

E-60 Highway Khevi-Ubisa-Shorapani-Argveta detailed design project – Boriti-Khevi section (F2)

Environmental Impact Assessment

Second Public Meeting

22 .02.2018



Objective of the project

- GoG is implemented a program for rehabilitation/upgrading of the main highways.
- **F2 – Boriti-Khevi, financial support from Asian Development Bank (ADB),**
- F3 – Kv.Tseva-Boriti, financial support from European Investment Bank (EIB),
- F4 – Argveta-Kv.Tseva, financial support from Japanese International Cooperation Agency (JICA).

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Need for EIA – national and Lender’s requirements

- **National legislation** – Construction of motor roads of international or intrastate significance, construction of tunnels and/or bridges located on the motor roads of international or intrastate significance required EIA.
- **IFI requirements** – The project belongs to Category A activity and requires full scale EIA.

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Participants

- ✓ Road Department is responsible for management of project;
- ✓ Detailed design is developed by consortium of Italian companies IRD-SPEA;
- ✓ EIA is developed by International consultant and Gamma Consulting Ltd team.

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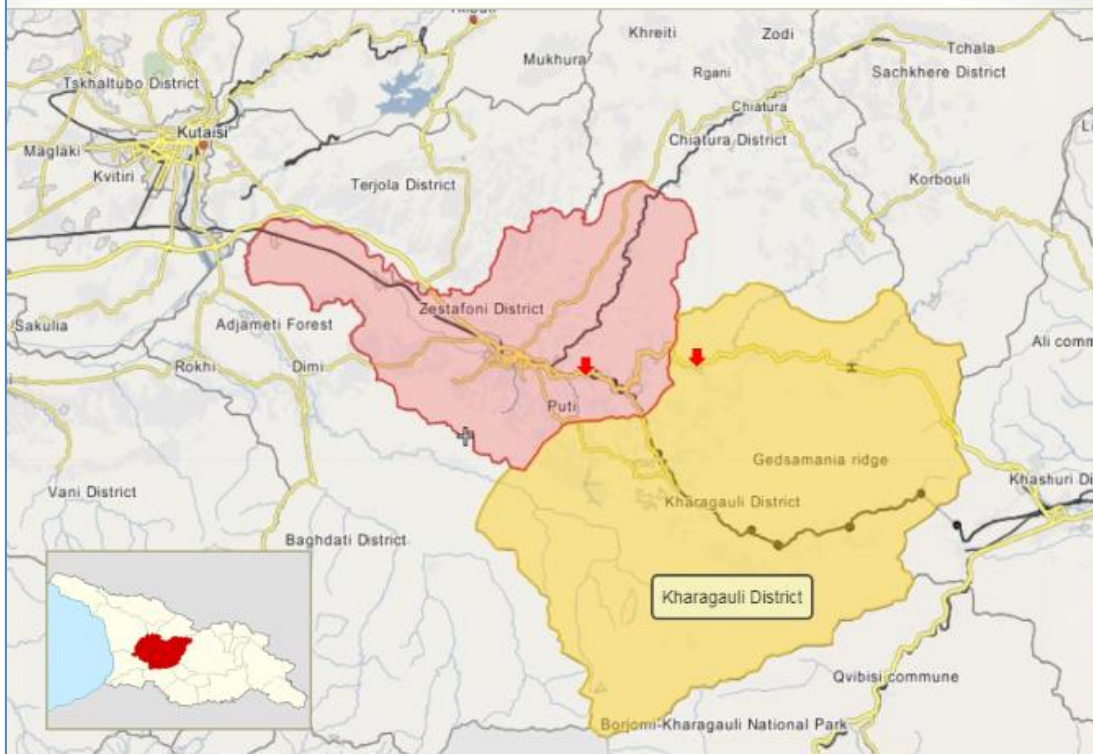
Alternatives

For selection of priority option the following alternatives have been considered:

- Zero (no action) alternative
- 3 optimised alternatives suggested on Feasibility study
- New alignment (within the boundary of the corridor proposed at FS)
- Pavement alternatives

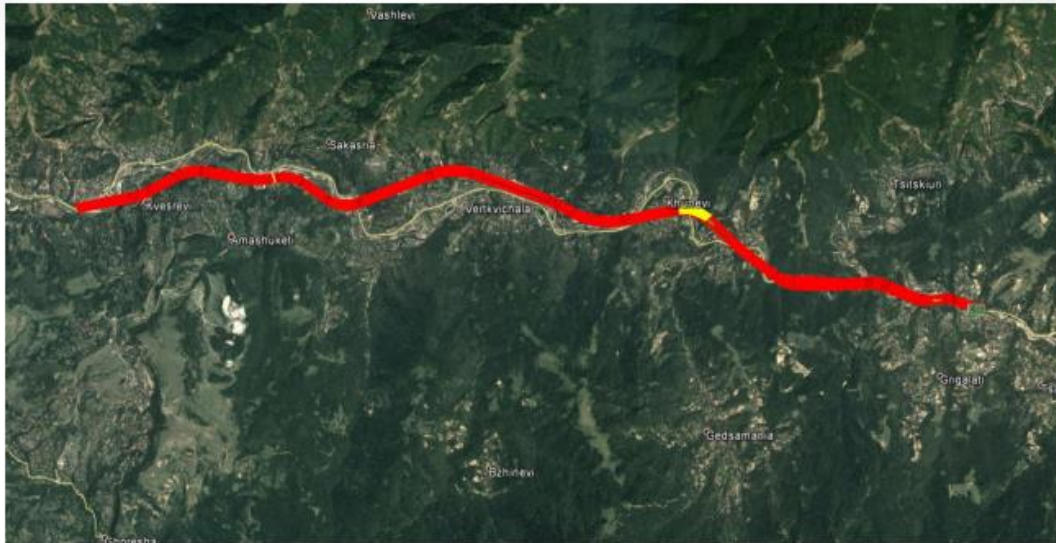
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Location of the project



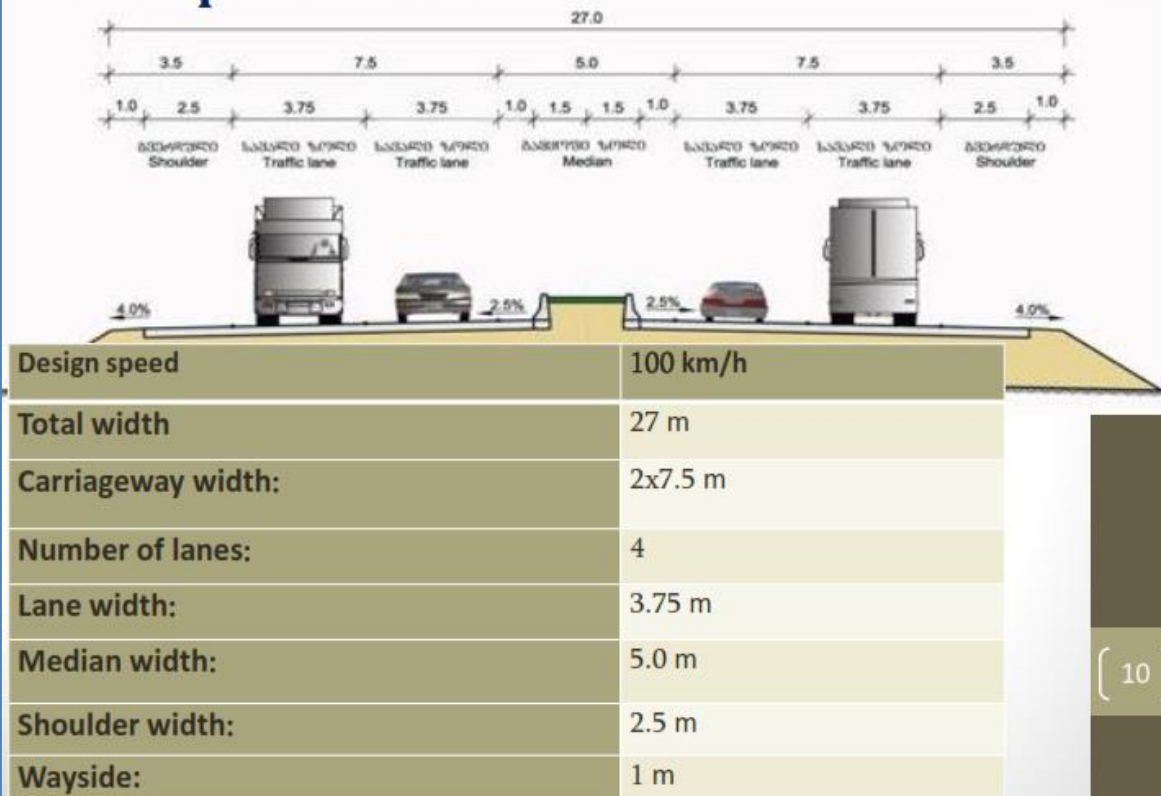
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Project description

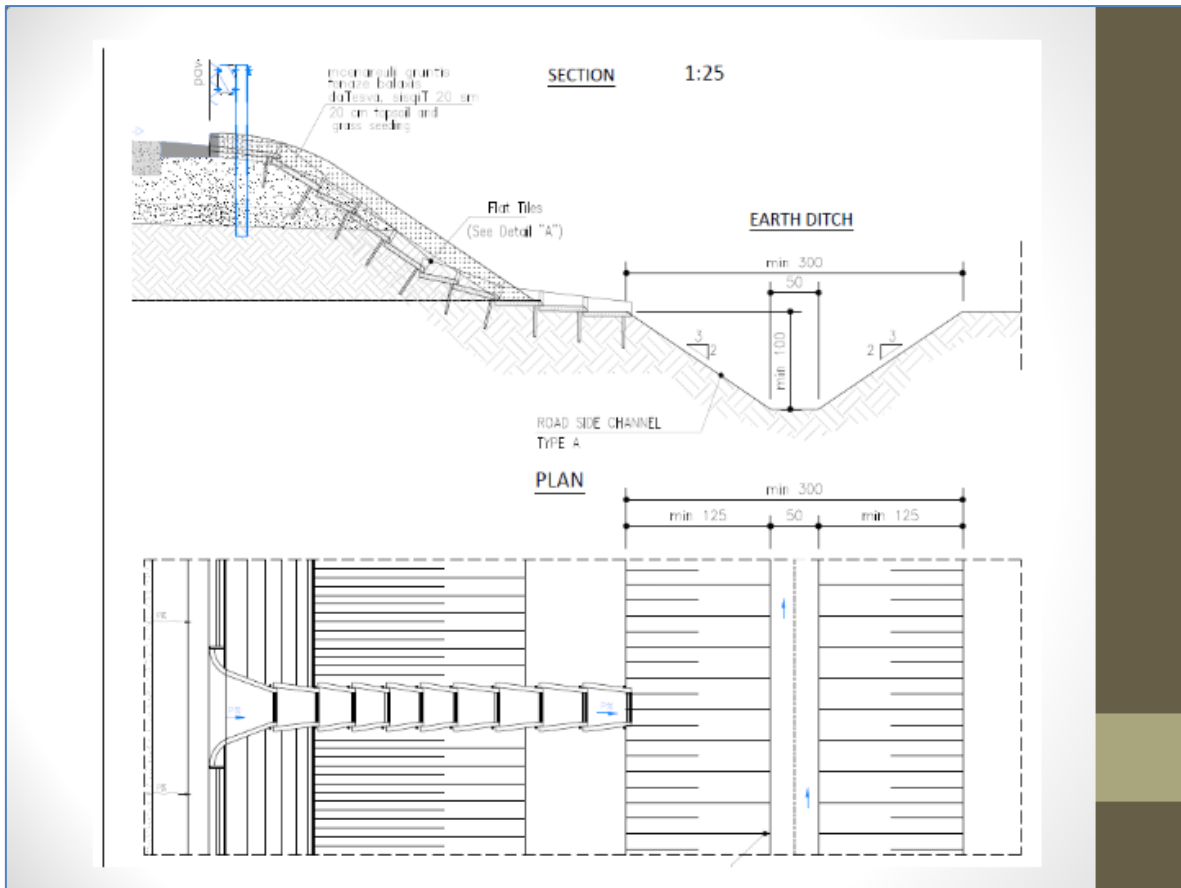


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Road parameters



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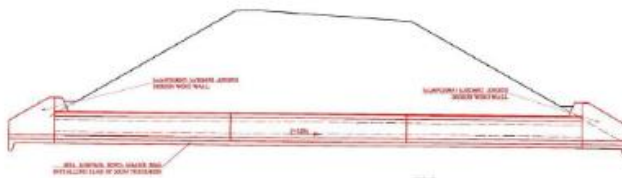


Pavement

N	Pavement layers	Thichness,mm
1	Cement-concrete	280
2	Gravel	300
3	Sand-gravel mis	300

Project description

- The main structures include:
 - Tunnels
 - Bridges (34 bridges; 16 AT and 18 TA direction)
 - Underpasses for local roads 6.0x4.5 m
 - Cattle passages: 4.0x2.5 m
 - Culverts: 2.0x2.5 m; 1x1m



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Project description

Length of the **tunnels**:

- Argveta-Tbilisi direction - **5645** m
- Tbilisi-Argveta direction - **6640** m

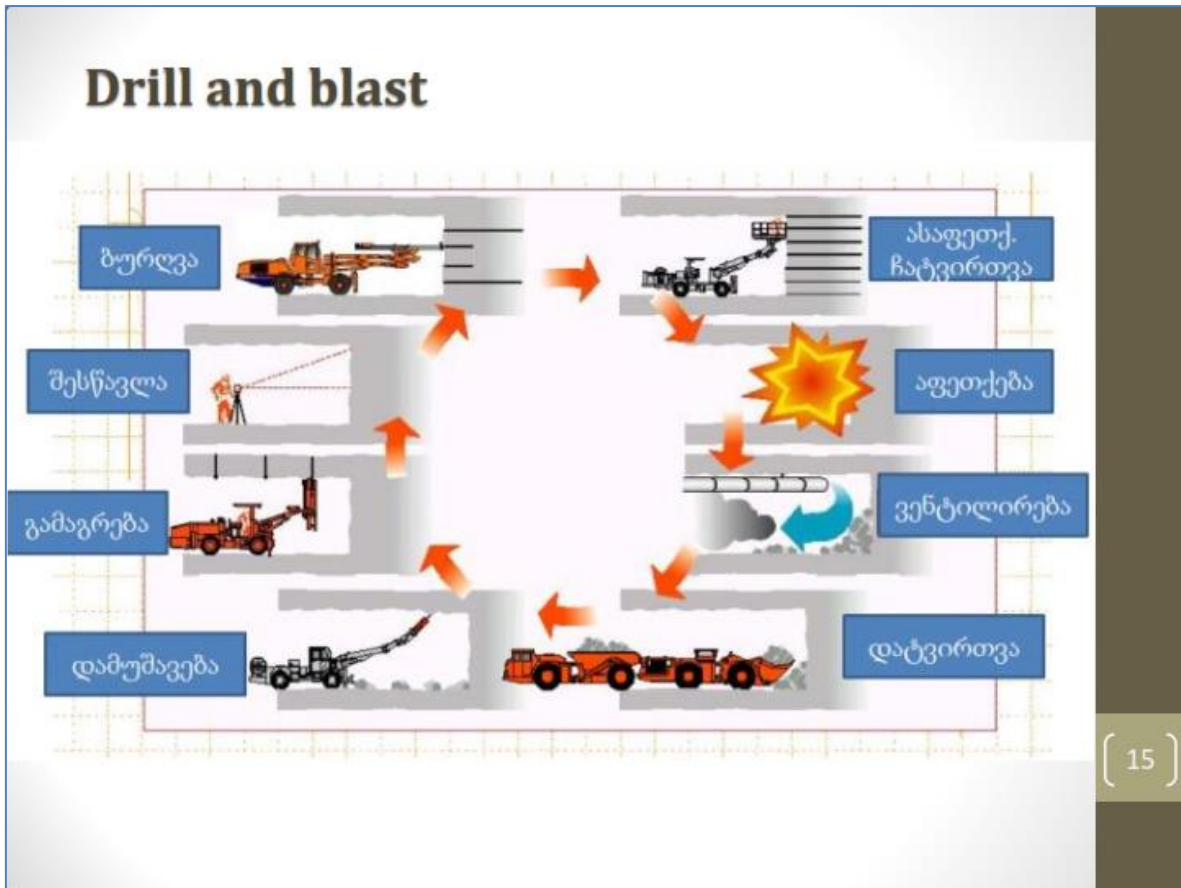
Length of the **bridges**:

- Argveta-Tbilisi direction - **3465** m
- Tbilisi-Argveta direction - **7115**m.

Section F2 of the Khevi-Ubisa-Shorapani-Argveta Road (E60 Highway)
Environmental Impact Assessment

	BRIDGES	PK [m]	PKf [m]	TOT Length [m]
	TA			
1	BRI 2.1.01-TA	160	270	110
2	BRI 2.1.02-TA	910	970	60
3	BRI 2.1.03-TA	1,055	1,090	35
4	BRI 2.1.04-TA	1,320	1,360	40
5	BRI 2.1.05-TA	1,500	1,600	100
6	BRI 2.1.06-TA	1,650	1,720	70
7	BRI 2.1.07-TA	1,920	2,060	140
8	BRI 2.1.08-TA*	2,150	2,240	90
9	BRI 2.1.09-TA	2,380	2,820	440
10	BRI 2.1.10-TA	3,080	3,530	450
11	BRI 2.1.11-TA	3,900	4,040	140
12	BRI 2.1.12-TA	4,690	4,960	270
13	BRI 2.1.13-TA	5,770	7,040	1,270
14	BRI 2.1.14-TA	8,590	9,040	450
15	BRI 2.1.15-TA	9,800	9,990	190
16	BRI 2.1.16-TA	10,070	10,150	80
17	BRI 2.1.17-TA	10,995	11,100	105
18	BRI 2.1.18-TA	11,930	12,150	220
	Total length TA, m			4,260

	BRIDGES	PK [m]	PKf [m]	TOT Length [m]
	AT			
1	BRI 2.1.01-AT	140	260	120
2	BRI 2.1.02-AT	870	960	90
3	BRI 2.1.03-AT	1,000	1,080	80
4	BRI 2.1.04-AT	1,300	1,400	100
5	BRI 2.1.05-AT	1,470	1,580	110
6	BRI 2.1.06-AT	1,660	1,720	60
7	BRI 2.1.07-AT	1,860	2,000	140
8	BRI 2.1.08-AT	2,500	2,820	320
9	BRI 2.1.09-AT	3,120	3,590	470
10	BRI 2.1.10-AT	3,880	4,040	160
11	BRI 2.1.11-AT	4,690	4,960	270
12	BRI 2.1.12-AT	5,800	7,170	1,370
13	BRI 2.1.13-AT	8,600	9,040	440
14	BRI 2.1.14-AT	9,800	9,990	190
15	BRI 2.1.15-AT	10,070	10,150	80
16	BRI 2.1.16-AT	11,930	12,150	220
	Total length AT, m			4,220
	Total length – both directions, m			8480



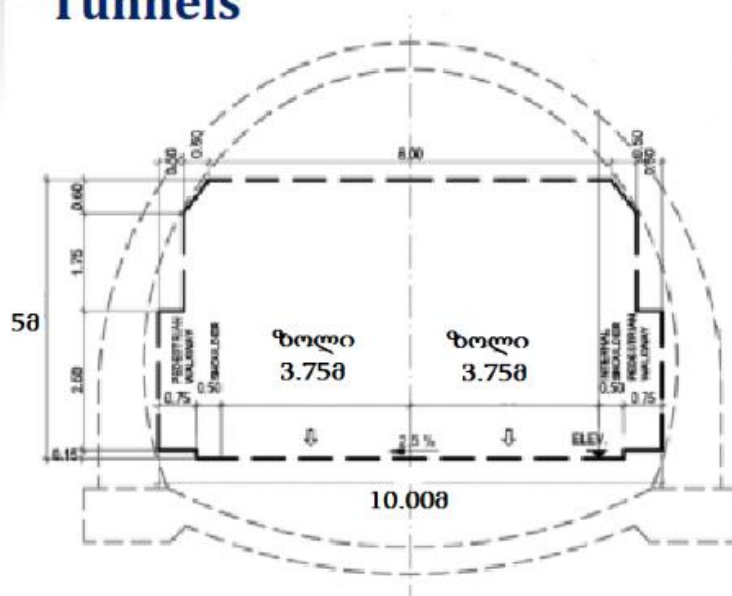
Tunnels

	Tunnels	PK [m]	PKf [m]	Length, m
		TA		
1	TUN 2.0.01-TA*	770	880	620
2	TUN 2.0.02-TA*	1,740	1,892	440
3	TUN 2.0.03-TA	2,830	3,050	1,085
4	TUN 2.0.04-TA	3,570	3,800	230
5	TUN 2.0.05-TA	4,050	4,560	670
6	TUN 2.0.06-TA	5,450	5,720	875
7	TUN 2.0.07-TA	7,140	8,510	1,370
8	TUN 2.0.08-TA	10,320	10,970	455
9	TUN 2.0.09-TA	11,180	11,760	1,135
	Total length TA, m			6,880

Tunnels

	Tunnels	PK [m]	PKf [m]	Length, m
	AT			
1	TUN 2.0.01-AT	800	850	690
2	TUN 2.0.02-AT	1,110	1,290	40
3	TUN 2.0.03-AT	1,750	1,850	430
4	TUN 2.0.04-AT	2,030	2,430	470
5	TUN 2.0.05-AT	2,830	3,110	120
6	TUN 2.0.06-AT	3,590	3,800	255
7	TUN 2.0.07-AT	4,070	4,570	705
8	TUN 2.0.08-AT	5,500	5,740	850
9	TUN 2.0.09-AT	7,190	8,500	395
10	TUN 2.0.10-AT	10,320	11,020	365
11	TUN 2.0.11-AT	11,170	11,800	1,150
	Total length AT, m			5,470
	Total length, both directions, m			12,350

Tunnels



Distance
between the
vertical axis
=30m

The tunnels will be equipped with ventilation, lighting, firefighting system, emergency communication systems, emergency exits.

What does the EIA process consist of



Description of the baseline status of environment



Assessment of impact on physical environment – air, soil, water



Assessment of impact on biological environment –
vegetation/flora, fauna



Assessment of impact on social and economic – employment,
cultural heritage, other



Development of mitigation measures



Assessment of residual impact



Environmental management and monitoring

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Stages

- Baseline data gathering and analysis – desk top and field works;
- Identification of recipients, impacts, assessment of the scale of impact (significance);
- Comparison of alternatives from the view of: possibility negative impact reduction (mitigation), costs, significance of residual impact;
- Selection of preferable alternative;
- Development of management and monitoring plan covering all stages of the project.

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Boundaries of assessment

Terrestrial biodiversity	200 m from the centreline of the design road, m. 5 m from access roads.
Aquatic biodiversity	River crossings - 50 m upstream and 250m downstream the crossing.
Air	200m from the centreline.
Noise	250m from the centreline.

Impacts on pre-construction stage

Planned activity	Impact
<ul style="list-style-type: none"> • Obtaining permits and licences required for implementation of works; • Development and approval of plans (such as: waste management, traffic management, erosion management, etc.); • Identification of sources/suppliers of materials; • Selection of the sites for camps; material, topsoil, subsoil, waste storage areas with consideration of environmental and safety requirements. 	No impact is related to these activities

Impacts on pre-construction stage (continued)

Planned activity	Impact
<ul style="list-style-type: none"> Preparation of the area – clearance of vegetation, topsoil removal and temporary stockpiling, preparation/grading of the worksites; Works on the project site and off-site works. 	<ul style="list-style-type: none"> Dust and emissions; Noise and vibration; Generation of waste, littering; Risk of soil and water pollution with spilled fuel/oil ; Soil compaction or erosion; Impact on vegetation/flora and fauna; Impact on infrastructure, impact on baseline traffic; Need for resettlement, land acquisition, temporary land use; Safety risks – population, workers; Temporary employment possibilities (Note: Positive temporary impact).

Impact during construction

Planned activity	Impact
<ul style="list-style-type: none"> Inert material (material for arrangement of embankment) management – transportation to the site; Stockpiling of material in pre-selected locations; Cut slopes, arrangement of embankment, ramming; Tunnelling – drilling, removal of tunneling waste, facing; Arrangement of drainage/water management system; Bridge construction – river water management during construction works; Bridge – earthworks, concrete and assembling works; 	<ul style="list-style-type: none"> Dust, emissions, including welding aerosols; Noise and vibration; Generation of waste (in particular spoil material, other liquid and solid waste) Deterioration of water quality when working near/in the riverbed (increase of turbidity, pollution with spilled materials, litter); Risk of flow blockage; Risk of soil pollution with spilled fuel/oil, litter; Soil ramming, erosion; Disturbance of wildlife; Impact on vegetation

Impact during construction (continued)

Planned activity	Impact
<ul style="list-style-type: none"> • Paving; • Road marking, installation of road signs; • Works on the project site and off-site works. 	<ul style="list-style-type: none"> • Impact on wildlife and vegetation/flora; • Impact on traffic flow • Impact on infrastructure; • Risk accidental damage of private properties; • Temporary employment (Note: positive impact) • Safety risks – population, workers; • Support of satellite businesses (Note: positive impact)

Impact during operation

Planned activity	Impact
<ul style="list-style-type: none"> • Traffic on the new road; • Maintenance of road, tunnels and bridges 	<ul style="list-style-type: none"> • Dust and emissions; • Noise and vibration – related disturbance of fauna and population; • Safety risks (drivers, pedestrian, cattle/animals); • Waste • Impact during maintenance works – type of impacts will be similar to those expected during construction. The scale, magnitude and duration will depend on the type and location of the sites subject to rehabilitation.

Works implemented by the field survey teams

- Vegetation/flora and fauna surveys in the project corridor;
- Surface water, ground water and soil quality assessment – sampling and analysis;
- Determination of baseline noise, air quality levels;
- Vibration measurements;
- Social data gathering.

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Noise modelling

- Modelling of noise is being carried out by IRD contractor company. Software: SOUND PLAN VER. 7.2. Based on the modelling data need and location of noise mitigation (noise barriers) is determined.

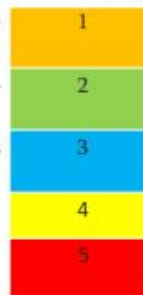


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Biodiversity

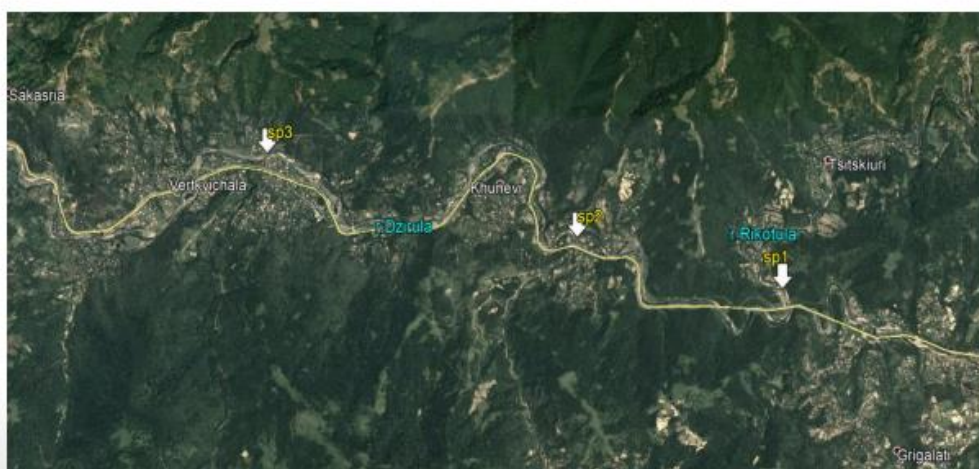
Main habitats in the project corridor with indication of respective codes

	#
Code of Georgia 62GE04 Vegetation of agricultural-economic settlements and cultivable land	1
Code of Georgia 91EO Alluvial forest with Adler trees - <i>Alnus glutinosa</i> and ash tree - <i>Fraxinus excelsior</i>	2
Code of Georgia 323GE Clayey and rock riverine vegetation with duckweed/Alpine rivers and their ligneous vegetation	3
Code of Georgia 9160GE Oak or oak-hornbeam forests (<i>Quercitum</i> - <i>Carpinion betuli</i>)	4
Code of Georgia 918 0 GE Tilio-Acerion forests of slopes, screes and ravines	5



Fish species

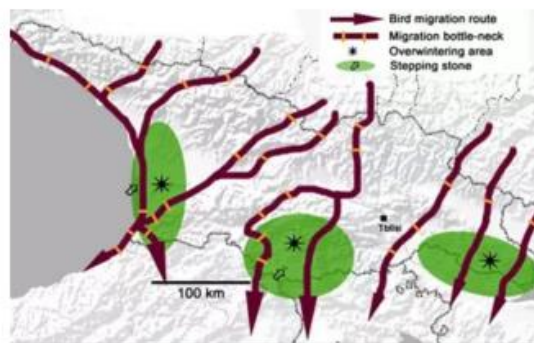
#	Latin name	Common name
1	<i>Leuciscus leuciscus</i> Linnaeus, 1758	Common dace
2	<i>Chondrostoma colchicum</i> Derjugin, 1899	Colchic nase
3	<i>Capoeta sieboldi</i> Steindachner, 1864	Colchic khramulya
4	<i>Neogobius fluviatilis</i> , Pallas 1814	Monkey goby
5	<i>Cobitis taenia</i> Linnaeus, 1758	Spined loach
6	<i>Alburnus alburnus</i> , Linnaeus, 1758	Bleak



Protected species

Species	GRL	IUCN	Other	Section N
Caucasian squirrel	VU	LC	EU Habitats Directive (92/43) IV 21/05/92; Bern Convention II 01/03/02, in parts of its range where these apply.	4/5
Otter	VU	NT	Appendix I of CITES, Appendix II of the Bern Convention, Annexes II and IV of the EU Habitats and Species Directives	3/4
Mediterranean turtle	VU	VU	-	1/2/3

Birds



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Protected areas



Impact	Ranking
Construction	
Air quality deterioration	L-M depending on location, S, R, local
Noise and vibration	L-M depending on location, S, R, local
Impact on water quality	L-M depending on location, S, R, local
Impact on soil quality	L-M depending on location, S, R, local
Impact on vegetation/flora	L-M depending on location, local. In the areas that are not directly used for construction impact is temporary and reversible. Recultivation
Impact on fauna	L-M depending on location, S, R, local. Impact will be related to noise, emission, light pollution, road kills. Impact on aquatic fauna because of possible increase of turbidity in river crossings.
Landscape-visual	L-VL depending on location , S, R, local

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Operation	
Air quality	According to the modelling data no specific mitigation measures are requires
Noise and vibration	Low to medium . according to the modelling data, installation of noise barriers is planned.
Impact on water quality	Low, related to discharge of runoff from the carriageway. Treatment units are envisaged in the design
Impact on soil quality	Low to negligible – possible pollution with runoff and littering
Impact on vegetation/flora	Negligible
Impact on fauna	Low. Impact will be related to noise, emissions, lighting, impact on aquatic in case of water pollution. Mitigation measures related to water quality preservation and other impacts are defined.
Landscape- visual	Visual change caused by the presence of new infrastructure

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