

Executive Summary

The seventh meeting of PIARC Technical Committee E.1 (Adaptation Strategies and Resiliency) was held in Oslo, Norway, on 15-16th May 2019. The meeting was Chaired by Jürgen Krieger (BASt Germany) and comprised representation from Germany, Norway, China, Japan, South Africa, UK, and Mexico. Caroline Evans, Australia participated in this meeting via skype.

The Technical Committee meeting was hosted by the Norwegian Public Roads Administration, and comprised a two-day meeting, followed by a Technical Site visit to Bjørvika, Oslo's waterfront, which has undergone enormous change the past 10 years. The visit included a lecture about the submerged tunnel, visit to the tunnel and a tour of the area highlighting water management, environmental measures, and resilient adaptation measures.

On October 1st, 2018, Working Group 1 submitted the final draft report to the PIARC Strategic Theme Coordinator for review. This involved the completion of a report entitled: *Adaptation methodologies and strategies to increase the resilience of roads to climate change – Case Study Approach*. Additionally, in October 2018 the final draft report for Working Group 2 on the review of the *PIARC International Climate Change Adaptation Framework for Road Infrastructure* was submitted to the PIARC Strategic Theme Coordinator for review. At the Oslo meeting, these reports were finalised according to the agreed deadlines, and have been submitted for translation into French and Spanish. These reports are scheduled for release by the World Congress, to be held in Abu Dhabi in October 2019.

Additionally, an objective of this meeting was to prepare for the PIARC World Congress in Abu Dhabi in October 2019. This involved reviewing the programme and papers for the Congress as well as preparing the presentations on the deliverables of the TC which include:

- Presentation of the final reports for Working Group 1 and 2, and Case study Taskforce (TS E.1 Resiliency)
- Contributions to a Special session (SS3) on Resilience
- Contributions to a Workshop on the “PIARC International Climate Change Adaptation Framework for Roads”

The Technical Committee also discussed proposed topics for the next Strategic Plan. It was noted that the work of this Committee will continue in the next cycle for 2020-2023. The Draft Terms of Reference was discussed to ensure consistency between the tasks of this current cycle and the next cycle.

Background

Within the PIARC Strategic Plan exists Strategic Theme E: Climate Change, Environment and Disasters. The goal of this strategic theme is to increase the resiliency of transportation infrastructure to the impacts of climate change events, while, at the same time, protecting investment and reducing the impact of road transportation on the environment.

This strategic theme includes three Technical Committees, one of which is PIARC Technical Committee E.1, which deals with transport strategies for climate change adaptation to increase resiliency of road infrastructure.

The work of the Technical Committee E.1 builds on the outputs of the previous cycle to further refine the *International Climate Change Adaptation Framework for Road Infrastructure*. The activities of TC E.1 are divided into two Working Groups and a Taskforce:

- Working Group 1 (WG1) aims to investigate and disseminate information regarding current adaptation strategies being adopted to increase the resilience of road infrastructure
- Working Group 2 (WG2) involves the refinement of the *International Climate Change Adaptation Framework for Road Infrastructure* (based on the Special Project developed in the 2011-2015 cycle) and follow-up of its implementation

- Case Study Taskforce has been formed to consolidate case studies using a database. The outputs of these working groups are complementary, with the results of WG1 informing the refinement of the Framework developed by WG2

The previous sixth meeting of PIARC Technical Committee E.1 (Adaptation Strategies and Resiliency) was held in Beijing, China in October 2019.

Work Program

At the Technical Committee meeting, the Chair provided an overview of the Committee's work plan and each Working Group Leader presented on the progress towards achieving the objectives according to the Strategic Plan. Key information is discussed in the following section.

Meeting Outputs

Working Group 1 – Adaptation Strategies to Increase Resiliency (Caroline Evans, Australia, Working Group Leader)

The Working Group 1 Leader presented on the objectives of WG1 which is to identify case studies on climate change data requirements, vulnerability/criticality assessments, adaptation measures and benefit-cost analysis, as methodologies underpinning the PIARC *International Climate Change Adaptation Framework for Road Infrastructure*.

In December 2018, the Strategic Theme Coordinator provided comments on the WG1 report. These comments were received and integrated into the report. At the Oslo meeting, the final draft report from WG1 was discussed and agreed by the Working Group and Technical Committee. This report is being translated into French and Spanish and is scheduled for publication by the Congress in October 2019.

Working Group 2, Refinement of Climate Change Adaptation Framework (Gordana Petkovic, Norway, Working Group 2 Leader)

Gordana Petkovic, Norway (Working Group 2 Leader) provided an update on the progress of WG2. The WG2 report presents the work that has been done by the TC E.1 on investigating the applicability of the Climate Change Adaptation Framework (developed in the 2011-2015 cycle, as a Special Project), experience from its application, and possibilities for its refinement. The main output for the refinement of the Framework is formed from case studies collected by the Case Study Task Force.

Complementarities between the WG1 and WG2 reports were discussed to ensure that these reports are aligned. In December 2018, the Strategic Theme Coordinator provided comments on the WG2 report. This report was finalised at the Oslo meeting, and is being translated into French and Spanish and is scheduled for publication by the Congress in October 2019.

Case Study Task Force (Beata Krieger, Germany)

Beata Krieger, Germany provided an overview of the work undertaken to collect the case studies and the results. A technical report of the work was developed and will be published only in English. The report deals with the collection, classification and provision of case studies on climate change adaptation and resiliency of road infrastructure. The report provides an overview of the work undertaken by the TC E.1 internal Task Force. This report has been finalised and will be available by the Congress in October 2019.

Technical Site Tour and Workshop

On Wednesday, May 15th, 2019, the Technical Committee visited Bjørvika, Oslo's waterfront, which has undergone enormous change the past 10 years. The visit included a lecture about the submerged tunnel, visit to the tunnel and a tour of the area highlighting water management, environmental measures, and resilient adaptation measures.

Emerging issues

TC E.1 members are contributing to a T20 Policy Brief for G20 on the topic of “Building Resilient Infrastructure Systems”. T20 is the think-tank of the G20 Group of countries. In December 2018, TC E.1 members prepared a contribution for the G20 meeting in Argentina in December 2018. This topic was accepted for further consideration and submitted to a Summit in Berlin in mid-March 2019, and then to the G20 meeting in Tokyo in May 2019.

The Committee discussed the program and review of papers for the PIARC World Congress in Abu Dhabi in October 2019. This involved preparing the presentations on the deliverables of the TC which include:

- Presentation of the final reports for Working Group 1 and 2, and Case study Taskforce
- Contributions to a Special session on Resilience
- Contributions to a Workshop on the “PIARC International Climate Change Adaptation Framework for Roads”

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 designed to transfer state-of-the-art practice globally.

The outputs of the WG1 and WG2 reports will assist in informing Austroads members to analyse road networks and to select and assess the adaptation measures with regard to the consequences of climate change. Further opportunities to disseminate the work of the Committee were through identified linkages with:

- T20 Policy Brief for G20 (as noted above)
- UNCTAD “Climate Change Adaptation for International Transport: Preparing for the Future”
- TRB Annual Meeting
- TRB Session at “Transportation Resilience 2019”, Washington 2019
- Routes/Roads – N380

Conclusions and Future Meetings

The Working Groups are on track for delivering their outputs at the final event for this PIARC cycle, which is *the World Road Congress in Abu Dhabi, October 2019*.

Caroline Evans
Principal Economist, Arcadis
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