


**Economic Commission for Europe**
**Inland Transport Committee**
**Working Party on Transport Trends and Economics**
**Group of Experts on Assessment of Climate Change  
 Impacts and Adaptation for Inland Transport**
**Twenty-second session**

Geneva, 28 and 29 March 2022

**Report of the Group of Experts on Assessment of Climate  
 Change Impacts and Adaptation for Inland Transport at its  
 twenty-second session**
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## I. Attendance

1. The Group of Experts on Assessment of Climate Change Impacts and Adaptation for Inland Transport (hereafter called GE.3) held its twenty-second session (fourth session under its new mandate) on 28 and 29 March 2022. The session was chaired by Ms. S. Haensel (Germany) and held as a hybrid meeting with virtual participation through Zoom platform and in-person participation.
2. Representatives of the following United Nations Economic Commission for Europe (ECE) member States participated: Albania, Armenia, Canada, Finland, France, Germany, Ireland, Poland, Portugal, Russian Federation and United Kingdom of Great Britain and Northern Ireland.
3. Representation of the following international organizations participated: United Nations Conference on Trade and Development (UNCTAD) and World Association for Waterborne Transport Infrastructure (PIANC).
4. The following non-governmental organization was represented: International Union of Railways (UIC).
5. At the invitation of the secretariat, experts from the following organizations participated: Climate Sense, EUROCONTROL, European Investment Bank (EIB), PKP Polish Railway Lines (PKP PLK), UIC (University of the Aegean, University of Birmingham and World Road Association (PIARC).

## II. Adoption of the agenda (agenda item 1)

*Documentation:* ECE/TRANS/WP.5/GE.3/43

6. GE.3 adopted the session's agenda as contained in ECE/TRANS/WP.5/GE.3/43.

## III. Initiatives in climate change impact assessment and adaptation for inland transport (agenda item 2)

7. GE.3 continued its discussion on initiatives in climate change impact assessment and adaptation for inland transport with a view to understand if any new approaches, tools and/or methodologies exist or are being developed that could be integrated by GE.3 in its work. In particular GE.3 considered information on (i) the EUROCONTROL study on Climate Change Risks which assesses impacts of climate change on European aviation, (ii) the Guide on using adaptation pathways for decision making developed as British Standard (BS8631:2021), (iii) the outcomes of the PIARC's International Seminar on Climate Change Adaptation and Resilience of Road Networks in Low- and Middle-Income Countries, (iv) the updates with regard to the kick-off of the UIC Resilient Railways facing Climate Change: Heavy Rains (ReRa-Rain) project, (v) the work aimed at the development of guidelines for climate risk assessment in European Union (EU) taxonomy, (vi) the suggested path to a development of transport system stress test guide, and (vii) the Polish National Road Administration (GDDKiA)–JASPERS<sup>1</sup> project on climate change adaptation for national roads in Poland including notably the assessment of the Polish road network vulnerability to climate change as well as a business case for adaptation.
8. University of Aegean updated GE.3 with regard to the existing state of knowledge on the evolution of the potential hazards for inland transportation under Climate Variability and Change.
9. GE.3 appreciated the information shared respectively by representative of EUROCONTROL, Chair of BSI<sup>2</sup> Climate Change Adaptation Panel, PIARC, UIC, Federal

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<sup>1</sup> JASPERS is a joint technical assistance from the European Investment Bank and the European Commission. (<https://jaspers.eib.org/>)

<sup>2</sup> British Standards Institution

Environment Agency, ETH Zurich<sup>3</sup>, JASPERS and University of Aegean. In the discussion following the presentations, GE.3 agreed to: (i) collect more information on adaptation pathways in transport in collaboration with EUROCONTROL and PIARC and other interested entities, (ii) stay abreast of progress in the development of guidelines for climate risk assessment in EU taxonomy and in the UIC ReRa-Rain project, (iii) incorporate JASPERS experience and knowledge in working out resource material for business-case for adaptation, and (iv) establish a group of volunteers for intersessional work to initiate elaboration of a guide and/or standard for transport system stress tests. Such guide/standard should assist in defining stress test including test scenarios and usage of indicators.

10. Further to the GE.3 request at the previous session, a small group of volunteers presented Informal document (March 2022) No. 2 in which considerations on ways for data collection on transport direct damage or disruption costs due to extreme weather events are discussed. The small group suggested adoption of an incident-based approach and so analysis of single transport incidents due to weather events which led to any economic losses and adaptation cost which should prevent such losses to occur. On that basis business cases for adaptation should be assessed. For data collection purposes, the small group drew up a questionnaire on railway incidents due to various levels of precipitation, which could be used for data collection in UIC RERA RAIN project. It proposed that questionnaires for other extreme weather events, such as e.g. heatwaves as well as for other modes of transport are also developed.

11. GE.3 thanked the small group for its work. It welcomed the development of the first questionnaire as well as requested that other specific questionnaires (on other extreme weather events and for other inland modes of transport) are developed and circulated to transport infrastructure and operation managers through different platforms such as UIC, Trans-European Motorway Project (TEM), Trans-European Railway Project (TER), etc. GE.3 further requested that in the development of the questionnaires, the small group consults JASPERS to incorporate JASPERS experience and knowledge from the project in Poland focused on understanding business case for adaptation. Finally, GE.3 requested the small group to provide updates at the next session on progress achieved.

12. Concerning the structure of the future final report and how the developed and presented material should be integrated in it based on ideas submitted by experts, GE.3 decided to postpone the discussion to the next session. It also requested experts to share their ideas in this regard through the secretariat.

13. PIANC briefly informed about finalisation of two technical notes, one on ways to deal with climate change uncertainties and other on costs and consequences of extreme weather and the case for adaptation of ports and inland waterways. GE.3 requested PIANC to introduce in more detail these technical notes at the next session upon their publication.

#### **IV. Climate change and transport assets data (agenda item 3)**

14. University of Birmingham on behalf of experts from Canada, Germany and Climate Service Germany updated GE.3 on their intersessional work and presented Informal document (March 2022) No.1 which suggests indices and thresholds for climate change impact analysis related to high-temperatures and heavy precipitation. The document further suggests investigating feasibility of analysing projected changes for windstorms.

15. GE.3 welcomed the suggestions. It agreed to start elaboration of maps presenting projections depicting the future changes for the following indices by using the same methods as in ECE/TRANS/283:

- High temperatures: annual count of days when daily maximum temperature is greater than 25, 32 and 43°C.

<sup>3</sup> Swiss Federal Institute of Technology in Zurich

- Heavy precipitation: annual count of days with daily precipitation greater than 50, 100 and 150mm and annual count of days with 3-day precipitation greater than 50, 100 and 150mm.

16. GE.3 agreed then to start analysing the maps, upon their availability, from the next session and when doing so to consider if using a regional approach (percentile thresholds) rather than grid scale approach would be sensible for analysis of impacts from heavy precipitation.

17. With regard to windstorms, the small group was requested to make specific index or indices proposal at the next session.

## **V. National and sub-national projects on climate change impact assessment and transport asset adaptation needs (agenda item 4)**

18. Experts from EUPAVE, CEMAX, Canada, Ireland, Germany and France made presentations at the current session on projects relevant to the work of GE.3. EUPAVE and CEMAX spoke about experience and available knowledge about road pavement resilience due to extreme weather events with focus on differences between concrete and asphalt pavements. Canada presented its review undertaken on transport thresholds. Ireland informed about the work done by its Meteorological Service to standardize future climate information for Ireland. Germany spoke about a project conducted by Federal Road Institute to assess standards and regulations whose content may be subject to amendments in the context of climate change. Finally, France informed about a systematic approach undertaken in the region of Provence-Alpes Cote d'Azur to enhancing the climate resilience of transport system.

19. GE.3 appreciated the informative presentations. It acknowledged the recommendation that adaptation should also be assessed in the context of mitigation actions, and that an adaptation action which negatively affects mitigation action should not be prioritized.

20. With regard to thresholds, the discussions should be pursued under the item on climate change and transport assets data, when the projections maps be discussed. Should GE.3 decide to develop any guide on changing thresholds, e.g. in the context of review of standards and/or regulations, such discussion should be pursued under the item on guidelines for integrating climate change considerations in planning and operational processes.

21. With regard to network criticality assessment, France informed that it developed a methodology for assessing functional criticality of its networks. JASPERS stated to be aware of some work in Spain on this matter. To this end, GE.3 requested France to present its methodology at the next session. It also invited JASPERS and the secretariat to identify authors of the Spanish work and invite them to present the report at the next session. GE.3 also requested the secretariat to assess internally, which data is collected, in particular through the work of the ECE Transport Statistics secretariat, and could be used for calculating criticality indicators such as worked out in Germany as presented at the twenty-first session.

22. GE.3 requested then experts to present at the next session national and sub-national projects on climate change impact assessment and transport asset adaptation needs. In this context, Canada and Germany informed they would consider presenting assessments of the devastating flood events which occurred in summer 2021 and decision taken on how to build back better.

## **VI. Database on adaptation measures (agenda item 5)**

23. PIARC presented its ongoing work on the review of case studies on road adaptation measures and how PIARC intends to structure the case studies in its final report so as to assist the work of road managers in using methods for comparison and selection of adaptation measures. It also shared its intension to combine adaptation responses into adaptation pathways.

24. GE.3 welcomed the information provided by PIARC and requested a more detailed presentation of the final report once it becomes published.

25. Inspired by the presentation on the guide on using adaptation pathways for decision making under item 2, and as reflected under item 2, GE.3 agreed to collect examples of adaptation pathways developed for transport. University of Birmingham, EUROCONTROL, PIARC and Climate Sense expressed their interest to work with the secretariat on this subject. To this end, GE.3 requested the secretariat and a group of volunteers to engage in the intersessional work and to collect examples and prepare for a targeted discussion at the next session.

## **VII. Guidelines for integrating climate change considerations in planning and operational processes (agenda item 6)**

26. The secretariat informed briefly about a conference held in Moscow on 15-16 November 2021 whose aim was to raise awareness on the importance of adaptation of transport systems to climate change in countries of Eastern Europe, Caucasus and Central Asia. A more detailed information on the conference and its outcomes should be presented at the future sessions.

27. PIARC reported on its XVI World Winter Service and Road Resilience Congress which had taken place in Calgary on 7–11 February 2022. The secretariat briefly informed about the Foresight Session on the work of GE.3 held within this Congress on 11 February 2022. GE.3 appreciated the opportunity the Congress offered to promote its work towards enhancing climate change resilience in transport.

28. The Chair informed about a submission of an abstract on behalf of GE.3 to Transport Research Arena (TRA) 2022 Conference in Lisbon dedicated to European research and technology on transport and mobility. The abstract discusses how the work undertaken by GE.3 can translate in action at the regional and local levels to enhance adaptation of transport to climate change. The Conference organizers informed on their acceptance of the abstract and requested preparation of a conference paper. GE.3 thanked the Chair and the secretariat for promoting its work to various transport audiences. It requested the Chair and the secretariat in continuing this work, including through participation in events such as the TRA 2022 Conference.

29. The Chair also invited experts from GE.3 to contribute to the new special issue of the journal ‘Atmosphere’. Interested experts should contact the Chair directly.

30. With regard to the organization of future workshops to promote the work on transport adaptation to climate change, GE.3 noted limited participation of experts from the Mediterranean countries in its work. To this end, GE.3 requested the secretariat to explore opportunities to organize a workshop for the Mediterranean region.

31. GE.3 agreed then to consider issues such as stress tests and adaptation business case assessment and related guidance under item 6 instead of item 2.

## **VIII. Other business (agenda item 7)**

32. The Chair informed GE.3 that Ms. Elizabeth Smalley, in view of her position change within Transport Canada, would no longer be available to serve in her role as the GE.3 Vice-Chair. Canada provided a statement from Ms. Smalley to experts.

33. GE.3 thanked Ms. Smalley for co-chairing earlier sessions, for strong engagement in Group’s work, for offering the Canadian perspective, for mobilizing Canadian experts on various topics related to the subject of transport adaptation to climate change as well as for playing an instrumental role in preparation and finalization of the final report of the preceding Group. GE.3 wished Ms. Smalley many successes in future professional endeavors. GE.3 also welcomed continuous engagement from Transport Canada in its work.

34. GE.3 requested then the secretariat to include elections of the Vice-Chair in the agenda of the next session, so that along Mr. J. Kleniewski from Poland, also a second Vice-Chair is elected for the remaining period of the mandate.

## **IX. Date and place of next meeting (agenda item 8)**

35. The secretariat informed GE.3 about the scheduled date for twenty-third session on 31 October and 1 November 2022 in Geneva.

## **X. Summary of main decisions (agenda item 9)**

36. The secretariat summarized the decisions taken by GE.3. The full report of the session, prepared by the secretariat in consultation with the Chair and Vice-Chairs, would be shared electronically after the session for adoption.

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