

**Technical Committee D.3 – Road Bridges
Erica Smith – Main Roads Western Australia
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Executive Summary:

The PIARC Technical Committee D.3 (Road Bridges) held its eighth and last meeting in Mexico City, MEXICO on the 28th of September 2011 combined with the XXIV World Road Congress held 26th to 30th September 2011. The primary purpose of the meeting was to finalise preparations for the XXIV World Road Congress, present the final outcomes of the 4-year work program and complete the General Report for PIARC.

Background:

Technical Committee D.3 (Road Bridges) dealt with assessment of bridge condition, innovative maintenance and rehabilitation techniques with the aim of improving the quality of road infrastructure through the effective management of assets in accordance with user expectations and managers' requests.

I attended the eighth meeting in Mexico City on the 28th of September 2011 as the member representing Australia and New Zealand. There are 45 full and corresponding members of D.3 with approximately 20 attending this meeting.

The primary purposes of this eighth meeting were to:

- deliver presentations on sub-committee reports to the Mexico Congress;
- organise a session of the Mexico Congress for Road Bridges; and
- finalise the General Report for PIARC reporting on the 2008-2011 cycle.

The following projects were approved by PIARC for the committee work cycle:

1. Management of Bridge Stock and Adaptation to Climate Change – Leader, Borre Stensvold (Norway).
2. Inspector Accreditation, Non-Destructive Testing and Condition Assessment for Bridges – Leader, Erica Smith (Australia).
3. Large Road Bridges - Management, Assessment, Inspection and Innovative Maintenance Techniques – Leader, Thierry Kretz (France).

Work Programme:

All sub-committee final reports have been completed and were submitted to the PIARC General Secretariat. These reports are due to be published on the PIARC website by the end of this year.

Meeting Outputs:

The achievements of the eighth meeting of the D.3 Technical Committee held in Mexico City include:

- Sub-committee report presentation by the group leaders for the approved projects;
- Organisation of a technical session for the XXIV World Road Congress on Road Bridges incorporating approved papers from Mexico, Japan, Finland and Spain; and
- Finalisation of the General Report for PIARC.

Emerging Issues:

The main issues identified by the committee are as per the first meeting and include:

- Climate Change – adaptation to climate change and how this affects the inspection and management of the bridge stock;
- Inspection and Condition Assessment – innovations in inspection techniques for improved safety, innovation in testing techniques, and training and qualifications of inspectors; and
- Large Scale Structures – methodologies for assessing large scale structures and innovative maintenance techniques that can be applied to these structures.

Some information about the projects:

Inspection and Condition Assessment of Bridges

This topic deals with the procedure for detailed inspection and condition assessment of bridges. Inspections provide the base information on the condition of the bridges, and hence the need for maintenance and its timing. The reliability of the condition assessment is limited by the accuracy of visual inspections and specific in situ test results. As such, it is of critical importance to have a bridge inspection system that is reliable, consistent and detailed.

The most effective regimes for inspector characteristics and qualifications, course organisation, duration and contents, and inspector requalification are recommended. Condition assessment procedures have been assessed with recommendations on certain characteristics needed in order to provide a logically consistent framework for management decision support and communication of bridge performance.

Non-Destructive Testing for Bridges

This topic refers to the non-destructive testing techniques used throughout the world, their applications, advantages and shortcomings. The most effective techniques for non-destructive testing of different structural elements made of different construction materials, taking account of costs, complexity and safety are investigated.

Large Bridges - Management, Assessment, Inspection and Innovative Maintenance Techniques

In order to deal with the specific problems of large bridge management a questionnaire was disseminated between PIARC members, with the specific objectives:

- To get information on large bridges, maintenance and condition assessment; special attention was given to cable stayed and suspension bridges;
- To get specific information on innovative maintenance and rehabilitation techniques.

The aim of the questionnaire was to collect data on individual large bridges.

Management of the Bridge Stock

This topic is related to the evaluation of different approaches used for bridge management. A detailed questionnaire was prepared, responses were analysed and results were documented, with comments regarding costs and necessary expertise or knowledge to manage the operation as a whole.

Responses also highlight several measures that could help in the prioritisation of bridge projects. The experience and training of the inspectors are critical to a successful implementation as well as the ease of understanding and usage by decision makers.

Adaptation to Climate Change

The study focussed on investigating how climate change is defined in different countries and if any change in the bridge design methodology has occurred as a result of climate change. Responses will help understand the impact of climate change and its effect on the design, construction and maintenance of bridges.

Learnings for Australia and/or New Zealand:

The primary objective of this Technical Committee of PIARC is to contribute to the capture of leading edge research and practices in the field of bridge engineering and disseminate this information to member countries. It is considered that the outputs of this committee are of material benefit to both Main Roads Western Australia and Austroads.

All projects have direct relevance to Austroads members as they are aligned with current strategies and core technology. Final reports will be available to download on the PIARC website in coming months.

Dissemination:

All reports from D.3 will be circulated to Austroads Council members, observers, programme managers and assistants (for circulation to relevant task forces and review panels), member contacts and other PIARC technical committee representatives and be placed on the Austroads website.

Benefits from Other Associated Activities:

The PIARC D.3 meeting was held in conjunction with the XXIV World Road Congress.

TC D.3 held a technical session for Road Bridges with the following accepted papers also presented:

- Rio Papaloapan Bridge: Design and Successful Application of Non-Destructive Inspection Techniques – Mexican Institute of Transport, Mexico.
- Study on Reduction of Vibration Control Devices for Akashi-Kaikyo Bridge – Honshu-Shikoku Bridge Expressway Co. Ltd., Japan.
- Large Road Bridges Rehabilitation, Example of Aquitaine Bridge – Ministry of Ecology, Sustainable Development, Transport and Housing, France.
- Inspection of Prestressed Concrete Road Bridges by the Ultrasound 3D Tomographer System – Ramboll Finland Oy, Infrastructure & Transport, Finland.
- Maintenance Plans for Highway Bridges – Ministry of Public Works, Spain.

Conclusions and Recommendations:

The D.3 work plan was topical and highly relevant to member activities and complementary to work of interest to Austroads. By supporting continued Australian involvement in the PIARC Technical Committee on Road Bridges, Austroads will be able to obtain the benefits of PIARC research in a variety of issues with direct applicability to Australia and New Zealand.

All sub-committee final reports are due to be published on the PIARC website by the end of this year.