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Knowledge Sharing Workshop on Road Asset Management Systems

October 6, 2021

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- Annual planning cycle
- Challenges/Solutions
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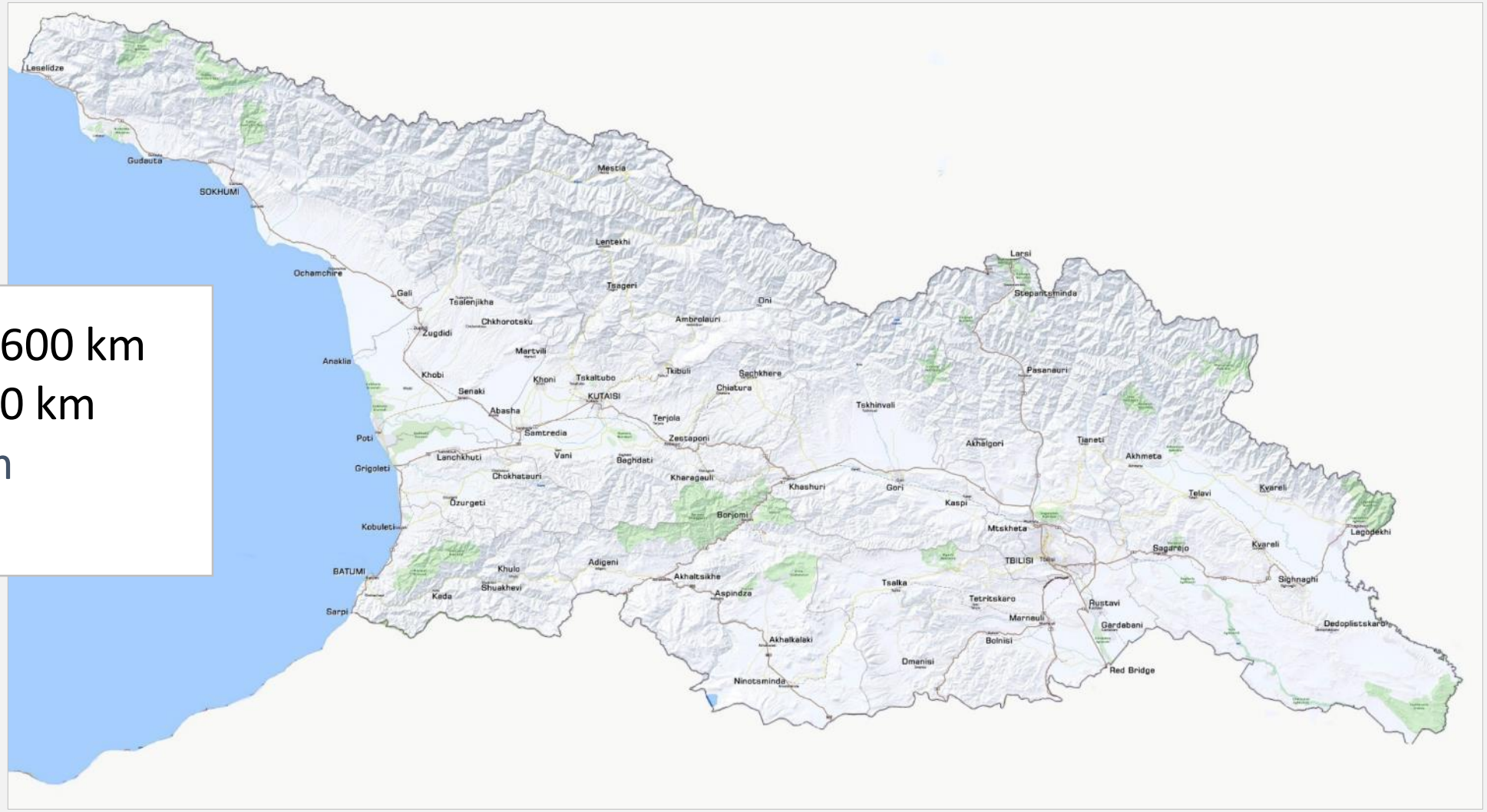
Road Network

International - 1 600 km
Secondary - 5 300 km
Local - 13 000 km
Total: 20 000 Km



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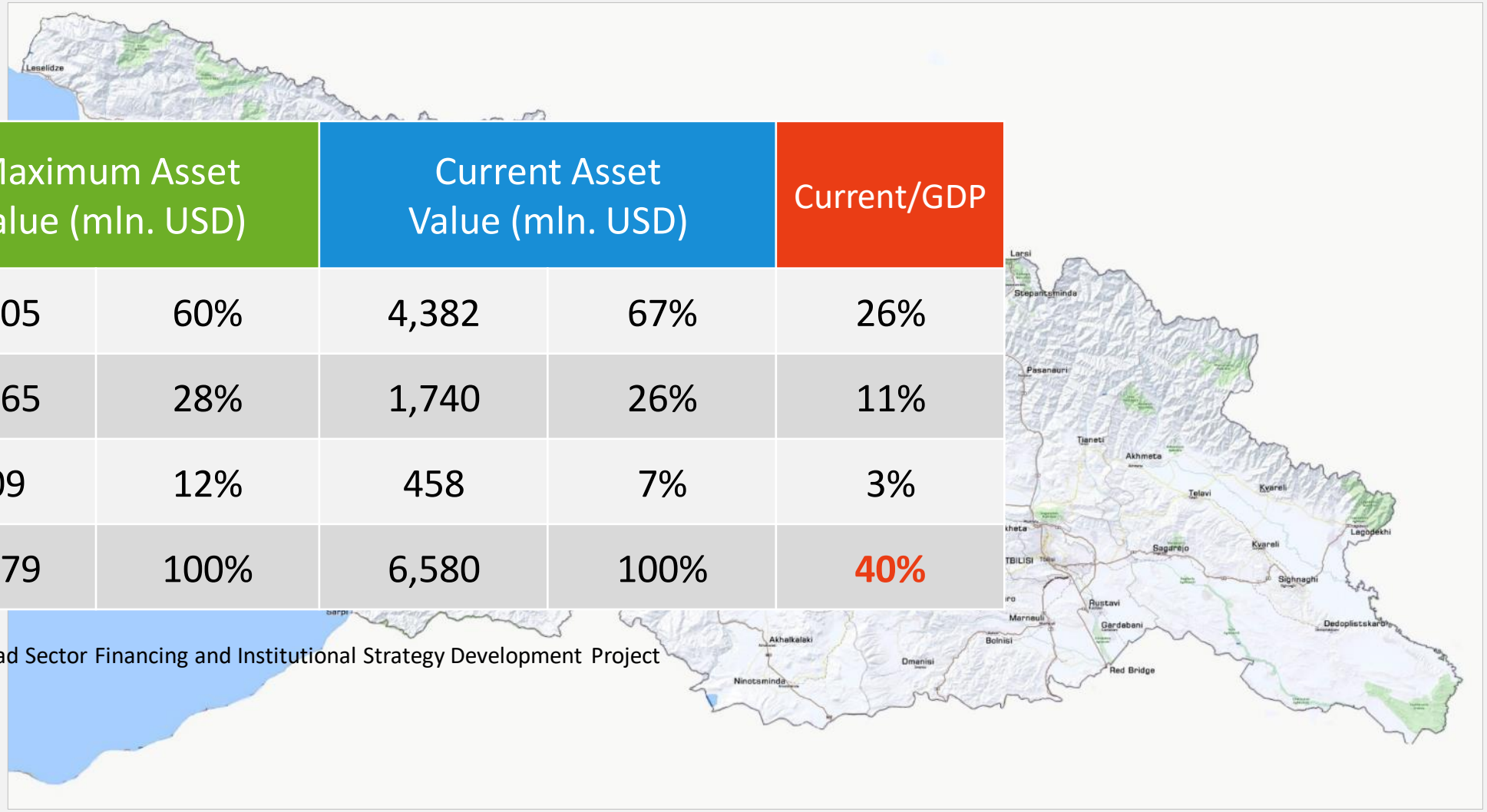
Asset Value

Road Network	Maximum Asset Value (mln. USD)		Current Asset Value (mln. USD)		Current/GDP
International	4,505	60%	4,382	67%	26%
Secondary	2,065	28%	1,740	26%	11%
Local	909	12%	458	7%	3%
Total:	7,479	100%	6,580	100%	**40%**

Source: WB RONET study under Road Sector Financing and Institutional Strategy Development Project



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Georgia RAMS development overview

2007 - 2021

Enhancement of Georgia RAMS started in 2007 and Initial steps included data collection equipment and data processing tools.

Enabling simple analysis such as overall road network condition in terms if IRI, identification of roads with high traffic and roughness,
Rough estimation of network backlog, etc.

Later HDM4 tool for multi year planning based on life-cycle cost benefit analysis was introduced.

Enabling better estimation of network backlog and prioritization of investment works based on economic indicators.

All related activities including data collection where done in-house

At this stage, pilot 5 year OPRC project was initiated.

Service level requirements were developed

Data collection equipment upgraded to facilitate monitoring of OPRC contract

As the condition of road network was getting better, just economic indicators were not sufficient to prioritize low traffic roads.

Additional indicators for multi-year planning was introduced.

Guideline documents were developed for preparation and update of multi year plan

To facilitate preparation of safety improvement plans, Georgia implemented iRAP methodology.

Data collection equipment was upgraded to support iRAP requirements

Staff has been trained and accredited

RD carries out iRAP assessment inhouse.

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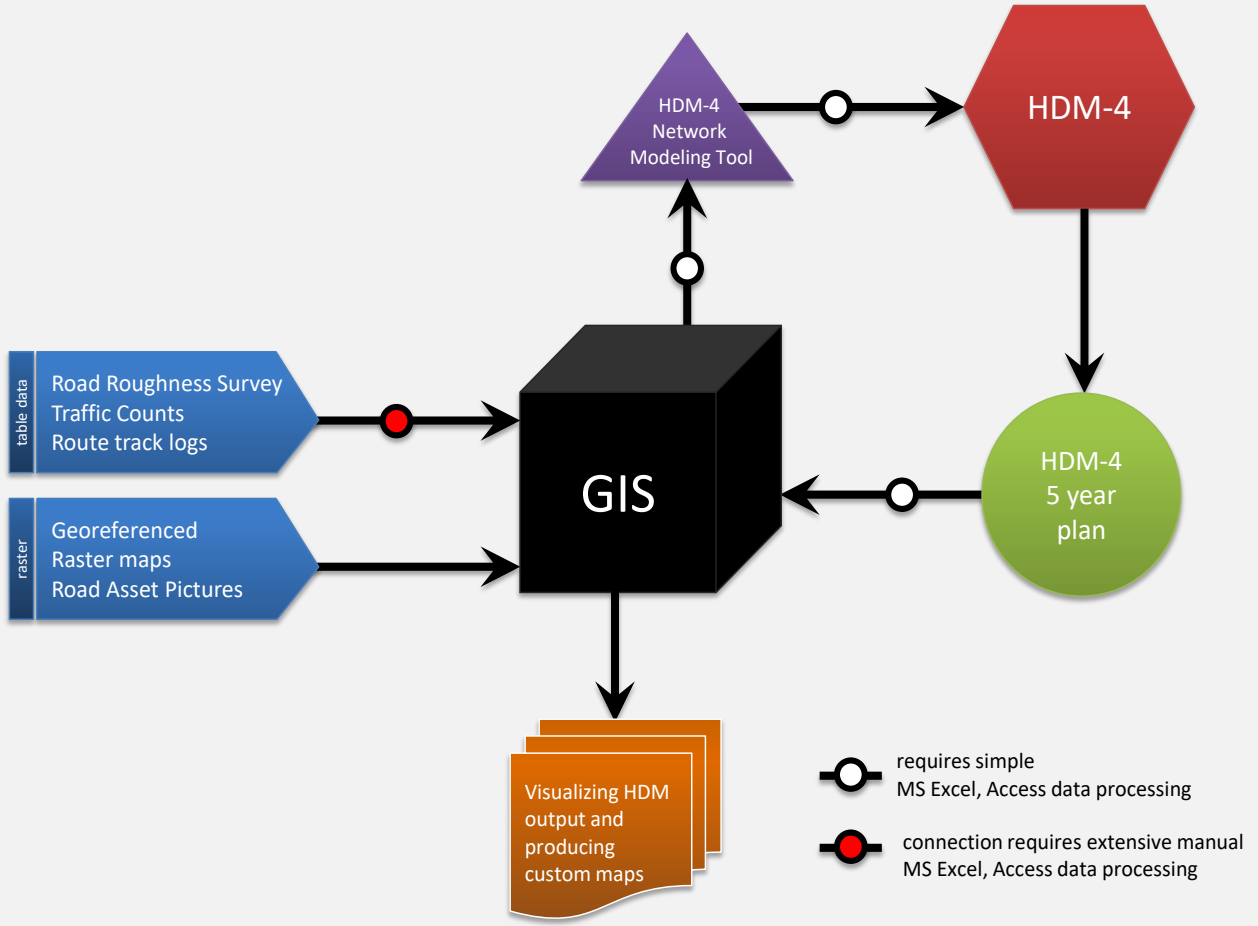
RAMS Operation

- Data collection, operation and maintenance of road asset management systems and planning is carried out in-house by Planning Unit within Roads Department of Georgia.
- Unit comprises of data collection specialists, GIS/CAD/HDM4 specialists and road engineers.
- Total number of personnel – 8

Systems:

- Data collection - ROMDAS system
- Asset management information system – ESRI GIS
- Multi year programming, life cycle cost benefit analysis - HDM-4



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Data Collection

Annual data collection:

- Traffic counts with automated radar equipment – around 200 locations.
- IRI surveys on all international and secondary roads with IRI < 8
- 360 Degree video logs for iRAP coding and visual assessment
- Road Geometry, GPS data, Odometer chainage data.

External data:

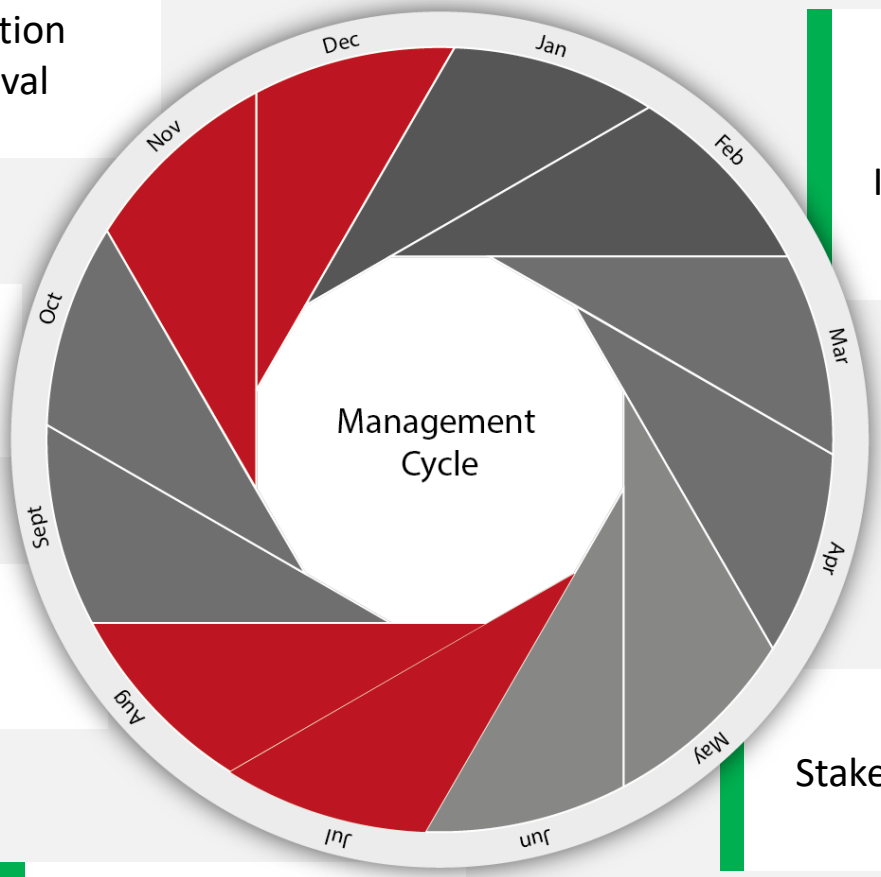
- Accident data for ministry of internal affairs
- Border crossing, transit data from customs
- Population and census data from national statistics office of Georgia
- Information from municipalities, tourism and agriculture.

RAMS – Annual Planning Cycle

Follow up and Evaluation
Budgeting and approval

Annual data collection
Inventory, Road condition, traffic etc.

Preparation and approval
of next year plan



Preparation of
multi year program

Stakeholders inputs

Data Processing

RAMS – Multi year program steps

1. Annual data collection
2. Structuring the available data, using GIS data base and Network modelling tool
3. Defining Maintenance Strategies and unit costs
4. Conducting HDM4, program analysis (life cycle)
5. Using the HDM-4 unconstrained solution
6. Assigning non-monetary Indicators using GIS spatial analysis
7. Preparation of a 5 year program of prioritized road project candidates, based on benefit- cost ratio (NPV/C), population density and other non-monetary indicators.
8. Preparation of project list and thematic maps for engineers to prioritize and apply budget constraints
9. Preparation of project fact sheets for the selected projects for next year

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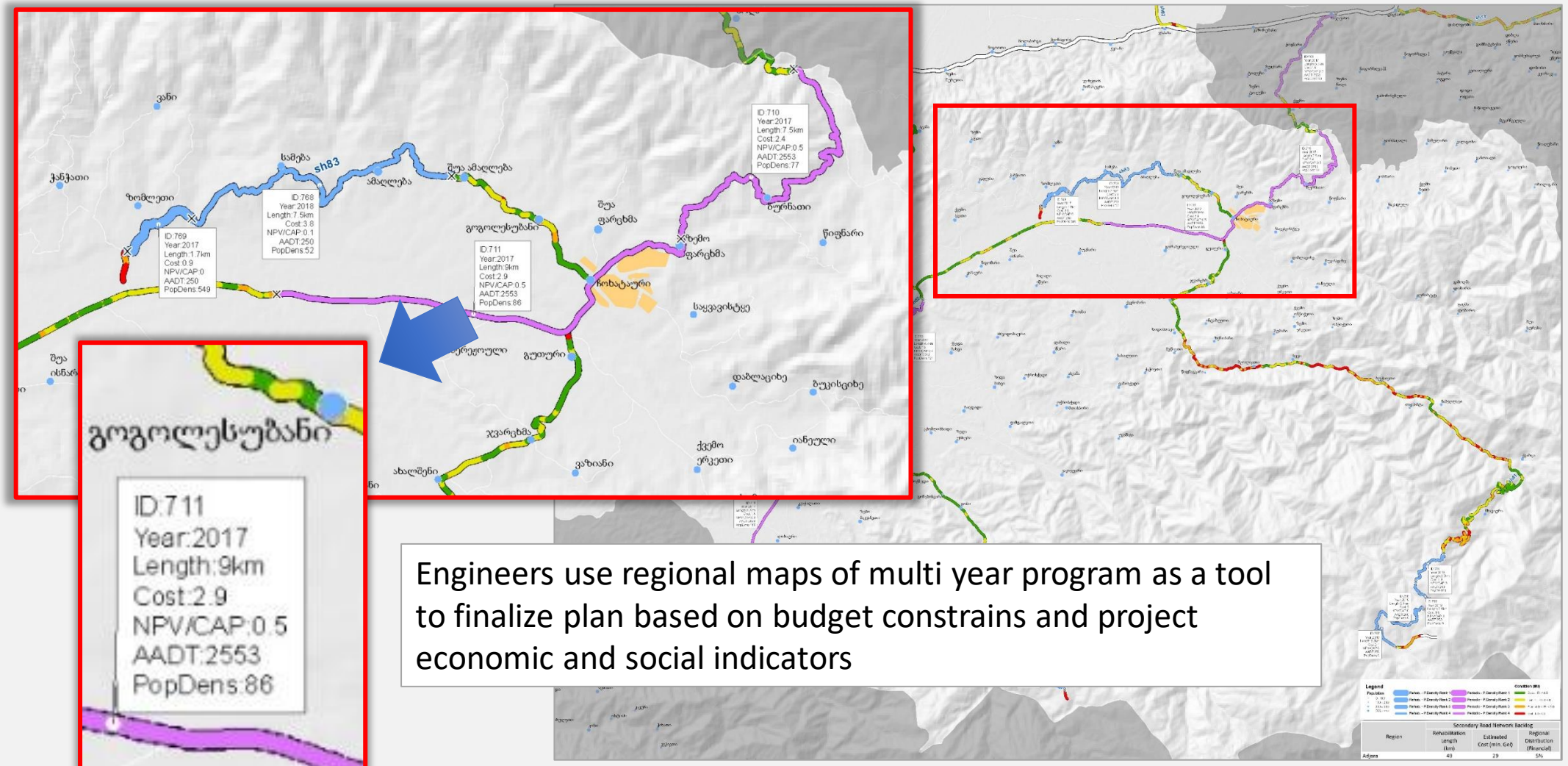
Program maps



Engineers use regional maps of multi year program as a tool to finalize plan based on budget constrains and project economic and social indicators

Project Fact-Sheet

Project name, description and rationale for prioritization

Main indicators NPV/CAP, Population Density

Secondary Indicators assessing mobility and social impact

Project area map, road condition

Rehabilitation of: Sh37 Sadakhlo-Tsopi-Askhepi secondary road km3-km8 Section

Project Description

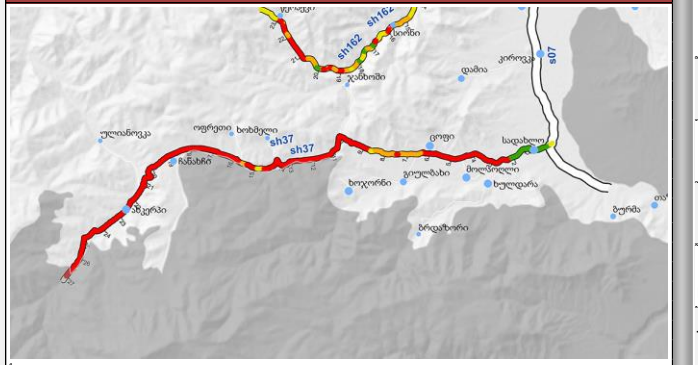
Following road section is part of rolling program for year 2018, section connects international road S07 Marneuli-Sadakhlo to Armenia border and provides access to social services to more than 1500 people. Road is considered importan in terms of Agriculture as well as providing minimum standard of mobility and integration.

Utilization		Class	Economic Indicators (mln. Gel) / Road Works			
Traffic (AADT)	250	1	Total Capital Cost	3.0	Pavement str	
Heavy Vehicles (%)	2.5		NPV	0.14	Bridge/Culver	
[1]Condition	10.91	4	NPV/Cost Ratio	0.03	Traffic Safety	n/a
[2]Population Density	227	4	Cost/Pop. Ratio	0.002	Environment	n/a

Socio Economic Impact Assesment

Objective	Indicator	Unit
Enhanced National Connectivity	Part of Secondary Road connecting two international roads.	N
Enhanced Regional Connectivity	Distance from the centre of section to closest city centre.	34km
Enhanced economic activities	Number of registered businesses in the district where the section is	
Population	Number of people living within 2km buffer along the road section.	
Education	Number of schools within 2 km buffer along the road section.	7
Tourism	Number of attraction within 2 km buffer along the road section.	2
Poverty	Percentage of people receiving government support within district where road section is located.	n/a
Life Line Road	The road is the only possibility for connecting the village to outside world.	y

Project Area Map



[1]Description of Condition Classes (Good, Fair; poor and Bad) is found in Chapter 4, section 1.1
[2]Number of persons/2km buffer from the homogenous section divided by section length

Economic Indicators	
Total Capital Cost	3.0
NPV	0.14
NPV/Cost Ratio	0.03
Cost/Pop. Ratio	0.002

Part of Secondary Road connecting two international roads.	N
Distance from the centre of section to closest city centre.	34km
Number of registered businesses in the district where the section is located.	347
Number of people living within 2km buffer along the road section.	1520
Number of schools within 2 km buffer along the road section.	7
Number of attraction within 2 km buffer along the road section.	2
Percentage of people receiving government support within district where road section is located.	n/a
The road is the only possibility for connecting the village to outside world.	y

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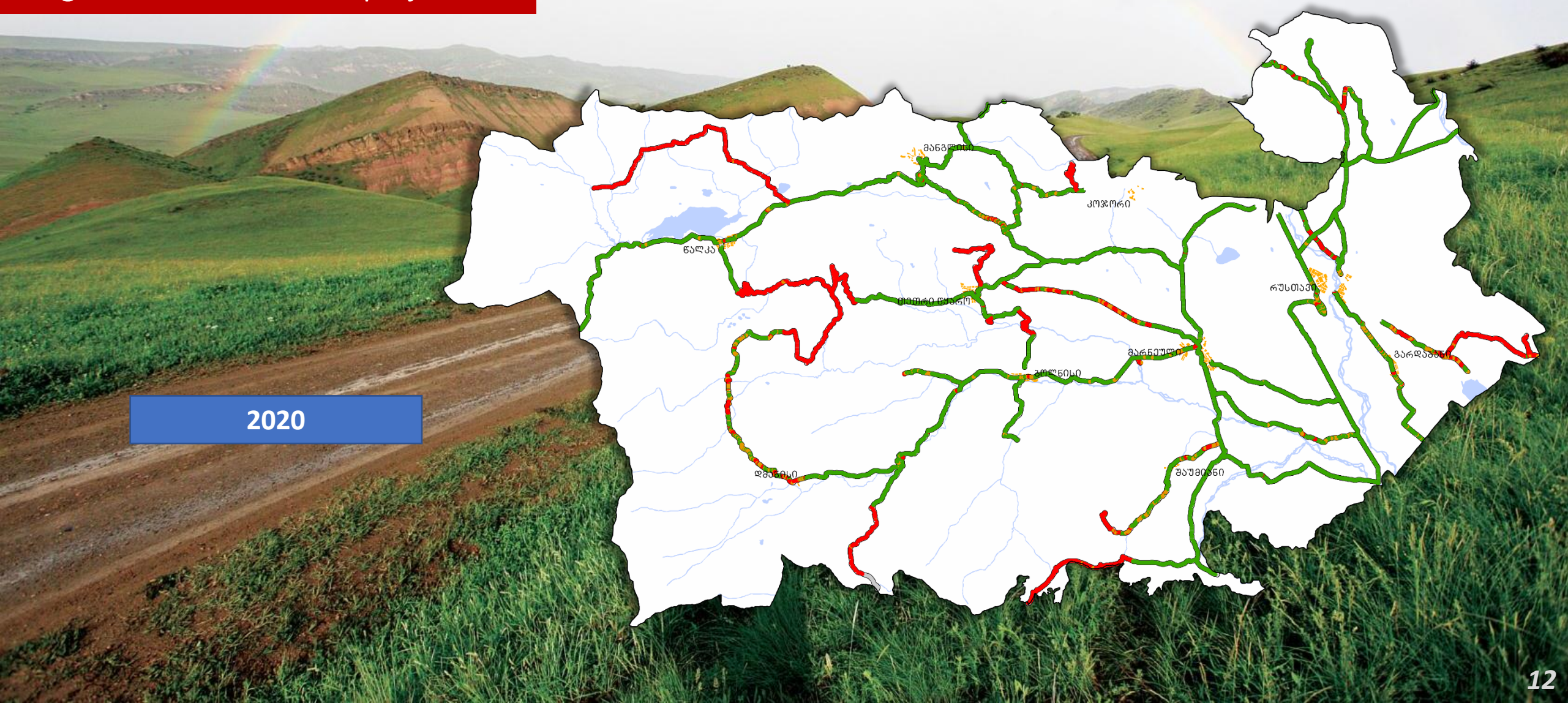
Long term asset condition projection



2020

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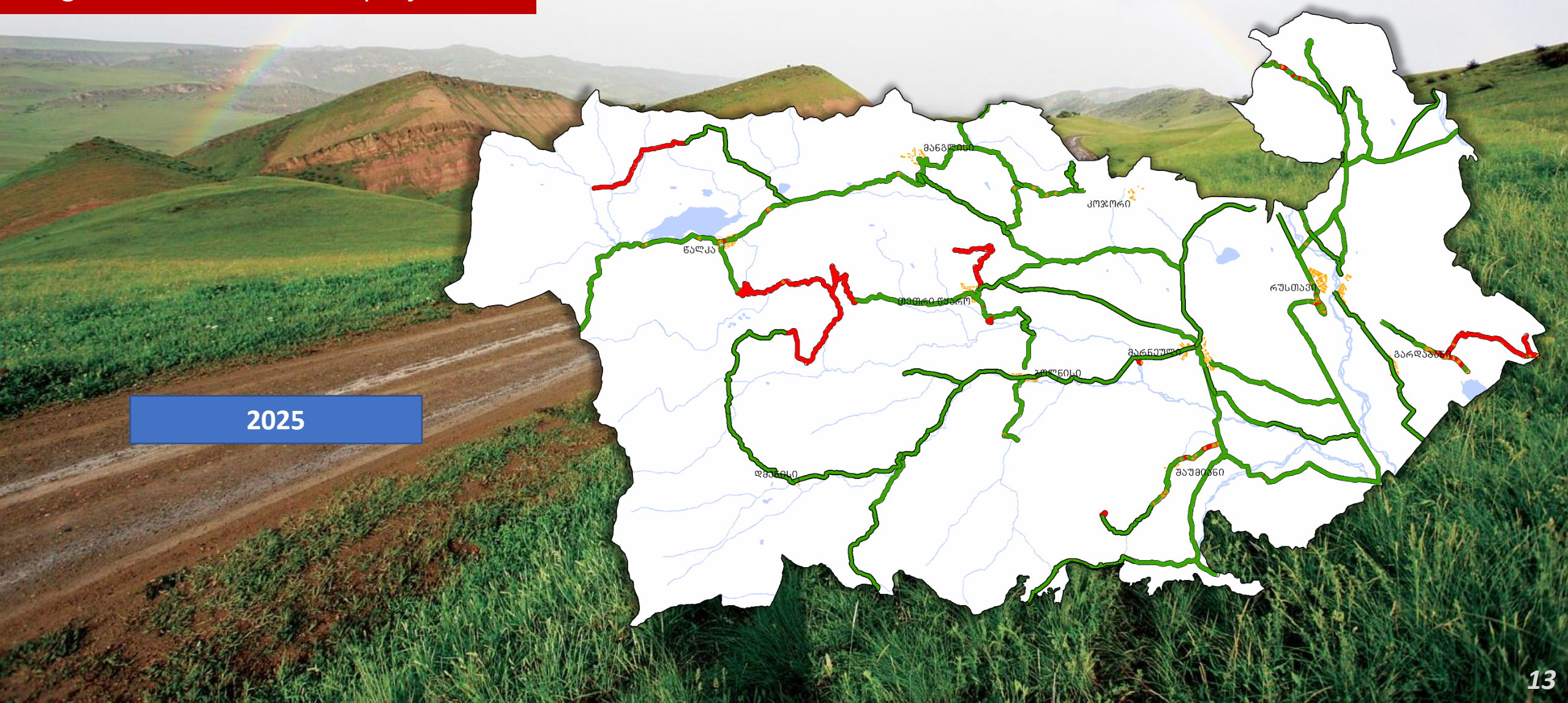
Long term asset condition projection



2025

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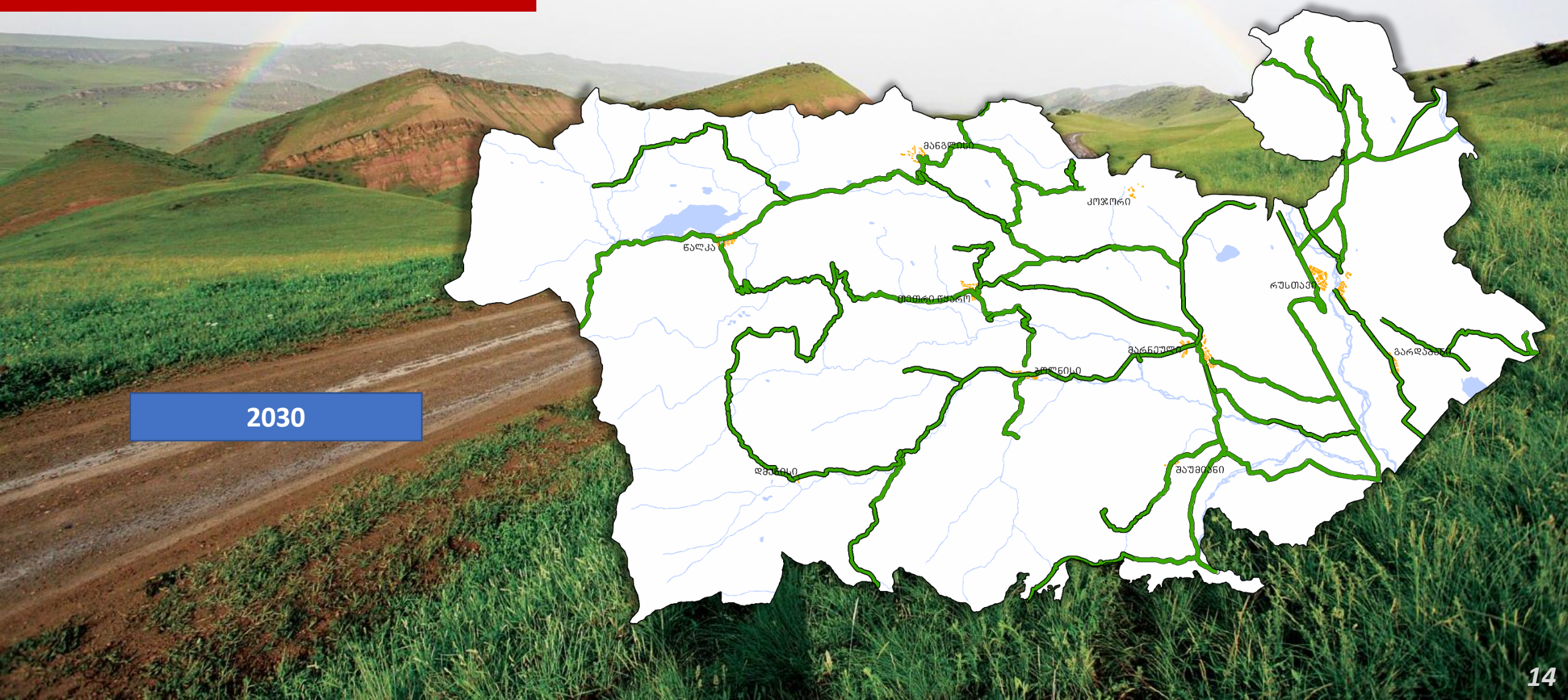
Long term asset condition projection

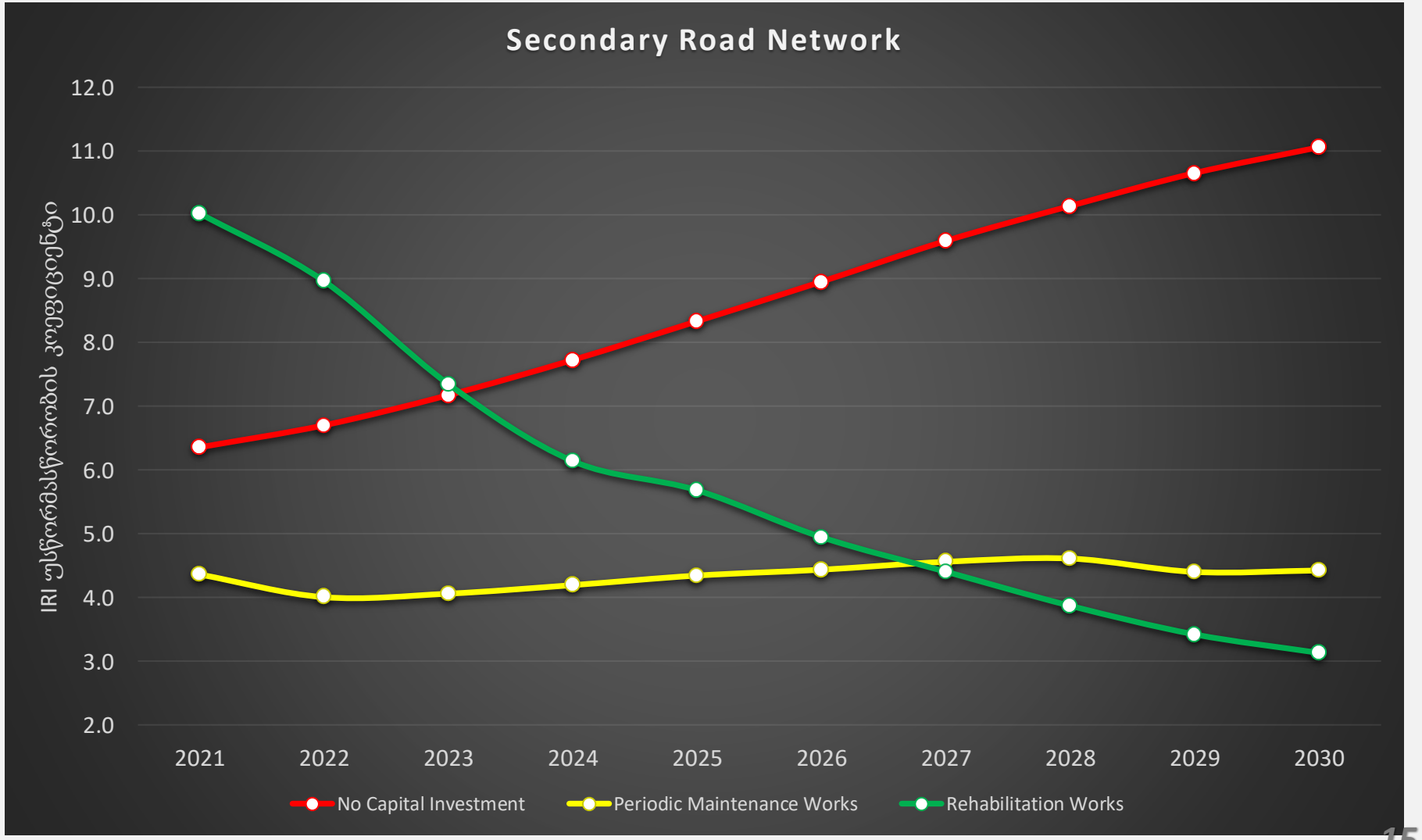


Long term asset condition projection

Total required investment on backlog recovery and maintenance:
2.9 bln. GEL

Total reduction in RUC as a result of investment: **15.5 bln. GEL**

Cost benefit ratio (CBR): **5.3**



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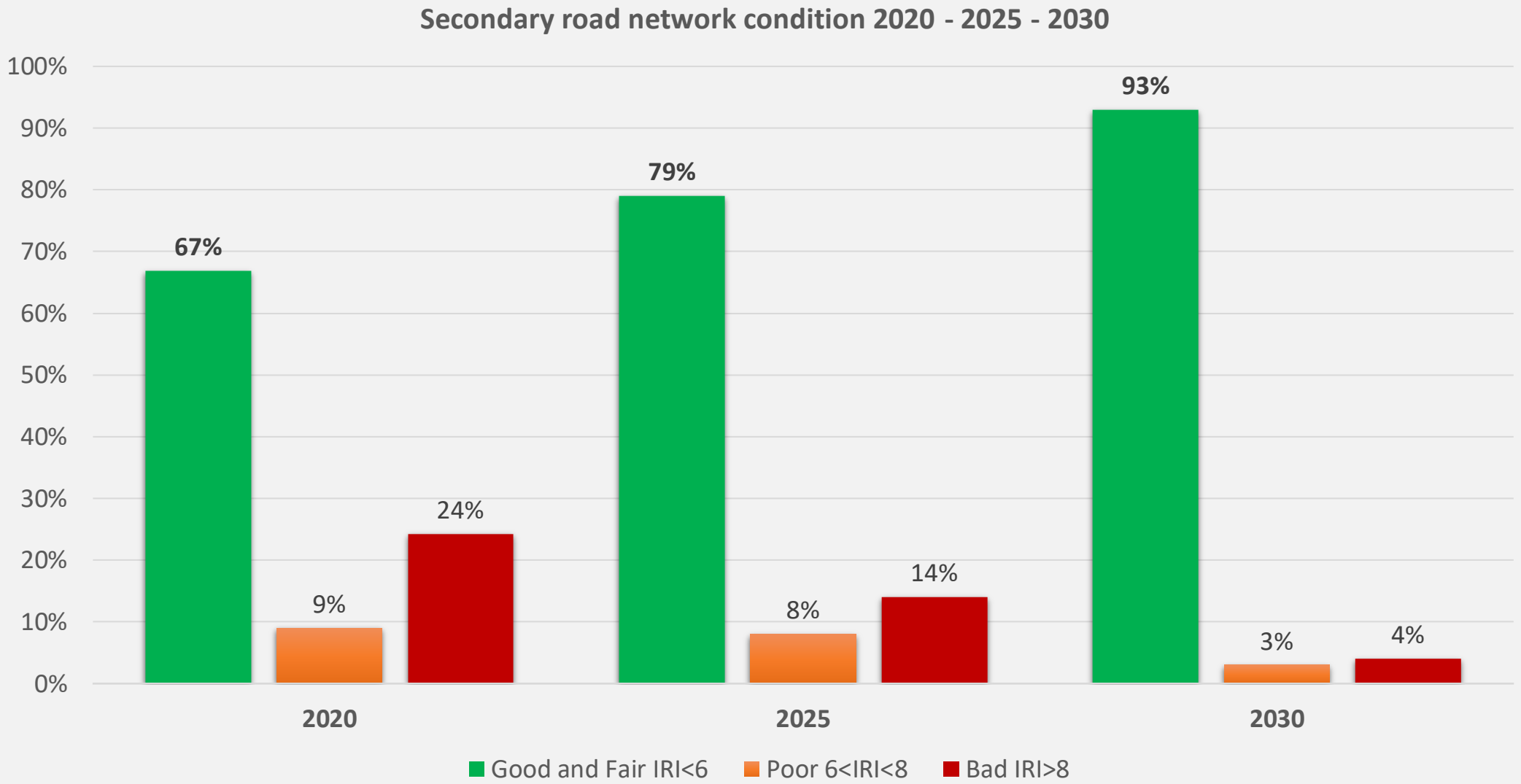
Long term asset condition projection



iRAP surveys

Coding Example

iRAP surveys

Coding Example

Challenges/Solutions

1. Challenges with long term sustainability of implemented systems and equipment and maintenance of human resource capacity

Was addressed by developing written guidelines and technical manuals in combination of video recordings of all capacity building and training activities – classroom videos + computer screen recordings.

2. Limited number of personnel for network level data collection and processing

Was addressed by focusing on only automated data collection and processing methodologies – such as high speed IRI measurements, GIS spatial analysis tools for automated data processing

3. Challenges with implementation of Pilot OPRC contract

Was addressed by conducting large scale workshops for the contractors on OPRC contracting

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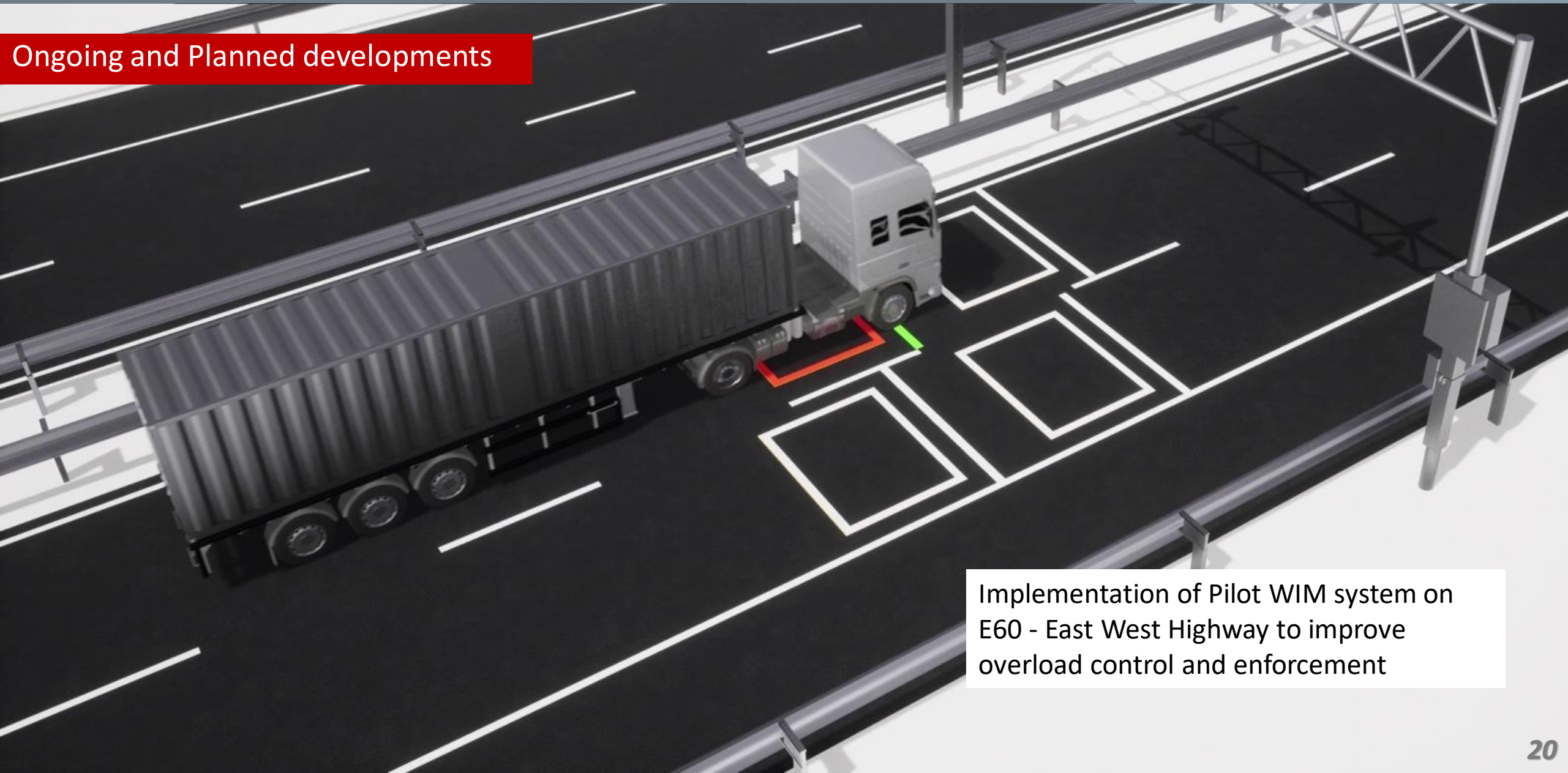
Ongoing and Planned developments



Implementation of Pilot WIM system on E60 - East West Highway to improve overload control and enforcement

Ongoing and Planned developments

Ongoing procurement of Drones for high resolution mapping and asset inspection

Main Objectives:

- Bridge Inspections
- Digital Terrain Mapping
- Monitoring of construction sites
- 3D reconstruction
- Calculation of cut/fill volumes
- Emergency response

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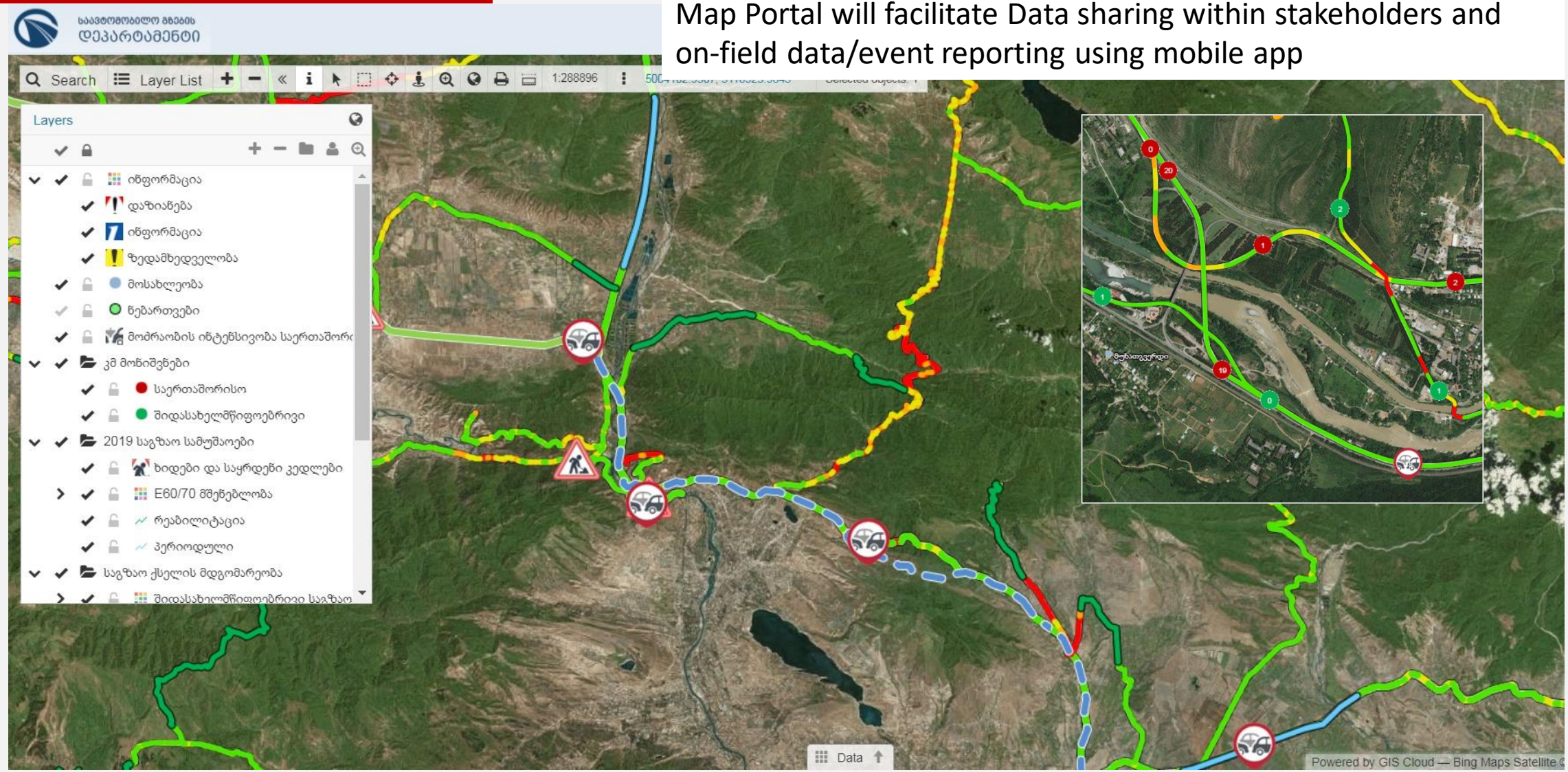
Ongoing and Planned developments

Implementation of cloud based GIS
Map Portal will facilitate Data sharing within stakeholders and on-field data/event reporting using mobile app



Thank you