

Slovak practical example – Considering climate change risks within infrastructural project preparation: FS Žilina – Košice railway corridor

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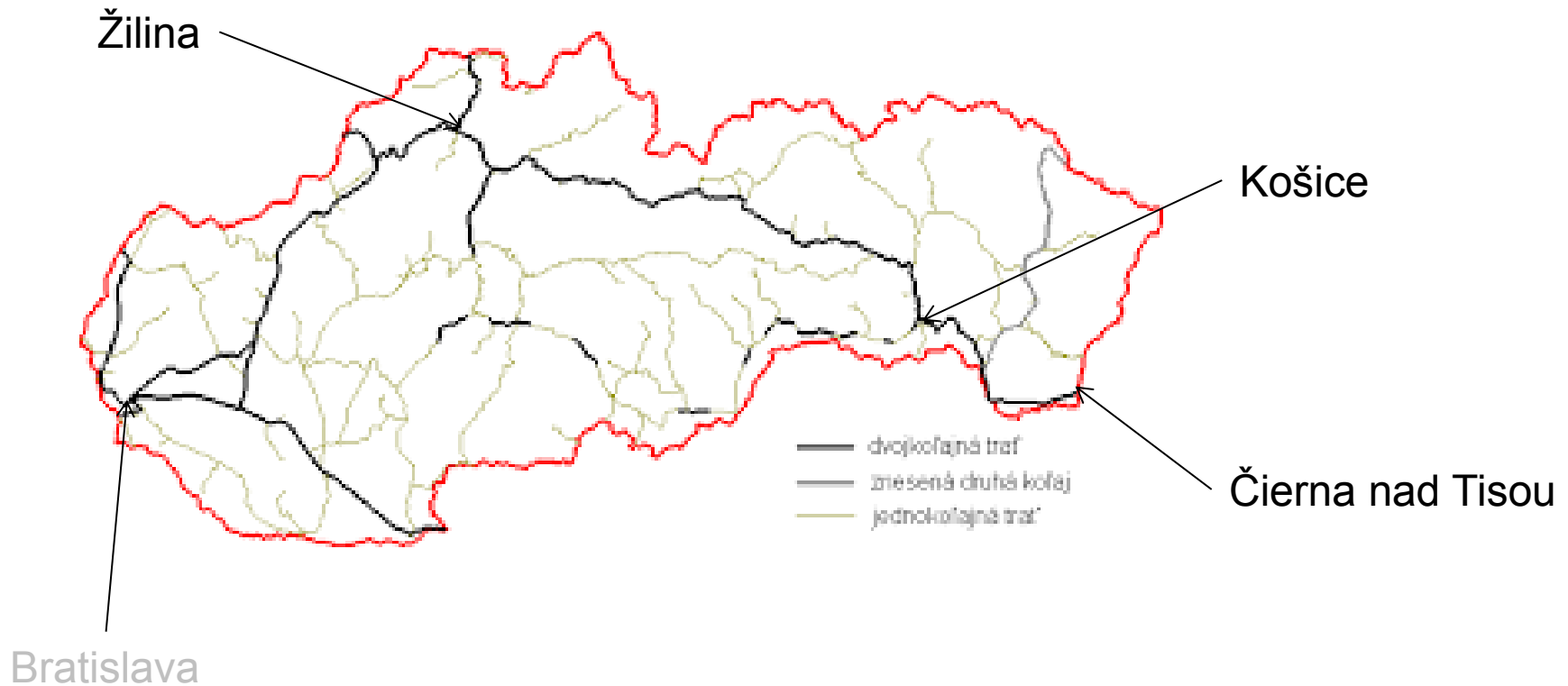


OP Integrated Infrastructure

- One of first 10 OPs approved by COM
- Explicit mention of obligation to undertake screening of projects based on Guideline for Project Managers
- About 55% of investments in transport part of OP geared towards sustainable transport
- Indicative allocation for the support of aims in the area of climate change – 590 mil. EUR
- National Climate Adaptation Strategy approved on level of Government of the Slovak Republic



VI Rail corridor Climate Change Assessment experience



Feasibility Study Žilina – Čierna nad Tisou

- Goal: a comprehensive new FS for modernisation of the railway corridor Žilina – Košice – Čierna nad Tisou (Slovakia/Ukraine border)
- Old FS from 2006 – with only one option for 160km/h
 - New FS works started in April 2014
 - Delivery: September 2015
 - 6th Railroad corridor Žilina-Čierna nad Tisou (260 km) (continuation of Corridor Bratislava – Žilina)
 - Study done in close cooperation with Jaspers



Climate Change Assessment within the FS

- One of the first MS to undertake on study of this scale
- CCA started in spring 2015 during the last 3rd of works on FS (before the alternatives selection)
- Is done before design works
- Administrative procedures to be taken to include CCA within the FS works
- CCA provided:
 - *Inputs for MCA and alternatives selection*
 - *More detailed assessment for 5 selected alternatives*



Step 1: Screening

- Identification of the climate sensitivities of the project
- Expert judgment used to determine key risks

Key issues:

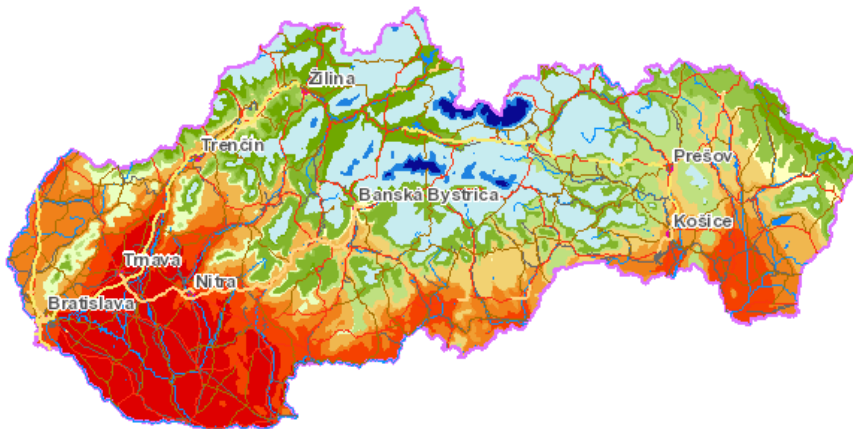
- Flooding – riverine and flash floods
- Landslides (in conjunction with flooding)
- Avalanches
- Icing /freezing rain
- Extreme winds



Step 2: Baseline Analyses

Baseline:

- Review of risks on the existing corridor
- 13 areas problematic because of floods, torrents and unstable slopes
- + new issue of landslides because of uphill deforestation identified
- Flood maps for Q1000 and maps of unstable areas
- CC scenarios for summer and winter rainfall (landslides and avalanches) – unable to find



(Climate areas in Slovakia)



Step 2: Baseline Analyses

Future projections available only for:

- Climate: national CC scenario (very general)
- Flooding: Q500/Q100/Q1000

Historic data (no projections):

- Flash floods - extreme localized rainfall (15 minute rain)
- Monthly average rainfall and temperature
- Monthly average snow cover

Missing climatic data:

- Strong winds
- Ice spells

Data on past problems:

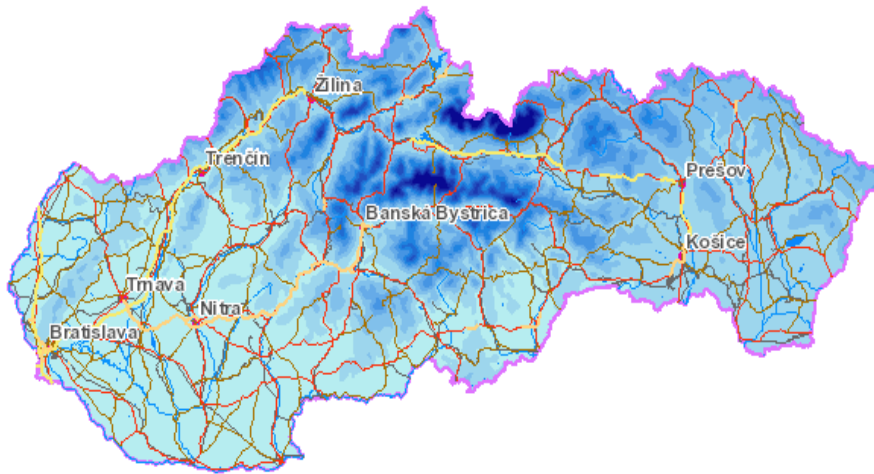
- No records of damage to existing infrastructure

Data not publicly accessible in the required resolution
– needs to be obtained from SHMU and VUV

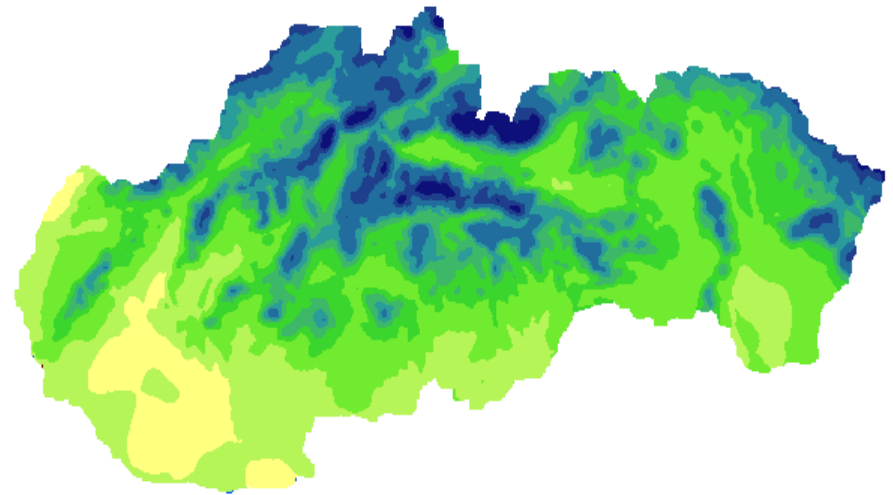


Step 2: Baseline Analyses

Average number of frost days



Average rainfall



Step 3: Vulnerability and Risks Assessment

Past risks (vulnerability to baseline/ observed climate)

- Records from similar events
- Emphasis on cumulative impacts and determine the impact significance



Consideration of Vulnerability fed into Alternatives (CC – one of MCA criteria) and suggestions to technical design – bridge pillars in torrents (lessons from Alps)

Expected future risks (assessment of future climate vulnerability):

- Spatial analyses
- Crossings with risk/sensitive areas
- Elevation

(National adaptation strategy too general to provide any clear reference)

Step 4: Adaptation Options/ Mitigation Measures

Options Considered

- Locational and height options: Most used
- Suggestions for more detailed planning: highlighting key sections and objects that need attention
- Technological options: bridges could be from steel so that they could be possibly lifted or easily repaired, design of traction poles, culverts, bases of bridges and pillars,
- Management options: Should we use the most modern machines which are sensitive to e.g. ice? Should there be solid plan for short-term deployment of diesel machines during ice spells (or when there is meteorological warning about possible ice conditions)?

Difference between Essential and Supporting Infrastructure

Essential infrastructure: bridges, rails

Supporting infrastructure: traction –searching for options – potentially consider whether it can be allowed to malfunction / stop



Step 5: Decisions to be taken based on CCA

Recommendations:

Consider and where possible choose win-win, no-regret and low cost options

For essential infrastructure ensure robust design

- the one which is essential for maintenance of system operation,
- the one which would be costly or time consuming to repair

For unessential infrastructure

- apply adaptive management - warning systems and emergency response systems
- plan for possible collapse (know what needs to be done to arrange operation and what options exist for rebuilding it)



Lessons learnt/suggestions

- First time doing this type of assessment
- Early involvement in the FS preparations (even earlier would be better)
- Use available scenarios – CC and flooding
- Lack of data is an issue (particularly concerning extreme events)
- Workshops with relevant stakeholders were very useful
- Improve internal and external consultations to get improved data and insights into past problems and trends (how often, is it getting worse, etc.)
- Describe the impacts and uncertainties in words – do not rely solely on sensitivity/exposure table



Next Steps – Slovakia Transport

- National systematic approach needed – new study on climate assessments for transport infrastructure about to be launched – list of key issues of concern and types of data to be sought
- Roundtable discussions held and future events planned
- Sector specific engineering tips and guidelines may need to be developed in the future
- Database of possible options for addressing different risks in each sector would be very helpful – as part of the process after the risks were identified and assessed) to help initial discussions not to reinvent the wheel (input into and draw on DG Clima/Climate Adapt)



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Thank you for your attention

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