

Mitigation measures

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Purpose of mitigation measures

1. To avoid, minimize, or compensate likely adverse effects related to the plan or programme
2. To enhance potential positive effects of its implementation

Mitigation measures = the key output of SEA

Guiding principles

- Mitigation measures should reflect the likely impacts identified and cover both policy as well as ‘technical’ levels of planning
- When formulating mitigation measures, it is important to consider
 - Level of the plan or programme
 - The way of its implementation and institutions involved
- Mitigation measures have to be ‘reasonable’ i.e. possible to implement
- Proposed mitigation measures have to be communicated with the planning team and agreement reached on how the mitigation measures will be integrated in the plan and/or its implementation

Types of mitigation measures

- Changes of the planning document
 - New/modified objectives and priorities
 - Additional actions or reformulation of activities proposed by the plan
 - Alternative locations
 - Alternative technologies
 - Alternative sequencing/timing
- Conditions for the implementation
 - Alternative sequencing/timing
 - Preliminary advice on the scope of any environmental assessment of detailed project proposals
 - Monitoring requirements

Alternatives

Alternatives can be considered as a way how to mitigate likely impacts

- SEA has to evaluate and compare alternative options **included in the plan or programme**
- However, SEA may also propose new alternatives to be included in the plan to prepare the document with no or minimal environmental and health impacts

Hierarchy of alternative options

Is the proposed development necessary? (Need or demand management options)



How should it be done? (Method or process options)



Where should it go? (Location options)



When should it be implemented? (Timing or sequencing options)

Responsibilities regarding alternatives

- Primarily, **planning experts should develop alternatives** as a part of the plan-making
- **SEA may generate additional alternative options** i.e. elaborate new alternatives or recommend new alternatives to be developed by planning team
- However, **intensive communication and cooperation between planning and SEA teams is essential** (otherwise integrating SEA suggestions in the plan or programme will not happen)

SEA of the Renewable Energy Strategy of Azerbaijan



Example of mitigation measures

General recommendations

- To prepare – following results of SEA – following studies as a part of Action Plan
- A detailed ‘Existing Conditions Map’ showing the location of: existing energy developments; industrial facilities; urban settlements; important environmental areas; land use zones; and other important sites.
- A detailed ‘ARES development Areas Map’, which shows the details of the first map, overlaid by potential sites/areas where ARES could be developed. This map should also indicate
 - ‘Key Development Zones’ (where ARES are highly encouraged),
 - ‘Potential Development Zones’ (where ARES are suitable depending on further assessment), and
 - ‘No-Go Zones’ (where ARES are not permitted).

Measures regarding air quality

- The facilities for energy production from biomass and waste should not be located in areas that currently have low air quality.
- Wind farms and solar energy are preferred in areas with low air quality, to reduce GHG emissions and other air pollutants from traditional sources of energy and fossil fuels.
- The Best Available Techniques (BAT) should be employed to minimize adverse effects to the air quality
- The likely effects on air quality during construction (including transport) stage should be properly assessed in the EIA process and appropriate mitigation measures defined.
- Geothermal energy production should use closed systems equipped with special gasholders to minimize emissions into the air.
- Biogas should be optimally produced from sorted household garbage, organic waste, or agricultural manure.

Measures regarding water resources

- Hydropower plants should not be located in the natural reserves (natural and biosphere reserves, national parks, important ornithological areas, etc.)
- New, efficient technologies should be used for dry cleaning of solar panels to minimize water consumption.
- Avoid and significantly limit stormwater runoff containing pollutants from cleaning and construction into water bodies.
- Before determining the location of hydropower plants (especially when a series of hydropower plants is planned), a detailed study should be conducted that analyses the likely cumulative effects on the entire river basin, taking into consideration the following issues (but not limited to):
 - Minimal environmental flows (i.e. the quantity, timing, and quality of water flows required to sustain freshwater and estuarine ecosystems)
 - Water demand of the population living within the river basin (including technical and irrigation water)
- Derivative Types of (Run-of-River) hydropower plants should be preferred

Measures regarding health

- Wind turbines should not be located closer than 0.5km – 1km (depending on the noise studies and other impact studies) from residential buildings and 500m from work facilities.
- Potential impacts associated with wind turbines on ‘shadow flicker’ and ‘blade glint’ which may cause distractions to local people (e.g. car drivers) should be managed through measures such as micro-siting turbines, orienting turbines appropriately, stopping wind turbine operation temporarily (e.g. during intense light periods at sunset), and selecting non-reflective white coatings of the turbine blades.
- Noise levels of wind farms and other ARES developments should comply with the relevant noise guidelines, including those recommended by the World Health Organisation (WHO).
- When further planning hydropower development, the water demands of the local population should be considered in order to avoid water shortages.
- Potentially hazardous facilities, such as biogas processing facilities and enterprises, should be located at least 1km from residential buildings or settlements.

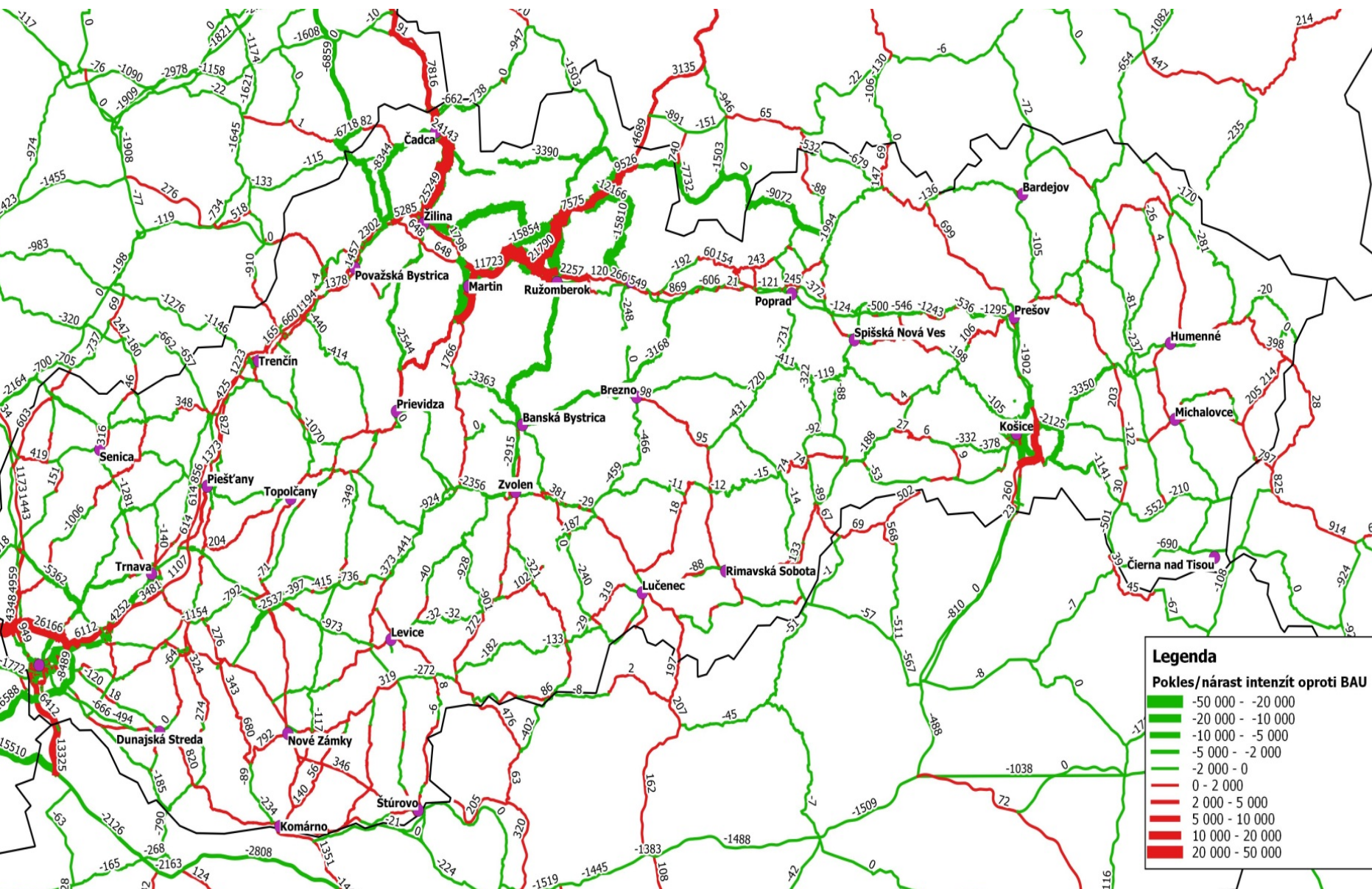
SEA of the National Transport Development Strategic Plan until 2030, Slovakia



Example of mitigation measures

Main features of the Plan

- Strategic plan is a long-term planning document as a basis for EU co-funding of the transport projects
- Measures proposed for following transport modes
 - Roads
 - Railways
 - Air transport
 - Water transport
 - Public and non-motorized transport
- Both management (soft) measures as well as sections of transport infrastructure
- Outlined road and railway corridors (however not precisely spatially determined)



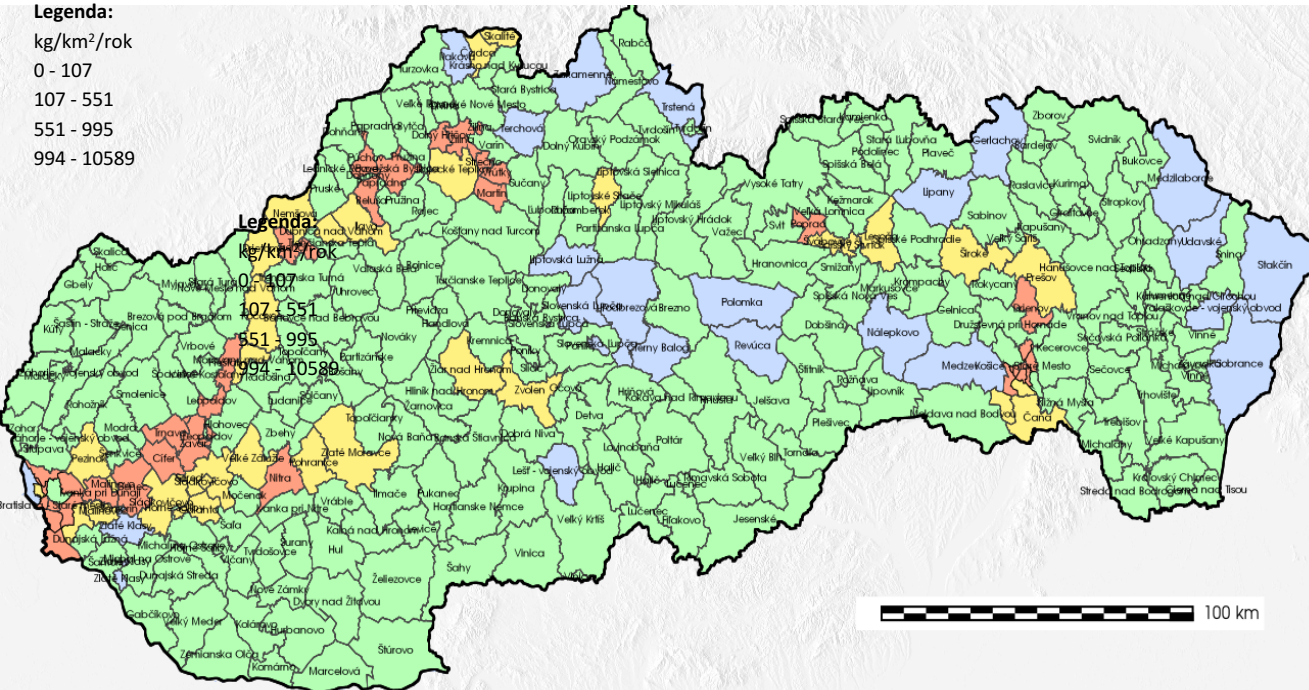
SEA approach

- Qualitative assessment
 - Socio-economic aspects (e.g. employment, livelihood, active lifestyle and related health issues), water resources, biodiversity and nature protection, cultural heritage
- Quantitative analyses
 - GHGs emissions
 - Air quality
 - Noise
- Spatial analyses
 - Air quality
 - Noise
 - Biodiversity and nature protection
 - Climate change risks
 - Cultural heritage

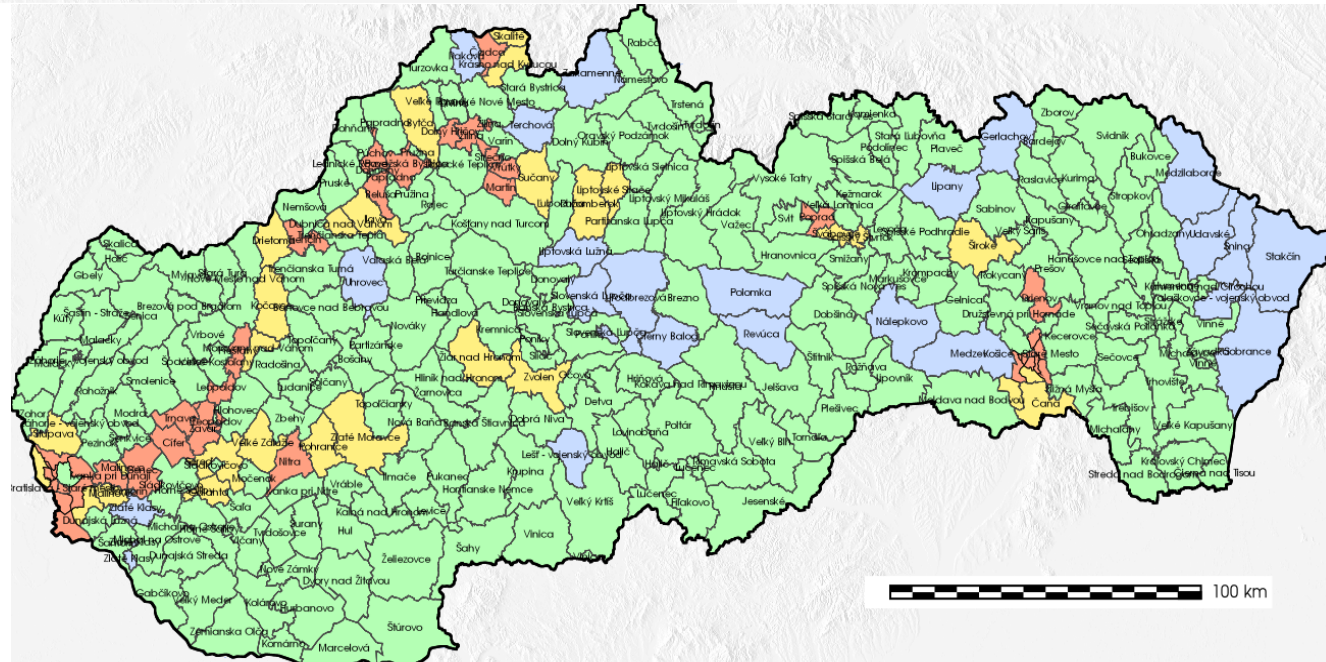
Emissions of PM10 – BAU scenario (2030)

Legenda:

- kg/km²/rok
- 0 - 107
- 107 - 551
- 551 - 995
- 994 - 10589

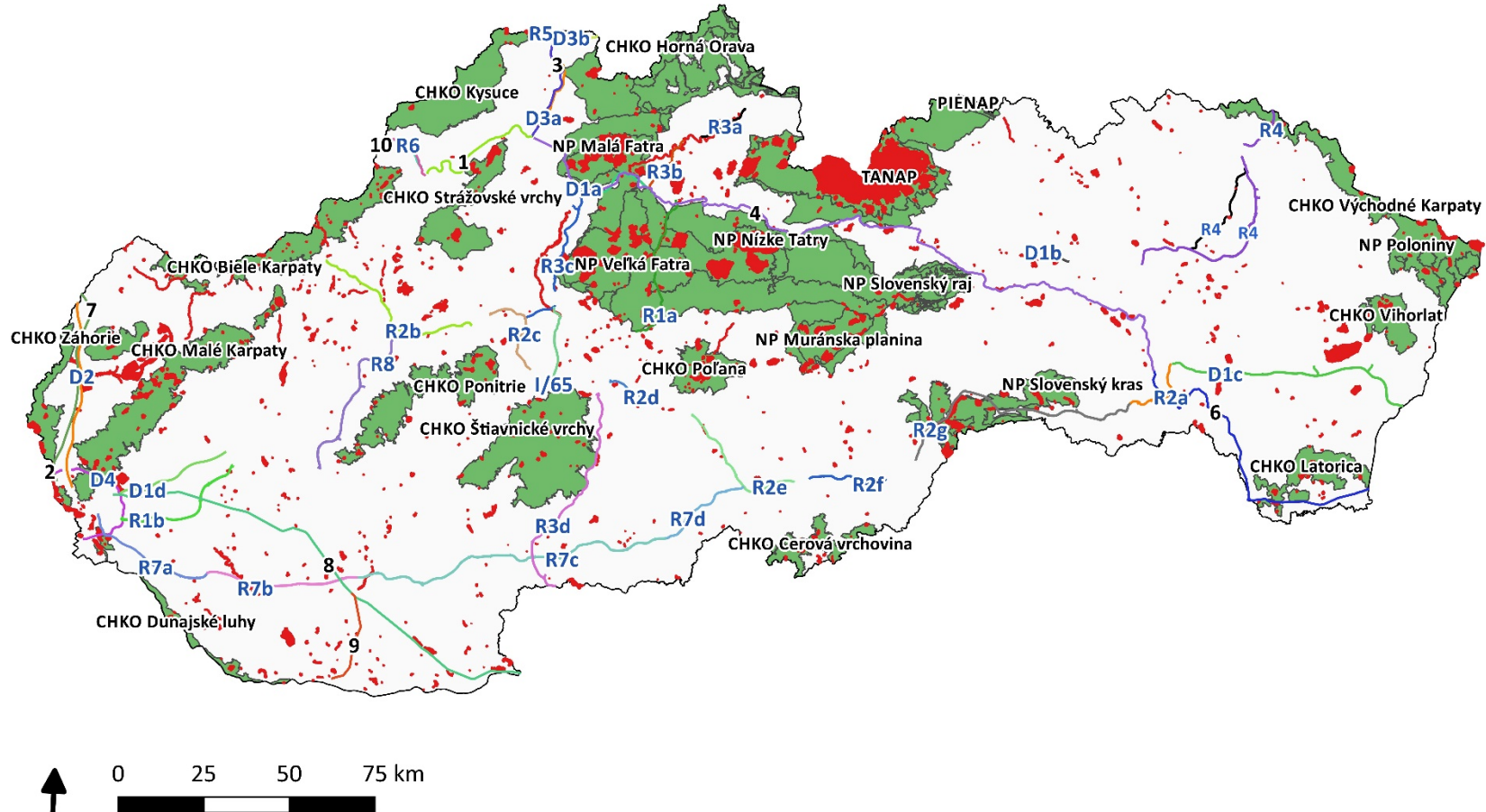


Emissions of PM10 – with Plan's measures (2030)



Biodiversity and nature protection

Identifikácia potenciálnych konfliktov koridorov dopravnej infraštruktúry s chránenými územiaми



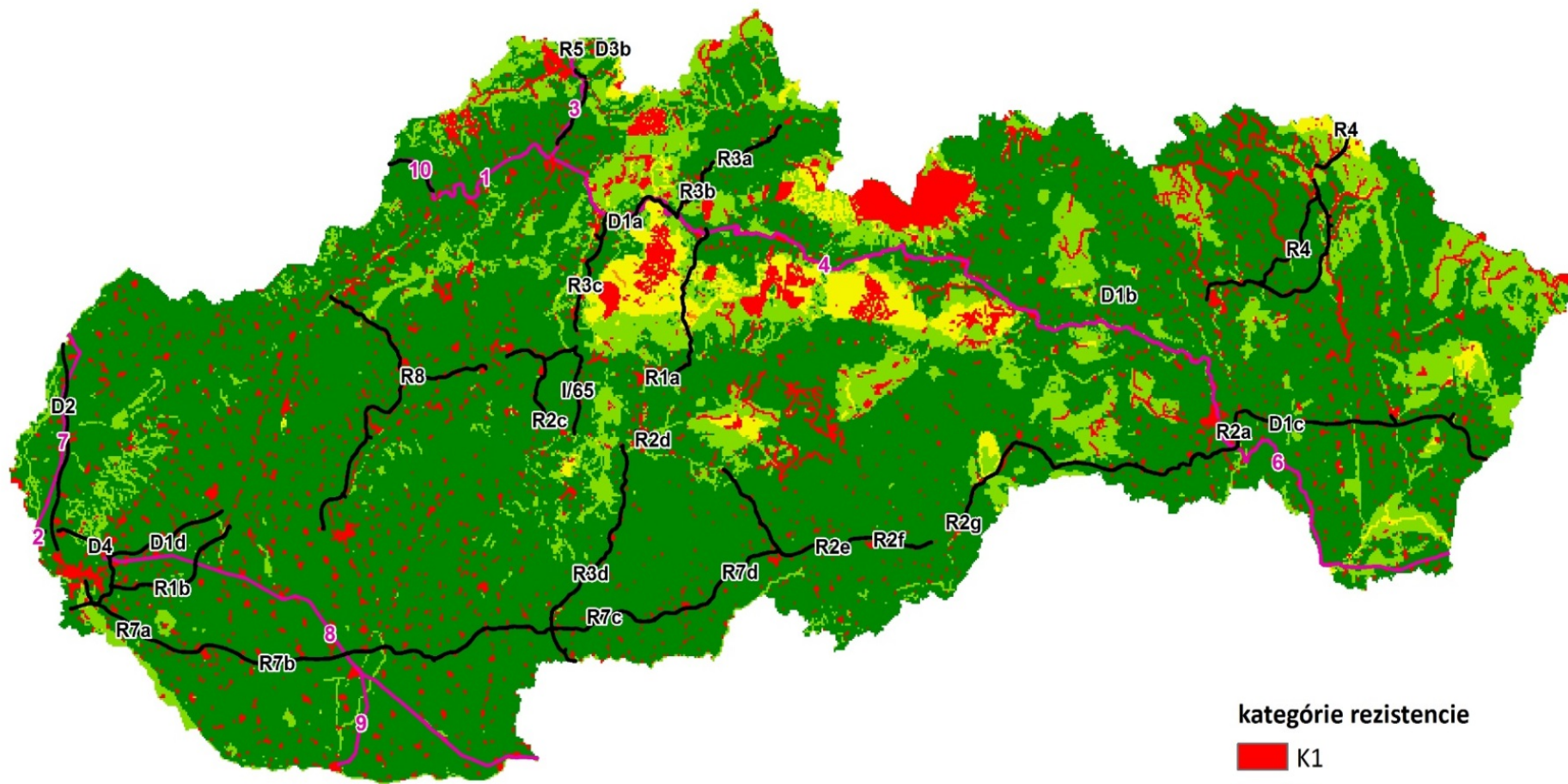
Zdroj dát: SOPSR (2016)
Zostavil: Integra Consulting s.r.o. (2016)

— Hodnotený dopravný koridor

■ Veľkoplošné chránené územia
■ Maloplošné chránené územia

Synthesis of spatial analyses

- Identification of critical areas considering environmental and health risks and limitations
- Determination of ‘resistance’/’ of the territory for transport infrastructure projects
- Based on spatial analyses, the country territory was divided in five categories:
 - K1: extremely sensitive, fully ‘resistant’ for transport infrastructure
 - K2: highly sensitive, can be used only in exceptional cases with implementation of extensive mitigation measures
 - K3: sensitive, potential conflicts, however these can be avoided through alternative options
 - K4: less sensitive, low ‘resistance’ to transport infrastructure
 - K5: non-sensitive, free for transport infrastructure development



kategórie rezistencie

- K1
- K2
- K3
- K4
- K5

- cestné koridory
- železničné koridory



SEA mitigation measures

- Strategic level
 - Enhance air quality monitoring in the ‘hot-spots’ identified (and SEA also determined the key section of new transport infrastructure where the air quality monitoring is the most important)
 - To include to the Plan support to introducing low-emissions zones in the cities
- Guidance for further development of transport infrastructure projects
 - Recommendations for project level assessment (EIA) especially regarding noise and biodiversity for specific sections of new transport infrastructure
 - **Synthesis of spatial analysis provides a basis for prioritisation of transport infrastructure projects**

Questions or comments?

Thank you for your attention!



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