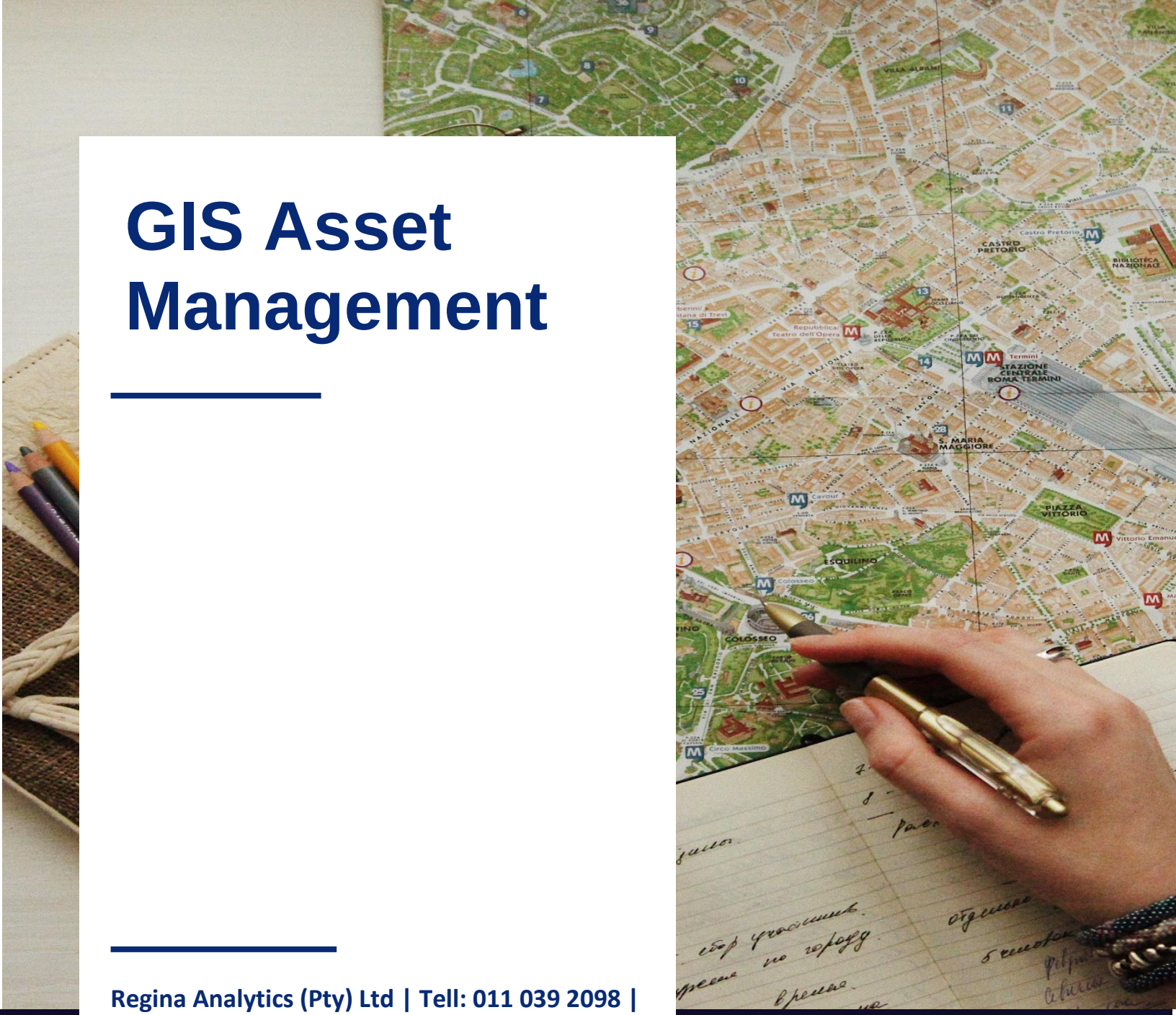
GIS Asset Management



Regina Analytics (Pty) Ltd | Tell: 011 039 2098 | Cell: 076 490 8390 | Email: Enquiry@reginaanalytics.co.za | Web: www.reginaanalytics.co.za
Address: Office No. 38, Cash Converters Building – 22 Mac-Mac Road, Waterfall Office Park, Vorna Valley, Midrand, Johannesburg, 1685

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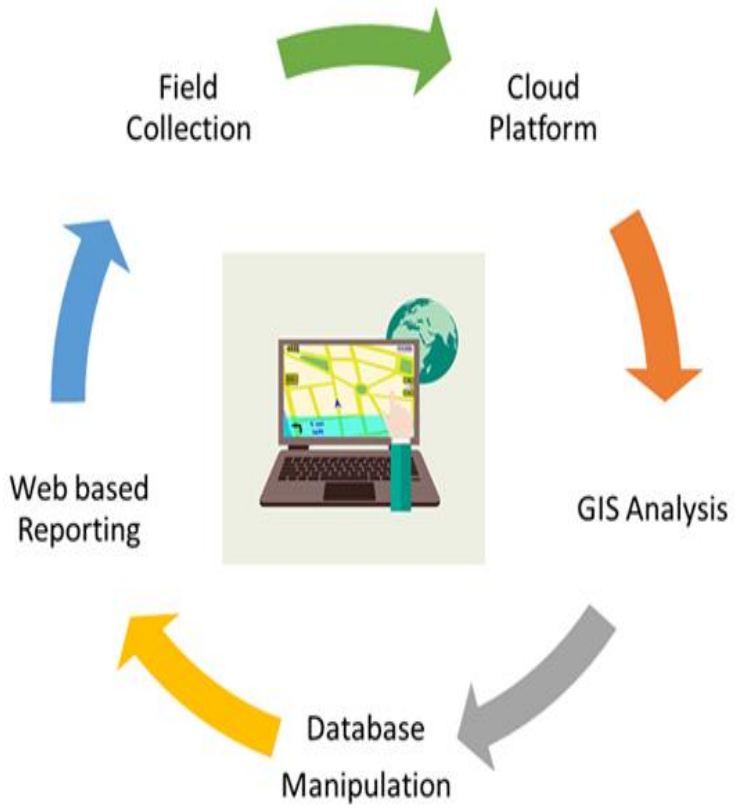
GIS Asset Management Life Cycle

Asset Management is providing desired level of service at lowest life cycle cost. Desired level of service is what you want your assets to provide and the lowest life cycle cost gives best appropriate cost.

Asset managers must minimize risks and maximize performance while managing cost and resources for both fixed and moving assets. Innovative managers use smart maps and dashboards to achieve a holistic view of their assets. Location intelligence enhances daily operations, maintenance, and investment planning.

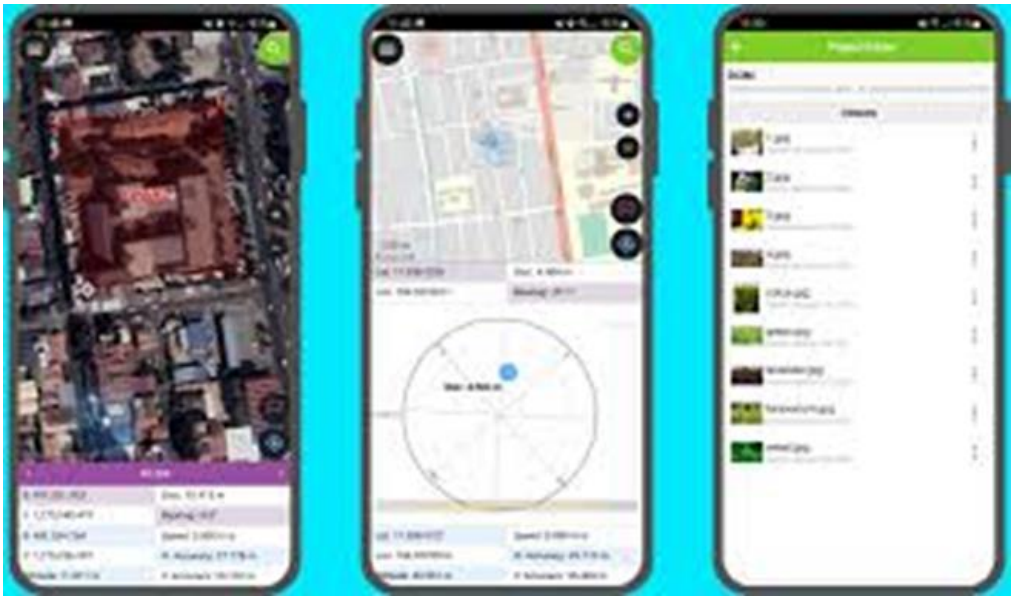


Collect

After collecting data on the field, it needs to be brought back to the office for analysis, visualization and archiving. Depending on the amount of field workers involved and the complexity of your geo data infrastructure, different approaches need to be taken for an optimized workflow. Take your organization's digital maps with you, anywhere and anytime. Use a current map to find assets and areas of interest or to see what is in the surrounding area. Promote your spatial awareness and understanding when performing inspections, evaluating your assets, or engaging in other activities that benefit from spatial context.

Field

If you plan to collect data points and map them without collecting additional data such as height, condition, etc. this option will allow you to obtain the longitude (X) and latitude (Y) for each location you want to record on the field. XY Data can be easily mapped with GIS (both desktop and online).

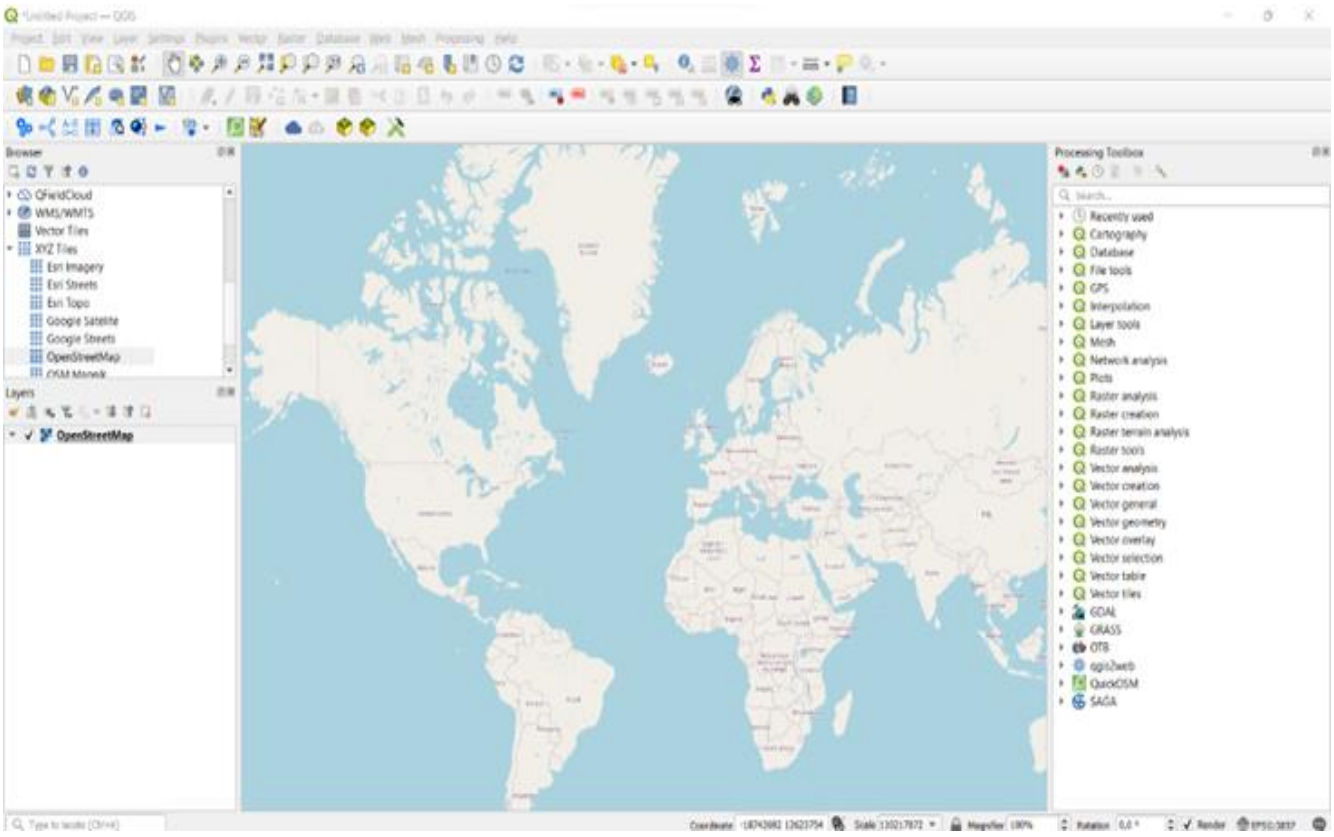


Cloud

Two specific scenarios for GIS in the cloud are particularly compelling: Increasing Operational Efficiencies with On-Demand GIS Cloud infrastructure allows GIS users to systematically or temporarily increase their computing power and data storage capacity without impacting their local IT infrastructures

Explore

A geographic information system (GIS) is a computer system for capturing, storing, checking, and displaying data related to positions on Earth's surface. A Geographic Information System (GIS Software) is designed to store, retrieve, manage, display, and analyze all types of geographic and spatial data. GIS software lets you produce maps and other graphic displays of geographic information for analysis and presentation.

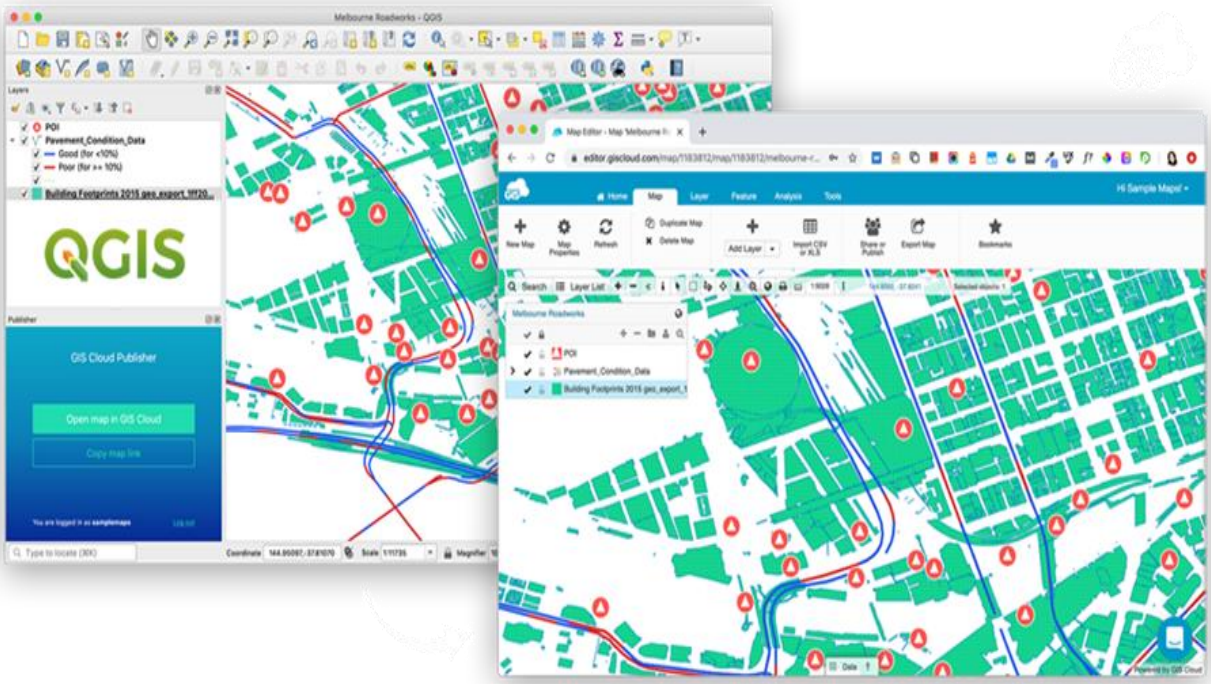


Database Manipulation

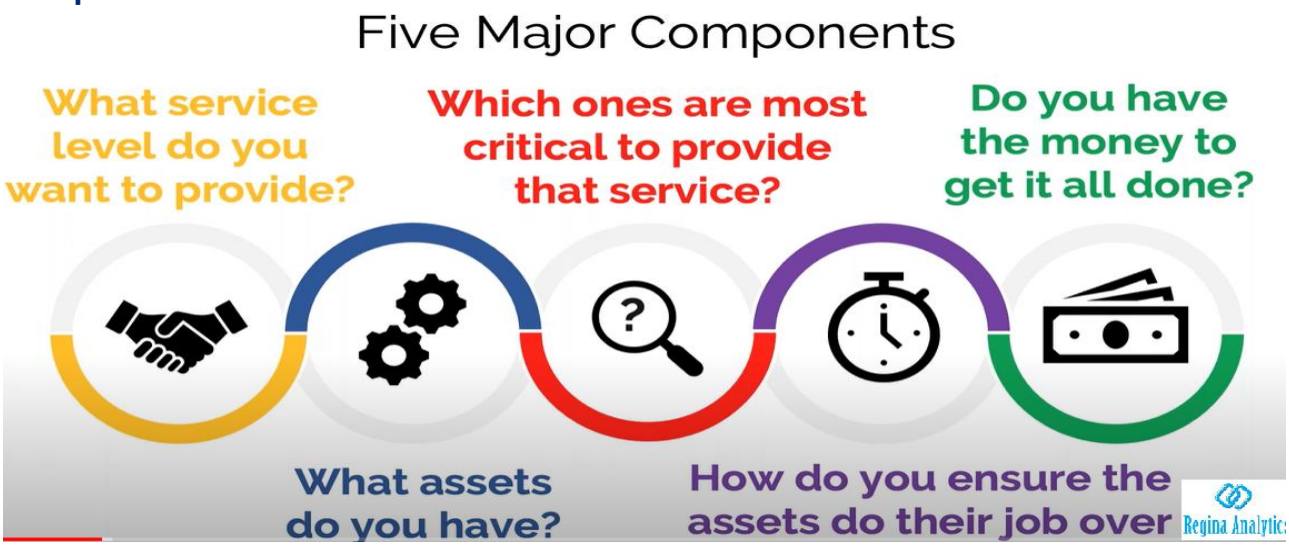
A geospatial database is optimized for storing and querying data that represents objects defined in a geometric space, such as vector data and raster data. With data volume growing exponentially, a geospatial database provides the best manageability and security to analyze large, complex, heterogeneous spatial data.

Web

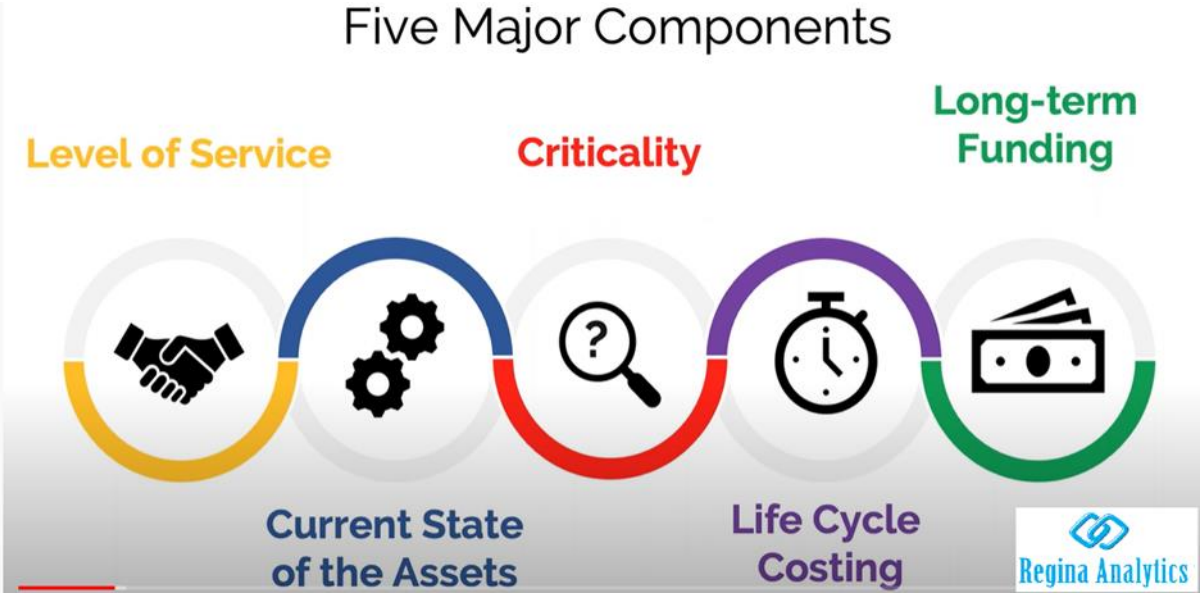
A Web Mapping Service (WMS) is a service hosted on a remote server. Similar to a website, you can access it as long as you have a connection to the server.



Components



The solution will be aiming to tackle the above questions in relation to the elements below


Five Major Components
Level of Service
Criticality
Long-term Funding
Current State of the Assets
Life Cycle Costing
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Process

When using GIS and its capable smart mapping to perform asset analysis and management, one can reduce errors, save time, and make informed, data-driven decisions. A GIS enterprise asset management (EAM) program can be implemented on the bases of the following Steps:

Complete Asset Inventory

An asset registry, in GIS is represented as features in various feature classes stored in datasets in geodatabase. It is relatively straightforward to have a one-to-one relationship between the asset registry and the GIS geodatabase as physical ledger. The concepts of mass assets, units of property, spare parts, and so forth, go into this definition and therefore are beyond the scope of this document. With respect to GIS, the following can be used as an example of asset registry terms:

Asset Term	GIS Term	Example
Asset family	Dataset	property
Asset class	Feature Class	Roads
Asset specification	Attributes	Condition
Asset	Feature	Temp_ID

The asset registry is the foundation to an asset management program and is inherently a function of the geodatabase in GIS.

Complete Inventory

An inventory program gives context to what data is collected for any given asset and can drive a GIS feature class attribution and data collection architecture. A water utility may have the programs such as Water mains, hydrant flushing or Sanitary sewer cleaning. Having a dedicated program on the annual Operating Plan (AOP) is beneficial for funds spent with in a GIS enterprise management program.
Determine Level Of Service

The level of service (LOS) or service level may use multiple criteria which are often reported as Key Performance Indicators (KPIs). GIS can play a role in LOS by carrying the appropriate attributes for network system analysis, or it can help in engineering designs. Overall system reliability can be improved by sectionalizing or isolating problem prone areas. The GIS network can be used to optimize those assets and devices for segmentation. Water loss, or more specifically, Non-Revenue Water, can be reduced by implementing District Metered Areas (DMAs).

Define Roles and Responsibilities

Asset management Best Practices require aligning functional roles based on asset classes. Determining the number of resources in any given work group cant directly be supported by GIS by analyzing work efforts for a given set of assets, and then calculating overall effort when applied to the entire asset registry, including drive time for example.

Identify and calculate Risk

Calculating risk is the number one analytical benefit of using GIS in asset management. A data-driven, reproducible method of calculating risk demonstrates fiscal accountability and transparency to an organization's citizens, customers, and stakeholders. Using GIS to calculate risk converts institutional experience into the codified business rules from which to make decisions.

Simple risk equations such as the one below will be added to the RAMS for on-the-fly decision making:

Risk = (probability of failure) x (impact of failure)

Calculating the probability of failure for assets deals with maintenance activities, material degradation, and construction methodologies. The probability of failure is a function of the asset condition. A range of analysis tools can be added to the asset management system to better understand asset behavior at a large scale. A basic asset

management principle is that assets can fail from a lack of integrity and/or capacity overload. For example, busier roads are prone to more damage and roads on steeper elevations may require more maintenance. Criteria is added by a Geospatial specialist for seamless calculation and visuals.

Extrapolate a Forecast

A fundamental goal of an asset management program is to predict the future. Once this is determined or better yet, once asset performance curves are calculated and the useful life percentage for individual assets and asset classes is understood, the asset registry in the GIS can be used to extrapolate overall useful life of the system.

This asset-based level of analysis using the GIS to extrapolate to the entire system. Using the GIS to understand the why of failure allows the use of other GIS layers such as land use, land zoning, soil morphology, groundwater intrusion, and dynamic loading from streets, to overlay zones of impact to useful life for the assets and asset classes in the GIS.

Contact us for more information