REPUBLIKA SLOVENIJA
MINISTRSTVO ZA INFRASTRUKTURO

PA 1b

Infrastructure resilience for road & rail

Danube Region

Interreg
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14 Countries

(9 EU Member States

5 Non EU Member States)

Population: 115 mil

(EU-27: 448 mil)

Area: 1.092.591 km2

(EU-27: 4.225.134)

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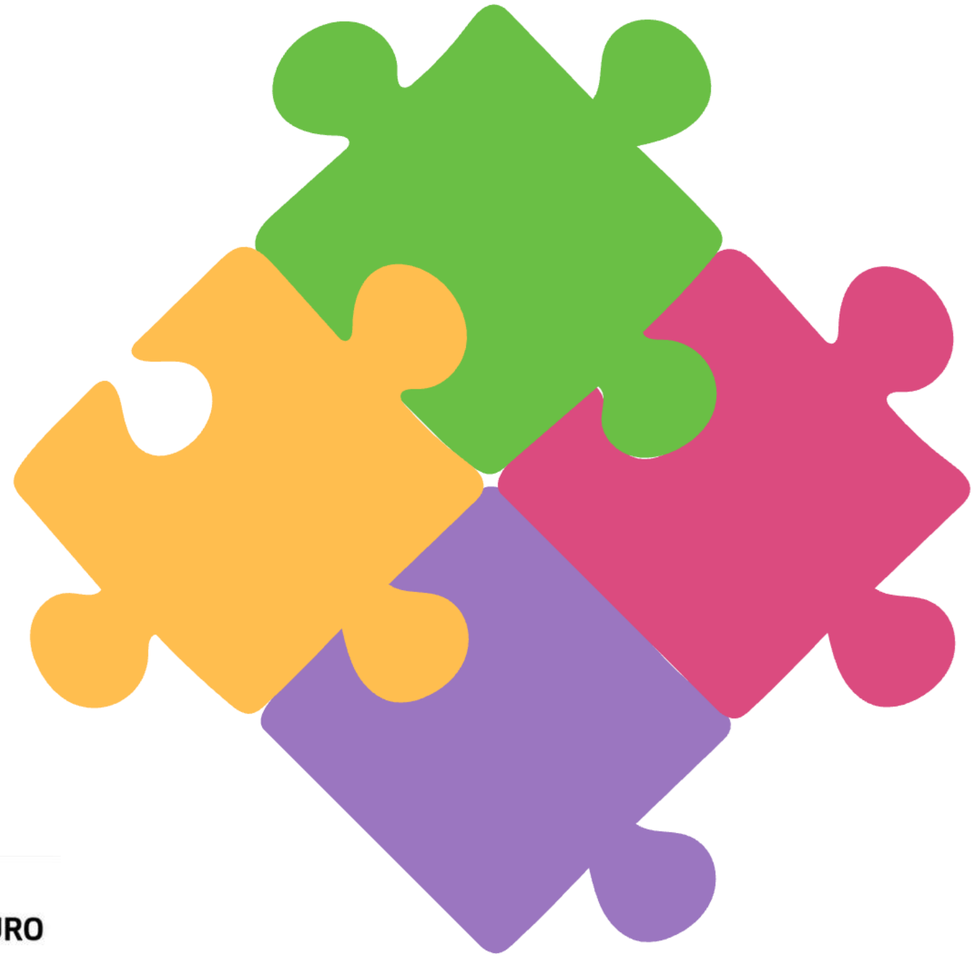
Danube river network

Total length of the Danube itself:

2,857 km

Sum of the Danube + the main named tributaries

13,713 km



Estimate of the whole river network in the Danube Basin (Danube + every tributary, branch and stream) ≈ 561,000 km.

Many reasons for risk?

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The Ministry of Infrastructure of the Republic of Slovenia is the lead partner in managing and coordinating priority area 1b:

"Improving mobility and multimodality – road, rail, and air connections."

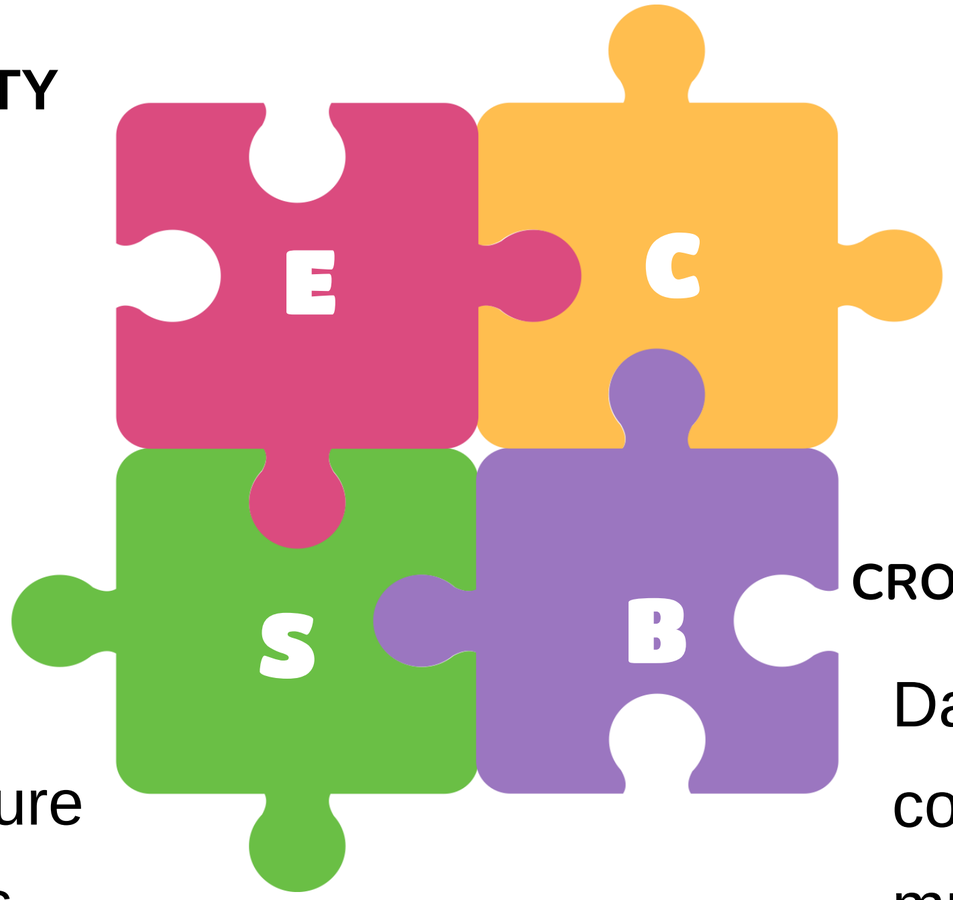
WHY RESILIENCE METTER

E ECONOMIC CONTINUITY

Keep supply chains and trade moving. (reduce high-cost outages)

S SAFETY

Protect lives by preventing infrastructure failures and accidents.



CLIMATE ADAPTION C

more frequent extreme weather (floods, heat, landslides).

CROSS-BORDER STABILITY B

Danube is a transnational corridor — disruptions have multi-country impacts

Key threats to road & rail

Flooding	Washouts, landslides, pavement damage	Track submersion, signaling failures

Key threats to road & rail

Extreme Heat	Asphalt rutting, bridge expansion	Rail buckling (track misalignment)

Key threats to road & rail

Earthquakes	Bridge collapse, road cracks	Track misalignment, tunnel damage

Key threats to road & rail

Snow & Ice	Slippery roads, blockages	Frozen switches, slower operations

Key threats to road & rail

Cyberattacks	**Traffic signal disruption**	**Signal & control system hacking**

PA1b's Efforts for Resilient Infrastructure

PA1b has **actively worked on promoting resilient transport infrastructure**, particularly in the face of climate change, natural hazards and other challenges.

Key activities are aimed to raise awareness and share experiences on how to better plan, build, and maintain resilient road and rail infrastructure in the Danube region.

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PA1b's Efforts for Resilient Infrastructure

- **2015 – 2025:** several items at **Steering group meetings** were dedicated to discussion on resilient infrastructure;

- **November 2017, Ljubljana: A joint workshop with the United Nations Economic Commission for Europe (UNECE) on resilient infrastructure in the Danube region**: This event focused on strengthening knowledge about transport-related Sustainable Development Goals (SDGs), especially SDG 9, which calls for building resilient infrastructure.

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PA1b's Efforts for Resilient Infrastructure

- **October 2024, Bled: the Ministerial Meeting – t**he meeting addressed also the need for a common approach to building and maintaining resilient transport infrastructure, aligning with European standards and policies.

- **June 2025, Sarajevo: Workshop "Advancing Connectivity, Interoperability and Resilience of the Danube Region Railway Network"** in co-operation with the Transport Community Permanent Secretariat. The agenda included also the session „Climate impacts and resilience of the rail infrastructure".

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PA1b's and Projects

- The PA1b actively supports projects that **contribute to building a more resilient transport** system. There are over 160 projects on PA1b‘s list of projects with added value. Since PA1b does not have its own dedicated budget for infrastructure, it helps in mobilizing funds and aligning projects with EU programmes (like CEF, the Interreg Danube Region Programme, HorizonEurope).

- Example of the project that contributes to resilient infrastructure includes INTERREG project **GeoNetSEE**. Its core function is to monitor and provide early warnings for geohazards, which directly enhances the resilience of both natural and manmade structures.

Major catastrophes

June 2023 — Kakhovka dam collapse (Ukraine)

Major downstream flooding & environmental damage (regional impacts).

Aug 2023 — Slovenia catastrophic floods

Widespread damage across municipalities.

Sept 2023 — Storm Daniel (Bulgaria & Greece)

catastrophic floods, bridges/roads destroyed.

Sept 2024 — Central European extreme rains

(often called 'Storm Boris') → Austria, Romania, Slovakia, Hungary heavily affected.

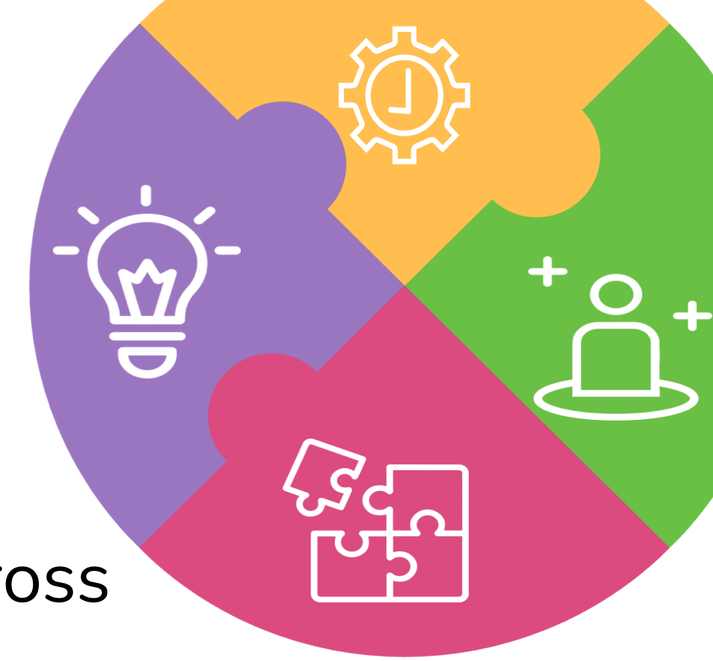
Oct 2024 – Jablanica flash floods & landslides

Railway embankment washouts (Sarajevo–Mostar), longclosures and major reconstruction (local & international response).

Jablanica flash floods & landslides


5,00 m
1,05 m

NEXT STEPS?



Basin-wide risk **mapping & harmonised** data exchange

Scale up **sensors & predictive maintenance** across TEN-T and national mainlines.

Upgrade **drainage & culverts** to climate-adjusted return periods

Build **alternative routings**, resilient multimodal hubs and quick-turn repair kits.

The EUSDR brings together and reduces differences between countries in the Danube macro-region

NEXT STEPS?

Financing: blended finance and contingency funds for rapid repairs.

Nature-based solutions: floodplain restoration and wetlands to reduce peak flows.

Cross-border emergency protocols and joint rapid-response teams.

The EUSDR brings together and reduces differences between countries in the Danube macro-region

Thank you for your attention

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