

# **Annex 1 Assessment of the alternatives**

Table 1 Methodology and classification scheme (level of assessment of objectives) on each identified environmental and social media and area

Environmental		Classificati	on Scheme (Level of Achieveme	ent of Objective)
and social aspects	Methodology	1	2	3
Community Health and safety	Need to install barriers for protection from noise and vibrations (lower number is better alternative).	Installation of up to 2 km of barriers	Installation of 2 km to 5 km of barriers	Installation of more than 5 km of barriers
Housing and community infrastructure	Dividing of the settlements by the highway can increase the social vulnerability of the local population and decrease quality of life of local residents.	Dividing settlement up to 20 houses or no settlement division	Dividing settlement with 20 – 100 houses	Dividing settlement with more than 100 houses
Resettlement and livelihood	Estimated level of farming activities conducted on the agricultural land to be acquired; Estimated level of business property to be acquired; Estimated level of physical resettlement of people;	Low level of farming activities; Impacting up to 5 businesses; Resettlement (to 5households).	Moderate level of farming activities; Impacting 5-10 businesses; Resettlement (5-10 households).	High level of farming activities; Impacting over 10 businesses; Resettlement (over 10 households).
Cultural and historical heritage	Assessment of the proximity of the protected Cultural Heritage and Historically sensitive sites	Complete avoidance (over 500 m)	Passing in vicinity over 100-500 m	Passing in vicinity up to 100 m
Geodiversity	With field prospection, analysis of maps and drone-based aero-imagery, remarkable geological and geomorphological localities are identified and impacts are estimated.	Low impact on geodiversity	Moderate impact	Significant impact on geodiversity
Geoheritage	Distance to the valuable geo sites (recorded previously) is calculated.	More than 5 km	2-5 km	up to 2 km
Geohazards	With field prospection, GIS-based modelling, landslide and rock fall rick, seismic risk and floods are estimated during both phases of the project. The highest weight is given to the operational phase. The seismic risk is considered during the statistical 100 years period.	Low geohazard risk	Moderate geohazard risk	Significant geohazard risk
Presence of natural habitats	The area of the identified natural habitats (rivers, riparian vegetation, wetlands) in the buffer of 2x500 m of the road line was estimated and their percentage was calculated	Low presence of natural habitats in the buffer area	Moderate presence of natural habitats in the buffer area	Significant presence of natural habitats in the buffer area
Presence of sensitive habitats	Habitats were assessed based on a scoring matrix. The number, distribution and coverage of sensitive habitat types was estimated by analysis of produced habitat map, their coverage was estimated by GIS.	Low values in terms of presence of sensitive habitats.	Between highest and lowest grade for crossing sensible sites of importance.	Crosses sensitive habitats
Biocorridors for large mammals	The assessment is based on Macedonian National Ecological Network (MAK-NEN)	Low potential for biocorridors	Habitats and landscapes require restoration to improve their functions as biocorridors.	Functional and proven biocorridors.
Agriculture	The agricultural area within the road buffer was estimated based on GIS analysis of the habitat map. Also, the agricultural area to be permanently used was estimated.	Low percentage or small area of agricultural land will be used.	High/medium or moderate area of agricultural land will be used.	High percentage and greatest area of agricultural land will be used.



Environmental		Classificati	on Scheme (Level of Achieveme	ent of Objective)
and social aspects	Methodology	1	2	3
Forests	Forest area within the road buffer was estimated based on GIS analysis of the habitat map. The forest area that will be permanently used was estimated.	Low percentage of forests which will be used.	High/medium forest area which will be used.	High percentage of forest area which will be used.
Hill pastures	The hill pastures area within the road buffer was estimated based on GIS analysis of the habitat map.	Low percentage hill pastures which will be used.	High/medium percentage hill pastures which will be used.	High percentage of hill pasture which will be used.
Soil erosion	Soil erosion model (map) is produced based on Erosion Potential Model (EPM) for the current area and including the impact of alternatives.	Low soil erosion rate (potential).	Medium soil erosion rate (potential).	High soil erosion rate (potential).
Ground water	For estimation of possible impact hydrological model on ground water quantity and level is prepared. Rock permeability and protection zone of the Nerezi wells is taken into consideration.	Minor impact on the ground waters.	Moderate impact on the ground water.	Significant impact on the ground water.
Surface water	Number of water bodies that may be affected, based on the expert judgment consider the type of activities, possible impacts during the both phases of the project.	Intersect/passing near surface water bodies and may cause "low" up to "medium" impact.	Intersect/passing near surface water bodies and may cause "medium" to "high" impact.	Intersect/passing near surface water bodies and may cause "high" impact".
Visual landscape	The landscape will be assessed according to its visual and functional characteristics, based on the expert judgment taking into account the number of bridges, introduction of new man-made structures in the landscape.	No adversely impact the landscape. No or only few manmade object will be introduced.	Moderate and visible changes in the landscape. Introduction of new structures on moderate scale.	Significant change on the landscape. Introduction of new structures which will change the visual landscape considerably.
Permeability (length of tunnels, bridges)	The landscape permeability will be assessed according to the number and length of bridges and tunnels.	Adequate number/length of bridges/tunnels in an area with biocorridor potential.	Medium number/length of bridges/tunnels in an area with biocorridor potential.	Low (inadequate) number/length of bridges/tunnels in an area with biocorridor potential.
Emission and air quality	Evaluation of generation of emissions and their impact on air quality during both phases of the project. The assessment is based on the type, scope and duration of activities.	Construction: Low to medium amount emission; impacts: "low" to "medium", Operation: Low amount of emission; impacts: "low" to "medium".	Construction: Medium to high amount of emission; impacts: "medium" up to "high" Operation: Medium to high amount of emission; impacts: "medium" to "high".	Construction: High amount of emissions; impacts: "high" Operation: High amount of emission; impacts: "high".
Climate change	Evaluation of generation of GHG emission and possible impact on climate changes during both phases of the project. The assessment is based on the type, scope and duration of activities.	Contribution on local and regional climate changes is possible; Construction: impacts "low" to "medium" Operation: impacts "low" to utmost "medium	Contribution on local and regional climate changes is possible; Construction: impacts "medium" Operation: impacts "medium"	Contribution on local and regional climate changes is possible; Construction: impacts "medium" to "high" Operation: impacts "medium" to "high"
Waste	Assessment of generated waste, according to the expert judgment taking into account the type of activities	"low" to "medium" amount of waste	"medium" to high amount of waste	"high" amount of waste
Noise and vibration in environment	Evaluation of emissions of noise and vibration and their impacts on the environment. The assessment is based on the type, scope and duration of activities.	Small scale of activities. "low" to "medium" level of emissions.	Medium to high scale of activities. "medium" up to "high" level of emissions.	High scale of activities. "high" level of emissions.



# **Analyses of the alternatives**

# Social aspects

# Community Health and safety

_	Blace-Stenkove North							
BAU	Alt DD2002	Alt 1	Alt 2	ALT1C	BAU	Alt 1	Alt 2	Alt 1C
No need to install	Barrier of 500 m (250 m	The same as Alt DD2002	Barriers of 500 m (250 m on each	The same as Alt DD2002	No need	The same	The	The
barriers for protection	on each side) at the		side) at the weekend settlement		of barriers	as BAU	same as	same as
from noise and	weekend settlement is		and additional 300 m near the				BAU	BAU
vibrations.	needed.		cattle farm are needed.					

Housing and community infrastructure

	Blace-Stenkove North							
BAU	Alt DD2002	Alt 2	ALT1C	BAU	Alt 1	Alt 2	Alt 1C	
Not divide	Divides weekend settlement with up to 10 houses.	Divides weekend settlement with	The same as	The same as	Not divide	The	The	The
settlements.	The envisaged viaduct will decrease the quality of	up to 10 houses. Acquisition of	Alt DD2002	Alt DD2002	settlements.	same as	same as	same as
	location of the weekend house.	weekend house.				BAU	BAU	BAU

# Resettlement and livelihood

	·	Blace-Stenkove No	rth			Blace-Stenkove	South	
BAU	Alt DD2002	Alt 1	Alt 2	ALT1C	BAU	Alt 1	Alt 2	Alt 1C
No economic	Low level of farming	Very low level of farming	Very low level of farming	Low level of farming	No economic	Moderate level of	Moderate	The same
or physical	activities will be	activities that will be	activities will be acquired. Up	activities that will be	or physical	farming activities	level of	as Alt 2
displacement	acquired. Up to 10	acquired.	to 6 companies/business will	acquired.	displacement	that will be	farming	
	companies/business will	Up to 3	experience loss of part of	Up to 5 business are		acquired.	activities	
	experience loss of part	companies/business will	business property.	expected to lose part		Up to 15 businesses	that will be	
	of business property.	experience loss of part of	One complete cattle farm	of the property.		will be affected with	acquired.	
	One complete cattle	business property.	will have to be acquired.	No people are		expropriation. No	Up to 5	
	farm will have to be	No people are expected to	Up to 5 households is	expected to be		people are	business	
	acquired. Up to 5	be physically resettled.	possible to be physically	physically resettled.		expected to be	are	
	households is possible	Two weekend houses are	resettled.	The shooting range		physically resettled.	expected to	
	to be physically	expected to be acquired.	One weekend house is	area and locations			lose part of	
	resettled.	The shooting range area	expected to be acquired, and	with adopted urban			the	
	One weekend house is	and the locations with	the second will lose its	documentations are			property.	
	expected to be	adopted urban	purpose. The shooting range	avoided.			No people	
	acquired, and the	documentations (where	area and locations with				are	
	second will lose its	facilities for different	adopted urban				expected to	
	purpose.	purposes will be build)	documentations (where				be	
		should be acquired.	facilities for different				physically	
			purposes will be build)				resettled.	
			should be acquired.					

# Cultural and historical heritage

	Blace-Stenkove North							
BAU	Alt DD2002	Alt 1	Alt 2	ALT1C	BAU	Alt 1	Alt 2	Alt 1C
New Cemetery of v.Blace is	New Cemetery of v. Blace is	New Cemetery of v.Blace is	The	The same	The road does not pass	The	The	The
~500+m, old Cemetery of v.	~300 m, old Cemetery of v. Blace	~500+m, old Cemetery of v. Blace	same	as Alt	through protected Cultural	same	same	same
Blace is ~800 m from the start of	is ~700 m from the start of the	is ~800 m from the start of	as Alt 1	DD2002	Heritage and Historically	as BAU	as BAU	as BAU





the alignment. Davina Kula is	alignment. Davina Kula is ~650	alignment. The Davina Kula is		sensitive sites		
~750 m.	m.	located ~500+m.				

# > Geodiversity and geohazards

Geodiversity

	Blace-Ster	nkove North			BI	ace-Stenkove South		
BAU	Alt DD2002	Alt 1	Alt 2	ALT1C	BAU	Alt 1	Alt 2	Alt 1C
The existing road passes through the valley-gorge of the Lepenec River. The gorge is not as spectacular as the sides are not too step and high. The impact on geodiversity is low.	Passes through the gorge of the Lepenec River (which is not so remarkable and deep), crossing many small tributary valleys. Impacts will be moderate, and more expressed during construction.	Very similar to Alt DD2002. Because of the larger length of the tunnels, the impact will be low in operational and slightly higher in construction phase.	The same as Alt 2002	Very similar to Alt 1, except of shorter length of tunnels The impact will be low in operational and slightly higher in construction phase.	The existing road passes through predominantly agricultural and commercial area. The impact is the lowest compared to other section.	Passes through predominantly agricultural and commercial area. The geodiversity value is low and the possible impact on it, except during the construction.	The same as Alt 1	The same as Alt 1.

Geo-heritage

	Blace-Stenkove North							
BAU	Alt DD2002	Alt 1	Alt 2	ALT1C	BAU	Alt 1	Alt 2	Alt 1C
The nearest recognized geo-heritage site	The nearest recognized geo-	The nearest recognized geo-	The	The	As the existing road	There is no	The	The
is the deeply incised gorge of Banjanska	heritage site is the gorge of	heritage site is the gorge of	same	same as	passes through the	well	same	same as
River (at distance 4-5 km). The gorge of	Banjanska River (at distance 4-5	Banjanska River (at distance	as Alt	Alt 1.	flat area of Skopje	recognized	as Alt	Alt 1
Lepenec has some geomorphological	km). The gorge of Lepenec has	4-5 km). The gorge of	1.		Plain, there is no	geo-	1	
significance but the impact of the existing	weak geomorphological	Lepenec has weak geo-			recognized geo-	heritage.		
road is minor.	significance.	heritage value, except as a			heritage sites.			
		protruding type of gorge.						

# Geo-hazards

		Blace-Stenkove North				Blace-Sten	kove South	
BAU	Alt DD2002	Alt 1	Alt 2	ALT1C	BAU	Alt 1	Alt 2	Alt 1C
The existing road	Passes along the	It has less cuts and	It has significant cuts	The	The existing road	It is without any	It is without significant geo-	The
passes along the	Lepenec Gorge,	embankments and	and embankments (will	landslide	passes through	significant geo-	hazard risk, except that of the	same as
bottom of the	with few	more tunnels, and the	be well protected), and	potential	predominantly flat	hazard risk	earthquake (M<6.5) from the	Alt 1.
Lepenec Gorge,	significant cuts.	landslide potential will	the landslide potential	will be	area, without	(landslides rock	Skopje seismic zone. As a	
with few	The landslide and	be lower than Alt	will be low to moderate.	similar	significant geo-	falls, floods,	treat to the planned tunnel	
significant cuts.	rock fall potential	DD2002. There is a	There is a moderate	with Alt 1.	hazard risk	excess erosion or	are ground waters and soil	
The landslide and	is low to	moderate long-term	long-term seismic risk		(landslides, rock	deposition),	subsidence/collapse in the	
rock fall potential	moderate. There	seismic risk (M<6).	(M<6) especially for the		falls, floods), except	except that of	terrain composed mostly by	
is low to	is a moderate	The risk from the geo-	number of bridges. The		that of the	the earthquake	river terrace deposits (sand,	
moderate.	long-term seismic	hazards is estimated	risk from the geo-		earthquake (M<6,	(M<6.5) from	gravel etc.). The risk from the	
There is a small	risk (M<6). The	as low during	hazards is estimated as		5) from the Skopje	the Skopje	geo-hazards is estimated as	
risk of torrential	risk from the geo-	operational and	moderate during		seismic zone.	seismic zone.	moderate during operational	
floods from the	hazards is	slightly higher during	operational and slightly				and slightly higher during	
east side torrents	estimated as	construction phase.	higher during				construction phase.	
and moderate	moderate during		construction phase.					
long-term seismic	operational and							



risk (M<6).	slightly higher				
	during				
	construction				
	phase.				

# BiodiversityPresence of natural habitats

	Blace-St	tenkove North			Blace-Stenkove South					
BAU	Alt DD2002	Alt 1	Alt 2	ALT1C	BAU	Alt 1	Alt 2	Alt 1C		
The existing road	Passes through area	Passes through and						The same		
passes in a vicinity to	dominantly covered by	area dominantly	as Alt1	1 and Alt DD2002.	predominantly agricultural and	predominantly agricultural	the Alt 1C. It crosses	as Alt 1		
riparian habitats and	hill pastures (with or	covered by hill		The differences	commercial area. It crosses one	and commercial area. It	the small fragment of			
river Lepenec. It	without shrubs) and	pastures (with or		are insignificant	small fragment of degraded	crosses one small	degraded riparian			
causes pollution and	some degraded oak	without shrubs) and		from aspect of	riparian belt along Vrazanska	fragment of degraded	belt along Vrazanska			
disturbance to natural	forests. It avoids river	some degraded oak		presence of	River. The values of biodiversity is	riparian belt along	River), only 100 m to			
habitats.	Lepenec and its	forests. It avoids river		natural habitats.	the lowest compared to other	Vrazanska River. The	the west.			
	habitats.	Lepenec and its			section.	values of biodiversity is				
		habitats.				low.				

# Presence of sensitive habitats

Blad	e-Stenkove North				Blace-Stenkove South				
BAU	Alt DD2002	Alt 1	Alt 2	ALT1C	BAU	Alt 1	Alt 2	Alt 1C	
The existing road passes through an area of	It passes through an area	The same	The same	The same	The existing road	It passes through an area of	The same	The same as Alt 1. The only	
low or medium sensitive habitats. No new	of low or medium	as Alt	as Alt	as Alt	passes through an	low sensitive habitats. Very	as Alt 1	difference to Alt 1 is that	
acquisition is required but	sensitive habitats. No high	DD2002.	DD2002	DD2002	area of low	small area of medium		ALT1 C crosses fragments one	
pollution/disturbance effect is taken into	sensitive habitats will be				sensitive habitats.	sensitive habitats and no high		degraded riparian (wetland)	
account.	impacted.					sensitive habitats will be		patch.	
	·					impacted.			

# Biocorridors for large mammals

_	Blace-Stenkove North				Blace-Stenkove South				
BAU	Alt DD2002	Alt 1	Alt 2	ALT1C	BAU	Alt 1	Alt 2	Alt 1C	
The existing road is an obstacle in the	It is situated in a potential biocorridor	The same as	The same as	The same as	The existing road is situated	It is situated in an area	The	The	
movement of large mammals, although most	which requires habitats restoration in	Alt DD2002	Alt DD2002	Alt DD2002	in an area which serves no	which serves no	same as	same as	
of the surrounding habitats require	order to improve its functions.				biocorridor functions	biocorridor functions.	Alt1	Alt1	
restoration.									

# > Soils & land use

#### Agriculture

<u> </u>									
	Blace-Stenkove North				Blace-Stenkove South				
BAU	Alt DD2002	Alt 1	Alt 2	ALT1C	BAU	Alt 1	Alt 2	Alt 1C	
The existing road passes through	It passes through an area	The same	The same	The	The existing road passes through predominantly	It passes through an area with	The	The	
an area with dominance of hill	with dominance of hill	as Alt	as Alt	same as	agricultural area (fields, acres, orchards). New	dominance of agricultural land.	same as	same as	
pastures and low amount of	pastures (used for cattle	DD2002	DD2002	Alt	acquisition of agricultural land is not foreseen.	Significant amount of agricultural	Alt1	Alt1	
agricultural land. No new	grazing) and low amount of			DD2002.	Nevertheless, it has continuous impact on the	land will be impacted during the			
acquisition of agricultural land is	agricultural land.				agricultural activities.	construction and operation phase.			
foreseen.									



#### **Forests**

	Blace-Stenkove North				Blace-Stenkove South			
BAU	Alt DD2002	Alt 1	Alt 2	ALT1C	BAU	Alt 1	Alt 2	Alt 1C
area with small surface of forests. No	surface of forests. Very small area	The same as Alt DD2002.	as Alt	DD2002		through an area	The same as Alt1	The same as Alt1
new acquisition of forest land is foreseen.	forest land is foreseen for acquisition.		DD2002			with almost no forest.		

#### Hill pastures

	Blace-Sten	kove North			Blace-Stenkove South				
BAU	Alt DD2002	Alt 1	Alt 2	ALT1C	BAU	Alt 1	Alt 2	Alt 1C	
The existing road passes	It passes through an area with	It passes through an area with	The same	The same	The existing road passes	It passes through an	The	The	
through an area with	dominance of hill pastures which	dominance of hill pastures which	as Alt	as Alt	through an area with very	area with very small	same	same	
significant amount of hill	are used for cattle grazing	are used for cattle grazing	DD2002.	DD2002.	small amount of hill	amount of hill	as Alt1	as Alt1	
pastures.	(sheep, cows).	(sheep, cows).			pastures.	pastures			

#### > Soil erosion

		Blace-Stenkove N	orth			Blace-	Stenkove South	
BAU	Alt DD2002	Alt 1	Alt 2	ALT1C	BAU	Alt 1	Alt 2	Alt 1C
The existing road	It passes through	It passes through the steep	It passes through the steep	It is very similar to	The existing	It passes through the	It passes through the	The
passes through the	the steep terrain	terrain with erodible soils.	terrain with erodible soils and the	Alt 1 and is more	road passes	flat area so the soil	flats so the soil erosion	same
valley bottom. The soil	with erodible	Because of the shorter	soil erosion potential (deposition	favourable in terms	through the	erosion (deposition)	potential is low,	as Alt1
erosion potential is	soils, thus the soil	embankments and cuts (and	in the bottom) is considerable on	of potential soil	relatively flat	potential is low,	especially considering	
low, but during the	erosion potential	longer tunnels) this	the embankments and cuts.	erosion than Alt 2.	terrain with	except in the part	long tunnel section 1.2	
heavy rains there is an	(deposition in the	alternative is more favourable	Significant length of the bridges	From the tunnels	weak soil	where intensive	km. During	
insignificant deposition	bottom) is	in terms of potential soil	will minimize soil erosion risk.	and cuts, significant	erosion	construction works	construction, there will	
of the eroded material	moderate.	erosion than Alt 2. In the	Bridges' construction will have	earth mass will be	potential.	with earth excavation	be slightly higher	
from the hillslopes.		tunnels, significant earth	impact on the soil erosion rate in	excavated and		and deposition are	erosion rate (usage of	
		mass will be excavated and	the torrential catchments which	evacuated.		planned.	machinery and works	
		evacuated.	the bridges cross.				on the sides.	

# > Water

#### **Ground water Blace-Stenkove North Blace-Stenkove South BAU** Alt DD2002 Alt 2 ALT1C BAU Alt 1 Alt 2 Alt 1C Alt 1 The existing road The alternative The existing It passes along the plain There is a risk of It passes higher, It passes mostly through It passes mostly There is a risk of impact passes through the mostly through the impermeable rocks through the is very similar to road passes with permeable alluvial groundwater pollution on the ground waters Alt 1. The along the plain east (left) side of the impermeable and there are no impermeable rocks sediments and the impact and dewatering of the especially during the valley bottom in rocks thus the and there are no impact will be with permeable on the ground water will be construction site. This significant springs or accidents (construction moderate especially during the contact with effect on the water sources. The significant springs or more expressed alluvial alternative is almost the and operational phase). alluvial deposits and ground waters tunnel sections will be water sources, thus during the sediments and the accidents (construction same as Alt1. The This alternative is the impact on the will be minor. the effect on the and operational phase). This planned tunnel will longer and construction the impact on located in the wider ground waters is groundwater's effects ground waters will be works. the ground alternative is located in the retain circulation of the (3rd) protection zone of low to moderate will be minor. The minor. The impact will water is wider (3rd) protection zone ground waters in the Nerezi wells and (during the impact will be more be more expressed estimated as of Nerezi wells and partially highest horizons. The partially close to the accidental fuel moderate. 2nd zone. The impact is expressed during the during the close to the 2nd zone. The impact on the leaking or by small construction phase. construction works. impact on the groundwater groundwater will be assessed as moderate.



dump sites along			will be moderate.	significant.	
the road.					

## **Surface water**

	Blace-S	tenkove North			Blace-	Stenkove South		
BAU	Alt DD2002	Alt 1	Alt 2	ALT1C	BAU	Alt 1	Alt 2	Alt
								1C
The existing national road	It may affect intermittent	It may affect intermittent	It may affect intermittent	The	The existing national road intersect	It may directly affect the rivers	The	The
intersect the intermittent	streams, River Lepenec	streams, River Lepenec	streams, River Lepenec	same	the River Vrazanska which is	Vrazanska and Lepenec	same	same
	during construction	during construction	during construction	as Alt1	tributary of the River Lepenec.	(construction of bridge/culvert on	as	as
places passes alongside	phase. The possible	phase. The possible	phase. The possible			the Vrazanska River and	Alt1	Alt1
the river Lepenec.	impacts may be assessed	impacts may be assessed	impacts may be assessed		without treatment (sedimentation	performance of construction		
Dewatering of the existing	as "medium" to "high".	as "medium". During the	as "medium" to "high".		and oil traps) cause pollution of the	activities in their vicinity). The		
road without treatment	During the operation will	operation will be lower	During the operation will		water as well as to the River	possible impact may be assessed		
cause impact on water	be lower (drained water	(the drained water will be	be lower (drained water		Lepenec as a recipient of these	as low to medium. The impacts		
which may be assessed as	will be treated).	treated).	will be treated).		water. The possible impact may be	during operation will be lower		
medium.					assessed as medium.	(drained water will be treated).		

## Landscape

	Blace-Stenkove North				Blace-Stenkove South				
BAU	Alt DD2002	Alt 1	Alt 2	ALT1C	BAU	Alt 1	Alt 2	Alt 1C	
The visual aspects of the	It passes in an area with already	The same	The same	The same	The visual aspects of the landscape are low due	It will have negligible	The	The	
landscape are severely	medium values of visual landscape. The	as Alt	as Alt	as Alt	to the dominance of anthropogenic activities	effect on the visual	same as	same as	
impacted by the existing	new road will introduce new elements	DD2002	DD2002	DD2002	(industry, commerce, agriculture) but the	aspects of the landscape	Alt 1	Alt 1	
road and number of	into the landscape (asphalt road,				existing road contributes with very low amount to	(which already has low			
industrial facilities.	bridges, tunnels, etc.)				the conditions.	value).			

# **Permeability (length of tunnels, bridges)**

		Blace-Stenkove North			Blace	-Stenkove South		
BAU	Alt DD2002	Alt 1	Alt 2	ALT1C BAU		Alt 1	Alt 2	_
								1C
The existing road is	The alternative includes	The alternative includes the total	The alternative includes the	This alternative	The existing road	The alternative	The	The
already an obstacle for	total length of permeable	length of permeable structures of	total length of permeable	includes the total	poses certain	poses restrictions	same	same
the movement of	structures of 6120 m. Such	6535m that will ensure movement of	structures of 6690 m that	length of permeable	restrictions for the	for the movement	as Alt	as Alt
animals. However, the			will ensure movement of	structures of 6095 m.	movement of	of animals. The	1	1
area is potential	of animals. The area is	potential biocorridor which already	animals. However, the area			biocorridor potentia	I	
biocorridor which	potential biocorridor which	requires restoration. This is more	is potential biocorridor	similar to Alt 1,	biocorridor potential	of the area is low.		
already requires	already requires	preferred alternative compared to	which already requires	although less	of the area is low.			
restoration.	restoration.	Alt DD2002 or Alt 2 to a certain	restoration.	preferable.				
		extent.						

# Air quality & climate changes Emission and air quality

В	Blace-Stenkove North					Blace-Stenkove South					
BAU	Alt DD2002	Alt 1	Alt 2	ALT1C	BAU	Alt 1	Alt 2	Alt 1C			
As a result of condition of the existing	Construction activity will	The same	The same	The same	As a result of the present condition of the	It will generate air emissions	The same	The same			
motorway, (increased traffic load,	generate air emission and	as Alt	as Alt	as Alt	existing motorway, followed by increased	during the construction phase	as Alt 1	as Alt 1			
queues and idling of vehicles),	cause impact on air quality	DD2002	DD2002	DD2002	traffic load, queues and idling of vehicles,	and may cause "medium" to					





increased air emissions are expected.	assessed as "medium" to	increased air emissions are expected. The "high "impact on air quality.	
The impact on the air quality are	`high".	impact on the air quality may be During the operation, the impacts	
estimated as "high".	During the operation the	estimated as "high". on air quality may be assessed as	
	possible impacts on air	"medium" to "high".	
	quality may be assessed as		
	"medium" to "high".		

Climate changes

	Blace-Stenkove North				Blace-Stenkove South								
BAU	Alt DD2002	Alt 1	Alt 2	ALT1C	BAU	Alt 1	Alt 2	Alt 1C					
As a result of condition of the	Construction activity will generate GHG.	The same	The same	The same	As a result of condition of the	Construction activity will generate	The	The					
existing motorway (traffic	These activities may contribute to local	as Alt	as Alt	as Alt	existing motorway (traffic	GHG. These activities may contribute	same as	same as					
congestion, idle working of the	climate changes and the possible	DD2002	DD2002	DD2002	congestion, idle working of the	to local climate changes and the	Alt 1	Alt 1					
vehicles), predicted increased of	impacts may be estimated as "medium",				vehicles), predicted increased of	possible impacts may be estimated as							
transport activities in the future	while in the operational phase, the				transport activities in the future	estimated to utmost "medium", while							
generation of GHG and impact on	highway traffic will generate GHG				generation of GHG and impact on	in the operational phase, the highway							
climate change may be estimated	emission and impacts may be assessed				climate change may be estimated	traffic will generate GHG emission							
as "medium".	as "medium".				as "medium".	and impacts may be assessed as							
						"medium".							

## Waste

			Blace-Stenkove South					
BAU	Alt DD2002	Alt 1	Alt 2	ALT1C	BAU	Alt 1	Alt 2	Alt 1C
Operation and	The alternative will generate	The alternative will generate	The alternative will generate	The	Operation and	The alternative	The alternative will	The
maintenance of the	high amount of waste as a	high amount of waste as a	high amount of waste as a	same as	maintenance of the	will generate to	generate bigger amount	same as
existing national	result of the scope of	result of the scope of work. It	result of the scope of work.	Alt	existing national	"medium" to	of waste compared with	Alt 1
road generates low	construction activities. It will	will generate the biggest	It will generate lower amount	DD2002	road generates low	"high" amount of	Alt 1 South as a result of	
to medium amount	generate lower amount of	amount of excavated material	of excavated material		to medium amount	waste as a result	construction of tunnel	
of waste.	excavated material compared	compared to Alt DD2002, Alt 2	compared to Alt 1 and Alt 1C,		of waste.	of the scope of	and other structures. It is	5
	to Alt 1, but generation of	and Alt1C, but generation of	but generation of other types			work.	expected generation of	
	other types of waste will be	other types of waste will be	of waste will be bigger.				high amount of waste.	
	bigger.	lower.						

Noise and vibration in the environment

110100 0												
	Blace-Stenkove No	orth	Blace-Stenkove South									
BAU	Alt DD2002	Alt 1	Alt 2	ALT1C	BAU	Alt 1	Alt 2	Alt 1C				
This alternative will result in	It will result in generation of	The same as Alt	The same	The	As a result of the condition of the national	It will result in generation of	The	The same				
higher traffic noise and	"high" level of noise and	DD2002. Constructed	as Alt	same as	road, followed by a traffic congestion and	"medium" to "high" level of	same as	as Alt 1				
vibration proportional to the	vibration during the	tunnels will reduce the	DD2002	Alt 1	idle working of the vehicles, predicted	noise and vibration during the	Alt 1					
expected increase of traffic	construction and "medium	level of noise and			increased of transport activities in the	construction and "medium" to						
load, queuing and idling of	to "high" during the	vibration.			future, this alternative will result in	"high" during the operation						
vehicles.	operation.				generation of "high" emissions of noise and							
					vibration in the environment.							



# Table 2 Summary of environmental and social impacts-MCA

Main Criteria	Indicators	Parameters	BA	U Blace No	-Stenk orth	ovec	Bla	ce-Stenl DD20		Alt	Blac	e-Sten No		Alt 1	Blac		kovec orth	Alt 1C	Blac	e-Stenl No		Alt 2	ВА	U Blace- Sou		ovec	Blace	e-Stenk Sou		Alt 1	Blace	e-Stenk Soi	kovec A	Alt 1C	Bla	ce-Ster Sc	nkoved outh	Alt 2		
		D.1.1 Community health and safety	1				1				1				1				1				1				1				1				1					
	D.1 Social aspects	D.1.2 Housing and community infrastructure	1	1,0	20%		1	1.3	20%		1	1,5	20%		1	1,0	20%		1	1,5	20%		1	1,0	20%		1	1,3	20%		1	1,0	20%		1	1,0	20%			
	2 Social aspects	D.1.3 Resettlement and livelihood	1		2070		2	1,0	-5/0		3	1,0	20,3		1		20,0		3	1,0	_0,0		1	.,0	1		2	1,0	_0,0		1	1,0	20,0		1		25%			
		D.1.4 Cultural and historical heritage	1				1				1				1				1				1				1				1				1					
		D.2.1 Geodiversity	1				2				1				1				2				1				1				1				1					
	D.2. Geodiversity & geohazards	D.2.2 Geoheritage	1	1,3	15%		2	2,0	15%		2	1,3	15%		2	1,3	15%		2	2,0	15%		1	1,0	15%		1	1,0	15%		1	1,0	15%		1	1,3	15%			
		D.2.3 Geohazards	2				2				1				1				2				1				1				1				2					
		D.3.1 Presence of natural habitats	2				2				2				2				2				1				1				1				1					
	D.3 Biodiversity	D.3.2 Presence of sensitive habitats	2	2 2,0 15%	15%	15%	15%		2	2,0	15%		2	2,0	15%		2	2,0	15%		2	2,0	15%		1	1,0	15%		1	1,0	15%		1	1,0	15%		1	1,0	15%	
		D.3.3 Biocorridors for large mammals	2				2			2				2				2				1				1				1				1						
D.		D.4.1 Agriculture	1			1,6	1			1,9	1			1,7	1			1,6	1			1,9	2			1,3	3			1,4	3			1,3	3			1,5		
Environment	D.4 Soil & land use	D.4.2 Forests	1	1,0	10%		1	1.5	10%	1,3	1	1,3	10%	1,,	1	1,3	10%		1	1.5	10%	1,3	1	1,3	10%	1,3	1	1,5	10%	1,4	1	1.5	10%	1,5	1	1,5	10%	1,3		
	S Son a rand dise	D.4.3 Hill pastures	1		.576		2	1,0	.5,0		2	1,0	.0,3		2	.,5	1.076		2	1,0	.0,0		1	1,0	,		1	1,0	.0,0		1	1,0	.0,0		1		.5%			
		D.4.4 Soil erosion	1				2				1				1				2				1				1				1				1					
	D.5 Water	D.5.1 Ground water	2	2,0	10%		1	1.5	10%		1	1,5	10%		1	1,5	10%		1	1.5	10%		2	2,0	10%		2	1,5	10%		2	1,5	10%		3	2,0	10%			
		D.5.2 Surface water	2	,3			2	-,,			2	.,.			2	.,3			2	-,,0			2	,_			1	.,0			1	.,5	.5.5		1					
	D.6 Landscape	D.6.1 Visual landscape	2	2,0	10%		2	2.0	10%		2	1.5	10%		2	1,5	10%		2	1.5	10%		1	1,0	10%		1	1,0	10%		1	1,0	10%		1	1,0	10%			
	_ 10 2411000400	D.6.2 Permeability (length of tunnels, bridges, fences, etc.)	2		.270		2	,			1	.,.			1	.,3			1	.,0			1	.,0			1				1				1					
	D.7 Air & Climate	D.7.1 Emission and Air quality	3	2,5	5%		2	2.0	5%		2	2,0	5%		2	2,0	5%		2	2,0	5%		3	2,5	5%		2	2,0	5%		2	2,0	5%		2	2,0	5%			
		D.7.2 Climate changes	2	,5	0		2	2,0			2	_,,			2	,3			2	2,0			2	,_			2	2,0			2	_,,			2					
	D.8 Waste	D.8.1. Waste	1	1,0	10%		3	3,0	10%		3	3,0	10%		3	3,0	10%		3	3,0	10%		1	1,0	10%		2	2,0	10%		2	2,0	10%		3	3,0	10%			
	D.9 Noise & vibrations	D.9.1.Noise&Vibrations	3	3,0	5%		3	3,0	5%		2	2,0	5%		2	2,0	5%		3	3,0	5%		3	3,0	5%		2	2,0	5%		2	2,0	5%		2	2,0	5%			

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Main Criteria	BAU Blace- Stenkovec North	Blace- Stenkovec Alt DD2002	Blace- Stenkovec Alt 1 North	Blace- Stenkovec Alt 1C North	Blace- Stenkov ec Alt 2 North	BAU Blace- Stenkovec South	Blace- Stenkov ec Alt 1 South	Blace- Stenkov ec Alt 1C South	Blace- Stenkove c Alt 2 South
D. Environment	1,6	1,9	1,7	1,6	1,9	1,3	1,4	1,3	1,5
Preferred Alternative (s)	1,6	1,9	1,7	1,6	1,9	1,3	1,4	1,3	1,5