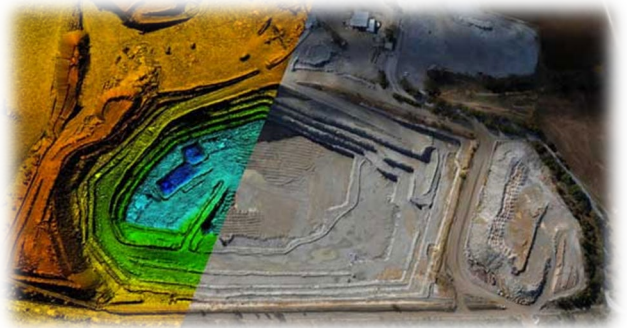
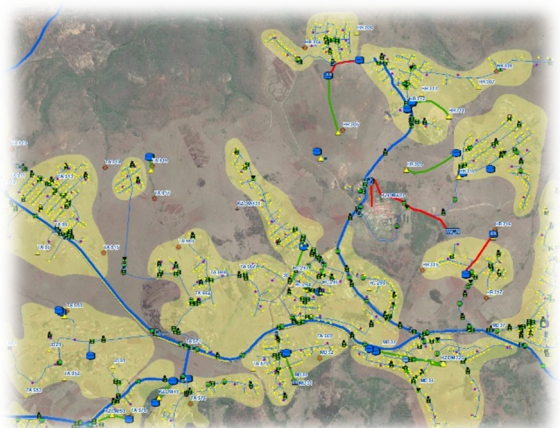
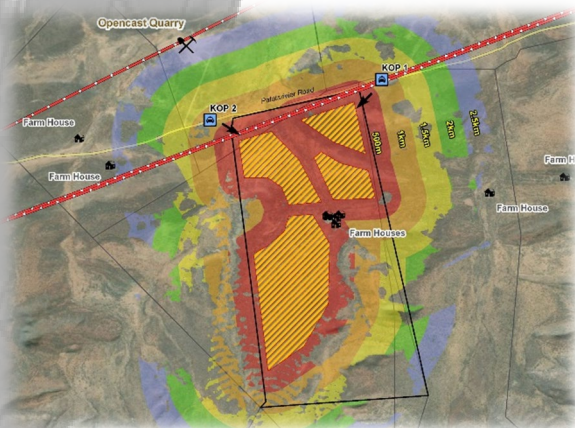


COMPANY PROFILE



ENGINEERING GIS
MUNICIPAL GIS
DRONE SURVEYING
ENVIRONMENTAL SUPPORT
SERVICES





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ZULMAP was established in February 2007 with its head office in Vryheid, and site offices in Ladysmith, Richards Bay, Mbombela and Tswane. ZULMAP has made valuable progress in supporting local government in strategic planning and development, as well as assisting private sector entities in GIS, Surveying, Remote Sensing & Environmental Management Services.

ZULMAP's primary focus is on GIS and Surveying Consulting Services, but has partnerships with several other companies to include specialist services complementing GIS and Surveying Services to clients.



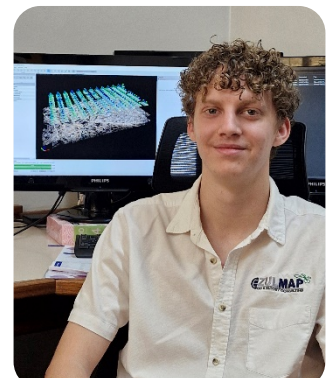
DIEGO DIKETANE
Managing Director



STHEMBISO MANDA
Director



WILLEM RICHTER
GIS Consultant



JADON RICHTER
GIS Technician & Drone
Pilot

NATURE OF BUSINESS

ZULMAP is providing support services to local government as well as the private sector in the following areas:

- ✦ **GIS:**
 - Municipal Infrastructure & Strategic Planning Support
 - Town Planning
 - Spatial Data Integration & Analysis
- ✦ **SURVEYING & REMOTE SENSING:**
 - Mining, Engineering, GIS
 - Drone Surveys: Infrastructure Inspections, Photogrammetry & LiDAR
- ✦ **ENVIRONMENTAL MANAGEMENT:**
 - Groundwater Studies
 - Integrated Water & Waste Management Plans
 - Invasive Plant Species Management Plans
 - Visual Impact Studies

ZULMAP has provided support services to the following District and Local Municipalities:

DISTRICT MUNICIPALITIES	LOCAL MUNICIPALITIES
Zululand	uPhongolo
uMzinyathi	Ntambanana
King Cetshwayo	AbaQulusi
uThukela	Jozini
iLembe	Nquthu
Joe Gqabi	uMngeni
Harry Gwala	Mfolozi
	Msinga
	Mthonjaneni
	Nkandla
	uMfolozi

In the private sector ZULMAP has provided support services to the following entities:

PRIVATE SECTOR	
ENGINEERS:	MINING:
▶ BVi Consulting Engineers	▶ Richards Bay Minerals
▶ ECA Consulting Engineers	▶ Mbila Resources
▶ DLV Engineers	TOWN & REGIONAL PLANNING:
▶ RAWS Consulting Engineers	▶ E -Plan Town Planners
▶ ZAI Engineers	▶ Jane Taljaard Town Planners
SURVEYING & DRONE TECHNOLOGY:	▶ Isibuko Town Planners
▶ Barsdorf Land Surveyors	GEOTECHNICAL:
▶ Precision Surveys	▶ Engecon Geoservices
▶ Aerobotics	▶ Geocon Geotechnical Consultants
▶ 3D60 Survey Solutions	DEVELOPMENT AGENCIES:
▶ Topham Surveys	▶ Richards Bay IDZ
▶ NN Land Surveyors	▶ Ground Africa
VISUAL IMPACT ASSESSMENTS	▶ Ntokozweni Housing
▶ Protea Energy	

ZULMAP personnel are multi-skilled with a high level of experience in GIS support & training, Surveying & Project Management. The following provides a brief overview of key personnel skills and experience:

EXPERIENCE	YEARS
Municipal Projects	17 years
GIS Support & Training	19 years
Surveying & Remote Sensing	30 years
Drone Surveys	5 years
Project Management	17 years
Environmental Management	5 years

Knowledge and experience on hardware and software include the following:

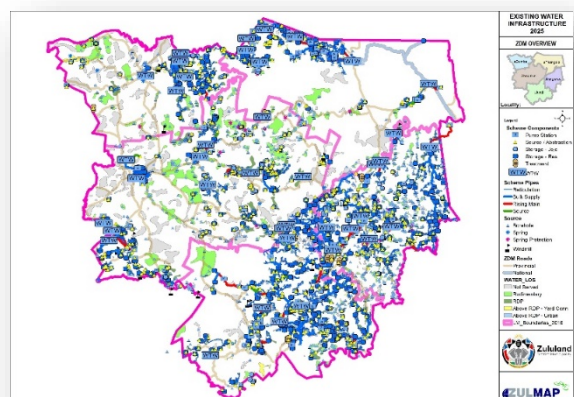
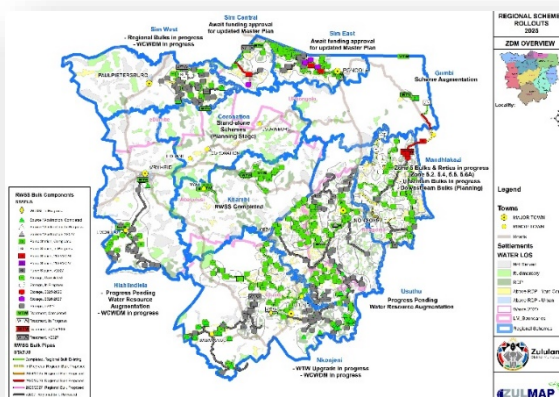
SOFTWARE / APPLICATIONS	HARDWARE
ArcGIS Pro, 10.x ArcGIS Online Global Mapper Google Earth Pro Trimble Terrasync AutoCAD Pix4D DJI Terra	Trimble DA2 Catalyst, Juno DJI Phantom 4 DJI M350 RTK with LiDAR

SUPPORT SERVICES

ENGINEERING & MUNICIPAL SUPPORT SERVICES

ZULMAP specializes in engineering support services work. Our services include:

- ✦ Conversion from CAD to GIS & GIS to CAD
- ✦ Geodatabase Management of as-built information converted to GIS
- ✦ Topographic & Engineering Surveys
- ✦ GIS and Spatial Analysis Support for business plans and funding applications for infrastructure projects
- ✦ Water, Sanitation, Roads Master Plans, Water Services Development Plans

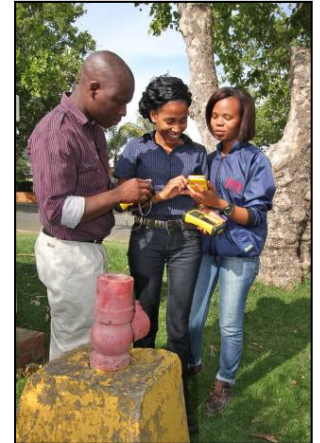


GIS FIELD SURVEY DATA COLLECTION

ZULMAP provides field survey data collection support for projects where surveyed positions need to have associated details captured as well (feature attributes). This process is done via a pre-defined, electronic data form on GPS units, or mobile phone apps.

Data capturers complete all relevant information electronically on-site by means of a touch screen interface on the GPS. This method has the following advantages:

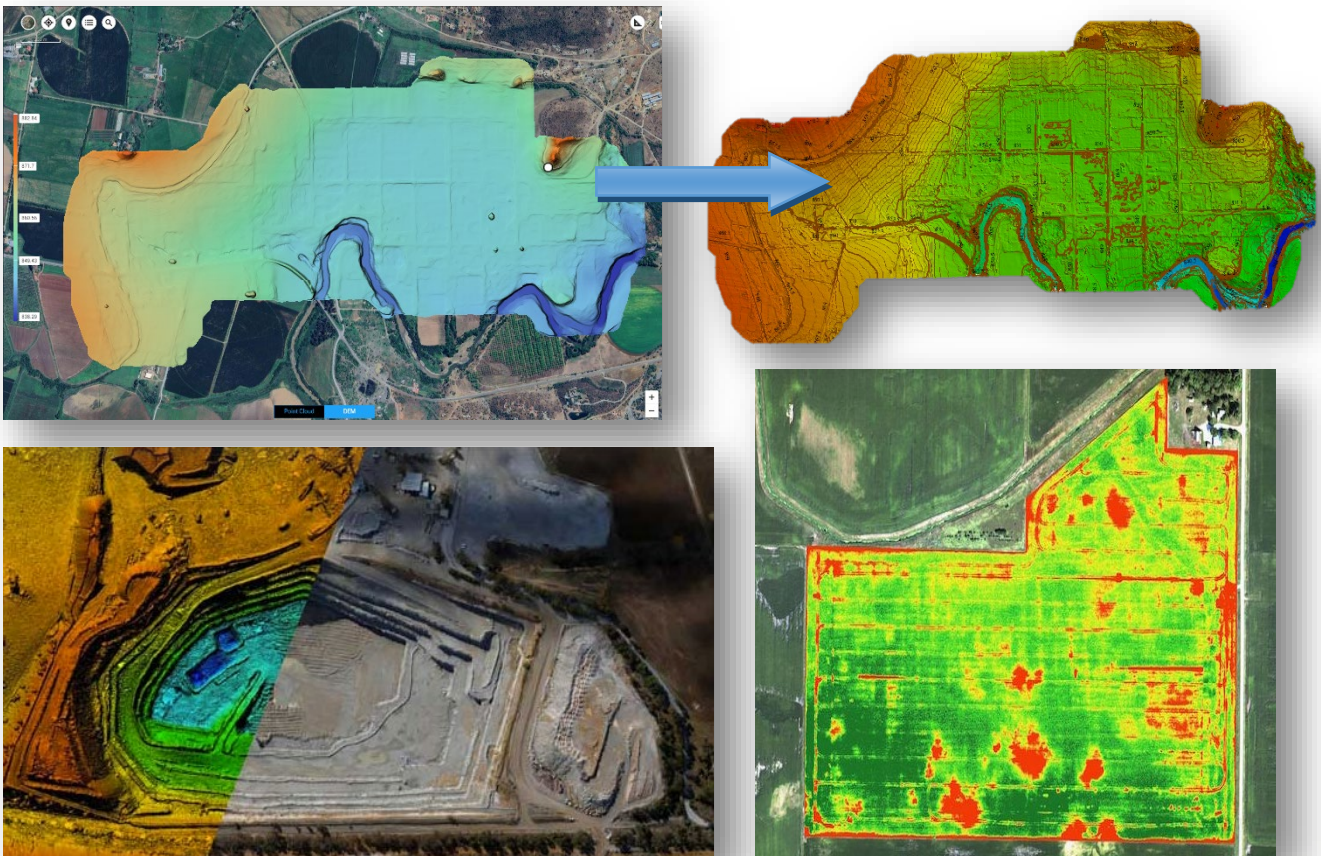
- ✦ Eliminates the need to write down information on paper forms and recapture these details again in a database afterwards.
- ✦ Eliminates typing errors associated with the paper form method.
- ✦ Eliminates the tedious and time-consuming job of associating photographs taken in the field, with GPS coordinates. Photographs can be taken via the built-in digital camera, and are automatically geo-tagged and hyperlinked with their surveyed positions.



REMOTE SENSING & DRONE SURVEYS

ZULMAP specializes in various remote sensing surveys and applications, such as drone-based aerial surveys and surface modelling, stock-pile surveys etc.

ZULMAP is a reseller of the industry-standard post-processing software Pix4D.



MUNICIPAL GIS

Overview

ZULMAP provides a holistic approach to GIS support for local government, where both the end-user as well as management can benefit from its GIS. Through a systematic approach and implementation plan, municipalities can develop a proper, functional GIS system which can provide support services to any department within the municipality.

The major aspects of such a GIS can be seen below:

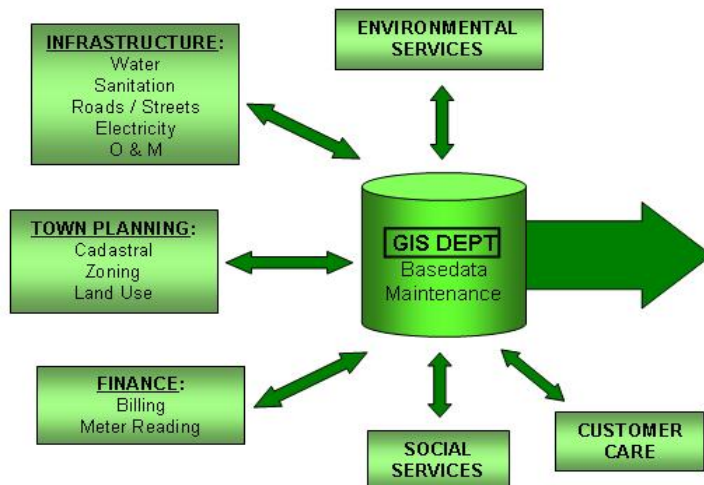
STEP 1:

Establish Workflow Processes

- > What are the **needs** of the client
- > What is **required** to address these needs via GIS
- > **Gap analysis** on spatial data to address clients' needs
- > **Data maintenance** workflow processes:
 - ✓ From where,
 - ✓ by whom and
 - ✓ how will data sets be maintained

STEP 2:

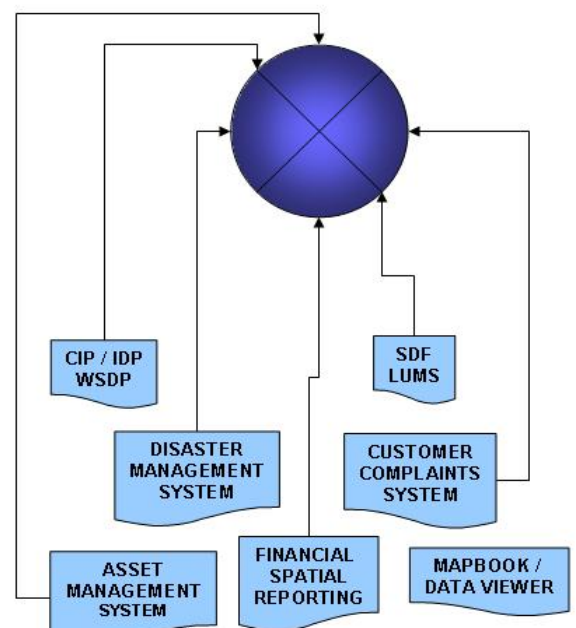
Data Maintenance



STEP 4:

Integrated Management System

(Inter-departmental Decision Support System)

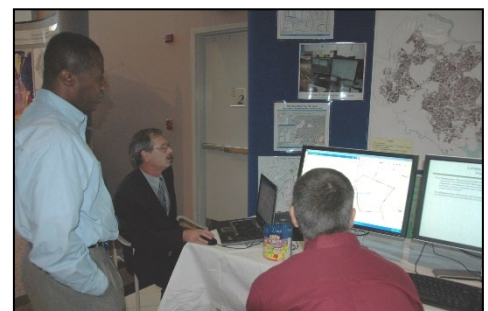


STEP 3:

Departmental Applications / Support

The most valuable and effective GIS is one where end-users and management both benefit from it:

- ⊕ **End-users**
(not necessarily within GIS office) can easily view and/or update spatial data.
- ⊕ **Management**
Can be provided with easy and fast reporting systems on spatial data.



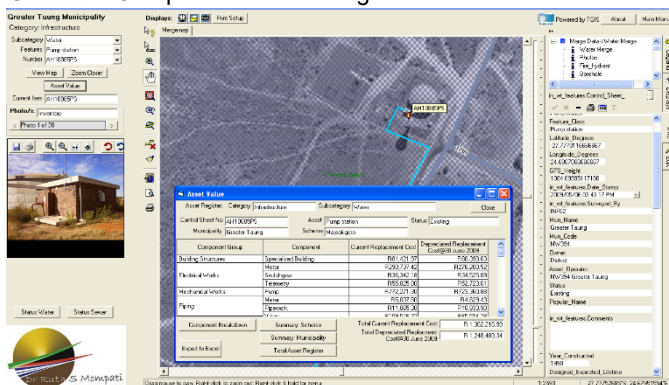
GIS-based Management Systems

ZULMAP can provide its clients with customised, user-friendly spatial data applications for both end-users and management in order for the above criteria to be met within a municipal setup. Examples of such applications include the following:

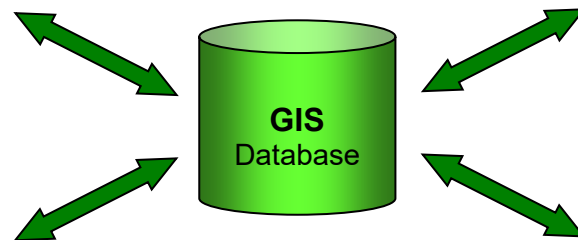
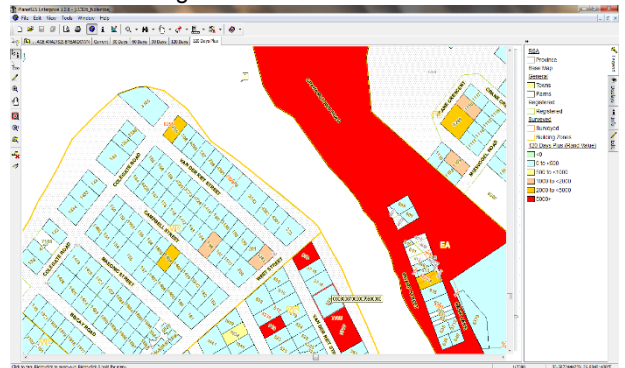
- ✦ **Integrated Management Systems** customised to the client's environment and needs.
- ✦ **Localised or web-based GIS Viewer** with direct access to main GIS database (*Open-source and/or proprietary software*)
- ✦ Exporting project details to **Google Earth** to enable users to view data in a 3D environment without the need for expensive software.
- ✦ Updating of **Cadastral-related details**, such as land use and zoning, via user-friendly end-user interface
- ✦ Automated **Building Plan Approval System** linked to Cadastral data set
- ✦ Reporting system on **Financial Details** linked with Cadastral data set, such as water usage, billing etc.
- ✦ **Asset Management System** integrated with spatial data

Below are a few examples of an integrated management system with the GIS as the basis. Users can update attribute details and management is able to draw reports by querying the spatial data:

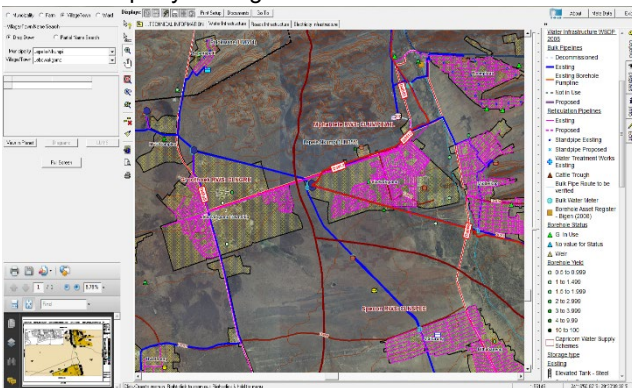
GRAP 17 Compliant Asset Management



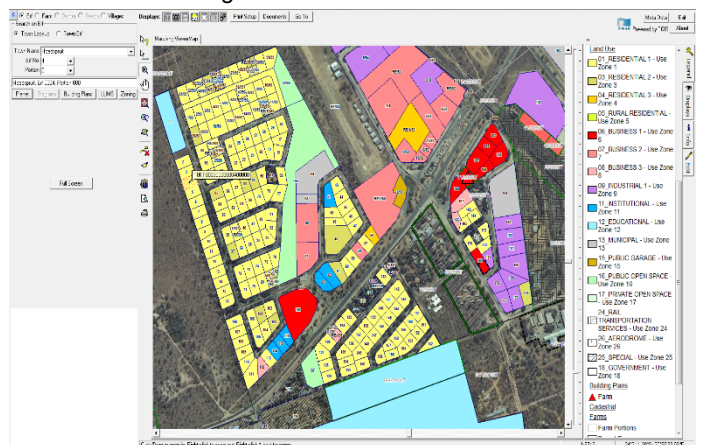
Financial Management



Land & Property Management



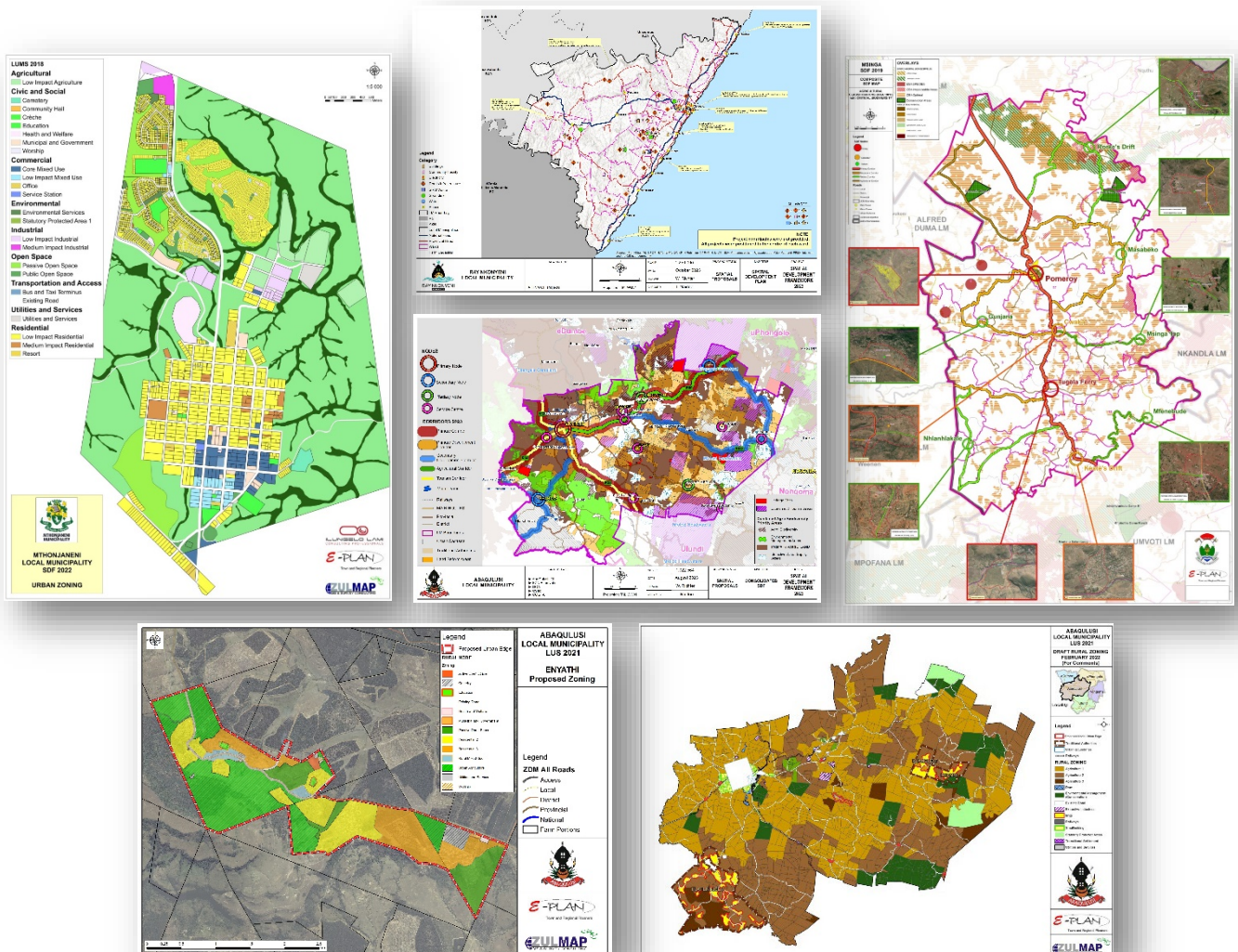
Infrastructure Management



Shared Services

The following are services rendered by ZULMAP to DM's in terms of the GIS Shared Services initiative:

- ✦ **PHASE 1: GIS Data Verification**
 - ✦ Spatial Data Status Quo
 - ✦ Comprehensive metadata sheet with Data Gap Analysis (*spatial features & attributes*)
 - ✦ Prioritisation of, and recommendations for data gaps
- ✦ **PHASE 2: GIS Capacity & Resources**
 - ✦ GIS Hardware & Software Status Quo
 - ✦ Network & Internet Connectivity infrastructure to support Shared Services
 - ✦ Personnel & Resources to support Shared Services
 - ✦ Needs Analysis & Recommendations for Shared Services
- ✦ **PHASE 3: Long-Term Support Options to DM Shared Services**
 - ✦ Capacitate and enable existing GIS person within DM to support LM's
 - ✦ Source, scan, digitise, update and maintain bulk GIS work on behalf of appointed Shared Services personnel within DM
 - ✦ Support for compilations of Water & Sanitation Master Plans, WSDP's, SDF's, CIP's, Housing Plans, IDP's etc.



ENVIRONMENTAL MANAGEMENT

ZULMAP has provided support to several clients on environmental-related projects, such as **Groundwater Protocols**, **EIA** and **VIA** studies.

We have developed a unique scoring matrix for VIA studies which makes the assessment process less subjective to the person conducting the study. The photomontage process is done professionally, creating a realistic representation of the infrastructure on the proposed location, with and without mitigation.



Figure 39: KOP 1: Current View



Figure 40: KOP 1: Current View with proposed infrastructure



Figure 41: KOP 1: Current View with proposed infrastructure after mitigation

Table 7: KOP 3: Visual Index Score before mitigation

CATEGORY	Total Points	Criteria	Rating	Total Score
Direct	70	Visibility	Dominant	34.42
		Visual exposure	High	
		Visual sensitivity of area	Medium	
		Visual sensitivity of receptors	Medium	
		Visual absorption capacity (VAC)	Low	
		Visual intrusion	High	
		Lighting (Day)	Medium	
Indirect	20	Lighting (Night)	High	15.75
		Extent	Local	
		Duration	Long-term	
		Intensity	High	
Cumulative	10	Probability	Definite	6.67
		Additive	High	
		Synergy	High	
		Time crowding	Low	
		Space crowding	High	
		Neutralizing	None	
		Visual Index Rating	High	

Mitigation Required to meet VIA objectives:

Enhance VIA objectives: Mitigation needs to be implemented to reduce visual intrusion

Table 8: KOP 3: Visual Index Score after mitigation

CATEGORY	Total Points	Criteria	Rating	Total Score
Direct	70	Visibility	Medium	34.42
		Visual exposure	Medium	
		Visual sensitivity of area	Medium	
		Visual sensitivity of receptors	Medium	
		Visual absorption capacity (VAC)	Medium	
		Visual intrusion	Medium	
		Lighting (Day)	Low	
Indirect	20	Lighting (Night)	Medium	12.83
		Extent	Local	
		Duration	Long-term	
		Intensity	Medium	
		Probability	Highly probable	
Cumulative	10	Additive	Medium	4.67
		Synergy	Medium	
		Time crowding	Low	
		Space crowding	Medium	
		Neutralizing	None	
			Visual Index Score	51.92
			Visual Index Rating	Medium

Mitigation Required to meet VIA objectives:

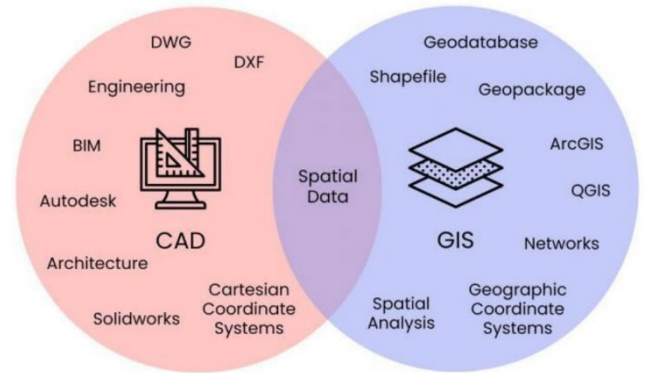
Within VIA objectives.

SPATIAL DATA INTEGRATION & CONVERSIONS

Several data conversion processes have been optimised for clients to make spatial data more compatible and accessible, with better visual and performance qualities than standard tools. This has enabled users outside a GIS environment to be able to view and query data in a similar manner than GIS personnel.

These include:

- ✦ GIS to CAD / CAD to GIS
- ✦ GIS to Google Earth / Google Earth to GIS
- ✦ Raster conversions
- ✦ GPS data type conversions
- ✦ ArcReader Project Files



CONTACT DETAILS

VRYHEID (Head Office)

