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Európske štrukturálne a investičné fondy
OP Integrovaná infraštruktúra 2014 – 2020

MINISTERSTVO DOPRAVY A VÝSTAVBY SLOVENSKEJ REPUBLIKY

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Amendment to the Integrated Infrastructure Operational Programme (Version 6.0)

Evaluation of the Strategy Paper

Comprehensive guidance on implementing the Integrated Infrastructure OP 2014-2020

Final Version

3 June 2019

The project is co-financed from the European Regional Development Fund
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Processor

The report of the impact assessment of the strategy paper was prepared by a team of experts composed of the following people: Mgr. Martin Smutný, Mgr. Michal Musil, MSc., Ing. Radim Seibert, Ing. Michal Damek, Mgr. Rastislav Rybanič, Ing. Jana Moravcová, Ing. Kateřina Zemanová, RNDr. Lenka Šikulová, Mgr. Zuzana Lackovičová, Ing. Vlastimil Bogdan and Ing. Pavol Bobot.

N.B to the adviser

This document has been drafted in accordance with Comprehensive Consulting Services Agreement No. 536/AE00/2018, as amended by Addendum 1 to No. 565/AE00/2018. It is intended exclusively for use by the project management section of the Ministry of Transport and Construction of the Slovak Republic to assess the impact of the change in the Integrated Infrastructure Operational Programme on the environment.

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List of abbreviations

CCB	Central Coordinating Body
EC	European Commission
EU	European Union
ITS	Integrated Transport System
MTC	Ministry of Transport and Construction of the Slovak Republic
MOE	Ministry of Environment of the Slovak Republic
OPII	Integrated Infrastructure Operational Programme
ECV	Estimated contract value
RIS	River Information Service
MA	Managing Authority
PPO/"Office"	Public Procurement Office
Public Procurement Directive	Directive 2014/24/EU of the European Parliament and of the Council on public procurement and repealing Directive 2004/18/EC
IB	Intermediate body
Old Public Procurement Act	Act No. 25/2006 Coll. on public procurement and on the amendment of certain laws, as amended
KSGR	Košice Self-governing Region
Public Procurement Act	Act No. 343/2015 Coll. on public procurement and on amendment of certain laws, as amended
ESI Fund Act	Act 292/2014 Coll. on contributions granted from European Structural and Investments Funds and on the amendment of certain acts
Public Works Act	Act No. 254/1998 Coll. on public works
ŽSR	Slovak Railways (Železnice Slovenskej republiky)

I. Basic data about the contracting entity

I.1 Name

Ministry of Transport and Construction of the Slovak Republic

I.2 Registered office

Námestie slobody 6, 810 05 Bratislava, Slovak Republic

I.2.1 Full name, address, phone number and other contact details regarding the contracting entity's authorized representative from whom relevant information about the strategic paper may be obtained and place for consultation

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Place for consultation:

Ministry of Transport and Construction, SR, Námestie slobody 6, Bratislava.

There can be consultation during the entire examination of the strategy paper regarding changes therein nationwide under Section 63 (1) of Act 24/2006 Coll. on environmental impact assessments and on the amendment of certain laws, as amended (the "Act").

The timing of consultation is determined "case by case" through the contact person above and at the request and by agreement of the entities who have expressed interest i consultation.

II. Basic information about the strategy paper

II.1 Name

Amendment to the Integrated Infrastructure Operational Programme (Version 6.0) in connection with the adoption of selected priority axes ("OPII").

II.2 Site (Slovakia, region, district, municipality)

The OPII is a nationwide strategy paper covering the entire Slovak Republic.

II.3 Municipalities covered

The municipalities covered by the OPII are those incorporated into 79 districts and 8 regions in the Slovak Republic.

II.4 Authorities covered

Slovak Government

Office of the Deputy Prime Minister of the Slovak Republic for Investments and Informatization

Ministry of Agriculture

Ministry of Finance

Ministry of Education, Science, Research and Sport

Ministry of Culture

Ministry of Agriculture and Rural Development

Ministry of Defense

Ministry of Foreign and European Affairs

Ministry of Interior

Ministry of Health

Ministry of Environment

Ministry of Labor, Social Affairs and Family

Ministry of Justice

Bratislava Self-governing Region

Trnava Self-governing Region

Trenčín Self-governing Region

Banská Bystrica Self-governing Region

Nitra Self-governing Region

Žilina Self-governing Region

Prešov Self-governing Region

Košice Self-governing Region

Association of Towns and Communities of Slovakia

Union of Towns and Cities of Slovakia

Union of Employers of Transport, Posts and Telecommunications

Association of Transport, Posts and Telecommunications Trade Unions

Slovak Chamber of Commerce and Industry

Association of Construction Entrepreneurs of Slovakia

II.5 Approval authority

The amendment to the OPII will be approved by the Slovak Government and then by the European Commission.

II.6 The content and main objectives of the strategy paper and relationship with other strategy papers

II.6.1 Nature of the strategy paper

The Integrated Infrastructure Operational Programme is a programming document of the Slovak Republic for drawing aid from EU funds in 2014-2020 for the transport sector and for enhancing access to information and communication technologies and improving their use and quality. The OPII was approved in European Commission Decision C(2014) 8045, dated 28 October 2014.

The Managing Authority ("MA") is responsible for preparing, managing, monitoring and evaluating the OPII and this is done by the Ministry of Transportation and Construction of the Slovak Republic ("MTC"). The Intermediate Body ("IB") for the OPII is the Office of the Deputy Prime Minister of the Slovak Republic for Investments and Informatization.[1] In the OPII, the IB is the authority responsible for meeting the objectives of Priority Axis 7 - Information society, where the scope of authorization for some of the MA's tasks is defined in the Agreement No. Z 58/2016 on assumption by the Intermediate Body of some of the Managing Authority's OPII Priority Axis 7 duties of 29 October 2016, as amended by Addendum 1, effective 3 May 2018.

The OPII impact assessment was handled in 2013 and 2014 by the Ministry of Transport, Construction and Regional Development of the Slovak Republic ("MTCRD"), in cooperation with the Ministry of Environment of the Slovak Republic ("MOE"), in accordance with Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment and with Act No. 24/2006 Coll. on environmental impact assessments and on amendment of certain laws, as amended ("Act 24/2006 Coll.). The process was published on the MTCRD's, Ministry of Finance's and MOE's websites. Based on the outcome of the OPII environment impact assessment process provided in the Act and in Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001, an opinion was issued on 4 March 2014 that recommended approval of the OPII, subject to compliance with the conditions laid down therein.

Regulation (EU) No 30 of the European Parliament and of the Council of 1303/2013 laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund and repealing Council Regulation (EC) No 1083/2006 vests the MA with the power to propose amendments to the Operational Programme. Requests for the amendment of programmes must be duly justified and, in particular, contain the expected effects of the amendments to the programme on achieving Union strategy for smart, sustainable and inclusive growth and the specific objectives defined in the programme.

[1] Passage of Act 171/2016 Coll., amending Act 575/2001 Coll. on organization of government and central state administration authority activities and on the amendment of certain laws, transferred on 1 June 2016 the powers vested in the Ministry of Finance to the Information Society Section at the Office of the Deputy Prime Minister of the Slovak Republic for Investments and Informatization. Following the change in the determination of competencies, the Slovak Government approved the Office of the Deputy Prime Minister of the Slovak Republic for Investments and Informatization to be the Intermediary Body for Priority Axis 7 - Information society. The Intermediate Body for OPII Priority Axis 7 had been the Ministry of Finance prior to 1 June 2016.

Changes in the strategy paper that are subject to preparation and approval at the national level and which could have an impact on the environment need to be reconsidered in the environmental assessment.

Initiatives to amend the OPII relate, in particular, to the current state of implementing Priority Axes 4, 5, 6 and 7,[2] which either have not achieved adequate progress or have the potential to increase allocations. The Managing Authority for the OPII proposed new activities and changes to existing activities within Priority Axes 4, 5, 6 and 7, to raise their absorption potential. They form the prerequisites for a possible increase in the financial framework of these priority axes in 2019, either within internal reallocation or from other operational programmes. Amendments to the OPII accordingly include adopting or adding content to selected priority axes in the Operational Programme.

II.6.2 Content of the strategy paper

The amendment to the OPII version 6.0 aims toward adapting and adding content of the selected priority axes to the Operational Programme. Since the adoptions and additions to the OPII are formulated in rather general terms, proposals for specific activities exist to implement the amendment to the OPII. In assessing the possible impact of the OPII amendment, these specific activities are taken into account (see Chapter IV - Evaluation reports), so a brief description of them is presented below as part of the description of the adoptions and additions. It should also be noted that, despite specific activities currently subject to the processing of project documentation and/or related supports (e.g. feasibility studies), it is presumed, in the case of approval of prepared documents and studies, that implementation of these activities will also be financed from the OPII.

The diagram below provides an overview of the change in the OPII involving the territorially specified OPII intentions in water transport infrastructure (Priority Axis 4),[3] railway infrastructure (Priority Axis 5) and road infrastructure (Priority Axis 6).

[2] Changes in PA 7 are the outcome of consultations in the SEA process. See the minutes of the negotiations of 26 April 2019 (Appendix 1).

[3]There is no new intention at the new location in the Port of Bratislava, but there are changes in the scope and type of activities at the port.

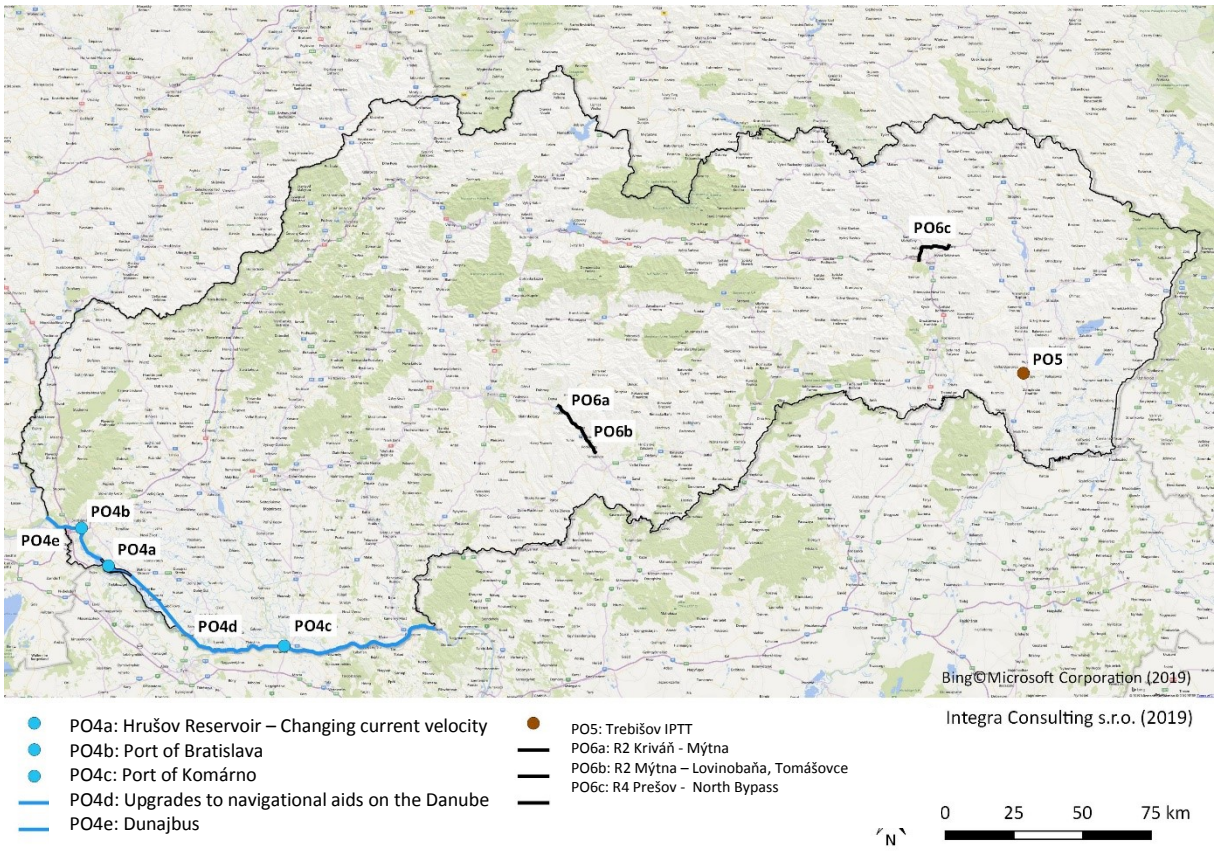


Figure II-1 Territorially specified intentions in the OPII

<u>Summary of proposed amendments to the OPII</u>:

1. Adaption and addition to the content of Priority Axis 4;

2. Adaption and addition to the content of Priority Axis 5;

3. Adaption and addition to the content of Priority Axis 6;

4. Adaption and addition to the content of Priority Axis 7;

1. <u>Priority Axis 4 - Water transport infrastructure (TEN-T CORE)</u>

- **Changing the name of Specific Objective 4.1 including adapting and expanding its content**

The amendment to the OPII to version 6.0 includes a proposal by the OPII MA to change the name of Specific Objective 4.1. The new name would be *"Specific Objective 4.1. Improving the quality of services provided on the Danube Waterway."* As part of the Specific Objective, the OPII MA is creating space for the implementation of activities prioritizing pre-project and project preparation, as well as implementation of specific projects to improve the navigability of the Danube Waterway. Intervention in the Danube Waterway includes projects that cover the upgrade and construction of public ports in Bratislava and Komárno.

- **Additions to the Komárno public port financed from OPII funds**

Even though the standing of the public port in Bratislava as the main port in Slovakia remains undisputed and its upgrade is one of the main priorities for inland waterway transport, the MTC is accordingly directing its resources toward upgrading the public port at Komárno. The Komárno public port is the second largest port in Slovakia and is located at the confluence of the Váh River and the

international waterway on the Danube, which is part of the Rhine-Danube TEN-T Corridor. The Komárno public port plays an important role in moving goods originating from Great Schütt Island (Žitný Ostrov). Planned interventions from the OPII in the Komárno public port are the addition of projects financed from the Connecting Europe Facility - Port Master Plan and Feasibility Study, whose objective is to assess alternatives for upgrading the public port. Following a summarization of development possibilities, procurement of project documentation and the actual upgrade of the port infrastructure in the recommended variant is envisaged.

- **Change in eligible beneficiaries**

Adaption and addition to the content of PA 4 requires adaption of the recipients in the list of eligible beneficiaries for the Priority Axis. It is expected that involvement of new entrants and, in particular, implementation of the draft project charter will improve navigation parameters on the Danube international waterway, making water transport more attractive to potential carriers and forwarders and increasing water transport and transport operations in Slovakia. Entrants whose addition as PA 4 eligible beneficiaries have been proposed by the OPII MA:

- Slovenský vodohospodársky podnik, štátny podnik
- Vodohospodárska výstavba, štátny podnik
- Slovak University of Technology in Bratislava
- Pro-Danubia - Association of Municipalities for Local Transport on the Danube
- Transport Authority

Concurrently and following passage of Act 284/2018, amending Act 338/2000 Coll. on inland navigation and on the amendment of certain laws, as amended, which changed a number of laws, it was proposed to drop the Waterborne Transport Development Agency from the list of PA 4 eligible beneficiaries. Adoption of the new act on 1 November 2018 abolished the Waterborne Transport Development Agency, whose role was taken over by the Ministry of Transport and Construction as its legal successor.

- **Changing the name of "A" including adapting and expanding its content**

Following the intention to procure appropriate stages of the project documentation, as well as implementing projects aimed at ensuring the required parameters on the Danube Waterway's fairway, the OPII MA proposes to change the name of "A" to "*A: Improving navigability on the Danube Waterway".* Should the EC have a negative opinion of the feasibility study for the projects in this activity, construction of the infrastructure will not be financed from the OPII.

To implement this adoption, the project charter *Changing current velocity in the lower Hrušov Reservoir - pre-project and project preparation* was drafted. The main objective of this national project is to design a technical solution to increase the velocity of the current in the lower Hrušov Reservoir, thereby preventing it from silting, improving water transport safety and creating the conditions both for removing choke points in the TEN-T water transport infrastructure and making this transport method attractive for water transport carriers and operators. Results to date from monitoring the natural environment with respect to the impact of the Gabčíkovo Dam indicate continuing deterioration of navigation conditions in the lower Hrušov Reservoir. Intensive silting in the water ducts located in the lower Hrušov Reservoir expose it to risk mainly from its impact on navigation and is causing the water depth to sink to the minimum level required for operations at this stretch. Assessments from available monitoring and measurement and of ongoing sedimentation and clogging at the bottom imply the measures taken to date to dredge sediments have not been enough and need to be supplemented by new measures focused on increasing current velocity at the lower Hrušov Reservoir to reduce sedimentary deposits.

An analysis of the costs and benefits (CBA), feasibility study and subsequent documentation of the construction project will be drafted for a technical solution and these will be the supporting documents for the environmental impact assessment provided in Act 24/2006 Coll. on Environmental Impact Assessments.

- **Changing the name of "B" including adapting and expanding its content**

Along with the addition of the public port at Komárno to OPII funding, the OPII MA proposes changing the name of "B" to "*B: Upgrades and public port construction in Bratislava and Komárno"*.

Considering the existing state of safety and security at the public ports, it is desirable to take appropriate action (implementing port monitoring systems) in order to rapidly identify emergencies and shorten response time for rescue and intervention units. Simultaneously, there is a need to implement appropriate emergency measures which would minimize damage and rescue in emergency situations. Implementation of these safety and security measures is planned for both public ports (Bratislava, Komárno).[4]

After adapting Activity B, intervention in the Bratislava public port will be accordingly eligible for alternative fuel development support leading to the greening of water transport as recommended by the EC (construction of an LNG terminal), creating the conditions for ecologically replenishing operating fluids into river vessels and effectively managing operating and disposing of water transport wastes (constructing vessel facilities). Concurrently and in the context of the existing OPII text, activities concentrating on upgrading applicable port infrastructure were dropped, involving mooring elements, quay walls, walkways along the banks, berths and warning signs, with no plans to implement these interventions.

To implement this adoption, drafts of the following project charters were prepared:

- Facilities for vessels (Bratislava)

  The project objective is to produce a technical and economic study: "*Building vessel facilities at the Bratislava public port - pre-project preparation*" identifies the most appropriate technology for refueling services, loading drinking water, collecting waste, (pumping out fecal and drainage water, collecting waste oil, municipal waste and both collecting and removing hazardous waste) and treating waste (cleaning/processing), removing it and discharging purified wastewater.

- Building an LNG terminal at the Bratislava public port – pre-project preparation

  The LNG terminal is planned to follow a broader distribution chain relationship where a natural gas supplier will deliver gas through a pipeline to a terminal in the Port of Bratislava, which would then refine and distribute it by water to end users - other ports on the Danube, etc. Since LNG is both a traded commodity and a fuel, the LNG terminal is envisaged to be also an LNG refueling station. The feasibility study aims to identify technologies for producing and distributing LNG, compare them in terms of environmental, economic and security considerations and recommend a technology that would be the most advantageous in view of the Bratislava public port's specificities. The feasibility study will cover the following:

    - Technical study
    - Documented safety of the selected technology
    - CBA
    - EIA

- Port security - pre-project preparation

  The objective is to design a system for shortening reaction time in an emergency, which an installed monitoring system would identify. Installation of the system is envisages for the entire demarcated public port area in the basic TEN-T Core network. The monitoring system would be required to provide information about cargo dock emergencies and vessels navigating to and from the port during an emergency and also exchange information about safety conditions which

[4] Overall development of both public ports is addressed in the Master Plan. Master Plan II, the second phase of the strategy for developing the Bratislava public port, is the subject of an SEA assessment, with the decision issued in January 2019 https://www.enviroportal.sk/sk/eia/detail/strategia-rozvoja-verejneho-pristavu-bratislava-faza-ii-master-plan-ii.
Communication from the Strategy Paper for the Master Plan (the strategic plan for development of the Komárno public port) was filed in December 2018.

would protect the port, vessels and port facilities in the event of an emergency. The system would also rapidly identify emergencies and, where necessary, call rescue and intervention units, thereby contributing toward mitigating the adverse impacts of emergency situations on the environment at public ports in the basic TEN-T Core network. The monitoring system will function with already available navigation data from individual systems, such as the River Information System (RIS).

- **Broadening the focus of "C. Introducing modern technology into the management of maritime and port operations"**

The original focus of the activity in question was directed only toward supporting the RIS. Since these activities are to be co-financed from the Connecting Europe Facility (CEF), the OPII MA proposes to broaden the focus toward upgrading navigational aids to synergistically complement RIS. The RIS application and implementation of related technical measures on the Danube Waterway will enable increased infrastructure capacity, optimal use of existing infrastructure and improved safety in maritime and port operations. Concurrently, this section proposes the option of purchasing a buoy tender to operate along the stretch of the Danube Waterway between Gabčíkovo Dam and Štúrovo, if a feasibility study supports it.

To implement this adoption, a project charter was drafted entitled "*Feasibility study for the upgrade of buoy technology and navigational aids in the Danube waterway of international importance."* The project would focus on upgrading buoy technology and navigational aids along the Danube in the stretch from the Austro-Slovak border (km 1,880.26) to the Slovak-Hungarian border (km 1,708.20). The study will include an assessment of existing navigational signs and the technology they use, a design for installing and upgrading signaling navigational signs and buoys, for the upgrade of signaling devices (intelligent AIS AtoNs Beacons and a system for monitoring and operating them), for integrating intelligent and virtual buoys into the River Information Service system and for an optimal fairway buoy system with regard for the existing fleet operated by Slovenský vodohospodársky podnik, š. p.

- **Adding a new eligible activity "D. Introducing regular passenger navigation on the Danube (Dunajbus)"**

The objective of the activity is to use the inland waterways as a means to improve traffic handling in the greater Bratislava region. It involves implementing the comprehensive intention to construct a regular passenger navigation system on the stretch of the Danube Waterway between Šamorín and Bratislava. The project aims to establish a passenger river shuttle service covering the 50 kilometers between Bratislava-Devín and the village of Vojka nad Dunajom by constructing new port marinas (to become stops with a shelter and some as stops with snack bars) which will incorporate existing marinas, creating eight stops for ships along the Danube. Continuous traffic flow would be ensured by seven (7) catamarans with a displacement of 40 tonnes with no load and 50 tonnes with a full load. A depot and winter port will be established not far from the Hamuliakovo marina. The proposal includes expanding the original parking area and constructing a new parking area.[5]

[5] The intention was submitted in January 2019, see https://www.enviroportal.sk/sk/eia/detail/-pravidelna-osobna-vodna-doprava-po-dunaji-dunajbus-

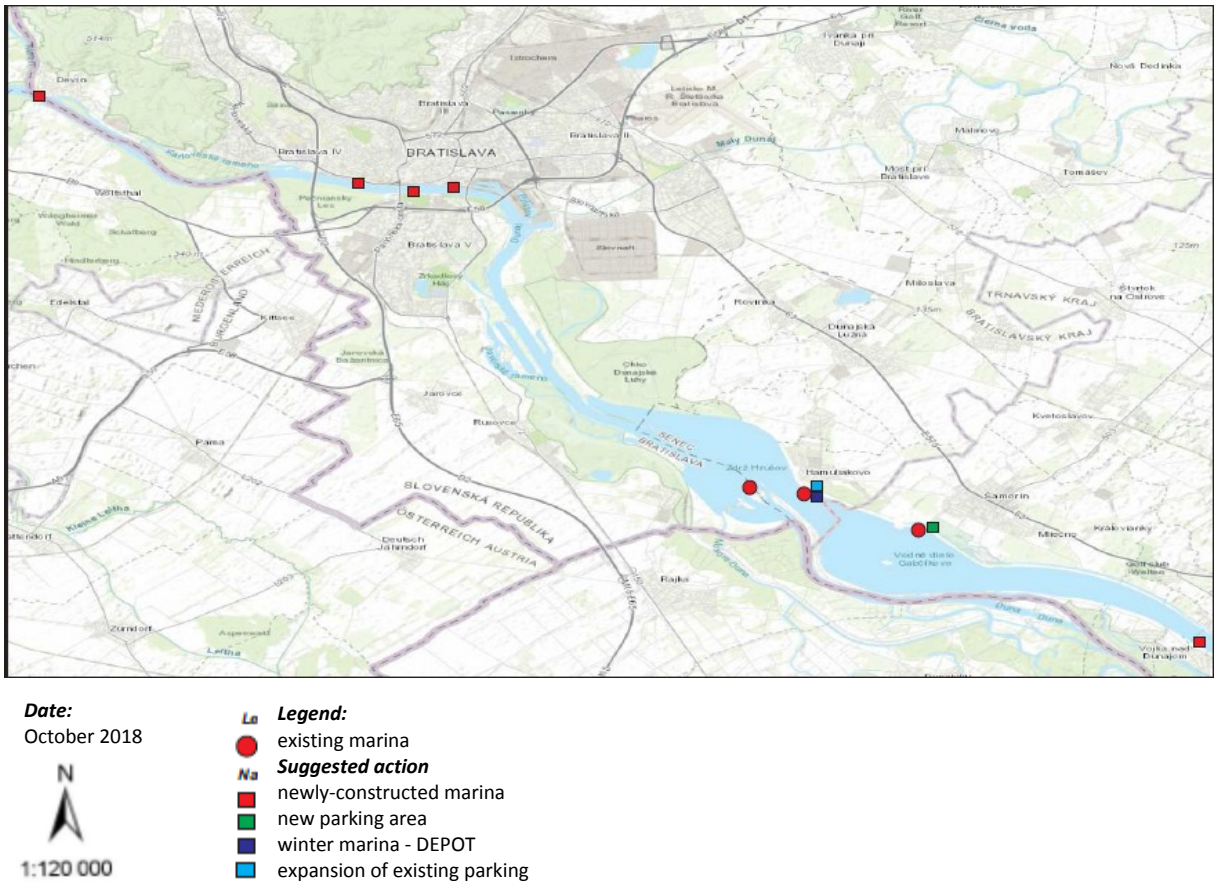


Figure II-2: Map of the expanded Dunajbus network

Source: EIA, October 2018, EKOJET, s.r.o., Industrial and landscape ecology

PA 4 resources would be preferably channeled toward drafting a feasibility study to identify the potential for introducing regular passenger navigation in the greater Bratislava region and, if the project were feasible, to procure design documentation. It is envisaged that the project's implementation phase would require, in particular, the construction of berths for river vessels, a Park & Ride lot and bulwarks to protect them, as well as the purchase of the vessels themselves to transport passengers. Should the EC have a negative opinion of the feasibility study, neither construction of the infrastructure nor purchase of the vessels would be financed from the OPII.

2. Priority Axis 5 - Railway infrastructure and upgrading of rolling stock

The OPII MA for PA 5 proposes adding new activities and specifying the existing priority axis text in greater detail, specifically:

- **Changing the name of Priority Axis 5 and adding a new specific objective 5.3**

The OPII MA proposes changing the name of PA 5 to *"Railway infrastructure and upgrading of rolling stock"*. Simultaneously, it proposes adding thereto a new specific objective *"Specific objective 5.3: Enhancing the attractiveness and quality of public rail passenger transport by upgrading rolling stock."* The aim of this modification is to create space for upgrading rolling stock providing public passenger transport by rail.

- **Adding a new activity "I. Upgrading public rail passenger transport rolling stock"**

Because of increasing interest among passengers in rail passenger transit, the MTC sees the scope for broadening projects of this type also to other regions in Slovakia. Therefore, it proposes to support the suburban and regional transport segment by adding the option to acquire new trainsets, primarily in Prešov Region, to PA 5.

- **Adding an activity to construct checkpoints on the Slovak Railways (ŽSR) network**

OPII MA proposes as part of "*B: Reducing rail transport safety risks (e.g. eliminating level railway crossings in road infrastructure and upgrading railway crossings)"* to specify with greater detail the intention to construct infrastructure manager checkpoints. Building these points may constitute a significant contribution toward reducing the number of safety incidents and traffic accidents in the ŽSR network. Specific points would be located along the ŽSR network and furnished with technical installations in accordance with the feasibility study of constructing network checkpoints and would include the method for integrating data into the ŽSR network.

- **Changing the name of "C" including adapting and expanding its content**

Following the intention to construct an intermodal terminal in Trebišov from PA 5 funds, the OPII MA proposes changing the name of "C" to "*C: Construction and upgrading of intermodal terminals for rail passenger transport and for integrated passenger transport and connecting them to the road network."* The OPII MA proposes adoption so the main characteristic of the Trebišov structure is to integrate transport systems in building an integrated transport system (ITS) as part of the KSGR's integration of individual passenger transport (automobile and bicycle) and public passenger transport (bus and rail) and also pooling facilities on a commercial basis for ITS passengers.

3. Priority Axis 6 - Road infrastructure (outside the TEN-T CORE)

The OPII MA proposes more detailed specification of the existing PA 6 wording, namely:

- **Adding the R2 and R4 expressways**

The OPII MA proposes for expressway construction to add further stretches of the R2 and R4 which, in the event of an increase in the OPII financial framework, can be funded from resources in the operational programme. The stretches to be added to PA 6 by the OPII MA are:

- R2 Kriváň - Mýtna; and
- R2 Mýtna – Lovinobaňa, Tomášovce.

The present construction (including both stretches above) were assessed by the MOE in accordance with National Council of the Slovak Republic Act 127/1994 Coll. on Environmental Impact Assessments, as amended by Act 391/2000 Coll., amending the earlier mentioned law on assessing environmental impact. The EIA process was completed with the final opinions for the R2 Expressway Zvolen – Lovinobaňa from the environmental impact assessment issued by the MOE on 17 February 2006 (4366/04-1.6) and for the R2 Expressway Lovinobaňa – Ožďany from the environmental impact assessment issued by the MOE on 18 December 2007 (2329/07-3.4/ml.).

Subsequently, Communication of changes in the proposed R2 Expressway Kriváň - Lovinobaňa, Tomášovce was drafted at the construction authorization documentation (CAD) stage and this was submitted to the MOE, which on 13 February 2017 decided from the communication that no substantial adverse impact on the environment was envisaged and so there was no assessment under Sec. 18 (1) (e) of Act 24/2006 Coll. on Environmental Impact Assessments, as amended. On 7 June 2017, Národná diaľničná spoločnosť, a.s. (National Highway Company) filed the second Communication of changes in the R2 Expressway Kriváň – Lovinobaňa, Tomášovce, Stretch I Kriváň – Mýtna. The MOE initiated action in the investigation procedure. On 23 August 2017, the MOE issued its decision (No. 6260/2017-1.7/dj R) not to require further assessment of the proposed project changes. On 25 September 2017, an appeal against the MOE's decision in No. 6260/2017-1.7/dj R was field with the Ministry by a party to the proceedings. Nothing has yet been decided regarding the appeal.

A joint communication of changes was drafted for both stretches in 2018, although each stretch is located in a different phase of project preparation. For the stretch between Kriváň and Mýtna, technical requirements for construction work have been prepared (in the form of tender

documentation), while for the stretch from Mýtna to Lovinobaňa and Tomášovce construction authorization documentation has been drafted.

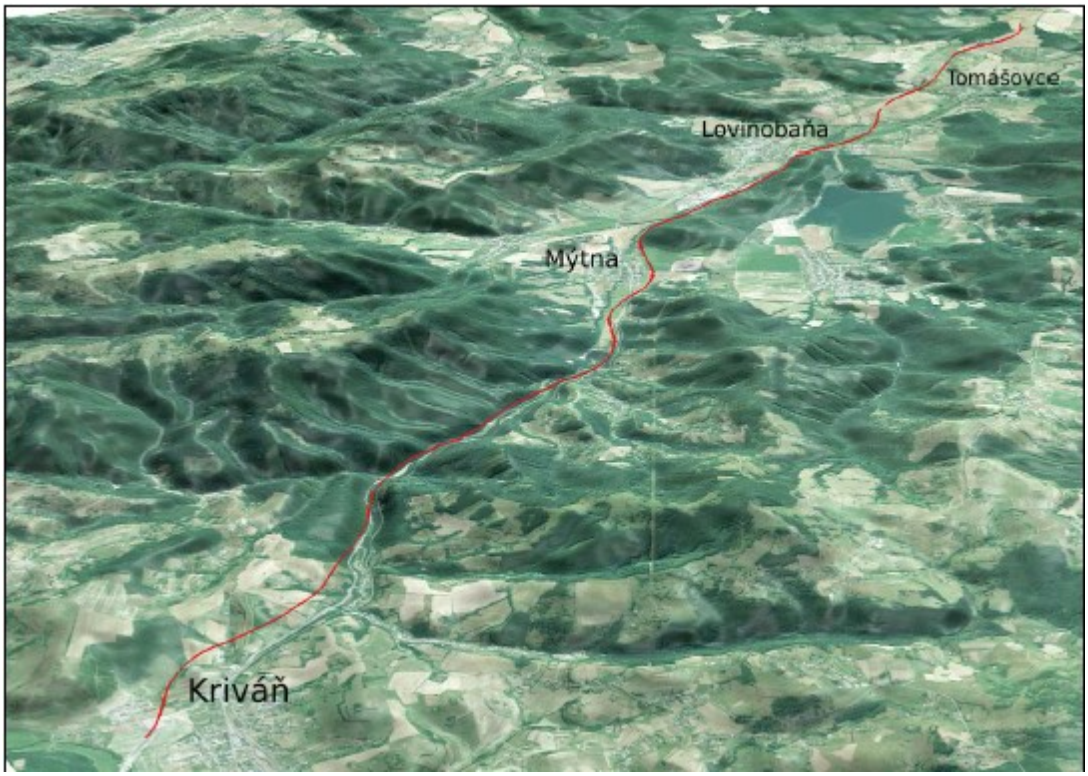


Figure II-3: R2 route for the stretch between Kriváň and Lovinobaňa.

Source: Communication of changes in the proposed activity in Annex 8a to Act 24/2006 Coll. Integra Consulting, s.r.o., 2018.

Another stretch whose addition to PA 6 has been proposed is:

- R4 Prešov – North Bypass.

This is the stretch of construction of the R4 Expressway bypassing Prešov to the north in the proposed category R 24.5/100, functioning to address transit traffic currently creeping through Prešov. The construction aims to link the D1 Motorway and R4 Expressway between Kapušany and Giraltovce to relieve traffic on the existing Prešov road and to insert interchanges to reallocate source and destination traffic. This would result in improved driver safety with smoother and more comfortable driving. The Prešov-North interchange will shift transit traffic away from Route I/68 in the central city and the direct connection of I/68 to the D1 and R4.

In 2004, *R4 Expressway Prešov- North Bypass* was drafted by Dopravoprojekt, a.s. Bratislava as an assessment report which was subsequently submitted to the MOE as the competent authority under Act 24/2006 Coll. The MOE issued its final opinion on the environmental impact assessment on 17 February 2006. In 2009, planning authorization documentation was drafted which essentially factored significant changes from tunnels, bridges, protection walls and size of land to be appropriated into the environmental impact assessment. As construction was prepared, further changes were made, which in 2014 were reflected in design drawings from construction authorization documentation and subsequently in two communications of changes in proposed activities (2015 and 2017).

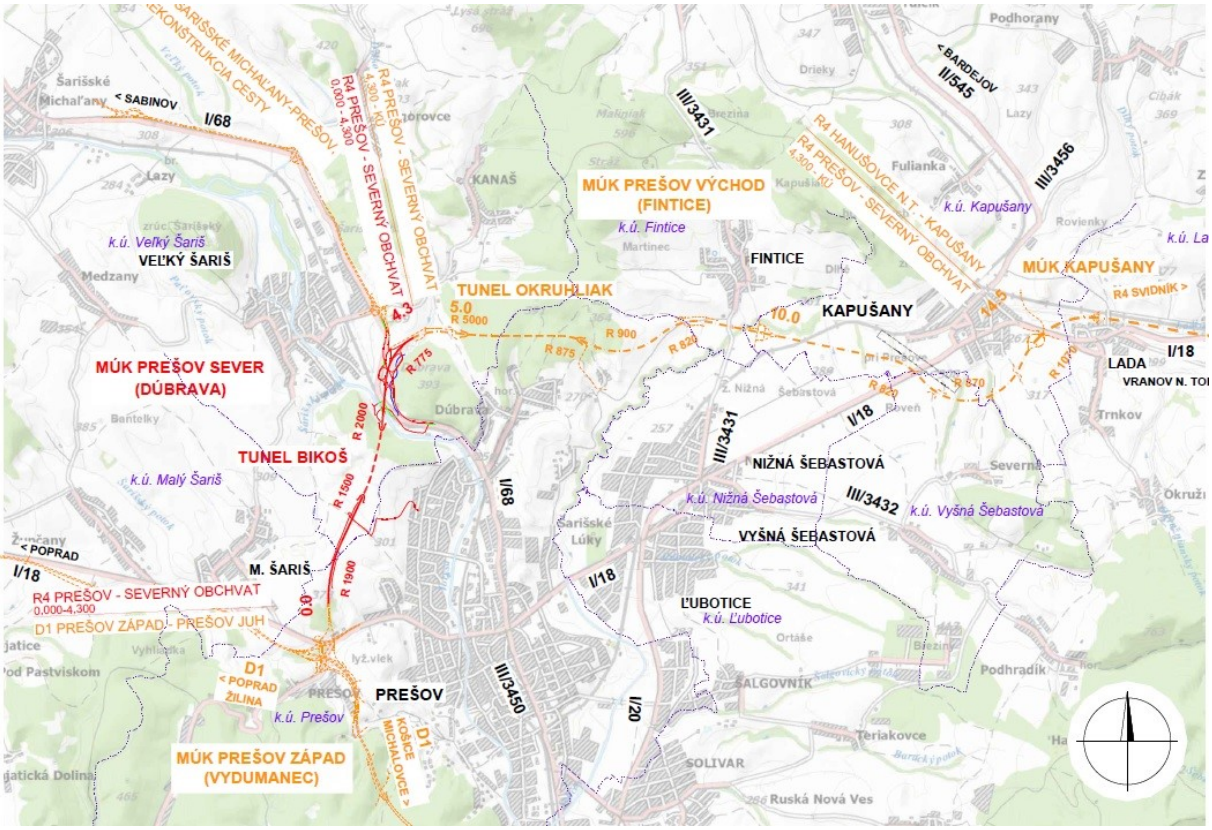


Figure: II-4: Transparent situation of the R4 Prešov – North Bypass.

Source: R4 Prešov – North Bypass, Detailed construction design. HBH Projekt, s.r.o., 2017.

- **Supporting the introduction of alternative fuels in road transport**

This new activity aims to promote market development of alternative fuels in road transport, including development of the relevant infrastructure. The relevant measures for promoting alternative fuels will be implemented through financial instruments which have been set up at the national level and are included in the OPII. Selected measures will respect the national policy framework and the national policy for introducing an alternative fuel infrastructure, which was approved by the Slovak Government in 2016 following the provisions of Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of alternative fuels infrastructure. The most promising area of support from the OPII, in line with the action plan for the development of e-mobility in the Slovak Republic, appears to promote an electric car charging infrastructure.

4. Priority Axis 7: Information society

- **Supporting the construction of smart cities and regions through ICT (adding an activity to specific objective 7.4)**

Information and communication technologies (ICT) play an important role in urban change, carbon footprint reduction, more effective use of energy sources and providing residents with better services. ICT is an integral part and base for smart cities concepts since they enable integration of diverse urban systems and processes. The objective of this new activity is to promote ICT introduction in cities. The beneficiaries of the national projects will be pilot cities, with significant involvement from the European Commission and World Bank, which are already working together with the Prešov and Banská Bystrica self-governing regions under the Catching-Up Regions initiative.

- **Promoting innovative SME solutions using public administration data and services (adding an activity to specific objective 7.2)**

The objective of this new activity is to create a Small Project Fund, which would encourage innovative small and medium-sized enterprises (SMEs) through a voucher mechanism to use open public administration data to create new applications and services. In practice, the Small Project Fund will be implemented through a national project whose beneficiaries will be subsequently appropriated aid through vouchers to finance the emergence of innovative applications using open public administration data. Beneficiaries of the national project will be the Office of the Deputy Prime Minister of the Slovak Republic for Investments and Informatization. Beneficiaries of aid will be individuals and legal entities as defined by Sec. 2 (2) of the Commercial Code, which are established and pursue economic activities in Slovakia.

II.6.3 Main targets

The global objective of the OPII is to support permanently sustainable mobility, economic growth and job creation while improving the business climate through development of transport infrastructure, public passenger transport and an information society. OPII investments will prioritize the filling of gaps and missing transport links in the core infrastructure at both the national and cross-border levels, with an emphasis on a sustainable, greener and more cost-efficient transport infrastructure. Information society investment should contribute toward improving quality and access to information and communication technologies and increasing their use and quality.

In terms of allocations, OPII is the largest operational programme in Slovakia for the 2014-2020 programming period. Around € 4.646 billion has been earmarked for OPII. Of that figure, € 3.697 billion is to be allocated for transport, while € 927 million will support the development of an information society.[6]

Subject to revision is the adoption or adding of content to selected priority axes in the Operational Programme, specifically Priority Axis 4: Water transport infrastructure (TEN-T CORE), Priority Axis 5: Railway infrastructure (outside the TEN-T CORE), Priority Axis 6: Road infrastructure (outside the TEN-T CORE) and Priority Axis 7: Information society.

The proposed amendment to the OPII changes the objectives (specific objective 4.1), adds a new specific objective 5.3 and expresses the need to assess new activities in terms of their impacts on the environment and human health. The programme's objectives to achieve the Union strategy for smart, sustainable and inclusive growth remain unchanged.

The proposed amendment to the OPII has no effect on the information provided in the Slovak Republic's 2014-2020 Partnership Agreement in accordance with Article 15 (1) (a) (iii), (iv) and (vi) of the General Regulation. Thus, approval of the OPII Amendment does not affect the need to amend the 2014-2020 Partnership Agreement.

II.6.4 Relationship with other strategy papers

Strategy papers and EU policies

- Europe 2020 strategy for jobs and smart, sustainable and inclusive growth
- Community Strategic Guidelines
- EC cohesion policy legislation
- EC legislation covering rules on competition
- EC public procurement legislation
- EC legislation protecting and enhancing the environment

[6] Including national co-financing. Financial data are effective from OPII version 4.0.

- EC legislation on equal opportunities, gender equality and non-discrimination
- WHITE PAPER: Roadmap to a Single European Transport Area — Towards a competitive and resource efficient transport system, COM (2011) 144, as amended
- European Agreement on Main International Traffic Arteries (1983)
- Roadmap for moving to a competitive low carbon economy in 2050, COM (2011) 112, as amended
- Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU

Strategy papers and Slovak Republic policies

- Slovak Spatial Development Perspective (KURS 2001) - with amendments of the binding part and application in 2011 (KURS 2011)
- Programme Manifesto of the Government of the Slovak Republic for 2016-2020
- National Reform Programme for the Slovak Republic (2017)
- Strategic Transport Development Plan for Slovakia to 2030
- Slovak Republic Partnership Agreement 2014-2020
- National Concept for the Informatization of Public Administration
- Strategy paper for the growth of digital services and next-generation access infrastructure (2014 – 2020)

Other national and sector strategic materials

- Long-term railway development programme
- Programme of railway infrastructure upgrades
- Concept for the development of water transport in the Slovak Republic (and updates)
- General programme for implementing NAIADES in the Slovak Republic
- Updated concept for developing the Bratislava, Komárno and Štúrovo public ports
- National position on the EU strategy for the Danube region
- Concept of the development of combined transport
- Development of public passenger transport over individual transport

III. Background data on the current state of the environment in the affected territory

III.1 Background information on the current state of the environment including health and likely evolution unless the strategy paper is implemented

The proposed Amendment to the Integrated Infrastructure Operational Programme (Version 6.0) adapts and adds the content of the nationwide strategy paper. Therefore, this chapter describes the condition and development of the main environmental components at the national level. This section is based on analyses processed under SEA for the Integrated Infrastructure Operational Programme 2014 – 2020 (ENVICONSULT spol. S R.O., 2013) and the SEA for the Strategic Transport Development Plan for Slovakia to 2030 – Phase II (Transport Research Institute, 2016), and is mainly aimed at updating information for 2015-2017.

The environmental situation at the sites to be potentially affected by implementation of the proposed OPII Amendment is described in detail in III.3.

III.1.1 Air

The OPII contains transport measures scattered across the entire Slovak Republic. The impact of the OPII on air quality is therefore nationwide, mainly concentrated around proposed changes in transport infrastructure, in particular roads (near current roads which would experience traffic relief in most cases and near proposed new structures which would newly contribute toward pollution.

The impact on ambient air quality varies at the local and regional level. There are always low emission sources, so they act on the ambient air above the terrain. Dispersion in the air and the impact of traffic-related emmissions on ambient air quality is limited compared to other pollution sources. So in populated areas, therefore, traffic-related emissions contribute directly to the breathing zone of inhabitants. Primary emissions from traffic (in terms of impact significance, particulate matter, nitrogen oxides and polycyclic aromatic hydrocarbons are critical) act locally, predominately at a distance up to the first hundreds of meters from the road. From a regional point of view, it is not possible to overlook the fundamental effect of nitrogen oxide and volatile organic compound emissions from automobile traffic on the creation of secondary aerosol, which in heavily urbanized areas with developed traffic significantly contribute to particulate matter concentrations in ambient air.

The significant negative cumulative effect of the many roads found in larger urbanized units often has a fundamental effect on the impact traffic has on ambient air quality. The impact of this interaction at larger locations often exceeds immission limits for particulate matter (mainly in the permissible number of exceedances of the highest daily values) and, at frequented road nodes, the immission limit for nitrogen dioxide (average annual concentration) is also exceeded. When there is cumulative action from line sources, larger communities experience significant contributions of polycyclic aromatic hydrocarbons into the ambient air from traffic which in village structures is not so significant. Therefore In cities, traffic can create a significant part of total concentrations in the ambient air of benzo[a]pyrene.

In addition to the already mentioned pollutants, traffic is also the source of many other pollutants such as benzene, other volatile organic substances and carbon monoxide. Relevant immission limits for these substances have been met in Slovakia with a reserve.

Current ambient air quality

Particulate matter and nitrogen oxides

The following table compares the five-year average of ambient concentrations for 2011-2015 with 2016-2017.

Table III-1: Average annual ambient PM and NO_2 concentrations ($\mu g.m^{-3}$)

Location	PM_{10}		$PM_{2.5}$		NO_2	
	Average 2011-2015	Average 2016-2017	Average 2011-2015	Average 2016-2017	Average 2011-2015	Average 2016-2017
Immission limit:	40	40	25	25	40	40
Unit:	$\mu g.m^{-3}$	$\mu g.m^{-3}$	$\mu g.m^{-3}$	$\mu g.m^{-3}$	$\mu g.m^{-3}$	$\mu g.m^{-3}$
Banská Bystrica, Štefánikovo nábrežie	36.3	31	29.4	21	41.3	36
Banská Bystrica, Zelená	-	21	18.4	15	7.3	12
Bratislava, Jeséniova	24.8	20	15.7	14	16.6	14
Bratislava, Kamenné nám.	25.6	18	-	11	-	-
Bratislava, Mamateyova	29.5	22	22.5	15	26.0	23
Bratislava, Trnavské mýto	35.1	27	-		42.1	40
Bystričany, Rozvodňa SSE	34.0	29	22.7	18	-	-
Gánovce, Meteo. st.	-	-	-	-	-	9
Handlová, Morovianska cesta	26.2	23	20.1	17	-	
Hnúšťa, Hlavná	27.6	25	18.8	17	-	-
Humenné, Nám. slobody	28.1	24	21.6	20	14.7	11
Chopok, EMEP	-	-	-	-	-	3
Jelšava, Jesenského	40.0	33	30.6	23	13.8	9
Kojšovská hoľa	-	-	-	-	-	3
Kolonické sedlo, Hvezdáreň	19.5	18	13.7	10	-	-
Košice, Amurská	27.7	25	20.0	18	-	-
Košice, Štefánikova	33.9	31	22.9	21	30.1	30
Krompachy, SNP	32.2	25	25.6	17	12.4	15
Malacky	25.4	21	-	18	23.7	28
Martin, Jesenského	29.0	26	19.1	19	26.6	25
Nitra, Janíkovce	29.6	23	18.7	18	13.5	13
Nitra, Štúrova	29.6	27	29.5	15	36.3	33
Prešov, Arm. gen. L. Svobodu	34.5	29	23.1	19	39.4	38
Prievidza, Malonecpalská	30.9	25	23.1	20	21.6	18

Location	PM_{10}		$PM_{2.5}$		NO_2	
	Average 2011-2015	Average 2016-2017	Average 2011-2015	Average 2016-2017	Average 2011-2015	Average 2016-2017
Ružomberok, Riadok	38.2	28	25.4	22	25.9	21
Senica, Hviezdoslavova	29.0	25	19.1	16	-	-
Stará Lesná, Institute of Archaeology, Slovak Academy of Sciences, EMEP	18.1	14	11.8	12	7.2	4
Starina, reservoir, EMEP	-		-		-	3
Strážske, Mierová	29.2	25	21.2	21	-	-
Topoľníky, Aszód, EMEP	23.7	24	19.3	16	8.0	8
Trenčín, Hasičská	34.0	30	22.8	16	26.7	29
Trnava, Kollárova	31.0	26	21.4	18	29.4	37
Veľká Ida, Letná	41.4	35	25.6	23	-	-
Vranov nad Topľou, M. R. Štefánika	27.3	25	20.2	19	-	-
Zvolen, J. Alexyho	25.5	22	20.3	16	-	-
Žiar nad Hronom, Jilemnického	22.4	17	17.5	14	-	-
Žilina, Obežná	34.8	30	26.2	25	21.1	23

Explanatory notes: - ...no value can be calculated due to the lack of measured data (no detailed data)

Source: Slovak Hydrometeorological Institute, Report on air quality and air pollution sources in the Slovak Republic for 2010-2017

Immission limits exceeded for the highest daily particulate matter concentrations of PM_{10} are documented in the following table.

Table III-2: Highest short-term ambient PM_{10} concentrations ($\mu g.m^{-3}$)

Location	PM_{10}	
	Average 2011-2015	Average 2016-2017
Immission limit:	50	50
Averaging time:	24 hours	24 hours
Unit:	$\mu g.m^{-3}$	$\mu g.m^{-3}$
Banská Bystrica, Štefánikovo nábrežie	88	45
Banská Bystrica, Zelená	-	15

Location	PM_{10}	
	Average 2011-2015	Average 2016-2017
Bratislava, Jeséniova	16	15
Bratislava, Kamenné nám.	26	5.3
Bratislava, Mamateyova	35	14
Bratislava, Trnavské mýto	39	29
Bystričany, Rozvodňa SSE	36	18
Handlová, Morovianska cesta	31	17
Hnúšťa, Hlavná	37	23
Humenné, Nám. slobody	18	22
Jelšava, Jesenského	56	52
Kolonické sedlo, Hvezdáreň	8	5.3
Košice, Amurská	29	16
Košice, Štefánikova	52	35
Krompachy, SNP	57	27
Malacky	43	11
Martin, Jesenského	39	20
Nitra, Janíkovce	26	18
Nitra, Štúrova	33	15
Prešov, Arm. gen. L. Svobodu	64	31
Prievidza, Malonecpalská	36	13
Ružomberok, Riadok	89	29
Senica, Hviezdoslavova	24	17
Stará Lesná, Institute of Archaeology, Slovak Academy of Sciences, EMEP	3	0.7
Strážske, Mierová	36	17
Topoľníky, Aszód, EMEP	18	15
Trenčín, Hasičská	56	40
Trnava, Kollárova	42	19
Veľká Ida, Letná	101	57

Location	PM_{10}	
	Average 2011-2015	Average 2016-2017
Vranov nad Topľou, M. R. Štefánika	37	15
Zvolen, J. Alexyho	24	14
Žiar nad Hronom, Jilemnického	15	8.0
Žilina, Obežná	70	31

Explanatory notes: - ...no value can be calculated due to the lack of measured data (no detailed data)

Source: Slovak Hydrometeorological Institute, Report on air quality and air pollution sources in the Slovak Republic for 2010-2017

In terms of meeting immission limits, the worst situation remains at average annual concentrations of $PM_{2.5}$ particulate matter and the permissible number of exceedances of the average daily concentration of PM_{10} particulate matter. In the case of $PM_{2,5,}$ a tightened immission limit needs with respect to the OPII period to be taken into consideration after 2020, which would result in the applicable immission limit probably being exceeded in most measured locations.

The highest hourly concentrations of NO_2 are not given in tabular form because, in terms of accommodating an immission limit, they are potentially problematic only locally at extreme "hot-spots". In measurements conducted in Slovakia over the past 5 years, the only evidence of the exceeded immission limit was at the Trnava-Kollárova station. It was a local matter not repeated in 2016 and 2017. In terms of protecting air, the issue of average annual ambient concentrations of nitrogen oxides (NO_x) is also important, in addition to concentrations of nitrogen dioxide.

The relevant immission limit has been established to protect ecosystems. Evaluating compliance with it is relevant only at sites with sensitive ecosystems and only in the neighborhood of frequently travelled roads such as in the center of larger communities, motorways and expressways, and in frequented road notes where higher class roads intersect. Elsewhere, meeting quality air standards is not an issue. Based on an expert estimate by an evaluator, it can be expected that heavily urbanized locations with significant sources of nitrogen oxides can expect the ratio of NO_2 in NO_x to be around 2:3 to 3:4, while only reaching 80-90% at locations with lower pollution rates (and far from pollution sources). The summarized five-year averages of ambient concentrations shown in the table above imply that, outside large cities, all measured concentration of NO_2 range below 20 $\mu g.m^{-3}$. So it is possible to estimate that the immission limit of NO_x amounting to 30 $\mu g.m^{-3}$ is not exceeded in any ambient air measurements outside of the largest human settlements. This indicates that any possible exceeding of the NO_x immission limit and the negative impact on ecosystems can only be local within Slovakia, at close proximity to some exceptionally frequented transport structures. These small areas and any measures to mitigate the impact on ambient air may be identified in the EIA with respect to the territorial scale of the assessment, not in the documents presented. For the reasons mentioned earlier, total NO_x will not be subject to assessment in subsequent chapters of the documentation. The evaluation report concentrates its attention on ambient air quality and the substantially more serious situation of NO_2 on health.

The above tables show 2016 and 2017 to have been on average more favorable in terms of concentrations in the main pollutants than in the previous five years. Concentration has decreased at all measurement sites and so the number of locations where immission limits have been exceeded has markedly dropped. It is most probably the result of exceptionally good dispersion conditions in 2016.

Benzo(a)pyrene

The ambient air monitoring network for benzo(a)pyrene in Slovakia is less dense than for the earlier mentioned substances. Results from measuring sites in 2010-2017 are contained in the following table.

Table III-3: Average annual ambient benzo(a)pyrene concentrations ($ng.m^{-3}$)

Location	Benzo(a)pyrene	
	2010-2014 mean	2015-2017 mean
Immission limit:	1	1
Unit:	$ng.m^{-3}$	$ng.m^{-3}$
Banská Bystrica, Štefánikovo nábrežie	-	3.7
Bratislava, Jeséniova	0.8	0.6
Bratislava, Trnavské mýto	0.9	0.8
Krompachy, SNP	2.7	1.9
Nitra, Janka Kráľa	1.2	-
Nitra, Štúrova	0.8	1.3
Prievidza, Malonecpalská	1.9	1.4
Starina, reservoir	0.3	-
Trenčín, Hasičská	3.8	-
Trnava, Kollárova	1.1	0.8
Veľká Ida, Letná	4.4	4.8

Explanatory notes: - ...no value can be calculated due to the lack of measured data (no detailed data)

Source: Slovak Hydrometeorological Institute, Report on air quality and air pollution sources in the Slovak Republic for 2010-2017

At most measured locations, benzo(a)pyrene exceeded the immission limit. In contrast to the other earlier assessed substances, lower concentrations of benzo(a)pyrene were not evident in 2016-2017. Indeed, higher concentrations were identified in a number of locations.

Causes of worsening air quality related to the OPII Amendment

There has been no change in the main factors influencing air quality compared to the assessment contained in the original OPII SEA. In light of the operational programme's focus, nitrogen oxide immission limits in Banská Bystrica – Štefánikovo nábrežie, Bratislava – Trnavské mýto, Nitra – Štúrova and Prešov – Arm. gen. L. Svobodu are substantially exceeded with a high probability of it caused by the impact of automotive traffic. The causes of continued exceedances of annual PM_{10} particulate matter immission limits are complex. Traffic should be expected to be a major contribution toward exceeding the relevant limit in Banská Bystrica – Štefánikovo nábrežie and Ružomberok – Riadok, while elsewhere this is caused mainly by industry. In the case of $PM_{2.5}$ particulate matter, traffic is the major contributor toward exceeding immission limits at the following locations: Banská Bystrica – Štefánikovo nábrežie, Košice – Štefánikova, Nitra – Štúrova, Prešov – Arm. gen. L. Svobodu, Ružomberok – Riadok, Trenčín – Hasičská, Žilina – Obežná and Prievidza – Malonecpalská. In summary, it is possible, on the basis of the average annual concentrations measured since 2010, to state that the road traffic burden is the main cause of exceedances of immission limits in the cities

of Bratislava, Banská Bystrica, Košice, Nitra, Prešov and Trenčín. Traffic likewise contributes significantly toward exceeding the limits in the cities of Žilina, Ružomberok and Prievidza.

Exceedance of benzo[a]pyrene immission limits is a transnational problem common to all countries of the former Eastern bloc. Limits are steadily exceeded in Veľká Ida, which is moreover significantly influenced by coke production at U.S. STEEL. At the remaining measured locations, exceedance of the benzo(a)pyrene immission limit is jointly caused by traffic and local solid fuel heating of homes. The share of these two sources groups varies according to the size of the community, where traffic contributes relatively more (probably the dominant share) in larger cities such as Bratislava and Trnava, while household heating contributes more in smaller communities such as Krompachy and Prievidza. The second highest measured value in Slovakia was found in Banská Bystrica. Considering its size (3.7 times the limit exceeded) it can be estimated that the cause of the exceedance is mainly local heating. Traffic is a major contributor to exceeding the limit, but is not dominant from this perspective.

Concentrations at the newly measured location in Banská Bystrica confirm the presumption expressed in the original SEA OPII that, in view of sparsely deployed stations for the measurements of benzo[a]pyrene, immission limits for this substance are accordingly exceeded also in places where no measurements are made, particularly in valleys and at poorly-ventilated municipalities with a high proportion of household solid fuel heating.

Pollution to date

On the emission side, there is a relevant trend of emissions from automotive traffic in OPII terms. The gradual upgrade of cars is reducing the amount of motor vehicle exhaust emissions from both automotive engines and exhaust gases, although resuspension of dust from the road and from brake lining, tire and surface abrasion significantly contributes toward total emissions, where the upgrade of vehicles has practically no impact. It is contributing over the long term toward the growth of automotive traffic intensity, which is leading to a gradual elevation of emissions. These conflicting factors in aggregate are causing trend of total traffic emissions to be characterized in the long term as stagnant. Significant deviations from this overall trend are becoming evident at the local level, mainly due to infrastructure measures having an impact on the local intensity of road traffic.

From the time series of measured ambient air quality values, an overall generally decreasing trend of nitrogen oxides concentrations is evident. The total decrease can also be found in the case of particulate matter, although 2017 data indicate recurring deterioration in the situation because 2014-2016 was overwhelmingly favorable in terms of dispersion conditions. The drop in particulate matter concentrations between 2011 and 2016 was not induced by dominant changes from pollution sources, since it also occurred in stations at non-contaminated sites (regional background), which are only insignificantly affected by local sources. For the reasons mentioned earlier, PM concentrations need to be assessed at the end of the evaluation period as stagnant.

Expected development unless the proposed OPII Amendment is implemented

If the OPII is implemented without the proposed Amendment, an increase in traffic emissions can be envisaged due to the growth in traffic and congestion at infrastructure bottlenecks, especially of particulate matter. In the case of nitrogen oxides, emissions will probably decrease or the trend will be stagnant due to traffic growth offset by enhanced engine efficiency and devices to reduce emissions. Compared to current developments, the drop in particulate matter emissions will slow down due to gradual growth in traffic intensities combined with the rising contribution of abrasion in road traffic emissions. Overall, after stripping out year-to-year weather fluctuations and following the implementation of current air protection strategies, a decline in key pollutants in ambient concentrations is expected. Given the difficulty in practically implementing some conceptual measures, in particular in the individual household heating sector, it is not possible to figure on a demonstrated reduction in ambient concentrations before 2025, especially in the case of benzo[a]pyrene. For the remaining substances, it is possible during the OPII period (with no implementation of the proposed amendments) to characterize the expected trend in NO_x concentrations as decreasing, to be slightly decreasing in the case of particulate matter and

stagnating in the case of benzo[a]pyrene. Significant surface problems with meeting immission limits for most of the measuring sites) are likely to persist for $PM_{2,5}$ particulate matter, and with certainty in the case of benzo[a]pyrene.

In view of the nature of the proposed OPII Amendment, it can be envisaged that implementation will not affect current trends at the national level and possible impacts would be seen only locally.

III.1.2 Climate change

Greenhouse gas emissions

The last national inventory of greenhouse gas emissions noted total emissions production in Slovakia to have reached 41,269.49 Gg of equivalent CO_2 in 2015. This value is a 44.6% reduction in emissions from the baseline year 1990. Compared to 2014, emissions increased 1.45%. However, this year-to-year fluctuation from economic recovery (emissions grew in the energy, industrial and waste sectors) does not affect the overall sustained trend in the decline of overall emissions, where it fell 10% between 2010 and 2015 (from the published 6th National Inventory Report).[7]

Traffic holds a special position among emission-producing sectors since it is very difficult to legislatively regulate it. Moreover, a shift has been observed in recent years from public passenger transport to motorized individual transport, while the percentage of heavy goods transport is also rising. Fuel consumption from road transport is growing sharply, while rail is experiencing a slight decrease in fuel consumption. Nevertheless, in relation to the drop in greenhouse gas emissions, it should be noted that the decrease was mainly due to improvements in sectors other than transport. Transport, as in most other EU countries, significant contributes to greenhouse gas production and, moreover, has been exhibiting a rather worsening trend.

Transport's share to total greenhouse gas production is about 16%. Total emissions of equivalent CO_2 from assessed road and rail traffic were equal to 6,400.61 Gg in 2014, of which CO_2 emissions were 6,321.57 Gg. For methane this was 15.88 Gg and for nitrous oxide it was 63.16%. CO_2 emissions therefore contribute 98.8% to total greenhouse gas production from both road and rail transport.

Road traffic is the biggest producer of greenhouse gas emissions, comprising 97.7% of greenhouse gas emissions assessed from road and rail transport. Emissions of equivalent CO_2 from road traffic were 6,343.0 Gg in 2015. Of this figure, 98.9% is CO_2, 0.3% is methane and 0.8% is nitrous oxide. Between 1990 and 2015, CO_2 emissions in road traffic grew by 1.8 Mt, or about 19%.

Road traffic is the second biggest producer of greenhouse gas emissions, comprising 2.2% of greenhouse gas emissions assessed from road and rail transport. Emissions of equivalent CO_2 from rail traffic were 145.49 Gg in 2014. Of this figure, 92.5% is CO_2, 0.1% is methane and 7.4% is nitrous oxide. Enhanced quality, energy

efficiency and a fall in adverse environmental impacts has been seen in rail transport through EU subsidies. Upgrading of rolling stock has contributed toward the decline in fuel consumption in rail transport. Emissions had sharply fallen up until 2003. Since that year, the decline has stabilized and decreased in intensity. Between 2013 and 2014, rail transport emissions dropped 5.9%.

Estimates of future greenhouse gas emissions from transport suggest a continuation of this negative trend. Outputs from the transport model used to prepare and evaluate the Strategic Transport Development Plan for Slovakia to 2030 (2016) indicate, based on a comparison of current traffic

[7] Seventh National Report of the Slovak Republic on Climate Change (2017).

intensity on the transport network (BASE 2014 scenario) with estimated traffic intensities in 2030 (BAU 2030) that a continuation of current transport trends in transport in by 2030 would result in a more than 55% rise in total greenhouse gas emissions from road transport and a more than 46% rise in total greenhouse gas emissions from rail transport.[8] Similarly, projections for CO_2 emissions presented in the reporting under Article 4 and Article 12 of the United Nations Framework Convention on Climate Change and the Kyoto Protocol indicate CO_2 emissions from transport to be about 30% by 2030 compared to the current situation (depending on the scenario used).[9]

It is clear in this context that no implementation of the additional measures will leave the Slovak Republic with a major challenge to meet targets for reducing greenhouse gas emissions from transport, defined at the EU level, even in situations where the Effort Sharing Decision (ESD) gives Slovakia the opportunity to elevate transport emissions further to a certain degree.[10]

Signs of climate change

The fifth evaluation report of the Intergovernmental Panel on Climate Change (2014) confirms global warming to be clearly underway, to be faster than anticipated by some past scenarios and by 2100 the earth can be warmer on average by 1.5 to 4.5 °C compared to the pre-industrial period.[11]

The updated Strategy for the Slovak Republic's Adaption to the Adverse Consequences of Climate Change (issued by the MOE in 2018) points out that Central Europe bears the general features of climate change. Warming is reflected in all locations and climatic areas. Trends in atmospheric precipitation are not so clear, but this is due to their greater variability, as well as to modifying aggregate windward and leeward influences. The following was observed in Slovakia between 1881 and 2010:

- Growth in average annual air temperature of 1.73 °C;
- Decline in annual atmospheric precipitation averaging about 0.5% (more than 10% at places in southern Slovakia, with sporadic increases in precipitation up to 3% in the north and northeast);
- Decrease in relative air humidity (in south Slovakia from 1900 to today of about 5% and less in other parts);
- Drops in all characteristics of snow cover up to an elevation of 1,000 m in almost all of Slovakia (an increase has been reported at higher elevations);
- Rise in potential vapor and fall in soil humidity – characteristics of water vapor from soil and plants, soil humidity and sunlight confirm, in particular, that south Slovakia is generally drying;
- Changes in climate variability (especially precipitation) – examples are the short time interval between alternating extremely moist and dry years: 2003 was an extremely dry year and partly also 2007, while 2010 and 2016 were extremely humid years and 2011 was a particularly dry year and so partly was 2012. Over the past 15 years, there has been more significant growth in the incidence of extreme daily and multiple-day precipitation, resulting in an elevated risk of local floods in different areas of Slovakia. On the other hand, local or full-scale droughts occurred much more frequently in the period between 1989 and 2017 than previously, mainly due to long periods of relatively warm weather with small precipitation at some part of the growing season. The drought

[8] Impact evaluation from the Strategic Transport Development Plan for Slovakia to 2030 - Phase II on the environment and human health. Evaluation of the Strategy Paper (2016).
[9] For example, the WEM ("with measures") scenario estimates a rise from 6,665.3 Gg of CO_2 in 2015 to 7,888.3 Gg of CO_2 in 2030. See the Seventh National Report of the Slovak Republic on Climate Change (2017).
[10] According to the Effort Sharing Decision, Growth in GHG emissions by 2020 should not reach values higher than 13% compared to 2005 in sectors outside the Emission Trading System (which mainly applies to transport) by 2020. However, according to the Effort Sharing Regulation (2018), Slovakia will be in the sectors outside the Emission Trading System until 2030, with a reduction of 13% compared to 2005.
[11] https://www.ipcc.ch/report/ar5/syr/

was particularly pronounced between 1990 and 1994 and in 2000, 2002, 2003 and 2007, while in some regions of western Slovakia there were droughts also in 2015 and 2017.

Looking ahead, the Strategy for the Slovak Republic's Adaption to the Adverse Consequences of Climate Change formulates the following general conclusions on further climate developments in Slovakia:

Air temperature

- Average air temperatures should progressively rise by 2-4 °C compared to 1951-1980, while preserving the current year-to-year and inter-seasonal temporal variability;
- Daily minimum temperatures should rise a little faster than daily maximum temperatures, resulting in a fall in average daily air temperature amplitude;
- No scenarios foresee significant changes in annual air temperature, but in the autumn months, the temperature rise should be less pronounced than during the remainder of the year.

Total precipitation

- Annual precipitation should not change substantially, but it is envisaged to rise slightly (around 10%) especially in northern Slovakia;
- Major changes should occur in the mode and timing of precipitation, where a slight decline in precipitation is generally expected in the summer (mainly in southern Slovakia) and slight to moderate growth in precipitation during the remaining months of the year (mainly in winter and in northern Slovakia). In warmer months of the year, an increase in the variability of precipitation is expected and more often there will be little precipitation and dry periods on one hand and a markedly more severe short rainy period on the other hand;
- Because warmer weather is expected in winter, up to an elevation of 900 meters, snow cover will be irregular and winter flooding will occur more often - snow cover will clearly be on average greater only at elevations above 1,200 meters, but less than 5% of Slovakia lies above that elevation and it cannot significantly influence drainage conditions.

Other climatic elements and characteristics

- No significant changes are expected in global radiation, speed and wind direction;
- In view of the amplification of storms in warmer months of the year, a more frequent incidence of strong winds, windstorms and storm-related tornadoes is expected;
- Decrease in soil humidity in the south of Slovakia (growth of potential evapotranspiration in the growing season during the year of about 6% to 1 °C of heat, with precipitation in the growing season during the year not significantly increasing).

III.1.3 Noise and vibrations

In the outside environment, transport-related noise from especially the following sources are distinguished:

- Noise from road traffic and waterways including urban mass transit;
- Noise from rail traffic on railway tracks;
- Noise from air traffic and noise around airports.

In terms of noise level, strategic noise maps have been produced. This is a consequence of road traffic considered to produce the most noise. Strategic noise maps (SNM) are designed to overall assess noise exposure in a given area caused by different noise sources (transport, industry) and describes an existing, past or anticipated noise situation expressed in the form of noise indicators. The aim is to identify areas where specified action values for individual noise indicators are exceeded and to establish the number of people exposed to excessive noise in the observed area.

Road traffic

Strategic noise maps were produced for highways and expressways between 2011 and 2013 (so-called "Phase I and Phase II). SNM produced for year 2016 as Phase III of the assessment covered the acoustic situation on observed roads, especially at stretches where more than 3,000,000 motor vehicles drive per year. SNMs are produced for these roads every five years, as part of the monitoring of the acoustic situation across the entire EU. Strategic noise maps were produced for the stretches of motorways and expressways shown on the map below.

Overview of the situation and list of assessed

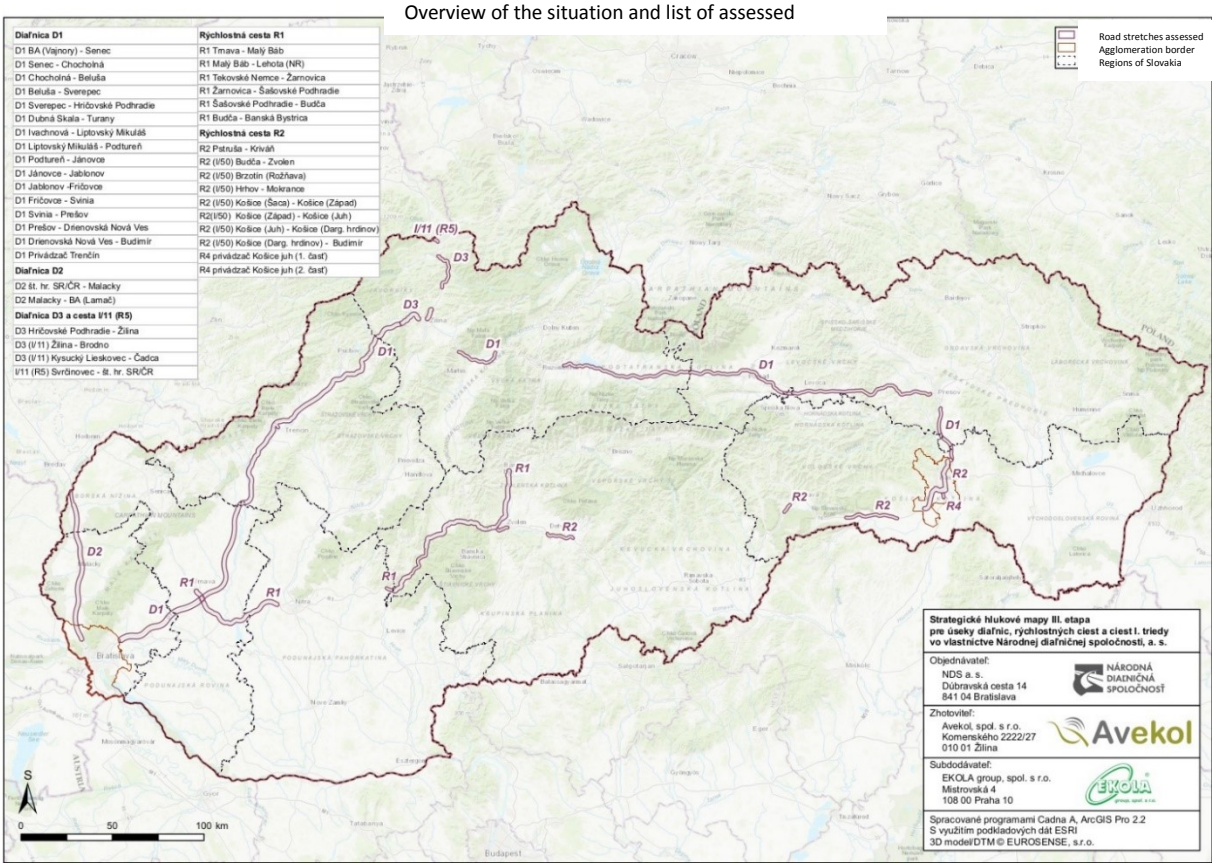


Figure III-1: Map of stretches for strategic noise maps - NDS Report

Source: Action Plan for Noise Protection (Phase III), Národná diaľničná spoločnosť, a.s.

The Slovak Road Administration (SSC), administering first-class routes in Slovakia, is required to process strategic noise maps and action plans in the vicinity of first-class routes, where in the specified years traffic intensity was greater than 6 million vehicles a year (status in 2006) and 3 million vehicles per year (status in 2011 and every 5 years). Strategic noise maps have not been produced to date for first-class routes owned by the SSC. Strategic noise maps available for these roads are thus from 2006.

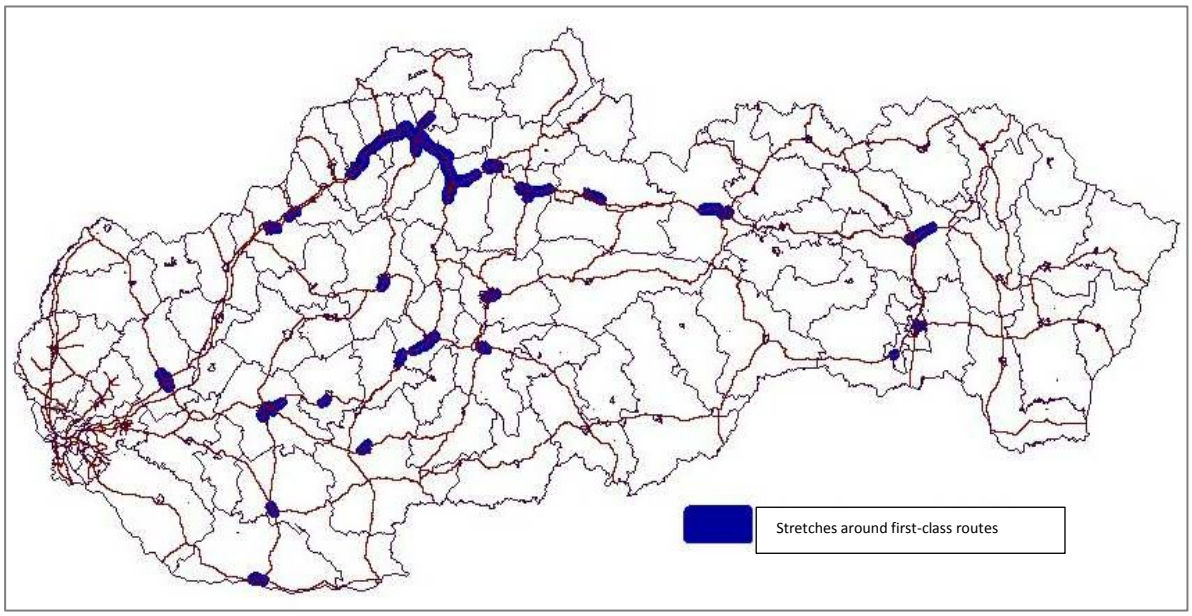


Figure III-2: Map of stretches for strategic noise maps - SSC Report

Source: http://www.hlukovamapa.sk/

Rail transport

Rail transport can also be considered a noise producer. A strategic noise map was processed for selected railway stretches administered by ŽSR and operating in 2016. The following figure displays selected stretches of major railway lines administered by ŽSR in 2016 where strategic noise map maps were produced.

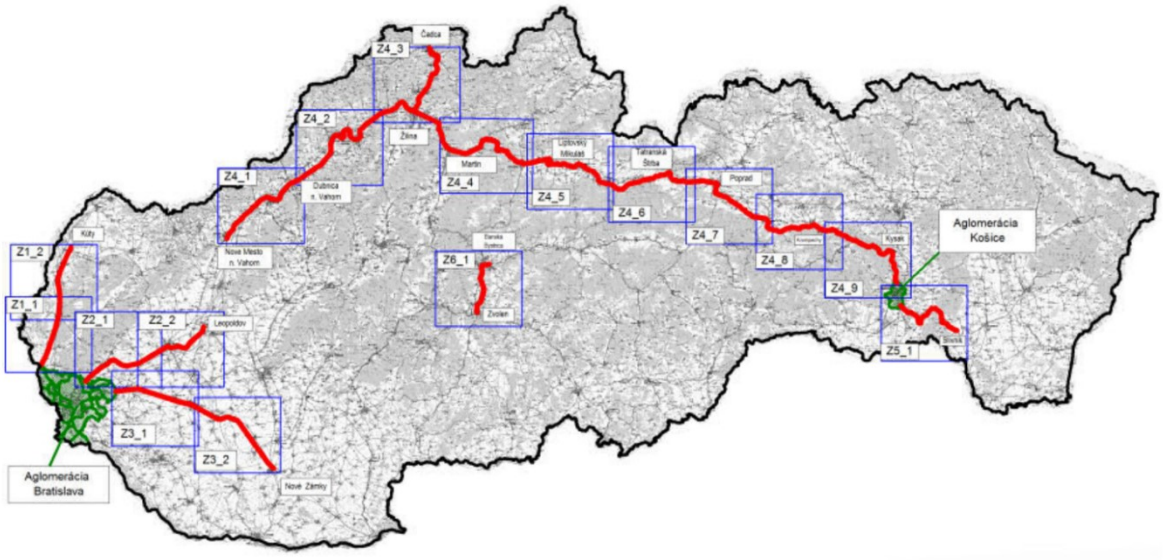


Figure III-3: Stretches where strategic noise maps of railway lines administered by ŽSR were produced

Source: EUROAKUSTIK, s.r.o. Bratislava (2016)

The area around these railway lines administered by ŽSR, where the intensity of train movement in 2016 was greater than 30,000 per year, are spread across the entire Slovak Republic. Overall, the area surrounding the major railway lines are divided into six contiguous units for their condition in 2016.

Table III-4: Specific stretches for strategic noise maps of railway lines administered by ŽSR

Stretch	Stretch name	Track	Number of trains in 2016
Z1	Devínska Nová Ves - Zohor	ŽSR - 110	43 949
	Zohor – Kúty	ŽSR - 110	38 172
Z2	Bratislava Rača - Trnava	ŽSR – 120	43 857
	Trnava – Leopoldov	ŽSR – 120	37 286
Z3	Bratislava Vajnory – Galanta	ŽSR – 130	40 606
	Galanta – Šaľa	ŽSR – 130	43 171
	Šaľa – Palárikovo	ŽSR – 130	40 671
	Palárikovo – Nové Zámky	ŽSR – 130	41 169
Z4	Nové mesto nad Váhom - Trenčín	ŽSR – 120	36 841
	Trenčín - Púchov	ŽSR – 120	32 974
	Púchov – Žilina	ŽSR – 120	32 974
	Žilina – Čadca	ŽSR – 127	32 974
	Žilina – Odbočka Váh	ŽSR - 180	54 430
	Žilina / Teplička - Odb. Váh	ŽSR - 180	55 099
	Varín – Žilina / Teplička	ŽSR - 180	54 351
	Vrútky - Strečno	ŽSR - 180	51 146
	Vrútky – Kraľovan	ŽSR - 180	41 488
	Kraľovany – Liptovský Mikuláš	ŽSR - 180	44 437
	Liptovský Mikuláš – Štrba	ŽSR - 180	37 705
	Štrba – Poprad	ŽSR - 180	39 850
	Poprad – Spišská Nová Ves	ŽSR - 180	43 755
	Spišská Nová Ves – Spišské Vlachy	ŽSR - 180	39 389
	Spišské Vlachy – Margecany	ŽSR - 180	39 204
	Margecany – Kysak	ŽSR - 180	39 952
	Kysak – Košice	ŽSR - 180	55 233
Z5	ŽST Košice Barca – výhybka Slivník	ŽSR - 190	33 311
Z6	Zvolen – Banská Bystrica	ŽSR - 170	33 978

Source: EUROAKUSTIK, s.r.o. Bratislava

Air transport

An amendment to Act 2/2005 on assessment and control of noise in the outdoor environment imposes an obligation for competent authorities to produce noise maps for major airports with more than 50,000 takeoffs and landings per year by 30 June 2012. None of the airports located in Slovakia met the condition.

Water transport

Construction requirements for the navigability for inland waterways imply an obligation to comply with hygienic noise levels at 70 dB (Directive 2006/87/EC of the European Parliament and of the Council of 12 December 2006 laying down technical requirements for inland waterway vessels and repealing Council Directive 82/714/EEC). There are no relevant outputs covering water transport noise issues (e.g. noise maps).

Noise pollution from transport unless the proposed OPII Amendment is implemented

The development of noise burden from transport was modelled at the strategic level in Slovakia when the Strategic Transport Development Plan for Slovakia to 2030[12] was prepared in 2016. This strategic assessment of noise burden from transport, based on data from average daily automotive traffic intensities, the composition of data flow and average speeds across the entire road network, prepared data layers illustrating sound pressure levels at the edge of roads when traffic intensities were modelled in 2014 (baseline year 2014). Similar sound pressure data at the edge of roads was modelled in the same way for the modelled traffic intensity on the future road network, were measures proposed in the Strategic Transport Development Plan for Slovakia to 2030 not to be realized by 2030 (BAU 2030 scenario). The transferred comparison showed a rise in the modelled BAU 2030 scenario of sound pressure from traffic on a major part of the road network compared to the modelled status in 2014.

To get an idea of the scale of the affected population, the number of registered buildings were calculated that were located a distance of 50, 100 and 200 meters from different sound pressure levels on the edge of roads. The visualization in the figure shows a reduction in the number of registered buildings located 50, 100 and 200 meters away from the sound pressure level generated from traffic under 60 dB and the almost equivalent rise in the number of buildings located 50, 100 and 200 meters away from the sound pressure generated from traffic exceeding the 60 dB threshold.

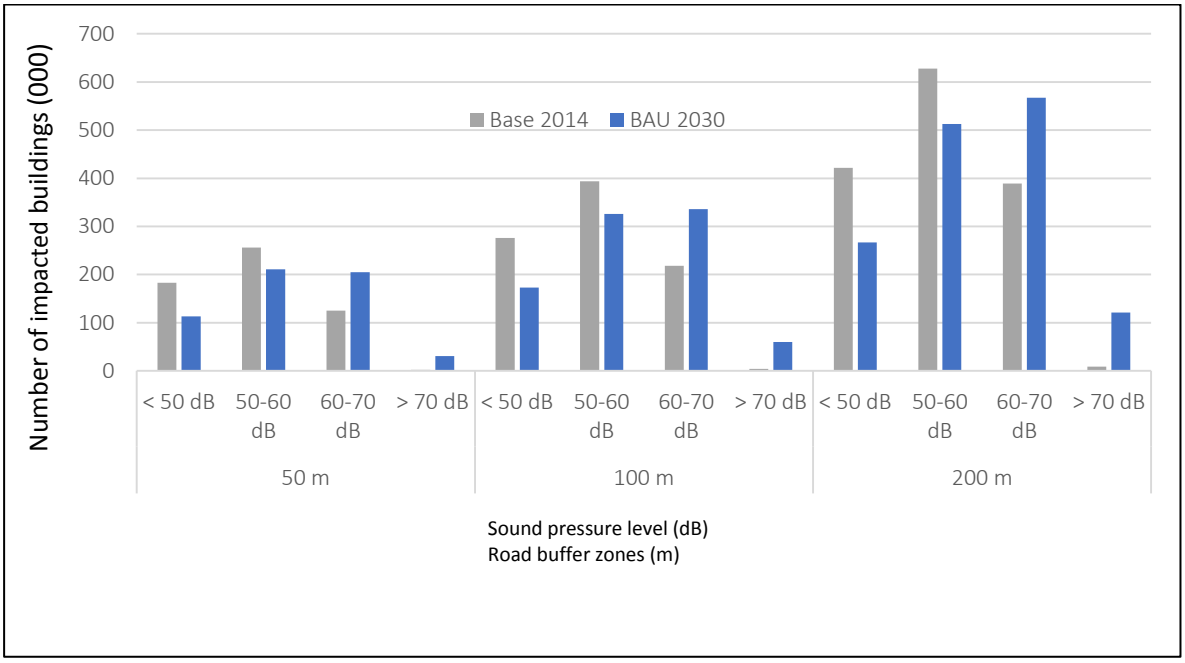


Figure III-4: Number of registered buildings in Slovakia located 50, 100 and 200 meters from sound pressure levels under 50 dB, 50-60 dB, 60-70 dB and over 70 dB on the edge of roads

Source: SEA SPRDII SR 2030 (2016).

This finding made clear that there would be an overall increase in sound pressure levels from traffic without the implementation of the Strategic Transport Development Plan for Slovakia to 2030 (in the modeled BAU 2030 scenario), which would have to be addressed in strategic noise maps and the implementation of adequate noise control measures (noise absorbent barriers, underground roads, lower speed limits and limiting traffic on the most burdened roads), based on applicable sound standards in Slovakia. These measures cover priorities in major urban areas such as Bratislava,

[12] Impact evaluation from the Strategic Transport Development Plan for Slovakia to 2030 - Phase II on the environment and human health. Evaluation of the Strategy Paper (2016).

Trnava, Trenčín, Prievidza, Žilina, Nitra, Nové Zámky, Banská Bystrica, Poprad, Prešov, Košice and also a range of partial problem areas.

Considering that the OPII is a sub-instrument for financing measures proposed in the Strategic Transport Development Plan for Slovakia to 2030, it can be concluded that the failure to implement infrastructure measures in the OPII will most likely continue the existing negative trend identified in the modelled calculations prepared as part of the SEA assessment therein. In view of the nature of the proposed OPII Amendment, it can be envisaged that its implementation will not affect current trends at the national level and possible impacts would be seen only locally.

III.1.4 Water conditions

Slovakia is a landlocked state whose territory covers a major watershed between the Baltic and Black Sea. A total of 47,084 km^2 (approx. 96% of Slovakia's area) is in the Black Sea watershed and water from this catchment area drains through the Danube and its tributaries. The remaining 1,950 km^2 (approx. 4%) drains through the Dunajec and Poprad Rivers to the Baltic Sea.

Water policy currently applied in the Slovak Republic is based on Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community measures in the field of water policy ("Water Framework Directive" or "WFD"), which was transposed to Act 364/2004 Coll. on water and on the amendment of SNC Act 372/1990 Coll. on offenses, as amended (Water Act) and related implementing regulations.

Surface water

Slovakia currently (i.e. for the 2nd planning cycle) defines 1,510 surface water bodies, of which 1,436 fall within the Danube River Basin District (RBD) and 74 in the Vistula River Basin District. Under conditions in Slovakia, only rivers are in the defined surface water categories, including rivers with changed categories - water reservoirs (there are 23 water bodies, all lying within the Danube RBD). Natural lakes with an area greater than 0.5 km^2 defined as separate bodies of water are not present in Slovakia and, in view of the inland situation within the country, are neither coastal or transitional waters.

Of the above mentioned number of surface water bodies, 85 are defined as markedly changed water bodies (of which 23 are in a modified category) and 75 are defined as artificial water bodies.

Surface water quality

Qualitative surface water indicators were monitored in 2017 at 438 spots for general and operational monitoring. Surface water quality at all monitored sites in 2017 met limits for selected general indicators and indicators of radioactivity. The limits most exceeded in the general indicators were for nitrite nitrogen in all sub-basins. Requirements for surface water quality reflected in indicators for a group of synthetic and non-synthetic substances were not met for arsenic, zinc, copper, total cyanide, 4-methyl-2,6-Di-terc butylphenol, aniline and benzothiazole. The annual average environmental quality standard (EQS) was exceeded for cadmium, mercury, lead, alachlor, di(2-ethyl hexyl) phthalate (DEHP), fluoride, 4-nonylphenol and 4-terc-octylphenol. In the group of biological and microbiological indicators, requirements were not met for the saprobic index for biosestone, abundances of phytoplankton, chlorophyll-a, coliform bacteria, thermotolerant coliforms, intestinal enterococci and cultivable microorganisms at 22 °C.

Assessing surface water conditions

In the light of requirements in the Water Framework Directive, the quality of surface water is expressed by ecological status/potential and chemical status. Ecological status/potential is evaluated primarily through biological quality elements, while supporting elements in the evaluation are physical, chemical and hydro-morphological quality. Water transport has been accordingly linked with adverse impacts on the hydro-morphology of surface water.

When assessing the condition of surface water for the 2nd planned cycle (i.e for the 2009-2012 reference period), very good and good ecological status/potential was recorded in 56.2% of total surface water over a length of 8,073.43 kilometers. 34.8% of surface water over a length of 7,565.46 kilometers was found to be in an average ecological status/potential. Poor and very poor conditions/potential were found in about 9% of the surface water over a length of 2,159.41 kilometers (all of these classified surface water bodies were located in the Danube RBD). The best situation in terms of ecological status/potential was documented in the Poprad-Dunajec, Slaná, Hron and Hornád sub-basins.

A good chemical status was found in 1,473 (97.6%) surface water bodies. 37 (2.4%) surface water bodies did not have a good chemical status, of which only 1 water surface body lies in the Poprad-Dunajec watershed (Vistula RBD). Assessment the surface water chemical status consisted of evaluating the incidence of 41 priority substances and other pollutants. Failure to achieve a good chemical status due to the exceedance of quality standards was caused by non-synthetic substances (12) and synthetic substances. Synthetic substances were indicated in 24 of the water surface bodies, of which aggregated industrial pollutants were found in 14 of them, pesticides in five and other pollutants also in five.

Groundwater

Slovakia currently (i.e. for the 2nd planning cycle) defines 102 groundwater sites. Of this number, 16 are defined in Quaternary sediments, 59 in pre-Quaternary soil and 27 in geothermal groundwater structures. There were three groundwater sites registered in the Vistula RBD in pre-Quaternary soils and one in Quaternary sediments, while all the other sites lie in the Danube RBD.

Groundwater quality

In 2017, groundwater quality was monitored at 175 baseline sites and 220 operational monitoring sites. Established limits were exceeded at both types of monitoring. Unfavorable oxidation-reducing conditions were in the forefront, indicating frequent exceedance of allowable concentrations of manganese, total iron and Fe and bivalent iron. The most common non-conforming indicator in all Quaternary groundwater was the percentage of oxygen saturation. Besides these indicators, the effects of anthropogenic pollution on groundwater quality indicated exceeded in chloride (Cl^-) and SO_4^{2-} limits. The nature of land use (agricultural) is reflected in elevated levels of oxidized and reduced forms of nitrogen in groundwater. In trace elements, permissible values were exceeded especially in arsenic, and to a lesser degree lead, aluminum and mercury. The presence of specific organic substances in groundwater is an indicator of the influence of human activity. A wider scale of specific organic substances was recorded in 2017 at operational monitoring sites. Values most frequently exceeding limits were found in the polyaromatic hydrocarbon group (most often naphthalene, phenanthrene, acenaphthene and fluorocarbons), in the volatile aliphatic hydrocarbon group, with perchloroethylene most commonly exceeding the limit, and atrazine the most common from the pesticide group. In the general organic substances group, total organic carbon levels and the NEL index limit value were exceeded.

In terms of groundwater quality, lowland areas were the most polluted. These areas are in western Slovakia (in the riverine zone of the lower Váh River from Galanta to Komárno) and in eastern Slovakia (Medzibodrožie and the Roňava floodplain). The least polluted water is at river sediments in the upper and central parts of the Váh, Hron, Poprad and Hornád river basins and groundwater accumulating in the Mesozoic carbonates found at mountain ranges.

Assessing groundwater conditions

Groundwater conditions were assessed by evaluating their chemical and quantitative status.

In the second planning cycle, 11 groundwater sites out of a total of 71 in the Danube RBD were classified in poor chemical condition (of which 7 Quaternary formations and 4 pre-Quaternary formations) and the other 60 were in good chemical condition. The anthropogenic impact is more evident in shallow horizons, with 7 out of 16 groundwater sites in Quaternary formations classified

in poor condition, or 44.6% (4,565,379 km^2) of the total Danube RBD Quaternary formation surface. In the Vistula RBD, all groundwater was classified in good chemical condition.

The quantitative status of all 75 groundwater sites defined in Quaternary sediments and pre-Quaternary soils were evaluated. Geothermal structures were not evaluated due to insufficient data. Three groundwater sites in the Danube RBD were determined to be in poor quantitative state, of which one site in Quaternary sediments (covering a 934,295 km^2 area or 9.1% of the total area of the Danube RBD's quaternary formations) and two sites in pre-Quaternary soil (with an area of 1,228,546 km^2 or 2.61% of the total pre-Quaternary formations in the Danube RBD). In the Vistula RBD, all groundwater was classified in good quantitative condition.

Drinking water supply

Water is supplied from surface water and groundwater greater than 10 m^3 in area that are used to abstract drinking water, usable to supply a population of more than 50 or enabling the abstraction of water for this purpose. There are protected areas defined for safeguarding water used for abstraction (see III. 2.4).

Water pollution

Surface water and groundwater in Slovakia are burdened with point surface pollution sources. The main sources of organic and trophic pollution are urban agglomerations, industry and agriculture. Sources of priority and relevant substances in water are mainly waste water from industry, chemicals applied in agriculture, wastewater from mining and accidental pollution incidents. A significant source of some types of substances can also be atmospheric deposition.

Traffic is also a source of contaminants that pollute water either directly or through atmospheric deposition (especially NO_x or likewise PAHs or PCBs). Ordinary operation of vehicles on roads causes relevant pollution of the water through runoff from paved surfaces (chlorides from winter maintenance materials) or oil (from drainpipes, tires, etc.). A substantial part of the severe deterioration of water (from accidental pollution) is linked to traffic. For example, in 2012 there were 21 cases of severe water deterioration caused by traffic (on 14 roads, on 5 navigable waterways and 2 railway lines).

Probable development unless the proposed OPII Amendment is implemented

Given long-term trends and the currently applied water policy, further gradual improvement in surface and groundwater conditions may be expected at the national level in future, within the context of implementing measures to improve the status of water bodies contained in river basin management plans, and later in particular in the context of limiting the impact of point sources of pollution. The volume of effluent discharged into surface water has been long declining, while purified sewage discharges have been rising as a percentage. The amount of discharged pollutants contained in wastewater has decreased with the upgrading of manufacturing technologies and the application of more efficient wastewater treatment processes.

Conversely, the risks from traffic can be seen as progressively growing due to rising traffic intensities. The construction of new transport elements is also linked to the risk of impacting surface and groundwater in specifically affected areas, although upgrades to traffic infrastructures generally ensures greater safety and reduces the risk of water pollution. The OPII Amendment newly adds some activities linked to the risk of negative impact on surface and ground water, while directly targeting the introduction of modern technologies and enhancement of traffic safety and the promotion of more efficient transport modes, and so it can be therefore envisaged that the proposed amendment to the OPII will not more markedly impact the earlier described trends. In view of the nature and scope of the proposed OPII Amendment, the impacts on national trends will be of little importance.

III.1.5 Land, rock environments and mineral resources

Agricultural and forested lands

The permanent appropriation of land and forested property is a priority impact when implementing transport infrastructure projects.

The total area in Slovakia was 4,903,420 hectares in 2017, with agricultural land composing 48.6%, forests 41.3% and land neither used for agriculture or forestry 10.1%. Between 2000 and 2017, agricultural land area fell 2.4% (by 58,714 hectares) to the current 2,381,953 hectares. 2.3% growth in waterways (an increase of 2,151 hectares) and 1.2% growth in forested land (an increase of 23,121 hectares) were documented, where the maximum percent increase compared to 2000 of 8% came in built-up land and courtyards (an increase of 17,641 hectares). Agricultural land has been declining continually since 1990, becoming built-up areas and courtyards. Anthropogenic pressure on land use for purposes other than its primary and environmental functions is causing the slow decline. Agricultural and arable land in Slovakia further shrank in 2017. A 6.9% rise in built-up areas was documented between 2000 and 2015. Currently, 4.8% of Slovakia is developed (31 December 2017).

This trend can be expected to continue, given further construction of technical infrastructure. The construction of traffic infrastructure also involves the appropriation of land, where the most land is appropriated for road traffic followed by rail transport. The rise in land taken for road traffic infrastructure - road carriageways amounted to 15.7534 hectares (0.11%) in 2014. When land was appropriated to be taken for traffic infrastructure, the carriageway surface was taken into account and if it was taken for a motorway or motorway exit, expressway or expressway exit, or for first-class, second-class or third-class route. No significant changes were noted in land appropriated for water infrastructure and since 2008 only 185.07 hectares has been taken.

The development of transport and in particular road infrastructure induces secondary impacts as a consequence of the attractiveness of the land, resulting in the emergence of new shopping, service and manufacturing land, which has been noticeable in particular near motorway and expressway exits.

in the context of land, the same issues of civil engineering waste disposal are linked with the development of transport infrastructure, primarily with soil inappropriate for embankment fill and from the driving of tunnels. Surplus material further indicates the establishment of permanent or temporary depots and further taking of land associated with them.

Rock environment

A particular problem found in relation to soil and land environments is stability. In Slovakia, an atlas of maps covering the stability of slopes in the country (Šimeková, Martinčeková et al. 2006; Dionýz Štúr State Geological Institute) registered 21,192 slope deformations with an area of 257,500 hectares, or 5.25% of Slovakia's area. In 2017, records from seismic stations in the national network interpreted 10,719 tele-seismic, regional or local seismic phenomena.

70-80 earthquakes were localized with epicenters within Slovakia. Five earthquakes were macro-seismically observed in Slovakia, all with epicenters inside the country.

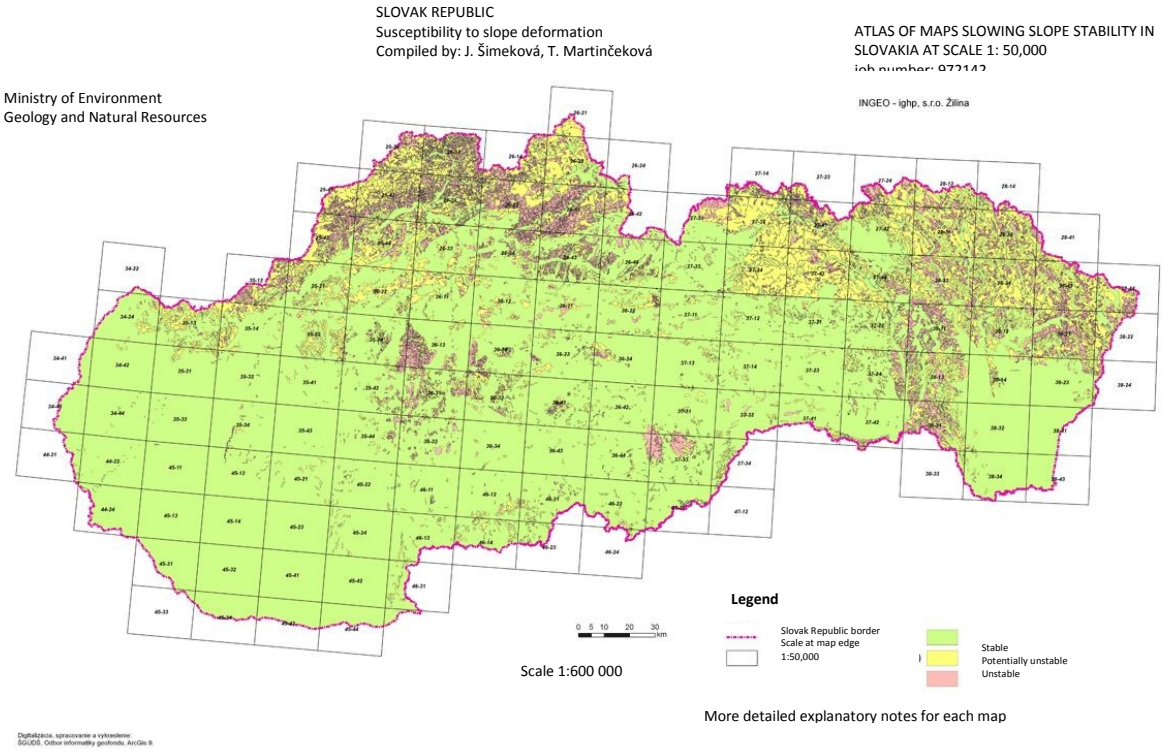


Figure III-5: Map of slope stability indicating map indices SCALE 1: 50,000

Source: Atlas of maps showing slope stability in Slovakia

Out of the total number of slope deformations registered, 94.5% were caused by landslides and slope currents. Other types of slope deformations were less than 5.5%, with 95 of them (0.4%) combined slope deformations. In view of the assessment of broken surfaces which is more representative than numerous evaluations, falling rock from landslides appear more common (78.12%) than block deformations (15.31%) and other types of slope disorders, including combined deformations (total 6.57%).[13]

Slope deformations endanger 98.8 kilometers of motorways and first-class routes and 571.4 kilometers or second and third-class routes and 67.2 kilometers of railways. Linear structures such as motorways, expressways, railways and first, second and third-class routes are most endangered and damaged by falling rock (99%). 12.9% of the total length of motorways and first-class routes are endangers or have been damaged by falling rock. Active landslides pose a risk and damage 11.2% of second and third-class routes, 10.1% of railways and 5.1% of road structures. Other structures at risk of active landslides or that have been damaged by falling rock are 6.5% of all structures, above-ground product lines 3.7%, gas lines 6.8% and water lines 4.2%.

Natural causes of slope deformations are climatic factors combined with water erosion, groundwater discharges and the effects of groundwater pressure. The main reason for the emergence of a large number of slope deformations in the first half of 2010 was mainly long-lasting rainfall in early June, when daily precipitation ranged between 25 and 50 millimeters throughout all of Slovakia and reaching in isolated areas up to 80 millimeters in the north and east of the country. Sustained and abundant rain caused significantly rising levels in almost all watercourses in Slovakia and subsequently flooding. The buoyancy effect of swollen water and extraordinary high soil saturation following previous rains weakened the slopes of rock massifs susceptible to landslides and resulted

[13]Landslide Risk Prevention and Management Programme (2014-2020), MOE 2013

in the emergences and development of large falling rock causing enormous material damage, generating the highest costs in Prešov and Košice Regions.

Anthropogenic interventions are also contributing to the emergence of slope deformations, particularly due to inappropriate civil engineering (undermining or aggravating unstable slopes) and uncontrolled runoff by both surface precipitation and sewage waters or the absence of it.[14]

Mineral resources

Information about mineral deposits is available at the map portal of the State Geological Institute (http://apl.geology.sk/gpark/). More detailed information about deposits in areas to be potentially affected by the proposed OPII amendment can be found in III.3.

Probable development unless the proposed OPII Amendment is implemented

Unless the proposed amendments to the OPII are implemented, depending on economic developments, it can be expected that growth in built-up areas will continue at the expense of losses in agricultural land. It can be envisaged that the trend will continue even despite declared endeavor to strengthen the protection of agricultural land, although due to greater attention devoted to the topic in planning and authorization of processes, clearly at a slower pace than to date.

Unless the infrastructures territorially defined in the OPII Amendment are implemented, land would not be temporarily or permanently appropriated for structures and there would be no secondary taking of land (for accompanying structures, permanent and temporary depots and other uses). However, the proposed amendment to the OPII would have little importance in terms of the possible impact on overall national trends.

III.1.6 Waste

A total of 14,284,891.98 tonnes of waste were produced in Slovakia during 2017. Compared to 2016, it was a rise in total waste produced of almost 34%. This growth was mainly due to increased construction and rerouting of road and rail networks.

The amount of waste produced between 2005 and 2017 is illustrated in the figure below.

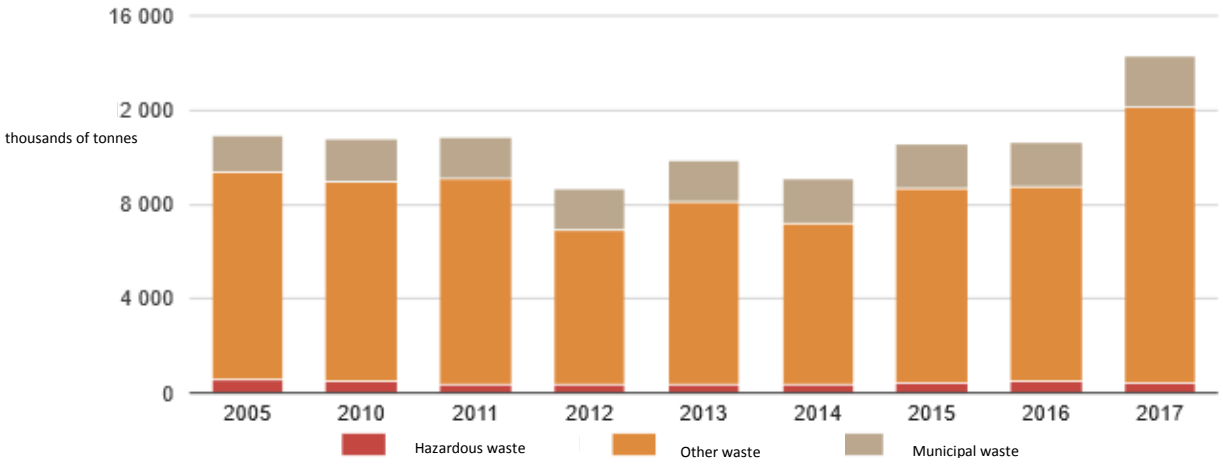


Figure III-6: Waste generated in Slovakia in 2005-2017

Source: MOE, Statistical Office of the Slovak Republic

[14] Report on accidental incidents of slope deformation and the necessity of eliminating risks to the life and property of residents (MOE 2013)

31% of total waste produced is recovered for recycling. The high proportion of waste landfill remains a problem, with up to 31% of the total waste generated in dumps.

Environmental burden

Environmental burden is defined in the meaning of the Geology Act as pollution caused by human activity which poses a serious risk to human health or the rock environment, groundwater and land, with the exception of environmental damage. It covers a wide range of areas contaminated by industrial, military, mining, transport and agricultural activities, as well as improper waste disposal. The incidence of environmental burdens in Slovakia according to the group of activities that caused them and to the priority for addressing them is illustrated in the following figure.

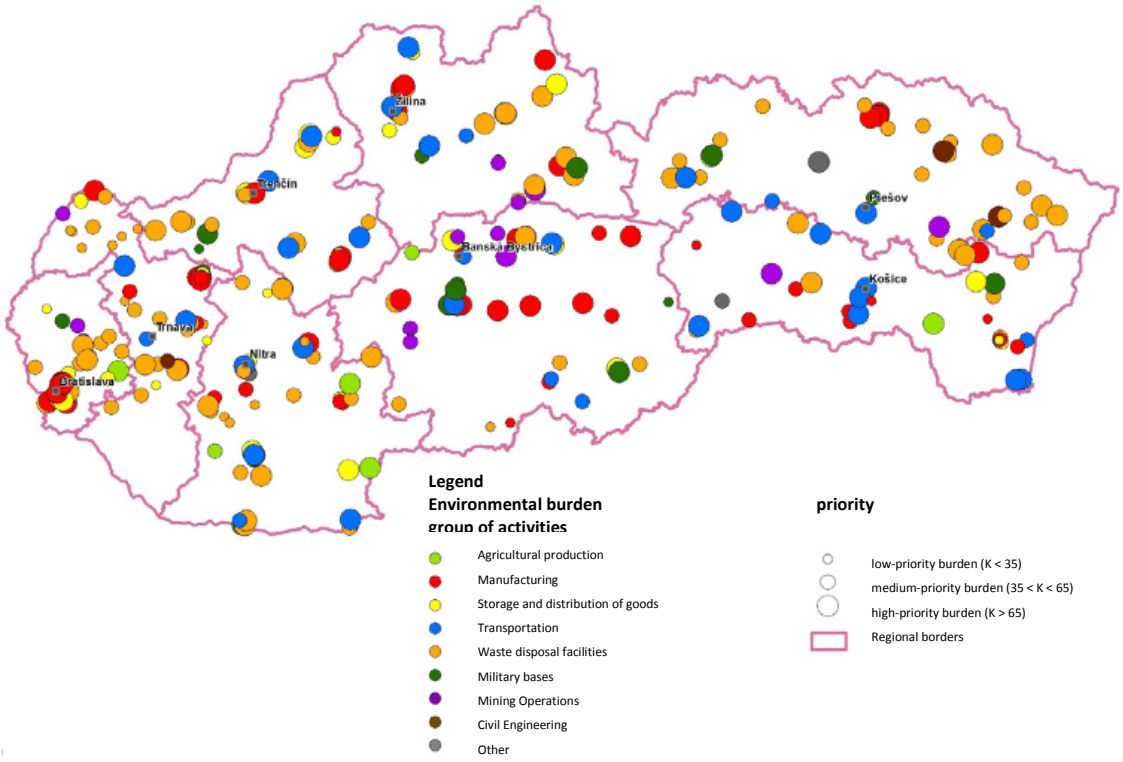


Figure III-7: Incidence of environmental burdens in Slovakia according to the group of activities that caused them and to the priority for addressing them

Source: Environmental Burden Information System, MOE, Slovak Environment Agency

Probable development unless the proposed OPII Amendment is implemented

In general, when considering progress to date, the current slightly growing (or stagnating) trend in the appearance of all types of waste produced in Slovakia should be expected. Unless the infrastructures territorially defined in the OPII Amendment are implemented, a define amount of construction and demolition waste would not be produced and there would be no soil waste or driving of tunnels. However, considering the nature of the proposed OPII Amendment, it would be of little importance in terms of influencing overall trends.

III.1.7 Nature and landscape

Forests cover the largest part of Slovakia (41%), with the area of forested land slightly rising between 2000 and 2017.[15] The species composition of these forests is 60% hardwoods, while they were originally composed of 79% such trees and the target for forest management is 63%. Defoliation is

[15] Report on the State of the Environment in the Slovak Republic in 2017. Forest management

the most common indicator of a forest's health, hence the degree of defoliation is used. There are five levels (0-4) in the scale based on the degree of defoliation. Between 2000 and 2014, the percentage of healthy trees (grade 0) fell from 18% to 3.1% for coniferous trees and from 29% to 11.9% for deciduous trees. From 2014 to 2017, the percentage of healthy coniferous trees rose from 3.1% to 10.7% and for deciduous trees it grew from 11.8% to 18.6%.

Arable land comprises 29% of Slovakia's area, with a slight decrease since 2000. 18% of Slovakia is permanent grassland, having also fallen slightly since 2000. In contrast, the percentage of built-up areas has risen and 5% of the country has been developed.

4.2% of Slovakia is composed of wetland ecosystems, but their status is favorable only for 3% of wetlands, while almost 70% are rated unfavorable and the status for the remainder is unknown. 14 wetlands with a total area of 40,389.1 hectares have been incorporated into the Ramsar Convention's List of Wetlands of International Importance.

A risk assessment of plant and animal species, the so-called "Red List" produced at the national level according to IUCN criteria, can be used as complementary information on the status of species and habitats. The current evaluation from the Updated Red List of cryptogams and flowering plants (Eliáš et al., 2015) includes 1,218 taxa or approximately 34% of the 3,619 indigenous species and archaeophytes in Slovakia's flora. 527 of these species (14.6%) are threatened (listed in the CR, EN and VU categories of the Red List Index). From this number, 80 taxa (7%) were not confirmed within Slovakia (66 are regionally extinct and 17 are probably extinct regionally). The remaining group comprises 347 taxa evaluated as not threatened (NT, 29%), 162 taxa classified as of least concern (LC, 13%), 91 taxa where data is insufficient (DD, 7%) and 8 taxa (1%) classified as either not evaluated (NE) or not applicable (NA). The fifth version of the Red List includes 27 taxa new for Slovakia's flora and 14 extinct and missing taxa which were reconfirmed. For various groups of animals, the updated Red List mentions 1,636 invertebrate species (6.6%) and 100 vertebrate species that were threatened as of 2015, or almost a quarter of the species described in Slovakia (24.2%). The most endangered are cockroaches (44.4%), mayflies (34.2%), dragonflies (33.3%) and also mollusks and spiders (up to 30%), while among vertebrates lampreys (100%) and both amphibians and reptiles (over 40%) are in danger. The higher number does not reflect an elevated threat to species, but rather thorough knowledge and subsequent inclusion or movement in numbers among the categories according to new IUCN criteria (more detailed evaluation at www.enviroportal.sk).

In the meantime, the second and most recent evaluation report on the status of habitats and species of Community interest in 2013 evaluated their status, compared to the report from the first monitoring period, as bad for roughly the same number of species and habitats, indicating insufficient measures taken to protect them. Although the percentage of species and habitats in a favorable state rose, it came from an enhanced level of knowledge rather than improvement in the actual situation. The status of many species is still rated as unknown. The most endangered habitats in Slovakia are the continental saltmarshes and salt meadows, Carpathian travertine saltmarshes, Pannonian inland sand dunes, alpine and subalpine calcareous grasslands, alpine snow plains on siliceous rock, dry grasslands and scrubland facies on calcareous substrates with the occurrence of species from the *Orchidaceae* family, active raised bogs, transient peat bogs and quagmires, calcareous saltmarshes with *Cladium mariscus* and species of the *Caricoin davallianae*, saltmarshes with a rich base and tuff mineral-rich springs. In terms of construction of transport infrastructure, wetland habitats which are susceptible to change in the water regime are the most threatened. The report on the status of birds issued in accordance with the Wild Birds Directive assessed 243 species, where the population in Slovakia is falling for 34% of them, 41% are stable, 14% are growing, 5% are subject to fluctuations and for 6% of bird species there is insufficient data to determine the population trend.

Factors negatively affecting biodiversity

An important factor endangering biodiversity is expanded construction at the expense of nature and agricultural land, including the appropriation of land for transport structures. This involves the taking of natural habitats and habitats of endangered species. It is not only structures encroaching upon

protected areas that are problematic, but also in open country where valuable landscape elements are removed. In addition, large transport structures fragment the country as a whole and especially larger forest growth and natural habitats, while reducing migratory pathways. The species composition changes near transport structures due to adjustments in vegetation; air, soil and water pollution from normal operation and potential accidents as well as noise and light pollution. There is also the direct slaughtering of animals and, in the case of large species, this is also a significant factor reducing transport safety, and for regularly migratory species such as amphibians or depopulation it may result in the extinction of local populations. Sprinkled rock salt also poses a danger to small songbirds that consume it. Finally, transport structures also influence the landscape. The impacts in some cases cover protected areas and Natura 2000 sites.

Invasive species are a major problem and they continue to spread despite measures taken to eradicate them. Invasive plant species occur on many sites and protected areas. 7 Invasive plant species are listed in MOE Decree 24/2003 Coll. as priorities *(Ambrosia artemisiifolia, Fallopia sp. (syn. Reynoutria), Helianthus tuberosus, Heracoleum mantegazzianum, Impatiens glandulifera, Solidago canadensis* and *Solidago gigantea),* however their eradication is primarily limited by lack of funds. Therefore, the removal of invasive plants is more concentrated on protected areas. Invasive animal species are not systematically monitored, but they are also a threat to indigenous species, especially some invasive fish species and American mink.

Intensive agricultural management has a number of negative impacts on biodiversity, caused for example by landscape mosaics, eradication of habitats, pumping of surface water, nutrients loads and application of pesticides. On the other hand, the absence of meadow management likewise has a negative impact, especially in humid climates, wetlands and other economically low-income or remote locations.

Generation of energy has a negative impact on biodiversity, such as from mining raw materials, associated with landscape changes, air pollution, thermal pollution, energy crops, disruption of flows and birds and bats killed by wind power plants.

Biodiversity is negatively affected by air pollution, which degrades sensitive ecosystems, causes forest growth to deteriorate due to acid rain and excessive input of nutrients into water and soil. Climate change has had a significant impact on biodiversity. Changing conditions are causing a number of species to become extinct, although it also allows other species to spread their range. Climate change comes from both natural causes and human action, in particular from greenhouse gas production. Pollution produced from stationary sources is decreasing, while traffic emissions including greenhouse gases have been growing. The negative impact may be seen in the abstraction of surface water, when there is a reduction in the flow of water associated with changes in the aquatic ecosystem and riverbank growth, on animal mortality rates and on the ground when vegetation is altered by changes in groundwater levels. The amount of pumped surface and groundwater is somewhat declining, yet problems may occur especially in the face of a lack of precipitation. Another negative factor is water pollution caused by discharges of wastewater and by agriculture and traffic. Technical intervention in water flows likewise have a negative impact on biodiversity, leading to changes in aquatic ecosystems. These interventions are sometimes implemented as part of transport development. Tourist development, construction of accommodation facilities, the construction and expansion of sports facilities and high traffic at some sites poses a risk to biodiversity, particularly in protected areas.

Probable development unless the proposed OPII Amendment is implemented

Unless the proposed OPII activities are implemented, there would be no impact on some plant and animal species and habitats, which would look substantially different if the current OPII is implemented. The OPII Amendment would add and specify some activities which earlier were not classified in the OPII (such as the R2 and R4 expressways and Dunajbus). However, it should be noted that, with reduced availability to regions, biodiversity is high in habitats extensively managed while it is at risk from abandonment and gradual phase-outs that directly threatens species linked to

these habitats. If the proposed OPII activities are not implemented, there would be less pressure on some protected areas. There would also be no encroachment on some protected sites.

If the proposed OPII activities are not implemented, no new barriers in the landscape would be created. On the other hand, upgrades to existing linear transport systems enables the mitigation of existing barriers in relation to migratory routes, improves the permeability of bio-corridors and thus mitigates the effects of fragmentation on species populations and reduces direct mortality rates for protected animal species.

However, it should be mentioned, in view of the nature of the proposed OPII Amendment, that the impacts on national trends will be of little importance.

III.1.8 Cultural heritage

The most important component of Slovakia's cultural heritage is reflected in its registered heritage sites, which consists of both national cultural monuments and heritage areas. In light of the content and purpose of the strategy considered, it is particularly relevant to protect immovable cultural monuments (as of 2 February 2018 there were 9,953 immovable national cultural monuments comprising 16,718 heritage structures) and historical monuments (28 conservation areas and 80 historical zones).[16]

A special aspect of Slovakia's cultural heritage is the Archaeological Heritage (Act 49/2002 Coll. on protection of registered heritage sites defines "archaeological finds" and "archaeological sites"). Discovery and documentation of them are essential for protecting Slovakia's archaeological heritage. The vast majority of archaeological research currently takes place in "studies are now being implemented in "rescue" research originating from capital investments, especially in the construction of transport infrastructure and other economic activities and civil engineering.

The analysis contained in the Preservation Strategy for Heritage Sites in 2017-2020[17] generally can classify civil engineering at registered heritage sites to be unsatisfactory. A percentage of heritage sites at various technical stages are maintained at approximately the same level. The percentage of sites in a disturbed condition has been constantly stuck at a high level of around 20%, while sites in a desolate state remains around 5%, although it should be borne in mind that each year sites cease to be protected because of the desolate conditions or physical demise.

An earlier analysis quoted "the situation is hardly satisfactory in land protection where there has been a failure to adequately protect and maintain heritage values at different protected sites. The conditions and principles for protecting conservation areas and historical zones are neither timely nor adequately incorporated into local and land-use planning documentation, and neither cities nor municipalities have updated or validated their documents (especially for financial reasons) and are particularly missing zoning plans for their rural zones. Even if the local planning document establishes land use in accordance with heritage protection polices, in practice the philosophy is frequently amended or supplemented to accommodate local interest groups." And furthermore: "Even more complicated is the situation of enforcing heritage protection interests in buffer zones that are themselves not heritage sites."[18]

UNESCO World Heritage Sites

[16]Register of National Cultural Monuments in Slovakia. http://www.pamiatky.sk/sk/page/evidencia-narodnych-kulturnych-pamiatok-na-slovensku.
[17] Ministry of Culture. Preservation Strategy for Heritage Sites in 2017-2020. March 2017
[18] Ministry of Culture. Concept for Protecting Heritage Sites, updated appendix for 31 December 2012 [2013]

A separate category is composed of cultural heritage monuments and sites in Slovakia that have been listed among UNESCO's World Heritage Sites. Currently these are:

1. Banská Štiavnica and local engineering monuments
2. Levoča, Spišský Hrad and associated monuments
3. Vlkolínec and its folk architecture reservation
4. Historical center of Bardejov
5. Wooden churches in the Slovak part of the Carpathian Mountains

In the context of strategic planning for further development of (not only) transport infrastructure, it is appropriate to take into account sites that have been proposed, but not yet listed:[19]

- Limes Romanus – ancient Roman monuments in the central Danube region
- Churches in Gemer and Abaúj (Abov) with medieval wall paintings
- Comorn Fortress at the confluence of the Danube and Váh in Komárno, Slovakia and Komárom, Hungary
- Chatam Sofer Memorial
- Tokay winegrowing region and its wine cellars
- Lenticular historical center of Košice
- Monuments of Great Moravia: Slavic hillfort in Mikulčice - Church of St. Margaret of Antioch

Probable development unless the proposed OPII Amendment is implemented

The relationship between the OPII and the issue of cultural heritage is very open. Without implementation of traffic infrastructure in the proposed OPII Amendment, which diverts part of traffic away from city and village centers, the negative impact of traffic (emissions and vibrations) can be expected to persist at heritage sites often situated in the core sections and so worsening the existing unfavorable state. However, the preservation of cultural sites is especially an issue of allocating the resources necessary to maintain them and so of relevant policy decisions. The traffic impacts are hardly negligible, but not a decisive factor in future development. In future, it is therefore possible to expect rather stagnation or slight improvement in existing problems, regardless of whether or not the proposed OPII amendment is implemented.

III.1.9 Population and health

The OPII contains transport measures across the entire Slovak Republic. The impact on public health is therefore nationwide. The assessed OPII Amendment will naturally have an impact mainly on the regions where intentions are proposed.

DEMOGRAPHY

Slovakia's population is slowly rising and as of 31 December 2016 the country has a total population of 5,435,343 and is subdivided into 79 districts, eight regions, 138 cities and 2,890 municipalities. 51.2% of the population is female. Almost 3 million live in cities. The country's mean population density is 111 people per square kilometer, while in Bratislava district it is 4,057 people per square kilometer. Migration from abroad has played a significant role in the increase in population.

As of 31 December 2018, a total 5,450,421 people live in Slovakia's towns and cities. Total population growth was 7,301, with 3,955 inhabitants migrating to Slovakia from outside the country.

The population has been declining for a long time in regions with rural communities and people there moving to urban agglomerations.

[19] Monuments Board of the Slovak Republic. Proposed World Heritage Sites. 7 April 2019. http://www.pamiatky.sk/sk/page/navrhy-na-zapis-do-svetoveho-dedicstva

The population continues to age, although this differs among the country's regions. The ageing index rose from 94.22 in 2015 to 96.96 in 2016, meaning that for 100 children aged 0-14 years, there were 96.96 people of working age. The highest ageing index, where even the number of senior citizens exceeded the number of children was seen in Trenčín (122.71), Nitra (121.57), Trnava (109.25) and Banská Bystrica (107.48) Regions. The lowest ageing index figures were for Prešov (72.69) and Košice (80.38) Regions.

The average age rose from 40.13 to 40.37 years. Life expectancy has become longer, increasing for men from 73.03 to 73.71 years and for women from 79.73 to 80.41 years.

QUALITY OF LIFE

Social and economic aspects

One of the quality of life indicators used is the poverty rate, which is the percentage of people to the total population whose equivalised disposable income is below the poverty risk threshold (60% of the national median equivalised disposable income). In 2016, 12.7% of Slovakia's population was at risk of poverty. This indicator should slightly improve over the long term, but Slovakia has long been among the countries with significant economic and social disparities between regions. Inequalities in social situations between the Slovakia's regions are linked to their differing economic and economic development. The problems of poorer regions are related to underdeveloped infrastructure, a worse-growing business environment and lower education levels among the population. The least vulnerable region in terms of poverty is Bratislava Region followed closely by Trnava Region.

Unemployment

Slovakia has long been grappling with a high unemployment rate, which in 2004 stood at 18.1%, but with the impact of various factors it gradually declined to 8.1% in 2017, although unemployment still remains higher within Europe and some regions are struggling with high unemployment rates and growth in unemployment. The length of unemployment is also high compared to elsewhere in Europe.

HEALTH

The main factors influencing long-term effects in health indicators are genetic anchoring, lifestyle, nutrition, customs, social and economic factors and the environment. Acutely and subsequently, mortality can be affected by suddenly worsening air quality and ongoing epidemics, although the effects work together and the result is related to both long-term pressure from determinants and short-term propagating impacts.

The health of residents in Slovakia can be expressed using life expectancy at birth. Life expectancy has gradually risen and simultaneously infant mortality has fallen, which is generally regarded as a favorable indicator of population health, but a significant role in this trend has been played by early diagnosis and advanced health care.

Causes of death

The most common cause of death among both women and men has long been cardiovascular disease (in 2016 42.2% of deaths in men and 54.3% of deaths in women). The dominant diagnosis was chronic coronary artery disease, where circulatory diseases was the cause of death in more than 45% of cases for both sexes. The second most common and an increasing cause of death in both sexes is cancer, which was 25.9% of all cases in 2016. The most common diagnosis in males was malignant tumors in the trachea, bronchitis and lung cancer, as well as tumors in the colon and rectum and prostate cancer. In women, the most common cause of death was breast cancer, tumors in the colon and rectum and again malignant tumors in the trachea, bronchitis and lung cancer. Respiratory diseases caused 6.9% of deaths in 2016 and was the third most common cause of death.

Impact of air pollution on health

As mentioned earlier, a specific problem from the perspective of public health in Slovakia is, despite the slow downward trend in the mortality rate from cardiovascular disease as the main cause of death, the growing trend of cancer reflected in the mortality rate. The impact of air quality, among other things here, probably comes especially from concentrations of aerosol particles and benzo(a)pyrene, together with factors such as lifestyle, occupation and social conditions and, finally, growing traffic burdens.

Ever declining mortality, prolonging the hope of living to an old age and accelerating demographic ageing is raising the incidence of disease in populations and raising the volume of health care needed. Concurrently, a positive trend can be observed in overall longer healthy lifetimes without long-term restrictions.

From the point of view of health impacts in Slovakia, there is significant air pollution caused by particulate matter (PM_{10} a $PM_{2.5}$) and bound by persistent organic pollutants (POPs), in particular polycyclic aromatic hydrocarbons (PAH), including benzo(a)pyrene. A significant percentage of air polluted by particulate matter has secondary particulates resulting from precursors in the air such as NO_x, SO_2, NH_3 and VOC.

Anthropogenic sources of pollution currently include most importantly traffic, industry, heat production and household burning. The transport factor has the logically strongest effect in urban agglomerations, while in rural regions the role of the most significant pollutant is played by household heating from the burning of solid fuels.

Impact of increasing noise exposure on health

Another specific problem from the public health perspective is growing exposure by the population to noise.

The main noise sources are mainly traffic facilities (highways, roads, urban streets, railways and airports) and less from technological equipment (mining and industry). The most prominent noise source is road traffic. Hygienic limits are being exceeded at zones adjacent to noise sources, something particularly important in densely populated areas.

Excessive noise provokes a series of reactions in the human body. Noise also has a mental impact. Noise disturbances and nuisances are a common subjective complaint in environmental quality and may constitute the initial stimulus for the development of neurotic, psychosomatic and psychological stress in several diseases. It is probable that it reduces general resilience to stress and interferes with normal regulatory systems. Excessive noise exposure in labor conditions decreases attention span, productivity and quality. Accordingly, it also significantly puts occupational safety at risk. Elevated noise levels may also deteriorate speech communication, changing behaviors and relationships and also disturbing sleep (decreasing depth, reducing sleep time and causing frequent awakening).

Due to the well-established adverse health effects of noise, the WHO believes it to damage the auditory system, impact the cardiovascular systems, disturb sleep and to cause problems among children in learning to speak and read.[20]

Expected development unless the proposed OPII Amendment is implemented

Unless the entire OPII is implemented including the newly proposed activities, a further rise in emissions caused by increased traffic and especially particulate matter can be expected.

[20] Guidelines for Community Noise, WHO, 1999

In view of the nature of the proposed OPII Amendment, it can be envisaged that implementation will not affect current trends at the national level and possible impacts on public health would be seen only locally and to a very limited degree.

III.2 Information related to particularly important areas environmentally, such as proposed Special Protection Areas, Special Areas of Conservation, the European network of Natura 2000 sites and water-protection areas.

The proposed Amendment to the Integrated Infrastructure Operational Programme (Version 6.0) adapts and adds the content of the nationwide strategy paper. Therefore, this chapter describes the situation of particularly important protected areas at the national level. Situations at sites to be potentially affected by implementation of the proposed OPII Amendment are described in detail in III.3.

III.2.1 Protected areas

The national system of protected areas consists, within the meaning of Act 543/2002 Coll. on nature and landscape conservation, of 9 national parks (NP) with 3rd degree protection and 2nd degree protection for the buffer zones around them, 14 protected landscape areas (CHKO) with 2nd degree protection and 1,097 small-scale protected areas composed of 209 national nature reserves (NPR), 382 nature reserves (PR) and 2 private nature reserves, 60 national natural heritage sites (NPP), 271 natural heritage sites (PP) and 172 protected areas (CHA) with 3rd, 4th or 5th level protection and 1 protected landscape element (CHKP). The area covered by the national parks, including the buffer zones comprise, 11.83% of Slovakia's area, while the protected landscape areas incorporate an additional 10.66%. In addition, there are at least 7 community protected areas that have been declared.[21]

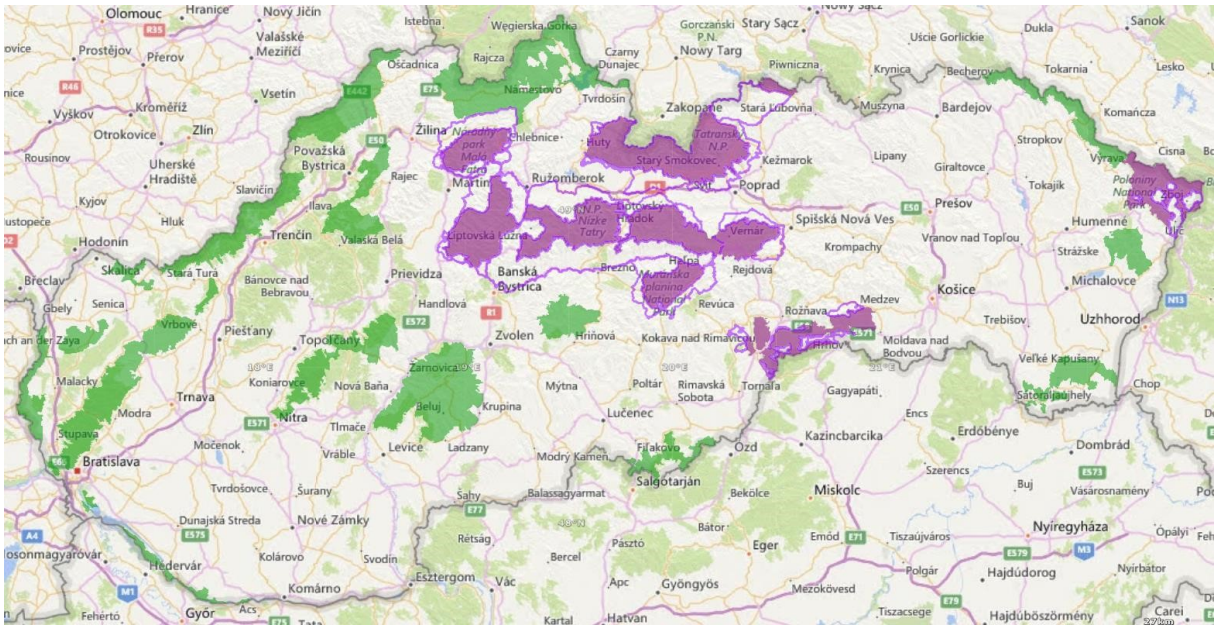


Figure III-8: Large-scale protected areas including buffer zones around national parks

Source: State Nature Conservancy, Banská Bystrica 2016

Under optimal conditions, almost two-thirds of the small-scale protected areas are at risk, 37% of sites are vulnerable and less than 2% are degraded. Posing threats to protected areas are particularly lack of care, inappropriate farming, intensive tourism and changes in the surrounding landscape.

[21] National List of Specifically Protected Nature Areas in Slovakia

Protected areas may be affected by direct confrontation with traffic infrastructure, especially in the case of large-scale sites. There may simultaneously be a negative impact on protected subject matter from the appropriation of natural and species habitats, fragmenting and degrading of habitats and the killing or disturbing of animals. There may be negative impacts even without direct confrontation, especially through adverse impacts on migration and fragmentation of migratory routes, water and soil pollution and other transferring of impacts. Clashes can occur mainly along construction sites for roads, while fewer along railways or in the development of water transport.

III.2.2 Natura 2000

The Natura 2000 network of protected areas is a coherent European system of sites that allow the preservation of natural habitats and habitats of species in their natural range or to restore the species to their natural range. It is a representative system of protected areas – sites significant from a Europe-wide perspective. Sites have been declared for species of wild animals and plants which are endangered, vulnerable, rare or endemic and for habitats threatened with disappearance, are small-scale or represent exceptional examples of the typical elements of a biogeographical area. The Natura 2000 network is legislatively identified and protected in Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds and in Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.

Special Areas of Conservation

On 17 March 2004, the Slovak Government approved the National List of Proposed Special Areas of Conservation and, on 14 July 2004, the MOE issued Decree 3/2004-5.1, laying down the National List of Special Areas of Conservation effective from 1 August 2004. The list originally containing 381 sites was updated in 2011 (with the addition of 97 sites and the dropping of 5 sites in "Phase B"). The updated Standard Data From issued by the European Commission in 2011 contains a national list of 473 Special Areas of Conservation. However, the process of adding sites to the list of Special Areas of Conservation has not yet been completely finalized in Slovakia. As is apparent from the European Commission's conclusions from the Biogeographical Seminar (March 2012), 21 habitats and 33 species of Community interest were inadequately covered, which still need to be included in Slovakia's national list. Therefore, work continued in identifying other sites.

On 25 October 2017, the Slovak Government approved Resolution 495/2017, the second updating of Special Areas of Conservation ("Phase C"), which contained 169 sites totaling 31,656.34 hectares in area. The update adds 473 SACs, which were submitted to the European Commission in 2004 and 2011. The total area of SACs in Slovakia thus rose from 11.92% to 12.56% of the country's area. The next step was to send the updated database of Natura 2000 sites in the prescribed format to the European Commission and to issue universally binding legislation establishing the national list of SACs and ensuring their protection. The Slovak Republic had to accede to the SAC update in the context of a formal communication from the European Commission to repeal No. 2016/2091 concerning the failure to define new sites for designated habitats and species of Community importance and to submit an updated database of Special Areas of Conservation. After the updated database was sent, bilateral negotiation with the European Commission took place in 2018 to assess the adequacy of the proposal and subsequently the sites were published in the Official Journal of the EU.

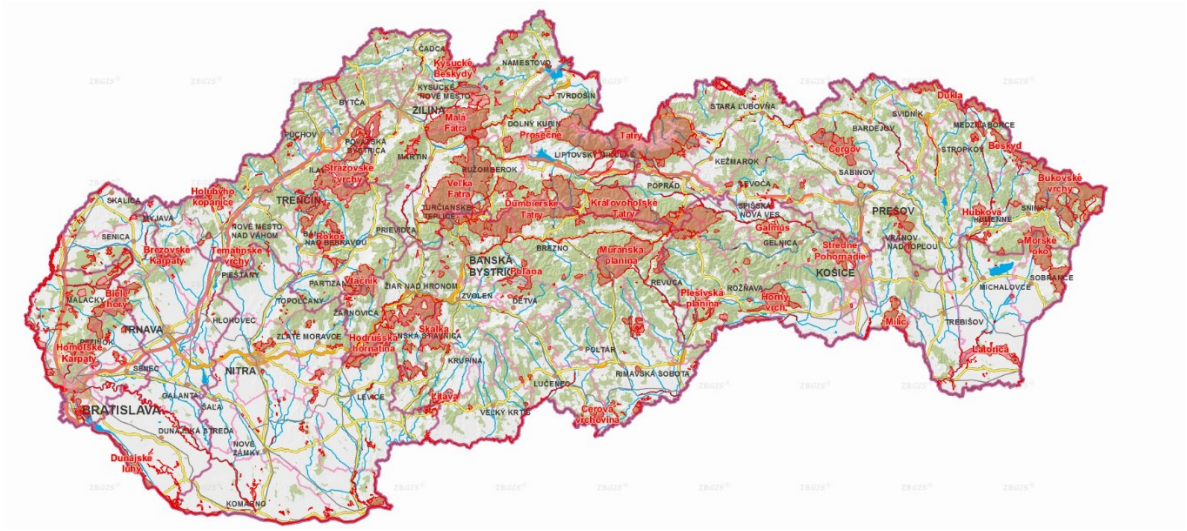


Figure III-9: Special Areas of Conservation in Slovakia

Source: State Nature Conservancy (www.biomonitoring.sk)

Special Protection Areas

On 9 July 2003, the Slovak Government approved the National List of Proposed Special Protection Areas. The list originally contained 38 Special Protection Areas and was amended in 2010 (to remove 2 sites and add 5). The most recently updated Standard Data From issued by the European Commission contains 41 Special Protection Areas. Special Protection Areas have first-degree protection and the protection conditions laid down in individual legislation governing the sites (MOE decrees and Slovak Government resolutions). The SACs total 1,284,806.0886 hectares in area.

Figure III-10 Special Protection Areas in Slovakia

Source: State Nature Conservancy (www.biomonitoring.sk)

Impacts on Natura 2000 sites may be the same as for the protected areas described above. When there are activities (plans and designs) which could have a potential impact on sites in the Natura 2000 network, independently or in combination with other plans and designs, an appropriate assessment will then need to be produced of these activities under Article 6.3 of the Habitats Directive. An appropriate assessment of the updated OPII is included in Appendix 5 to the evaluation report.

III.2.3 Ramsar wetlands and biosphere reserves

The Ramsar Convention placed 14 sites in Slovakia on the List of Wetlands of International Importance.

Table III-5: Ramsar wetlands in Slovakia

Name	Area (ha)
Domica	627.703
Šúr	1,006.035
Parížske močiare	181.728
Dunajské luhy (Danube Floodplains)	14,870.759
Senné Fishponds	405.247
Latorica	4,491.080
Orava Basin Wetlands	9,208.682
Morava River	5,305.628
Turiec Wetlands	756.710
Rudava River	2,261.154
Poiplie	387.316
Orava River and tributaries	582.532
Tisza River	924.605
Demänovská Dolina Caves	1,448.718

Source: State Nature Conservancy, 2019

Four sites were registered in the UNESCO Biosphere Reserve: Slovak Karst, Poľana, Eastern Carpathians and High Tatras.

III.2.4 Water management areas

Section 5 (1) (c) of Act 364/2004 Coll. on water, as amended, (Water Act) designates the following to be protected areas:

a) Sites with surface water to be abstracted for drinking;
b) Sites with water suitable for bathing;
c) Sites with surface water suitable for indigenous fish species to live and reproduce;
d) Areas protected from natural accumulation of water (water management areas - WMA);
e) Buffer zones around water supplies;
f) Water-quality benchmarks;
g) Sensitive areas;
h) Vulnerable areas;
i) Protected areas and their buffer zones defined in special regulations.[22]

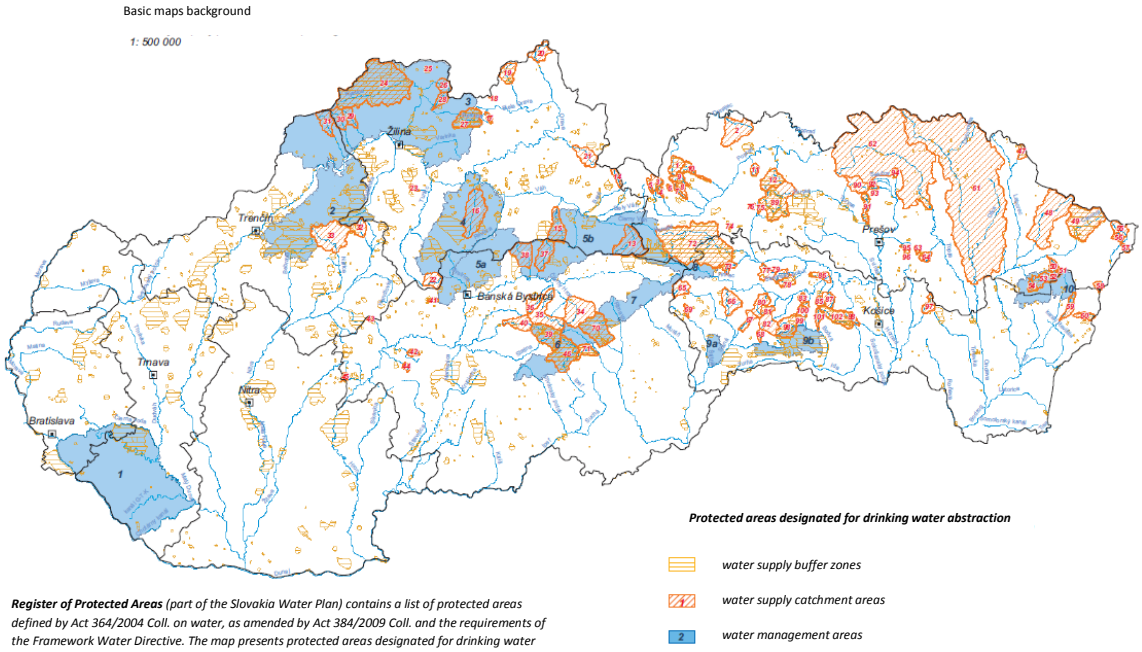
Protected areas designated for drinking water abstraction

[22] Section 17 of Act 543/2002 Coll. on Nature and Landscape Protection, as amended. Issues are dealt in III.2.1 and III.2.2.

Water is supplied from surface water and groundwater on average greater than 10 m^3 in area, at the date of their original condition or after abstraction, that are used to abstract drinking water, usable to supply a population of more than 50 or enabling the abstraction of water for this purpose. Slovakia defines three types of buffer zones to protect water supplies:

- Buffer zones around water supplies: Sec. 32 of Act 364/2004 Coll. on water, as amended, defines water supply buffer zones as whatever is decided by the national water management authority based on the health authority's binding opinion to ensure the protection of the water supply's spreading rate, quality and safety.
- Water catchment areas: There are 102 watercourses declared by Slovakia to be used or useable as water supply sources for abstraction of drinking water. The list of these sources is set out in MOE Decree 211/2005 Coll., establishing a list of important water flows and water supply watercourses.
- Water management areas (WMA): Water management areas are governed by Act 305/2018 Coll., as amended. WMAs are sites where natural accumulations of surface water and groundwater create favorable natural conditions. Activities can be planned and conducted in these areas only if adequate protection of the surface water and ground water can be ensured and the conditions for them to be created, occur and naturally accumulate and recover supplies are safeguarded. For this reason, the WMA has to be developed and, in particular, production and transport interests aligned with WMA requirements. In terms of constructing transport infrastructure, it is essential, in accordance with Sec. 3 (3a) (8) of the above act for the WMA to prohibit the building or expansion of structures that would require the application of pollutants during construction or operation. Currently, there are 10 declared WMAs in Slovakia with a total area of 6,942 km^2 or 14% of the country's area:
    1. Great Schütt Island (Žitný ostrov)
    2. Strážov Mountains (Strážovské vrchy)
    3. Beskid and Maple Mountains (Beskydy and Javorníky)
    4. Great Fatras (Veľká Fatra)
    5. Low Tatras (western and eastern)
    6. Upper catchment of the Ipeľ, Rimavica and Slatina rivers
    7. Muráň Plateau (Muránska planina)
    8. Upper basin of the Hnilec River
    9. Slovak Karst (Slovenský kras) (Plešivecká Planina, Horný Vrch)
    10. Vihorlat

The following map provides an overview of water supplies in Slovakia along with the abstracted amount to be reported and buffer zones.



Register of Protected Areas *(part of the Slovakia Water Plan) contains a list of protected areas defined by Act 364/2004 Coll. on water, as amended by Act 384/2009 Coll. and the requirements of the Framework Water Directive. The map presents protected areas designated for drinking water abstraction.*

Figure III-11: Water protection - protected areas designated for drinking water abstraction

Data source: Water Research Institute, 2006, 2009 Slovakia Water Plan, Compiled by: Slovak Environment Agency - Košice Center for Appraising Regional Environmental Quality, 2010

Sites with water suitable for bathing

Bathing water is defined by Act 355/2007 Coll. on protection, promotion and development of public health, as amended. Bathing water is defined in Section 8 as flowing or standing water where bathing is permitted or not prohibited and is traditionally purchased by a large number of people. Bathing water is monitored as required by requirements of Directive 2006/7/EC concerning the management of bathing water quality. The list of bathing waters is updated annually before the start of the bathing season. Every year bathing water is classified within the meaning of Directive 2006/7/EC in about three dozen natural sites.

Sites with surface water suitable for indigenous fish species to live and reproduce

Surface water designated as water suitable for fish to live is defined in Sec. 10 of the Water Act. Such water must meet water quality requirements and requirements separately designated for salmon waters and for carp waters under Slovak Government Resolution 269/2010 Coll., as amended.

Water-quality benchmarks

Sec. 32 of the Water Act defines water-quality benchmarks as the status that would exist in a watercourse with either no or minimum impact from human activity. The benchmark's status is the baseline for evaluating the condition of surface water. A water-quality benchmark comprises a one-kilometer stretch of a watercourse above the sampling point indicated by river kilometers. No activity is allowed at water-quality benchmarks that would disturb the existing status.

Sensitive and vulnerable areas

Sensitive areas are considered surface water either used or possibly used in the water supply whose water quality is or may be undesirable due to an elevated concentration of nutrients as well as any water supply requiring a higher level of wastewater treatment in the interest of elevated water protection. Slovak Government Resolution 174/2017 Coll., laying down sensitive and vulnerable areas considers all surface water in Slovakia to be sensitive (so the entire Slovak Republic has been established as a sensitive area).

Vulnerable areas are agricultural land from where storm water drains into surface water or seeps into groundwater and the nitrate concentration either is or may become in the near future greater than 50 mg/l. Vulnerable areas are defined by Slovak Government Regulation 174/2017 Coll. as agricultural land in specifically designated towns, in accordance with Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources ("Nitrates Directive").

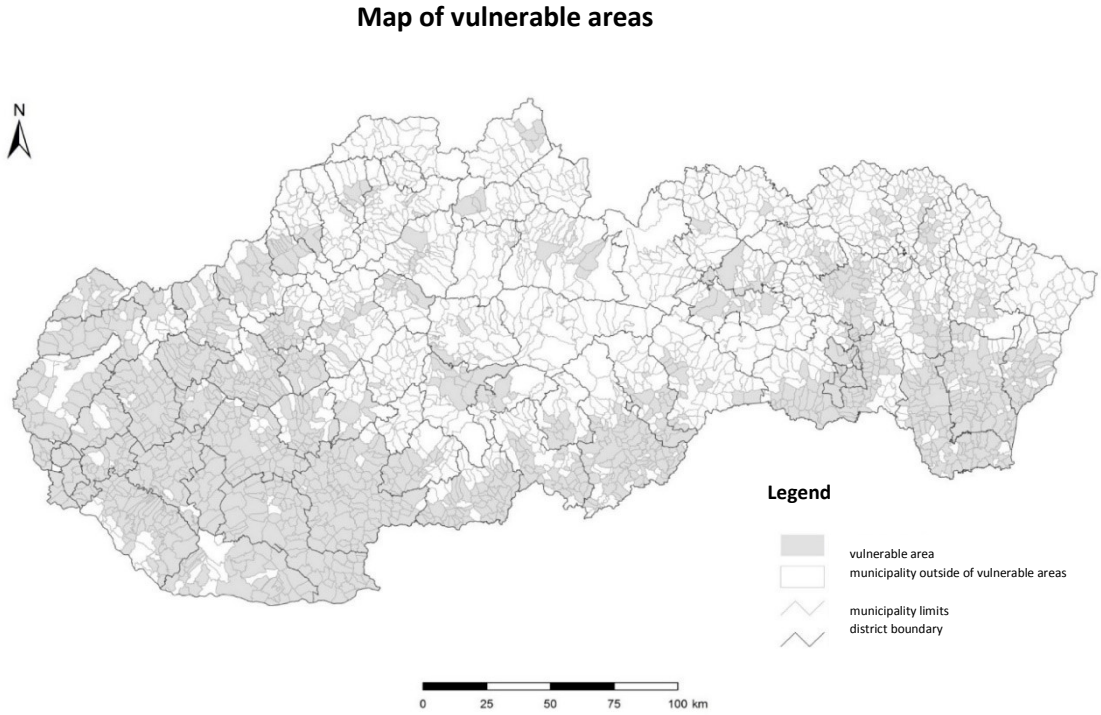


Figure III-12 Vulnerable areas in Slovakia

Source: Slovak Government No. 174/2017 Coll. (Annex 2)

Natural medicinal and mineral waters

Recognition of natural medicinal and mineral waters and their use and protection are governed by Act 538/2005 Coll., as amended. Buffer zones where activity that may adversely impact the source have been established to safeguard mineral waters.

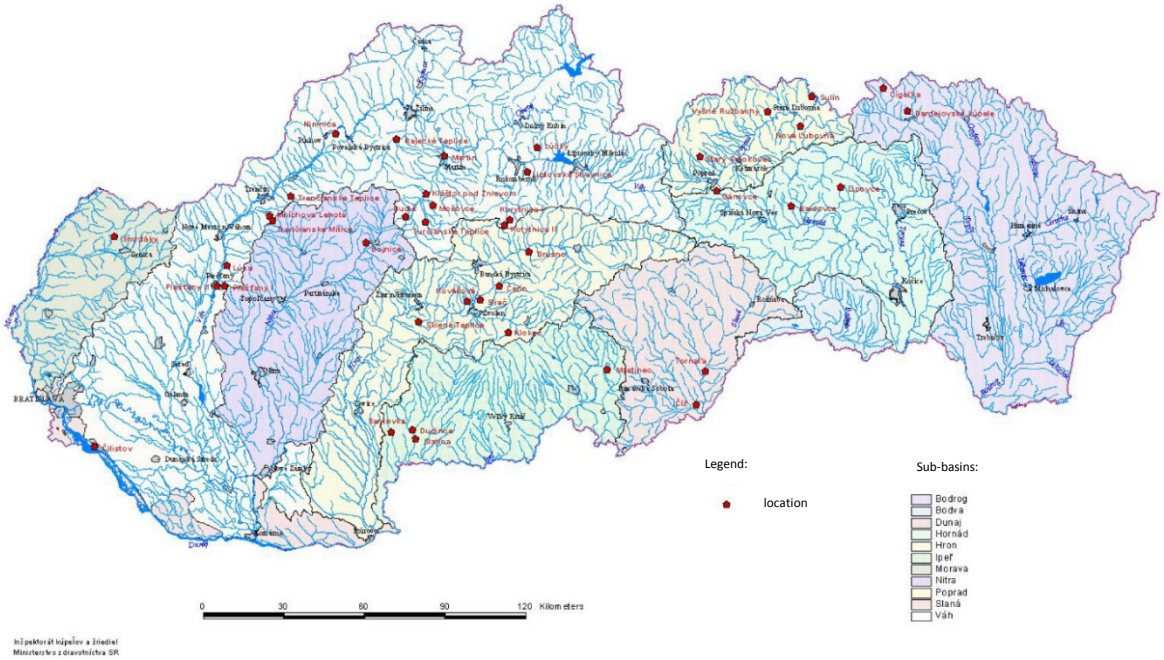


Figure III-13: Locations of recognized natural healing resources and natural mineral resources in Slovakia

Source: www.health.gov.sk (2008)

III.3 Environmental characteristics including health in areas likely to be significantly affected

The proposed Amendment to the Integrated Infrastructure Operational Programme (Version 6.0) adapts and adds the content of the nationwide strategy paper. Therefore, Chapter III.1 describes the condition and development of the main environmental components at the national level. As mentioned earlier in II.6.2, since the adoptions and additions to the OPII are formulated in rather general terms, proposals for specific activities exist to implement the OPII Amendment. This chapter analyzes the condition of relevant environmental components at sites which may be potentially affected by the implementation of the proposed OPII Amendment as the basis for assessing the impact of territorially specified intentions and activities in the proposed OPII Amendment (so in PA 4, 5 and 6 - see II.6.2).

III.3.1 Air

The OPII Amendment would be felt along all roads where the impact of implementation (i.e. new projects) would change traffic intensities. This concerns both current roads where a drop in the ambient air quality burden is soon provisionally envisaged in principle and so particularly newly proposed stretches that are a new burden or transfer part of the current burden to the area surrounding these new transport structures.

The assessed OPII Amendment then may have, in particular, local impacts on ambient air at the place where some measures will be implemented:

- Intervention in the Danube Waterway - projects that cover the upgrade and construction of ports in Bratislava and Komárno;
- Adding construction of the R2 and R4 expressways;
- Trebišov integrated passenger transport terminal.

Intervention in the Danube Waterway

Planned measures, especially regular DUNAJBUS passenger navigation along the Danube and the construction of vessel facilities in the Bratislava public port may have an impact on air in Bratislava and southwest of the city along the Danube. First, local effects on the ambient air near the starting points may be expected due to the change in road traffic intensities. In the case of vessels in the public port of Bratislava, it mainly concerns the impact in the construction phase (especially in emissions from construction-related vehicles).

The LNG terminal at the Port of Bratislava may have an appreciable impact on ambient air only if it will be used concurrently as a terminal for pumping LNG into commercial tankers. In such a case, it is not possible to exclude a little significant impact associated with the rise in commercial vehicles in the vicinity of the terminal (only in close proximity to routes used up to a maximum distance of the first kilometer units from the proposed facility).

Part of the site potentially affected by the projects can be characterized as sensitive in terms of ambient air quality. The reason is elevated ambient concentrations mainly of particulate matter and to a lesser degree also nitrogen oxides. As implied in III.1, pollution of these substances above the threshold occurs locally in Bratislava, while the situation in most areas of the city has been deteriorating, even though the margin in the immission limit is nevertheless adequate. The concentration of $PM_{2.5}$ particulate matter is approaching the maximum limit.

If there are changes in the Port of Komárno, it will potentially affect air where it is less polluted than the regionally elevated concentrations around Bratislava. Ambient air quality is not monitored in Komárno because Nitra Region only measures it in Nitra itself. From estimates, it can be expected from measurements at stations in Nitra that immission limits except for benzo[o]pyrene are below thresholds. It is not possible in the case of benzo[a]pyrene in Komárno to estimate from analogical figures at similar urban locations in Slovakia and exclude a slight exceedance of the immission limit in the first tens of percent above the threshold.

Adding construction of the R2 and R4 expressways

The proposed stretches of the R2 and R4 expressways are situated at sites predominately with low pollution, with sufficient margins below immission limits. The exception is a concentration of $PM_{2.5}$ of particulate matter near Prešov which may exceed the immission limit after 2020. The expressways will mostly be bypassing the built-up areas of municipalities where ambient air quality is not measured. Based on an analogical situation at background and suburban stations in the wider vicinity, it can be expected that current ambient concentrations at the site of the proposed road stretches will not reach the immission limits and there is a sufficient margin where they are located. When assessing the above ambient concentrations and the severity of the overall level of pollution at the site of the proposed civil engineered structures, it is necessary to consider also that they be for the most part bypassing built-up municipalities, so concentrations in exposed city centers will fall and the burden on ambient air will be moved to less burdened, uninhabited areas. From this point of view, their location is also acceptable even in areas with higher pollution, as long as it is characterized by low population density.

Trebišov integrated passenger transport terminal

Given that the measure will probably induce changes in car, an important factor in air quality, it is also necessary to pay due attention in the SEA process. Based on the description of measures in the proposed OPII Amendment (integration of transport systems in building an integrated transport system), it is probable that potential impacts of measures on air quality will have an overall positive nature, although on the local level it is not possible in light of the limited scope of technical information to exclude worsening ambient air quality. Air quality in Trebišov can be estimated from results of ambient air quality monitoring in Košice Region. The situation is monitored here at city stations in Košice, at a background location on Kojšovská hoľa and at the industrial stations located in Velka Ida, Strážske and Krompachy. Based on these data, it can be currently evaluated as good. The exception is likely to be the situation of benzo[a]pyrene in the central part of the city, where, like other similarly large locations in Slovakia, border concentrations or a slight exceeding of the limit are expected based on local and dispersion conditions that vary from year to year. In terms of the

highest daily concentrations of PM_{10} particulate matter, it is probable that the number of times when daily limits are exceeded will approach the permissible maximum, but not exceed it.

III.3.2 Climate

The proposed amendment to the OPII will have no impact on climatic conditions and existing climate trends. However, in light of the completed assessment, it is necessary to address the risks of the impact of climate change on the planned activities. In this context, it is therefore appropriate to focus on two groups of activities contained in the proposed OPII Amendment:

- Activities directed toward developing the Danube Waterway (changes in PA 4
- Specific construction of traffic infrastructure elements like the intermodal terminal in Trebišov (PA 5) and stretches of the R4 and R2 (changes in PA 6)

Future climate development is one of the important factors in implementing activities to develop the Danube Waterway. According to the adaptation strategy published by the International Commission for the Protection of the Danube (ICPDR),[23] it is possible to expect an increased annual average temperature in the Danube basin of 1.1 to 1.7 °C by 2050, while the seasonality of precipitation will deepen with damp winters and dry summers. There is a high probability of the intensity of extreme phenomena such as drought, heat waves and torrential rains becoming more frequent. Extreme hydrological phenomena such as floods are very difficult to predict, yet there is an envisaged increase in the frequency even in terms of intensity. The projected increase in water temperatures is likely to lead to negative consequences in terms of quality.

In view of the effects of climate change on the use of the Danube Waterway, the ICPDR expects from its analyses more frequent restrictions on navigation due to extreme water levels and volatile shipping conditions, in particular on open stretches of the river. Conversely, higher forecast winter temperatures may have a positive impact in terms of limiting the freezing of routes. Low water would lead to the need to limit payloads on ships and navigation time. This is especially the case in the central Danube flowing through Slovakia and Hungary, where less summer rainfall is expected in future.

In contrast to the intentions and activities related to the Danube Waterway, the construction of partial stretches of the road network and other transport infrastructure shows significantly less sensitivity to climatic conditions and climate change. Depending on local topographical and other conditions, the project level takes place on the basis of individual intentions, as required by the climate risk assessment and the proposals for adaptation measures to minimize them. The design of adaptation measures are significant as gradual changes in local meteorological and hydrological ratios, as well as extreme meteorological events that cause possible damage and also endanger lives.

The assessment carried out at the level of project preparation for the high-speed R2 Kriváň-Mýtna and R2 Mýtna-Lovinobaňa, Tomášovce indicated sensitivity to these specific risks:

- Snow phenomena (landslides such as shifting soil, mudslides, falling rock) due to snow and soil breakup);
- Icing phenomena (ice layers that cause water to gradually freeze or drops of rain or frost on the ground surface), black ice from rain falling on a cold surface making it difficult for vehicles to move and pedestrians to walk, glaze ice freezing as small drops on lampposts, traffic signs and antenna systems);

[23] ICPDR - International Commission for the Protection of the Danube River: Strategy on Adaptation to Climate Change. 2019.

- Floods (clogged culverts and small bridges blocked by drifting branches and pieces of ice and possible mechanical damage to them, waterlogged soil and reduced stability, disturbances in the stability of slopes);
- High temperatures (deformed road surfaces, faults in railway tracks).[24]

Similarly, in the context of the assessment exposure to climate risks in project preparation, the risks related to the R4 Prešov-North Bypass were assessed.

These risks are largely taken into account directly within project preparation and do not require above-standard measures.

III.3.3 Noise and vibrations

In terms of noise protection, mainly areas along the affected roads and railway lines would be influenced by the proposed amendment. The changes would be felt along all roads where the impact of implementing OPII would change traffic intensities. This concerns both current roads where a drop in noise pollution is soon provisionally envisaged in principle and so particularly newly proposed stretches that are a new burden or transfer part of the current burden to the area surrounding these new transport structures. Another change may be triggered by a change in the use of means of transport and thus a change in the frequency of operating them, e.g. replacing individual car transport with mass transit or reducing the use of rail or maritime transport at the expense of individual automobile transport (and vice versa). A significant change in terms of noise emissions may be the start of the transition toward electric cars for automotive transport.

Generally, it can be said that modern projects will mean the installation of modern and technically advanced solutions, but it is nevertheless necessary to proceed with caution and to assess the location of the identified solution (so that it is not located near a possibly protected structure that could negatively affect it) and the technology of the intention (which could interfere with its operational performance and spread vibrations). It is clear that placing them at sites not currently used would worsen the situation, or changing or adding contemporary technologies would change sound power/pressure and vibrations. In such cases, it is appropriate to add the preparation of a noise study or to measure noise and produce a modelled assessment of the situation after implementing the intention. Based on the modelled results, then sufficiently effective noise measures are added to the relevant draft.

The relationship between various proposed activities relevant to the issue of noise pollution and a description of the current situation in potentially affected areas are shown below.

Changing current velocity in the lower Hrušov Reservoir - pre-project and project preparation

Current noise pollution at the site is primarily caused by automotive traffic on Route I/63 or lower class roads running through the villages of Šamorín, Čilistov a Hamuliakovo. In the context of the project, noise is currently generated by the operation of tank maintenance, i.e. removing sediments and sludge which the project should reduce. The project can improve the noise situation by lowering sedimentation that would require less maintenance (such as from extracting sediments, storing them and compaction).

Safety and monitoring systems at the Ports of Bratislava and Komárno

Installing the monitoring systems has no direct link to influencing the noise situation. Currently and in future, the noise sources will be operated at the sites addressed to a similar extent, through the operation of water transport, maintenance engineering and technology in an emergency. In a broader context, the noise situation at the sites is influenced by car traffic on surrounding roads.

[24] Národná diaľničná spoločnosť, a.s. Climate Change Risk Assessment. R2 Expressway Kriváň – Lovinobaňa, Tomášovce, Stretch I of Kriváň – Mýtna (October 2017), Stretch II of Mýtna – Lovinobaňa, Tomášovce (June 2018).

Upgrades in the Ports of Bratislava and Komárno

Currently, port operations influence noise in surrounding residential areas and recreational centers because both ports are located in the centers of cities. The operation of a port is not an important noise source, although the sound power generated in particular from the frequency of the operation of ships and the accompanying technology (e.g. cranes), considering they have engines, is the same as for car traffic, and yet the operations mentioned above are less numerous. As a natural barrier, in both cases the current construction of buildings act to prevent the spread of noise to the wider vicinity, although downstream operations (in both manufacturing plants and berths) can be relatively intense in terms of noise. Based on the available information it cannot be specified whether hygienic limits are exceeded. Likewise, as in the case of the intentions above, noise pollution at the location is supplemented by noise from traffic on surrounding roads. In terms of the system for adding facilities at areas for waste collection, drainage of wastewater, collection of used oil and similar operations, there is guidance at the places where they operate for the noise situation and for the emergence and distribution of vibrations (placement of technology), loading (type of technology) and frequency of operation, including related traffic and route management. These activities can be altered by the situation at the site as to worse situations (greater traffic frequency or movement to a more problematic location), as well as for better situations (reduced frequency, more appropriate placement).

Upgrades to buoy technology and navigational aids on the Danube Waterway of International Importance

The current noise situation is influenced by operations on the Danube. Maritime transport emits less noise (even when compared to electric rail transport) yet the operation of motorboats, water scooters and similar watercraft can be locally rather noisy, although given the frequency of operation and due to the equivalence of hygienic limits there operation, hygienic limits are not envisaged to be exceeded. No exposure to the risk of a deteriorating noise situation and spread of vibrations is implied or expected from their own measures. The situation my change with the incidental presence of watercraft when markings allow, for example, a higher speed of operation and that can lead to sound power and a higher degree of vibrations proliferating. When adjusting the markings, preference should be given to quieting and relieving traffic close to protected objects, or to exclude certain modes of transport in risk-exposed areas (e.g. no motorboats allowed to move near residential buildings).

Regular DUNAJBUS passenger navigation

The dominant noise source at the site is motorized transport on first, second and third-class roads. The entire site falls under Category II, and so hygienic limits are 50 dB during the day at 45 dB at night. Maritime transport emits less noise (even when compared to electric rail transport). The project's own implementation will probably cause a minor local rise in noise pollution in relation to construction of parking areas, although the transfer of some road passenger transport to maritime transport on the Danube is envisaged to reduce individual motorized transport on existing roads. A noise study was conducted by EnA CONSULT Topoľčany, s.r.o. in 10/2018) for the intention, which states that existing noise pollution at the site is not above limits, and the model for the forecasting noise emission caused by the intention concluding the noise study states that noise would rise from operation of the related automotive transport only around 3.2 dB, while the rise would not exceed hygienic limits. Noise from operating the Dunajbus likewise will not exceed hygienic limits - the threshold for the decibel hygienic limit is less than about 50 meters from the boundary of protected residential buildings.

Trebišov integrated passenger transport terminal

Data in the EIA[25] mentions the dominant noise source at the site to be traffic (such as cars, buses and trains, although the main noise source is the operation of a wide gauge railway). In terms of vibration on the wide-gauge railway around the Trebišov rail station, the speed limit for trains is

[25] SIRECO s.r.o., 2014.

either 30 or 20 kilometers per hour on tracks at Trebišov station buildings. The EIA furthermore states the following:

- During operation of the Trebišov IPTT, the source of noise and vibrations at the site and nearby it will continue to be primarily traffic (rail, bus and individual operated cars) related to Trebišov IPTT operation, since traffic intensity will not significantly vary from what it is at present.
- In view of the broader relationships, individual motorized transport would be partially redirected to rail transport (changing the method of moving people based on greater use of mass rail transit by individuals travelling in the affected site between Trebišov and Košice), which is also the main objective of the integrated system itself, meaning the above implementation of the Trebišov IPTT will probably have a positive indirect impact on the noise situation from individual motorized transport at the affected site and the region.
- The impact of vibration from traffic related to the operation of the Trebišov IPTT is not envisaged for it, considering its distance from nearby buildings and the civil engineering characteristics and the above characteristics of the Trebišov IPTT.
- In general, it can be noted that the impact of implementing the Trebišov IPTT compared to the present situation would increase noise production during construction, while noise levels will be close to the same level as it is at present during its operation.

R2 Kriváň – Mýtna and R2 Mýtna – Lovinobaňa, Tomášovce

The EIA [26]currently indicates the environment to be burdened with traffic noise along Route I/16, which is not equipped with noise absorbent barriers. Adding to total noise pollution in the area is the operation of the railway line between Zvolen and Lučenec. No strategic noise map has been produced for the area.

R4 Prešov – North Bypass

Existing noise pollution at the site is expected to be relatively significant. The area has an intensively utilized network or roads in the relative proximity to the protected built-up area. Due to the exposure, a strategic noise map was produced in 2006 for Route I/18 at the site (http://www.hlukovamapa.sk/graficka-prezentacia-hlukovej-za-aze-v-okoli-ciest-i.-triedy.html) which shows significant pollution over the long term. Given the intention to divert transit traffic from the center of Prešov to the new D1-R4 connection, the noise situation will be significantly affected in a positive way also in the center of the city.

III.3.4 Water conditions

The following is significant in terms of water protection and possible impact on water conditions:

- Activities directed toward developing the Danube Waterway (changes in Priority Axis 4)
- Specific expressway stretches (changes in Priority Axis 6)
    - R4 Prešov - North Bypass
    - R2 Kriváň - Mýtna
    - R2 Mýtna – Lovinobaňa, Tomášovce

Intervention in the Danube Waterway

Surface water

The Slovak section of the Danube Waterway lies partially in the Danube floodplain and is composed of the following surface water (in order as the river flows):

- SKD0016 Dunaj (Danube)
- SKD0019 Dunaj (Danube)

[26] Integra Consulting, s.r.o., 2018.

- SKD0015 Supply channel (Gabčíkovo Dam)
- SKD0017 Dunaj (Danube) – most of the surface water is originally derived from the Danube bed running parallel to the channel, which is part of the waterway (Decree 22/2001 Coll.), but is not currently used for maritime transport. Only the lower part (below the connecting Danube channel near Sap) is actually used for navigation);
- SKD0018 Dunaj (Danube)

The stretch of the Danube defined as SKD0016 comprises the border with Austria. Austria's stretch of the water body is defined as ATOK411340000 Donau_01, Unterhalb Devin, EP groß. The stretch of the Danube defined as SKD0017 and SKD0018 comprise the border with Hungary. Hungary's stretch of the water body is defined as HUAEP443 Duna Szigetköz a HUAEP446 Duna Gönyű-Szob. Activities proposed for the Slovak section of the Danube Waterway may have a potential impact also on the water body defined for the Danube along the direction of the current. This is water body HUAOC756 Duna Szob-Budapest.

Table III-6: Characteristics of surface water comprising the Danube Waterway and the condition of the water

Water body	Length (km)	River km	Character	Ecological status/potential	Chemical status	Impact
D0016 Dunaj (Danube)	11.2	1880.2-1869	natural	good	good	
ATOK411340000 Donau_01	7	1880-1873	natural	good	bad	
D0019 Dunaj (Danube)	17.4	1869.1851-6	HMWB	average	bad	organic pollution, contamination by hazardous substances, habitat change
D0015 VDG	38.8	0-38.8	AWB	good	good	
D0017 Dunaj (Danube)	44.6	1851.6-1807	HMWB	average	good	habitat change
HUAEP443 Duna Szigetköz	61	1850-1789	HMWB	average	good	
D0018 Dunaj (Danube)	98.8	1807-1708-2	natural	average	good	eutrophication, habitat change
HUAEP446 Duna Gönyü-Szob	81	1789-1708	natural	average	good	
HUAOC756 Duna Szob–Budapest	48	1708-1660	natural	average	good	

Source: Danube Sub-basin Management Plan, 2015.

Some of the activities newly proposed or modified in the OPII revision relating to development and operation of the Danube Waterway cover all of the Slovak part of the waterway, while others can be specified and localized in the definition of individual surface water bodies. The following table presents an overview.

Table III-7: Activities newly proposed or modified in the OPII revision and localized in the definition of individual surface water bodies

Activity/Water Body	SKD0016 ATOK411340000	SKD0019	SKD0015	SKD0017 HUAEP443	SKD0018 HUAEP446

Improving navigability on the Danube Waterway[27]	x	x	x	x	x
Activities at the Port of Bratislava		x			
Activities at the Port of Komárno					x
Upgrades to navigational aids and implementation of related technical measures	x	x	x	x	x
Dunajbus	x	x	x		

Source: Hornád Sub-basin Management Plan, 2015.

Groundwater

There is groundwater found in Quaternary sediments, pre-Quaternary rocks and geothermal structures near the Danube. Projects that include adjustments in the Danube Waterway and operations along the route may have an impact on shallow groundwater directly in contact with the Danube's surface water.

Two groundwater sites are defined in the Danube's Quaternary sediments at Great Schütt Island, which is one of Slovakia's most important water management areas: SK1000200P (within the Danube sub-basin) and SK1000300P (within the Váh sub-basin).

Both are rated as groundwater sites in good quantitative and chemical condition. The Quaternary sediments (gravel and sands) at the Danube have sunk at the heart of a depression up to 520 meters. Water from the Danube infiltrates at the bank to add to groundwater reserves here, so the chemical composition of the groundwater here depends on the chemical composition of the Danube's river water and on changes in phase displacement levels, the path of the water and geochemical processes after the Danube water enters the rock environment, alongside other factors. The result is that anthropogenic-affected component content falls with depth. Monitoring boreholes drilled to a depth of 20 meters have found significantly continuous upward trends in nitrates, ammonium ions, chlorides, sulfates and arsenic. At greater depths (generally more than 50 meters) there are sources of drinking water to supply inhabitants with very high-quality groundwater.

Both SK1000200P and SK1000300P are defined as cross-border groundwater sites. The updated International Danube River Basin District Management Plan (2015) indicates them as significant cross-border sites coded as GWB-8 (Danube Basin, Great Schütt Island (Žitný ostrov)/Little Schütt Island (Szigetköz), Hanság-Rabča). It is defined as a significant cross-border site because the total size of the aquifer (2.211 km^2 in Slovakia and 1.152 km^2 in Hungary), provides a unique amount of available groundwater and significant simultaneous use as a source of drinking water and water for other purposes, with the presence of groundwater dependent terrestrial ecosystems and the site's level of protection (safeguarding drinking water sources) and a protected natural area).

The Hungarian part consists of four groundwater sites defined at a national level (HU_AIQ654, HU_AIQ572, HU_AIQ653 and HU_AIQ573) and is good chemical but poor quantitative condition, caused by excessive water abstraction with a negative impact on the state of the groundwater dependent terrestrial ecosystems. One such water body that has not reached a good quantitative status is HU_AIQ573.

Currently, the part of the aquifer in Hungary is replenished from water infiltrating from the Hrušov Reservoir. Where the reservoir is near the main bed (between Rajka and Dunakiliti), a significant cross-border flow of groundwater is detected under the Danube. The derivative stretch of the Danube under the water reservoir drains the surrounding groundwater and causes a drop in groundwater levels in the immediate vicinity of the riverbed. Both the quantity and the quality of groundwater replenishment from the reservoir depend heavily on increasing sediment in it along with physical and

[27] Preparation and possible implementation of *Increased current velocity in the lower Hrušov Reservoir* is included in Improved navigability on the Danube Waterway. The specific project concerns only SKD0015.

chemical processes. There is a system at the lower end of Little Schütt Island for replenishing what the former impact of the Danube does not adequately offset (Source: The Danube River Basin District Managment Plan, 2015).

The Quaternary sediments of the Danube under its confluence with the Váh then define SK1000600P, a site in good quantitative but poor chemical condition (contaminated by SO_4, chloride (Cl^-) and phenmedipham pesticides; significantly sustained upward trend of SO_4, Cl^-, NO_3).

Water management areas

The Danube sub-basin contains numerous groundwater water sites (77) and buffer zones for protecting them (29 totaling 6,030 hectares). Surface water in this area is not used as a water supply. Great Schütt Island is demarcated as the Žitný Ostrov WMA by Act 305/2018 Coll. on protected natural water accumulation areas, as amended. Slovak Government Resolution 174/2017 Coll., laying down sensitive and vulnerable areas considers all surface water in the Danube sub-basin (and all surface water in Slovakia) to be sensitive and most agricultural land at the affected site is likewise designated as vulnerable areas.

R4 Prešov - North Bypass

The area concerned lies in the central part of eastern Slovakia in the Hornád River sub-basin. It is drained by the Torysa River and its tributaries. Torysa and Sekčov are significant water-managed flows under Decree 211/2005 Coll. There are three surface water bodies defined at the site (H0016, H0068 and H0020- see the table).

Table III-8: Characteristics of surface water which may be affected by R4 Prešov - North Bypass and their condition

Water body	Length (km)	River km	Character	Ecological status	Chemical status	Impact
H0016 Torysa	46.05	102.3-56.25	natural	average	good	organic pollution, habitat change
H0068 Dzikov	14.6	14.6-0	natural	average	good	organic pollution
H0020 Sekčov	17.7	17.7-0	natural	good	good	???

Source: Hornád Sub-basin Management Plan, 2015.

Groundwater in the Quaternary sediments - SK1001200P, intergranular groundwater in the Quaternary alluvial deposits from the Hornád - intervenes in the area of interest. Updated plans show the groundwater to be in both poor quantitative and chemical condition. This is caused by the impact of diffuse and point sources of pollution, with elevated concentrations exhibited of chlorotoluron and perchloroethylene pesticides and a significant sustained upward trend then SO4, Cl- and TTE.

Here, two sites defined in pre-Quaternary rock (SK2004900F - Tatra group fractured groundwater with a Hornád sub-basin flysch zone and SK2005300P - Intergranular Košice Basin groundwater) further intervene in the site and they may be affected in particular by the Prešov North Bypass including the boring of two tunnels. Both groundwater sites are in good quantitative and chemical condition.

There are neither buffer zones nor protected water management areas located at the affected site. Part of the affected site is classified as vulnerable.

R2 Kriváň – Mýtna and R2 Mýtna – Lovinobaňa, Tomášovce

Most of the affected site is in the Ipeľ sub-basin. This site is drained by the Kriván Stream and its numerous tributaries. Both the Kriván and Budiná streams are significant water supplies under Decree 211/2005 Coll. There are four surface water bodies in the Ipeľ sub-basin lying within the area of interest (I0008, I0010, I0062 and I0133- see the table).

The northern part of the affected area encroaches upon the Hron sub-basin, which is drained by minor tributaries feeding the significant Slatina water source. These affected tributaries are defined as separate bodies of water and the Slatina is defined as R0011.

Table III-9: Characteristics of surface water which may be directed affected by the R2 Kriváň – Mýtna, R2 Mýtna – Lovinobaňa, Tomášovce and their condition

Water body	Length (km)	River km	Character	Ecological status	Chemical status	Impact
I0008 Krivánsky potok (Kriván Stream)	24.5	40.5-16	natural	average	good	contaminated by dangerous substances
I0010 Krivánsky potok (Kriván Stream)	16	16-0	natural	bad	good	organic pollution, habitat change
I0062 Bzovský potok	2.7	2.7-0	natural	bad	good	habitat change
I0133 Budínsky potok (stretch under Ružiná Dam)	1.8	1.8-0	natural	bad	good	habitat change
R0011 Slatina	34.2	41.4-7.2	natural	average	good	organic pollution, trophic pollution, habitat change

Source: Ipeľ Sub-basin Management Plan, 2015, Hron Sub-basin Management Plan, 2015.

Three groundwater sites intervene into the area of interest: 200220FP - sphenoid and intergranular groundwater on the northern Central Slovak Neovolcanites, 200280FKP - sphenoid and karst-sphenoid grounder in the Low Tatras and Slovak Ore Mountains (Slovenské Rudohoria) and 2003100P Intergranular groundwater of the Lučenec Basin and Cerová vrchovina highlands. All are defined in pre-Quaternary rock and are in good quantitative and chemical condition according to applicable river basin plans.

The route of the R2 Kriváň - Mýtna passes through a stretch between the villages of Podkriváň a Píla and the Upper Ipeľ, Rimavice and Slatiny Basin WMA. There are no buffer zones for water supplies in the directly affected site.

III.3.5 Soil, rock environments and mineral resources

Changing current velocity in the lower Hrušov Reservoir

An area that would be potentially affected is the Hrušov Reservoir and its very close proximity due to possible soil compaction from the movement of construction machines and soil to be temporarily taken to establish construction yards. However, it can be envisaged that this intention would not require the permanent appropriation of agricultural land.

Soil conditions in the area of interest are contingent on the transport of river gravel, sand and floating matter. They consist of light soil that is predominately sand mixed with gravel, while toward the southeast it becomes clay-sand to clay, created by alluvial river sediments. In terms of soil quality in Slovakia, the soil here is high quality. The Hamuliakovo and Šamorín deposits are located directly in the affected site.

Port of Bratislava

Potentially affected sites in terms of soil are parts in the cadastral districts of Bratislava-Ružinov, Staré Mesto and Petržalka located near the Port of Bratislava. Soil Map of Slovakia, shown at a scale of 1: 400,000 (J. Hraško, V. Linkeš, R. Šály, B. Šurina) shows at the affected site:

- Modal (cultizem) calcaric fluvisols
- Fluvial (cultizem gleysolic) gleysols
- Modal (cultizem), acid-saturated cambisols

These soils were anthropogenically impacted by construction of residential units, industrial sites, warehouses and for other uses and there are anthropogenic fills located here. The original soils are located only in the wider vicinity of the affected area. No mining or exploring for mineral resources is taking place near the site.

Port of Komárno

A potentially affected site in terms of soil is the area in close proximity to the port in the cadastral district of Komárno. The incidence of soils in the wider vicinity of the territory is contingent primarily on the nature and origin or the soil substrate. In terms of engineering and geological classification (Geological Survey Map of the Slovak Socialist Republic, Slovak Republic Geological Survey, 1998), it is part of a region of Neogene tectonic depressions in an area of the Inner Carpathian Lowlands, in Area 74 - Danube Lowlands, peat bogs F - valley fluvial river basins with alternating sandy and fine-grained soils predominating. The geological setting of the assessed area consists of anthropogenic sediments and both Quaternary and Neogene sediments (according to Bratislava geological records as of 2015).

Seismic activity can be identified from geodynamic phenomena in the assessed area. The area surrounding Komárno is in a seismically active region of southern Slovakia, where it encroaches the edge of the tectonic band in a north-south direction from Hungary. The Komárno epicenter itself is a relatively small area, stretching from the village of Nová Stráž in the west to the village of Iža in the east. Earthquakes in this zone have reached intensities of VI to IX on the MSK scale, while the strongest have occurred right in close proximity to Komárno, where fault systems cross in various directions.

No slope deformation has been registered at the affected site and no mineral deposits have been found there.

Danube waterway

The potentially affected site in terms of soil covers the area closest to the Danube from the Austro-Slovak border (km 1880.26) to the Slovak-Hungarian border (km 1708.20). Soil Map of Slovakia, shown at a scale of 1: 400 000 (J. Hraško, V. Linkeš, R. Šály, B. Šurina) shows the following soil units in the potentially affected site around the Danube River:

- In the first half, from the Cadastral District of Devín to just past the Cadastral District of Zlatná na Ostrove, calcaric cultizem fluvisols predominate accompanied with fluvial gleysols and light calcaric fluvisols from calcaric alluvial sediments, At spots there are soil types which are calcaric chernozem mollisols, local calcaric chernozem mollisols and black calcaric gleysolic mollisols from old calcaric fluvial sediments. In terms of soil types, clay soil dominates.
- Modal calcaric sandy to clay regosols intervene from the second half to the site, except for the above mentioned soil units, and are composed of sandy, typical chernozems, modal fluvisols and modal brown earth and cambisols.

Protected high-quality soil exist in southwest Slovakia and generally throughout the entire country. In view of the geomorphological breakdown, the addressed stretch starts at the mountain landscape of the entire Little Carpathians with the greatest part of the stretch lying afterward in the Danube Plains and later in the Danube Hills, ending at the Burda geomorphological unit. The Danube Plains are covered with sediments but there are also products of Paleocene and Eocene volcanism. They

are mainly filled with It is mainly filled with transitional and limnetic sediments (clay, gravel and sand) of less marine sediments.

The Mineral Deposits Map of Slovakia (Gargulák, M. et al., 2014) localizes at the affected site deposits of building stone at Devín, gravel sand and sand deposits at Čunovo, Kalinkovo, Šamorín and Hamuliakovo and also gravel sand and sand deposits at Zlatná na Ostrove a Patince, while near Štúrovo there is also the Obid lignite deposit.

Dunajbus

The potentially affected site in terms of soil covers the closest vicinity of the Danube in the stretch from Šamorín to Bratislava, namely the urban sections of the city and parts of Bratislava-Devín, Bratislava-Petržalka, Bratislava-Staré Mesto, Bratislava-Ruzinov, Bratislava-Čunovo, and the municipality of Hamuliakovo, the city of Šamorín and the village of Kyselica.

In the assessed area, calcaric cultizem fluvisols originally predominate accompanied with fluvial gleysols and light calcaric fluvisols from calcaric alluvial sediments. At spots there are chernozem, calcaric chernozem mollisols, local calcaric chernozem mollisols and black calcaric gleysolic mollisols from old calcaric fluvial sediments. In terms of soil types, clay soil dominates.

In terms of engineering and geological classification (Geoenviroportal, 2018), the assessed region is part of a region of Neogene tectonic depressions in an area of the Inner Carpathian Lowlands, in 74 - Danube Lowlands, F - valley fluvial river basins at the interface of alternating sand and fine-grained soils and predominately gravel soils.

The Mineral Deposits Map of Slovakia (Gargulák, M. et al., 2014) localizes at the affected site gravel sand and sand deposits at Čunovo, Kalinkovo, Šamorín and Hamuliakovo. The wider vicinity of the Cadastral District of Šamorín includes the Šamorín deposit of non-paraffinic crude oil, natural gas and gas condensate.

Trebišov integrated passenger transport terminal

A potentially affected site in terms of soil is the area in close proximity to the future terminal in the cadastral district of Trebišov. The most widespread found soil types and soil units in Trebišov are chernozems (black-brown earth and mollisols from loess and loess clay, local hard chernozems and Neogene clay vertisols), mollisols (gleysolic fluvisols, accompanying cultizem mollisols and gleys from calcaric and non-calcaric alluvial sediments), fluvisols (medium and hard gleysolic fluvisols, accompanying gleys from very hard alluvial sediments, cultizem fluvisols (accompanying gleysolic fluvisols, modal and light non-calacaric cultizem alluvial sediments and pseudo-gleys (modal, acid-saturated cultizem luvisols from loess clay and dilivia).

In the built-up territory of Trebišov, anthropogenic soils dominate such as cultizems and anthroposems. There is predominately soil for gardens, vineyards, orchards and soil on artificial substrates such as fill at sites and reclaimed areas, fill for railways and roads, built-up areas and areas not allowing plant growth such as gravel, waste dumps and landfills.

In terms of stability, the affected area and its surroundings are stable with no landslides. Due to the nature of the relief at the site, susceptibility to geodynamic phenomena is not expected.

The Trebišov integrated passenger transport terminal is situated on land where Trebišov's protected deposits and mining area (Deposit ID 91) for natural gas was declared by Bratislava-based NAFTA a.s. and the Trebišov mining area (Deposit ID 850) for gas condensate was also declared by the same company. There are no other exploratory areas, exclusive deposits on protected deposit areas, mining areas and mineral deposits as well as old mines and environmental burdens located at the site.

R2 Kriváň – Mýtna and R2 Mýtna – Lovinobaňa, Tomášovce

Soil Map of Slovakia, shown at a scale of 1: 400 000 (J. Hraško, V. Linkeš, R. Šály, B. Šurina) shows the following dominating soil units located at the stretch:

- Podzolic cambisols (cultizem podsols) and modal (cultizem) acid-saturated cambisols composed according to the map at most of the assessed area
- Modal (cultizem), acid-saturated cambisols
- Fluvial (cultizem gleysolic) gleysols
- Pseudo-gleysolic luvisols (cultizem pseudo-gleysols)
- Modal pseudo-gleysols (cultizem) and pseudo-gleysolic luvisols (cultizem luvisols), acid-saturated

In can be generally said that soils with sub-acid reaction and acid reaction with good to very good humus content are located here. In most cases, the soils are used for agricultural purposes as arable land and permanent grassland TTP and are medium or less than medium quality. In terms of geological engineered subdividing of the West Carpathians region, it is localized in the flood plains of the Slatina Stream in a region of Neogene tectonic depressions - 64 Slatina Basin (Hrašna, Klukanová, 2014).

There are several operating and unopened quarries near the proposed route of the R2 Kriváň – Mýtna and R2 Mýtna – Lovinobaňa. Based on available documents, the following soil borrows and deposits possibly exist in the region:

- Mýtna – Hrby: deposit with developed extraction of dolomite limestone intended as building stone
- Mýtna: deposit with developed limestone
- Ružiná: deposit with exploration of siliceous limestone for use as building stone

R4 Prešov – North Bypass

The potentially affected area is defined as part of the Cadastral Districts of Prešov, Veľký Šariš, Malý Šariš, Vyšná Šebastová, Ľubotice, Fintice and Kapušaný - along the route and in close proximity to R4 construction. Soil conditions at the assessed site are quite varied. Overall, there are 11 soil units.

In terms of soil quality in Slovakia, the soil here is medium quality.

No mineral deposits have been registered in the immediate vicinity of the expressway route. There are exclusive deposits of construction material in the wider vicinity, such as at Fintice, Okružná, Sedlice and Vyšná Šebastová. The presence of the following geodynamic phenomena has been documented in the assessed area: lateral and deep erosion of surface flows and water erosion on slopes.

III.3.6 Waste

As mentioned in III.1, the waste issue is particularly related to the rise in waste generated due to construction and rerouting of road and rail networks. At the individual intention level, this aspect is addressed in the EIA process. At the strategic assessment level, particularly when considering the OPII in general and the proposed Amendment, there has been no purposely detailed assessment of the current state of waste management in individual regions. For this reason, only information in terms of the national level (III.1) is indicated in the analytical section and nothing for individual, potentially affected sites.

III.3.7 Nature and landscape

Based on the proposed changes in the OPII Amendment and the analysis of the possible impacts on the environment and landscape, including possible impacts on protected areas and Natura 2000 sites, changes where implementation of the projects may have a direct impact on nature conservation interests will now be discussed. When a strategic paper leading to changes in beneficiaries or to the purchase of new means of transport is amended, that means the envisaging of no impact on nature conservation.

Changing current velocity in the lower Hrušov Reservoir

The project to change the current velocity in the lower Hrušov Reservoir should be implemented in areas with a low concentration of nature conservation interests and is focused particularly on pre-project and project preparation for this activity.

In preparing the project documentation, it is necessary to take into account that the activity itself is planned to be implemented at a site where several nationally and internationally protected areas are located nearby. The resulting project could have an impact on the following:

- Sites in the Natura 2000 network, in particular the Danube Floodplains SPA (SKCHVU007), Bratislava Floodplains SAC (SKUEV0064, SKUEV2064), Podunajské Biskupice Floodplains (SKUEV0295) and Hrušov SAC (SKUEV0270)
- Internationally Protected Area - Danube Floodplains (Dunajské luhy) Ramsar Wetlands
- Protected areas in the national system such as the Danube Floodplains Protected Landscape Area, Kopáčsky Ostrov Nature Reserve and possibly others.

Only after a thorough impact assessment of the protected areas and their protected subject matter, and completion of the EIA process will further project preparation phases proceed.

Port of Bratislava

In terms of nature conservation interests, the activities planned in the Port of Bratislava should have no significant impact on them. When assessing individual projects, it is necessary to check whether they would be no impact on the nearby Natura 2000 sites below:

- CHVÚ Dunajské luhy (SKCHVU007) - Danube Floodplains SPA
- ÚEV Bratislavské luhy (SKUEV0064, SKUEV2064) - Bratislava Floodplains SAC
- ÚEV Malý Dunaj (SKUEV0822) - Little Danube SAC

The Danube Floodplains SPA and the Bratislava Floodplains SAC are located near the Port of Bratislava, while the Little Danube SAC has an outlet into the Little Danube near the port.

No impacts on other nature conservation interests from implementation are envisaged.

Port of Komárno

In terms of nature conservation interests, the activities planned in the Port of Komárno should have no significant impact on them. When assessing individual projects, it is necessary to check whether they would be no impact on the nearby Natura 2000 sites below:

- ÚEV Dunaj (SKUEV2393) - Danube SAC
- ÚEV Vážsky Dunaj (SKUEV0819) - Váh Danube SAC

Both sites are located near the Port of Komárno. No impacts on other nature conservation interests from implementation are envisaged.

Danube waterway

Activities connected to maintenance of the Danube Waterway would not have a negative impact on nature conservation and Natura 2000 when there is compliance with all regulations governing the design and authorization of these activities. Nevertheless, when preparing the pre-project and project documentation, impacts on the Natura 2000 site, RAMSAR internationally protected sites, nationally protected sites and other nature conservation interest should be assessed consistently.

Dunajbus

- **CHVÚ Dunajské luhy (SKCHVU007) - Danube Floodplains SPA**
- **ÚEV Bratislavské luhy (SKUEV2064) - Bratislava Floodplains SAC**
- ÚEV Bratislavské luhy (SKUEV0064) - Bratislava Floodplains SAC
- ÚEV Biskupické luhy (SKUEV0295) - Podunajské Biskupice Floodplains SAC
- ÚEV Hrušov (SKUEV0270) - Hrušov SAC
- ÚEV Ostrovné lúčky (SKUEV0269) - Ostrovné lúčky SAC

An appropriate assessment of the impacts on Natura 2000 sites by SOS/Birdlife was prepared for the project (10/2018) as part of the EIA, where the first two of the sites roughly marked were identified as sites affected by the project. The appropriate assessment found the impact on the Natura 2000 network by *Regular Dunajbus passenger navigation along the Danube* to be slightly negative on several protected subject matters in the Danube Floodplains SPA (SKCHVU007) and the Bratislava Floodplains (SKUEV2064). The slightly negative impact was found with 50 protected subject matters in the Danube Floodplains SPA and 12 in the Bratislava Floodplains SAC (SKUEV2064). There was no significantly negative impact found on any of protected subject matter.

To mitigate or eliminate the negative impact on the protected subject matter affected, 14 mitigating measures have been proposed whose compliance would be necessary to implement the project. The measures aim at minimizing the risk of bird collisions on glazed surfaces, minimizing disturbance, habitat appropriation and the impact on selected food and nesting habitats and minimizing disruption from the risk of accidents.

The site is likewise part of the Ramsar wetlands in the internationally significant Danube Floodplains. Like in the case of the Natura 2000 site, implementation and operation of the Dunajbus will not have a negative impact on Ramsar wetlands.

Apart from near the Natura 2000 site, the proposed Dunajbus will also be localized near several protected areas in the national system (Danube Floodplains Protected Landscape Area, the nature reserves of the Dunajské ostrovy, Ostrovné lúčky, Kopáčsky ostrov, Topoľové hony and Gajc, and the protected areas of Pečniansky les, Soví háj Bajdeľ, Poľovnícky les and PP Panský diel). These protected area would not be significantly affected by project implementation.

Trebišov integrated passenger transport terminal

The EIA has been processed for the Trebišov integrated passenger transport terminal (Trebišov IPTT) and the envisaged impacts on nature conservation and landscape interests have been assessed. Construction and operation of the Trebišov IPTT would have no impact on the Ondava River Plain SPA (SKCHVU037) located in the vicinity of Trebišov and at a distance of about 930 meters southwest of the project.

In view of the species composition occurring in the territory in question and the nature of the site where the Trebišov IPTT is going to be implemented, there can be conclusively no probability of direct or indirect adverse impact on the site's gene pool and biodiversity, nor any impact on protected areas in the national network or in the character of the surrounding landscape.

R2 Kriváň – Mýtna and R2 Mýtna – Lovinobaňa, Tomášovce

A separate study on nature conservation and the R2 Kriváň - Lovinobaňa - Mýtna, Tomášovce project's impact on Natura 2000 sites was produced by Integra Consulting in 2018 and appears in Annex 7.

The study investigated the impact of the assessed stretch of the R2 on the Natura 2000 sites in the network, including impacts on migrating protected subject matter (especially large carnivores) and cumulative impacts. Two new Site of Community Importance (Uderinka and Hradné Lúky) have been included in the so-called "Phase C" approved by the Slovak Government in 2017. Based on information from the study, that construction of the R2 Kriváň - Lovinobaňa, Tomášovce expressways would have no negative impact on sites in the Natura 2000 network and its surroundings.

The overall impacts from construction of that stretch of the R2 on biodiversity, fauna, flora and habitats are acceptable and balanced by the public interest in building the R2 expressway and measures established by nature and landscape conservation authorities, lowering the impacts of the project. No impacts are envisaged at protected areas in the national system near the construction of the R2 stretch, other than permitted and mitigated encroachment into the Krívan Stream Natural Heritage Site.

R4 Prešov – North Bypass

In order to assess the impact on Natura 2000 sites surrounding the projected R4, an appropriate assessment was produced by HNH Projekt (01/2014) with a detailed impact assessment from construction of the R4 Expressway North Bypass on the Natura 2000 network located nearby and their protected subject matter. Based on the appropriate assessment, it can be said that the stretch of the R4 expressway has no negative impact on the integrity of the Natural 2000 network.

To mitigate negative impacts that emerge, several mitigating measures have been proposed which should be implemented when the design is constructed.

No impact on other protected nature areas near the R4 Prešov – North Bypass were identified. The issue of the R4's impact on migrating animals needs to be resolved as part of the elaboration of the Stretch II of R4 Prešov - North Bypass.

III.3.8 Cultural heritage

In the context of the proposed OPII Amendment, projects associated with the use and development of the ports at Bratislava and Komárno have the same potential to influence cultural heritage.

The freight port in Bratislava is a complex divided into three parts:

- Zimný prístav (Winter Harbor) with two docks - the original old port (construction started in 1897)
- Pálenisko (construction between 1975 and 1983) – a newer dock with transshipment and services stations including transshipment of mineral oils
- Lodenica ("Repair Shipyard") (constructed between 1975 and 1983) – the shipyard repair station and repair station for Slovenský vodohospodársky podnik, š.p. is situated at the dock

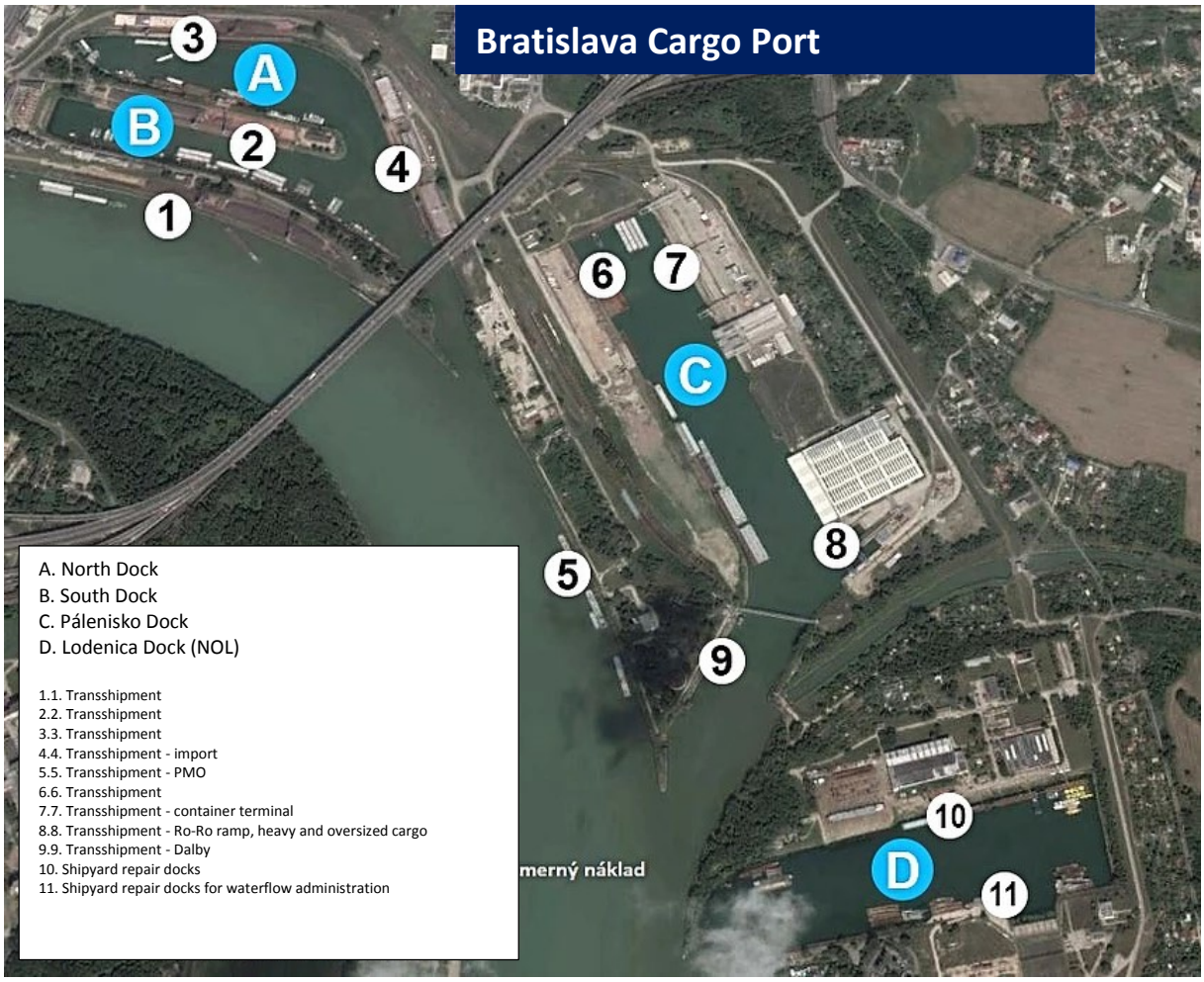


Figure III-14: Bratislava Cargo Port

Source: Verejné prístavy, a.s. (https://www.portslovakia.com/o-nas)

The Zimný Prístav complex is particularly an important set of engineering monuments and there is an intention to establish here a Shipyard Museum. Several local buildings have been declared national cultural heritage sites: Maritime workshop and ship lift (built in 1943-44 and a heritage site since 2014), the Old Bargeman House (Starý dom lodníkov, built 1940-42 and a heritage site since 2008), Warehouse 7 (built 1921-22 and a heritage site since 1986) and a pumping station (built 1904-05 and a heritage site since 2011). Another cultural heritage site that has been accordingly preserved since 1994 is a stretch of a flood barrier extending into the Cadastral Districts of Nivy and Ružinov, called the Upper Schütt Island Flood Barrier (Hornožitnoostrovná hrádza), which was built in the middle of the 19th century. The entire site including the method of use and the protection of valuable structures are the subject of an ongoing conceptual solution whose conclusions are not yet available.

Likewise, there are heritage sites of significant value located close to the Port of Komárno. The port area is spread over more than 20 hectares, but on a relatively narrow stretch of land near the city center and a residential neighborhood, in close proximity to the Fortress of Comorn (Komárňanské fortifikačné opevnenie) at the confluence of the Danube and Váh rivers in Komárno, which has been suggested for inclusion as a UNESCO World Heritage Site as the "Komárno-Komárom Fortification System at the Confluence of the Danube and Váh Rivers.

For other geographically defined activities and projects suggested in the framework of proposed OPII Amendment, any possible impact on the cultural heritage site at the scale of the strategic assessment is insignificant. As part of the project preparation for the R4 Prešov - North Bypass, a relevant set of heritage sites both in the historic core of Prešov and the surrounding area has been compiled. Protected historic sites are also located in neighborhoods close to the planned R2 route and near the

terminal in Trebišov. In all cases, project preparation included consultation with the competent heritage preservation authorities and compliance with the conditions they had specified (e.g. rescue archaeology).

III.3.9 Population and health

In terms of public health, mainly areas along the affected roads and railway lines would be influenced by the proposed amendment. The changes would be felt along all roads where the impact of implementing OPII would change traffic intensities. This concerns both current roads where a drop in ambient air burden and noise pollution is soon provisionally envisaged in principle and so particularly newly proposed stretches that are a new burden or transfer part of the current burden to the area surrounding these new transport structures. Another positive change may be triggered by a change in the use of means of transport and thus a change in the frequency of operating them, e.g. replacing individual car transport with mass transit or reducing the use of rail or maritime transport at the expense of individual automobile transport (and vice versa). A significant change in terms of hazardous substance emissions may be the launch of the transition toward electric cars for automotive transport.

In general, it will be necessary to assess specific intentions in terms of their impact on air quality, the noise situation and also the well-being of residents and public health.

Relationship between individual proposed activities relevant to the issue of public health and description of the current situation:

Upgrades and public port construction in Bratislava and Komárno

There are potentially affected sites in close vicinity to the ports at Bratislava and Komárno (maximum 1 km away). In terms of health, there is a relevant problem at the site with lower air quality = regionally, increased concentration of particulate matter and benzo[a]pyrene around Bratislava. Increased concentration of benzo[a]pyrene envisaged in Komárno (based on analogical figures from similar urban locations in Slovakia it is not possible to exclude slight exceeding of the immission limit in the first tens of percent above the threshold.

Introducing regular passenger navigation on the Danube (Dunajbus)

A potentially affected site is the transport corridor between Bratislava and Šamorín. The main air quality issue here is increased pollution by scattered particulates whose level exceeds immission and benzo[a]pyrene limits and the slight exceeding of the immission limit cannot be excluded for the centers of these communities.

Reducing rail transport safety risks (e.g. eliminating level railway crossings in road infrastructure and upgrading railway crossings)

A potentially affected site is generally Slovakia's entire rail network.

Construction and upgrading of intermodal terminals for rail passenger transport and for integrated passenger transport and connecting them to the road network

A potentially affected site is the area surrounding the Trebišov intermodal terminal, which at the moment is in unsatisfactory condition.

Expressway construction (outside the TEN-T CORE)

A potentially affected site is a belt along the proposed R2 and R4 expressways. In the case of the R4, the situation in the center of Prešov will also be affected, which will be relieved by the new R4 bypass.

There are no public health issues surrounding the new R2 route. The R4 also reflects the issue of air quality in the center of Prešov due to possible exceeding of the crossing of the $PM_{2.5}$ immission limit

when it is tightened after 2020, especially in the vicinity of frequented first-class routes and their interchanges.

Supporting the introduction of alternative fuels in road transport

The potentially affected site is the entire Slovak Republic. The main public health issue is again increased concentrations of pollutants in some areas, especially particulate matter and benzo[o]pyrene, which would exceed immission limits at some locations.

III.4 Environmental challenges including health issues that are relevant in terms of the strategy paper

This chapter presents a summary of the main environmental challenges relevant to the OPII as a whole in terms of the changes proposed in the Amendment to the Integrated Infrastructure Operational Programme (Version 6.0) in connection with the adoption of selected priority axes.

III.4.1 Air pollution

Transport has a significant impact on air quality in the Slovak Republic. Emissions from transport are a significant percentage of national emissions, especially in the case of nitrogen oxides, particulate matter and polycyclic aromatic hydrocarbons bound thereto. Traffic emissions at a number of sites contribute to unsatisfactory air quality. At many locations, exceedances of immission limits found in recent years can be attributed to the impact of car traffic.

Immission limits in PM_{10} particulate matter, NO_2 and benzo[a]pyrene have been exceeded since 2010 in terms of both their average annual concentrations and short-term values. After 2020, immission limits for $PM_{2.5}$ particulate matter will most likely be exceeded because there will be a stricter limit in place after that year. The situation is unfavorable in terms of percentages from measured locations exceeding immission limits for $PM_{2.5}$ particulate matter and benzo[a]pyrene. These problems are bound together because benzo(a)pyrene is mainly contained in the finest particulate matter fractions.

The dominant part of the impacts on air quality is linked to road traffic from cars, while other transportation modes are of little significance. The action may be only a little significant and local except in extreme cases of accumulation of many means of transport in a small area (e.g. busy non-electrified train stations, transport hubs, airports and frequented ports). In terms of protecting the air, pollution sources outside of road traffic are negligible for the proposed OPII Amendment within SEA.

The potential impacts of the assessed OPII Amendment on air will only be of a local nature, triggered by changes in road transport around certain measures (Dunajbus, adaptation of the ports of Bratislava and Komárno and expressway construction on the R2 and R4).

III.4.2 Climate

Greenhouse gas emissions

Greenhouse gas emission from road traffic have not been stabilized in Slovakia and the EU to date. This trend contrasts with the EU proposal in the White Paper on the Roadmap to a Single European Transport Area — Towards a competitive and resource efficient transport system, which calls for a reduction of greenhouse gas emissions from transport by 2050 of at least 60% compared to 1990. For this ambitious target to be met, the White Paper proposes a set of measures to develop and introduce new and sustainable fuels and fuel systems, optimizing multimodal logistics chains including the use of energy efficient types of transport and increasing transport efficiency and using infrastructure through information systems and market-driven incentives. Some measures in this plan are also subject to the proposed OPII Amendment.

Adapting to climate change

Because climate change is continuing and will be continuing even into subsequent decades, there is a need to take into account also the possible risks for transport infrastructure caused by the change in climatic conditions. The updated Strategy for the Slovak Republic's Adaption to the Adverse Consequences of Climate Change issued by the Ministry of Environment in 2018 states that extreme meteorological phenomena are reflected immediately and intensively in the transport sector with marked negative consequences. They will lead to an increase in the transport time of goods, travel time and increase in the likelihood of accidents and damage to traffic infrastructure. High and low temperatures, intense storms and snow calamities whose frequency and intensity that reflect climate change are increasing and causing serious complications in nearly all modes of transport.

Table III-10: Impact of climate change on traffic

Transportation	Impacts	Implications
Road	Extreme weather - storms, flooding	Road detours and shut-downs, damage to road infrastructure, possible increase in the number of traffic accidents.
	Worsened meteorological conditions (rain, snow, ice, fog)	Decreased safety and traffic flow, traffic restrictions, possible increase in the number of traffic accidents.
	Worsened winter conditions - frequent snowfalls, wind, long winters	Increased winter maintenance requirements, possible road surface damage, higher road surface quality requirements, possible increase in the number of traffic accidents.
	Falling rock and landslides	Closed traffic routes.
Air	Extreme weather - storms, flooding	Disruption of airport traffic, lockouts, infrastructure damage
	Worsened meteorological conditions (rain, snow, ice, fog)	Flight delays
Rail	Extreme weather - storms, flooding	Disrupted traffic, closures, infrastructure damage
	Worsened winter conditions - frequent snowfalls, wind, long winters	Increased winter maintenance requirements, damage to tracks and switches
	Landslips	Closure of tracks
Water	Extreme weather - storms, flooding, drought	Disrupted navigable waterway traffic, closures, infrastructure damage
	Worsened winter conditions - frequent snowfalls, wind, long winters	Frozen water, disrupted navigable waterway traffic, problems with floating ice.

Source: Strategy for the Slovak Republic's Adaption to the Adverse Consequences of Climate Change (MOE, 2018)

III.4.3 Noise and vibrations

Results from noise mapping indicate road traffic to be the basic noise source exceeding hygienic limits in Slovakia (95%). The main noise source primarily involves drive trains, especially at low vehicle speeds, while at higher speeds noise from tires spinning on the road surface predominate. On the other hand, rail transport is more likely to contribute to noise pollution only locally. It has been demonstrated that all noise provokes higher nervous system disorders that leads to auditory damage and also damages other organs while reducing the body's resistance to outside negative impacts, stimulating the development of other diseases. Cardiovascular disease has been shown to have the closest relationship between health and long-term exposure to noise.

Vibrations, the main source of which is road and rail transport, are another phenomenon that negatively affects human health. Their incidence depends on vehicle design, axle pressures, speed and acceleration, road cover quality, roadway construction and, in the case of rail transport, contact between the track and bogies. They are particularly felt in the immediate vicinity of the cargo transported. However, long-term exposure may cause permanent health damage, including pathological changes to the central nervous system. Besides the negative impact on human health, transport causes vibrations that exposes buildings (and tangible property) to risk, particularly in the immediate vicinity of traffic.

III.4.4 Surface water and groundwater

Road traffic dominates in its impact on water quality and quantity among different transport modes, with specific impacts linked accordingly to construction of waterway infrastructure and operation of water transport.

High risks are linked to the construction of transport infrastructure and operation. in particular, on roads at sites significant to water protection. When implementing infrastructure measures, they may clash with protected water management areas and both water sources and their buffer zones.

Pollution of surface water and groundwater

Linear communications are a source of water and noise pollution. Traffic contributes to water pollution due to atmospheric deposition, which increases trophic water pollution because of both NO_x emissions and contamination by other substances (such as petrol and benzo[o]pyrene. However, the main risk of deteriorating water quality comes from runoff of contaminated precipitation from roads and other paved surfaces such as parking areas. Polluted water running off those surfaces may contaminate surface water and ground water in the surrounding soil. Ordinary operation of vehicles on roads causes relevant pollution by chlorides from winter maintenance materials and crude oil (from drainpipes, tires, etc.). Less frequent, but with a more severe impact on water quality, may be accidental leakage (from an accident involving chemical substances, or leaks while handling fuels). Oil spills are the most common.

In the case of water running off of roads into watercourses, attention must be paid to cleaning them. Measures must be taken to prevent harmful substances from entering groundwater when they are disposed through drying. A special risk category is possible collision with protected water-management areas, water supplies and their buffer zones, and sources of natural healing and mineral waters and their buffer zones, too. These impacts need to be addressed in particular in the placement of structures and technical designs of them.

The risks from the emission of pollutants into the air and direct leaking of contaminants into an aquatic environment (both in normal operation and accidents) are also associated with waterway shipping.

The nature of point sources of pollution can then have some important elements of transport infrastructure such as petrol stations and shipping ports.

During actual construction of transport infrastructure, surface water around the structure can be affected when rinsing soil, in addition to possible accidental pollution. This pollution is characterized by its temporary nature and conditions where classical water treatment technologies cannot be applied. The construction and maintenance of infrastructure and waterways is linked to direct interference with water flows that are used for navigation. In construction, sludge forms in water from the swirling of solid particles caused by disturbances at the banks or dredging. If the dredged sediments contain pollutants, they may release them and contaminate the water environment. During construction work, water may be accidentally contaminated (by petroleum substances, cement mixtures or other pollutants).

Hydrological and hydro-morphological changes to service water

Rainwater running off paved surfaces into receptacles has an impact on their hydrological characteristics. It accelerates the draining of water from the landscape and worsens flood situations. The negative impact can be largely alleviated by disposing of rainwater by soaking in the ground or implementing such appropriate technical measures such as retention tanks as part of the drainage of reinforced surfaces. The transport structure can reduce the flow profile and be an obstacle to the drainage of large water bodies, which should be respected when placing structures and in selecting a technical solution. Possible appropriation and fragmentation of forests, which would reduce their function to prevent flooding, can contribute toward worsening it.

The issue of hydro-morphological changes to water bodies is also dependent on traffic infrastructure. Significant hydro-morphological changes may be associated with projects for the development of water transport infrastructure, but may also be affected if roads are constructed, for example if they cross or otherwise affect waterbeds, requiring them to be adjusted or rerouted.

Influencing the quantitative status of groundwater

No impacts in terms of increased groundwater abstraction during construction or operation is envisaged, other than standard road network maintenance.

The groundwater regime can be affected during construction mainly when construction intervenes in an aquifer, for example when boring tunnels and cutting through hills. The groundwater level may be lowered and the groundwater flow rate may be affected as well as habitats dependent on the water regime.

Water Framework Directive

These main water management issues were identified in relationship to the Water Framework Directive which endanger the attainment of its environmental objectives:

- Organic surface water pollution;
- Surface water contaminated by nutrients and the risk of eutrophication;
- Surface water contaminated by priority and chemical substances relevant for Slovakia;
- Hydro-morphological changes to surface water;
- Change in groundwater quality;
- Change in groundwater quantity;

Traffic and transport infrastructure are generally not considered to be a key issue in terms of impacts on water quality and quantity and/or a threat to the condition of it. These are generally considered to be urban agglomerations, industry and agriculture. However, the transport sector plays a definite role in most of the water management issues defined above. The impacts can be more severe if they act in valuable or sensitive areas. One of the objectives in assessing the strategy paper is therefore to minimize the clash between significant water management sites and assurance of their protection.

III.4.5 Waste production

Wastes are generated in transport primarily from vehicle replacement, when constructing and upgrading traffic infrastructure and in transport itself.

Act 79/2015 Coll. on wastes defines waste management as the collection, haulage, recovery and disposal of waste, including Manipulation with waste is understood as collection, transport, recovery and disposal of waste, including treating disposed waste. Waste production fluctuated between 2002 and 2016 with documented annual increases and decreases, while in 2017 transport waste grew markedly. The transport and communications sector produced 1,141,950 tonnes of waste in 2017, an increase of 931,108 tonnes from the previous year, of which 35,169 tonnes was hazardous waste and 1,106,781 tonnes was other waste.

In connection with the development of traffic infrastructure, the production of construction and demolition waste is an important issue. It originated not only from construction, but also from maintenance of, and changes in, already completed structures and in the removal of them. Between 2010 and 2013, average annual production ranged around 2.6 million tonnes.

Construction and demolition waste are a significant source of secondary raw material. In 2013, 47% of civil engineering waste was recycled. The above is based on Slovakia's Waste Management Programme for 2015-2020, which set targets for construction and demolition waste determined by increasing waste to be recycled and other conversion of material to at least 70% of weight by 2020, and including backfilling operations using waste from safe construction and debris from demolitions as a substitute for other materials without using naturally occurring material defined in EWC Code 17 05 04.

III.4.6 Nature and landscape

The relevant problems in nature and landscape protection are mainly biodiversity loss, unfavorable conditions in protected areas and Natura 2000 sites, the threat to a variety of plant and animal species, degradation and loss of natural habitats, the spread of invasive species, fragmentation of the landscape and its reduced migratory permeability, expansion of built-up areas to the detriment of nature, insensitive interventions in the landscape, the adverse status of watercourses and water, soil and air pollution. These problems have several causes including traffic.

Negative impacts of constructing new infrastructure on nature and landscape are especially the following:

- Fragmented habitats, ecosystems and the landscape as a whole;
- Encroachment upon specially protected areas and sites in the Natura 2000 network;
- Influencing the landscape;
- Risks from the spread of invasive species;
- Changes in the species composition of land in close proximity to constructed roads such as planting non-indigenous species, species from the impact of changes in conditions, exhalation, chemical substances from winter maintenance of roads, traffic, noise, etc.);
- Disruption of animal migratory routes (barrier effect);
- Animal mortality from crossing roads;
- Animals disturbed by noise and light when constructing and operating infrastructure.

The positive impact of developing transport development is the application of mitigating measures for transport infrastructure, for example by integrating elements permitting migration and preventing conflict between animals and means of transport (construction of eco-ducts, wide bridges, culverts, fences, barriers to amphibians, etc.), while improving air quality in burdened areas where traffic is routed.

III.4.7 Cultural heritage

The main issue in cultural heritage is ensuring preservation and maintenance, as well as use in a manner not detrimental to its cultural and historical values. The relationship to the transport issue is quite open.

In an analysis of the condition of heritage sites, a reduction was cited in both the number and real property values of them in connection with continuously ongoing changes in the civil engineering and technical condition of the properties at national cultural monuments, properties in conservation zones, properties in historical monument zones, the reinforced impact of climate change and climatic conditions, the impact of construction and other human economic activities and deteriorating hydrogeological and hydrological conditions which have been highlighted especially in recent years during emergencies (floods, landslides, subsoil erosion, etc.).[28]

From the point of view of traffic, the main risk for preserving cultural heritage is not the evidently direct clashes of transport buildings with preservation of monuments (which is mostly assured satisfactorily by the competent authorities), but rather indirect impacts, such as the penetration of intensive transport into the historical cores of communities. In the context of transport, the most important impact is the atmospheric deposition of certain pollutants on materials constituting valuable objects (buildings, sculptures and other works of art), including also the natural components of cultural monuments, protected area and UNESCO sites. It can be envisaged that the implementation of a series of structures with the potential of moving some traffic from urban areas would contribute toward changing the impact of emissions and vibrations on cultural monuments, historical zones and reservations with a positive impact on their condition. The development of a new transport infrastructure can also have a negative impact on the values and nature of historical sites or the integrity of individual sites. The risk of these negative impacts and conflicts from the newly proposed projects are assessed in the EIA.

The specific problem, and potentially significant in the context of the assessment concept, is the protection of technical monuments and valuable structures in the Bratislava and Komárno river ports as well as protected historical sites in their immediate vicinity.

III.4.8 Health

A specific problem from the perspective of public health in Slovakia is, despite the slow downward trend in the mortality rate from cardiovascular disease as the main cause of death, the growing trend of cancer reflected in the mortality rate. The impact of air quality, besides other things, probably comes especially from concentrations of aerosol particles and benzo(a)pyrene, together with factors such as lifestyle, occupation and social conditions and, finally, growing traffic burdens.
From this perspective, the potential positive impacts of the strategy comprise the pursuit of the greatest possible movement of traffic outside densely populated areas. Furthermore, the following positive changes can be expected in relation to the total comfort of the population and consequently to public health:

- Enhancing and promoting a healthy lifestyle
  - A well-constructed transport infrastructure facilitates positive change in the behavior of inhabitants and their lifestyles, especially in better use of cycling to commute to work, creating adequate zones around schools and using them for exercise. Improvements can be expected in reducing the incidence of obesity and cardiovascular disease.
- Preserving or improving air quality
  - Reductions can be expected in the number of respiratory problems by the exposed population (such as asthmatic seizures) and in the incidence of chronic obstructive pulmonary disease (COPD), mainly in non-smokers.
- Compliance with noise limits and reduction in noise (where possible and expedient)
  - Improvements can be expected in quality of life, children's cognitive function (in exposed schools) along with a reduction in myocardial infarctions where the population is exposed to noise above defined limits.
- Equal and equitable access to health and social care, education and employment opportunities

[28]Concept for Protecting Heritage Sites, updated appendix for 31 December 2012

- Better transport infrastructure and organization of mass transit enables everyone (the disabled, mothers with small children and the poor) to have access to services, education and work.

- Reducing poverty and economic exclusion
  - Income level and the distribution of wealth data are significant determinants of physical and mental health. Transport creates new jobs both in construction and use of infrastructure (petrol stations, hospitality services) and the availability of transport is an essential condition of economic development.

III.5 Environmental aspects including health aspects found at international, national and other levels relevant in terms of the strategy paper and how they have been taken into account during the preparation of the strategy paper.

III.5.1 Environment objectives

SEA OPII 2014-2020 has among other things been further addressed through an evaluation of compliance of the objectives and activities of the individual OPII priority axes with the environmental objectives formulated in the SEA.[29]

Table III-11 OPII environmental objectives

Area	Objective
Population-related transport aspects	Improve access to transport services and promote social inclusion
Population health	Reduce the noise burden on the population
	Reducing air pollution levels in residential neighborhoods
	Increasing transport safety
Air and climate factors	Reducing traffic emissions
	Reducing greenhouse gas emissions
Soil and rock environment	Minimizing the appropriation of agricultural land and forests
	Preventing risks from unstable rock environments
Water	Not impairing the ecological and chemical status of surface water and the quantitative and chemical status of groundwater

[29]See IV.2 and Appendix 1: Evaluation of the Strategy Paper (ENVICONSULT spol. s r.o., 2013).

	Restricting encroachment into protected water-management areas
	Protecting against floods
Biodiversity and the OP	Protecting precious natural environments and ecosystem functioning
	Ensuring the integrity of sites in the Natura 2000 network
Landscape conservation	Monitoring landscape ecological stability
	Preserving landscape integrity and its scenic value
Cultural heritage	Protect cultural heritage
Material resources	Increase energy efficiency
	Rationally use natural resources and not generate waste

Source: Evaluation of the Strategy Paper. ENVICONSULT spol. s r.o., 2013.

When evaluating the individual measures in the proposed OPII Amendment, compliance with general reference objectives established in the OPII SEA above and also with selected objectives in key environmental and health protection documents at the national (or international) level relevant for individual assessment of components - see below. Evaluation of the individual measures proposed in the revised OPII (see Chapter IV) likewise includes an assessment of whether and to what degree the proposed amendments contribute toward achieving the environmental and health protection targets.

In view of the nature of the proposed OPII Amendment, when there are no changes in the overall focus, priorities and objectives of the OPII, and based n the assessment of possible impacts of the individual changes (see Chapter IV below), it can be stated that the OPII Amendment will have no significant impact on the OPII's compliance with objectives covering environmental protection and protecting the health of inhabitants.

Air

- The air quality objective aims to maintain it in places where air quality is good and to improve it in places where air quality is not good. Good air quality means an air pollution level lower than the limit value, target value and the obliged reduction in concentration exposure (*Act 137/2010 Coll. - the Air Act)*

- In zones and agglomerations where the levels of sulfur dioxide, nitrogen dioxide, PM10, $PM_{2.5}$, lead, benzene and carbon monoxide in ambient air are below the respective limit values specified in Annexes XI and XIV, Member States shall maintain the levels of those pollutants below the limit values and shall endeavor to preserve the best ambient air quality, compatible with sustainable development (*Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe*)

Climate change

- Promote adaptation to climate change while preventing and managing risk. Optimizing the proposed transport infrastructure in terms of the impact of climate changes, particularly in view of exposure to the risk of floods and torrential rains (*Strategy for the Slovak Republic's Adaption to the Adverse Consequences of Climate Change*)

- Reducing total GHG emissions 13% by 2020 compared to 2005 (*Climate and Energy Package 2020*)

- Reducing total GHG emissions 80-95% by 2050 compared to 1990 (*Roadmap for moving to a competitive low carbon economy in 2050*)

- Reducing total GHG emissions 9-20% by 2030 and 54-67% by 2050 compared to 1990 (*Roadmap for moving to a competitive low carbon economy in 2050*)

- Growth in GHG emissions by 2020 should not reach values higher than 13% compared to 2005 in sectors outside the Emission Trading System *(Effort sharing decision, ESD*)

- Reducing GHG traffic emissions at least 20% by 2030 from 2008 levels (*White Book - Roadmap to a Single European Transport Area - Towards a competitive and resource efficient transport system (2011) and European strategy for low-emission mobility (2016)*

- Reducing GHG traffic emissions at least 60% by 2050 from 1990 levels (*White Book - Roadmap to a Single European Transport Area - Towards a competitive and resource efficient transport system (2011) and European strategy for low-emission mobility (2016)*

Noise and vibrations

- Reduce existing noise pollution – exposure of the population to transport noise, compliance with limits in the external environment, in particular taking into account site functions (protection of spa, school and medical equipment and residential construction (*Slovak Government Regulation of 16 January 2002 on protecting health against noise and vibration, as amended*)

Water conditions

- Achieving environmental objectives by 2015 in the first planning cycle or by 2021, at the latest by 2027 (*Slovakia Water Plan, Revised 2015*)

- Guaranteeing high/quality and sufficient drinking water and reducing pollution of other waters below the allowable rate (*Strategy, Principles and Priorities of the National Environmental Policy*)

- Ensuring conservation and efficient use of water resources (*Orientation, Principles and priorities in the Slovak Republic's Water Policy by 2027*)

Land, rock environments and mineral resources

- Reducing soils heavily to very heavily threatened by erosion through land consolidation, reclamation of environments disturbed by agricultural and forestry production and establishment of an optimal structure for soil and landscape (*Strategy, Principles and Priorities of the National Environmental Policy*)

- Using soil production to stabilize land and retain the highest quality soil, preventing unjustified appropriation (*National Land Policy of the Slovak Republic*)

- Implementing activities not related to land management and use to avoid endangering the soil's ecological functions (*National Land Policy of the Slovak Republic*)

- Effectively monitoring and minimizing geological hazards and risks (*Strategy, Principles and Priorities of the National Environmental Policy*)

Waste

- Shifting from material recovery as a single priority in Slovakia's waste management to avoiding the generation of waste in compliance with its waste hierarchy (*Strategy, Principles and Priorities of the National Environmental Policy 2019 – 2025*)

- To raise the amount of construction and demolition waste to be recycled and other conversion of material to at least 70% of weight by 2020, and including backfilling operations using waste from safe construction and debris from demolitions as a substitute for other materials without using naturally occurring material defined in EWC Code 17 05 04 (*Waste Management Programme for the Slovak Republic in 2016-2020*)

Nature and landscape

- Halt deterioration in the condition of all species and habitats, in particular those covered by EU legislation, and achieve significant and measurable improvement in their status (*National Biodiversity Protection Strategy to 2020*)

- Maintain and enhance the condition of separately protected areas (*Strategy, Principles and Priorities of the National Environmental Policy*)

Cultural heritage

- Recognize, protect, conserve, mediate and transmit Heritage Sites to further generations (*Concept for Protecting Heritage Sites in the Slovak Republic*)

Population and health

- Significantly improve the health of the population, reduce health inequalities, strengthen public health and promote health dialogue across other sectors (*Health 2020*)

- Improving the quality of indoor and outdoor air for everyone, as one of the most important environmental factors endangering the environment through measures directed toward continuous improvement in meeting WHO guiding values (*Action Plan for Environment and Health in the Slovak Republic V*)

- In zones and agglomerations where the levels of sulfur dioxide, nitrogen dioxide, PM10, $PM_{2.5}$, lead, benzene and carbon monoxide in ambient air are below the respective limit values specified in Annexes XI and XIV, Member States shall maintain the levels of those pollutants below the limit values and shall endeavor to preserve the best ambient air quality, compatible with sustainable development (*Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe*)

III.5.2 Site trafficability for transport corridors

An evaluation of the site's trafficability for the transport corridor was produced as part of the SPRDII SEA. There was a synthesis in identifying potential conflicts in the considered transport structures with various environmental values and/or analysis of the site's resistance to major transport structures. The evaluation is the first and fundamental information about the resistance of the area to the planned transport corridor.[30] It works with the following five basic categories for site resistance:

Table III-12: Essential characteristics of the categories used

Resistance	Resistance	Description	Characteristics	Color

[30] See IV.4 of the Evaluation of the Strategy Paper, Transport Research Institute, 2016.

categories	(k)			coding
K1	1.0 - 0.81	highly sensitive site	The site is not trafficable for a structure, only sites having the highest level of protection or its value is quite exceptional are included. Inclusion in this category should always be clearly underlain by legislation.	red
K2	0.8 - 0.61	compromising site, highly valuable	Site is trafficable only om exceptional cases and for special and often very extensively minimization and offsetting measures.	orange
K3	0.6 - 0.41	compromising site, moderately valuable	Site has relatively significant conflicts with applicable phenomena, indicated as compromising and allows a search for suitable optimal solutions.	yellow
K4	0.4 - 0.21	compromising site, less valuable	Site has less significant conflicts, relatively trafficable. An element occurs here, but its resistance is very small.	light green
K5	0.2 - 0.0	free site	Site where the intention can be allowed with no restrictions in terms of the factor. Usually an area where the evaluated element is not present.	dark green

Source: Evaluation of the Strategy Paper. Transport Research Institute, 2016

The OPII Amendment contains territorially specified OPII intentions in water transport infrastructure (PA 4) and railway infrastructure (PA 6). The figure below illustrates the localization of these intentions in the area with the indicated resistance rate according to SEA SPRDII both for the entire Slovak Republic, and then for individual intentions.[31]

[31] The background resistance map of the site was created according to the methodology for assessing its trafficability to linear structures under TP181 (Transport Ministry of the Czech Republic, 2006) for purposes of the SEA SPRDII assessment. Due to the size of the area, a 500 x 500 meter map resolution was used to synthesize the results.

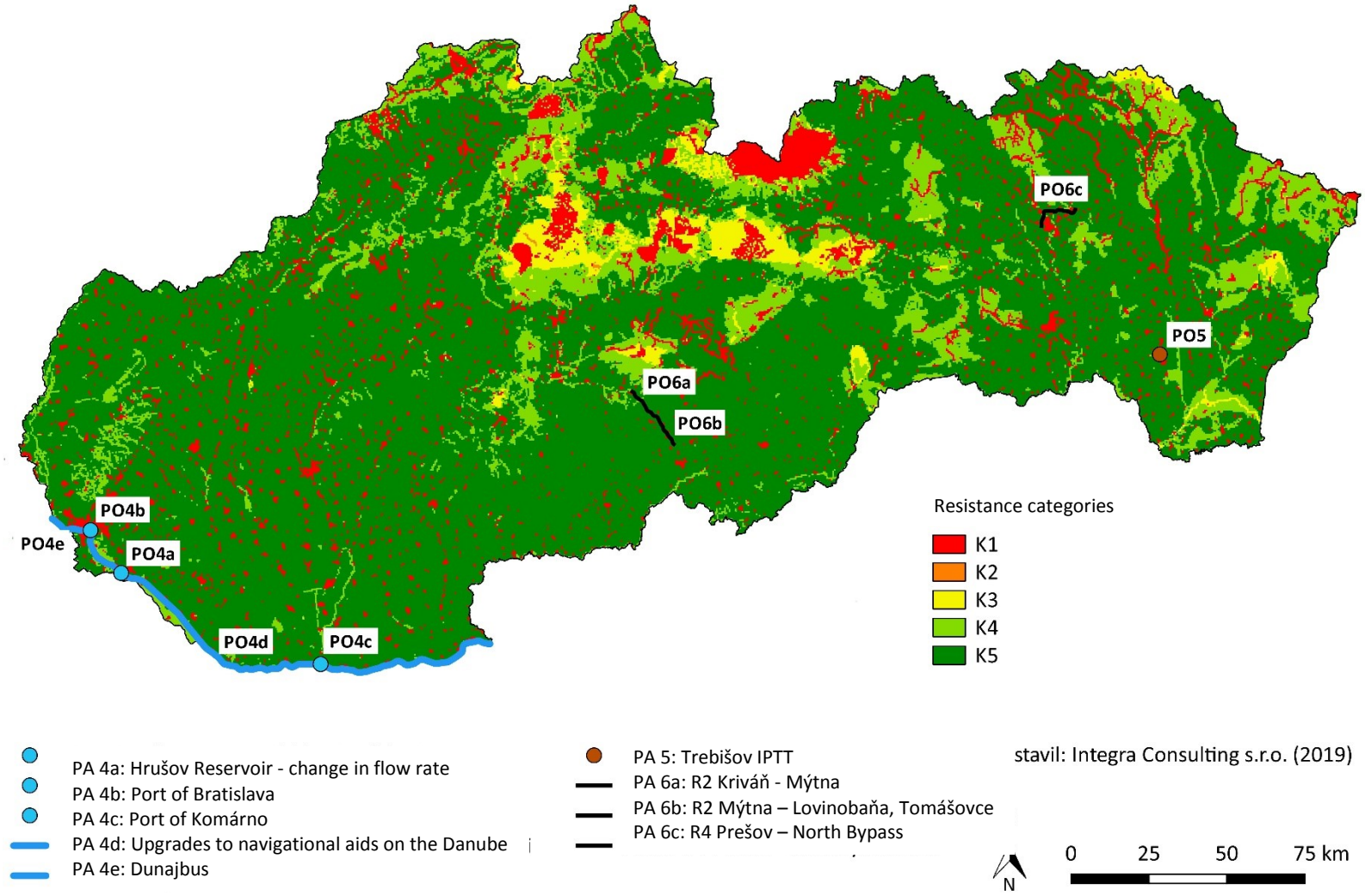


Figure III-15 Localization of territorially specified OPII intentions at the site with the indicated resistance rate

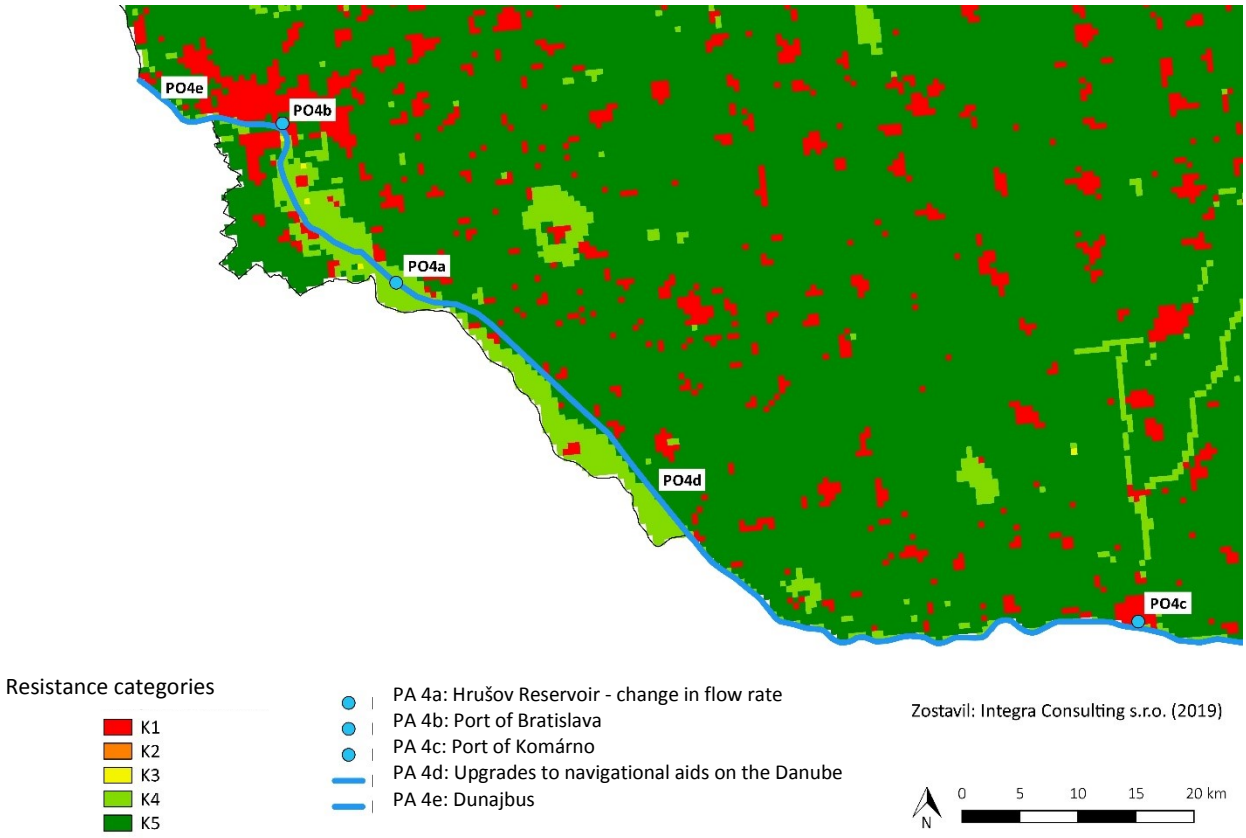


Figure III-16 Localization of territorially specified PA 4 intentions at the site with the indicated resistance rate

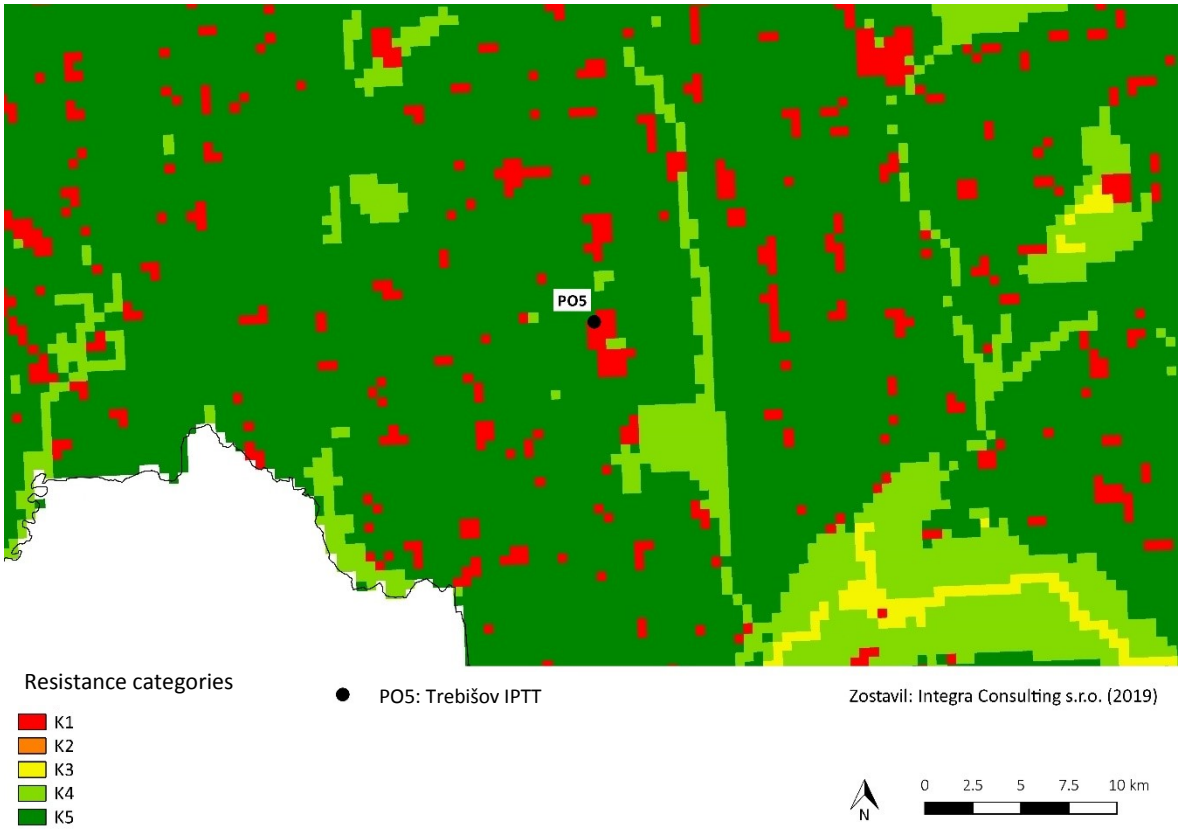


Figure III-17 Localization of the Trebišov IPTT intention at the site with the indicated resistance rate

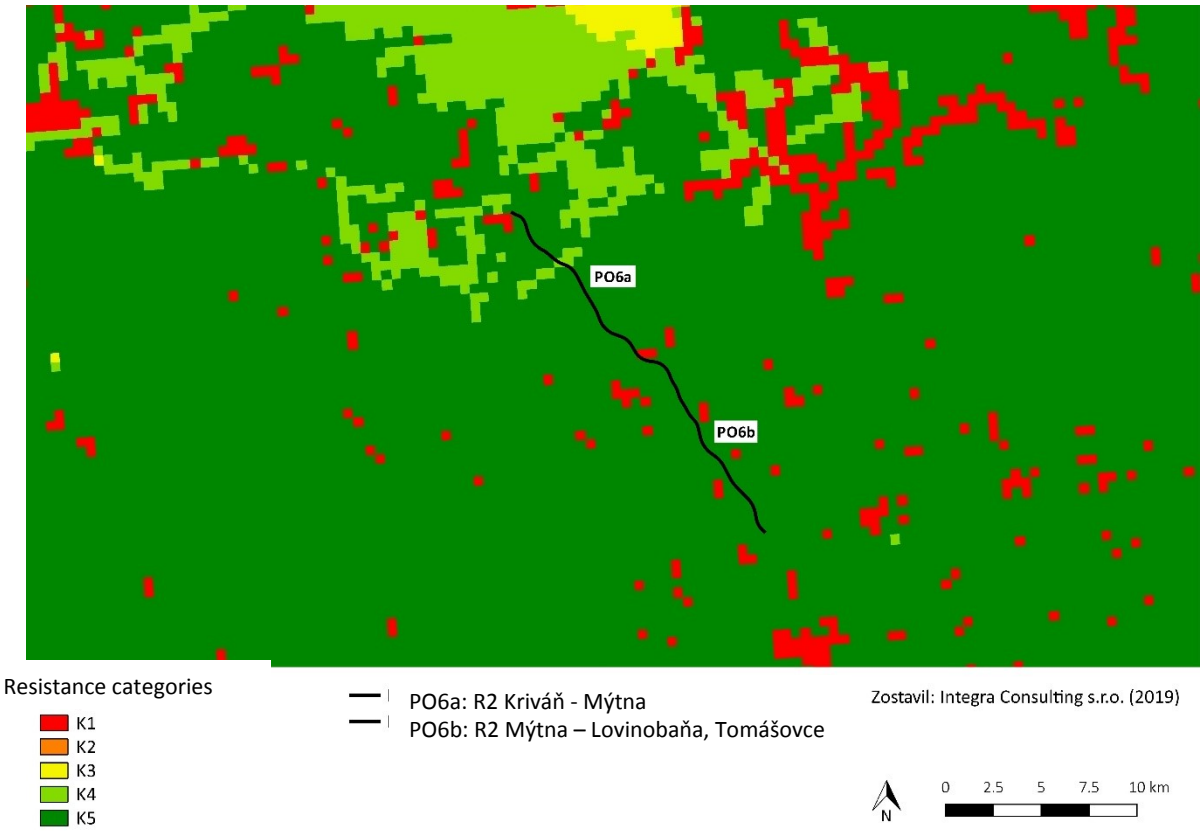


Figure III-18 Localization of the R2 Kriváň – Mýtna a R2 Mýtna – Lovinobaňa, Tomášovce intentions (PA 6) at the site with the indicated resistance rate

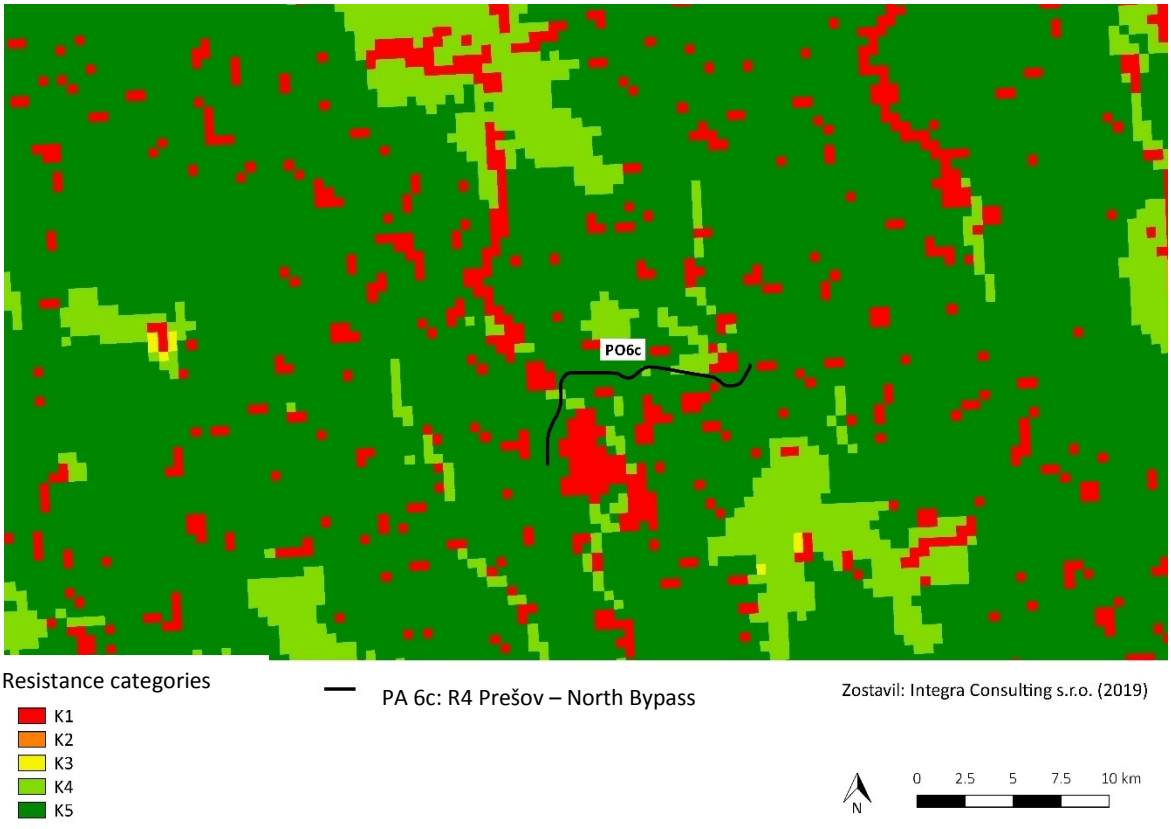


Figure III-19 Localization of the R4 Prešov – North Bypass intention (PA 6) at the site with the indicated resistance rate

Based on the site analysis, it is clear that some intentions are localized at a site with high transport corridor sensitivity, mainly the ports at Bratislava and Komárno and the Trebišov IPTT. However, given the nature of these intentions, the upgrades to existing ports and the localization of Trebišov IPTT at urban sites can be envisaged to be able to eliminate risks associated with the implementation.

IV. General data on envisaged impacts of the strategy paper including health

IV.1 Framework conditions between the proposed OPII Amendment and individual environmental components

The table below illustrates the basic framework conditions between the proposed OPII Amendment and individual environmental components which were assessed. A detailed impact evaluation of individual components including a description of uncertainties and possible cumulative impacts follows Section IV.1 below.

Legend:

+2	significantly positive impact
+1	positive impact
0	no impact
-1	negative impact
-2	significantly negative impact
?	The assessment is burdened by significant uncertainty

Table IV-1: Framework conditions between the proposed OPII Amendment and individual environmental components

OP Amendment (or related specific intention or activity)	Air	Climate change	Noise and vibrations	Water	Soil and rock environment	Waste	Nature and landscape	Cultural heritage	Population and health
Priority Axis 4 - Water transport infrastructure (TEN-T CORE) • Changing the name of Specific Objective 4.1. Improving the quality of services provided ~~in the Bratislava public port~~ on the Danube Waterway • Additions to the Komárno public port financed from OPII funds • Change in eligible beneficiaries									
Changing the name and expanding the content of A. ~~Feasibility study for~~ improving navigability on the Danube Waterway *Including the intention:* • *Changing current velocity in the lower Hrušov Reservoir - pre-project and project preparation*	0	?/-1	0	?/-1	0	0	?/-1/-2	0	0
Changing the name and expanding the content of B. Upgrades and public port construction in Bratislava and Komárno *Including the intentions:* • *Safety and monitoring systems at the Ports of Bratislava and Komárno* • *Upgrades in the Ports of Bratislava and Komárno* • *LNG terminal at the Port of Bratislava*	0/-1	0	0/+1 ?	+1/-1	0/-1	0	0/-1	-1/0/?	0/+1
Broadening C. Introducing modern technology into the management of maritime and port operations and implementation of related technical measures *Including the intention:* • *Upgrades to navigational aids at the Slovak stretch of the Danube international waterway and implementation of related technical measures*	0	+1	0	+1	0/?	0	0	0	0
	+2/-1	0	+2/-1	-1	0	0	-1	0	+2

OP Amendment (or related specific intention or activity)	Air	Climate change	Noise and vibrations	Water	Soil and rock environment	Waste	Nature and landscape	Cultural heritage	Population and health
Adding new eligible activities to D, Measures in Activity D. Introducing regular passenger navigation on the Danube (Dunajbus)									
Priority Axis 5 - Railway infrastructure and upgrading of rolling stock Changing the name of Priority Axis 5 Railway infrastructure and recovery of rolling stock and adding a new specific objective "5.3: Enhancing the attractiveness and quality of public rail passenger transport by upgrading rolling stock"									
Adding a *specific intention* to construct checkpoints to B. on the ŽSR network". Reducing rail transport safety risks	0	0	0	0	0	0	?	0	+2
Changing the name and expanding the content of C. Construction and upgrading of intermodal terminals for rail passenger transport and for integrated passenger transport and connecting them to the road network. *It particularly covers the Trebišov intermodal terminal*	+1/-1	+1	?	0	0	0	0	0	+1/-1
Adding a new activity I. Upgrading public rail passenger transport rolling stock	0	+1	+1	0	0	0	0	0	+1
Priority Axis 6 - Road infrastructure (outside the TEN-T CORE)									
A. Expressway construction (outside the TEN-T CORE) • Adding the R2 Kriváň – Mýtna and R2 Mýtna – Lovinobaňa, Tomášovce • Adding the R4 Prešov – North Bypass	+1	0	+2	-2/-1	0/-1	0	0/-1	0	+1
Adding a new activity C. Supporting the introduction of alternative fuels in road transport.	+1/0	+1	+2	0	0	0	?	0	0/+1
Priority Axis 7: Information society									
Supporting the construction of smart cities and regions through ICT	?	?	?	?	0	?	0	0	?
Promoting innovative SME solutions using public administration data and services	0	0	0	0	0	0	0	0	?

IV.2 Envisaged significant environmental and health impacts on the proposed (primary, secondary, cumulative, synergic, short, medium and long-term, permanent, temporary, positive and negative) PA 4, PA 5 and PA 6

Below is a description of the possible impacts of the proposed changes in Priority Axes 4, 5 and 6 on the environment and health of inhabitants (broken down by individual components and topics). In view of the nature of the proposed adoptions to PA 7 and the possible impacts, an assessment of these changes to the priority axis has been processed in aggregate in the separate subchapter IV.2.

IV.2.1 Air

IV.2.1.1 Potentially significant impacts from the proposed OPII Amendment relevant in terms of air:

Priority Axis 4 - Water transport infrastructure (TEN-T CORE):

Measures in Activity B. Upgrades and public port construction in Bratislava and Komárno.

Main relevant issues and potentially affected sites:

There are potentially affected sites in close vicinity to the ports at Bratislava and Komárno (maximum 1 km away). Regionally, there is an increased concentration of particulate matter and benzo[a]pyrene around Bratislava. Increased concentration of benzo[a]pyrene is envisaged in Komárno (based on analogical figures from similar urban locations in Slovakia it is not possible to exclude slight exceeding of the immission limit in the first tens of percent above the threshold.

There are potentially affected sites in close vicinity to the ports at Bratislava and Komárno (maximum 1 km away). Regionally, there is an increased concentration of particulate matter and benzo[a]pyrene around Bratislava. Increased concentration of benzo[a]pyrene is envisaged in Komárno (based on analogical figures from similar urban locations in Slovakia it is not possible to exclude slight exceeding of the immission limit in the first tens of percent above the threshold.

Potential impacts and risks:

The LNG terminal at the Port of Bratislava may locally contribute to pollution of particulate matter through the impact of potential commercial transport of LNG. The scope of the impact will depend on the daily and annual transport capacity. In Komárno, the potential impacts on air are insignificant.

Measures in Activity D. Introducing regular passenger navigation on the Danube (Dunajbus)

Main relevant issues and potentially affected sites:

A potentially affected site is the transport corridor between Bratislava and Šamorín. The main air quality issue here is increased pollution by scattered particulates whose level exceeds immission and benzo[a]pyrene limits and the slight exceeding of the immission limit cannot be excluded for the centers of these communities

Potential impacts and risks:

The envisaged transfer of passenger car transport to the ship (the feasibility study estimates only a few thousand vehicles/day) would relieve the currently congested roads in the Šamorín-Bratislava corridor. Locally, noise situation quality may worsen near the new Park & Ride capacities and access roads (maximum up to 500 meters).

Priority Axis 5 - Railway infrastructure and upgrading of rolling stock

Measures in Activity C. Construction and upgrading of intermodal terminals for rail passenger transport and for integrated passenger transport and connecting them to the road network

Main relevant issues and potentially affected sites:

A potentially affected site in terms of air is the area surrounding the passenger intermodal terminals and their link to the road network (about 1 km). There are currently no significant air quality issues at these locations. The air quality here is good except for benzo[a]pyrene in the center of Trebišov, whose concentration, similar as in other communities of similar size in the region, is probably approaching the immission limit or oscillating year-to-year around it, depending on climatic changes.

Potential impacts and risks:

Conceptually, in terms of air, it would be a measure with a positive impact by enhancing mass transit comfort with associated probable relief on the road network from individual motorized transport.

The risks are only of a local nature. There would be an increase in ambient concentrations, especially of particulate matter and NO_x near intermodal terminal from the impact of car transport. This may approximate the limit for 24-hour PM_{10} particulate matter concentrations.

Priority Axis 6 - Road infrastructure (outside the TEN-T CORE)

Measures in Activity A. Expressway construction (outside the TEN-T CORE)

Main relevant issues and potentially affected sites:

A potentially affected site is the approximately one-kilometer wide belt along the proposed R2 and R4 expressways. In the case of the R4, the situation in the center of Prešov will also be affected, which will be relieved by the new R4 bypass. There are no air quality issues surrounding the new R2 route. The R4 also reflects the issue of air quality in the center of Prešov due to possible exceeding of the crossing of the $PM_{2.5}$ immission limit when it is tightened after 2020, especially in the vicinity of frequented first-class routes and their interchanges.

Potential impacts and risks:

The potential impact of both proposed expressway stretches is positive because they have the nature of diverting existing transfers from densely populated cities. A decline in ambient concentrations at populated locations is expected.

Measures in Activity C. Supporting the introduction of alternative fuels in road transport

Main relevant issues and potentially affected sites:

The potentially affected site is the Slovak Republic. The main air quality issue is increased concentrations of pollutants in some areas, especially particulate matter and benzo[o]pyrene, which would exceed immission limits at some locations.

Potential impacts and risks:

The potential impact is positive and the development of e-mobility will have a positive impact on reducing emissions from combustion engines in car transport. The largely positive impact is non-quantifiable because it cannot be estimated to the extent that the impact of implementing the strategy increases the percentage of vehicles powered by alternative fuels. The problem of high traffic-related ambient contributions to the concentration of priority substances, in particular particulate matter, is not primarily linked to exhaust emissions, but rather to overall car traffic. Particulate matter and benzo(a)pyrene are mostly emitted not from vehicle exhausts, but resuspension from the road surface and wearing of brake lining, tires and the carriageway. The mere reduction of exhaust emissions through alternative fuels will therefore have a relatively low benefit on ambient air, even if a significant part (in the dozens of percentage) of the cars on the road today are replaced. The most significant improvement may come from reductions in benzo[a]pyrene, whose resuspension would be lower. Considering these factors, the types of alternative fuels to promote would make no difference in terms of their impact on air quality.

IV.2.1.2 Potentially cumulative impacts on air

The changes in the OPII will have an overall positive impact on air. None of the measures can be expected to have either a significantly negative impact or be exposed to important risks. Most of the measures proposed have a potentially and predominantly positive effect and are conceptually directed towards reducing air pollution. The identified local risks have little significance and relate only to local effects in parts of individual communities (where the possible exposure to risk from the effects extend at most 1 km). All identified potential risks from individual measures are easily resolvable in the project preparation phase (EIA or the construction permit process).

The impacts of individual changes in the OPII will be reflected at other sites and so no cumulative effect can be expected. The national effect can only be expected in the case of measures for "Supporting the introduction of alternative fuels in road traffic", whose ambient effect would be "diluted" within Slovakia, however, so a reduction in ambient concentrations at specific locations will be insignificant (not quantifiable and below the threshold of detection by objective methods) and thus no cumulative significant effect on remaining measures can be expected.

IV.2.2 Climate change

IV.2.2.1 Potentially significant impacts from the proposed OPII Amendment relevant in terms of climate:

Priority Axis 4 - Water transport infrastructure (TEN-T CORE):

Measures in Activity A. Improving navigability on the Danube Waterway

Measures in Activity B. Upgrades and public port construction in Bratislava and Komárno.

Measures in Activity C. Introducing modern technology into the management of maritime and port operations and implementation of related technical measures

Measures in Activity D. Introducing regular passenger navigation on the Danube (Dunajbus)

Main relevant issues and potentially affected sites:

The potentially affected site is a stretch of the Danube comprising the Slovak section of the Danube Waterway. The site is potentially vulnerable to the impacts of ongoing climate change. There is a high probability of the intensity of extreme phenomena such as drought, heat waves and torrential rains becoming more frequent.Extreme hydrological phenomena such as floods are very difficult to predict, so there is an envisaged increase in the frequency even in terms of intensity. The projected increase in water temperatures is likely to lead to negative consequences in terms of quality.

Potential impacts and risks:

The measures would have no impact either on climatic conditions or climate change. Transferring part of passenger car traffic to maritime transport (as part of Activity D) would have no significant impact in terms of cutting emissions of greenhouse gases.

Climate change can reduce the effectiveness of the proposed interventions – e.g. a drop in water level in the fairway during the dry season despite deepening it. Similarly, a lower water level in the dry season may reduce the possibility of using port capacity.

Upgraded management of maritime and port operation (as part of Activity C) would have a positive impact on maritime safety. As a result, a reduction can be envisaged in the need to address the undesired impacts of climate change on maritime operations through investments in riverbed adjustments. etc.

Priority Axis 5 - Railway infrastructure and upgrading of rolling stock

Measures in Activity A. Construction and upgrading of intermodal terminals for rail passenger transport and for integrated passenger transport and connecting them to the road network.

Measures in Activity I. Upgrading public rail passenger transport rolling stock

Main relevant issues and potentially affected sites:

According to available estimates in conditions found in Slovakia, climate change has been linked to growing following risks to rail transport:

- Extreme weather - storms, flooding: Disrupted traffic, closures, infrastructure damage
- Worsened winter conditions (common snowfall, wind, long duration of winter): Increased winter maintenance requirements, damage to tracks and switches
- Landslips: Closed tracks

Potential impacts and risks:

A certain positive impact can be envisaged in terms of limiting greenhouse gas emissions in connection with transferring some road traffic to rail transport. This effect will be small in view of the scope of the proposed intervention. Climate risks are insignificant due to the nature of the proposed projects.

Priority Axis 6 - Road infrastructure (outside the TEN-T CORE)

Measures in Activity A. Expressway construction (outside the TEN-T CORE)

Main relevant issues and potentially affected sites:

A potentially affected site is the area along the route of the proposed R2 and R4 expressways. The assessment carried out at the project preparation level indicated sensitivity to these specific risks:

- Snow phenomena (landslides such as shifting soil, mudslides, falling rock) due to snow and soil breakup);
- Icing phenomena (ice layers that cause water to gradually freeze or drops of rain or frost on the ground surface), black ice from rain falling on a cold surface making it difficult for vehicles to move and pedestrians to walk, glaze ice freezing as small drops on lampposts, traffic signs and antenna systems);
- Floods (clogged culverts and small bridges blocked by drifting branches and pieces of ice and possible mechanical damage to them, waterlogged soil and reduced stability, disturbances in the stability of slopes);
- High temperatures (deformed road surfaces, faults in railway tracks)
- Storms (gusts of winds, extreme precipitation, hail) and resulting temporary safety and operational restrictions.

Potential impacts and risks:

Climate risks can reduce the useful life of capital investments, lower traffic safety operations and raise costs for monitoring and maintenance. The assessment of climate risks suggests that the proposed projects are not significantly exposed to risk from this point of view.

Measures in Activity C. Supporting the introduction of alternative fuels in road transport

Main relevant issues and potentially affected sites:

Persistent high greenhouse gas emissions from traffic.

Potential impacts and risks:

A certain positive impact can be envisaged in terms of limiting greenhouse gas emissions. E-mobility has a low emission intensity under conditions in Slovakia, given the resource base, where currently almost 80% of electricity is consumed from low-emission or no-emission power generation and the percentage of low-emission production will continue to grow (Action Plan for Development of E-mobility in the Slovak Republic, 2018).

IV.2.2.2 Potentially cumulative impacts on climate and summary of climate risks

In light of the objective to reduce greenhouse gas emissions, the proposed amendment to the OPII will have a slightly positive impact, in particular with regard to the proposed, promoted introduction of alternative fuels and support for the development of e-mobility, where a significant percentage of non-emission or low-emission electricity production in the Slovak energy mix (mainly due to the high share of nuclear energy) has a positive impact on the overall emission balance of greenhouse gases. Intervention in the support of railway infrastructure and multimodal solutions facilitating the transfer of part of road transport to rail will also have a partially positive impact. The promotion of road transport through the construction of sub-sections in the expressway network is also present in the proposed OPII Amendment but, in terms of the effects on the development of greenhouse gas emissions, it is a marginal issue.

In terms of climate risk, the most significant and most sensitive of the proposed interventions is the improvement of the Danube waterway. The uncertainties associated with climate change increase the risk of inefficient resource efficiency. However, the planned interventions themselves have no significant potential to aggravate existing problems tied to the impact of climate change on the Danube waterways.

Other proposed investments in transport infrastructure (both road and rail) are already subject to the relevant assessment of climate risks in the project preparation phase and their sensitivity depends on specific technical solutions and local conditions. For specific projects where the allocation of support through the OPII review is considered, the rate of these risks is small.

IV.2.3 Noise and vibrations

IV.2.3.1 Potentially significant impacts from the proposed OPII Amendment relevant in terms of noise and vibrations

Priority Axis 4 - Water transport infrastructure (TEN-T CORE):

Measures in Activity A. Improving navigability on the Danube Waterway

Main relevant issues and potentially affected sites:

The area in closest proximity to the addressed intention is always a potentially affected site in terms of noise and vibration. Current noise pollution at the site is primarily caused by automotive traffic on Route I/63 or lower class roads running through the villages of Šamorín, Čilistov a Hamuliakovo. in the context of the project, noise is currently generated by the operation of tank maintenance, i.e. removing sediments and sludge which the project should reduce.

Potential impacts and risks:

No major negative impact in the noise situation is envisaged. The project can improve the noise situation by lowering sedimentation that would require less maintenance (such as from extracting sediments, storing them and compaction).

Measures in Activity B. Upgrades and public port construction in Bratislava and Komárno

Main relevant issues and potentially affected sites:

Currently and in future, the noise sources will be operated at the sites addressed to a similar extent, through the operation of water transport, maintenance engineering and technology in an emergency. In a broader context, the noise situation at the sites is influenced by car traffic on surrounding roads.

Currently, port operations influence noise in surrounding residential areas and recreational centers because both ports are located in the centers of cities. The operation of a port is not an important noise source, although the sound power generated in particular from the frequency of the operation of ships and the accompanying technology (e.g. cranes), considering they have engines, is the same as for car traffic, and yet the operations mentioned above are less numerous. As a natural barrier, in both cases the current construction of buildings act to prevent the spread of noise to the wider vicinity, although downstream operations (in both manufacturing plants and berths) can be relatively intense in terms of noise. Based on the available materials it cannot be specified whether hygienic limits are exceeded.

Potential impacts and risks:

Custom operation of safety and monitoring systems has no direct link to influencing the noise situation and the spread of vibrations. Impact on these areas can be expected when it responds on its own to an emergency (e.g. pump operation and other responses). When there is early detection of a safety risk, the response can be shorter and more targeted, ultimately leading to a reduction in the length of the negative impact, such as the noise situation. If the LPG terminal is implemented, it would depend on the particular location of it. Generally, it can be said that an appropriate assessment would rather improve the situation than worsen it. In terms of the system for adding facilities at areas for waste collection, drainage of wastewater, collection of used oil and similar operations, there is guidance at the places where they operate for the noise situation and for the emergence and distribution of vibrations (placement of technology), loading (type of technology) and frequency of operation, including related traffic and route management. These activities can be altered by the situation at the site as to worse situations (greater traffic frequency or movement to a more problematic location) and for better situations (reduced frequency, more appropriate placement).

Measures in Activity C. Introducing modern technology into the management of maritime and port operations and implementation of related technical measures

Main relevant issues and potentially affected sites:

The current noise situation is influenced by operations on the Danube. Maritime transport emits less noise (even when compared to electric rail transport) yet the operation of motorboats, water scooters and similar watercraft can be locally rather noisy, although given the frequency of operation and due to the equivalence of hygienic limits there operation, hygienic limits are not envisaged to be exceeded.

Potential impacts and risks:

No significant impact is envisaged. In terms of the system for adding facilities at areas for waste collection, drainage of wastewater, collection of used oil and similar operations, there is guidance at the places where they operate for the noise situation and for the emergence and distribution of vibrations (placement of technology), loading (type of technology) and frequency of operation, including related traffic and route management. These activities can be altered by the situation at the site as to worse situations (greater traffic frequency or movement to a more problematic location) and for better situations (reduced frequency, more appropriate placement).

Measures in Activity D. Introducing regular passenger navigation on the Danube (Dunajbus)

Main relevant issues and potentially affected sites:

The dominant noise source at the site is motorized transport on first, second and third-class roads. The entire site falls under Category II, and so hygienic limits are 50 dB during the day at 45 dB at night. Maritime transport emits less noise (even when compared to electric rail transport).

Potential impacts and risks:

The envisaged transfer of passenger car transport to the ship (the feasibility study estimates only a few thousand vehicles/day) would relieve the currently congested roads in the Šamorín-Bratislava corridor. Locally, noise situation quality may worsen around the parking areas or at selected departure and arrival times.

Priority Axis 5 - Railway infrastructure and upgrading of rolling stock

Measures in Activity C. Construction and upgrading of intermodal terminals for rail passenger transport and for integrated passenger transport and connecting them to the road network.

Main relevant issues and potentially affected sites:

A potentially affected site in terms of air is the area surrounding the Trebišov intermodal terminal.

In accordance with Act 24/2006 Coll., an EIA was produced by SIRECO s.r.o. in August 2014 for the project. The above data mentions the dominant noise source at the site to be traffic (such as cars, buses and trains, although the main noise source is the operation of a wide gauge railway). In terms of vibration on the wide-gauge railway around the Trebišov rail station, the speed limit for trains is either 30 or 20 kilometers per hour on tracks at Trebišov station buildings.

No noise study was produced as part of the cited EIA communication. Conclusions drawn from the communication:

- During operation of the Trebišov IPTT, the source of noise and vibrations at the site and nearby it will continue to be primarily traffic (rail, bus and individual operated cars) related to Trebišov IPTT operation, since traffic intensity will not significantly vary from what it is at present.
- In view of the broader relationships, individual motorized transport would be partially redirected to rail transport (changing the method of moving people based on greater use of mass rail transit by individuals travelling in the affected site between Trebišov and Košice), which is also the main objective of the integrated system itself, meaning the above implementation of the Trebišov IPTT will probably have a positive indirect impact on the noise situation from individual motorized transport at the affected site and the region.
- The impact of vibration from traffic related to the operation of the Trebišov IPTT is not envisaged for it, considering its distance from nearby buildings and the civil engineering characteristics and the above characteristics of the Trebišov IPTT.
- In general, it can be noted that the impact of implementing the Trebišov IPTT compared to the present situation would increase noise production during construction, while noise levels will be close to the same level as it is at present during its operation.

Potential impacts and risks:

Impacts may be both positive and negative. This is a project in an area that has been significantly halted by residential buildings. Any reinforcement of the terminal function's needs to be carefully assessed at the project level because the impact may be significant and the frequency of the affected population high. Preparing a detailed noise study allows a solution to be proposed that would entail improvement.

Measures in Activity I. Upgrading public rail passenger transport rolling stock

Main relevant issues and potentially affected sites:

A potentially affected site is generally Slovakia's entire passenger transport rail lines.

Potential impacts and risks:

A slightly positive impact in the noise situation is envisaged. Modern sets have a lower level of aerodynamic noise, thanks to a better suspension system and lower chassis noise (including reduced vibrations).

Priority Axis 6 - Road infrastructure (outside the TEN-T CORE)

Measures in Activity A. Expressway construction (outside the TEN-T CORE)

Main relevant issues and potentially affected sites:

An EIA was produced by Integra Consulting s.r.o. for the stretch of the R2 in July 2018. The cited communication currently indicates the environment to be burdened with traffic noise along Route I/16, which is not equipped with noise absorbent barriers. Adding to total noise pollution in the area is the operation of the railway line between Zvolen and Lučenec. No strategic noise mapping has been produced for the area.

Existing noise pollution at the site at the R4 is relatively significant. The area has an intensively utilized network or roads in the relative proximity to the protected built-up area. Due to the exposure, a strategic noise map[32] was produced in 2006 for Route I/18 at the site which shows significant pollution over the long term.

Potential impacts and risks:

In implementing the new stretch of the R2, traffic will be diverted to the edge of the city, which would improve the noise situation inside it around the current stretch of Route I/16, with an expected drop in traffic of 75-80%.

The implementation of the R4 stretch and the connecting of the current high-speed stretches would relieve car traffic in the center of Prešov and move it to the new stretch of the R4. This would have a positive impact on the noise situation within Prešov.

Measures in Activity C. Supporting the introduction of alternative fuels in road transport

Main relevant issues and potentially affected sites:

A potentially affected site is generally the area around the road network.

Potential impacts and risks:

A positive impact is envisaged. Electric cars are significantly less noisy than combustion engines.

IV.2.3.2 Potentially cumulative impacts on the noise situation

The OPII Amendment will have an overall positive impact on the noise situation. It can be envisaged that implementation of the intentions and their impacts on the noise situation (whether direct or cumulative) would improve the noise situation by transferring traffic from urban centers to bypass roads, shifting from individual motorized transport to mass transit and moving from train to maritime transport (Dunajbus), with upgrades to trains and replacing combustion engines with electric cars. Although some of the intentions will intensity operations (e.g. the Trebišov terminal, strengthening the ports in Bratislava and Komárno) all are addressed with a view toward reducing noise pollution or moving noise to places where protected structures will not be affected. No accumulation of negative impacts is expected but, on the contrary, the more intentions implemented, the more positive the synergy effect will be.

[32] http://www.hlukovamapa.sk/graficka-prezentacia-hlukovej-za-aze-v-okoli-ciest-i.-triedy.html

IV.2.4 Water conditions

IV.2.4.1 Potentially significant impacts from the proposed OPII Amendment relevant in terms of water

Priority Axis 4 - Water transport infrastructure (TEN-T CORE):

Measures in Activity A. Improving navigability on the Danube Waterway

Main relevant issues and potentially affected sites:

The site is the location of the Great Schütt Island WMA, numerous groundwater sources and the buffer zones around them. Some of the surface water which comprises the Danube Waterway is indicated to be in unsatisfactory condition. Unsatisfactory condition of certain groundwater sites in Quaternary sediments of the Danube, pollution and the trend toward higher concentrations of pollutants in the upper layers of the Danube's Quaternary sediments.

The Great Schütt Island WMA, a large-capacity water supply for Šamorín and a source of natural healing water fir Čilistov, is located at the site potentially affected by "*Changing current velocity in the lower Hrušov Reservoir"*. The unsatisfactory quantitative state of HU_AIQ573, which includes the cross-border GWB-8 (infiltrated by the Hrušov Reservoir).

Potential impacts and risks:

Navigability on the Danube Waterway may be improved by different types of intentions and measures. Generally, it can be expected that the implementation will be associated with interventions in the hydro-morphology of the flow, in particular with the effect on flow depth and in level and flow conditions themselves, with the possible impact on groundwater and the Danube's own water. When implementing the intentions, the effect on the quality of surface water and subsequently also groundwater will be accordingly endangered. Exposure to the risk of deterioration/failure to achieve good water body conditions, including outside Slovakia, cannot be excluded. Inappropriate interventions can (even secondarily) affect the yield and quality of water resources. Impacts cannot be further evaluated without knowledge of the specific projects.

As far as the impacts on maritime operations are concerned, once the measures have been implemented, it is possible to envisage certain increased intensity of maritime operations on one hand (where the risk to water quality rises) and increased safety on the other (with exposure to the risk falling), and the overall impact can be assessed as insignificant.

From the point of view of the specific project "*Changing current velocity in the lower Hrušov Reservoir"*:

- When implementing the projects, water could be contaminated (by sludge, leaking contaminants), although the impact will be temporary.
- The project objective is to influence sedimentation processes in the fairway. Higher current velocity and reduced settling of fine particles can limit the fouling of the bottom in the fairway, with a potentially positive impact on the infiltration of surface water into groundwater. However, there can be the opposite effect outside the fairway, where the dammed area can be accordingly affected by eutrophication and deterioration of oxygenation conditions.
- The direct influence of the water body's hydro-morphology (D0015 VDG) is assessed as irrelevant, as it is an artificial water body.

Measures in Activity B. Upgrades and public port construction in Bratislava and Komárno

Main relevant issues and potentially affected sites:

Bratislava: The affected SKD0019 Dunaj (Danube) is defined as heavily affected, with its ecological potential average, chemical status poor and, among things, it has been contaminated by dangerous substances.

Komárno: The affected SKD0018 Dunaj (Danube) and HUAEP446 Duna Gönyü-Szob are defined as natural, with their ecological potential average and chemical status good.

Potential impacts and risks:

When implementing the projects, construction and adoption of the ports may contaminate water (sludge, leaking contaminants), although the impact will be temporary, and the intensity depends on similar specific projects and rather local impacts can be expected.

In the long term, safety in port operations will increase, a sustained positive impact. Conversely, operation of the LNG terminal in the port of Bratislava may be linked to new risks, yet it can be assumed that these risks can be minimized or eliminated by an appropriate project solution.

Measures in Activity C. Introducing modern technology into the management of maritime and port operations and implementation of related technical measures

Main relevant issues and potentially affected sites:

The site is the location of the Great Schütt Island WMA, numerous groundwater sources and the buffer zones around them. Some of the surface water which comprises the Danube Waterway is indicated to be in unsatisfactory condition, namely (ATOK411340000 Donau_01, SKD0019 Dunaj), the unsatisfactory condition of certain groundwater sites in Quaternary sediments of the Danube, pollution and the trend toward higher concentrations of pollutants in the upper layers of the Danube's Quaternary sediments.

Potential impacts and risks:

Upgraded management of maritime and port operation would have a positive impact on maritime safety, and a reduction of the risk of contaminated water in emergency conditions can be envisaged. Any related technical measures would have a very tiny envisaged scope and the impacts from implementing them are assessed as negligible.

Measures in Activity D. Introducing regular passenger navigation on the Danube (Dunajbus)

Main relevant issues and potentially affected sites:

The site is the location of the Great Schütt Island WMA, numerous groundwater sources and the buffer zones around them. Some of the affected surface water is indicated to be in an unsatisfactory condition. SKD0016 Dunaj (Danube) and ATOK411340000 Donau_01 are defined as natural.

Potential impacts and risks:

Construction of berths for vessels, parking areas and bulwarks are a direct intervention into the riverbed and banks (affecting hydro-morphology - relevant especially for natural surface water).

When they are constructed, water quality can be influenced (sludge, escaping pollutants) and the berths and parking areas when they are operating will be sources of pollutants. Under normal conditions (outside of an emergency), low intensity impacts at a rather local scale can be envisaged.

The introduction of regular shipping will mean an increase in the intensity of maritime transport (slightly increasing exposure to risks in terms of water quality).

Priority Axis 6 - Road infrastructure (outside the TEN-T CORE)

Measures in Activity A. Expressway construction (outside the TEN-T CORE)

Propose appropriate winter maintenance technology at the stretch of the R2 Kriváň-Mýtna passing through the Upper Ipeľ, Rimavice and Slatiny Basin WMA to eliminate the risk of contaminants penetrating into the groundwater. The chemical status of the affected surface water and groundwater is good, with the surface water defined as natural, but the ecological status is not good, among other things due to a change in habitats.

At the potentially affected site at the proposed completion of the R4, the chemical status of the affected Quaternary groundwater site is poor, while exhibiting an upward trend in chloride (Cl^-) concentrations among other things. The affected surface water is defined as natural, but its ecological status is not good, among other things, due to the change in habitats.

Potential impacts and risks:

When implementing new expressway stretches, there is a danger of exposure to the risk of surface water or groundwater pollution and they will be a linear source of pollution when the stretches are operating. The impact has been assessed as potentially significant for the R2 Kriváň-Mýtna passing through the Upper Ipeľ , Rimavice and Slatiny Basin WMA.

Constructing of expressways physical intervenes with water flows due to routing and they can be significant encroachments into the hydro-morphology in the case of I0008 Kriván Stream because the R2 runs for a long stretch close to the stream's flow.

In the case of the R4, exposure to the risk of impacting quantitative groundwater characteristics while boring the tunnel cannot be excluded.

IV.2.4.2 Potentially cumulative impacts on water

Possible surface water and groundwater impacts were identified in some new or changed OPII activities.

First of all, these are activities proposed as part of Priority Axis 4 - Water transport infrastructure (TEN-T CORE). Here it could potentially be the most risky to perceive potential implementation of the projects for improved navigability of the Danube waterway, which generally can be associated with interventions in the hydro-morphology of the flow, in particular with the effect on flow depth and in level and flow conditions themselves, with the possible impact on groundwater and the Danube's own water. When implementing the intentions, the effect on the quality of surface water and subsequently also groundwater will be accordingly endangered. In general, exposure to the risk of deterioration/failure to achieve good water body conditions, including outside Slovakia, cannot be excluded. Inappropriate interventions can (even secondarily) also affect the yield and quality of water resources. The above risks cannot be further evaluated and the significance determined without knowledge of the specific projects. These are not included in Revision I, although preparation and possible implementation of *Increased current velocity in the lower Hrušov Reservoir* is envisaged, localized in the artificial water body SKD0015 - Gabčíkovo Dam (Vodné dielo) and whose anticipated impacts on surface water and ground water have been assessed as slightly negative.

The impacts of other new or adapted activities proposed under Priority Axis 4 can be assessed as a slightly negative (Dunajbus) to slightly positive. Activities aimed at upgrading the waterways and public ports at Bratislava and Komárno are positively perceived and they can contribute toward enhancing safety in waterway operations and reducing exposure to the risks associated with emergency conditions.

Accordingly, negative impacts on surface water and groundwater may be linked to the completion of stretches of the R2 and R4 expressways, which have been newly added to the OPII. The risk of pollution is relevant for completion and operation of the expressways and the impact has been assessed as potentially significant for the R2 Kriváň-Mýtna passing through the Upper Ipeľ , Rimavice and Slatiny Basin WMA. The R2 is exposed to risk in terms of possible impact on the hydro-morphology of the surface water at SKI0008 R2 Kriván Stream because it runs for a long stretch

close to the stream's flow. In the case of the R4 Prešov - North Bypass, exposure to the risk of impacting quantitative groundwater characteristics while boring the tunnels cannot be excluded.

Measures have been proposed to mitigate or minimize identified risks and the negative impacts of individual activities directed towards pre-project and project preparation of the intentions.

Substantial activities are planned on the Danube Waterway in terms of the cumulative and synergic impacts on surface water and groundwater. Implementation of some of the proposed activities include interventions in the riverbed and banks of the flow (implementing measures to improve navigability on the Danube and constructing berths and parking lots for Dunajbus). There would be intervention in water body hydro-morphology and it could be substantial where they are defined as natural above Bratislava (SKD0016 Dunaj, ATOK411340000 Donau_01) and on the stretch of the Danube composing the border between Slovakia and Hungary (SKD0018 Dunaj a HUAEP446 Duna Gönyü-Szob). While interventions in the implementation of Dunajbus infrastructure are local in scope and may be considered in terms of the hydro-morphological condition of the affected water bodies to be insignificant, interventions for improved navigability may be potentially significant. It will depend on the form of the specific projects. *Increased current velocity in the lower Hrušov Reservoir*, whose implementation is figured, is localized in SKD0015-VDG, defined as artificial and therefore the envisaged interventions are evaluated as insignificant.

The objective of the proposed activities is to make the waterway more attractive and directly attract new public water transport (Dunajbus) and, once the measures have been implemented, it may be thus envisaged that maritime transport intensity will rise, which would be linked to increasing exposure to the risk of water pollution on the Danube from normal operation as a result of accidents. Pollution may affect all water bodies comprising the Slovak section of the waterway and accordingly water bodies on the Danube downriver (HUAOC756 Duna Szob–Budapest). However, the risk of accidents will be reduced by planned upgrading of the fairway and public ports. The impacts can therefore be assessed as slightly negative.

No measures have been particularly proposed to mitigate or minimize identified cumulative and synergic impacts of activities planned for the Danube Waterway, yet measures are proposed for individual activities.

With respect to identified negative impacts on stretches of the expressway routes which have been newly added to the OPII, cumulative action cannot be excluded in the case of the R4 Prešov - North Bypass and some stretches of roads and motorways not subject to the revised OPII. These are mainly the D1 Prešov West to Prešov South, which is similar to the R4 - North Bypass to be partially resolved by the tunnel. Quantitative groundwater characteristics of SK1001200P a SK2005300P may be affected by both projects. SK1001200P is a shallow hydrological collector defined in Quaternary alluvial deposits of the Hornád River and has a poor quantitative and chemical status, where completion and operation of the proposed stretches of road may either worsen it further or hinder it reaching a good status in the future.

In addition to the projects mentioned earlier, the water body would be also affected by the D1 between Budimír and Bidovce and the R2 between Košice Šaca and Košické Oľšany (projects not subject to the revised OPII). As part of (pre) project preparation of all the intentions, increased attention would need to be paid toward water protection and to proposing feasible measures for minimizing the risk of contaminating surface water and groundwater during construction and operation of the intentions.

IV.2.5 Soil and rock environment

IV.2.5.1 Potentially significant impacts from the proposed OPII Amendment relevant in terms of the soil and rock environment

Priority Axis 4 - Water transport infrastructure (TEN-T CORE):

Measures in Activity A. Improving navigability on the Danube Waterway

Measures in Activity B. Upgrades and public port construction in Bratislava and Komárno.

Measures in Activity C. Introducing modern technology into the management of maritime and port operations and implementation of related technical measures

Measures in Activity D. Introducing regular passenger navigation on the Danube (Dunajbus)

Main relevant issues and potentially affected sites:

Protected high-quality soil exist in southwest Slovakia and generally throughout the entire country. The affected site has localized deposits of building stone at Devín, gravel sand and sand deposits at Čunovo, Kalinkovo, Šamorín and Hamuliakovo and also gravel sand and sand deposits at Zlatná na Ostrove a Patince, while near Štúrovo there is likewise the Obid lignite deposit. The wider vicinity of the Cadastral District of Šamorín includes the Šamorín deposit of non-paraffinic crude oil, natural gas and gas condensate. The area surrounding Komárno is in a seismically active region of southern Slovakia

Potential impacts and risks:

Upgrades and public port construction at Bratislava and Komárno would involve the appropriation of land that has not been specified in detail. Land would be taken also for construction of the parking areas associated with the Dunajbus project that is located between the incoming channel for the Gabčíkovo Dame and the left-hand seepage channel for the dam. Implementation of the remaining proposed projects would not require any significant permanent appropriation of agricultural land. Only the area in very close proximity to them may be effected due to possible soil compaction from the movement of construction machines and due to soil to be temporarily taken in order to establish construction yards.

In a nationwide context, the OPII Amendment will not have a long-term impact on soil and rock environment use.

Priority Axis 6 - Road infrastructure (outside the TEN-T CORE)

Measures in Activity A. Expressway construction (outside the TEN-T CORE)

Main relevant issues and potentially affected sites:

R2 Kriváň – Mýtna and R2 Mýtna – Lovinobaňa, Tomášovce

The route goes over highland terrain of which part is through agricultural land used as either arable land or permanent grassland and part is through forested land. There are medium to less quality soil located here. There are several operating and unopened quarries near the proposed route. The following soil borrows and deposits possibly exist in the region.

- Mýtna – Hrby: deposit with developed extraction of dolomite limestone intended as building stone
- Mýtna: deposit with developed limestone
- Ružiná: deposit with exploration of siliceous limestone for use as building stone

R4 Prešov – North Bypass

In terms of soil quality in Slovakia, the soil here is medium quality. Sites in eastern Slovakia built by mountains of Carpathian flysch, the outer and inner Carpathian Paleogene and rocks in a narrow band of a transitional zone were particularly affected by accidental landslides. No mineral deposits have been registered in the immediate vicinity of the expressway route. There are exclusive deposits of construction material in the wider vicinity, such as at Fintice, Okružná, Sedlice and Vyšná Šebastová.

Potential impacts and risks:

The most significant impact from construction and operation of roads on the soil, its quality and stability is the placement of any structure (temporary and permanent taking of land) and thus the loss of productivity from a particular part of the land. Boring tunnels, collecting fill and cutting into the landscape can disturb the stability of slopes, cause landslides and erosion, accelerate weathering and contaminate the soil environment.

IV.2.5.2 Potentially cumulative impacts on land and the rock environment

Only road infrastructure projects (i.e. added to the preparing of the R2 and R4 stretches require significant demands for land. Any permanent appropriation of land would be for construction of the road and shoulders. Land will be temporarily appropriated for structures on the construction site (construction yards, material storage, storage of soil and also manipulation belts along the road). The most significant impact from construction and operation of roads on the soil, its quality and stability is the placement of any structure (temporary and permanent taking of land) and thus the loss of productivity from a particular part of the land.

Boring tunnels, collecting fill and cutting into the landscape can disturb the stability of slopes, cause landslides and erosion, accelerate weathering and contaminate the soil environment, especially in the case of the R4, where the occurrence of subsequent geodynamic phenomena has been documented at the site such as lateral and deep erosion of surface flows and water erosion on slopes.

Other changes included in the OPII have negligible demands for land claims and do not encroach on any unstable territory.

The OPII Amendment would have no significant negative impacts on the soil and rock environment and, in a nationwide context, it will not have a long-term impact on soil and rock environment use. Possible accumulation of the negative impacts from individual changes in the OPII described above were not identified.

IV.2.6 Waste

IV.2.6.1 Potentially cumulative impacts in terms of waste treatment

Implementation of the proposed OPII Amendment may increase construction waste, especially at the local level. A large quantity of excavated soil would be created from construction of infrastructural intentions at the R4 Prešov - North Bypass, for example when the two tunnels are bored. In the remaining changes included in the OPII, construction and demolition wastes will be generated, including excavated earth produced to a much lesser extent.

The OPII Amendment would have no significant negative impacts on waste production and, in a nationwide context, it will not have an impact on long=term waste management trends. Possible accumulation of the negative impacts from individual changes in the OPII described above were not identified.

IV.2.7 Nature and landscape

IV.2.7.1 Potentially significant impacts from the proposed OPII Amendment relevant in terms of nature and landscape

Priority Axis 4 - Water transport infrastructure (TEN-T CORE):

Measures in Activity A. Improving navigability on the Danube Waterway

Main relevant issues and potentially affected sites:

In preparing the project documentation, it is necessary to take into account that the activity itself is planned to be implemented at a site where several nationally and internationally protected areas are located nearby. The resulting project could have an impact on the following:

- Sites in the Natura 2000 network, in particular the Danube Floodplains SPA (SKCHVU007), Bratislava Floodplains SAC (SKUEV0064, SKUEV2064), Podunajské Biskupice Floodplains (SKUEV0295) and Hrušov SAC (SKUEV0270)

- Internationally Protected Area - Danube Floodplains (Dunajské luhy) Ramsar Wetlands

Protected areas in the national system such as the Danube Floodplains Protected Landscape Area, Kopáčsky Ostrov Nature Reserve and possibly others.

Potential impacts and risks:

There is a high risk in implementation of negative impacts on protected subject matter around Natura 2000 sites and also the impact on international commitments and national nature conservation interests. As part of the ongoing EIA, there was a commitment defined in the scoping of the assessment issued by the MOE on 6 July 2016 to produce an appropriate assessment of the impact of the project on the sites in the Natura 2000 network.

Measures in Activity B. Upgrades and public port construction in Bratislava and Komárno.

Main relevant issues and potentially affected sites:

Port of Bratislava

The Danube Floodplains SPA and the Bratislava Floodplains SAC are located near the Port of Bratislava, while the Little Danube SAC has an outlet into the Little Danube near the port.

Port of Komárno

There are Natura 2000 sites near the Port of Komárno:

- ÚEV Dunaj (SKUEV2393) - Danube SAC

- ÚEV Vážsky Dunaj (SKUEV0819) - Váh Danube SAC

Potential impacts and risks:

Risk of negative impacts on protected subject matter at the Natura 2000 site and also the impact on international commitments and national nature conservation interests. In the EIA and appropriate assessment, there needs to be an investigation of whether the planned activities will have an impact on the following Natura 2000 sites around the Port of Bratislava:

- CHVÚ Dunajské luhy (SKCHVU007) - Danube Floodplains SPA
- ÚEV Bratislavské luhy (SKUEV0064, SKUEV2064) - Bratislava Floodplains SAC

- ÚEV Malý Dunaj (SKUEV0822) - Little Danube SAC

In the EIA and appropriate assessment, there needs to be an investigation of whether the planned activities will have an impact on the following Natura 2000 sites around the Port of Komárno:

- ÚEV Dunaj (SKUEV2393) - Danube SAC
- ÚEV Vážsky Dunaj (SKUEV0819) - Váh Danube SAC

No impacts on other nature conservation interests from implementation are envisaged.

Measures in Activity D. Introducing regular passenger navigation on the Danube (Dunajbus)

Main relevant issues and potentially affected sites:

An appropriate assessment of the impacts on Natura 2000 sites by SOS/Birdlife was prepared for the project (10/2018) as part of the EIA. The appropriate assessment found the impact on the Natura 2000 network by regular Dunajbus passenger navigation along the Danube to be slightly negative on several protected subject matters in the Danube Floodplains SPA (SKCHVU007) and the Bratislava Floodplains (SKUEV2064).

There was no significantly negative impact found on any protected subject matter. Therefore, including Dunajbus in the OPII would have no negative impact on the integrity of the Natura 2000 network.

The site is likewise part of the Ramsar wetlands in the internationally significant Danube Floodplains. Like in the case of the Natura 2000 site, implementation and operation of the Dunajbus will not have a negative impact on Ramsar wetlands.

Apart from near the Natura 2000 site, the proposed Dunajbus will also be localized near several protected areas in the national system (Danube Floodplains Protected Landscape Area, the nature reserves of the Dunajské ostrovy, Ostrovné lúčky, Kopáčsky ostrov, Topoľové hony and Gajc, and the protected areas of Pečniansky les, Soví háj Bajdeľ, Poľovnícky les and PP Panský diel). These protected area would not be significantly affected by project implementation.

Potential impacts and risks:

See above. The slightly negative impact was found with 50 protected subject matters in the Danube Floodplains SPA and 12 in the Bratislava Floodplains SAC (SKUEV2064).

Priority Axis 5 - Railway infrastructure and upgrading of rolling stock

Measures in Activity C. Construction and upgrading of intermodal terminals for rail passenger transport and for integrated passenger transport and connecting them to the road network

Main relevant issues and potentially affected sites:

The EIA has been processed for the Trebišov integrated passenger transport terminal (Trebišov IPTT) and the envisaged impacts on nature conservation and landscape interests have been assessed. Construction and operation of the Trebišov IPTT would have no impact on the Ondava River Plain SPA (SKCHVU037) located in the vicinity of Trebišov and at a distance of about 930 meters southwest of the project.

In view of the species composition occurring in the territory in question and the nature of the site where the Trebišov IPTT is going to be implemented, there can be conclusively no probability of direct or indirect adverse impact on the site's gene pool and biodiversity, nor any impact on protected areas in the national network or in the character of the surrounding landscape.

Potential impacts and risks:

See above. No impacts on nature conservation interests are envisaged.

Priority Axis 6 - Road infrastructure (outside the TEN-T CORE)

Measures in Activity A. Expressway construction (outside the TEN-T CORE)

Main relevant issues and potentially affected sites:

R2 Kriváň – Mýtna and R2 Mýtna – Lovinobaňa, Tomášovce

Based on the existing studies[33], that construction of the R2 Kriváň - Lovinobaňa, Tomášovce expressways would have no negative impact on sites in the Natura 2000 network and its surroundings.

The overall impacts from construction of that stretch of the R2 on biodiversity, fauna, flora and habitats are acceptable and balanced by the public interest in building the R2 expressway. No impacts are envisaged at protected areas in the national system near the construction of the R2 stretch, other than permitted and mitigated encroachment into the Krívan Stream Natural Heritage Site.

R4 Prešov - North Bypass

In order to assess the impacts on Natura 2000 sites surrounding the projected R4, an appropriate assessment was produced by HNH Projekt (01/2014) with a detailed impact assessment from construction of the R4 Expressway North Bypass on the Natura 2000 network located nearby and their protected subject matter, and it can be said that the R4 expressway will have no negative impact at this stretch on the integrity of the Natura 2000 network.

Potential impacts and risks:

See above. The issue of the R4's impact on migrating animals needs to be resolved as part of the elaboration of the Stretch II of R4 Prešov - North Bypass.

IV.2.7.2 Potentially cumulative impacts on nature and landscape

The different changes in the strategy paper can have various impacts on nature conservation, the landscape, protected areas and Natura 2000 sites. The impacts have been assessed and evaluated for several activities clearly defined by specific projects and their localization whose conclusions should to be respected or there needs to be continued assessment (R2, R4, Trebišov IPTT, Dunajbus, adjusting the current at Hrušov Reservoir).

Activities that are not specifically defined need to be further elaborated in detail at the project level and their impacts on the environment and Natura 2000 sites defined in the EIA and appropriate assessment (Port of Bratislava, Port of Komárno, adjustments in the Danube Waterway).

No cumulative impacts of the proposed OPII Amendment at the strategic level is envisaged for nature conservation and Natura 2000. When implementing the strategy paper as a while, it is necessary to integrate the strategy conclusions in environmental protection, including the biodiversity strategy. It is essential to carefully address the identification and mitigation of cumulative impacts at the level of individual projects using the EIA and appropriate assessment instruments for the impact on Natura 2000 sites.

IV.2.8 Cultural heritage

IV.2.8.1 Potentially significant impacts from the proposed OPII Amendment relevant in terms of cultural heritage

Priority Axis 6 - Road infrastructure (outside the TEN-T CORE)

Measures in Activity B. Upgrades and public port construction in Bratislava and Komárno

Main relevant issues and potentially affected sites:

Unsatisfactory state of the Heritage Fund. Protecting Slovakia's archaeological heritage. Especially in the context of the considered OPII Amendment:

- Protecting engineering monuments at the Zimný Prístav complex in Bratislava

[33] For example, Communication of changes in Annex 8a for the R2 Kriváň - Lovinobaňa, Tomášovce (Integra Consulting, 2018)

- Protecting the Comorn Fortress near the Port of Komárno
- The fortification system at the confluence of the Danube and Váh in Komárno, Slovakia and Komárom, Hungary

Potential impacts and risks:

Planned investment and development of the ports may have a negative impact on existing protected heritage sites and related valuable buildings that are protected heritage sites not being used. It may also have an indirectly negative impact on historical buildings in city centers near the ports.

IV.2.8.2 Potentially cumulative impacts on cultural heritage

The proposed amendment to the OPII is not significant in terms of impacts on cultural heritage. Only activities aimed at promoting the development of the river ports at Bratislava and Komárno have potential exposure to risk because there are historically valuable structures and sites at these locations whose protection has not been definitely addressed in all cases.

No unfavorable cumulative impacts from the proposed OPII Amendment on cultural heritage is envisaged. In the context of the entire OPII, there will be predominately a slightly positive impact with a reduced burden on the historical centers of these towns by automotive traffic and so a decrease in negative impact (from air pollution and vibrations) on the civil engineering of the localized valuable historical buildings there.

IV.2.9 Population and health

IV.2.9.1 Potentially significant impacts from the proposed OPII Amendment relevant in terms of population and health

Priority Axis 4 - Water transport infrastructure (TEN-T CORE):

Measures in Activity B. Upgrades and public port construction in Bratislava and Komárno

Main relevant issues and potentially affected sites:

There are potentially affected sites in close vicinity to the ports at Bratislava and Komárno (maximum 1 km away). In terms of health, there is the relevant problem of reduced air quality at the site: Regionally, increased concentration of particulate matter and benzo[a]pyrene around Bratislava. Increased concentration of benzo[a]pyrene envisaged in Komárno (based on analogical figures from similar urban locations in Slovakia it is not possible to exclude slight exceeding of the immission limit in the first tens of percent above the threshold.

Potential impacts and risks:

The anticipated impacts are quite positive, but of little significance. Should the LNG terminal operate in the Port of Bratislava, there may be a reduction in the surrounding waterway of particulate matter pollution from existing maritime transport using conventional fuels. The scope of the impact will depend on daily and annual transport capacity. In Komárno, the potential impacts on public health are insignificant.

Measures in Activity D. Introducing regular passenger navigation on the Danube (Dunajbus)

Main relevant issues and potentially affected sites:

A potentially affected site is the transport corridor between Bratislava and Šamorín. The main air quality issue here is increased pollution by scattered particulates whose level exceeds immission and benzo[a]pyrene limits and the slight exceeding of the immission limit cannot be excluded for the centers of these communities.

Potential impacts and risks:

The envisaged impact is positive. The envisaged transfer of passenger car transport to the ship (the feasibility study estimates only a few thousand vehicles/day) would relieve the currently congested roads in the Šamorín-Bratislava corridor.

From a public health perspective, this is a welcome alternative to urban transport and, if the planned LPG refueling terminal is used, a certain drop in air pollution from existing automotive and maritime transport can be envisaged, and so a positive impact on public health.

Priority Axis 5 - Railway infrastructure and upgrading of rolling stock

Measures in Activity B. Reducing rail transport safety risks (e.g. eliminating level railway crossings in road infrastructure and upgrading railway crossings) - adding partial activity "construction of infrastructure manager checkpoints on the ŽSR network"

Main relevant issues and potentially affected sites:

A potentially affected site is generally Slovakia's entire rail network.

Potential impacts and risks:

Reducing safety risks has always had a positive impact on public health on a local scale.

Measures in Activity C. Construction and upgrading of intermodal terminals for rail passenger transport and for integrated passenger transport and connecting them to the road network

Main relevant issues and potentially affected sites:

A potentially affected site is the area surrounding the Trebišov intermodal terminal.

Potential impacts and risks:

Conceptually, in terms of public health, it would be a measure with a positive impact by enhancing mass transit comfort with associated probable relief on the road network from individual motorized transport.

The risks are only of a local nature. There may be an increase in ambient concentrations, especially of particulate matter and NO_x near intermodal terminal from the impact of car transport. This may approximate the limit for 24-hour PM_{10} particulate matter concentrations.

Measures in Activity I. Upgrading public rail passenger transport rolling stock

Main relevant issues and potentially affected sites:

A potentially affected site is generally Slovakia's entire passenger transport rail lines.

Potential impacts and risks:

A slightly positive impact on health is envisaged. The new trains would probably have an impact on reducing ambient noise.

Priority Axis 6 - Road infrastructure (outside the TEN-T CORE)

Measures in Activity A. Expressway construction (outside the TEN-T CORE)

Main relevant issues and potentially affected sites:

A potentially affected site is the approximately one-kilometer wide belt along the proposed R2 and R4 expressways. In the case of the R4, the situation in the center of Prešov will also be affected, which will be relieved by the new R4 bypass.

There are no public health issues surrounding the new R2 route. The R4 also reflects the issue of air quality in the center of Prešov due to possible exceeding of the crossing of the $PM_{2.5}$ immission limit when it is tightened after 2020, especially in the vicinity of frequented first-class routes and their interchanges.

Potential impacts and risks:

The potential impact of both the proposed expressway stretches is positive because they have the nature of diverting existing transfers from densely populated cities. A decline in ambient concentrations and noise at populated locations is expected.

Measures in Activity C. Supporting the introduction of alternative fuels in road transport

Main relevant issues and potentially affected sites:

The potentially affected site is the entire Slovak Republic. The main public health issue is increased concentrations of pollutants in some areas, especially particulate matter and benzo[o]pyrene, which would exceed immission limits at some locations.

Potential impacts and risks:

Supporting the introduction of alternative fuels can have a positive impact on reducing the concentrations of pollutants and therefore also on public health, but it depends on how fast the measures are implemented.

IV.2.9.2 Potentially cumulative impacts on the population and health

The OPII Amendment will have a slightly positive impact on public health. None of the measures can be expected to have either a negative impact or be exposed to significant risks. Most of the measures proposed have a potentially and predominantly positive effect and are conceptually directed towards reducing air pollution and noise, while enhancing comfort and indirectly also improving public health.

The impacts of individual changes in the OPII on public health will be reflected every time elsewhere, according to the situation of the intentions and so no cumulative effect can be expected. The national effect can be expected to be only limited in the case of *"Supporting the introduction of alternative fuels in road transport."*

IV.3 Envisaged significant environmental and health impacts on the proposed changes in PA 7

Supporting the construction of smart cities and regions through ICT

Promoting innovative SME solutions using public administration data and services

The development of new technologies and technological innovations bring undisputed benefits, for example, from saving energy and water resources and producing less waste while, on the other hand, it may be linked to some particularly socio-economic risks (loss of jobs in certain sectors, security risks associated with the handling of personal data, safety risks in operating autonomous means of transport, cybercrime) or unanticipated environmental influences.[34,35]

[34] For example, see Reiss, T., Millar, K.: Introduction to special section: Assessment of emerging science and technology: Integration opportunities and challenges. Science and Public Policy, Volume 41, Issue 3, June 2014, Pages 269–271.
[35] For example, see Galdon-Clavell, G.: (Not so) smart cities?: The drivers, impact and risks of surveillance-enabled smart environments. Science and Public Policy, Volume 40, Issue 6, December 2013, Pages 717–723.

Development of smart cities with each other above benefits also entails risks. The following systems can be affected:[36]

- Transport systems - smart transport, managing and controlling it, navigation systems, autonomous means of transport
- Energy systems – smart metering and management using centralized or "engineered" grids
- Banking and finance - e.g. toll and parking collection systems
- Communications and information systems - navigational and signaling systems
- Water supply - management and optimization
- Medical systems - dependence on sensors (e.g. cardio-stimulators) and communication systems

[36] Edited from Johnsen, S. and O.: Risks, Safety and Security in the Ecosystem of Smart Cities. In Risk Assessment, 2017. 10.5772/intechopen.70740

V. Proposed measures for preventing, eliminating, minimizing and offsetting impacts on environment and health

V.1 General Recommendations

In terms of climate change:

Introduce climate proofing in (pre-)project preparation for large infrastructure investments climate proofing, whose results would be taken into consideration in finalizing the technical solution and operational monitoring.

In terms of noise and vibrations:

Only three measures are appropriate, depending on the degree of project preparation:

- Measuring noise/vibrations to verify the current situation at the site of interest;
- Producing a noise study to model the possible impacts of the intentions and, if hygienic limits are exceeded, to prepare a draft of sufficiently effective noise measures;
- Measuring noise/vibrations to review the situation in operating the intention, the effect of implemented anti-noise measures and, where appropriate, to draft additional measures to comply with hygienic limits.

In terms of water

- Both the OPII and individual activities should be implemented in accordance with requirements of the Water Framework Directive with respect toward defining conditions and conservation at sites protected under Sec. 364/2004 Coll. on water, as amended (Water Act);
- As part of (pre) project preparation of specific intentions to eliminate or minimize the risks of contaminating surface and groundwater during both implementation and operation of the intentions;
- As part of (pre) project preparation of specific intentions to eliminate or minimize the risks of impacting the quantity of surface and groundwater during both implementation and operation of the intentions.

In terms of soil and rock environment:

As part of (pre) project preparation of specific intentions for all investments in infrastructure, quantify the possible appropriation of land and assess possible impacts to mineral deposits.

In terms of nature and landscape:

The impacts of projects on the surrounding Natural 2000 network, internationally protected areas (e.g. Ramsar wetlands) and natural conservation interests (species, habitats and protected areas) needs to be carefully assessed when preparing, evaluating and authorizing projects, with recommendations to mitigate negative impacts in the assessment and the EIA to be consistently incorporated into higher-level stages of documenting the projects.

In terms of population and health:

No significant risks to public health were identified in the assessment of impacts from the OPII Amendment. However, it is necessary, within the assessment of the impact of the individual projects proposed for the programme, to focus on their possible negative impacts on air quality and the noise situation as described below in this chapter and subsequently to establish specific measures to minimize or offset them. Public health is also closely related to climate change risks, and it is therefore necessary to assess individual specific intentions in a detailed evaluation of whether they

respond adequately to these risks and that all options are used to minimize their impact on public health.

V.2 Measures to divert, reduce or mitigate possible significant negative impacts on the environment including on health which could result from implementation of the strategy paper

V.2.1 Priority Axis 4 - Water transport infrastructure (TEN-T CORE)

Changing the name of Specific Objective 4.1. Improving the quality of services provided on the Danube Waterway *(Note: including adding the Komárno public port to funding from OPII resources and adapting eligible beneficiaries)*

Improved navigability on the Danube Waterway *(Note: includes "Changing current velocity in the lower Hrušov Reservoir - pre-project and project preparation")*
In terms of climate change:

To reduce the risk of negative impacts on climate change, the following applicable measures are recommended:

- Address bottlenecks in waterways based on a through feasibility study that takes into account rising climate change uncertainty.
- Investigate opportunities for improving navigability through modern technologies and flexible, customizable technical solutions instead of using large-scale static interventions in the river bed.

In terms of noise and vibrations:

Processing a noise study can be recommended especially for the closest residential building to evaluate the operation of newly-constructed structures (e.g. placement of the rowing course) and the expected increased vessel movement (with a view toward improving fairways and making recreation and water sports such as motorboats more attractive).

Appropriately plan construction work (e.g. so there is no construction at night and to limit the length of heavy construction). Consider in the warehouse and fuel pumping solution the placement of such buildings so that service stations are not located near any residential building.

In terms of water

To reduce the risk of negative impacts on water, the following applicable measures are recommended:

- Address bottlenecks in waterways based on a through feasibility study that takes into account possible cross-border aspects linked to impacts on water and identifies a technical solution for the intention (or alternatives) with minimal impact on the quality and quantity of surface water and groundwater and to verify compliance with the requirements of the Water Framework Directive.

Selecting a technical solution for "Changing current velocity in the lower Hrušov Reservoir - pre-project and project preparation") without negative impacts on the replenishment of cross-border surface water GWB-8.

In terms of nature and landscape:

The impacts of projects on the surrounding Natural 2000 network, internationally protected areas (e.g. Ramsar wetlands) and natural conservation interests (species, habitats and protected areas) needs to be carefully assessed when preparing, evaluating and authorizing projects, with recommendations to mitigate negative impacts in the assessment and the EIA to be consistently incorporated into higher-level stages of documenting the projects.

Upgrades and public port construction in Bratislava and Komárno

- *Safety and monitoring systems at the Ports of Bratislava and Komárno*
- *Upgrades in the Ports of Bratislava and Komárno*
- *LNG terminal at the Port of Bratislava*

In terms of air:

In the follow-up stage of action to place the LNG terminal, to specify the capacity of any possible automotive transport and more specifically judge the impact on air quality, emphasizing the resuspended dust component with the effect of overall car transport on access roads.

With regard to existing increased ambient air load in Bratislava and vicinity, it is recommended at least to approximately specify the capacity of the proposed LNG terminal and the planned method of linking it to the road and rail network, estimating the maximum percentage of LPG transported by road to and from the terminal. The outcome from the assessed impact on ambient air of road transport together with the current load should be potentially included in the subsequent authorization of the building (when the capacity is greater than 25 commercial vehicles per day).

In terms of climate change:

The port infrastructure must be designed to take into account rising climate change uncertainty

In terms of noise and vibrations:

Consider in the noise study the location of the activities or placement of new technologies (drainage of wastewater, collection of used oil and similar operations), loading (type of technology) and frequency of operation including related traffic and route management.

In terms of nature and landscape:

The impacts of projects on the surrounding Natural 2000 network, internationally protected areas (e.g. Ramsar wetlands) and natural conservation interests (species, habitats and protected areas) needs to be carefully assessed when preparing, evaluating and authorizing projects, with recommendations to mitigate negative impacts in the assessment and the EIA to be consistently incorporated into higher-level stages of documenting the projects.

There needs to be an investigation of whether the planned activities will have an impact on the following Natura 2000 sites around the Port of Bratislava:

- CHVÚ Dunajské luhy (SKCHVU007) - Danube Floodplains SPA
- ÚEV Bratislavské luhy (SKUEV0064, SKUEV2064) - Bratislava Floodplains SAC
- ÚEV Malý Dunaj (SKUEV0822) - Little Danube SAC

Investigate whether the planned activities will have an impact on the following Natura 2000 sites around the Port of Komárno:

- ÚEV Dunaj (SKUEV2393) - Danube SAC
- ÚEV Vážsky Dunaj (SKUEV0819) - Váh Danube SAC

In terms of cultural heritage:

The use of the port sites and their vicinity valuable from a cultural heritage point of view have to be resolved comprehensively as part of spatial planning that should accordingly include an assessment of the possible environmental impacts (SEA), which would also include a cultural heritage impact evaluation.

Introducing modern technologies for managing maritime and port operations and implementing related technical measures

Note: includes "Upgrades to navigational aids at the Slovak stretch of the Danube international waterway and implementation of related technical measures")

In terms of noise and vibrations:

No exposure to the risk of a deteriorating noise situation and spread of vibrations is implied or expected from their own measures. The situation my change with the incidental presence of watercraft, for example when markings allow a higher speed for traffic and that can lead to sound power and a higher degree of vibrations proliferating. When adjusting the markings, preference should be given to quieting and relieving traffic close to protected objects, or to exclude certain modes of transport in risk-exposed areas (e.g. no motorboats allowed to move near residential buildings).

Introducing regular passenger navigation on the Danube (Dunajbus)

In terms of air:

Impact of the measure itself for introducing passenger navigation is positive, therefore it does not require prevention, minimization or offsetting.

It is essential to specify the Park + Ride zone's capacity not to worsen air quality around the boarding areas. When new parking capacity for over 500 vehicles is built in villages, it is recommended to assess the total ambient air quality situation in the neighborhood (including the contribution of existing car traffic) to the dispersion study, emphasizing the quantification of particulate matter and including resuspension from the road surface.

In terms of climate change:

In (pre) project preparation, consider possible climate change related uncertainties – e.g. potential growth in the number of days of forced downtime due to extreme weather conditions and the impact of these risks reflected in the analysis of the project's economic viability.

In terms of noise and vibrations:

A noise study is recommended to verify the noise situation and changes it causes in the affected area (boarding points, parking capacities).

In terms of water:

As part of (pre) project preparation to eliminate direct clashes with protected water supplies.

In terms of nature and landscape:

To mitigate or eliminate the negative impact on the protected subject matter affected, 14 mitigating measures were proposed as part of the EIA whose compliance would be necessary to implement the project. The measures aim at minimizing the risk of bird collisions on glazed surfaces, minimizing disturbance, habitat appropriation and the impact on selected food and nesting habitats and minimizing disruption and the risk of accidents.

V.2.2 Priority Axis 5 - Railway infrastructure and upgrading of rolling stock

Construction and upgrading of intermodal terminals for rail passenger transport and for integrated passenger transport and connecting them to the road network *(Note: covers construction of the Trebišov terminal)*

In terms of air:

In the follow-up stage of action to place the intermodal terminal, to specify the capacity and place new capacity including quantification of traffic intensity changes on surrounding roads and parking areas. Use this data to prepare a pollution dispersion model including existing transport contribution to ambient air and the impact of redispersion from roadway surfaces.

In terms of climate change:

Railway infrastructure should be constructed to respect local conditions and relevant risks including climate.

In terms of noise and vibrations:

It is strongly recommended to produce a detailed noise study complemented with measurements of existing noise at the site.

In terms of cultural heritage:

Project preparation should take comments by heritage preservation authorities into account and also their conditions (e.g. rescue archaeology).

In terms of population and health:

See the recommendations on air and noise.

V.2.3 Priority Axis 6 - Road infrastructure (outside the TEN-T CORE)

Adding the R2 Kriváň – Mýtna and R2 Mýtna – Lovinobaňa, Tomášovce

In terms of air:

Consistently apply standard anti-dust measures during construction and place conditioning lines and construction material depots at least 500 meters away from buildings in a community.

In terms of climate change:

Conduct climate proofing during pre (project) preparation using the methodology devised by the Ministry of Transport and Construction.[37] See the climate change risk assessments for construction of the R2 Expressway Kriváň – Lovinobaňa, Tomášovce, Stretch I of Kriváň – Mýtna (ENVIGEO 2018) and for construction of Stretch II of the R2 Expressway Mýtna – Lovinobaňa, Tomášovce (ENVIGEO 2017). The assessment does not imply the need to implement measures beyond those contained in the construction design documentation. Therefore no other measures in the OPII Amendment SEA are proposed.

In terms of noise and vibrations:

The project included a proposal for anti-noise measures and it was stated at the end of the document that "ambient noise pollution in the assessed stretch of the R2 expressway would not exceed permissible equivalent ambient sound pressure values after anti-noise measures are implemented - installation of noise absorbent barriers - during the day, in the evening and at night other than five-family homes in 2041 and five-family homes in 2031. Protecting these homes against noise using noise absorbent barriers is limited by restrictions in the height of them (maximum of 4 meters) due to their location on bridges. Measures would also need to be taken for these family homes to increase airborne sound insulation of the building envelope for the protected building in terms of protecting the interiors from noise made by the R2 expressway."

At higher project design stages, it would be necessary review the assessment's currency and of any noise study and to update the entire assessment, if necessary. The assumptions and conclusions drawn from the noise assessment are reviewed by measuring noise at the site once the intention has been implemented.

In terms of water:

[37] Transport Research Institute, 2018: Methodological guide to assessing the impacts of climate change on major projects in the transport sector. https://www.opii.gov.sk/download/f/zmena_klimy/metodicka_prirucka_posudzovania_dopadov_zmeny_klimy.pdf

- Ensure rain water is drained at the stretch of the R2 Kriváň-Mýtna passing through the Upper Ipeľ, Rimavice and Slatiny Basin WMA to eliminate the risk of contaminants penetrating into the groundwater;
- Propose appropriate winter maintenance technology at the stretch of the R2 Kriváň-Mýtna passing through the Upper Ipeľ, Rimavice and Slatiny Basin WMA to eliminate the risk of contaminants penetrating into the groundwater;
- Minimize intervention in watercourses.

In terms of soil and rock environment:

Building yards and construction material landfills would be placed either on land permanently appropriated for the R2 expressway (at interchanges) or in areas not used for agricultural purposes.

When expanded mining of mineral resources is planned, it is suggested to conduct a full assessment of the impact on the environment of either extending existing mining sites or opening new ones.

The risks of accidental landslides need to be addressed in the context of follow-up design work,- particularly in detailed design proposals (measures to stabilize slopes).

In terms of waste:

Possible depots for mined material and equipment for processing them (mobile chippers, recycling and grading lines) will be placed outside built-up areas of communities (at least 200 meters away) and at an adequate distance from a village to cover possible increased adverse impact from noise and dust.

In terms of nature and landscape:

Specific impacts were identified at the individual project level (especially impacts on biodiversity, fauna, flora and habitats, see IV. 2.7.1) and they need to be mitigated as proposed in specific documentation and decisions by nature conservation authorities.

In terms of cultural heritage:

Project preparation should take comments by heritage preservation authorities into account and also their conditions (e.g. rescue archaeology).

In terms of population and health:

See the recommendations on air and noise.

Adding the R4 Prešov – North Bypass

In terms of air:

Consistently apply standard anti-dust measures during construction and place conditioning lines and construction material depots at least 500 meters away from buildings in a community.

In terms of climate change:

Climate proofing was processed in (pre-) project preparation for large infrastructure investments and its outcome would be taken into consideration in finalizing the technical solution and operational monitoring. The climate change risk assessment for the R4 Expressway Prešov-North Bypass (VÚD, 2018) notes the main identified risks to be at the level of operational and safety restrictions associated with extreme precipitation and strong winds, along with hail especially during storms and these are only temporary in nature (lasting several dozen minutes). This risk can be accepted in view of the existence of a highway information system that allows a sufficiently timely response to an adverse weather situation. The assessment further notes the need to add an assessment of certain incremental risks at the next stage of preparing design documentation (e.g. risk of local road flooding caused by extreme precipitation such as storms, of a waterlogged road base caused by extreme

precipitation and the risk of disturbances in the stability of fill, cuts in slopes and supporting walls due to extreme precipitation or extreme drought. In terms of the OPII SEA, it has been sufficiently addressed. Therefore no other measures in the OPII Amendment SEA are proposed.

In terms of noise and vibrations:

Potentially negative impacts in terms of the noise situation in Veľký and Malý Šariš have been resolved in the design documentation. The need to construct noise absorbent barriers is expected from the noise study that was prepared (INSL, Martin, August 2013). According to conclusions mentioned in the design, the following is required for compliance with hygienic limits:

- 1 noise absorbent barrier is proposed for the R4 (left-hand side at km 3.180/3.800).
- Land has been prepared at km 0.0 – 1.6 on the right-hand side for individual housing. The unpaved R4 shoulder is broadened to allow a noise absorbent barrier to be placed in the future after individual housing has been constructed.
- The height of the barrier is proposed to be 3 meters above the terrain (at another place in the design 3.5 meters above the terrain is mentioned). Noise absorbent barriers are considered to be sound absorbing, opaque and matte-coated. At bridges they are fully reflective, translucent and matte.

In terms of soil and rock environment:

Building yards and construction material landfills would be placed either on land permanently appropriated for the R4 expressway (at interchanges) or in areas not used for agricultural purposes.

When expanded mining of mineral resources is planned, it is suggested to conduct a full assessment of the impact on the environment of either extending existing mining sites or opening new ones.

The risks of accidental landslides need to be addressed in the context of follow-up design work,- particularly in detailed design proposals (measures to stabilize slopes).

In terms of waste:

In the next stages of project documentation, the amount of material excavated from the Bikoš and Okruhliak tunnels and the method for disposing of it will be specified in detail.

In terms of nature and landscape:

Specific impacts were identified at the project level and they need to be mitigated as proposed in specific documentation and decisions by nature conservation authorities.

The issue of the R4's impact on migrating animals needs to be resolved as part of the elaboration of Stretch II of R4 Prešov - North Bypass.

In terms of cultural heritage:

Project preparation should take comments by heritage preservation authorities into account and their conditions (e.g. rescue archaeology).

In terms of population and health:

See the recommendations on air and noise.

Supporting the introduction of alternative fuels in road transport

The specific activities listed below are recommended for inclusion in the OPII Amendment when they aim to create an optimal environment for the development of e-mobility and other types of low-carbon transport, thereby increasing the positive environmental impacts from implementing PO 6.

- Broadening electric car charging infrastructure

It is critical for optimal results to use also current urban infrastructure. It is not always necessary to build a completely new recharging station that frequently requires a complicated connection to the grid. It is especially difficult to construct them in those city neighborhoods with cultural, historical or other values. The following examples use infrastructure already built.

Smart trolley grid

The trolleybus fleet and its infrastructure are used for more than operating the means of transport. They also recuperate electricity and return it to the overhead contact line. The excess current is then sent to the charging stand or to charge electric bicycles. This system is advantageous in places where it is difficult to connect the charging station to a power source with the required parameters. Such a system operates in Arnhem, Netherlands. Below is the link to Trolley 2.0., an example of international cooperation which examines the potential of tram networks. The city of Prague is also looking at the use of overhead tram cables. https://www.smarttrolleygrid.com/en

The use of in motion charging (IMC) in trolleybus transport is attractive. It consists of another EV battery charged while the vehicle is braking. The technology enables the trolleybus to run for longer distances away from the overhead contact line. This allows routes to be extended to places where trams have yet to be introduced.

Smart trolley grids are understandably applicable in cities with tram services such as Žilina, Prešov, Banská Bystrica, Košice and possibly Bratislava.

Recharging points at existing transformer stations

There are a large number of traffic stations located in neighborhoods and other residential quarters that can be effectively used to build recharging points. Generally, they are well-accessible points with room to park cars and have adequate electric power input. An example is the "wall boxes" from the PRE Group, which is building these chargers in Prague neighborhoods (see photo).

https://www.pre.cz/cs/profil-spolecnosti/media/tiskove-zpravy/zcela-novy-typ-nabijecich-stanic-v-praze/

- Expanding service stations to offer alternative fuels - particularly CNG and LNG

Such stations can complement existing provisioning mechanisms offered by the Ministry of Economy as part of the National Policy Framework for Market Development of Alternative Fuels (Measure 2).

There are currently 1,500 passenger cars running on CNG in Slovakia. Underdeveloped infrastructure and a lack of service stations (19 altogether including those just built) are particularly hindering development. The Czech Republic could become a model example where the government closely cooperates with natural gas companies and, under certain circumstances, obliges them to set up stations and promote the technology. The vast majority of the stations are owned by the company. With 185 public stations and 20,000 passenger cars and vans, the Czech Republic ranks among Europe's leaders in CNG use for automotive transport.

- Using electrical bicycles for alternative transport

Bicycle transport plays a major role in urban mobility and has the potential to reduce greenhouse gas production and facilitate overburdened infrastructure. European legislation defines electric bicycles as bicycles with pedals that are equipped with an auxiliary electric engine with maximum continuous power of 0.25 kW, whose power progressively falls as the engine slows down when the bicycle reaches 25 kilometers per hour or as soon as the cyclists stops pedaling. The operating costs are low and there is a wide area of application.

Electric bicycles for government employees

Additional support for clean urban mobility can be found from municipalities and regions that have had the opportunity to receive government support for the purchase of commercial and passenger electric cars. Shared city bicycles for government employees offers a healthy and fast alternative for urban transport. Instead of mass transit or cards, employees can use electric bicycles which provide easy transport thanks to promotion of pedaling. Electric bicycles are used for this purpose by employees for the most varied urban errands or they can be used as part of benefits for private purposes. Similar benefits are already well-known outside Slovakia. An example comes from London's Waltham Forest district, which provides electric bicycles at no charge to its employees. https://www.transportxtra.com/publications/local-transport-today/news/59702/free-e-bike-hire-for-waltham-forest-staff/

Electric bicycles in postal services

Research and modelling projects have shown that electric and cargo bicycles can replace up to 51% of all automotive logistical transport. In light of the increasing demand for improved delivery services and the deteriorating traffic situation in cities, electric bicycles have becomes a means to streamline postal service while avoiding crowded streets.

Deutsche Post uses 1,000 electric bicycles while La Post in France has the most numerous fleet with 25,000 electric bicycles. In 2015, Hrvatska Pošta launched the delivery of letters by electric bicycle in Croatia. Cargo bikes are now used by private shipping companies such as DHL, GLS, UPS and FedEx.

GPS allows real-time monitoring. The system provides data on delivery speed and route length, which is then used to plan and optimize delivery routes. Post carriers log into the system using their own unique IDs. It is easy to find who was last using an e-bike (by comparing each individual employee's performance).

- Processing background analysis and plans

The issue of green mobility development has been very thoroughly written in many documents, although they often overlap or repeat in many of them. It can be noted that a coherent strategy is missing for the development of CNG service stations and a specific plan for building recharging points for e-mobility. An action plan for developing e-mobility has been included in these measures, but it only defines very generally how such development should be accomplished. In order to effectively implement the OPII Amendment, the preparation of a schedule for building charge points and analyzing demand among eligible beneficiaries especially needs to be proposed.

V.2.4 Priority Axis 7: Information society

Supporting the construction of smart cities and regions through ICT

We recommend only those intentions that are based on the "smart city strategy" prepared for the city. The benefits and risks of these envisaged new technologies and innovation should also be part of the processing of the strategy and taken into account when approving them.

It is very challenging and virtually impossible to fully forecast the implications of the new technologies, their interactions with each other and the links to other forces causing changes in society. The objective of evaluating the technology[38] is therefore not an accurate prediction of the impacts, but rather to identify potentially significant changes and risks or findings of how a smart

[38] See https://www.iaia.org/wiki-details.php?ID=26

city follows the principles of sustainable development. The outputs from the evaluation can thus provide feedback for those processing a "smart city strategy" and those developing and implementing specific new technologies.

In view of the economic situation in regions of the Slovak Republic, it can be recommended to focus on areas economically less developed (e.g. Prešov, or Banská Bystrica) to promote their development.

Promoting innovative SME solutions using public administration data and services

It is recommended to create an overview of the risks associated with developing the technologies that can be supported in the OPII and taking into account these risks when evaluating and selecting projects for support.

VI. The reasons for selecting alternatives taking into account the objectives and geographical dimensions of the strategy paper, describing how the evaluation was carried out and including difficulties in providing the necessary information, such as technical flaws or uncertainties

VI.1 Addressing alternatives

The OPII Amendment has been drafted and submitted for evaluation of one variant. It follows from the purpose of the document that it updates the already approved Operational Programme to increase its absorption potential in the remaining, relatively limited time until the end of the programming period. Given that the proposed adaptions have to comply with OPII objectives and conditions, while taking into account the short time horizon for support, it is not essentially for formulating an alternative reason and the proposed OPII Amendment was formulated to enable projects to receive support which are in such a preparation phase to allow them to receive financial support from the OPII by the deadline set in the OPII conditions. In light of the limited number of projects fulfilling both these conditions, no alternative solutions need to be prepared in the process of drafting the OPII Amendment.

VI.2 Methodological approach to the OPII Amendment SEA

The proposed amendment to the OPII changes the strategic document at the national level to address the main transport measures of national interest, as well as to support partial transport network measures whose potential impact on the environment was subject to a SEA in 2013. For this reason, the environment impact assessment of the OPII Amendment focused particularly on evaluating possible impacts of specific projects considered in the context of the proposed OPII Amendment as appropriate candidates for receiving support (whether or not they are explicitly mentioned in the proposed OPII Amendment), with the aim of identifying potential environmental and health risks and formulating appropriate measures to exclude or mitigate them.

In order to evaluate the impacts of the OPII Amendment on the environment and human health at the national level, an updated analysis was used that had been prepared as part of the SEA for its own OPII (2013) and likewise, in particular, the impact evaluation from the *Strategic Transport Development Plan for Slovakia until 2013 - Phase II* on the environment and human health (SEA SPRDII SR 2030, 2016). A description of the status, trends and envisaged environmental developments without implementing the OPII amendment ("baseline scenario") has been thus prepared, among other things, also from using the outcome of the transport modeling used in the SEA SPRDII SR 2030 (2016), so the current, most comprehensive description of the expected development of transport prepared in the strategic planning of Slovakia's transport sector. Given the scope and nature of the individual proposed changes to the OPII, it is clear that the extent of possible impacts of the OPII Amendment on existing conditions and trends at the environmental level will be small.

At the level of possible impacts from individual specific projects considered for OPII support, the impact assessment of the OPII Amendment relies on publicly available information about specific intentions, in some cases including existing EIA dossiers. The objective behind assessing the impact from the OPII Amendment neither duplicates the already submitted EIA nor estimates from the available project documentation the possible impacts at the level of the detailed EIA. As mentioned above, the impact assessment from the OPII Amendment concentrates on identifying the risks (and potentially positive impacts) which need to be taken into account in the more detailed phases of project preparation for these intentions, and especially to identify possible cumulative or synergic impacts related to implementation of the potentially supported intentions.

The OPII Amendment does not propose any territorial management of transport corridors, nor does it address them. In order to evaluate specific potential projects, routes set out in land-use planning or projects have been used. However, this is not included in the OPII, which does not address routing in proposed measures.

In view of the nature of the measures addressed in the proposed OPII Amendment, assessment of their impacts is burdened to a considerable degree by uncertainty, particularly about the impacts of generally formulated procedures either at the national level or on the entire transport network (e.g. support for e-mobility and rolling stock upgrades). For measures relating to specific intentions for constructing road network stretches, in view of details from available documented project information including the EIA, the degree of uncertainty with respect to direct impacts in most of the evaluated environmental components (such as noise, nature and biodiversity, local ambient air) is relatively high. An exception is the contribution of these projects toward overall emissions of pollutants, including greenhouse gases, as it is such a small part of the overall road network that the impact from either implementing them or not on the total emissions situation at the national level can be hardly estimated. For these reasons, no quantitative assessment of the impact of the OPII Amendment on national greenhouse gas emissions has been carried out and the proposed measures have been assessed only qualitatively, i.e. whether they can contribute to achieving the greenhouse gas emissions objectives or not.

VII. Proposed monitoring of environmental impacts including impacts on health

The SEA for the original OPII proposed a set of indicators for monitoring the impacts from its implementation on the environment. Likewise, the SPRDII SEA proposed a set of indicators and formulated recommendations for the method of monitoring for relevant environmental components. In compliance with the final opinion of the OPII SEA, [39] an information monitoring system (ITMS) was established for monitoring the OPII to register, process, export and monitor programming and financial management, control and audit data. In addition, information is available for the entire transport sector, obtained in the "Processed Environmental Traffic Monitoring and Analysis" (Transport Research Institute) which comprises addressing and processing traffic emissions in the Slovak Republic, monitoring and creating, an environmental indicator database and the significant environmental indicators for evaluating conditions and protecting biodiversity in Slovakia for 2017.

The proposed monitoring shown below is based on the draft SPRDII SEA. Although the OPII Amendment SEA is primarily aimed at assessing impacts from the proposed changes, it can be recommended, especially when projects financed from the OPII taking several years would take several years to implement, to propose and introduce a system for monitoring the impacts from implementing the entire OPII on the environment and public health (and not just to monitor the impacts from implementing the OPII Amendment). The proposals and recommendations below are therefore formulated for the entire transport sector where OPII support measures will be implemented.

Air

Air quality and changes thereto from the impact of implementing individual OPII intentions can be objectively evaluated only on the basis of ambient air quality measurements at the relevant site. The indicator value must be firmly tied to the outcome of measurements or modelling at a particular site. However, an appropriate site for monitoring indicator values cannot be selected without a specific measure reflecting it. For a number of measures, the indicator and its value can therefore be set at the project level, i.e. in the EIA phase or in the follow-up authorization of construction.

To monitor the impacts of the entire OPII and prevent exposure to possible ambient air quality risks, it is suggested each year to evaluate it and the trend in regional emissions from road traffic in the Bratislava and Žilina regions. It is likewise recommended to broaden ambient monitoring at places where the impact of transport on ambient air quality is envisaged to be significant. These locations and the pollutants are:

Table VII-1: Proposed expansion of air quality monitoring

Location	Pollutants	Reasoning
Ružomberok, Riadok	benzo(a)pyrene	high existing traffic burden, poorly ventilated valley
Prešov, Arm. gen. L. Svobodu	benzo(a)pyrene	transport congested city center (no bypass), large exposed population (dense urban construction)
Krásno nad Kysucou, Námestie Mieru	PM_{25} particulate matter, benzo(a)pyrene	The Čadca-Žilina road corridor has been indicated to have an indicated significant traffic impact and a potentially deteriorating impact on the

[39] See https://www.enviroportal.sk/eia/dokument/211193?uid=a38f15ff4b8c765e8525dcefd53925c06af6f94a),

		concept. Here the greatest change in transport emission density is expected in the corridor to be at Krásno nad Kysucou

Greenhouse gas emissions

It is recommended to compare and coordinate the methodology for calculating greenhouse gas emissions from transport used in Slovakia for reporting within the EU and the UNFCCC with methodologies for the calculation of greenhouse gas emissions from transport projects used by the European Investment Bank.[40] The comparative analysis would seek to describe possible deviations between the different calculation procedures and establish a calculation methodology for use in the transport sector (for OPII and for the new OP, or the update in the Strategic Transport Development Plan for Slovakia to 2030 and downstream planning processes).

Noise

Noise monitoring is appropriate at selected locations that are potentially problematic in terms of noise pollution. It is suitable to collect noise at these locations through occasional and regular measurements progressively supplemented by noise studies assessing solutions and site development. Measurements may be supplemented, where appropriate, by a questionnaire to be filled at the affected sites which would complement and broaden noise measurements with details characterizing the population in terms of their health and attitudes toward noise. Traffic noise is appropriately monitored with the aid of 24-hour outdoor noise measurements periodically every two or three years during the spring or autumn, under standard conditions. Each measurement includes a survey of traffic intensity and patterns.

In the SPRDII SEA, locations subject to assessment from modeled calculations had the equivalent sound pressure [dB(A)] calculated at the estimated edge of roads identified as critical sites, where a high sound pressure level was 85 [dB] had been recorded and a number of residential buildings are located in the greater vicinity (up to 100 meters from the road). Critical sites where noise monitoring has been proposed are identified in IV.3.3. of the SPRDII Evaluation Report Detailed noise studies should be conducted at least in those locations connected with the construction of new roads (or improvements in current roads) and complemented as needed with noise measurements, and based on the specific situation determined to take adequately effective draft anti-noise measures (e.g. structural roadway layers reducing noise or noise-absorbent barriers). When designing an anti-noise solution, it is necessary to verify it at the stretch either by strategic noise mapping (Phase II was carried out in 2011) or with action plans prepared by the different regions in 2012 and 2013 (based on data from strategic noise maps that were produced in 2011 and do not take the changes in 2012 and 2013 into account), since these materials were processed when no specific solution to the structure was known and no changes in congestion had called for the structure.

The choice of sites for monitoring noise should be adjusted on the basis of precise land management of the new structures. Once construction has been completed and the proposed measures have been implemented, it is recommended to review their effectiveness through noise measurements. Depending on the frequency of traffic on the road in question (e.g. due to timing), noise measurements can be repeated and the effectiveness of the anti-noise measure reviewed.

Population and health

[40] European Investment Bank. 2012. Methodologies for the Assessment of Project GHG Emissions and Emission Variations, Version 10.1.

Table VII-2: Proposed health impact indicators

Health protection objectives	Proposed indicators
Reducing the number of deaths and injuries from road accidents	Determining the percentage of pedestrians and cyclists in accidents and among fatalities.
Preserving or improving air quality	Assessing ambient concentrations of PM, N_2O and B(a)P in communities (in cooperation with the Slovak Hydrometeorological Institute).
Complying with noise limits and reducing noise	See monitoring of noise impacts above.
Enhancing healthy lifestyles	Cardiovascular disease mortality rate in cooperation with the National Health Information Center.
Promoting equal and equitable access to health and social care	Monitoring emergency medical care ambulance trips and response time in different regions or catchment areas.
Job opportunities in transport	Transport sector employment statistics.
Economic status of inhabitants	Average wage of transport employees.
Enhancing transport related to physical and mental health and comfort (partly stated in other objectives)	Kilometers of cycle trails

Nature and landscape

It is recommended to monitor the following OPII implementation impact indicators to achieve natural conservation objectives:

- Appropriated land in different type protected areas or according to the degree of protection when implementing infrastructure measures;
- Appropriated habitats of national interest and habitats of Community interest The area is proposed in order to provide for the protection of habitats of European importance;
- Measures implemented to offset negative impacts.

Surface water and groundwater

When projects are implemented to accomplish the OPII, it is recommended to monitor and evaluate the following qualitative and quantitative indicators:

- Condition of surface water and groundwater not affected by the OPII or the implementation of individual activities in accomplishing the OPII;
- Yield and quality of water supplies at sites which would be affected by implementation of individual activities in accomplishing the OPII;
- Any elimination of individual water sources;
- Any breach of measures governing a water management area or a managed water resource's buffer zone;
- Rise in chloride content in watercourses;
- How much impact traffic has on accidental deterioration of water;

Climate change

In view of the uncertainties, it is recommended to systematically monitor damage caused to roads by gradual changes in precipitation, wind and other climatic conditions. Priority should be given in

this circumstance to focusing on permits to be in future dimensioned for intensive torrential rainfall and more extreme conditions in small water flows. Results from such monitoring can be used for a systematic overview of the scope and frequency of exposure to potential risks.

At the same time, it is recommended to monitor the incidence of any glazed or black ice. In the event of any gradual increase in the scope and frequency of these phenomena due to climate change, it is recommended to establish a warning system for the entire rail network in Slovakia on the possible occurrence of glaze or black ice. This warning system should be used to make operating decisions on the risk of possible jams involving trains and their passengers on tracks and whether operations could not be provided by diesel locomotives or substitute bus transport (if possible).

Waste

In view of the environmental objectives in the waste management area, it is recommended to monitor waste production indicators from construction and upgrading of traffic infrastructure and the utilization rate of materials obtained during it.

In view of the nature of the OPII and the specific changes thereto, no monitoring of the impact on the remaining environmental components is proposed. Potential negative impacts must been addressed through procedures provided in Act 24/2006 *Coll.*

VIII. Envisaged significant cross-border environmental and health impacts

In terms of potential cross-border impacts of the proposed changes to the OPII, substantial activities are planned on the Danube Waterway where impacts on surface water and ground water beyond the borders of the Slovak Republic can be envisaged. Implementation of measures to improve navigability on the Danube and constructing berths and parking lots for Dunajbus include encroaching on the Danube riverbed and banks. There would be intervention in water body hydro-morphology and it could be substantial where they are defined as natural, namely above Bratislava (SKD0016 Dunaj, ATOK411340000 Donau_01) and on the stretch of the Danube composing the border between Slovakia and Hungary (SKD0018 Dunaj a HUAEP446 Duna Gönyü-Szob között). While interventions in the implementation of Dunajbus infrastructure are local in scope and can be considered in terms of the hydro-morphological condition of the relevant water bodies to be insignificant, interventions for improved navigability may be potentially significant. It will depend on the form of the specific projects. *Increased current velocity in the lower Hrušov Reservoir* is localized in SKD0015-VDG, defined as artificial and therefore the envisaged interventions are evaluated as insignificant.

The objective of the proposed activities is to make the waterway more attractive and directly attract new public water transport (Dunajbus) and, once the measures have been implemented, it can be thus envisaged that maritime transport intensity will rise, which would be linked to increasing exposure to the risk of water pollution on the Danube from normal operation as a result of accidents. Pollution may affect all water bodies comprising the Slovak section of the waterway and also water bodies on the Danube downriver (HUAOC756 Duna Szob–Budapest-között). However, the risk of accidents will be reduced by planned upgrading of the fairway and also public ports. The impacts may therefore be assessed as slightly negative.

No relevant measures have been particularly proposed to mitigate or minimize identified activities planned for the Danube Waterway (see Chapter V above).

No possible cross-border impacts of the proposed OPII Amendment on other environmental components or health were identified.

IX. Non-technical summary of provided information

This report on the assessment of a strategic paper has been processed in accordance with Act 24/2006 Coll. on environmental impact assessment and amendment of certain laws, as amended. The report presents conclusions from the assessment of the impacts on the environment and human health of the proposed Amendment to the Integrated Infrastructure Operational Programme (Version 6.0) in connection with the adoption of selected priority axes ("OPII Amendment").

IX.1 OPII Amendment content

The Integrated Infrastructure Operational Programme is a programming document of the Slovak Republic for drawing aid from EU funds in 2014-2020 for the transport sector and for enhancing access to information and communication technologies and improving their use and quality. The OPII was approved in European Commission Decision C(2014) 8045, dated 28 October 2014. The contracting entity for both the OPII and the OPII Amendment is the Ministry of Transport and Construction of the Slovak Republic (MTC)

The OPII environment impact assessment process provided in Act 24/2006 Coll. and Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 and on health was conducted in 2013-2014 and was concluded with a positive opinion from the Ministry of Environment on 4 March 2014.

The proposed amendment to the OPII relates, in particular, to the current state of implementing Priority Axes 4, 5, 6 and 7, which either have not achieved adequate progress or have the potential to increase allocations. The Managing Authority for the OPII proposed new activities and changes to existing activities within Priority Axes 4, 5, 6 and 7, to raise their absorption potential. They form the prerequisites for a possible increase in the financial framework of these priority axes in 2019, either within internal reallocation or from other operational programmes. Amendments to the OPII accordingly include adopting or adding content to selected priority axes in the Operational Programme.

The amendment to the OPII aims toward adapting and adding content of the selected priority axes to the Operational Programme. Since the adoptions and additions to the OPII are formulated in rather general terms, proposals for specific activities exist to implement the OPII Amendment. A brief overview of the proposed changes and specific activities considered is provided below (a full description of the OPII Amendment can be found in II.6).

Priority Axis 4 - Water transport infrastructure (TEN-T CORE)

Changing the name of Specific Objective 4.1 including adapting and expanding its content

The amendment to the OPII to version 6.0 includes a proposal by the OPII MA to change the name of Specific Objective 4.1. The new name would be *"Specific Objective 4.1. Improving the quality of services provided on the Danube Waterway."* As part of the Specific Objective, the OPII MA is creating space for the implementation of activities prioritizing pre-project and project preparation, as well as implementation of specific projects to improve the navigability of the Danube Waterway. Intervention in the Danube Waterway includes projects that cover the upgrade and construction of public ports in Bratislava and Komárno.

Additions to the Komárno public port financed from OPII funds
Change in eligible beneficiaries
Changing the name of "A" including adapting and expanding its content

Following the intention to procure appropriate stages of the project documentation, as well as implementing projects aimed at ensuring the required parameters on the Danube Waterway's fairway, the OPII MA proposes to change the name of "A" to *"A: Improving navigability on the Danube Waterway".*

To implement this adoption, the project charter *Changing current velocity in the lower Hrušov Reservoir - pre-project and project preparation* was drafted.

Changing the name of "B" including adapting and expanding its content

Along with the addition of the public port at Komárno to OPII funding, the OPII MA proposes changing the name of "B" to "*B: Upgrades and public port construction in Bratislava and Komárno"*.

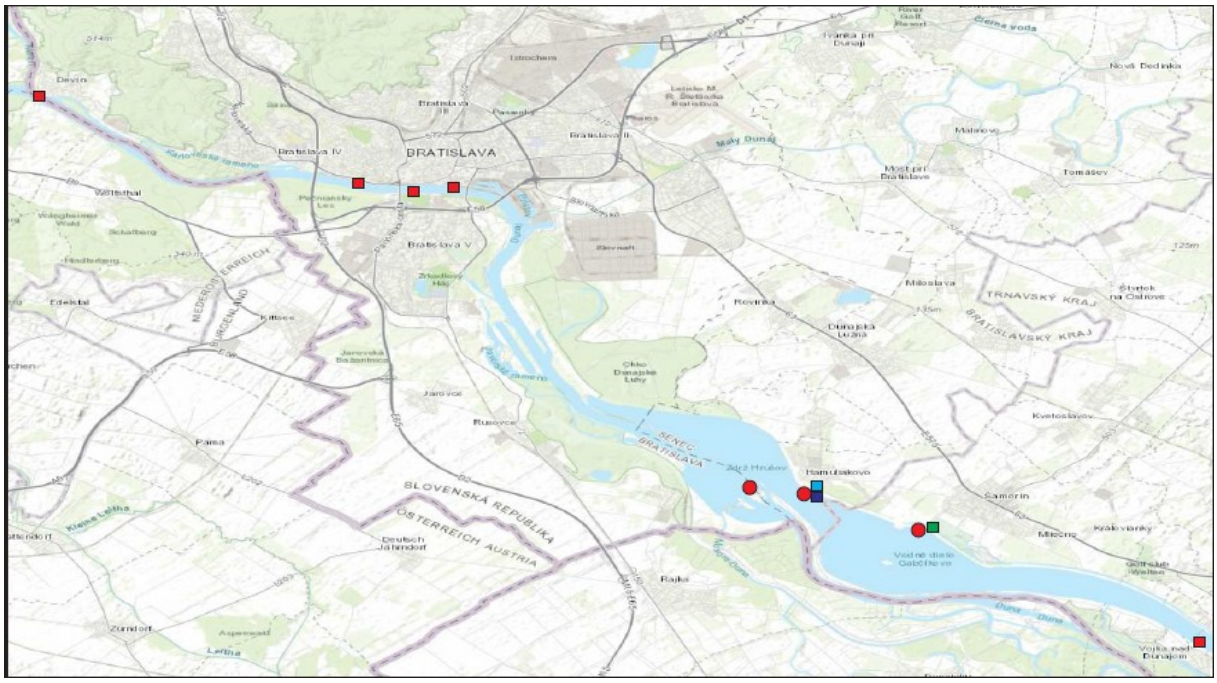
To implement this adoption, drafts of the following project charters were prepared:

- Facilities for vessels (Bratislava)
- Building an LNG terminal at the Bratislava public port – pre-project preparation
- Port security - pre-project preparation

Broadening the focus of "C. Introducing modern technology into the management of maritime and port operations"

Adding a new eligible activity "D. Introducing regular passenger navigation on the Danube (Dunajbus)"

The project aims to establish a passenger river shuttle service covering the 50 kilometers between Bratislava-Devín and the village of Vojka nad Dunajom by constructing new port marinas (to become stops with a shelter and some as stops with snack bars) which will incorporate existing marinas, creating eight stops for ships along the Danube (see the figure below).



Date:
October 2018

N

1:120 000

Legend:
existing marina
Suggested action
newly-constructed marina
new parking area
winter marina - DEPOT
expansion of existing parking

Figure IX-1: Map of the expanded Dunajbus network

Source: EIA, October 2018, EKOJET, s.r.o., Industrial and landscape ecology

Priority Axis 5 - Railway infrastructure and upgrading of rolling stock

The OPII MA for PA 5 proposes adding new activities and specifying the existing priority axis text in greater detail, specifically:

Changing the name of Priority Axis 5 and adding a new specific objective 5.3

The OPII MA proposes changing the name of PA 5 to *"Railway infrastructure and upgrading of rolling stock"*. Simultaneously, it proposes adding thereto a new specific objective *"Specific objective 5.3: Enhancing the attractiveness and quality of public rail passenger transport by upgrading rolling stock."* The aim of this modification is to create space for upgrading rolling stock providing public passenger transport by rail.

Adding a new activity "I. Upgrading public rail passenger transport rolling stock"

The amendment seeks to add the option to acquire new trainsets, primarily in Prešov Region, to PA 5 (due to growing interest among passengers in rail passenger services.

Adding an activity to construct checkpoints on the Slovak Railways (ŽSR) network

It involves building infrastructure management checkpoints, which may constitute a significant contribution toward reducing the number of safety incidents and traffic accidents in the ŽSR network. Specific points would be located along the ŽSR network and furnished with technical installations in accordance with the feasibility study of constructing network checkpoints and would include the method for integrating data into the ŽSR network.

Changing the name of "C" including adapting and expanding its content

Following the intention to construct an intermodal terminal in Trebišov from PA 5 funds, the OPII MA proposes changing the name of "C" to *"C: Construction and upgrading of intermodal terminals for rail passenger transport and for integrated passenger transport and connecting them to the road network."*

Priority Axis 6 - Road infrastructure (outside the TEN-T CORE)

The OPII MA proposes more detailed specification of the existing PA 6 wording, namely:

Adding the R2 and R4 expressways

The OPII MA proposes for expressway construction to add further stretches of the R2 and R4 which, in the event of an increase in the OPII financial framework, can be funded from resources in the operational programme. The stretches to be added to PA 6 by the OPII MA are:

- R2 Kriváň - Mýtna; and
- R2 Mýtna – Lovinobaňa, Tomášovce.

The structure (including both stretches above) was passed through the EIA process, which was completed with the final opinions for the R2 Expressway Zvolen – Lovinobaňa from the environmental impact assessment issued by the MOE on 17 February 2006 (4366/04-1.6) and for the R2 Expressway Lovinobaňa – Ožďany from the environmental impact assessment issued by the MOE on 18 December 2007 (2329/07-3.4/ml.).

A joint communication of changes was drafted for both stretches in 2018, although each stretch is located in a different phase of project preparation. For the stretch between Kriváň and Mýtna, technical requirements for construction work have been prepared (in the form of tender documentation), while for the stretch from Mýtna to Lovinobaňa and Tomášovce construction authorization documentation has been drafted.

Another stretch whose addition to PA 6 has been proposed is:

- R4 Prešov – North Bypass.

This is the stretch of construction of the R4 Expressway bypassing Prešov to the north in the proposed category R 24.5/100, functioning to address transit traffic currently creeping through Prešov. In 2004, *R4 Expressway Prešov- North Bypass* was drafted by Dopravoprojekt, a.s. Bratislava as an assessment report which was subsequently submitted to the MOE as the competent authority under Act 24/2006 Coll. The MOE issued its final opinion on the environmental impact assessment on 17 February 2006. In 2009, planning authorization documentation was drafted which essentially factored significant changes from tunnels, bridges, protection walls and size of land to be appropriated into the environmental impact assessment. As construction was prepared, further changes were made, which in 2014 were reflected in design drawings from construction authorization documentation and subsequently in two communications of changes in proposed activities (2015 and 2017).

Supporting the introduction of alternative fuels in road transport

This new activity aims to promote market development of alternative fuels in road transport, including development of the relevant infrastructure. The most promising area of support from the OPII, in line with the action plan for the development of e-mobility in the Slovak Republic, appears to promote an electric car charging infrastructure.

Priority Axis 7: Information society

Supporting the construction of smart cities and regions through ICT

The objective of this new activity is to promote information and communication technology (ICT) introduction in cities.

Promoting innovative SME solutions using public administration data and services

The objective of this new activity is to create a Small Project Fund, which would encourage innovative small and medium-sized enterprises (SMEs) through a voucher mechanism to use open public administration data to create new applications and services.

The diagram below provides an overview of the change in the OPII involving the territorially specified OPII intentions in water transport infrastructure (Priority Axis 4)[41], railway infrastructure (Priority Axis 5) and road infrastructure (Priority Axis 6).

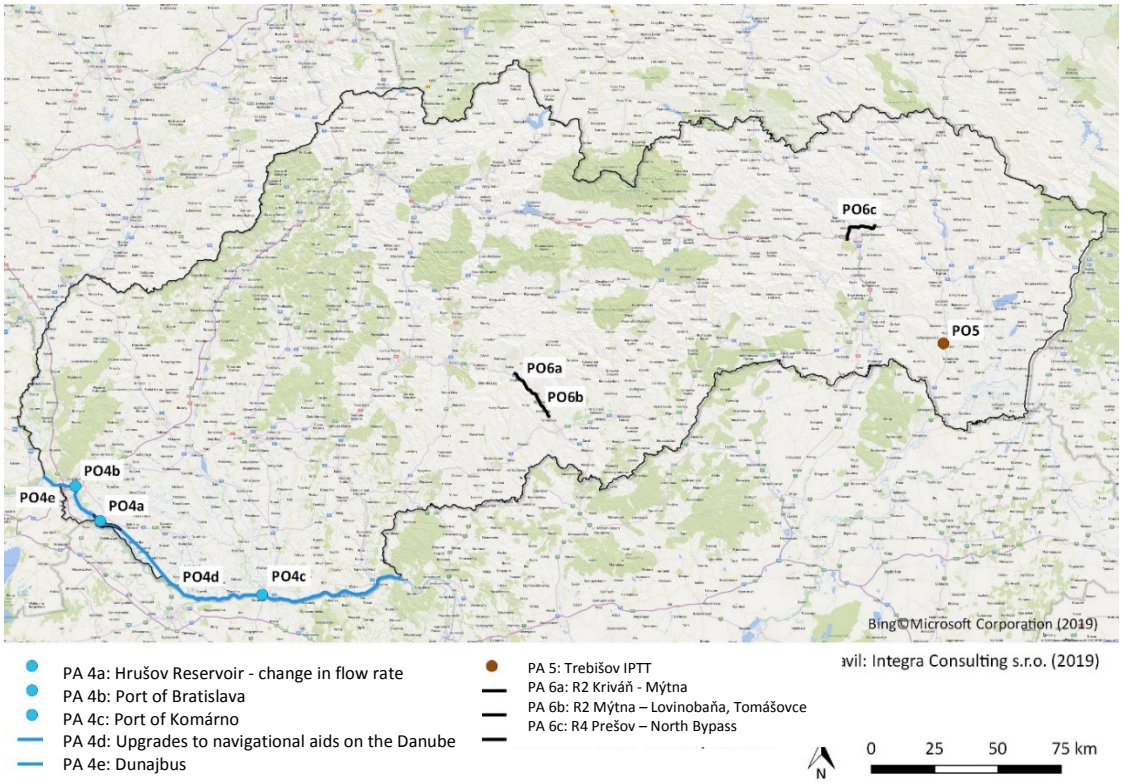


Figure IX-2: Territorially specified intentions proposed in the OPII Amendment

IX.2 Summary of the impact assessment of the OPII Amendment on health and the environment

The OPII SEA was launched on 17 December 2018 with a public notice on the change in the strategy paper together with the text of the OPII amendment in the EIA/SEA Information System on the OPII website www.opii.gov.sk. On the same day, information was published in the press (in the newspaper Pravda). MTC Decision No. 05562/2019/SRP/07341 of 28 January 2019 to consider the OPII Amendment was published on 8 February 2019. Subsequently, the MTC and MOE together prepared the draft Evaluation Scope, which was discussed with the authorities concerned on 8 February 2019. The scope of the evaluation was issued by the MTC in cooperation with the MOE and published on 14 February 2019 (it was published by Pravda on 25 February 2019), where the law permits comments on the evaluation scope for 10 days from its publication.[42]

The proposed amendment to the OPII changes the strategic document at the national level to address the main transport measures of national interest, as well as to support partial transport network measures whose potential impact on the environment was subject to a SEA in 2013. For this reason, the environment impact assessment of the OPII Amendment focused particularly on evaluating possible impacts of specific projects considered in the context of the proposed OPII Amendment as appropriate candidates for receiving support (whether or not they are explicitly mentioned in the proposed OPII Amendment), with the aim of identifying potential environmental and health risks and

[41]There is no new intention at the new location in the Port of Bratislava, but there are changes in the scope and type of activities at the port.

[42] All documents can be found in the SEA/EIA information system, see https://www.enviroportal.sk/sk/eia/detail/zmena-operacneho-programu-integrovana-infrastruktura-verzia-6-0-v-suvi

formulating appropriate measures to exclude or mitigate them. The objective behind assessing the impact from the OPII Amendment neither duplicates the already submitted EIA nor estimates from the available project documentation the possible impacts at the level of the detailed EIA. As mentioned above, the impact assessment from the OPII Amendment concentrates on identifying the risks (and potentially positive impacts) which need to be taken into account in the more detailed phases of project preparation for these intentions, and especially to identify possible cumulative or synergic impacts related to implementation of the potentially supported intentions.

IX.3 Key findings

IX.4 Environment and health impacts

Impacts on the air

The OPII Amendment will have an overall positive impact on air. None of the measures can be expected to have either a significantly negative impact or be exposed to important risks. Most of the measures proposed have a potentially and predominantly positive effect and are conceptually directed towards reducing air pollution. The identified local risks have little significance and relate only to local effects in parts of individual communities (where the possible exposure to risk from the effects extend at most 1 km). All identified potential risks from individual measures are easily resolvable in the project preparation phase (EIA or the construction permit process).

The impacts of individual changes in the OPII will be reflected at various sites and so no cumulative effect can be be expected. The national effect can only be expected in the case of measures for "Supporting the introduction of alternative fuels in road traffic", whose ambient effect would be "diluted" within Slovakia, however, so a reduction in ambient concentrations at specific locations will be insignificant (not quantifiable and below the threshold of detection by objective methods), thus no cumulative significant effect on remaining measures can be expected.

Impacts on climate and summary of climate risks

In light of the objective to reduce greenhouse gas emissions, the proposed amendment to the OPII will have a slightly positive impact, in particular with regard to the proposed, promoted introduction of alternative fuels and support for the development of e-mobility, where a significant percentage of non-emission or low-emission electricity production in the Slovak energy mix (mainly due to the high share of nuclear energy) has a positive impact on the overall emission balance of greenhouse gases. Intervention in the support of railway infrastructure and multimodal solutions facilitating the transfer of part of road transport to rail will also have a partially positive impact. The promotion of road transport through the construction of sub-sections in the expressway network is also present in the proposed amendment to the OPII but, in terms of the effects on the development of greenhouse gas emissions, it is a marginal issue.

In terms of climate risk, the most significant and most sensitive of the proposed interventions is the improvement of the Danube waterway. The uncertainties associated with climate change increase the risk of inefficient resource efficiency. However, the planned interventions themselves have no significant potential to aggravate existing problems tied to the impact of climate change on the Danube waterways.

Other proposed investments in transport infrastructure (both road and rail) are already subject to the relevant assessment of climate risks in the project preparation phase and their sensitivity depends on specific technical solutions and local conditions. For specific projects where the allocation of support through the OPII Amendment is considered, the rate of these risks is small.

Impacts on the noise situation

The OPII Amendment will have an overall positive impact on the noise situation. It can be assumed that the implementation of intentions and their impacts on the noise situation (whether direct or cumulative) aims to improve the noise situation by transferring traffic from urban centers to bypass, shifting from individual motorized transport to mass transit and moving from train to maritime

transport (Dunajbus), while upgrades to trains and replacing combustion engines with electric cars. Although some of the intentions will intensity operations (e.g. the Trebišov terminal, strengthening the ports in Bratislava and Komárno) all are addressed with a view toward reducing noise pollution or moving noise to places where protected structures will not be affected. No accumulation of negative impacts is expected but, on the contrary, the more intentions implemented, the more positive the synergy effect will be.

Impacts on water

Possible surface water and groundwater impacts were identified in some new or changed OPII activities.

First of all, these are activities proposed as part of Priority Axis 4 - Water transport infrastructure (TEN-T CORE). Here it could potentially be the most risky to perceive potential implementation of the projects for improved navigability of the Danube waterway, which generally can be associated with interventions in the hydro-morphology of the flow, in particular with the effect on flow depth and in level and flow conditions themselves, with the possible impact on groundwater and the Danube's own water. When implementing the intentions, the effect on the quality of surface water and subsequently also groundwater will be accordingly endangered. In general, exposure to the risk of deterioration/failure to achieve good water body conditions, including outside Slovakia, cannot be excluded. Inappropriate interventions can (even secondarily) also affect the yield and quality of water resources. The above risks cannot be further evaluated and the significance determined without knowledge of the specific projects. These are not included in the OPII Amendment, although preparation and possible implementation of *Increased current velocity in the lower Hrušov Reservoir* is envisaged, localized in the artificial water body SKD0015 - Gabčíkovo Dam (Vodné dielo) and whose anticipated impacts on surface water and ground water have been assessed as slightly negative.

The impacts of other new or changed activities proposed under Priority Axis 4 can be assessed as a slightly negative (Dunajbus) to slightly positive. Activities aimed at upgrading the waterways and public ports at Bratislava and Komárno are positively perceived and they can contribute toward enhancing safety in waterway operations and reducing exposure to the risks associated with emergency conditions.

Accordingly, negative impacts on surface water and groundwater may be linked to the completion of stretches of the R2 and R4 expressways, which have been added to the OPII. The risk of pollution is relevant for completion and operation of the expressways and the impact has been assessed as potentially significant for the R2 Kriváň-Mýtna passing through the Upper Ipeľ, Rimavice and Slatiny Basin WMA. The R2 is exposed to risk in terms of possible impact on the hydro-morphology of the surface water at SKI0008 Kriván Stream because the R2 runs for a long stretch close to the stream's flow. In the case of the R4 north bypass around Prešov, exposure to the risk of impacting quantitative groundwater characteristics while boring the tunnel cannot be excluded.

Substantial activities are planned on the Danube Waterway in terms of the cumulative and synergic impacts on surface water and groundwater. Implementation of some of the proposed activities include interventions in the riverbed and banks of the flow (implementing measures to improve navigability on the Danube and constructing berths and parking lots for Dunajbus). There would be intervention in water body hydro-morphology and it could be substantial where they are defined as natural, namely above Bratislava (SKD0016 Dunaj, ATOK411340000 Donau_01) and on the stretch of the Danube composing the border between Slovakia and Hungary (SKD0018 Dunaj a HUAEP446 Duna Gönyü-Szob). While interventions in the implementation of Dunajbus infrastructure are local in scope and may be considered in terms of the hydro-morphological condition of the affected water bodies to be insignificant, interventions for improved navigability may be potentially significant. It will depend on the form of the specific projects.

The objective of the proposed activities is to make the waterway more attractive and directly attract new public water transport (Dunajbus) and, once the measures have been implemented, it may be

thus envisaged that maritime transport intensity will rise, which would be linked to increasing exposure to the risk of water pollution on the Danube from normal operation as a result of accidents. Pollution may affect all water bodies comprising the Slovak section of the waterway and accordingly water bodies on the Danube downriver (HUAOC756 Duna Szob–Budapest). However, the risk of accidents will be reduced by planned upgrades to the fairway and also public ports. The impacts can therefore be assessed as slightly negative.

With respect to identified negative impacts on stretches of the expressway routes which have been newly added to the OPII, cumulative action cannot be excluded in the case of the R4 Prešov - North Bypass and some stretches of roads and motorways not subject to the OPII Amendment. These are mainly the D1 Prešov West to Prešov South, which is similar to the R4 - North Bypass to be partially resolved by the tunnel. Quantitative groundwater characteristics of SK1001200P and SK2005300P may be affected by both projects. SK1001200P is a shallow hydrological collector defined in Quaternary alluvial deposits of the Hornád River and has a poor quantitative and chemical status, where completion and operation of the proposed stretches of road may either worsen it further or hinder it reaching a good status in the future.

In addition to the projects mentioned earlier, the water body would be also affected by the D1 between Budimír and Bidovce and the R2 between Košice Šaca and Košické Oľšany (projects not subject to the OPII Amendment). As part of (pre) project preparation of all the intentions, increased attention would need to be paid toward water protection and to proposing feasible measures for minimizing the risk of contaminating surface water and groundwater during construction and operation of the intentions.

Impacts on the soil and rock environment

Only road infrastructure projects (i.e. added to the preparing of the R2 and R4 stretches require significant demands for land. Any permanent appropriation of land would be for construction of the road and shoulders. Land will be temporarily appropriated for structures on the construction site (construction yards, material storage, storage of soil and also manipulation belts along the road). The most significant impact from construction and operation of roads on the soil, its quality and stability is the placement of any structure (temporary and permanent taking of land) and thus the loss of productivity from a particular part of the land.

Boring tunnels, collecting fill and cutting into the landscape can disturb the stability of slopes, cause landslides and erosion, accelerate weathering and contaminate the soil environment, especially in the case of the R4, where the occurrence of subsequent geodynamic phenomena has been documented at the site such as lateral and deep erosion of surface flows and water erosion on slopes.

Other changes included in the OPII have negligible demands for land claims and do not encroach on any unstable territory.

Individual changes in the OPII would have no significant negative impacts on the soil and rock environment and, in a nationwide context, it will not have a long-term impact on soil and rock environment use. Possible accumulation of the negative impacts from individual changes in the OPII described above were not identified.

Impacts in terms of waste

Implementation of the proposed OPII Amendment may increase construction waste, especially at the local level. A large quantity of excavated soil would be created from construction of infrastructural intentions at the R4 Prešov - North Bypass, for example when the two tunnels are bored. In the remaining changes included in the OPII, construction and demolition wastes will be generated, including excavated earth produced to a much lesser extent.

Individual changes in the OPII Amendment would have no significant negative impacts on waste production and, in a nationwide context, it will not have an impact on long=term waste management

trends. Possible accumulation of the negative impacts from individual changes in the OPII described above were not identified.

Impacts on nature and landscape

The different changes in the strategy paper can have various impacts on nature conservation, the landscape, protected areas and Natura 2000 sites. The impacts have been assessed and evaluated for several activities clearly defined by specific projects and their localization whose conclusions should to be respected or there needs to be continued assessment (R2, R4, Trebišov IPTT, Dunajbus, adjusting the current at Hrušov Reservoir).

Activities that are not specifically defined need to be further elaborated in detail at the project level and their impacts on the environment and Natura 2000 sites defined in the EIA and appropriate assessment (Port of Bratislava, Port of Komárno, adjustments in the Danube Waterway).

No cumulative impacts in the added sections of the OPII Amendment at the strategic level are envisaged for nature conservation and Natura 2000. When implementing the strategy paper as a while, it is necessary to integrate conclusions of other strategies in environmental protection, including the biodiversity strategy. It is essential to carefully address the identification and mitigation of cumulative impacts at the level of individual projects using the EIA and appropriate assessment instruments for the impact on Natura 2000 sites.

Impacts on cultural heritage

The proposed amendment to the OPII is not significant in terms of impacts on cultural heritage. Only activities aimed at promoting the development of the river ports at Bratislava and Komárno have potential exposure to risk because there are historically valuable structures and sites at these locations whose protection has not been definitely addressed in all cases.

No unfavorable cumulative impacts from the proposed OPII Amendment on cultural heritage is envisaged. In the context of the entire OPII, there will be predominately a slightly positive impact with a reduced burden on the historical centers of these towns by automotive traffic and so a decrease in negative impact (from air pollution and vibrations) on the civil engineering of the localized valuable historical buildings there.

Impacts on population and health

The OPII Amendment will have a slightly positive impact on public health. None of the measures can be expected to have either a negative impact or be exposed to significant risks. Most of the measures proposed have a potentially and predominantly positive effect and are conceptually directed towards reducing air pollution and noise, while enhancing comfort and indirectly also improving public health.

The impacts of individual changes in the OPII on public health will be reflected every time elsewhere, according to the situation of the intentions and so no cumulative effect can be expected. The national effect can be expected to be only limited in the case of *"Supporting the introduction of alternative fuels in road transport."*

IX.4.1 Variants and uncertainties

The OPII Amendment has been drafted and submitted for evaluation of one variant.

Given that the proposed adaptions have to comply with OPII objectives and conditions, while taking into account the short time horizon for support, the proposed OPII Amendment was formulated to enable projects to receive support which are in such a preparation phase to allow them to receive financial support from the OPII by the deadline set in the OPII conditions. In light of the limited number of projects fulfilling both these conditions, no alternative solutions need to be prepared in the process of drafting the OPII Amendment.

In view of the nature of the measures addressed in the proposed OPII Amendment, assessment of their impacts is burdened to a considerable degree by uncertainty, particularly about the impacts of generally formulated procedures either at the national level or on the entire transport network (e.g. support for e-mobility and rolling stock upgrades). For measures relating to specific intentions for constructing road network stretches, in view of details from available documented project information including the EIA, the degree of uncertainty with respect to direct impacts in most of the evaluated environmental components (such as noise, nature and biodiversity, local ambient air) is relatively high. An exception is the contribution of these projects toward overall emissions of pollutants, including greenhouse gases, as it is such a small part of the overall road network that the impact from either implementing them or not on the total emissions situation at the national level can be hardly estimated or would be negligible. For these reasons, no quantitative assessment of the impact of the OPII Amendment on national greenhouse gas emissions has been carried out and the proposed measures have been assessed only qualitatively, i.e. whether they can contribute to achieving the greenhouse gas emissions objectives or not.

IX.5 Recommendations for preventing, eliminating, minimizing and offsetting impacts on environment and health[43]

IX.5.1 General Recommendations

The proposed OPII Amendment does not address the spatial routing of the transport corridors, which are considered in separate studies identifying the routes and in land-use plans. The following general recommendations are formulated in the process of implementing OPII measures, including the preparation of individual project intentions:

In terms of climate change:

Introduce climate proofing in (pre-) project preparation for large infrastructure investments, whose results would be taken into consideration in finalizing the technical solution and operational monitoring.

In terms of noise:

It is appropriate, depending on the degree of project preparation:

- Measuring noise/vibrations to verify the current situation at the site of interest;
- Producing a noise study to model the possible impacts of the intentions and, if hygienic limits are exceeded, to prepare a draft of sufficiently effective noise measures;
- Measuring noise/vibrations to review the situation in operating the intention, the effect of implemented anti-noise measures and, where appropriate, to draft additional measures to comply with hygienic limits.

In terms of water

- Both the OPII and individual activities should be implemented in accordance with requirements of the Water Framework Directive with respect toward defining conditions and conservation at sites protected under Sec. 364/2004 Coll. on water, as amended (Water Act);
- As part of (pre) project preparation of specific intentions to eliminate or minimize the risks of contaminating surface and groundwater during both implementation and operation of the intentions;

[43] Chapter V describes the recommendations in detail.

- As part of (pre) project preparation of specific intentions to eliminate or minimize the risks of impacting the quantity of surface and groundwater during both implementation and operation of the intentions.

In terms of soil and rock environment:

As part of (pre) project preparation of specific intentions for all investments in infrastructure, quantify the possible appropriation of land and assess possible impacts to mineral deposits.

In terms of nature and landscape:

The impacts of projects on the surrounding Natural 2000 network, internationally protected areas (e.g. Ramsar wetlands) and natural conservation interests (species, habitats and protected areas) needs to be carefully assessed when preparing, evaluating and authorizing projects, with recommendations to mitigate negative impacts in the assessment and the EIA to be consistently incorporated into higher-level stages of documenting the projects.

In terms of population and health

Within the assessment of the impact of the individual projects proposed for the programme, focus on their possible negative impacts on air quality and the noise situation and subsequently to establish specific measures to minimize or offset them. Public health is also closely related to climate change risks, and it is therefore necessary to assess individual specific intentions in a detailed evaluation of whether they respond adequately to these risks and that all options are used to minimize their impact on public health.

IX.5.2 Specific measures

To prevent or minimize negative impacts specific for the individual proposals in the OPII Amendment, it is recommend to taker the following specific measures:

Priority Axis 4 - Water transport infrastructure (TEN-T CORE)

Improved navigability on the Danube Waterway *(Note: includes "Changing current velocity in the lower Hrušov Reservoir - pre-project and project preparation")*

- To reduce the risk of negative impacts on climate change, the following applicable measures are recommended:
  - Address bottlenecks in waterways based on a through feasibility study that takes into account rising climate change uncertainty and possible cross-border aspects linked to impacts on water and identifies a technical solution for the intention (or alternatives) with minimal impact on the quality and quantity of surface water and groundwater and to verify compliance with the requirements of the Water Framework Directive.
  - Investigate opportunities for improving navigability through modern technologies and flexible, customizable technical solutions instead of using large-scale static interventions in the river bed.
  - Produce a noise study in particular for the closest residential building
- Selecting a technical solution for "Changing current velocity in the lower Hrušov Reservoir - pre-project and project preparation") without negative impacts on the replenishment of cross-border surface water GWB-8.
- The impacts of projects on the surrounding Natural 2000 network, internationally protected areas (e.g. Ramsar wetlands) and natural conservation interests (species, habitats and protected areas) needs to be carefully assessed when preparing, evaluating and authorizing projects, with recommendations to mitigate negative impacts in the assessment and the EIA to be consistently incorporated into higher-level stages of documenting the projects.

Upgrades and public port construction in Bratislava and Komárno

- *Safety and monitoring systems at the Ports of Bratislava and Komárno*
- *Upgrades in the Ports of Bratislava and Komárno*
- *LNG terminal at the Port of Bratislava*

- In the follow-up stage of action to place the LNG terminal, to specify the capacity of any possible automotive transport and more specifically judge the impact on air quality, emphasizing the resuspended dust component with the effect of overall car transport on access roads.
- With regard to existing increased ambient air load in Bratislava and vicinity, it is recommended at least to approximately specify the capacity of the proposed LNG terminal and the planned method of linking it to the road and rail network, estimating the maximum percentage of LPG transported by road to and from the terminal. The outcome from the assessed impact on ambient air of road transport together with the current load should be potentially included in the subsequent authorization of the building (when the capacity is greater than 25 commercial vehicles per day).
- Consider in the noise study the location of the activities or placement of new technologies (drainage of wastewater, collection of used oil and similar operations), loading (type of technology) and frequency of operation including related traffic and route management.
- The impacts of projects on the surrounding Natural 2000 network, internationally protected areas (e.g. Ramsar wetlands) and natural conservation interests (species, habitats and protected areas) needs to be carefully assessed when preparing, evaluating and authorizing projects, with recommendations to mitigate negative impacts in the assessment and the EIA to be consistently incorporated into higher-level stages of documenting the projects. There needs to be an investigation of whether the planned activities will have an impact on the following Natura 2000 sites around the Port of Bratislava:
    - CHVÚ Dunajské luhy (SKCHVU007) - Danube Floodplains SPA
    - ÚEV Bratislavské luhy (SKUEV0064, SKUEV2064) - Bratislava Floodplains SAC
    - ÚEV Malý Dunaj (SKUEV0822) - Little Danube SAC
- Investigate whether the planned activities will have an impact on the following Natura 2000 sites around the Port of Komárno:
    - ÚEV Dunaj (SKUEV2393) - Danube SAC
    - ÚEV Vážsky Dunaj (SKUEV0819) - Váh Danube SAC
- The use of the port sites and their vicinity valuable from a cultural heritage point of view have to be resolved comprehensively as part of spatial planning that should accordingly include an assessment of the possible environmental impacts (SEA), which would also include a cultural heritage impact evaluation.

Introducing modern technologies for managing maritime and port operations and implementing related technical measures *Note: includes "Upgrades to navigational aids at the Slovak stretch of the Danube international waterway and implementation of related technical measures")*

- No exposure to the risk of a deteriorating noise situation and spread of vibrations is implied or expected from their own measures. The situation my change with the incidental presence of watercraft, for example when markings allow a higher speed for traffic and that can lead to sound power and a higher degree of vibrations proliferating. When adjusting the markings, preference should be given to quieting and relieving traffic close to protected objects, or to exclude certain modes of transport in risk-exposed areas (e.g. no motorboats allowed to move near residential buildings).

Introducing regular passenger navigation on the Danube (Dunajbus)

- It is essential to specify the Park + Ride zone's capacity not to worsen air quality around the boarding areas. When new parking capacity for over 500 vehicles is built in villages, it is recommended to assess the total ambient air quality situation in the neighborhood (including the contribution of existing car traffic) to the dispersion study, emphasizing the quantification of particulate matter and including resuspension from the road surface.
- In (pre) project preparation, consider possible climate change related uncertainties – e.g. potential growth in the number of days of forced downtime due to extreme weather conditions and the impact of these risks on the project's economic viability.
- A noise study is recommended to verify the noise situation and changes it causes in the affected area (boarding points, parking capacities).
- As part of (pre) project preparation to eliminate direct clashes with protected water supplies.

- To mitigate or eliminate the negative impact on the protected subject matter affected, fourteen mitigating measures have been proposed as part of the EIA whose compliance would be necessary to implement the project. The measures aim at minimizing the risk of bird collisions on glazed surfaces, minimizing disturbance, habitat appropriation and the impact on selected food and nesting habitats and minimizing disruption from the risk of accidents.

Priority Axis 5 - Railway infrastructure and upgrading of rolling stock

Construction and upgrading of intermodal terminals for rail passenger transport and for integrated passenger transport and connecting them to the road network *(Note: covers construction of the Trebišov terminal*

- In the follow-up stage of action to place the intermodal terminal, to specify the capacity and place new capacity including quantification of traffic intensity changes on surrounding roads and parking areas. Use this data to prepare a pollution dispersion model including existing transport contribution to ambient air and the impact of redispersion from roadway surfaces.
- It is strongly recommended to produce a detailed noise study complemented with measurements of existing noise at the site.

Priority Axis 6 - Road infrastructure (outside the TEN-T CORE)

Adding the R2 Kriváň – Mýtna and R2 Mýtna – Lovinobaňa, Tomášovce

- Consistently apply standard anti-dust measures during construction and place conditioning lines and construction material depots at least 500 meters away from buildings in a community.
- At higher project design stages, it would be necessary review the assessment's currency regarding impacts on the noise situation and of any noise study and to update the entire assessment, if necessary. The assumptions and conclusions drawn from the noise assessment are reviewed by measuring noise at the site once the intention has been implemented.
- Ensure rain water is drained at the stretch of the R2 Kriváň-Mýtna passing through the Upper Ipeľ, Rimavice and Slatiny Basin WMA to eliminate the risk of contaminants penetrating into the groundwater;
- Propose appropriate winter maintenance technology at the stretch of the R2 Kriváň-Mýtna passing through the Upper Ipeľ, Rimavice and Slatiny Basin WMA to eliminate the risk of contaminants penetrating into the groundwater;
- Building yards and construction material landfills would be placed either on land permanently appropriated for the expressway (at interchanges) or in areas not used for agricultural purposes.
- When expanded mining of mineral resources is planned, it is suggested to conduct a full assessment of the impact on the environment of either extending existing mining sites or opening new ones.
- The risks of accidental landslides need to be addressed in the context of follow-up design work,-particularly in detailed design proposals (measures to stabilize slopes).
- Possible depots for mined material and equipment for processing them (mobile chippers, recycling and grading lines) will be placed outside built-up areas of communities (at least 200 meters away) and at an adequate distance from a village to cover possible increased adverse impact from noise and dust.

Adding the R4 Prešov – North Bypass

- Consistently apply standard anti-dust measures during construction and place conditioning lines and construction material depots at least 500 meters away from buildings in a community.
- Potentially negative impacts in terms of the noise situation in Veľký and Malý Šariš have been resolved in the design documentation. The need to construct noise absorbent barriers is

expected from the noise study that was prepared (INSL, Martin, August 2013). According to conclusions mentioned in the design, the following is required for compliance with hygienic limits:
    - 1 noise absorbent barrier is proposed for the R4 (left-hand side at km 3.180/3.800).
    - Land has been prepared at km 0.0 – 1.6 on the right-hand side for individual housing. The unpaved R4 shoulder is broadened to allow a noise absorbent barrier to be placed in the future after individual housing has been constructed.
    - The height of the barrier is proposed to be 3 meters above the terrain (at another place in the design 3.5 meters above the terrain is mentioned). Noise absorbent barriers are considered to be sound absorbing, opaque and matte-coated. At bridges they are fully reflective, translucent and matte.
- Building yards and construction material landfills would be placed either on land permanently appropriated for the expressway (at interchanges) or in areas not used for agricultural purposes.
- When expanded mining of mineral resources is planned, it is suggested to conduct a full assessment of the impact on the environment of either extending existing mining sites or opening new ones.
- The risks of accidental landslides need to be addressed in the context of follow-up design work,-particularly in detailed design proposals (measures to stabilize slopes).
- In the next stages of project documentation, the amount of material excavated from the Bikoš and Okruhliak tunnels and the method for disposing of it will be specified in detail.
- Specific impacts on nature and biodiversity were identified at the individual project level and they need to be mitigated as proposed in specific documentation and decisions by nature conservation authorities. The issue of the R4's impact on migrating animals needs to be resolved as part of the elaboration of Stretch II of R4 Prešov - North Bypass.

Supporting the introduction of alternative fuels in road transport

- The specific activities listed below can be recommended for inclusion in the OPII Amendment when they aim to create an optimal environment for the development of e-mobility and other types of low-carbon transport, thereby increasing the positive environmental impacts from implementing PO 6.
    - Broadening electric car charging infrastructure
    - Expanding service stations to offer alternative fuels - particularly CNG and LNG G
    - Using electrical bicycles for alternative transport
    - Processing background analysis and plans

Priority Axis 7: Information society

Supporting the construction of smart cities and regions through ICT

We recommend only those intentions that are based on the "smart city strategy" prepared for the city. The benefits and risks of the envisaged new technologies and innovation should also be part of the processing of the strategy and taken into account when approving it. In view of the economic situation in regions of the Slovak Republic, it can be recommended to focus on areas economically less developed (e.g. Prešov, or Banská Bystrica) to promote their development.

Promoting innovative SME solutions using public administration data and services

It is recommended to create an overview of the risks associated with developing the technologies that can be supported in the OPII and taking into account these risks when evaluating and selecting projects for support.

X. Economic challenges

Implementation of the intentions in the proposed OPII Amendment will be financed from current OPII sources, from funds not drawn by completed projects, from sources reallocated for the benefit of the OPII from other operational programmes and from sources transferred between the OPII priority axes. Since the reallocation process had not been completed when the Evaluation Report was finalized, the economic challenges posed by the amended OPII Amendment could not be exactly quantified.

It should be stressed that the reallocation process was contingent upon approval by the EC at the time when the Evaluation Report was finalized (in May 2019). In light of the results from the Slovak Government's discussion on 21 May 2019, it is probable to envisage the transfer of funds from the Integrated Regional Operational Programme (IROP) to the above source. However, the transfer and the eventual amount are contingent on an analysis of IROP absorption capacity, whose submission for discussion by the Slovak Government is expected during July 2019.

XI. Appendices

XI.1 Appendix 1: MINUTES of the consultations to change the strategy paper

MINUTES

from the consultation about the change in *"Amendment to the Integrated Infrastructure Operational Programme (Version 6.0) in connection with the adoption of selected priority axes in the SEA process"*, which took place on 26 April 2019 at the Ministry of Transport and Construction

1. Present:

Ing. Erna Dohnáliková, General Director, Information Society Intermediate Body, Office of the Deputy Prime Minister of the Slovak Republic for Investments and Informatization (ÚPPVII)
Martin Smutný, MSc., Consultant, Integra Consulting, Ltd.
PhDr. Pavol Bžán, MA., Director of Programming and Programme Monitoring, MTC
Ing. Lenka Formánková, Programming and Programme Monitoring, MTC
Bc. Michaela Ďuriníková, Programming and Programme Monitoring, MTC

2. Subject of consultation:

The consultation involved requirements to add the contents of the ongoing revision of the Integrated Infrastructure Operational Programme, version 6.0 ("OPII") in connection with the adding of activities in Priority Axis 7 - Information society (PA 7).

3. Consultation:

Ms Dohnáliková noted that it was necessary to change the beneficiary small and medium-sized enterprises in the OPII as part of adding the small projects fund. Another requirement from the ÚPPVII was the addition of projects for supporting the development of the Smart Cities Initiative, with pilot projects to be defined for the cities of Prešov and Banská Bystrica.

Mr Bžán spoke about the meeting of the planned OPII Monitoring Committee (MC) on 17 June 2019, where the actual OPII revision was submitted as part of the SEA process and to which representatives from ÚPPVII were invited.

The stakeholders agreed to the basic prerequisite for financing activities related to the development of smart cities being the existence of a relevant strategy paper at the level of the concerned city, which will provide an analytical basis for future investment projects.

The representative from Integra Consulting spoke about the working method for the Evaluation Report, which was three-quarters completed and the PA 7 specifications still needed to be delivered to finalize the report.

4. Conclusions:

- Supplying and incorporating the proposed changes in the OPII strategic paper from the Office of the Deputy Prime Minister of the Slovak Republic for Investments by the end of the 18th working week (fifth of May), changing the text to be added to the OPII and the exact text for tracking changes in the document; and
- Sending a record of the consultation with the Office of the Deputy Prime Minister of the Slovak Republic for Investments and inviting representatives from the office to a public discussion of the OPII revisions (version 6.0).

Bratislava, 30 April 2019

Approved by: PhDr. Pavol Bžán, MA.

Prepared by: Bc. Michaela Ďuriníková

XI.2 Appendix 2: Appropriate Assessment of the Impact of the Integrated Infrastructure Operational Programme 2014-2020 Version 6 on the sites in the Natura 2000 network

The appropriate assessment is provided as a separate attachment.

XI.3 Appendix 3: Evaluation of comments by the parties concerned on the notice of the change in the strategy paper

Line	Concerned authority/public	Comment	Evaluation
1.	Ministry of Finance of the Slovak Republic	no comments	
2.	Ministry of Economy of the Slovak Republic	no comments	
3.	Ministry of Culture of the Slovak Republic	no comments	
4.	Ministry of Defense of the Slovak Republic	Requires all documents processed in connection with the preparation and implementation of individual projects to be submitted for assessment by the Minister of Defense	The requirement is directed towards further project preparation phases and acknowledged.
		When project proposals are processed, Defense Ministry bases and facilities (including buffer zones) located at the sites should be respected	The requirement is directed towards further project preparation phases and acknowledged.
5.	Ministry of Labor, Social Affairs & Family of the Slovak Republic	no comments	
6.	Ministry of Agriculture and Rural Development of the Slovak Republic	no comments	
7.	Ministry of Social Affairs and Family of the Slovak Republic	no comments	
8.	Ministry of Justice of the Slovak Republic	no comments	

9.	Ministry of Education, Science, Research and Sport of the Slovak Republic	no comments	
10.	Ministry of Interior of the Slovak Republic, European Programmes Section	no comments	
11.	Ministry of Foreign and European Affairs of the Slovak Republic	no comments	
12.	Ministry of Environment of the Slovak Republic, Section for Environmental Assessment and Waste Management	Requests assessment of the document under the law, The Evaluation Report assesses the following: - Direct and indirect environmental impacts; - Impacts on health; - Impacts on protected areas including proposed mitigation measures; - Impacts on environment beyond national borders	Potential impacts specified in the MOE requirement are assessed in the Evaluation Report (see Chapters IV and VIII).
		When adapting the selected priority axes, the other strategy papers should be also taken into account, especially the following: - Agenda 2030 for Sustainable Development - National Investment Plan to 2030	These documents were taken into account when proposing the OPII Amendment. When evaluating the individual measures in the proposed OPII Amendment, compliance with general reference objectives established in the OPII SEA and also with selected objectives in key environmental and health protection documents at the national (or international) level relevant for individual assessment of components. Evaluation of the individual measures proposed in the OPII Amendment (see Chapter IV). Evaluation Report)

			also includes an assessment of whether and to what degree the proposed amendments contribute toward achieving the environmental and health protection targets.
		Requires the other prepared strategy papers to be also taken into account, especially the following: - Greener Slovakia - Strategy of the Environmental Policy of the Slovak Republic until 2030; - Low Carbon Development Strategy of the Slovak Republic to 2030 with a View toward 2050 - Strategy for Improving Air Quality - Vision and Strategy for Development of the Slovak Republic to 2030	In light of some of the above documents being in the preparatory or discussion process, or are not related to the proposed OPII Amendment, the comment could not be accepted. But once the documents are approved, they may be in future taken into account at the appropriate strategic level, in particular when the Strategic Transport Development Plan is updated or when the Operational Programme for financing the development of transport in the 2021-2027 programming period is processed. When evaluating the individual measures in the proposed OPII Amendment, compliance with general reference objectives established in the OPII SEA and also with selected objectives in key environmental and health protection documents at the national (or international) level relevant for individual assessment of components. Evaluation of the individual measures proposed in the OPII Amendment (see Chapter IV). Evaluation Report) also includes an assessment of whether and to what degree the proposed amendments contribute toward achieving the environmental and health protection targets.
		Requests, when assessing the proposed amendment for new and modified existing activities not to conflict with environmental objectives	When evaluating the individual measures in the proposed OPII Amendment, compliance with general reference objectives established in the OPII SEA and also with selected objectives in key environmental and health protection documents

			at the national (or international) level relevant for individual assessment of components. Evaluation of the individual measures proposed in the OPII Amendment (see Chapter IV). Evaluation Report) also includes an assessment of whether and to what degree the proposed amendments contribute toward achieving the environmental and health protection targets. In view of the nature of the proposed changes to the OPII, when there are no changes in the overall focus, priorities and objectives of the OPII, and based n the assessment of possible impacts of the individual changes, it can be stated that the OPII Amendment will have no significant impact on the OPII's compliance with objectives covering environmental protection and protecting the health of inhabitants.
		Points out that, for individual OPII projects, it will be required after submitting the non-repayable grant application to have it reviewed for compliance with the law by the EIA coordinator	The requirement is directed towards further project preparation phases and acknowledged.
13.	Ministry of Environment of the Slovak Republic, Section for Nature Conservation, Biodiversity and Landscape	Requests assessment of the document under the law, The Evaluation Report assesses impacts on nature conservation and landscape interests including the Natura 2000 network	Potential impacts on nature conservation and landscape interests including the Natura 2000 network are assessed in the Evaluation Report.
14.	Association of Transport, Posts and Telecommunications Trade Unions	no comments	
15.	Banská Bystrica Self-governing Region, Department of Planning and Environment	no comments	

16.	Nitra Self-governing Region, Department of Transport and Roads	no comments	
17.	Association of Towns and Communities of Slovakia	no comments	

XI.4 Appendix 4: Evaluation of Comments by the Parties Concerned

Line	Concerned authority/public	Comment	Evaluation
1.	Ministry of Education, Science, Research and Sport of the Slovak Republic	no comments	
2.	Banská Bystrica Self-governing Region, Department of Planning and Environment	no comments	

XI.5 Appendix 5: Addressing Specific Evaluation Requirements

Requirement	**Method**
When preparing the Evaluation Report, take into account all opinions and statements sent in the notice and in the scope of evaluating the change in the national outreach strategy paper;	Opinions and statements sent in the notice and in the scope of the evaluation were taken into account as the report was prepared.
Evaluate in writing whether all opinions (including from the public) were considered or not considered and the statements in the notice and in the scope of evaluating the change in the national outreach strategy paper, and in a separate chapter evaluate whether the individual points were considered in the scope of the evaluated change in the national outreach strategy paper;	The evaluation of all comments including individual specific requirements in the evaluation scope are included in the Evaluation Report (Appendices 3 and 4).
Evaluate in the evaluation report the impact of changed in the national outreach strategy paper on nature conservation and landscape interests including the European network of protected Natura 2000 sites ("appropriate assessment") according to the Methodology for assessing the impact of plans and projects on sites of the Natura 2000 network in the Slovak Republic (State Nature Conservancy of the Slovak Republic, 2014, 2016).	Impacts on nature conservation and landscape interests including the European network of protected Natura 2000 sites were evaluated. An appropriate assessment prepared according to the Methodology for assessing the impact of plans and projects on sites of the Natura 2000 network in the Slovak Republic (State Nature Conservancy, 2014, 2016) is attached to the Evaluation Report (Appendix 2).