

Executive Summary:

The Asset Management Technical Committee (TC3.3) has four Working Groups (WG) addressing four issues:

- WG 1 – 3.3.1 Innovative approaches to Asset Management Systems
- WG 2 – 3.3.2 Measures for improving resilience of road network.
- WG 3 – 3.3.3 Renewal and rejuvenation of aging infrastructure.
- WG 4 – 3.3.4 Update of the Asset Management Manual.

Over the last two and half years of the current cycle WG 2 – 3.3.2 has been working virtually in producing a series of key outputs as set out in their terms of reference.

The Working Group 2 is made up of 17 representatives from the wider TC3.3 Asset Management committee. The group has been meeting monthly with a primary focus of delivering a Technical Report for publishing. Titled "Measures for improving resilience of road network".

This was the first meeting outside of the inaugural meeting in France January 2020 where the working group members came face to face. PIARC approval was sort and approved to allow the working group to meet face to face in Zurich Switzerland. The group was hosted by FEDRO (Federal Roads Office) which is the Swiss Authority for road infrastructure and individual traffic. The meeting also allowed for others to attend virtually.

The meeting was attended in person by 10 delegates with one other member attending online.

The main activity of the meeting was to:

- review the draft technical report, chapter by chapter
- agree revised content and flow of report, including provisions for additional information
- confirm structure and content for the introduction and conclusion chapters.

The final draft report will be delivered to the TC 3.3 Asset Management group for review. The aim is that the final report will be published prior to the XXVII World Road Congress – Prague 2023.

In addition to the technical report the group also visited the Überdeckung Schwamendingen (Schwamendingen Enclosure) project. The projects' objective is to mitigate impairments caused by the motorway, so they are completely or largely eliminated with an enclosure, to increase the quality of life in the residential area.

Background:

PIARC was established in 1909 as a non-profit association to promote global cooperation of road and road transport related issues. A strategic plan is prepared every four years, with the activities in the plan to be delivered by a series of committees comprised of representatives from member countries.

The new 2020-2023 plan is categorised into four Strategic Themes:

1. Road Administration
2. Mobility
3. Safety and Sustainability
4. Resilient Infrastructure

Works in the Safety and Sustainability Strategic Theme over the 2020-2023 period are undertaken by four Technical Committees and one Task Force:

- TC 3.1 – Road Safety TC 3.2 – Winter Service
- TC 3.3 – Asset Management
- TC 3.4 – Environmental Sustainability in Road Infrastructure and Transport
- TF3.1 – Road Infrastructure and Transport Security

In previous cycles the Asset Management Technical Committee has been part of Infrastructure-related themes, but in this cycle has been placed in the Safety and Sustainability theme. The reason for this was said to be to develop a more ‘management-focused’ approach rather than an ‘asset-focused’ approach.

Jack Hansby (Waka Kotahi, NZ Transport Agency), Ulysses Ai (ARRB) and David Jansen (Department of Transport, Vic.) are the Austroads members on TC3.3 Asset Management

Work Program:

Technical Committee 3.3 is focused on collating the latest knowledge on emerging processes and technologies and extending products developed in the previous cycle to disseminate best-practice knowledge in the area of asset management.

WG 2 focus is on:

- Identifying and quantifying the risks and global losses associated to damages of transportation system and to establish efficient risk mitigation strategies within a holistic approach on road infrastructure
- Identify best practices and approaches of Road Asset Management measures to improve the resilience of the road infrastructure

The outputs, their reported progress, and the expected deadlines for each of the issues in WG 2 are summarised below:

Output	Commentary	Status	Due Date
Articles for Routes and Roads Magazine	<p>WG was requested to provide one article for a special edition of Routes and Roads focusing on Resilience</p> <p>Jack Hansby (NZTA) led the development of Article 2 which included case studies from New Zealand, Portugal, Serbia, Mozambique, Argentina, and China</p>	WG 2 submitted 2 articles which were both published in the June 2021 publication	<p>March 2021</p> <p>COMPLETED</p>

Output	Commentary	Status	Due Date
World Winter Service and Road Resilience Congress, Calgary 2022	WG 2 agreed to provide 3 papers to the Congress Jack Hansby (NZTA), David Hein (Canada) and Rade Hadjin (Switzerland) provided papers	Paper submitted by Jack Hansby on Seismic Retrofitting of NZ Bridges was accepted. The paper was selected as 1 of 60 papers to be presented in a live session at the Congress	February 2022 COMPLETED
		All papers accepted for the conference were allocated a 1hr slot, where the paper was presented as an ePoster	February 2022 COMPLETED
International webinar "Measures to improve resilience of Road networks"	A one-and-a-half hour virtual event on, evaluation of resilience of road networks, practical measures to increase resilience and recovery experience in cases of infrastructure failures due to extreme events. This included both the theoretical background for managing of resilience as well as its practical application in decision making	The webinar comprised presentations by Rade Hajdin, David Hein, Jack Hansby (NZTA) and Mauro D'Apuzzo	28 April 2022 COMPLETED
Case Studies for Asset Management Manual	As part of the Input into WG 4 Update of the Asset Management Manual, WG 2 was asked to provide 2 case studies for publication into the manual	Case studies have been provide by Jack Hansby (NZTA) and David Hein (Canada)	June 2022 COMPLETED
Technical Report	The main scope of WG 2 is building on the case studies from the previous PIARC cycles and investigation on how resilience can be included within the decision-making procedures in asset management. The suggestion was that the report comprise short case studies which address each of the various measures that affect the aspects of resilience.	Draft report to be delivered 15 December 2023	Final Report Published prior to Prague Congress October 2023

Meeting outputs:

The meeting was well attended, by the key contributors to the technical report, those responsible for leading the content of each chapter.

Report Structure and status is as follows:

1. Introduction (blank)
2. Resilience Assessment (In draft)
3. Reduction of exposure of road assets to threats (In draft)
4. Mitigation of road asset failures to threats (Complete)
5. Mitigation of the consequences of road asset failures/closures (Complete)
6. Recovery (In draft)
7. Resilience approaches in asset (In draft) management
8. Conclusion (blank)

The TC 3.3 is responsible for reviewing the content of the technical report and providing feedback to WG 2 prior to submitting to the General Secretariat for final review, translation and publication.

WG 2 is on target to deliver against the agreed milestone and reflects the commitment from the core group of team members who have worked long and hard to achieve all of the milestones agreed to in the terms of reference.

Emerging issues:

No major issues have emerged from the meetings so far.

Learnings for Australia and/or New Zealand:

The work program for this committee parallels efforts within New Zealand and Australia and by Austroads specifically to improve high-level guidance on best practice in asset management, to maintain an understanding of how new approaches can continue to be incorporated, and to consider questions of risk and resilience from existing threats and the challenges being posed on all roading authorities from the impacts of climate change.

Dissemination:

The Technical Report will be published on PIARC's website.

Benefits from other associated activities: Überdeckung Schwamendingen Project

The working group was given the opportunity to have a site visit at the Überdeckung Schwamendingen (Schwamendingen Enclosure) project.

The project is focussed on one of the busiest motorways in Zurich, with around 110,000 vehicles a day, travelling through the middle of a residential area. As a result, the noise limit values are exceeded day and night, and the air is heavily polluted with exhaust fumes from motor vehicles. The impairments caused by the motorway are to be completely or largely eliminated with an enclosure, to increase the quality of life in the residential area. Accordingly, the project enjoys support from the local population.

The Schwamendingen enclosure envisages completely enclosing the section between the Aubrugg motorway junction and the Schöneich tunnel of the A1 national road over a length of 940 meters with a two-way tunnel. The tunnel will be built using the open pit method and with moving traffic (refer photo below showing current construction). The building should be completed around 2024 with an estimated cost of \$600M Swiss Francs.

The expected increase in living and quality of life through the Schwamendingen enclosure has also triggered an impetus for the structural development of the adjacent residential area. Landowners and cooperatives are responding with studies and new construction plans for their properties. However, the living space should also remain affordable for families.

The transformation process is supported by the city of Zurich. The Office for Urban Development has drawn up an urban development concept for the area. This is based on test planning and feasibility studies. A special use plan will define the structural options in the project.



Conclusions and recommendations:

The face-to-face meeting enabled the working group to:

- review in detail the draft technical report, chapter by chapter
- agree and revise content and flow of report, including provisions for additional information, and
- confirm structure and content for the introduction and conclusion chapters.

As the cycle progresses there will be further opportunities for knowledge exchange with other committee members who are experts in areas of value to both New Zealand and Australia.

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