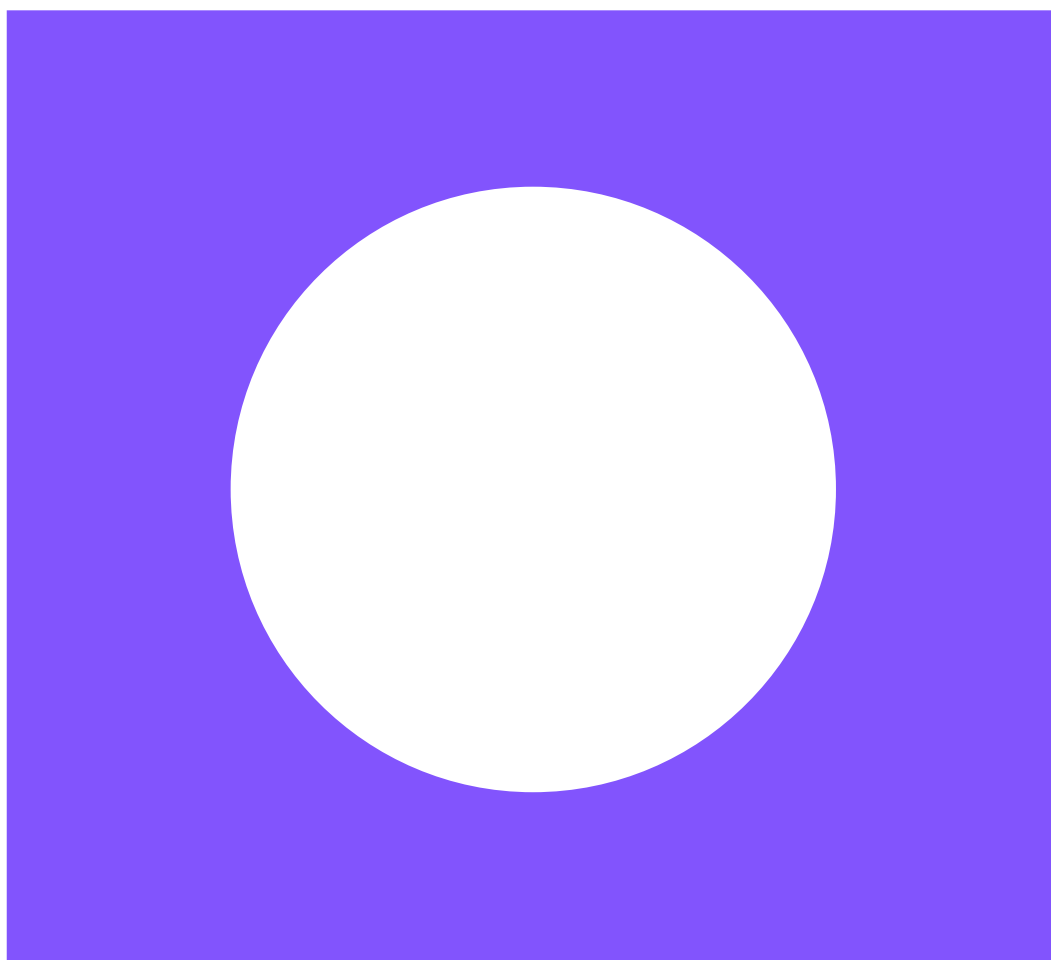


Tárgy: M9 gyorsforgalmi út déli lekötéséhez kapcsolódóan tompai új, teherforgalmi határátkelőhely és kapcsolódó gyorsforgalmi úti szakasz tervezése tanulmány terv és környezetvédelmi engedély szinten			
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M9 Road Connection at Tompa and Construction of a New Border Crossing Point

Environmental Impact Assessment
Non-Technical Summary

April 2025

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Environmental Impact Assessment
Non-Technical Summary

April 2025

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1 Antecedents

1.1.1 Antecedents, design disposition

On 8 January 2024, the Ministry of Construction and Transport (hereinafter: Client) signed a design contract with the consortium formed by FŐMTERV Engineering Design Ltd. and Roden Engineering Office Ltd. for the performance of the task in the subject of "Design of a new freight border crossing point and a related expressway section in Tompa in connection with the southern connection of the M9 expressway" (PST: A009.26). As a subcontractor of the Consortium, SpeciálTerv Kft. (hereinafter: Designer) prepared the study plan, which formed the basis of the environmental impact study. The environmental impact assessment (EIA) was prepared by Mott MacDonald Hungary Kft. as a subcontractor of SpeciálTerv Kft.

Based on the information available to the designer, there is no preliminary plan for the object project.

According to the design disposition, the Planner was responsible for planning the continuation of the binding with the same parameters as the previous phase in a length of approximately 7.0 km at the study plan level for a new border crossing point to be established in the area of Tompa.

The planning task included the preparation of studies and proposals regarding the starting point of the road section and the border intersection, consultation with the planner of the previous section and the Serbian side, participation in the work and consultations of the Serbian-Hungarian working group. The design of the border crossing point was also part of the task in the draft plan and at the level of land use.

1.1.2 Legal context

From the point of view of legal alignment, the most relevant legislation is Government Decision 1342/2023 (VII.31.), which decided on the necessity and financial background of the examination of the new alignment of the M9 expressway and the designation of a new border intersection.

The planned development of the section affected by the investigation (hereinafter referred to as the Project) is the basis of Government Decree 345/2012 (XII.6.) on declaring administrative authority cases related to certain transport development projects as matters of major importance from the point of view of the national economy and on the designation of the competent authorities . **National Road Transport Projects / 1.1. On the basis of Section 1.1.83 of the Motorways, as "Implementation of the section between the M95 expressway, the M9 expressway and the Tompa, national border" it qualifies as an investment of major importance.**

Pursuant to Annex 1 of Government Decree 314/2005 (XII.25.) (on the environmental impact assessment and the uniform environmental use permit procedure, hereinafter: Environmental Impact Assessment and Uniform Environmental Use Permit Procedure, hereinafter: Environmental Impact Assessment Act), the planned activity can be classified into the following points:

37. Public roads and private roads not closed to public traffic,

a) construction of expressways (motorways, expressways) with junction elements

For the above reasons, the investment is one of the activities subject to an Environmental Impact Assessment.

Pursuant to Section 7 (1) of the Environmental Protection Act, the environmental impact assessment procedure is initiated by the environmental authority at the request of the environmental user. The application must be accompanied by an environmental impact assessment. The general content requirements of the environmental impact assessment are set out in Annex 6. This study was prepared accordingly.

Pursuant to Section 10 (6a) of the Land Use Act, in the case of an activity the implementation of which requires the installation of a alignment facility, the impact assessment must also include the examination of the effects of the alignment facility, the related facilities, related activities and other facilities affected by the alignment facility (in particular crossing roads, public utilities).

1.1.3 Purpose of the planned activity

Expansion of the capacity of existing border crossing points for freight and passenger traffic crossings on the border section with Serbia, and

- an alternative freight route to relieve existing connections,
- savings in freight travel time and mileage,
- improving the economic potential of the region;
- the establishment of a direct expressway connection from Serbia between the M6 and the national border.

In this environmental impact assessment, the M9 expressway A3 and the complex rest area and border crossing point C variant are examined in detail among the previously examined variants.

1.2 Subject matter of the permit application

Permit application for a complex rest area and a new freight border crossing point and a related expressway section in Tompa to be established within it.

2 Planned activities

The length of the design phase is 6.057 km, the subject of the study is the Tompa section of the M9 expressway and the establishment of a new joint Hungarian-Serbian border crossing point.

Table 2.1: Technical parameters of the expressway examined in the Authorised Public Account.

Technical Parameter	Typical quantity
Total length (m)	6 057
Of which new route (m)	6 057
Of this, existing route (m)	0
Nodes (pcs)	-
Works of art (pcs)	4
Watercourse crossings, culverts	-

Source: Study plan, January 2025

2.1 Technical parameters

According to the Technical Road Specification e-UT 03.01.11 "Road Design (KTSZ)", the technical parameters of expressways:

- Road category: K.II. Planning Department,
- Design Speed: 110 km/h,
- Environmental condition: A
- Length of the road: 6057 m (6,057 km)

2.1.1 Cross-sectional design

Cross-sectional design of the expressway

- Number of traffic lanes: 2 x 2 lanes,
- Traffic lane width: 3.5 m,
- Enclosure width: 2 x 8 m,
- Width of the shoulder: 1.5 m,
- Crown width: 20 m

2.2 Site plan design

2.2.1 Horizontal Routing

The planned intervention is located in Bács-Kiskun County, in the administrative area of the city of Tompa. The route of the planned expressway to be examined was designated between the settlements of Mélykút and Tompa. The location of the border intersection point concerns the area of the Kiskunhalas district.

Basic data of the planned expressway:

- The starting section of the planned route: 70+813 km
- End section of the planned alignment: 76+870 km
- Length of the planned route: 6,057 m (6,057 km)

The trail starts at chainage 70+813 km, joins the previous section here and goes almost south on arable land until chainage 72+000 km. Then the route turns to the SW with an arc radius of $R=1100$ m, then crosses the paved road of an industrial area at chainage 72+905 km. Here, the paved road of the industrial area crosses the expressway on a separate level from above (structure B1 j.). The track then runs in a straight line, then before crossing road 5501 j., it turns again with a radius of $R=1500$ m in a nearly southerly direction. The expressway crosses the existing national road 5501 km in km 73+951. During the planning process, it was determined that at the intersection of road 5501, the expressway will be constructed as an overpass. The reason for this is primarily to ensure the direction of movement of big game, and cycling development can also be established as part of the designated Euro-velo 13 trail. The intersection of the roads is unfavourable, so on road 5501 there are 14+363 – 15+113 km alignment correction is made. With alignment correction, a more favorable crossing angle can be ensured, which results in a more economical solution in terms of structure construction. The trail then goes almost in a southerly direction and reaches the border at chainage 76+870 km.

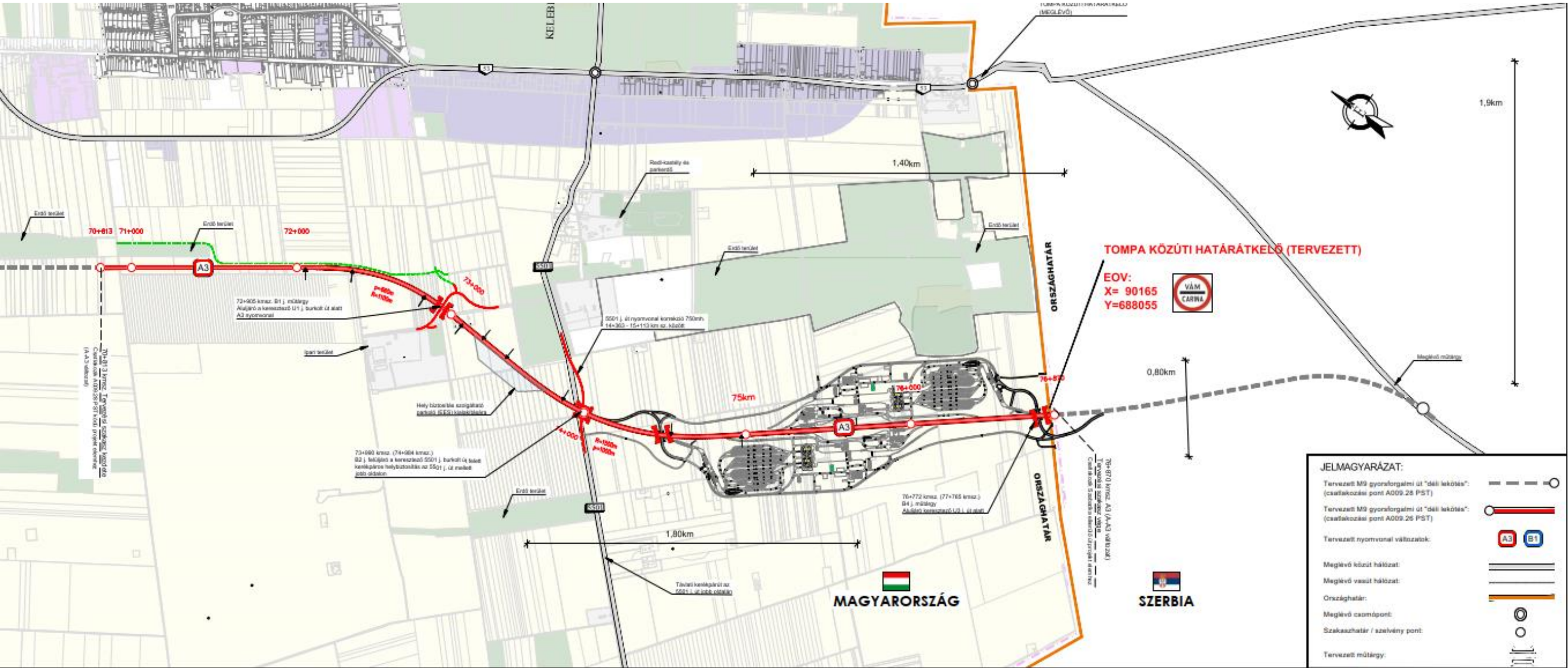
Table 2.2: Topographic alignment - parameters applied

Site parameters	Permissible extreme value		Extreme value applied
Smallest horizontal radius	R [m]	600	1000
Minimum Transition Arc Parameter	p[m]	220	560

Source: Study plan, January 2025

The planned establishment of the joint border post is planned approximately between chainages 75+000 – 76+500.

Figure 2.1: Version examined in the EIA



Source: Study plan, January 2025

2.2.2 Elevation Alignment

The planned route leads through the lowland area, so its elevation line is lowland in nature.

The horizontal lines used comply with the parameters 110 km/h, but they can also be used for higher design speeds (130 km/h).

Table 2.3: Elevation Alignment - Applied Parameters

Height parameters	Permissible extreme value		Extreme value applied
Biggest Rise	e [%]	5	3,5
Smallest convex arch	Rd [m]	9200	9200
Smallest concave arc	Rh [m]	5000	5000

Source: Study plan, January 2025

2.3 Junctions

No junction is planned on the section of the planned expressway.

2.4 Structures

In the design area, 4 structures must be built in the following places and structures:

Table 2.4: Planned structure and number of km of structures (bridges)

Bridge sign	Km no.	Bridge type	Designed structure
B1	72+905	Underpass crossing under dirt road U1	Prefabricated durable superstructure
B2	73+990	Overpass crossing 5501 j. over road and wildlife passage	Prefabricated durable superstructure
B3	74+488	Underpass crossing under road U2	Clamped Steel Cabinet Support Mule Bridge
B4	76+772	Underpass under road U3	Clamped Steel Cabinet Support Mule Bridge

Source: Study plan, January 2025

2.5 New network elements to be developed together with the road

2.5.1 Related road corrections

The installation of the expressway requires the correction of national road 5501 j at the crossing of km 73+984 km on a length of 750 m, between its chainage 14+363 – 15+113 km.

Due to the planned expressway, it is also necessary to correct the paved road leading to an industrial area (former MgTsz site) on a length of about 760 m near the 73+000 km section of the expressway.

2.5.2 Correction of intersecting and parallel dirt roads

Access to the areas cut off during the implementation of the planned expressway will be ensured by parallel dirt roads, in consultation with the municipalities concerned. Dirt road crossings are created at a separate level in the necessary places. The paved sections of the dirt roads are paved with a width of 6.50 m and a crown width of 8.50 m, while the stabilized unpaved sections are 4.0 - 7.0 m wide, depending on their network role, length and expected

traffic volume. Before the connection of the dirt roads to the paved road, a mud-shaking pavement of at least 50 m will be built.

Approximately 2330 m of dirt roads will need to be built/corrected during the entire design phase.

2.6 Planned complex rest area and border crossing point

After the border intersection, a complex rest area is planned to be established on the Hungarian side, which also includes the facilities of the border crossing point necessary for the Hungarian and Serbian border controls. The two functions cannot be separated from each other, they are closely related to each other. Below is a brief introduction to the planned complex rest area and border station and its facilities. **It is to be noted that, based on the designer's disposition, the border crossing point had to be designed only at the level of a concept plan (sketch plan), therefore the plans of the facilities and the border station presented here may still change in the following planning phases (permit and construction plans).**

The planned design of the complex rest area and border station **that Figure 2.2** Presents.

Within the complex rest area, the border crossing must be suitable for unrestricted freight traffic, ADR and live animal crossing, in addition to passenger traffic. With regard to road connections, passenger and freight handling areas and parking spaces for cars, buses, trucks and vehicles transporting dangerous goods will be established at the border crossing point in a well-separated manner.

In the area, offices, service rooms, social rooms, a police building, inspection buildings and halls, warehouses, passenger traffic areas, toilets, and parts of the building for the accommodation of persons subject to official procedures are necessary to adapt to the function of the border crossing point.

2.6.1 Baseline Information

- Design site area: ~900,000 m² (~90 ha).
- Current zone classification: Ma - 1 — Agricultural territorial zone.

The current zoning of the area does not allow the establishment of a border crossing, so the regulatory plan needs to be modified.

2.6.1.1 Headcount data

In order to ensure the continuous operation of the border crossing, the operation of the crossing must be ensured in shifts between 0 and 24 hours, both on the Hungarian and Serbian sides.

According to the preliminary concept plans and one, the total number of employees is 1411, which includes both the Hungarian and Serbian employees, and the total number of employees given by the various authorities was also taken into account.

2.6.1.2 Parking requirement

The placement of passenger cars for the staff and service of the border station was planned taking into account Annex 4 of Government Decree No. 253/1997 (XII.20.) (OTÉK):

- 11. for every 200 m² of the manufacturing and assembly premises of an industrial (factory) independent purpose unit,
- 14. for each started 20 m² net floor area of the premises of offices and other independent units for long-term stays,

Taking into account the above, the parking needs of each building are determined according to the table below, both in terms of border control on the entry and exit sides (H – border control on the entry side, S – border control on the exit side).

Table 2.5: Planned parking demand for employees and service employees per building.

Page	Fate.	Building Name	Net floor area (m2)	Parking space requirement (pcs)	Number of planned tree planting
H	001	Main building	4591	78	13
H	002	Passenger level crossing	440		
H	101	VAT Refund Office	27	3	1
H	102	Primary Passenger Car Test Location	0	0	0
H	103	Secondary Passenger Car Inspector	243	2	1
H	104	Passenger toilets + NTPS office	133	3	1
H	105	Passenger toilet	66	0	0
H	201	Bus Terminal	1290	27	5
H	202	Bus Physical Test Location	0	0	0
H	301	Freight Testing Hall	387	2	1
H	302	Border Inspection Posts for Veterinary and Phytosanitary Purposes	1265	10	2
H	303	Racehorse reception building	469	4	1
H	304	Live animal reception building	2012	18	3
H	305	Vehicle Disinfectant	274	0	0
H	306	Customs Clearance Office	1326	46	8
H	307	Balance House	96	3	1
H	308	Police checkpoint	63	2	1
H	309	Dangerous goods inspection site	41	0	
H	310	X-ray inspection site		0	
H	311	Freight washroom	37	0	0
H	901	Dogs	358		
H	902	NAV warehouse and reserved vehicle parking	276	2	1
H	903	Police warehouse and confiscated vehicle parking	143	2	1
H	904	Maintenance workshop	308	3	1
H	905	Cold storage for goods	66,35	0	0
H	-	Employee parking	0	80+30	
And	001	Serbian Authorities Main Building	921	21	4
And	102	Primary Passenger Car Test Location	0	0	0
And	103	Secondary Passenger Car Inspector	243	2	1
And	104	Passenger toilets + toll office	133	3	1
And	105	Passenger toilets	66		
And	201	Bus Terminal	1290	27	5
And	202	Bus Physical Test Location	0	0	0
And	301	Freight Testing Hall	387	2	1
And	302	Border Inspection Posts for Veterinary and Phytosanitary Purposes	1265	10	2
And	303	Racehorse reception building	469	4	1

Page	Fate.	Building Name	Net floor area (m2)	Parking space requirement (pcs)	Number of planned tree planting
And	304	Live animal reception building	2012	18	3
And	305	Vehicle Disinfectant	274	0	0
And	306	Customs Clearance Office	1326	46	8
And	307	Balance House	96	3	1
And	308	Police checkpoint	63	2	1
And	309	Dangerous goods inspection site	41	0	0
And	310	X-ray inspection site	0	0	0
And	311	Freight washroom	37	0	0
And	901	Dog kennel	0	0	0
And	902	Warehouse and reserved vehicle parking	1200	4	1
And	-	Employee parking	0	62+80+30	
Altogether				627	70

Source: Study plan, January 2025

In addition to the staff working and serving at the border crossing point, a significant number of parking spaces have also been planned for border crossers, preventing the congestion of vehicles experienced at the current Tompa border crossing point, which on the Hungarian side will be congested up to the Tompa bypass section of main road 53. On both sides of the border, the following parking numbers are planned for those crossing the border:

Table 2.6: Preliminary parking numbers planned for complex rest areas

Page	Name of the parking lot	Parking number (pcs)
Hungarian	ADR Parking	50
Hungarian	Cargo parking	250 (73+97+80)
Serbian	ADR Parking	50
Serbian	Cargo parking	250 (73+97+80)
All parking lots		600

Source: Self-edited based on the January 2025 Study Plan

2.6.2 Planned facilities and public utility needs of border crossing points

According to the preliminary concept, the energy needs of the border crossing point will be as follows on the Hungarian (H) and Serbian (S) border control sides.

Table 2.7: Energy needs of the planned facilities of the border crossing point based on the architectural sketch plan

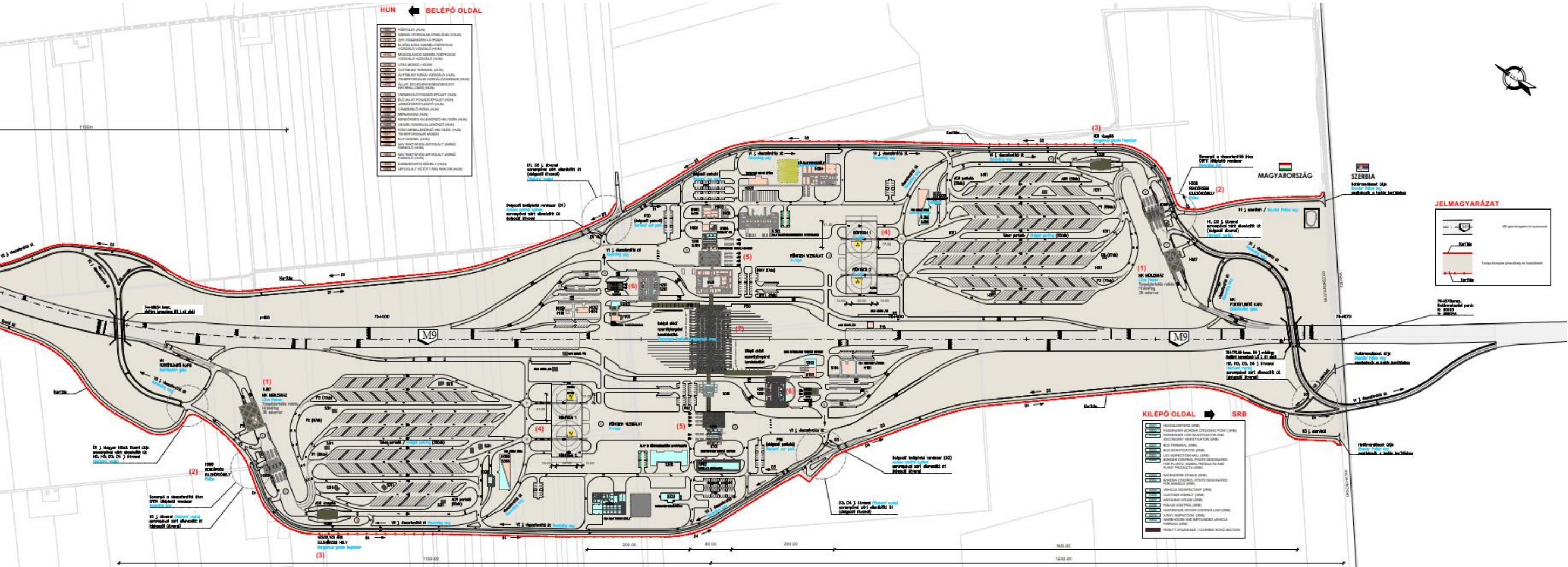
Country	No	Building Name	Water Requirements	Electricity (excluding mechanical engineering)
			V (m3/h)	kW
H	001	Main building	90,40	235,24
H	002	Passenger level crossing	0,00	80,00
H	101	VAT Refund Office	0,48	8,18
H	102	Primary Passenger Car Test Location	0,00	0,00
H	103	Secondary Passenger Car Inspector	0,62	10,73
H	104	Passenger toilets + NTPS office	1,65	3,19

Country	No	Building Name	Water Requirements	Electricity (excluding mechanical engineering)
H	105	Passenger toilets	1,45	2,65
H	201	Bus Terminal	2,96	54,60
H	202	Bus Physical Test Location	0,00	0,00
H	301	Freight Testing Hall	0,48	11,61
H	302	Border Inspection Posts for Veterinary and Phytosanitary Purposes	2,72	64,52
H	303	Racehorse reception building	0,48	20,47
H	304	Live animal reception building	1,20	60,37
H	305	Vehicle Disinfectant	0,12	4,00
H	306	Customs Clearance Office	12,60	64,72
H	307	Balance House	0,48	3,85
H	308	Police checkpoint	0,24	2,84
H	309	Dangerous goods inspection site	0,12	1,42
H	310	X-ray inspection site	0,00	0,00
H	311	Freight washroom	2,00	0,74
H	901	Dogs	0,62	6,53
H	902	NAV warehouse and reserved vehicle parking	0,00	5,53
H	903	Police warehouse and confiscated vehicle parking	0,12	2,86
H	904	Maintenance workshop	1,20	5,31
H	905	Confiscated Goods Cold Storage	0,00	1,59
S	1	Serbian Authorities Main Building	22,60	58,81
S	102	Primary Passenger Car Test Location	0,00	0,00
S	103	Secondary Passenger Car Inspector	0,62	10,73
S	104	Passenger toilets + toll office	1,62	3,19
S	105	Passenger toilets	1,45	2,65
S	201	Bus Terminal	2,96	54,60
S	202	Bus Physical Test Location	0,00	0,00
S	301	Freight Testing Hall	0,48	11,61
S	302	Border Inspection Posts for Veterinary and Phytosanitary Purposes	2,72	64,52
S	303	Racehorse reception building	0,48	20,47
S	304	Live animal reception building	1,20	60,37
S	305	Vehicle Disinfectant	0,12	4,00
S	306	Customs Clearance Office	12,60	64,72
S	307	Balance House	0,48	3,85
S	308	Police checkpoint	0,24	2,84
S	309	Dangerous goods inspection site	0,00	0,00
S	310	X-ray inspection site	0,00	0,00
S	311	Freight washroom	2,00	0,74
S	901	Dogs	0,00	0,00
S	902	Warehouse and reserved vehicle parking	0,00	33,15
Altogether			169,51	1014,05

Source: Study plan, January 2025

For the design of the planned complex rest area and border crossing point, see the figure below.

Figure 2.2: General site plan of the planned border crossing point



Source: Study plan, January 2025

The construction of the planned 2 X-rays requires a high-voltage electrical supply and at least 32 Amperes of electric current for the secondary testing workshop.

In the later planning phase necessary for the safe operation of the border crossing point, the planning (indication on the drawing) of the water network and the water abstraction options for firefighting purposes (above-ground fire hydrant, fire water reservoir if necessary) is necessary.

In order to illuminate the border crossing point at night, the electrical network and the related fittings and structures must be designed in a later planning phase, and explosion-proof lighting equipment must be designed and installed at the ADR testing sites.

For the planned resting place, the following is also required:

- Water supply approx. 3200 m
- Wastewater disposal approx. 4900 m
- Power supply approx. 3000 m

pipeline construction.

In terms of buildings, according to the energy concept plan, a total of 5500 m² of solar panels will be installed, which can cover about 55% of the annual electricity demand.

2.6.3 Architectural appearance

The aim of the project is to create a modern and forward-looking building complex using the most modern architectural technologies and materials. Innovative architectural solutions such as modular construction, intelligent building management systems and environmentally conscious use of materials all contribute to the long-term sustainability and flexible adaptation of buildings.

Color scheme

When choosing the color scheme of the buildings, the architectural concept design preferred the use of natural and restrained colors. This color palette has a beneficial effect on people not only aesthetically, but also psychologically.

Natural colors, such as earth tones (browns, beiges, grays), suggest harmony and calmness, in harmony with the environment.

Figure 2.3: Planned colours of the buildings



Source: Study plan, January 2025

Use of materials

During the design process, it was important to create a modern and forward-looking building complex using modern architectural technologies and materials in the architectural sketch plan. Innovative architectural solutions such as prefabrication and modular construction and environmentally conscious use of materials all contribute to the long-term sustainability of buildings. For the façade cladding of the buildings, timeless and durable materials such as raw concrete surfaces and sheet metal cladding of different textures were chosen, which provide a

modern and contemporary solution and give the building a sophisticated appearance. On buildings that can also be used by public traffic, wooden façade cladding also appears on smaller surfaces. The natural appearance of wood gives warmth and character to buildings, but its application is not only aesthetically beneficial, but also beneficial from a sustainability point of view, as wood comes from renewable sources.

The structure of the space covers is made of wood and steel, which gives a pleasant appearance to those passing underneath. The illuminating surfaces of the roof, of course, make this space below bright.

The covering of the organically undulating roof surfaces consists of a combination of white metal sheet and translucent polycarbonate with UV protection, which easily follows the shape of the broken roof. Sheet metal cladding also appears on the hall buildings. The use of quality materials suggests durability and elegance in both buildings and space coverings.

2.7 Location

The examined route touches the south-western administrative area of the city of Tompa in Bács-Kiskun county, Hungary. On the Serbian side, the route will affect the outskirts of Subotica and Kelebija.

3 Impact processes and impact areas

3.1 Impact processes

The Table 3.1 shows the impacts, impact processes and the environmental elements and systems involved in the different phases of the planned activity.

Table 3.1: Possible environmental impact processes

Factors	Influencers	Direct effects	Indirect effects
Establishment			
Site preparation, site reservation	Air, noise	Increase in immission caused by emissions	Disturbing effect on wildlife and humans; Health damage
	Earth, soil	Volume decrease Erosion	Decrease in agricultural usability Degradation of vegetation
	Surface waters	Changes in runoff conditions	Fragmentation of a catchment area
	Wildlife	Habitat and habitat loss Jamming	Biodiversity loss Periodic decline in the number of individuals, migration
	Landscape	Changes in land and land use	Changes in the cityscape
	Settlement	Change of property boundary Disturbance/excavation of archaeological sites Possible deterioration of monumental values Employment growth	Functional outages in some areas Destruction of cultural heritage values/placing them under protection Socio-economic prosperity is increasing
Substructure and superstructure works (material handling, emissions from machinery, damage to roadside areas)	Air, noise	Increase in immission caused by emissions	Disturbing effect on wildlife and humans; Health damage
	Earth, soil	Changes in soil structure and compactness	Changes in soil water balance
	Air	Transient air pollution	Soil and water contamination
	Wildlife	Disturbance, habitat loss	Migration, degradation
	Settlement	Noise and vibration interference	Changes in the condition of structures
	Landscape	Aesthetic effect, landscape change	-
Generation and storage of construction waste	Earth, soil	Soil pollution	Water quality degradation
	Landscape	Aesthetic effect	-
Realization			
Traffic (increasing or reorganizing)	Air, noise	Increase in immission on the trail and in its surroundings, disturbance of noise and vibration	Physiological changes
	Wildlife	Disturbance, loss of living space Individual death	Migration, degradation
	Settlement	Disturbing effects of noise and vibration on the track and its surroundings	Physiological changes

Factors	Influencers	Direct effects	Indirect effects
Road as a facility	Wildlife	Limiting fragmentation, migration and migration Hitting due to the lure effect of the roadway Habitat expansion with marginal vegetation	Population degradation Genetic drift Appearance of new species
	Air	Changes in microclimate	Ecosystem change
	Surface water	Changes in water dynamics	Changes in water flow
	Landscape	Changes in land and land use	Changes in landscape and landscape structure
	Settlement	Changes in the condition of structures Creation of new structures	Innovation impacts: new investments in the region Change of settlement character Changes in settlement relations Economic growth of the region
Road maintenance, winter cleaning	Earth, soil	Soil pollution	Deterioration of water quality
	Wildlife	Disturbance, habitat loss	Habitat degradation
Abandonment			
Demolition works	Ibid., as in construction	Ibid., as in construction	Ibid., as in construction
Recultivation	Wildlife	Habitat and habitat expansion More close-to-nature areas	Biodiversity increase
	Landscape	Land and land use change	Landscape and landscape structure change
Disaster			
Accidents	Earth, soil	Accidental soil contamination	Reduced usability Deterioration of quality of life and living space
	Surface water	Accidental water pollution	
	Air	Emergency air pollution	Soil and water pollution due to sedimentation Adverse physiological effects
	Settlement	Noise and vibration interference	Adverse physiological effects
	Wildlife	Habitat and habitat loss Individual death	Degradation

3.2 Impact areas

3.2.1 Landscape protection

From the point of view of our study, the systems of the habitats affected by the trail, the people living in and visiting the affected settlements, and those who will use the built road in the future can be considered as having an impact. When choosing the ideal route version, the primary consideration is the preservation of valuable areas, habitats and landscape elements, and during the design, the users of the road and those who suffer from its effects are in the focus of the design (e.g. integration into the landscape).

From the point of view of landscape protection and townscape protection, the extent of the impact area is primarily influenced by the topography, vegetation cover, territorial built-up area and the proposed measures. The direct area of influence is the part of the region whose landscape, unique landscape value and land use method are directly affected by the investment. This cannot be expressed in terms of a uniform distance, the immediate area of influence varies depending on all this.

It also indirectly affects all the areas from which the planning phase of the route can be seen, and the landscape elements that can be seen from the planned section. Visual effects may vary depending on the factors (interventions) and the individual effect bearers (landscape elements). Indirect areas of influence shall be all areas where any impact of the investment can be perceived (regional development, land use change, landscape protection, landscape rehabilitation).

Direct Impact Area

From the point of view of landscape protection/townscape protection, the area directly occupied by the facility is understood as the area directly used by the facility.

Indirect Impact Area

It also indirectly affects all the areas from which the road can be seen and the landscape elements that can be seen from the road. Visual effects may vary depending on the factors (interventions) and the individual effect bearers (landscape elements). The individual interventions may also differ according to the sensitivity of the landscape, the intensity of the interventions and the extent of the effects. Indirect areas of influence shall be considered all areas where any impact of the investment can be perceived (regional development, land use change, landscape protection, landscape rehabilitation), which is possible even at a distance of several km.

There is also a change in terms of visual effects, as in the case of large structures, the area of impact is much more extensive (e.g. bridges, roundabout junctions, etc.) than if we only take the effects of the roadway on the landscape. The effect on the landscape in the vicinity of the junctions can also be an area development, as these areas can become more valuable as a result of easier access.

3.2.2 Wildlife and ecological system

The natural or near-natural habitats in the area and its vicinity, the animals that live, live, feed, breed, rest, hide and migrate are the beneficiaries of the investment.

Direct Impact Area

In the case of a planned aligned facility, the direct area of influence (construction area) extends to the border of expropriation/land acquisition.

Indirect Impact Area

When delimiting the indirect impact area, a strip of 100 meters from the axis of the planned route was taken into account in the case of areas covered with agricultural or natural or natural vegetation.

Obviously, in the vicinity of the intersections of separate levels and the corrected sections of the planned paved and agricultural roads, the area of influence is adapted and widened to the necessary facilities.

3.2.3 Geological medium, groundwater

From the point of view of the geological medium, soil and groundwater, the soil and geological medium of road shoulders and ditches, the topsoil next to the roadway, groundwater, in some cases the aquifer water and the water bases settled on them are the ones that bear an impact.

Impact Areas

In the case of soil, the immediate area of influence will be the zone surrounded by the expropriation border, service roads outside the border, and landfills and temporary land

occupations established during construction. The indirect area of influence is limited to a strip of approximately 50 m wide from the boundary line of these facilities.

In the case of the geological medium, a similar direct and indirect area of influence can be expected.

In the case of groundwater, the area of the shoulder and the ditch can be considered as the direct area of influence. An indirect area of influence is the area affected by the flow of groundwater, the extent of which depends on the groundwater level, the direction of groundwater flow and the composition of the soil.

3.2.4 Surface waters

From the point of view of surface waters, the watercourses in the vicinity of the trail and the watercourses crossed by it are the ones that have an impact. In our case, however, neither a watercourse nor stagnant water can be found in the design area.

Impact Areas

The direct area of influence of surface waters at the crossing of watercourses and at the point of discharge of rainwater drained from the road into the receiver is 25-50 m on the upstream side and 50-100 m on the downstream side, depending on the nature of the watercourse, however, such areas cannot be designated in the examined area, because the planned investment does not cross watercourses.

3.2.5 Air quality

From the point of view of air protection, the impact bearers are the population living in the immediate and indirect vicinity of the trails and the wildlife found in nature reserves that are sensitive to air quality.

Impact Areas

Due to the dust removal during construction and the emission of machinery, the area of influence of the expressway is estimated to be 100 meters. At the border crossing point, this distance was set at 200 m, considering that taller buildings and structures are also being built. An impact area of 50 m will be defined around the axis of the newly established dirt roads.

The effects of the operation within the immediate area of influence (this is the expropriation limit in practice) increase due to transport-related emissions, but the increase is almost undetectable for those living next to the road (at a distance of more than 50 m from the road) (<5%).

The effect of the operation on the public road network surrounding the project, which is considered to be the indirect area of impact of the expressway, will be improving, as a significant part of the increase in traffic and expected traffic (not counting the insert version) will be transferred to the expressway during operation, so we expect a significant drop in emissions there.

3.2.6 Noise and vibration

Those living in the part of the settlement affected by the planned road and those visiting its surroundings, those working at workplaces in the area, and the travelling public using the planned road can be considered as having an impact.

Impact Areas

From the point of view of noise and vibration, we distinguish between direct and indirect areas of influence. The direct area of influence is defined by Government Decree No. 284/2007. (X. 29.) Government Decree.

Indirect area of impact, the area related to the implementation and operation of the investment, where its noise and vibration protection effects prevail. In particular, the environment of transport and access routes can be considered as such, where noise and vibration loads increase due to construction and implementation (operation).

The construction impact area is 65 metres from the boundary road axes of the alignment and the border crossing point (isoline of reduction to 65 dB).

According to the measurement report, the night-time noise pollution at the traffic measurement points is at or above the limit value along main road 53. At the environmental/operational measuring point, the result of the night-time measurement is also close to the limit value, but the statistical value is more than 10 dB below the limit value. With regard to safety, the area of effect is defined by the night-time limit of 10 dB (45 dB), from which the effects of other traffic-type noise sources within the affected area are subtracted. This area of influence also includes the operational area of the border crossing, which is estimated to be 100 meters from the bordering road sections – however, expressed in sound pressure level, they are at least 1 order of magnitude (10 dB) lower.

The construction and operation vibration protection impact area of the investment is the 10-metre environment of the investment area, which is not relevant due to the long distance of the buildings to be protected, and is fulfilled within the expropriation limit based on a preliminary estimate, so there is no need to delimit it separately.

3.2.7 Built environment and settlements

From the point of view of the protection of the built environment, the affected settlements and the structures intended for human habitation are the ones that bear the influence. In addition, among the effects on the built environment, we take into account the protection of built and material monuments of cultural heritage (monuments, archaeological sites).

Impact Areas

By direct area of influence, we mean the affected houses and structures that are structurally or otherwise affected by the investment. All built objects that are subject to the more distant (spatial and temporal) effects of the investment can be found in an indirect impact area.

Direct area of impact: the direct area of influence of the project is the actual physical occupation of the route during construction (the expropriation boundary) and any other buildings or structures located within a 25-25 meter strip from the route. The direct area of operation is the entire area managed by the road operator.

Indirect area of impact: from the point of view of the built environment, the road network elements affected by transport, as well as temporary landfills or treatment areas for the disposal of demolished and extracted materials, are located in an indirect area of influence during construction. The outskirts of the affected settlement of Tompa can be considered an indirect area of influence both during construction and operation. In the operation phase, main road 52 and road 5501 can also be interpreted as indirect areas of impact. In the case of main road 53, its load will be significantly reduced as a result of the development due to the new border crossing, so the operation of the expressway and border crossing point will be improving from the point of view of the built environment.

3.2.8 Social, economic, environmental health impacts

In a narrower sense, the users of the new road and those living in the vicinity of the line, and in a broader sense, the inhabitants and economic operators of Tompa (H) – Subotica (SRB) are the beneficiaries of the investment.

The extent of the socio-economic and environmental health impacts primarily includes the population living and working in the Tompa-Subotica area, as well as the users of the expressway and the new border crossing point.

4 Estimation and evaluation of environmental impacts

The assessment of the impacts of the route variant based on the data provided by the Client, the Designer and the relevant authorities, as well as on-site visits and measurements, can be summarised as shown in the table below. The assessment basically takes into account the most unfavourable case. Given that a possible abandonment with the termination of the built infrastructure will have very similar effects to the construction, this is not separately included in the summary.

Table 4.1: Summary of the estimated impacts of the M9 Tompa mooring and the new complex rest area/border crossing point in the period of installation (construction) and implementation (operation)

Speciality	Installation (construction)	Implementation (operation)
Landscape	Bearable	Bearable
Wildlife	Terminating	Bearable
Geological medium	Terminating	Neutral
Groundwater	Bearable	Neutral
Surface water	Neutral	Neutral
Air quality	Bearable	Remedial
Noise and vibration	Bearable	Neutral
Climate	Bearable	Bearable
Built environment	Bearable	Remedial
Socio-economic	Remedial	Remedial
Environmental health situation	Bearable	Remedial

Source: Magyar – Tombácz – Fülöp - Teszár: Preliminary Study – Impact Assessment – IPPC. Small Library of Environmental Protection, 16. 2007.

4.1 Expected changes in the state of environmental elements and systems

4.1.1 Landscape protection and townscape protection

From the point of view of landscape protection, the planning area is almost entirely made up of large-scale agricultural areas, which fundamentally determine the land use, land cover, structure, function and landscape character/character of the planning area. On the south-directed section of the planned route and in the vicinity of the border crossing point, the landscape characteristics are determined by the area of the Tanács Forest and the Báró Pasture. Close-to-nature areas or larger green areas can only be found in these areas: mainly dry sand steppe grasslands (pasture with reeds of trees) and oak and ash forest areas surrounded by domestic and non-native poplar forest plantations. All in all, it can be said that the trail leads through a landscape that has been significantly influenced and transformed by man.

The construction of the examined trail will have a tolerable impact on the current landscape ecological relationships, the trail and the border crossing point will not affect semi-natural

habitats at all, and will not touch grasslands, shrubs or rows of trees that would be valuable from a landscape ecological point of view. In connection with the construction (installation) of the investment, the change in the green area system can be expected more.

However, the operation will have a stressful effect on sensitive landscape elements, primarily on the area of the Tanács Forest and the Báró Pasture between 74+000 and 76+870 km, while between sections 70+813 and 74+000 km, it will have a tolerable impact on the landscape. In the case of the Tanács Forest and the Báró Pasture, the burden can be reduced to a tolerable level with the proposed impact reduction measures.

4.1.2 Wildlife protection

From the point of view of wildlife conservation, the planned investment does not affect marked areas, it avoids them far away. 99% of the examined area is provided by large-scale arable land (Á-NÉR codes: T1 and T2, TDO:1) and only 1% is provided by habitats with Á-NÉR codes U11, S6 and S7 with a naturalness index of 1-2. The investment will also avoid the areas with the best naturalness of the area, the area of the Báró Pasture and the Tanács Forest in Tompa, and no land occupation is expected in these areas.

The animal species of greater value from the point of view of nature conservation, whose breeding pairs, colonies, habitats and breeding sites may be affected by the construction of the planned road, are listed in the table below.

Table 4.2: Affected populations of protected species

Km Mileage	Species/taxon affected	Expected impacts
76+060 – 76+430	Black Stork(<i>Ciconia nigra</i>)	There is an active nesting of the planned route at a distance of about 785 m to the east of the axis line. The fence of the planned complex resting place and border crossing point will be about 420 m from the black stork's nest. Due to the long distance, no disturbance of the species is expected either during construction or operation. In order to protect the habitat of the Tanács Forest in general, we propose afforestation in the narrow area of about 20 m width between the current forest area and the planned border crossing point.
76+060 – 76+430	Thorn-prickly shrike (<i>Lanius collurio</i>)	The investment indirectly affects the nesting of 1 commissioner in the forest edge of the Tanács Forest. During construction, the edge of the forest will not be affected by the occupation of the area, however, due to the disturbance of the construction area 20 m away at the time of construction, it can be expected that the species will temporarily leave the area. At the time of operation, the sparse traffic on the U-turn road is expected to no longer disturb the breeding of the species.
76+870	Bee-eater(<i>Merops apiaster</i>)	There are 3 active nests at a distance of 100 m from chainage 76+870 km. The planned complex resting place and border crossing point and the 2x2 lane road will not directly affect the nesting site of bee-eaters, but during the construction, the area of the nesting site must be left in the habitat.

Our investigations have established that the planting (construction) will have a terminating effect, while the operation is considered bearable, as the planned road development does not affect areas delimited from a nature conservation point of view, nor does it use habitats of more than medium value (TDO:3-5). In addition, generalist species are present in the studied area only in agricultural areas that tolerate large-scale arable cultivation well. The planned investment will not result in a significant decrease in individuals at the population level, only changes at the level of local individuals are expected.

4.1.3 Geological Medium, Groundwater Protection

The entire investment area and impact area on the Lower Tisza right bank subunit (AIQ533) belongs to the catchment subunit.

The entire area of the study is covered by chernozem soils formed on Tertiary and Quaternary sediments, which belong to the soils of medium fertility. Soils with excellent or good site conditions are not affected by the road development. The groundwater level is located along the trail under the terrain between 2-8 m.

From the point of view of the status of groundwater, the affected settlement is classified as sensitive. There are no demarcated or designated water base protection protection areas on the trail and its approximately 1000-meter-wide buffer area.

The planned route does not affect any operating mining areas.

The impact of the construction is negligible **from the point of view of the geological medium** due to the new land use, and the construction effect on groundwater **is bearable**.

The effect of operation on the soil and groundwater is **neutral**.

4.1.4 Protection of surface waters

Based on our investigations, the development does not affect natural or artificial stagnant water and watercourses, bathing areas or springs in the area of impact of the development. The entire investment area and impact area on the Lower Tisza right bank subunit (AIQ533) belongs to the catchment subunit.

There is no on-site technological water requirement for the installation. The rainwater falling on the surrounding fields and ditches dries up. The water needs of the construction workers are met by water delivered to the site, and the generated social wastewater is collected and transported in the installed mobile toilets.

The operation of the expressway is not expected to have a significant impact on surface waters. Rainwater falling on the road and on the paved surfaces of the border station ends up in the ditches along the roads, from where it dries up. Surface waters are not affected by pollution during normal operation. Properly designed and constructed, regularly maintained culverts and structures, as well as the rainwater drainage system, have a neutral effect on surface waters.

The investment will not result in a deterioration of the classification of the affected water bodies according to the Water Framework Directive.

The impact of the construction and operation on surface waters **is neutral**, as the planned development does not affect surface waters.

4.1.5 Air quality protection

The impact of the expressway on air quality is bearable in the installation phase, **and during operation it is neutral and improving in the indirect area of influence**, as traffic is partially diverted from main road 53, so an improvement in air quality is expected in these parts. In the long-term year, the emission factors of HBEFA change in inverse proportion to the velocity, so no significant change in status is expected.

4.1.6 Noise and vibration protection

Currently, the dominant source of noise in the investment area is main road 53. To assess the noise situation, on-site noise measurement was carried out at 3 measuring points, based on the results of which the noise pollution near or above the limit value in the vicinity of road 53 could

be measured during the night, critical period. The noise condition and immission of the area were modelled with the help of the Wölfel IMMI modelling program for the current state and for the 15-year perspective year in the case of the unrealised and the realisation of the A3 route. Based on the test results, with the realization of the A3 alignment, a decrease is expected in terms of the facades to be protected along road 53 and the closest to it. The facades to be protected closest to the alignment and the border crossing station are located at a distance of more than 500 meters. During construction, it is necessary to avoid residential areas or minimize their touch, but noise reduction measures are not necessary during operation.

Due to the long distance between the buildings to be protected, **the impact of the construction will be bearable** (if construction traffic is at least partly on road 53) and **the noise effects of operation will be neutral** – on the other side of the border, the impact of both phases will be neutral.

4.1.7 Climate protection

From a climate perspective, construction will be bearable: during construction, the use of high-performance machines with combustion engines will result in greenhouse gas (GHG) emissions, and sinks will disappear due to the loss of arable land and the felling of trees. This is partly compensated by the planned planting of plants (afforestation) and the fact that most of the materials from the demolition (asphalt, concrete, earth) will be used on site (e.g. for embankment construction, embankment). Regardless of the project, the traffic on the road emits GHG, so it contributes to climate change, even if not significantly, and the impact of the implementation can be considered bearable.

No climate risk that can be considered "extreme" is expected in connection with the investment. High-risk events are the slow increase in average surface temperature and the frequency of heat shock and intense precipitation due to the increase in the number of heatwave days. Damage to the roadway due to the increasing average temperature, possible increased maintenance costs, as well as areas without drainage and inadequate drainage of the road base after intensive precipitation, harmful wetting, further washouts and damage to stability are associated with a high risk of vulnerability. The technical infrastructure and the service must be properly prepared for these during the design process. The planned intervention in the investment area will not have a significant impact on the region's climate adaptation capacity.

4.1.8 Protection of the built environment and cultural heritage

From the point of view of the built environment and cultural heritage, the construction of the examined section of the M9 and the new border crossing point with its related infrastructure and other facilities will cause a change in the structure of the outskirts of the settlement. In the case of the implementation of the planned investment, the demolition of the structure is not planned. Buildings or building complexes enjoying monument protection are not affected by the planned development. Due to the increase in freight traffic caused by construction transport, the vibration load of buildings and structures in the immediate vicinity of the route is expected to temporarily increase to a tolerable extent. In the case of any archaeological areas along the planned route and the complex rest area and border crossing point, preventive excavation must be carried out before construction and, if necessary, the rescue of finds reduces the risk of significant impact. Special attention must be paid to the involvement of public utilities and their appropriate replacement and protection during construction in order to mitigate the impacts. From the point of view of the built environment and cultural heritage, the impact of the construction of the Project is bearable.

Overall, the impact of the examined section of the M9 expressway and the operation of the complex rest area/border crossing point can be considered to be improving from the point of view of the built environment and cultural heritage, taking into account the fact that along the

current route of main road 53, the traffic load and its impact on the structure will be significantly reduced on the built-up inner area section. With the implementation of the new expressway and complex rest area/border crossing point, the risk of road accidents will be reduced and certain industrial areas may become more valuable due to their better accessibility, or in the case of residential properties, as a result of the decrease in road traffic.

4.1.9 Economic and social and public health impacts

The **economic and social effects of the installation** are favourable for those working on the construction. An increase is expected in employment and among suppliers, but the extent of this cannot be determined at present.

The economic and social impact of the construction is also positive, the new complex rest area and border crossing point will create new jobs, providing a livelihood for a total of more than 1000 new workers for the residents of both countries. At the time of operation, the border control of the two countries will take place in only one place, together, instead of the current separate Serbian and Hungarian border controls, so border crossing will be more modern and faster. This will have an economic stimulus effect, and economic relations between the two countries may become closer. Overall, **the investment will have** an improving effect from an economic point of view.

From a public health point of view, the impact of the construction **is bearable**. The construction of the expressway and complex rest area/border crossing point and the implementation of the related facilities will temporarily result in additional noise and vibration during construction, and the emission of air pollutants into the air is also expected to increase locally due to transport and the operation of machinery. However, this will only occur in the case of a few residential buildings next to main road 53 near the current border crossing point, as currently the town of Tompa is bypassed by main road 53.

The impact of the examined section of the M9 expressway and the operation of the new complex rest area/border crossing point **is improving**: in the long run, this route can bring a solution to the currently existing public health problems caused by traffic, as traffic is shifted outside the city's residential areas.

4.1.10 Conclusions

The environmental impact assessment did not identify any grounds for exclusion, or any significant or irreversible impacts or impacts which could not be reduced by mitigation measures that would prevent the installation and operation of the investment.

4.2 Expected changes in the health, quality of life and lifestyle of people affected by changes in environmental conditions

4.2.1 Establishment

During construction, temporary environmental loads typically appear, the effect of which is usually unfavorable, but intermittent and reversible. The main influencers related to construction activities are earthworks, construction of excavations, construction of work pits, structural construction and related transports related to road construction, construction of structures, replacement of public utilities.

In the case of construction/installation-type emergencies, it is primarily the workers performing construction and maintenance who are at risk, the risk of which can be significantly reduced by complying with the regulations and taking precautionary measures.

Constructions

The environmental health effects are indirect. At the time of construction, the effects of adding to the existing traffic in the area may be significant, but due to their periodic nature, they also pose a bearable load. The implementation of the planned bypass and the related facilities will temporarily cause additional noise and vibration during construction, and the emission of air pollutants into the air due to transport and the operation of machinery is also expected to increase locally. As an indirect effect of air pollution, the possible worsening of the symptoms of chronic respiratory diseases (e.g. asthma) should be taken into account. The environmental and health effects of the planned development are limited in space, primarily for those living in residential areas along the transport routes and bypasses.

The intersection of the public utilities affected by the route (drinking water, sewage, electricity, telecommunications and gas pipelines), the necessary relocations, replacements and placements in protective pipes can be specified in the course of further planning. Even before construction, during the public utility consultation, special attention must be paid to the consultations with the public utility providers. In the case of public utilities in an uncertain situation, a preliminary manual excavation is recommended.

Restrict in territory use

During the construction, traffic restrictions and diversions are expected in the southern part of the city, which will temporarily hinder the daily life and traffic of those living there and those passing by. The impact of territorial and traffic restrictions (speed reduction and overtaking bans) can vary depending on the given period: they result in increased travel times and lead to congestion. In periods of significant traffic, this is burdensome for drivers, and the number of stressful situations will increase.

During further planning and the preparation of organizational plans, special attention must be paid to the proper accessibility of the southern part of the city and to ensuring safe access by foot and car.

Use of green spaces

In the area under review, the most significant elements constituting the green space system are the grasslands and forest areas of the Báró Pasture and Tanács Forests, as well as the borderlands along the roads, as well as the boundaries created between agricultural areas, narrow forest strips protecting fields, and planted non-native forest patches.

The green area system will change during construction, and the vegetation and green area formed at the current location of the road will be destroyed. According to preliminary calculations, about 98% of the length of the route will affect arable land where there is no valuable green space.

The route variants of the planned investment will locally interrupt the green area system, cutting it in half, thus reducing its size. However, this effect can be mitigated by recultivating construction sites and planting plants. Plant planting is planned next to the planned border crossing point and on certain sections of the road for landscape protection and nature conservation purposes, which will achieve adequate coverage during operation.

4.2.2 Operation

Road traffic

With the implementation of the expressway and the new complex rest area/border crossing point, travel time between Hungary and Serbia is expected to decrease, so the quality of transport connections, including economic and social relations along the border, may be enhanced. With an expressway designed in accordance with the road standard, the risk of road

accidents will decrease, thanks to the rearrangement of traffic, the use of the existing bicycle paths in the settlement will become safer, and as a result of the decrease in road traffic, the values of the current residential properties along main road 53 may increase.

The public health impact is also generated primarily by traffic during operation, while air, noise and vibration pollution can be highlighted as factors that cause adverse effects. **In the case of the implementation of the expressway and the new complex rest area/border crossing point, the effect of the operation is improving:** in the long run, this route can provide a solution to the public health problems caused by the current traffic, as the majority of the traffic (the entire freight traffic) will be transferred to the new M9 section and the new border crossing point.

With the establishment of the new border crossing point, more than 1400 new jobs will be created together, thus employment in both the Serbian and Hungarian micro-regions will increase, and unemployment may decrease further along the southern border.

However, during operation, it must be taken into account that the relocation of transit traffic may cause a decrease in purchasing power for those engaged in retail and service activities (e.g. restaurants, buffets) next to the road leading to the border station, and the closure of businesses may even be expected. This may be mitigated by the fact that the existing border post will continue to provide passenger traffic.

Land use change

In the future, the residential areas along the current main road No. 53 may increase in value after the construction of the expressway due to the decreasing traffic. In the southern part of the settlement, along the expressway, the value of areas may increase due to their better accessibility.

The planned development will result in a reduction in arable land compared to the current state, as 99% of the planning area currently functions as agricultural land. Thus, agricultural cultivation ceases in the areas occupied by the road. The planned road development also crosses the current agricultural roads, so dirt roads will also be built to ensure access to the agricultural areas next to the expressway.

On some sections of the road under construction, planting of plants for landscape protection purposes will be implemented, which will already be adequately covered at the time of operation.

Green spaces/green areas

In the construction (installation) phase, changes are already taking place in the green area system, so none of the route variants will cause significant changes during operation.

4.3 Cross-border effects, conclusions

Based on the examination of the cross-border impacts, it can be concluded that **no significant cross-border environmental impact is expected** during the implementation of the investment.

5 Mitigation measures

5.1.1 Landscape protection

- On the entire section of the planned route, the destroyed surfaces remaining during the construction must be rehabilitated. Rehabilitation is to be carried out outside the area of the roadway and ditches, within the expropriation limit, or in other work areas used during construction, by ensuring the basic conditions of land use and ecological conditions prior to construction.
- In the affected areas, any public utility replacements that may become necessary must be carried out before rehabilitation. During rehabilitation works, increased attention is required near the utility lines so that the lines are not damaged.
- Within the expropriated areas, the planting work can be carried out after the rehabilitation of the abandoned dirt roads and ditches. The rehabilitated area outside the farm areas shall be returned to cultivation according to the cultivation branch of the neighbouring area.
- The rehabilitation of the destroyed surfaces remaining as a result of the construction of the facilities necessary for the implementation of other activities related to the investment (e.g. other structures related to water management) must also be ensured in the same way.
- The marching routes must be planned in such a way that sensitive natural and landscape values as well as areas sensitive from the point of view of landscape protection are not permanently and irreversibly damaged. It must be avoided with the parade routes, it cannot be developed:
 - in the area of the Tanács Forest and the Báró Pasture;
- The location and design of the parade routes in the vicinity of natural areas must be coordinated with the Kiskunság National Park Directorate before construction.
- In order to ensure the protection of slopes against erosion, the use of engineering biological methods – primarily grassland and shrub planting – is recommended along the entire length of the planned route. When planting plant species, it is worth choosing low-growing, low-growing species that tolerate unfavourable site conditions, but are locally enlarged if possible.
- In the case of the expropriation of areas of a size that may not be suitable for cultivation, it is recommended to plant a row of trees, shrubs or forest strips on the following sections:

Table 5.1: Proposed landscape protection measures

Km	Expected impact	Proposed action
70+960-71+460	Abandonment of cultivation on the eastern side of the road	Afforestation of the abandoned narrow arable land, in connection with the Tompa 76/A forest member located parallel to the
72+900-73+000	Abandonment of cultivation on the western side of the road	Afforestation of the abandoned narrow arable land, planting of trees on both sides of the access road correction leading to the MgTsz site
73+980-74+000	Abandonment of cultivation with the correction of the planned road 5501 j.	Installation of a row of trees on both sides of road 5501
76+060-76+430	Abandonment of cultivation in a narrow width of about 20 m between the planned resting place/border crossing point and the forest area of the Tanács Forest.	Afforestation of the abandoned narrow area and its attachment to the Tompa 63/A forest member

- The above km section numbers shall be specified/elaborated in the planting plans to be prepared in the following planning phases, depending on the final expropriation plans.

5.1.2 Wildlife protection

5.1.2.1 General protective measures:

- On the entire section, tree felling must be carried out outside the growing season (between 1 October and 1 March). If the earthworks and the removal of trees and shrubs cannot be carried out within the prescribed deadline, in this case the contractor in cooperation with the Kiskunság National Park Directorate, jointly assessing the location of the work with the wildlife conservation expert and the representative of the National Park Directorate before the works, officially recording the extent, nature and location of the planned interventions, carrying out any necessary wildlife protection measures, nature conservation supervision. In addition, if it is established during the consultation that no damage to nature conservation is expected, the work may be permitted. If damage to nature conservation is expected, the restriction cannot be lifted.
- Landfills, material extraction sites and sites may not be established in natural areas (grasslands, forest patches, groups of trees).
- A 2.4 m high protective fence is planned to be built on both sides of the planned expressway along the entire length of the planned section due to the presence of red deer. The lower 1 m high part of the protective fence must be provided with a denser 5x5 cm metal mesh between 70+813 and 73+000 km due to the risk of hitting the extremely large number of small mammals (hares, foxes, badgers).

5.1.2.2 Special protective measures:

- To ensure the movement of big game, an underpass game crossing is recommended in the 73+990 km chainage. The planned game crossing shall have the following parameters in accordance with the eUT 03.07.53:2019/M1:2021 standard:
 - Minimum height: 4.0 m (sized for red deer);
 - Minimum width of lane: 10 m;
 - Outdoor index: 1.5 or greater;
 - The lane running parallel to road 5501 must be separated from the road with little traffic by a guardrail;
 - The traffic lane cannot be provided with a solid pavement.
- Before starting the construction, the habitat of the protected sowing tares and the highly protected bee-eater must be surveyed. If the populations of the protected plant species and the nesting site of the highly protected bee-eater can still be found in the area, they must be demarcated and avoided by construction activities in accordance with the following point.
- The construction site must be clearly demarcated (taped, periodic protective fence) so that the forest area of the Tanács Forest in the vicinity of the construction site, as well as the habitat of protected plant species and the breeding site of the highly protected bird species are not damaged. The parameters for the delimitation are given in the following table.

Table 5.2: Parameters of the temporary demarcation of the construction site (taping, temporary protective fence)

Km	Page	Justification
72+735	left	In order to protect the stands of <i>the protected sowing tares</i> (<i>Agrostemma githago</i>) located on the edge of the dirt road
76+060-76+430	left	Forest edge of the Tanács Forest on the edge of a complex resting place/border crossing point in order to protect the forest habitat

Km	Page	Justification
76+870	left	Bee-eater (<i>Merops apiaster</i>) is suitable for nesting in order to protect the nesting site with 1-1.5 high sand walls

5.1.2.3 Operational recommendations

- The wildlife passage and the protective fence must be continuously maintained.
- On the surfaces affected by the construction, weed growth and primarily the spread of alien and invasive plants must be prevented, which requires continuous follow-up care (mowing, chemical weed control if necessary).
- The following is necessary to protect against the spread of invasive alien plants:
 - white acacia (*Robinia pseudoacacia*) – Its spread can be prevented by chemical control.
 - idol tree (*Ailanthus altissima*) – During earth movements, the topsoil infected with root fragments cannot be reused. Its spread can be prevented by chemical weed control.
 - western whip tree (*Celtis occidentalis*) – Cutting back the specimens that appear, preventing seed production, and if necessary, chemical extermination.
 - acacia (*Amorpha fruticosa*): the topsoil infected with root fragments cannot be reused during earthmoving. Mechanical eradication of seedlings must be carried out.
 - tall goldenrod (*Solidago gigantea*) – During earthmoving, the topsoil infected with root fragments cannot be reused. Its spread can be prevented by mowing, if necessary, by chemical weed control.
 - silkworm (*Asclepias syriaca*): the soil layer infected with its howitzer roots cannot be used. Its spread can be prevented by chemical weed control.
 - ragweed (*Ambrosia artemisifolia*) – It can be controlled by grassing open soil surfaces as soon as possible and by mowing.
- It is recommended to carry out the planned planting of plants along the main road and the afforestation and shrubs planned in the area of the border crossing point with fast-growing native tree species characteristic of the landscape (monocotyledon, striped goat chewer, blackthorn, domestic poplars, birch, etc.). The final planting plans and the list of tree and shrub species to be planted must be agreed with the Kiskunság National Park Directorate in the next planning phases.
- When planning lighting that may become necessary during operation, the provisions of Section 35 (1) d) of Act LIII of 1996 on the Protection of Nature and Section 54 (2) d) of Government Decree No. 253/1997 (XII.20.) on National Urban Planning and Building Requirements shall be taken into account.
- For the lighting of the sections to be illuminated and the border crossing point, it is recommended to use light sources with the least harmful effect on wildlife and color temperature: The light sources may emit up to 25% of their total power in the wavelength range below 550 nm. Light sources with a color temperature of up to 2500 K can be used. The light must be directed exclusively at the area to be illuminated (road, parking lots). In the case of luminaires, the ULOR value of 0 or very close to it must be ensured: no light should enter the part of the space above the plane of the horizon.

5.1.3 Geological Medium, Groundwater Protection

- During construction, only machines in perfect technical condition may be used. During construction, no pollutants may enter groundwater or soil.
- The temporary storage facilities for the waste generated during construction, the fuel storage facility and the location of the assembly area must be designated in an area that is less susceptible to contamination and not affected by high groundwater levels.

- Any pollutants that may spill on the work site must be immediately absorbed, collected and collected as hazardous waste in a collection container suitable for the purpose until removal.
- In the event of extraordinary pollution, it must be immediately eliminated and it must be reported to the competent environmental authority with the measures taken to eliminate it.
- The removed upper fertile layer must be deposited separately and used in subsequent landscaping (humus rescue). To do this, a soil protection plan must be developed in advance and approved by the authority.
- The excavated land should be used as close as possible, in the construction of embankments (where the excavated material is geotechnically suitable).
- It is recommended to arrange the work area as soon as possible, which includes plant planting.

5.1.4 Surface water protection

- Structures, pavements and drains must be dimensioned to drain large amounts of rainwater that can be predicted to occur as a result of less frequent but intense precipitation activity (showers, thunderstorms) due to climate change.
- During the construction, only machines in perfect technical condition may be used, no pollutants may enter surface waters.
- In the event of extraordinary pollution, it must be immediately eliminated and it must be reported to the competent environmental authority with the measures taken to eliminate it.

5.1.5 Air quality protection

- In dry, windy weather, watering should be used to reduce the amount of dusting.
- It is recommended to cover the material transported on the trucks.
- During construction works, it is necessary to use a wheel wash and/or to clean the mud applied to the paved road (by mechanical or manual force) for transport vehicles entering the main road from the unpaved construction site (in a justified meteorological situation) in order to minimise dust build-up.
- It is recommended to use the nearest possible material extraction sites or asphalt mixing plants.
- During construction works, machines in appropriate technical condition shall be used, which comply with the provisions of Decree 6/1990 (IV.12.) KöHÉM Decree.

5.1.6 Noise and vibration protection

5.1.6.1 Construction

- Minimizing the resulting noise performance level by using and maintaining modern machinery.
- When planning construction transport routes, preference should be given to roads with more traffic, avoiding sections in the inner area, and in the case of an inner area section, preference should be given to sections with fewer facades to be protected and/or better road quality.

5.1.6.2 Operation

- Regular maintenance of the road and border crossing point in order to prevent a large increase in emissions due to road defects.

5.1.7 Built environment

- In the case of public utilities in an uncertain situation, a preliminary manual excavation is recommended.
- In the case of buildings and structures located next to the alignment and in its immediate vicinity, a preventive condition survey (static condition survey) is recommended before the start of construction works and after commissioning.
- Preventive archaeological excavations must be carried out in the part of the archaeological site affected by earthworks using the method recommended in the Preliminary Archaeological Document. Archaeological observation is necessary during the entire period of construction, the cost of which must be calculated by the contractor.

5.1.8 Climate protection

- During construction, it is recommended to maintain traffic on the roads affected by the correction (avoiding congestion and slow driving, thus avoiding a significantly higher fuel consumption at low speeds).
- Structures, pavements and drains must be dimensioned to drain large amounts of rainwater that can be predicted to occur as a result of less frequent but intense precipitation activity (showers, thunderstorms) due to climate change.
- It is recommended to use the excavated soil and asphalt material from demolition as much as possible on site (e.g. for embankment construction, embankment).
- Limiting the work areas necessary for construction to as much as possible, protecting the vegetation there, reintroducing and replacing the absolutely necessary felled trees and vegetation as soon as possible, with professional and native species.
- The use of modern, modern and impeccable machinery and transport equipment is required.
- During construction, the health of the workers must be emphatically protected (e.g. provision of protective drinks on warmer days)

