



Georgian  
Railway  
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# Georgian Railway

*The impact of climate change on the railways:  
how to protect, adapt and mitigate*

*Speaker: Nutsa Kiknadze*



JSC Georgian Railway is a vertically integrated railway company which has the 1992 kilometers of electrified railway, including:

- Length of main rails: 1441.66 km
- Length of single-rail districts: 850 km
- Length of double-rail districts: 294.84
- Length of station rails: 563.16 km
- Length of approaching rails: 79.17 km
- Number of switch point levers: 2.004
- Number of tunnels: 32
- 90% of the entire route is electrified
- 40 transformer stations
- Air lines with an exploitation length of 854 km
- Electric supply to the infrastructure is provided by 53 electrical substations of high voltage, including 26 substations of high voltage.



A Climate Change consequences, such as climate-driven extreme weather, from hot to cold and wet to dry, poses serious challenges for railway infrastructure. Heat waves can cause tracks to buckle and expand, inviting train derailments, while freezes can damage overhead power lines. Flooding undercuts the embankments that line the tracks and can cause landslides that block trains, while droughts cause subsidence and dry out soils so tracks misalign.

The above-mentioned risks are even more intense in the case of the Georgian Railway, considering the geographical location of the country, the Georgian Railway operates on one of the most difficult terrains (including mountainous districts, proximity to the river, proximity to the sea shores and etc.)

And how GR use to protect, adapt and mitigate mentioned risks will be seen on next slides.



## Electrical Contact Networks, Power Transmission Lines and Substations



- In case of contact network and power transmission lines, when the temperature difference between day and night reaches 20 degrees, it may cause changes in the parameters of the contact network, which ultimately risks the line breaking and/or damage to the power receiver of the electrical train.
- Therefore, special staff performs maintenance on the lines - compensating devices are adjusted and then their smooth operation is strictly controlled.
- As for the substations, the above-mentioned temperature change threatens the proper operation of the transformers, therefore, oil change works are carried out in the oil-fired equipment.



# Railway Infrastructure

Critical risk areas have been identified and listed throughout the railway, each critical location is assigned a so-called "unique card" describing the critical nature of the location (dormant landslide, landslide hazard, flood hazard, etc.) and the following works are periodically carried out as necessary:

- Coast-protecting structure;
- Mining channels;
- Protective walls;
- Carrying out snow cover cleaning works with special vehicles owned by the railway;
- Continuous instrumental and visual monitoring;
- Greening strips;
- GHG emissions reports.



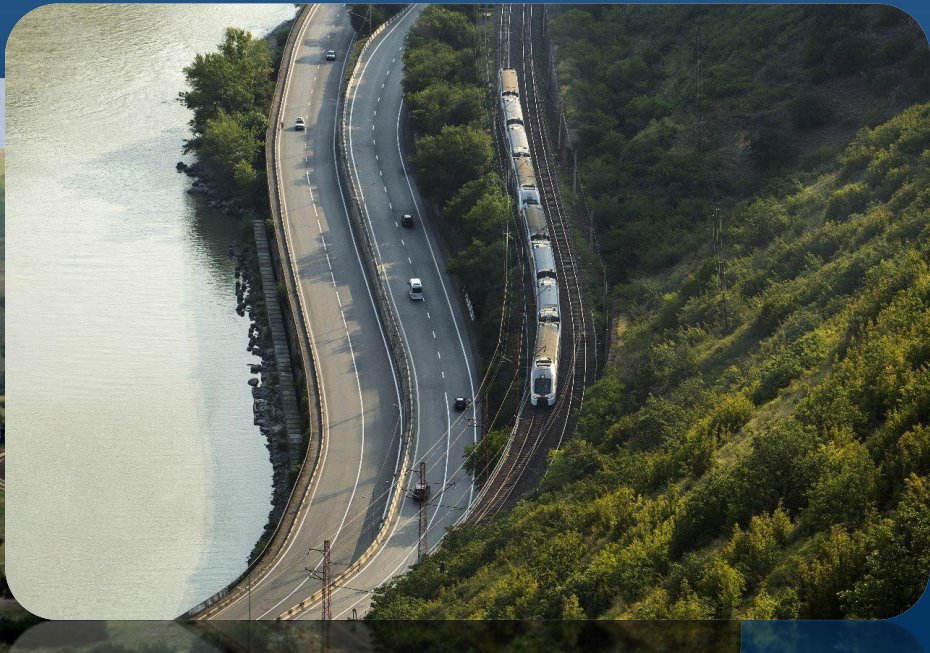
In addition, the most critical place on the Georgian railway is the section of the pass, where the modernization works of the railway are currently underway, a total of 43 km will be modernized according to the international standards.

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# Railway Modernization Project

- We are currently implementing the largest-scale infrastructural project of the last decades – the modernization of the Tbilisi-Makhinjauri railway main line. Importantly, after finishing the process, the railway infrastructure and safety will be improved;
- After the completion of the railway modernization project, 98% of Georgian railway will be fully electrified, which in turn will have a positive effect in terms of climate change.



# Thank You!

