

World Road Association (PIARC)
PIARC Technical Committee 1.4:
Climate Change and Resilience of Road Networks
Meeting 2: Virtual meeting, 26–30th October 2020

Executive Summary

The second meeting for the 2020-2023 cycle for Technical Committee 1.4: Climate Change and Resilience of Road Networks for the World Road Association (PIARC) was held virtually from 26-30th October 2020. The meeting was attended by Caroline Evans (National Transport Commission), Chair of the Technical Committee 1.4, Louis Bettini (Main Roads Western Australia), English-Speaking Secretary, and Stuart Woods (NZ Transport Agency), Working Group 2 Co-Leader. Lucinda Hoffman (TMR), Corresponding Member also attended.

In this cycle the Technical Committee (TC) will be addressing two issues:

- 1.4.1 Uniform and holistic methodological approaches to Climate Change and other hazards resilience
- 1.4.2 Update of the PIARC Climate Change Adaptation Framework.

The main activities of the meeting were to:

- Participate in a two-day plenary session (Day 1, 5) to introduce new members to the Committee, and obtain updates from the Chair, Strategic Theme Coordinator and Technical Advisor for Strategic Theme 1.
- Discuss the Terms of Reference and the Work Plans according to the objectives, outputs, and work methods, as dictated by the 2020-2023 Strategic Plan.
- Establish Working Groups and assign individual members to Working Groups for each of the issues listed above.
- Commence the program for the Work Programs including presentations provided by members of each Working Group, and internal Case Study Taskforce (Days 2-4).
- Discuss definitions and coordination of the topic of resilience across related PIARC TC's such as TC 1.5 Disaster Management and Strategic Theme 4: Resilient infrastructure.
- Discuss TC 1.4's participation in the Winter Congress in Calgary, February 2022. Undertake preliminary planning for forthcoming Workshops, Seminars, and future meetings.

The next TC 1.4 meeting was scheduled to be in Berlin, Germany 2021, together with a Workshop. Due to COVID-19 Germany has confirmed that face-to-face meetings are not possible, and this meeting will now be online. Options for a virtual Workshop are being discussed.

Background

Within the PIARC Strategic Plan exists Strategic Theme 1: Road Administrations. This strategic theme includes five Technical Committees, one of which is PIARC Technical Committee 1.4 which addresses climate change and other hazards resilience of road infrastructure, and update of the *International Climate Change Adaptation Framework for Road Infrastructure*.

In this cycle, the activities of the TC 1.4 are divided into two Working Groups and an internal Taskforce:

- Working Group 1 (WG1) Uniform and holistic methodological approaches to Climate Change and other hazards resilience. This WG aims to explore the effectiveness of a PIARC all-hazard approach for resilient road networks using case studies.
- Working Group 2 (WG2) Update of the PIARC Climate Change Adaptation Framework. This WG aims to update the Framework originally developed in 2012-2015, and builds on the work of the previous cycle (2016-2019) by TC E.1 Adaptation Strategies and Resilience which formulated proposals for the refinement of this Framework. These refinements and previous work will form the basis for updating the Framework within this cycle.
- Case Study Taskforce has been formed to consolidate case studies to assist in the development of the Working Group reports.

Work Program

TC 1.4 is focussed on expanding the collective knowledge for climate change adaptation and resilience to include impacts of climate change and other hazards, such as aging of infrastructure, climate change, natural disasters and cyber-security hazards. It extends the products developed in the previous cycle and aims to disseminate best-practice knowledge on methodological approaches for climate change and resilience with a top-down/whole-of-system perspective. The outputs and expected deadlines for each of the issues in TC 1.4 are described in the Strategic Plan and summarised below:

Strategies/Objectives	Outputs	Expected Deadlines
1.4.1 Uniform and holistic methodological approaches to Climate Change and other hazards resilience		
<ul style="list-style-type: none"> • Identification of hazards and environmental threats within the context of road infrastructure resilience (in consultation with other relevant TC's). • Approaches to: <ul style="list-style-type: none"> ○ Risk management within the context of resilience ○ Decision-making and uncertainties/deep uncertainties ○ Emergency management with the context of resilience ○ Resilience management and resilience engineering • Economic, social and environmental aspects of resilience management <ul style="list-style-type: none"> ○ Identification of the socio-economic impacts of hazards on roads ○ Identification of decision areas that need enhanced socio-economic information, and on the key users of such information. ○ Impact and socio-economic evaluation of measures to increase resilience on the availability of road transport infrastructure, and the cost effectiveness of different adaptation strategies • Define criteria to implementation of resilience into asset management practice (in consultation with other relevant TC's e.g. TC 3.3 Asset Management) • Encourage coordination with other TCs and TFs, such as T.C.1.5 – Disaster Management, T.C.2.4 – Road Network Operation/ITS, T.C.3.2 – Winter Service, T.C.3.3 – Asset Management, T.C.3.4 – Environmental Sustainability in Road Infrastructure and Transport, T.F.3.1 – Road Infrastructure and Transport Security, T.C.4.1 – Pavements, T.C.4.2 – Bridges, T.C.4.3 – Earthworks, T.C.4.4 – Tunnels and T.F.4.1 – Road Design Standards. 	Collection of Case Studies	December 2021
<ul style="list-style-type: none"> • Define criteria to implementation of resilience into asset management practice (in consultation with other relevant TC's e.g. TC 3.3 Asset Management) • Encourage coordination with other TCs and TFs, such as T.C.1.5 – Disaster Management, T.C.2.4 – Road Network Operation/ITS, T.C.3.2 – Winter Service, T.C.3.3 – Asset Management, T.C.3.4 – Environmental Sustainability in Road Infrastructure and Transport, T.F.3.1 – Road Infrastructure and Transport Security, T.C.4.1 – Pavements, T.C.4.2 – Bridges, T.C.4.3 – Earthworks, T.C.4.4 – Tunnels and T.F.4.1 – Road Design Standards. 	Full report based on case studies	December 2022
Issue: 1.4.2. Update of the PIARC International Climate Change Adaptation Framework for Road Infrastructure		
<ul style="list-style-type: none"> • Update of the PIARC Climate Change Adaptation Framework based in the work carried out on the other ToR of this T.C.: <ul style="list-style-type: none"> ○ Setting a strict separation of processes and methodologies. ○ Split the framework into two separate parts: <ul style="list-style-type: none"> ▪ Part 1: Processes and their descriptions. ▪ Part 2: Overview of possible methodologies for risk assessment and risk management, their data requirements and application limits. This is based on the work carried out by TC E.1 (2016-2019), and on case studies of holistic resilience approaches to be collected through a survey/questionnaire preformed together with WG1. • Consideration of new and innovative methodological approaches, in particular criticality assessment, adaptation pathways and evaluation of the overall economic, social and environmental value of adaptation measures. • Introduce the concept of holistic resilience in the Framework, where suitable. 	Roundtable with participation of all relevant TCs and TFs	February 2022
<ul style="list-style-type: none"> • Consideration of new and innovative methodological approaches, in particular criticality assessment, adaptation pathways and evaluation of the overall economic, social and environmental value of adaptation measures. • Introduce the concept of holistic resilience in the Framework, where suitable. 	Update Climate Change Adaptation Framework for Roads	December 2022

The tasks of Working Group 1 and 2 will be underpinned by a case study approach and supported by alternative ways of presenting results where possible. This involves coordination of outputs with the internal Case Study Task Force. This Task Force will draw on case studies already collected in the previous cycle by Technical Committee E.1: Adaptation Strategies and Resilience as well as further case studies identified through a survey this cycle.

The majority of the discussion in the meeting was on refining the Terms of Reference, initiating the tasks underpinning the Work Plans, identifying the needs of Lower Middle Income and High-Income Countries, and discussion of changes to future milestones due to COVID-19. An additional key aspect of discussion was on establishing alignment on definitions and approaches relating to resilience across related PIARC Technical Committees by way of a horizontal coordination processes in the context of these cross-cutting issues.

Meeting Outputs

TC 1.4 is currently on track with all milestones within the Work Plans and requirements from PIARC General Secretariat. The priority tasks for the meeting were achieved. These included:

- Finalisation of a Case Study Survey template to be distributed within PIARC and more widely in November 2020. Comments on this template were provided by the Case Study Task Force and members of WG1 and WG2 collectively.
- WG1 established a detailed Table of Contents to reflect topics such as the scope of road network resilience, examples of best practice in the implementation of road networks resilience, and uniform and holistic methodological approaches to road network resilience based on case studies. It was agreed that a WG1 meeting would be held between TC meetings to enable discussion of case studies collected and key aspects of the report.
- WG2 provided a:
 - presentation of the Framework and possibilities for its refinement according to previous reports and possible dissemination as new interactive Framework document
 - comparison of the PIARC Framework and national adaptation work being undertaken internationally
 - presentations from members: New Zealand Resilience Framework (Stuart Woods), Clarity project (Laura Parra), Climate adaptation in U.A.E. (Tala Abu Shuqair)
 - introduction to the survey of case studies and outline of latest Case Studies template
 - discussion on the update of the Framework: products, structure, contents and format, and possible tasks
 - possible establishment of task groups within WG2 to address key issues such as criticality and adaptive capacity
 - agreement for WG2 to hold a meeting between the TC meeting to progress tasks.
- The possibility of holding a webinar in between TC meetings was discussed as a way of sharing presentations across the TC.

An update was provided on the organisation of the World Winter Service and Road Resilience Congress to be held in Calgary, February 8-11, 2022. TC 1.4 has been invited to participate in this Congress and will be organising a session, will take part in the call for papers and agreement has been sought with Canada on the feasibility of organising a TC 1.4 meeting in Calgary for the first half of 2022. TC 1.4 has provided input to General Secretariat on the Call for Topics and contributed the topic of “Best practices for increasing resilience in road networks”. The call for paper abstracts is open till 30th November 2020, Website: <https://www.piarc-calgary2022.org/>.

At the Paris Kick-off meetings in February, it was identified that there are many definitions and approaches to resilience which should be considered across PIARC TC's. It was also identified that there is a need to align these by way of a horizontal coordination processes (TC 1.5, TC 3.3, ST4 and TF 3.1). A Briefing note has been developed to present a summary of the scope of initial key definitions, terminology and approaches and discusses coordination and collaboration opportunities with related TC's to reduce the risk of duplication between Work Plans, and enhance the sharing of information e.g. case studies. The TC also discussed different development paths of definitions and opportunities to update these on the basis of the Work Plans for TC 1.4 and in coordination with related TC's.

At the meeting, forthcoming Workshops and Seminars were discussed. It is planned that Meeting 3 would originally take place in May 2021 in Berlin, Germany including a workshop with the Federal Ministry of Transport and Digital Infrastructure (BMVI). Due to COVID-19, this meeting will be held virtually and options for a virtual workshop are being investigated. Additionally, a Seminar is planned in the second half of 2021 in Uganda. At the meeting examples of Seminars in the previous cycle were presented, as well as discussions relating to the establishment of the required Seminar Organising Committees. Organisation of the Seminar will continue as planned, pending COVID-19.

Emerging Issues

This initial meeting was primarily focussed on finalising the Case Study Collection survey, establishing the Working Groups, coordination of approaches and definitions of resilience with related TC's, and discussing the next steps required for the Workshop and Seminars scheduled in 2021.

COVID-19 is a significant factor affecting the ability for the TC to establish the same working relationships as if the meetings were face-to-face, and there was a need to revisit the entire program for the next three years relative to meetings, workshops, and seminars. Whilst no changes are expected to the overall timelines for the delivery of final reports the Committee will be assessing on an ongoing basis the impacts of COVID-19 on internal deadlines. It was agreed that a section relating to COVID-19 would be included in the WG1 report as part of the all-hazard approach, and whilst focused on climate change, WG2 will consider COVID impacts as a factor when assessing amplifying effects.

Learnings and Dissemination

Participation in the Technical Committee meetings has provided an opportunity to share learnings from Australia and New Zealand. This involves the dissemination of key projects in Australia and New Zealand designed to transfer state-of-the-art practice globally e.g. New Zealand Resilience Framework, presented by Stuart Woods.

The outputs of the WG1 and WG2 reports will assist in informing Austroads members to analyse road networks and to consider all-hazard and holistic impacts including economic, social and environmental aspects of resilience management.

Concepts relating to resilience and COVID-19 are being disseminated to the PIARC COVID-19 Response Team, of which Caroline Evans is an active member on this Team coordinated by PIARC General Secretariat. The objective of this Team is the rapid sharing of knowledge and practices between PIARC members on the impacts that the pandemic had on road administrations and road operators and their associated actions. More than 25 webinars in English, French, and Spanish that the Response Team have been organized, and has required a significant investment of time from both the COVID-19 Response Team and from PIARC staff members. Key issues and emerging trends relating to the impacts of COVID-19 across PIARC members and the road sector in general have been categorized as most evident to date:

- *Ensuring the health and safety of our employees as well as road users*
- *Maintaining activity and business continuity*
- *Responding to the impacts on the transportation of goods and people, especially given the fragility of supply chain lines during this period*
- *Managing the impacts on revenue and supply chains and looking at the role that we could play in reviving the economy after the crisis*
- *Maintaining relationships and collaborations with customers, system users and other interested parties*
- *Security, including new cyber-security issues faced.*

A number of presentations have been provided by Australian representatives and TC 1.4 members at the PIARC COVID-19 Response Team Webinars, including a presentation from Caroline Evans on the PIARC Response to COVID-19: Passenger transport & resilience on 29th July 2020:

<https://www.piarc.org/en/News-Agenda-PIARC/News/2020-07-21,Join-the-next-webinar-about-COVID-19-lessons-learned-so-far-and-way-forward-PIARC-2020.htm>

Caroline Evans has co-authored two bulletins, and a Routes Roads Article, and is working with the Response Team on developing a report on the initial impacts and responses to the pandemic from road and transport agencies.

Additionally, an article has been published by Caroline Evans, members of TC 1.4 and the PIARC COVID-19 Response team with Resilience Shift: A pivotal moment for the transport sector – and lessons for resilience, <https://www.resilienceshift.org/a-pivotal-moment-for-the-transport-sector-and-lessons-for-resilience/>

Conclusions and Future Meetings

The Work Plans for the TC and outputs to date are on-time and on-schedule. Due to the leadership positions appointed, Australia and New Zealand are well positioned to contribute and learn from the Work Program with the issues being highly relevant to an Australasian road and transport agency context.

The proposed schedule for future meetings of the TC are as follows, pending COVID-19 restrictions.

- Meeting 3: May 2021 – Virtual Workshop hosted by Germany / TC Meeting
- Meeting 4: September / October 2021 – Seminar / TC Meeting Africa (Uganda) (virtual?)
- Meeting 5: February 2022 – Winter Congress / TC Meeting, Calgary
- Meeting 6: TBA – Seminar / TC Meeting Malaysia with TC 1.5 Disaster Management and REAAA. Malaysian Road National Congress
- Meeting 7: TBA
- Meeting 8: October 2023 – WRC Czech Republic (Prague)

Caroline Evans (Chair of TC 1.4)

Principal Policy Advisor
National Transport Commission

Louis Bettini (English Speaking Secretary)

Principal Advisor Sustainability
Main Roads Western Australia

Stuart Woods (Co-Leader Working Group 2)

Lead Advisor – Resilience
Waka Kotahi New Zealand Transport Authority

Lucinda Hoffman (Corresponding Member)

Transport and Main Roads Queensland

November 2020