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**Economic Commission for Europe**
**Inland Transport Committee**
**Working Party on Transport Trends and Economics**
**Group of Experts on Climate Change Impacts and  
Adaptation for Transport Networks and Nodes**
**Thirteenth session**

Geneva, 22 and 23 June 2017

**Report of the Group of Experts on Climate Change Impacts  
and Adaptation for Transport Networks and Nodes on its  
thirteenth session**
**Contents**

	<i>Paragraphs</i>	<i>Page</i>
I. Attendance .....	1-5	2
II. Adoption of the agenda (agenda item 1).....	6	2
III. Climate Change and Transport Networks and Nodes: Presentations of initiatives at national and international levels (agenda item 2).....	7	2
IV. Partners and expected contributions (agenda item 3).....	8-12	2
V. Discussions on the final report of the Group of Experts (agenda item 4).....	13-22	3
VI. Other business (agenda item 5).....	23	6
VII. Date and place of next meeting (agenda item 6) .....	24	6
VIII. Summary of main decisions (agenda item 7) .....	25	6

## **I. Attendance**

1. The Group of Experts (hereafter called the Group) on Climate Change Impacts and Adaptation for Transport Networks and Nodes held its thirteenth session on 22 and 23 June 2017. The session was chaired by Mr. J. Kleniewski (Poland).
2. Representatives of the following United Nations Economic Commission for Europe (UNECE) member States participated: Denmark, Finland, France, Germany, Netherlands, Poland, Portugal, Slovenia and Spain. Representatives of Australia also attended via tele-conference under Article 11 of the Terms of Reference of UNECE.
3. Representatives of the following United Nations organizations or specialized agencies attended the meeting: United Nations Conference on Trade and Development (UNCTAD) and the World Meteorological Organization (WMO).
4. Experts of the European Union (EU, European Commission, Joint Research Centre and Permanent Delegation of the European Union to the United Nations Office and other international organizations in Geneva) also attended.
5. At the invitation of the secretariat, experts from the following organizations participated: Climate Service Centre Germany, CMS Cameron McKenna LLP and the University of the Aegean.

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

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6. The Group adopted the agenda.

## **III. Climate Change and Transport Networks and Nodes: Presentations of initiatives at national and international levels (agenda item 2)**

7. There were no presentations under this agenda item since the Group focused its discussions on the preparation of the final report and its cooperation with the different partners.

## **IV. Partners and expected contributions (agenda item 3)**

8. The Group recalled that at its previous session requested specific projections for different climatic factors from WMO. The Group during the session had the opportunity to further discuss this request, to address the challenges and obstacles and reconsider it. The Group's final decision was based on the principle that at this stage we should "keep it simple", we should use not all data available but the amount of data that can ensure a concrete and valuable for the Governments result and output.
9. The Group noted that, given the size of the UNECE region, and the subsequent requirements for transmission and storage of data are too large for currently available and accessible method. Therefore, the Group agreed to take two steps to establish a fully functioning system; as a starting point, the system would employ the climate projections driven from the global climate model (GCM) with a spatial resolution of ~300 km, and as such provide a coarse look at possible future changes in climate variables. These results may serve as a basis for more detailed investigation at a later stage. Given the nature of the

investment cycles and different lifetimes of critical infrastructure assets, the group agreed that 50 years would represent a suitable time horizon over which to consider possible changes in climate variables. An additional consideration when investigating possible future changes in climate is the emissions scenario under which changes are to be analysed. Given that the Group will be exploring changes in a future time period 50 years from now, it is important to consider more than one scenario, because the differences between different scenarios start to become more prominent with time. In the same context, it is important to investigate and indicate the extent of uncertainty within the newly developed system. The Group concluded that the system would employ the RCP2.6 scenario which is consistent with the goal set by the Paris Agreement, and the RCP8.5, which may be considered a “business as usual” scenario.

10. Furthermore, the Group also decided that WMO, through its World Climate Research Programme (WCRP) and the Climate Service Centre of Germany (GERICS), would provide primarily the projections for the following climatic factors: extremes on temperature, precipitation and winds. The Group was also to receive the data on sea level rising and floods by the EU Joint Research Centre in Ispra, Italy where significant and relevant research has already taken place. The secretariat should contact the JRC.

11. The representative from EU JRC, Mr. A. Christodoulou, presented the results from the PESETA<sup>1</sup> III and HELIX<sup>2</sup> projects on impacts of climate change on maritime transport. The JRC provides scientific and technical support to the European Commission for the development, implementation and assessment of EU policies. The climate change impacts and relevant risks for seaports are focused on the increased intensity of storms which leads to ports closure and on high precipitation which leads to flooding and inundated areas as well as to damaged storage buildings. Furthermore the increased temperature and the heat waves lead to adverse impacts on modes linking ports to the hinterland (roads, railways) and the high speed winds to the delays in unloading/loading vessels.

12. The representative of UNCTAD, Mrs. R. Asariotis, provided information on the UNCTAD capacity-building project on "Climate change impacts on coastal transport infrastructure in the Caribbean: Enhancing the adaptive capacity of Small Island Developing States". Case studies focusing on two vulnerable SIDS<sup>3</sup> in the Caribbean region (Jamaica and Saint Lucia) have been carried out to enhance the knowledge and understanding at the national level and to assist in developing a transferable methodology for assessing climate-related impacts and adaptation options in other SIDS. Preliminary results were presented and discussed at two national capacity building workshops in Saint Lucia and in Jamaica. More information can be found at the following link: <http://unctad.org/en/Pages/DTL/TTL/Legal/Climate-Change-Impacts-on-SIDS.aspx>.

## **V. Discussions on the final report of the Group of Experts (agenda item 4)**

13. Professor A. Velegrakis, Consultant of the Group, presented an updated version of Chapter one of Group’s final report on overview of recent climate change trends and projections affecting transportation in the ECE Region. This overview includes the phenomenology meaning how is the climate changing, the recent climate projections, the climate change implications for transport as well as some conclusions and recommendations. The main conclusions of this analysis are:

<sup>1</sup> Future Directions for European Impact Assessments

<sup>2</sup> High-End Climate Impacts and Extremes

<sup>3</sup> Small Island Developing States

- (a) There is ample evidence to suggest a significant and, in some cases, accelerating change,
- (b) The period 2011-16 was the warmest 6-year period on record for most of the ECE region,
- (c) Under both low-moderate and high emission scenarios, large increases in land temperatures projected, particularly for the northern ECE region,
- (d) The already diminishing sea ice/permafrost areas will be very significantly reduced,
- (e) Global mean sea level (MSL) rise in 2081-2100 projected to increase by up to 1 m; however there will be significant spatial variability,
- (f) In the ECE region, very hot summers will occur much more frequently under all scenarios,
- (g) Increases in heavy precipitation projected for central and NE Europe; increases in river flooding are also projected,
- (h) Large increase in heat wave frequency are projected for Europe,
- (i) Projections show higher ESLs for all European seas; Wave power will also increase particularly in the Baltic and the NE and NW Pacific.

14. The Group thanked professor A. Velegrakis for his efforts and for the preparation of this overview. It recalled that the main objective of this chapter is to provide a general and global overview of climate changes and agreed that this objective is accomplished. However, the Group agreed that the chapter should be revisited and possibly reviewed after having finalized all chapters of the final report in order to ensure compatibility and complementarity among the different chapters.

15. Professor A. Velegrakis also provided a first analysis of Governments' replies to Group's questionnaire. His main findings were as follows:

- (a) In total 20 Governments has replied to Group's questionnaire however few (15) responses provided information that could be statistically analysed,
- (b) Number of Governments' perceived importance of climate change: 61 per cent low or moderate and 39 per cent high (15 responses),
- (c) Critical infrastructure arteries and nodes useful for mapping: 8 responses, but numbers for ports and airport are skewed,
- (d) Perceived climatic impacts on critical infrastructure by factor and mode: information primarily for road and rail (9 responses),
- (e) Perceived change over time of climatic impacts on critical infrastructure by mode and factor: Very limited information for roads only (10 responses),
- (f) User requests for effective response measures: 42 per cent yes and 42 per cent no (12 responses),
- (g) Availability of information on climate change impacts by modal infrastructure: Varied answers (10 responses),
- (h) Basis for weather/climate information used: most respondents reported both observations and modelling 10 Responses,
- (i) Availability of downscaled forecasts/assessments for critical infrastructure: where available mostly up to 50 years (11 responses).

16. The Group agreed that the limited responses to Group's questionnaire could be result of many reasons for instance the agreed questionnaire was very demanding and requested information that lies on more than one Ministries etc. however in parallel justifies Group's main "raison d'être" which is the creation of awareness for climate change adaptation. Furthermore the Group noticed that some Governments replied to the questionnaire by providing links to their National strategies, action plans as well as policies already implemented. Also, during Groups' sessions Governments and Organizations representatives presented various good practices, policies and actions implemented. Therefore, the Group decided that a chapter should be added to the initial outline of Group's final report that would summarize all these good practices, strategies and case studies creating a library on climate change adaptation useful in creating awareness. The representative of Netherlands Mr. P. De Wildt volunteered to draft this chapter based on countries and organizations input and distribute it to all experts for their review.

17. The Group recalled that at its previous session the secretariat provided information on how the second chapter on the identification and sensitivity of transport infrastructure in the ECE region will be elaborated. The secretariat pointed out that since the information provided on the replies to the questionnaire on this topic was limited the information from the EC, the Trans European Transport Networks (TEN-T), the ECE EATL project and the work of ECE on road and rail censuses should be used. The E-road and E-rail Censuses provide comparable data on traffic flows on main European roads and railways. The E-roads table includes total length of E-Roads by width and number of carriageways and lanes, E-Road sections' average annual daily traffic (AADT), distribution of motor traffic by vehicle category etc. The characteristics of E-Railway lines provide information on volume and distribution of rail traffic, on the technical characteristics of the rail network (e.g. electrification) and on the stock situation at the end of reference year.

18. The Group agreed that since almost none of the States can officially declare their critical transport infrastructure and since no relevant data was provided in the replies to the questionnaire, the term "critical transport infrastructure" will not be used while presenting States transport infrastructure. Instead, and wherever the E-road and E-rail Censuses apply, the official titles of the relevant conventions that the E-road and E-rail Censuses refer to should be used. More specifically:

- (a) For roads: Main International Traffic Arteries (AGR),
- (b) For railways: Main International Railway Lines (AGC),
- (c) For inland waterways: Main Inland Waterways of International Importance (AGN),
- (d) For intermodal transport: Important International Combined Transport Lines and Related Installations (AGTC).

19. The 46 countries for which data exists from the E-road census (2000, 2005) are: Albania, Armenia, Austria, Azerbaijan, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, the Former Yugoslav Republic of Macedonia, France, Georgia, Germany, Greece, Hungary, Ireland, Italy, Kazakhstan, Kosovo, Kyrgyzstan, Latvia, Lithuania, Luxembourg, Montenegro, Netherlands, Norway, Poland, Portugal, Republic of Moldova, Romania, Russian Federation, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Tajikistan, Turkey, Turkmenistan, United Kingdom of Great Britain and Northern Ireland, Ukraine, Uzbekistan. For the rest 10 countries either the TEN-T or the EATL/TEM&TER data will be used.

20. The 30 countries for which data exists from the E-rail census (2005) are: Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Czechia, Denmark, Finland, France, Germany,

Hungary, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Republic of Moldova, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, the Former Yugoslav Republic of Macedonia, Turkey and Ukraine. For the rest 26 countries either the TEN-T or the EATL/TEM&TER data will be used.

21. The Group agreed that the initial matching of data from transport infrastructure based on traffic and from projections of the different climatic factors could produce a preliminary hot spots map, although the Spanish delegate expressed a big concern about producing hot spots maps for the ECE region (even if they are considered preliminary) only by means of placing transport infrastructure on spatial maps with climate projections. This task should be undertaken by the secretariat and this initial hot spots map should be produced for review by the experts at their next session. However, the experts also agreed that in order to ensure reliability, consistency and technical correctness of their output / final report each hot spot should be further analyzed and evaluated based on other factors such as socio-economic factors, quality of the infrastructure, adaptation measures already taken etc. The parameters based on which those “hot spots” should be further evaluated in order to ensure that they constitute real hot spots for a State / region as well as the methods that should be followed in order to collect all this additional information/data should be decided at the next session of the Group.

22. The Group took note that this session is the last one under the current mandate. The Group requested the secretariat to report at the 30th session (Geneva, 4-6 September 2017) of the Working Party on Transport Trends and Economics the developments of the Group’s work, the challenges is facing as well as the opportunities that exist in order to produce a very useful policy decision tool for Governments, the so called “hot spots map”. Also, it requests the extension of the mandate of the Group on the same terms of reference for one more calendar year starting after the final approval in April 2018 by UNECE Executive Committee.

## **VI. Other business (agenda item 5)**

23. There were no other items.

## **VII. Date and place of next meeting (agenda item 6)**

24. Sessions of the Group of Expert are not foreseen so as to allow WP.5, at its forthcoming session on 4-6 September 2017, to consider progress made and provide guidance on possible future activities of the Group of Experts, as appropriate, for approval by the Inland Transport Committee in February 2018.

## **VIII. Summary of main decisions (agenda item 7)**

25. The Group adopted its main decisions of its thirteenth session and requested the secretariat and the Chair to prepare the full and complete report for circulation to the members of the Group for comments on items other than those contained in its main decisions.