

# Geospatial

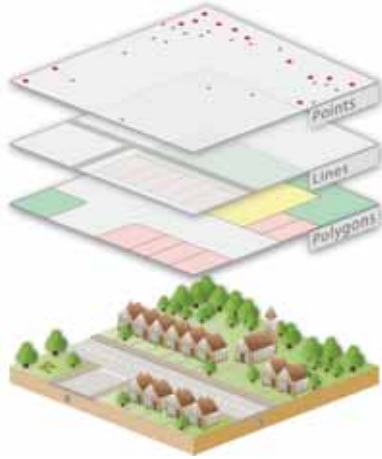
Geographic Information Systems (GIS)

A 3D bar chart with several bars in blue, yellow, and pink, positioned above a data table. The table contains numerical data arranged in a grid.

43	4650	6868	7964	4650	7964	3643
868	5878	3643	3568	5878	3568	6868
7689	4758	7689	1268	4758	1268	7689
4658	6585	4658	3568	6585	3568	4658
4654	4758	4654	6845	4758	6845	4654
8	3464	7080	3578	7080	3578	3464
579	5689	7089	3579	7089	3579	5689
720	6785	3648	9876	3648	9876	6785
		6867	7978	6867	7978	
		1231	3686	1231	3686	
			6979		6979	
			3242		3242	



# GIS

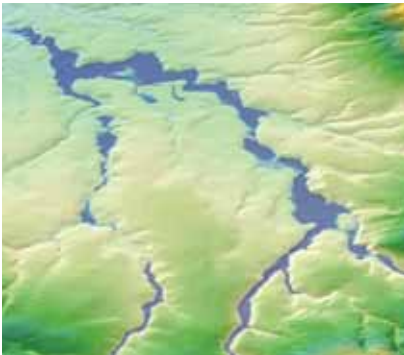


GIS stands for geographic information system. In simple terms, GIS is a computer-based system used for capturing, querying, analysing and displaying geographically referenced data. Also called geospatial data, geographically referenced data describes both location and characteristics of spatial features such as roads, land parcels, and vegetation on the Earth's surface. The image on the left shows the various feature representations of a GIS, these can represent real world features such as: Land Use, Elevation Data, Property Boundaries, Road Lines and location points.

GIS's ability to handle and process geographically referenced data distinguishes it from other information systems and allows it to be used in a wide variety of applications, for a large range of industries.

Using GIS you can view, understand, question, interpret, and visualise data to reveal relationships, patterns, and trends. The resulting data is commonly displayed in maps, but can be displayed in the form of non-spatial databases, globes, reports, images, geographical references and charts.

## Industry applications



### Water

GIS is a powerful tool for water, storm water and wastewater management.



The Beca GIS team offers solutions and support that are of particular value in the effective management and analysis of infrastructure and environmental processes relating to water. This includes integrated solutions for mapping, monitoring, modelling of networks and watershed data.

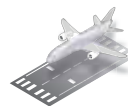
Applications for GIS in water management include:

- Flood hazard mapping.
- Cumulative flow analysis and stream delineation.
- Catchment delineation.
- Drainage (wastewater/storm water).
- Asset management and service planning.
- Visualisation of modelling results.
- Conceptual design of water management options.
- Pollution risk assessment.
- Mobile GIS.



### Airports

With GIS, Airport operators can collate complex data, allowing more efficient planning and operations.



An airport is a commercial operation with complex challenges. GIS provides operators and managers of airports with a tool to translate complex data into useful materials to support strategies and plans that lead to more efficient operations.

Applications of GIS in this sector include:

- Obstacle Limitation Surface (OLS) definition and analysis.
- Compliance with the Australian Noise Exposure Forecast (ANEF).
- Master planning.
- Geographic referencing of operational and planning documentation.
- Spatial modelling of hydrology, noise, wind and elevation.
- Integration of spatial and non-spatial data including CAD and GIS formats.
- Stakeholder consultation.
- Tracking changes in asset condition.
- Multi-dimensional modelling.



### Planning

GIS assists planners to clearly convey ideas and proposed developments.



GIS enabled mapping can be used to illustrate site and local context plans, as well as to show analysis of conditions and constraints of sites and surrounding land.

Applications of GIS in planning include:

- Sites and route identification and evaluation, based on desired criteria including distance from main routes, zoning requirements, property size or other factors.
- Analysis and visualization for site studies and conceptual design.
- Modelling of existing or expected future environment and community impacts.
- Support in project management where spatial relationships and/or data integration is important.
- Integrating data onto a single spatial platform to provide a familiar portal for data and information.
- Creating relationships between existing assets to form a homogenous picture.
- Line-of-sight/visibility analysis
- Adding spatial tools to existing websites or intranets.
- 3D modelling and visualisation.

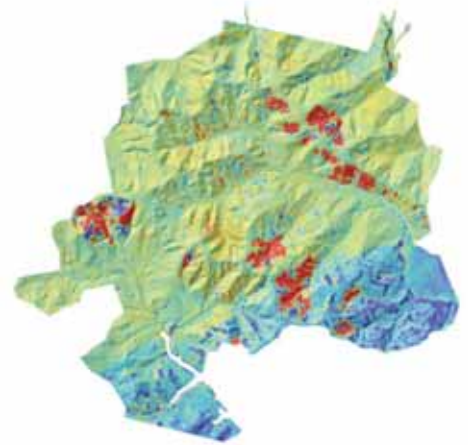
## Our Approach

Beca recognises that a multi-disciplinary approach to projects adds strength and value by providing clients with a wide variety of supporting skills and services.

Our GIS team is part of the Beca Group Ltd, an international multi-disciplinary engineering and related consultancy services organisation. We have access to a broad range of services and the capability to work in a diverse range of sectors.

To compliment GIS, the Beca group offers supporting services including traffic and transport, airports, planning, software development and multi-disciplinary engineering. We are able to draw on extensive resources both nationally and internationally within the group, to provide the best possible outcomes for each client's specific project. Beca also has access to a range of strategic business partners with specialised or niche skills, to provide customised solutions as required.

This combination of skills, experience and external support allows Beca's GIS team to provide clients with a complete solution.



### Traffic and Transport

The undeniable spatial nature of traffic and transport forms the basis for an inseparable relationship with GIS.



GIS has proven to be of great value to the traffic and transport management authorities, as well as the public they serve.

Applications of GIS in Traffic and Transport include:

- Road Safety Analysis, modelling and visualisation.
- Congestion monitoring, analysis and visualisation.
- Asset management and asset data integration.
- Tactical and strategic planning of transportation activities and works programmes.
- Operational mobile spatial enablement.
- Integration, analysis and real-time display of Intelligent transport solutions (ITS) data capture resource, eg GPS, side-mounted radar, loops, cameras, etc.

### Mining

GIS provides valuable information to support decision-making and strategic planning in the mining sector.



GIS has shown to be an indispensable tool in the mining sector, from exploration to operations, asset management and eventual closedown of sites at the end of their life. It provides valuable information to support decision-making and strategic planning.

Applications of GIS in mining include:

- Provide analysis and visualisation for strategic studies and conceptual design.
- Virtual design and modelling of mining resources and supporting infrastructure.
- Modelling of existing or expected future environmental and community impacts.
- Asset and resource management.
- Provide support in project management where spatial relationships and/or data integration is important.

### Power

GIS allows power transmission operators to more effectively manage and monitor their assets, resources and utilisation.



There are many uses for GIS in the power sector making it a powerful tool for owners and operators. This includes enabling easy identification of resources, as well as planning and managing utilisation to an optimal level.

Applications of GIS in Power include:

- Supply routes and infrastructure sites identification.
- Construction planning and monitoring.
- Modelling of assets and surrounding environment.
- Risk analysis (natural hazards, etc.) and criticality studies.
- Read and distribution analysis.
- Statistical analysis, eg client base analysis and projected supply/demand comparisons.

## Our Geospatial Team

Beca's GIS team works from our Auckland head office, offering support to clients across all industries as well as to internal clients within the Beca group.

As part of an experienced team with more than 40 technical specialists, we offer a wide range of services, ranging from analytical and technical, through to project management and strategic planning support. In particular the Beca GIS team is proud of the high quality of our mapping solutions, which are used to add value to services within the group beyond GIS.

Beca Geospatial provides specialist skills in data collection (ground survey and photogrammetric mapping), data management and data analysis of land information using both CAD and GIS tools.

## About Beca

The Beca group is a leading international engineering and related consultancy services organisation, specialising in the design and management of projects. From prestigious landmark developments, to functional and environmentally sustainable projects, Beca has extensive multi-disciplinary experience across a broad range of sectors.

Our employees number over 2,400, working on international projects out of 20 offices throughout the world. Our main hubs are in Australia, New Zealand and Singapore, supported by associated and affiliated offices in the UK, USA, Asia, the Middle East, the Pacific Islands and South America.

Trust and integrity are the cornerstones of our professional practice. This coupled with our size and reputation for pioneering design, innovation, quality and technical excellence has secured us award-winning projects in more than 70 countries.

For further information contact us on +64 9 300 9000 or [GIS@beca.com](mailto:GIS@beca.com).

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