

14th TRANSPORT SECTOR COORDINATING COMMITTEE (TSCC) MEETING OF THE  
CENTRAL ASIA REGIONAL ECONOMIC COOPERATION PROGRAM

## Using GIS as a tool for asset planning and management: lessons from work in Georgia

Ulaanbaatar, 30.4.2015





# KOCKS

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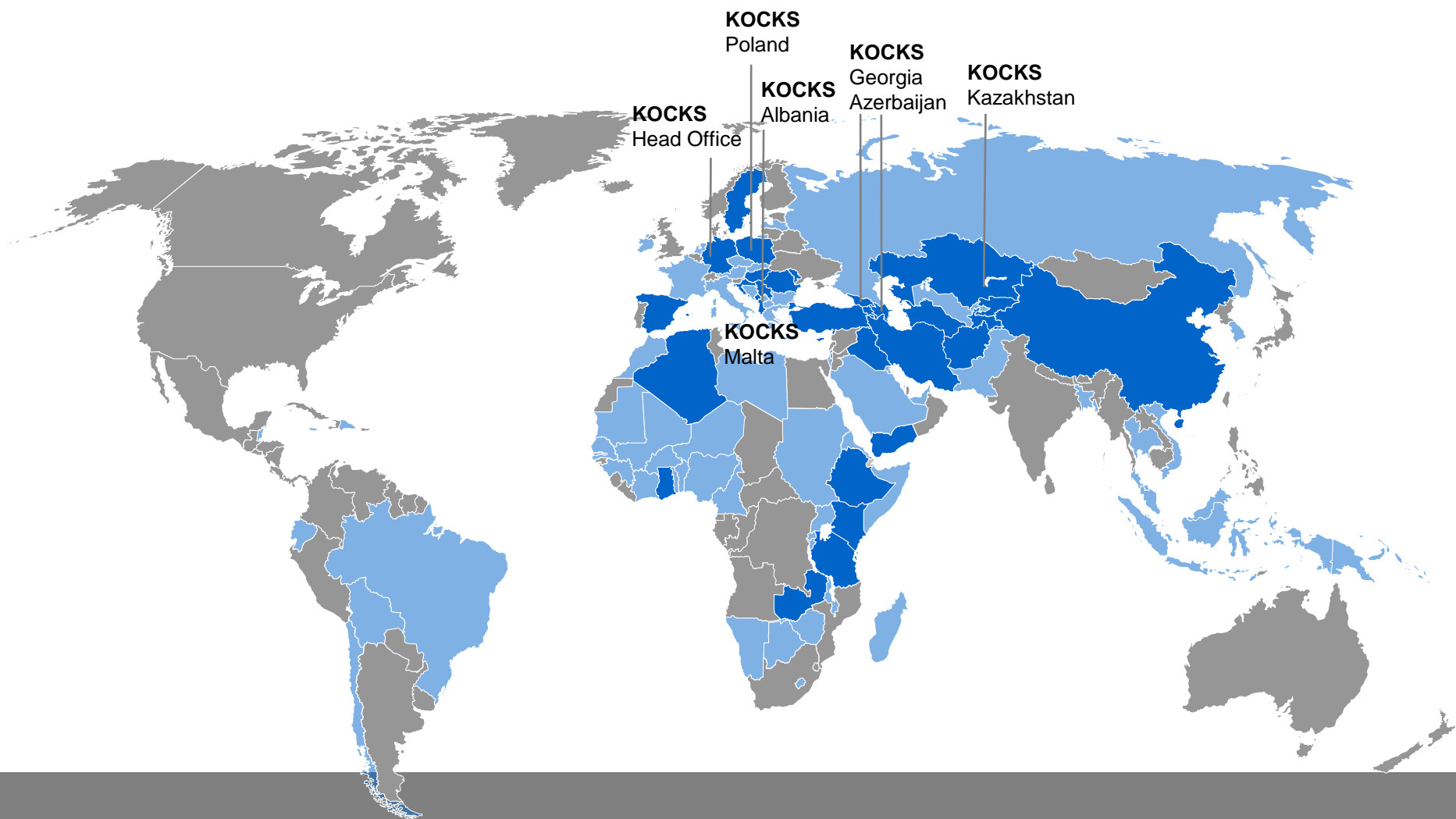
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Engineering since  
1946 for:*

**WATER & ENVIRONMENT**

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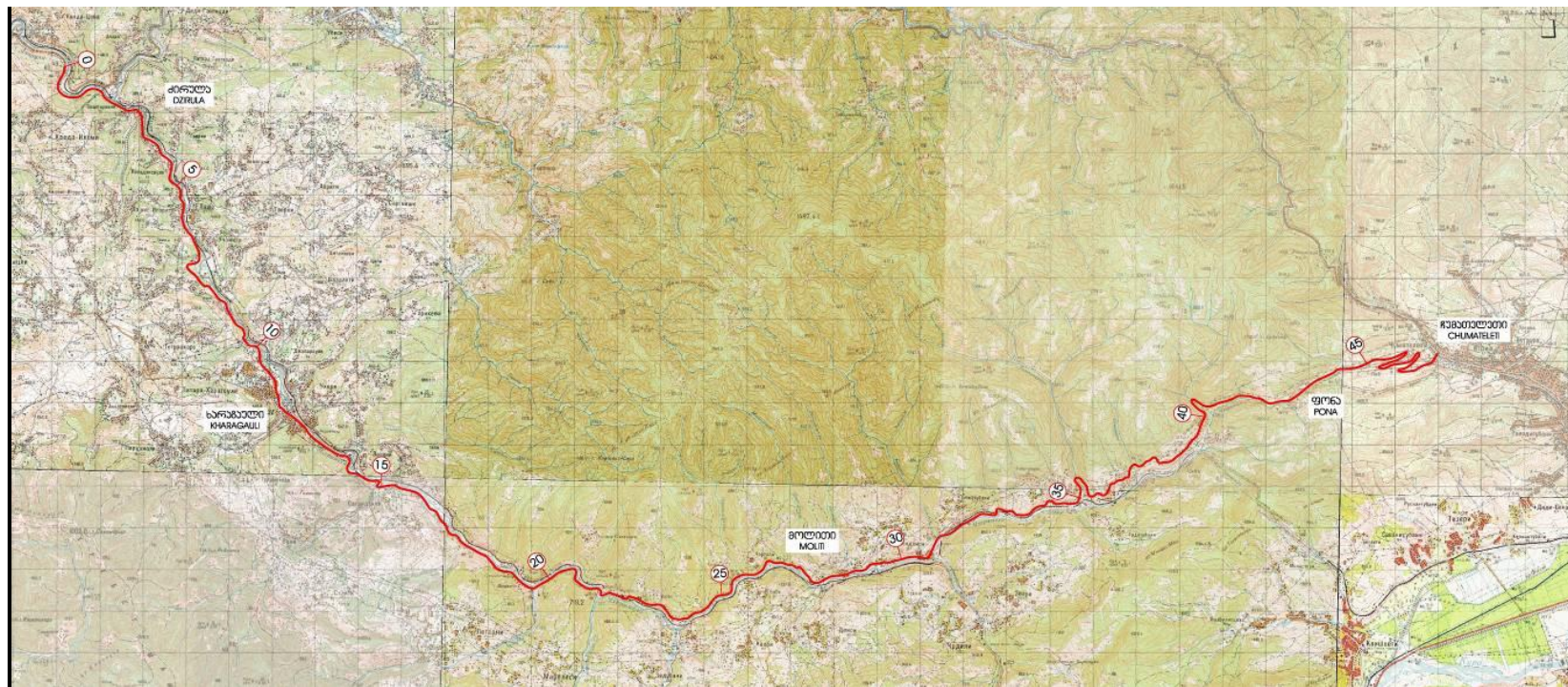


## ***INTERNATIONAL EXPERIENCE***

 **Projects 2015:** Afghanistan, Albania, Algeria, Armenia, Azerbaijan, China, Croatia, Cyprus, Ethiopia, Ghana, Georgia, Hungary, Iran, Iraq, Kazakhstan, Kenya, Kosovo, Kyrgyzstan, Luxembourg, Maldives, Malta, Moldova, Montenegro, Poland, Rumania, Russia, Senegal, Serbia, Spain, Sweden, Tajikistan, Tanzania, Turkey, Turkmenistan, Yemen, Zambia

 **Projects since 1946 (experience in the past 67 years)**

# ADB Project TA-8411 GEO: Secondary Road Improvement Project



## Objectives :

Improvement of the national connectivity and reliability of the transport network by serving as an alternative route to the highway E60 and the railway.

Improvement of the mobility of the municipality's population

## Main Outputs:

50 km of the rehabilitated road from Dzirula to Chumateleti, improved regional connectivity and feasible alternative route for the East West highway, and improved road safety.

Pilot GIS for project preparation, road design, construction, maintenance and operation

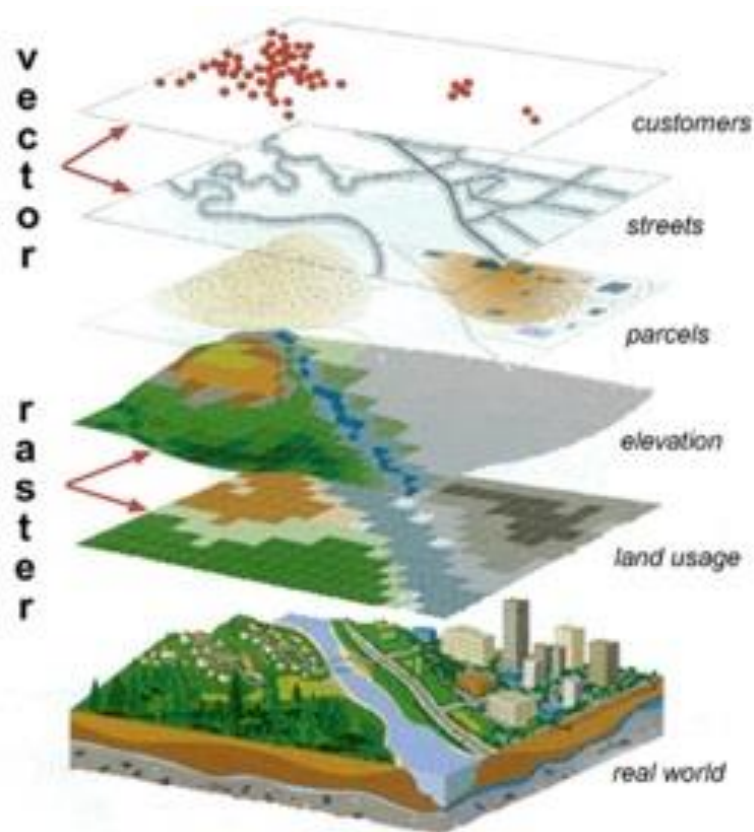
# GIS Objectives

## GIS Objectives

TA /TOR: The objective is to **provide a pilot GIS**, which can be used to compile and use data for project preparation, road design, construction, maintenance and operation.

- **To bring forth the importance of the need for data and systems integration within Road Department and Ministry of Transport**
- To point out the advantages of **GIS in transport projects**; and
- To explore potential **applications and benefits for users and beneficiaries of GIS in transportation**.

# Data Capture and Integration



20 data items from various sources have been collected as a basis incl.:

- Topographical Maps
- Aerial Photographs
- Digital elevation data
- Environmental baseline survey
- Social survey data
- Cadaster data
- Hydrological data
- Culvert inventory data
- Bridge inventory and condition data
- Utilities

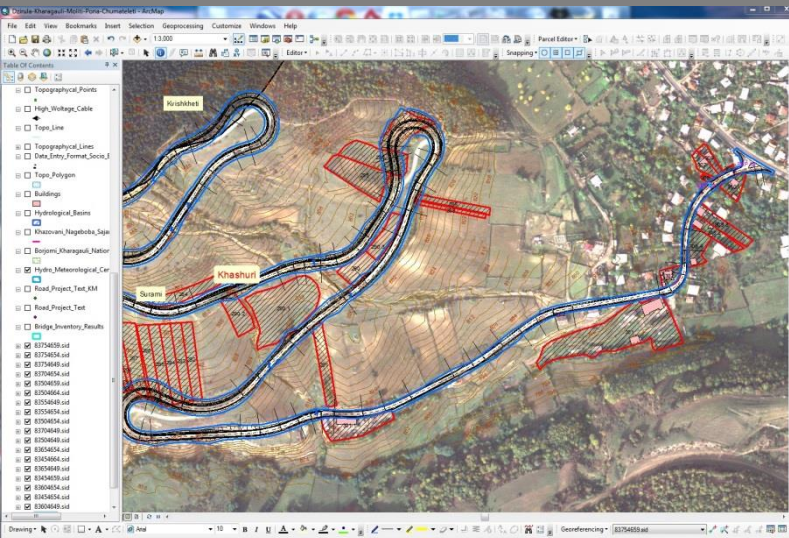
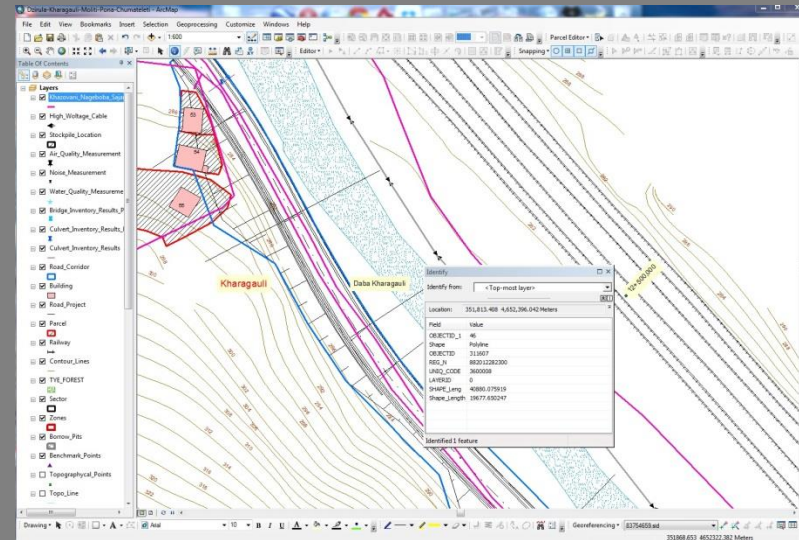
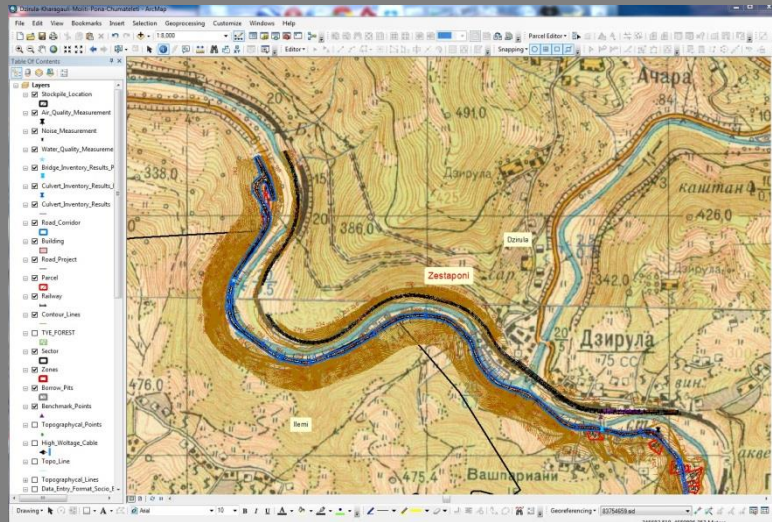
**Main Challenge: obtaining & synchronizing data from different sources**

# Role of GIS in Transport

## Application of GIS in Transportation Projects:

- Road Design / Alignment Selection
- Asset Management
- Land Management
- Traffic Safety
- Environmental Monitoring
- Transportation Routing
- Land Use changes

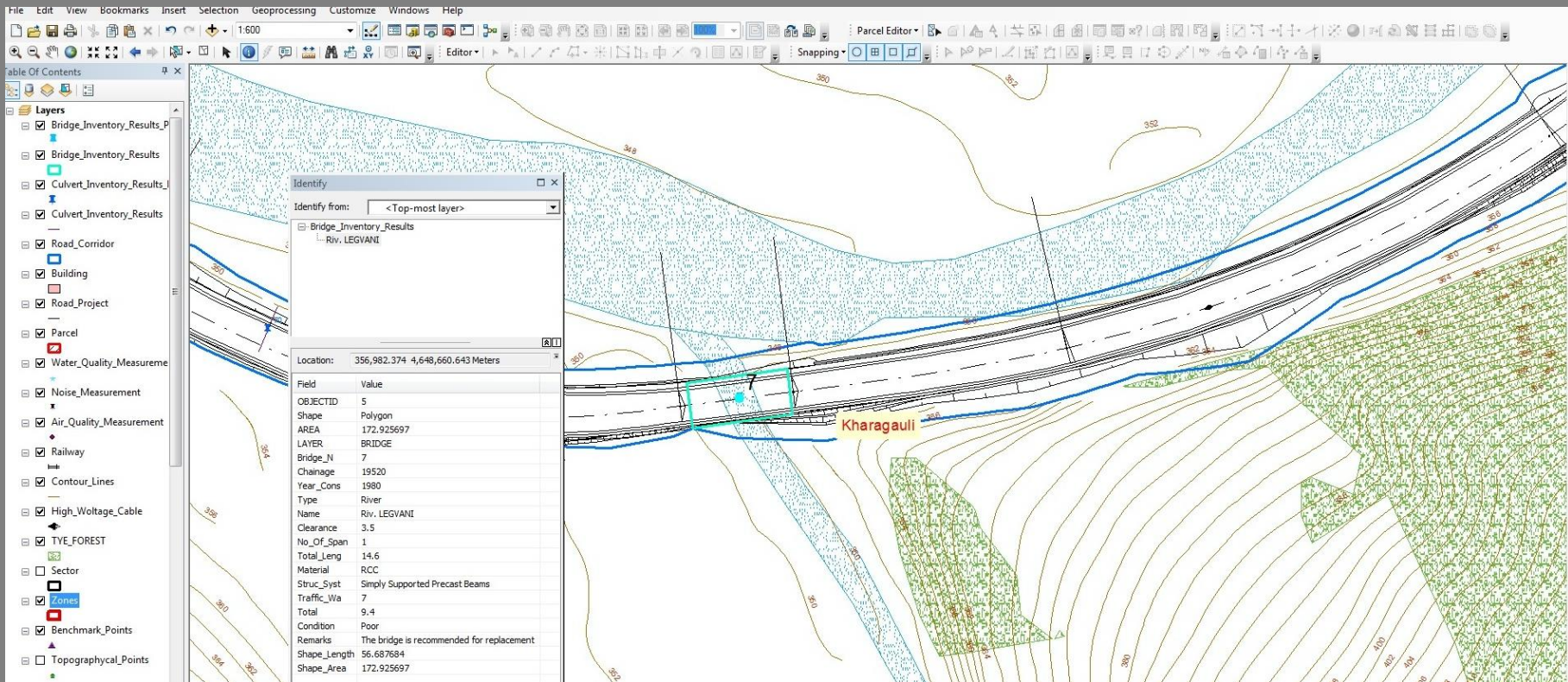
# Road Design / Alignment Selection



- GIS provides **digital terrain model** for road design
- Aerial photographs provide a **visual feedback** for the designer
- Cadaster data helps the designer to **minimise (private) land acquisition**
- **Utilities** are considered in early project stage



# Road Asset Management



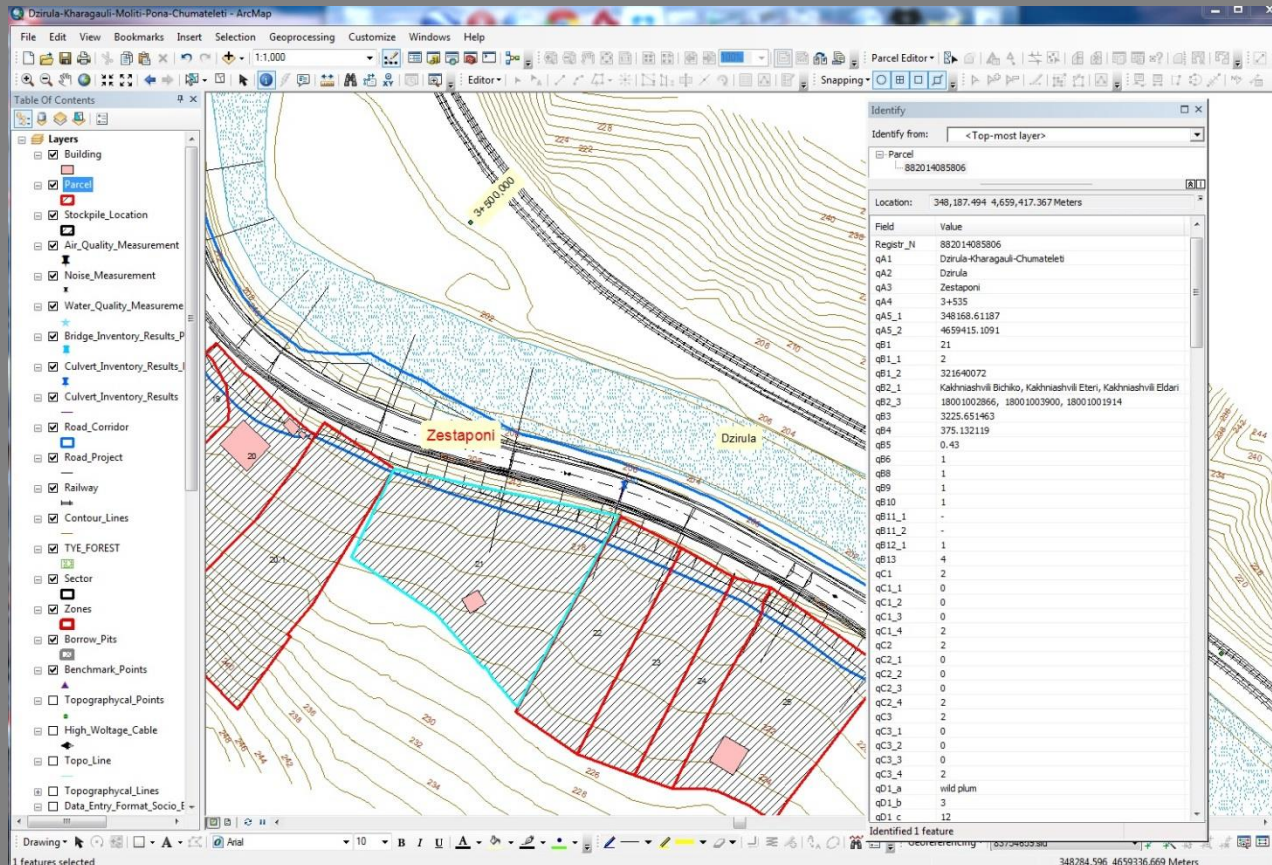
In GIS included

- Culvert inventory
- Bridge inventory and condition
- Display of objects and underlying data

Other assets can be incorporated at later stages

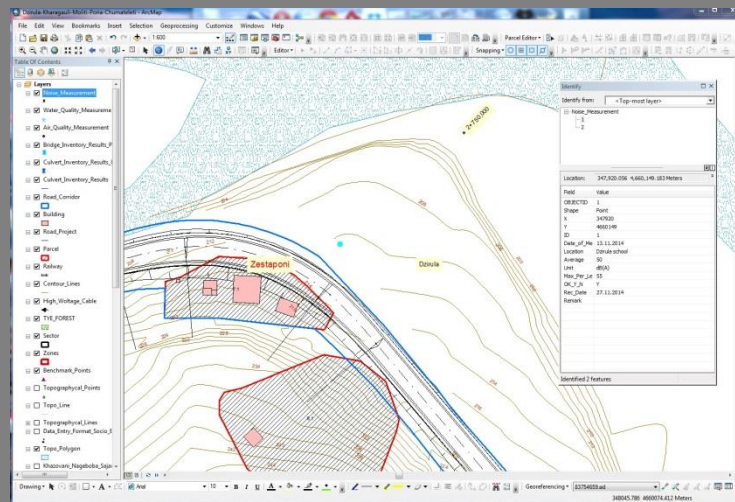
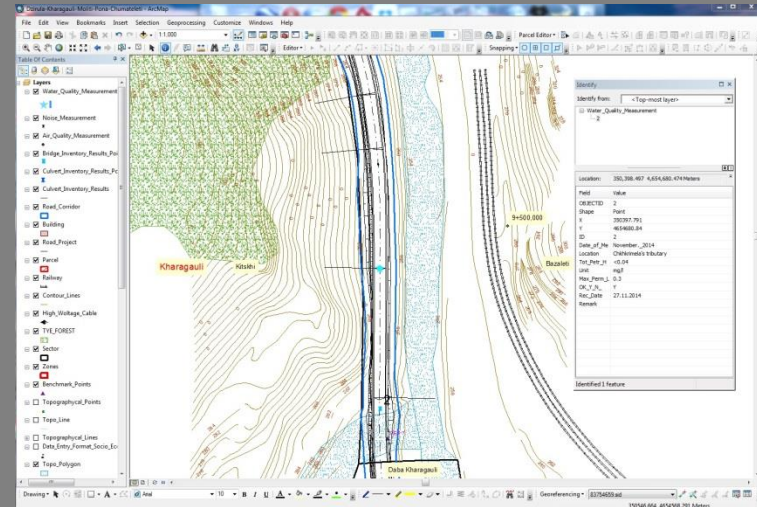
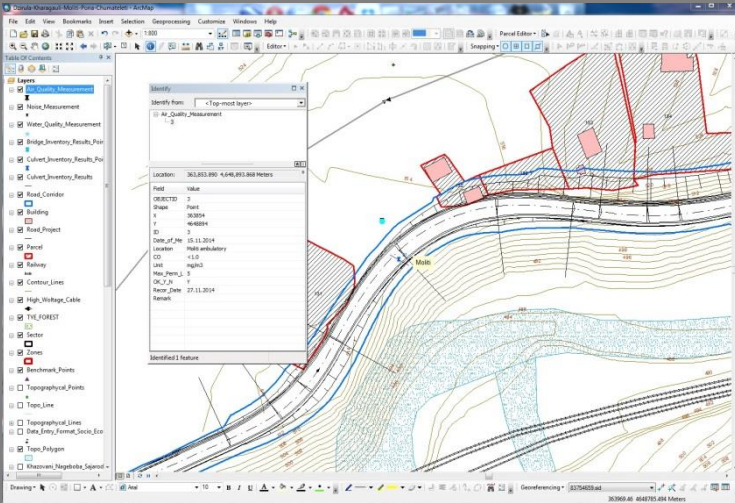
- Pavement structure and condition
- Road furniture
- Retaining wall inventory and condition

# Cadaster Issues & Land Management



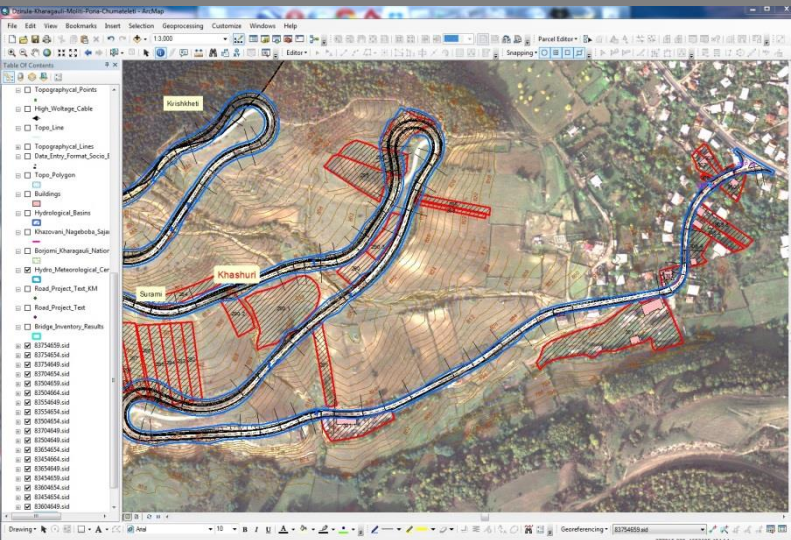
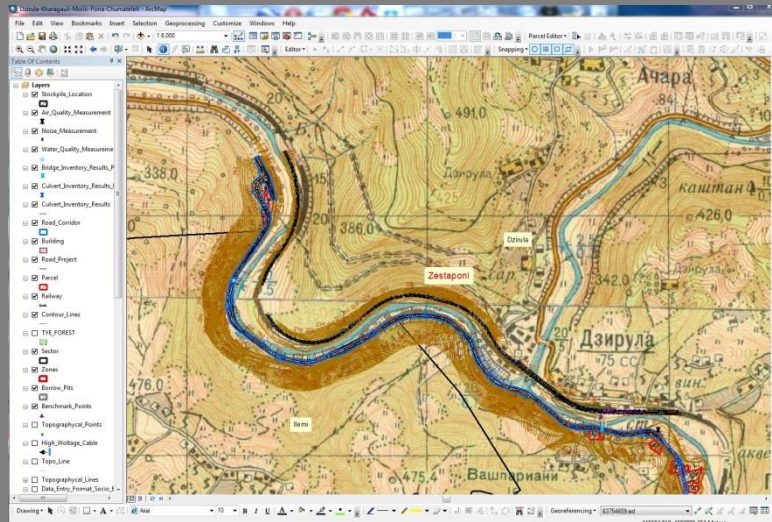
- Recording and managing land and property
- Identifying land owners
- Identifying land needs
- Verification of cadastral borders

# Environmental Monitoring



- Environmental monitoring is the process of determining the various data of environmental quality.
- Environmental baseline data in GIS includes noise, air and water quality

# Cost and Input in the project



- Base data was to be collected, generated and compiled for the TA (anyway)
- GIS compilation requires additional resources
  - GIS expert
  - staff time (depending on level of detail and available raw formats)
  - GIS software
  - add. Hardware depending on project size & content
- Downstream maintenance costs (outside our project)

# Main Benefits

## For the Client

- Improved information management facilitates more efficient decision making (e.g. alignment assessment, maintenance monitoring, accident analysis and mitigation)
- Facilitates public consultation
- Spatially displays project induced risks and aids in the development of alternatives and mitigation plans

## For the Public

- Visualization aids public understanding
- If available in public domain GIS data aids transparency and public acceptance

## For the Designer:

- Integrated data highlight potential problems and facilitate finding design solutions

## For 3<sup>rd</sup> Parties (potentially commercial)

- Ability to carry out “what if?” scenarios for e.g. warehouse location, access roads, transport planning (goods & people)

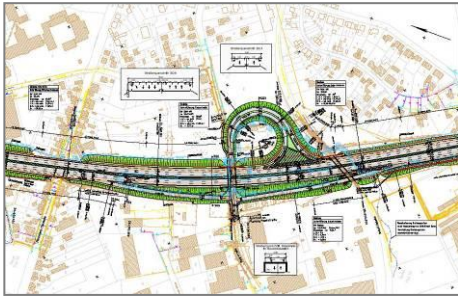
# Risks in Implementation of GIS

GIS is used for over two decades, but there are still certain risks for successful implementation:

- Insufficient data available to properly use or compile the GIS
- Insufficient resources allocated for GIS development, maintenance, and upgrading of the system (follow on costs)
- Lack of communication between developers, users and beneficiaries
- Strength, but also weaknesses of GIS are often unrecognized by decision-makers

Thank you for your attention.

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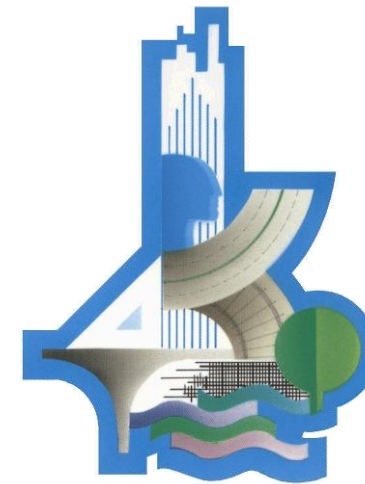
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