

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 and social aspects	Methodology	Classification Scheme (Level of Achievement of Objective)		
		1	2	3
<i>Community Health and safety</i>	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
<i>Housing and community infrastructure</i>	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
<i>Resettlement and livelihood</i>	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).
<i>Cultural and historical heritage</i>	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
<i>Geodiversity</i>	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
<i>Geoheritage</i>	Distance to the valuable geo sites (recorded previously) is calculated.	More than 5 km	2-5 km	up to 2 km
<i>Geohazards</i>	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
<i>Presence of natural habitats</i>	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
<i>Presence of sensitive habitats</i>	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
<i>Biocorridors for large mammals</i>	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.
<i>Agriculture</i>	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 and social aspects	Methodology	Classification Scheme (Level of Achievement of Objective)		
		1	2	3
<i>Forests</i>	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.
<i>Hill pastures</i>	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.
<i>Soil erosion</i>	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).
<i>Ground water</i>	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.
<i>Surface water</i>	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".
<i>Visual landscape</i>	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 man-made 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.
<i>Permeability (length of tunnels, bridges)</i>	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.
<i>Emission and air quality</i>	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".
<i>Climate change</i>	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"
<i>Waste</i>	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
<i>Noise and vibration in environment</i>	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					Blace-Stenkove South			
BAU	Alt DD2002	Alt 1	Alt 2	ALT1C	BAU	Alt 1	Alt 2	Alt 1C
No need to install barriers for protection from noise and vibrations.	Barrier of 500 m (250 m on each side) at the weekend settlement is needed.	The same as Alt DD2002	Barriers of 500 m (250 m on each side) at the weekend settlement and additional 300 m near the cattle farm are needed.	The same as Alt DD2002	No need of barriers	The same as BAU	The same as BAU	The same as BAU

Housing and community infrastructure

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

Resettlement and livelihood

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

Cultural and historical heritage

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

the alignment. Davina Kula is ~750 m.	alignment. Davina Kula is ~650 m.	alignment. The Davina Kula is located ~500+m.			sensitive sites			
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➤ **Geodiversity and geohazards**

Geodiversity

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 the valley-gorge of the Lepenec River. The gorge is not as spectacular as the sides are not too steep 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					Blace-Stenkove South			
BAU	Alt DD2002	Alt 1	Alt 2	ALT1C	BAU	Alt 1	Alt 2	Alt 1C
The nearest recognized geo-heritage site is the deeply incised gorge of Banjanska River (at distance 4-5 km). The gorge of Lepenec has some geomorphological significance but the impact of the existing road is minor.	The nearest recognized geo-heritage site is the gorge of Banjanska River (at distance 4-5 km). The gorge of Lepenec has weak geomorphological significance.	The nearest recognized geo-heritage site is the gorge of Banjanska River (at distance 4-5 km). The gorge of Lepenec has weak geo-heritage value, except as a protruding type of gorge.	The same as Alt 1.	The same as Alt 1.	As the existing road passes through the flat area of Skopje Plain, there is no recognized geo-heritage sites.	There is no well recognized geo-heritage.	The same as Alt 1	The same as Alt 1

Geo-hazards

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

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

Presence of natural habitats

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

Presence of sensitive habitats

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

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 movement of large mammals, although most of the surrounding habitats require restoration.	It is situated in a potential biocorridor which requires habitats restoration in order to improve its functions.	The same as Alt DD2002	The same as Alt DD2002	The same as Alt DD2002	The existing road is situated in an area which serves no biocorridor functions	It is situated in an area which serves no biocorridor functions.	The same as Alt1	The same as Alt1

➤ **Soils & land use**

Agriculture

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

Forests

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 an area with small surface of forests. No new acquisition of forest land is foreseen.	It passes through an area with small surface of forests. Very small area forest land is foreseen for acquisition.	The same as Alt DD2002.	The same as Alt DD2002	The same as Alt DD2002	The existing road passes through an area with almost no forest.	It passes through an area with almost no forest.	The same as Alt1	The same as Alt1

Hill pastures

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 an area with significant amount of hill pastures.	It passes through an area with dominance of hill pastures which are used for cattle grazing (sheep, cows).	It passes through an area with dominance of hill pastures which are used for cattle grazing (sheep, cows).	The same as Alt DD2002.	The same as Alt DD2002.	The existing road passes through an area with very small amount of hill pastures.	It passes through an area with very small amount of hill pastures	The same as Alt1	The same as Alt1

Soil erosion

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

Water

Ground water

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

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

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

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

Permeability (length of tunnels, bridges)

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 already an obstacle for the movement of animals. However, the area is potential biocorridor which already requires restoration.	The alternative includes total length of permeable structures of 6120 m. Such design ensures movement of animals. The area is potential biocorridor which already requires restoration.	The alternative includes the total length of permeable structures of 6535m that will ensure movement of animals. However, the area is potential biocorridor which already requires restoration. This is more preferred alternative compared to Alt DD2002 or Alt 2 to a certain extent.	The alternative includes the total length of permeable structures of 6690 m that will ensure movement of animals. However, the area is potential biocorridor which already requires restoration.	This alternative includes the total length of permeable structures of 6095 m. In this respect it is similar to Alt 1, although less preferable.	The existing road poses certain restrictions for the movement of animals. The biocorridor potential of the area is low.	The alternative poses restrictions for the movement of animals. The biocorridor potential of the area is low.	The same as Alt 1	The same as Alt 1

Air quality & climate changes

Emission and air quality

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

increased air emissions are expected. The impact on the air quality are estimated as "high".	assessed as "medium" to "high". During the operation the possible impacts on air quality may be assessed as "medium" to "high".				increased air emissions are expected. The impact on the air quality may be estimated as "high".	"high" impact on air quality. During the operation, the impacts on air quality may be assessed as "medium" to "high".		
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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 existing motorway (traffic congestion, idle working of the vehicles), predicted increased of transport activities in the future generation of GHG and impact on climate change may be estimated as "medium".	Construction activity will generate GHG. These activities may contribute to local climate changes and the possible impacts may be estimated as "medium", while in the operational phase, the highway traffic will generate GHG emission and impacts may be assessed as "medium".	The same as Alt DD2002	The same as Alt DD2002	The same as Alt DD2002	As a result of condition of the existing motorway (traffic congestion, idle working of the vehicles), predicted increased of transport activities in the future generation of GHG and impact on climate change may be estimated as "medium".	Construction activity will generate GHG. These activities may contribute to local climate changes and the possible impacts may be estimated as "medium", while in the operational phase, the highway traffic will generate GHG emission and impacts may be assessed as "medium".	The same as Alt 1	The same as Alt 1

Waste

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

Noise and vibration in the environment

Blace-Stenkove North					Blace-Stenkove South			
BAU	Alt DD2002	Alt 1	Alt 2	ALT1C	BAU	Alt 1	Alt 2	Alt 1C
This alternative will result in higher traffic noise and vibration proportional to the expected increase of traffic load, queuing and idling of vehicles.	It will result in generation of "high" level of noise and vibration during the construction and "medium" to "high" during the operation.	The same as Alt DD2002. Constructed tunnels will reduce the level of noise and vibration.	The same as Alt DD2002	The same as Alt 1	As a result of the condition of the national road, followed by a traffic congestion and idle working of the vehicles, predicted increased of transport activities in the future, this alternative will result in generation of "high" emissions of noise and vibration in the environment.	It will result in generation of "medium" to "high" level of noise and vibration during the construction and "medium" to "high" during the operation	The same as Alt 1	The same as Alt 1

Table 2 Summary of environmental and social impacts-MCA

Main Criteria	Indicators	Parameters	BAU Blace-Stenkovec North		Blace-Stenkovec Alt DD2002		Blace-Stenkovec Alt 1 North		Blace-Stenkovec Alt 1C North		Blace-Stenkovec Alt 2 North		BAU Blace-Stenkovec South		Blace-Stenkovec Alt 1 South		Blace-Stenkovec Alt 1C South		Blace-Stenkovec Alt 2 South				
			Value	Weight	Value	Weight	Value	Weight	Value	Weight	Value	Weight	Value	Weight	Value	Weight	Value	Weight	Value	Weight	Value	Weight	
D. Environment	D.1 Social aspects	D.1.1 Community health and safety	1		1		1		1		1		1		1		1		1		1		
		D.1.2 Housing and community infrastructure	1	1,0	20%	1	1,3	20%	1	1,5	20%	1	1,0	20%	1	1,0	20%	1	1,0	20%	1	1,0	20%
		D.1.3 Resettlement and livelihood	1			2		3		1		3		1		2		1		1		1	
		D.1.4 Cultural and historical heritage	1			1		1		1		1		1		1		1		1		1	
	D.2 Geodiversity & geohazards	D.2.1 Geodiversity	1			2		1		1		2		1		1		1		1		1	
		D.2.2 Geoheritage	1	1,3	15%	2	2,0	15%	2	1,3	15%	2	1,3	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		1		2	
	D.3 Biodiversity	D.3.1 Presence of natural habitats	2			2		2		2		2		1		1		1		1		1	
		D.3.2 Presence of sensitive habitats	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%
		D.3.3 Biocorridors for large mammals	2			2		2		2		2		1		1		1		1		1	
	D.4 Soil & land use	D.4.1 Agriculture	1		1,6	1		1,9		1		1,7		1		1,3		3		1,4		3	
		D.4.2 Forests	1	1,0	10%	1	1,5	10%	1	1,3	10%	1	1,5	10%	1	1,3	10%	1	1,5	10%	1	1,5	10%
		D.4.3 Hill pastures	1			2		2		2		2		1		1		1		1		1	
		D.4.4 Soil erosion	1			2		1		1		2		1		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%	2	2,0	10%	2	1,5	10%	3	2,0	10%
		D.5.2 Surface water	2			2		2		2		2		2		1		1		1		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%	1	1,0	10%	1	1,0	10%	1	1,0	10%
		D.6.2 Permeability (length of tunnels, bridges, fences, etc.)	2			2		1		1		1		1		1		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%	3	2,5	5%	2	2,0	5%	2	2,0	5%
		D.7.2 Climate changes	2			2		2		2		2		2		2		2		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%	1	1,0	10%	2	2,0	10%	2	2,0	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%	2	2,0	5%	2	2,0	5%



Main Criteria	BAU Blace-Stenkovec North	Blace-Stenkovec Alt DD2002	Blace-Stenkovec Alt 1 North	Blace-Stenkovec Alt 1C North	Blace-Stenkovec Alt 2 North	BAU Blace-Stenkovec South	Blace-Stenkovec Alt 1 South	Blace-Stenkovec Alt 1C South	Blace-Stenkovec 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