REAAA NEWSLETTER

REAAA Newsletter 2020-01
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For Members Only

Message from the President

A happy new year to all our members.

2020 promises to be an exciting year and I'm looking forward to working with you all – as individuals and institutional members. The strength of the team is each individual member. The strength of each member is the team.

As REAAA members we are proud to be the most effective regional organisation providing members with technology interchange and transfer and services to promote a better future in road-related engineering.

REAAA has an excellent history and future. The REAAA Governing Council will work hard to ensure we remain the centre of excellence, and knowledge, for the benefits of member countries.

As part of that we'll be focussing on initiatives in the coming years, including:

- Building on the activities identified as "of great value-added to members". These include our popular events which keep members up to date with the latest developments and information (both technical and business) and the provision of great opportunities for professional networking.
- Ensuring we continue to provide the right platforms to meet the needs of existing members and to attract and engage new members across our region.
- Making sure that REAAA remains a viable association for our young engineers and professionals (YEP).
- Reviewing the functions and tasks of each committee to support, and reflect, our increasingly broadened activities and ensure that we're in the strongest position to develop new activities.

I'm very proud to be in the privileged position to lead REAAA in this important task and in continuing the excellent outcomes of previous Presidents. Expanding on this willingness and helping more institutional members and professionals to profit from it, is the challenge I've set myself.

I hope you will all join me in looking forward to the coming year.

On behalf of Governing Council members and staff, I wish you and your family Happy Holidays and a Prosperous New Year 2020.

Romeo S Momo
President of REAAA

110th & 111th REAAA Governing Council Meetings

The 110th and 111th REAAA Governing Council meetings and related events were successfully held on 9th-12th April, 2019 in Taipei, Taiwan, and on 4th-5th October in Abu Dhabi, United Arab Emirates respectively.

The 111th Governing Council meeting and the 17th Young Engineers and Professionals (YEP) meeting were held on 5th October during the 26th PIARC World Road Congress, the very first meeting to be held in the Middle East. The President, Mr Romeo Momo, Council members and representatives from member countries were welcomed by Mr Claude van Rooten, the President of PIARC and Mr Ahmed Alhammadi of the Abu Dhabi Department of Transport.

Approximately 25 YEP members and observers attended the 17th YEP meeting. Following each country's activity report and discussion on facilitating Facebook page activity, two technical presentations were made by Dr Yusuf Adinegoro from Indonesia and Mr Satoshi Noda from Japan. The Chair, Ir Hamzah Hashim, wrapped up the meeting by encouraging active and continued participation.

Approximately 40 Council members and observers attended the 111th Council Meeting. Various discussions were carried out, especially related to the forthcoming 15th REAAA Conference in the Philippines in 2021 and nominations for the next Council term. The tentative schedules for the first Hwang Fund Award and the 8th Business Forum, to be held in Indonesia in conjunction with the 112th Council Meeting, were also discussed.

The next (112th) Governing Council Meeting will be held in Jakarta, Indonesia, on 13th to 16th July 2020. The Calendar of Events would provide further details.

Dr Sunghwan Kim
Chair of REAAA Korean Chapter

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The 26th World Road Congress in Abu Dhabi

The 26th World Road Congress was successfully held in Abu Dhabi, United Arab Emirates, from 6th–10th October 2019 under the theme of "Connecting Cultures-Enabling Economies". The Congress was organized by the Department of Transport of the Abu Dhabi Emirates in partnership with World Road Association (PIARC). With 43 ministers and more than 5,200 delegates from 144 countries, the Congress offered a unique program where all modes of transport were represented.

During this event, a wide range of professionals and experts shared their expertise in more than 50 session that explored a way on how to enhance the integrated infrastructure and prepare for future challenges.

The Congress was opened by the Minister of Infrastructure Development and Chairman of the Federal Transport Authority, H E Dr Abdullah Belhaif Al Nuami. The president of PIARC, Mr Claude Van Rooten, delivered the welcome speech, in which he expanded the values and objectives of the congress. During the opening ceremony, the 2019 PIARC prizes were announced, with awards made for outstanding papers in eight categories, including best innovation, safety of road users and workers, sustainable development, road design and construction. After the opening ceremony, the exhibition was inaugurated by H H Sheikh Theyab bin Mohammed bin Zayed Al Nahyan, Chairman of the Department of Transport of UAE.

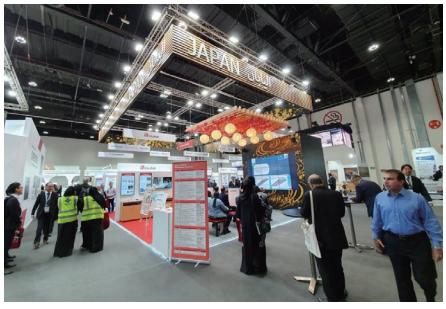
The congress exhibition featured 26 international pavilions presenting latest technology, research and case studies.

The following three topics were discussed at the Ministerial session: Future transport networks, Artificial intelligence for road infrastructure, and Land use planning. A total of 43 ministers contributed to a series of discussions on the importance of data in proper planning, the contribution of new technologies to road transport services, and road safety strategies.

Throughout the four days of the Congress, several technical sessions were held which were designed to present the work of the PIARC Technical Committees as well as to define future strategies. The focus areas included key structural elements (pavements, bridges), operational response (disasters, winter service) and governance (performance of transport administration).

In the closing session, Patrick Malléjacq, the Secretary-General of PIARC, presented key outcomes of the Congress and strategic directions for next period from 2020 to 2023. It also featured the official handover to the delegation from the Czech Republic who will be staging the 27th World Road Congress in Prague in 2023.

Bona Hong
REAAA Korean Chapter



Interview with Organizers

Hyunseok Kim, Technical Advisor of PIARC

Mr Hyunseok Kim, Technical Advisor of PIARC, coordinated various meetings and events during the recent World Road Congress in Abu Dhabi, including the REAAA Council and YEP meetings. Right after his trip to Abu Dhabi, the Newsletter team asked him about his experiences with the Congress this time.

Hyunseok Kim
Technical Advisor of PIARC

Please introduce yourself and your work with PIARC

Hello, REAAA members. Great to e-meet you all again through the REAAA Newsletter. I am Hyunseok Kim, one of the Technical Advisors (TA) at the PIARC General Secretariat in Paris, France. I am originally from the Korea Expressway Corporation. I have been on secondment to PIARC since March 2018. I have been working as the 5th TA from Korea to PIARC.

I would like to express my gratitude to Mr Romeo S Momo, the President of REAAA, and all REAAA members for attending the 26th World Road Congress in Abu Dhabi and gracing the occasion. It was great to have you all in such a big event for road professionals from all over the world.

Can you share your experience with the 26th Abu Dhabi World Road Congress?

The 26th World Road Congress in Abu Dhabi was held successfully from 6th–10th October 2019 with the ministerial participation of 43 countries and approximately 5,200 official participants from all over the world. Since its very first beginning in Paris in 1908, the World Road Congress has been one of the most important events in the field of road transportation. Four Congresses have been held in Asia and Australasia to date: Tokyo, Japan, in 1967; Sydney, Australia, in 1983; Kuala Lumpur, Malaysia, in 1999 and Seoul, Korea, in 2015.

The first Congress to be held in the Middle East, it offered a variety of approaches in the field of road transport to connect cultures and enable economies, as the Congress motto revealed.

In view of my personal experience in preparing two Congresses in Seoul and Abu Dhabi, as is the case in other areas, the road transportation sector is rapidly changing in terms of technology and policy, including topics such as autonomous driving, AI (Artificial Intelligence) and safety and gender equality. As a result, many issues arose and the need for cooperation from many institutions and experts was needed to resolve the issues.

In other words, despite differences in size of economy and geopolitical location, challenges in individual countries and regions can occur in other places. It reaffirmed that it is imperative to have an open forum so that case studies, ideas and technological applications from many countries can be shared.

What role did you play in holding the REAAA Council Meeting during this Congress?

I believe REAAA has been playing a pivotal role in the road transport sector in Asia and Australasia in this context, and PIARC recognizes REAAA as an important partner of its regional cooperation strategy (Asia, Latin America and Africa).

Of course, there are many differences in cultures and ways of working in each region, and that is what Associations such as PIARC and REAAA need to deal with and to overcome to serve their missions.

In fact, even when planning the 111th REAAA Council Meeting and the 16th YEP Meeting, there were several differences with the hosting teams.

But we continuously talked and narrowed down the differences and we thankfully were able to hold the meetings successfully.

I was also in charge of the overall support related to participation and presentations from Asia and Australasia in various sessions, including REAAA members, throughout the Congress. It was very meaningful to finish this well.

What are you doing now after the Congress?

The Congress ended with enthusiastic participation and warm encouragement as well as great interest from you all. Like all participants, the PIARC Secretariat staff has returned to daily life. We are now preparing to review the outcomes of all the activities of the Congress, and document various comments and lessons learned.

The Congress Proceedings will be completed early in 2020 and posted on the PIARC website. Further, all technical reports from the 2016-2019 strategic cycle will also be published and available for all to refer to.

Do you like to add any comment for better international cooperation in the road transport sector in Asia and Australasia?

Since PIARC previous cycle, Mr Shigeru Kikukawa, the PIARC Vice President has reported and emphasized PIARC-related Asia-Pacific activity to the Executive Committee and the Council, and gained a lot of consensus on the collaborative endeavor between REAAA and PIARC regarding the Pavement Technology; Climate Change, Resilience and Emergency Management; and Road Safety Committees. I strongly believe that the environment is ready for the experts in the region to interact with the world and I hope that the region actively participates in the Technical Committees and their activities.

Any words to add?

The PIARC General Secretariat has not only French staff but also TAs from all over the world, including Korea and Japan. All PIARC staff would welcome more colleagues from the region to join and they are always there to talk and help. Please feel free to contact the Secretariat and I look forward to seeing you all in the Kick-off Meeting for the new strategic cycle 2020-2023.

Gamsahabnida (Thank you)!

IO Song
REAAA Korean Chapter

110th REAAA Governing Council Meeting in Taipei

The 110th Road Engineering Association of Asia and Australia (REAAA) Governing Council Meeting was held at the Taipei International Convention Center (TICC) in Taipei, Taiwan from 9th–12th April, 2019. Over 150 delegates from over 10 countries attended this four-day event, which included the 7th Business Forum, the 15th Young Engineers & Professionals Meeting (YEP), the 110th Governing Council Meeting, a meeting of the Pavement Technology Committee (PTC), and a technical visit.

The 7th Business Forum was attended by about 160 delegates. The theme for the Forum was 'Smart, sustainable and resilient roads with future engineer leadership'. The aim was to present and share practical technical applications, road and highway developments over the last 50 years, and to encourage emerging leaders from each country to share their experiences. The forum included four sessions: 'Development of highway system in 50 years and beyond', 'Sustainable development for road and safety', 'The practice and application of smart roads', and 'The disaster risk management of resilient roads'.

The Business Forum was followed by the 15th YEP meeting, which was held at the Woolloomooloo restaurant in a casual cocktail dinner setting. About 80 delegates attended the dinner. Discussion centred on various engineering topics, including social and ethical issues in engineering, public transportation developments. The YEP representatives gave outstanding presentations; they agreed that there was a need to grow the existing professional network among member countries.

The PTC meeting and the 110th REAAA Governing Council Meeting took place on the third day. Forty members attended the PTC meeting and 70 members attended the Council Meeting. The PTC will be conducting a survey to explore the methods of pavement structural design used in each country, including how the issues of resilience and sustainability are being addressed. Future meeting schedules were set dring the Council meeting. It was agreed that the 111th Council meeting would be held in Abu Dhabi in October, 2019, the 112th meeting in Indonesia in the first half of 2020, and the 113th meeting in New Zealand in the second half of 2020.

A total of 33 members participated in technical visits at two locations on the fourth day. The first visit was to the Directorate General of Highways, MOTC, where members visited the Highway Disaster Prevention Center and the Taiwan Highway Museum. The second visit was to the Transit-Oriented-Development: Taipei Bus Station. Productive discussions were held during the visits.

CRF Welcome Reception

CRF Welcome Reception

7th Businesas Forum

Group photo from 7th Business Forum

Group photo from 15th REAAA YEP meeting

15th REAAA YEP meeting

Pavement Technology Council meeting

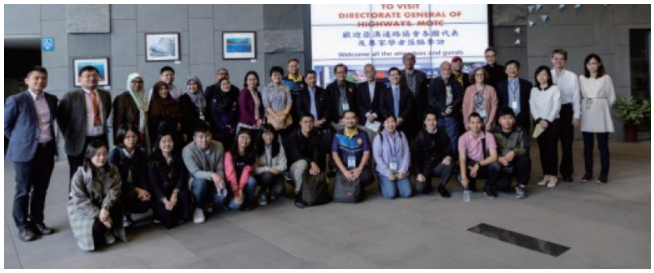
110th REAAA Council Meeting

110th REAAA Council Meeting

During the visit to the Directorate General of Highways, MOTC, members learned about Taiwan's road disaster prevention strategy and the history of Taiwan's road evolution. The following passage is a brief introduction to the Highway Disaster Prevention Center and the Taiwan Highway Museum:

The exhibits at the **Taiwan Highway Museum** tell the story of Taiwan's road construction history chronologically. The Museum provides information and exhibits on different aspects of the 70-year history of the Directorate General of Highways (DGH), including new construction, maintenance, supervision, public transportation, and driver education. The exhibition commences with the launch of the DGH in 1946, and then every themed area covering 20 years of DGH history. The Museum preserves the highway culture for future generations and promotes exchange and innovation.

During the second visit to the Transit-Oriented-Development, members were informed that the Taipei Bus Station is one of the most successful BOT projects in Taiwan, including the positive effect that it has had on transport in the old western district of Taipei.



Technical Visit – Directorate General of Highways, MOTC

Technical Visit – Taiwan Highway Museum, Directorate General of Highways, MOTC

Technical Visit – Taipei Bus Station

The Highway Disaster Prevention Center identifies, monitors, and manages the early signs of potential disastrous events in order to reduce casualties on highways. During a disaster event, the following procedure is carried out: identify dangerous zones on highways, notify the public in advance, and make sure roads are clear after the event.

The **Taipei Bus Station** is a four-story elevated intercity bus terminal; 4,000 to 5,000 intercity buses use the facility daily. It is one of the most efficient and successful BOT bus stations in the world. It connects the new railway station with retail stores, apartments, offices, a move theatre, and the most important-intercity bus terminal. The project commenced operation in 2009. The passenger flow from both the bus terminal and the railway station is the core of the business for this project. The facilities in this complex conveniently meet the demands of the customers. The BOT project is owned by the 'Radium Life Tech. Corp., Ltd, one of the largest developers in Taiwan.

The China Road Federation (CRF) was pleased to host these events. We thank everyone who came to Taipei for the events and hope that we have inspired others to thrive in the engineering community.

China Road Federation

7th REAAA Business Forum

The REAAA Business Forum was established to facilitate business-to-business collaboration in road engineering or related topics and to enhance membership of REAAA by attracting business practitioners, institutions and private companies as well as government bodies.

The vision is "to be the center of information to support and facilitate collaboration among business entities in the road engineering industry in the region". The mission is "to always encourage, facilitate and connect through business-to-business collaboration in road engineering-related industry, especially in the Asia and Australasian regions".

To achieve the vision and mission, Business Forums have been conducted since 2014, normally in conjunction with REAAA Governing Council Meetings or REAAA Conferences.

The first three Business Forums were held in Bali in April 2014 (Theme: "Public-private partnerships"), Sydney in October 2014 (Theme: "Road technology support and products related to road projects") and Tokyo in November 2016 (Theme: "New technologies in road construction), including a field visit to the Japan Highway Techno Fair. They were very successful in facilitating business cooperation. About 200 delegates participating these events.

The 4th Business Forum was held in Bali on 23rd March 2017. The theme was "Expanding opportunities for infrastructure investment in developing countries". It featured prominent speakers from many countries. About 100 delegates attended the Forum.

The 5th Business Forum was held in Manila, Philippines, on 21st July 2017 in conjunction with the 15th REAAA Conference and other associated events, including the 107th Governing Council Meeting. The theme was "Golden era of infrastructure development in the Philippines". About 80 delegates attended the Forum.

The 6th Business Forum was held in Kuala Lumpur on 30th October 2018. The theme was "Potential partnerships for business opportunities in Asia-Australasia". About 70 delegates participated in attended the Forum.

The latest (7th) Business Forum was held in Taipei on 10th April 2019. The theme was "Smart, sustainable, and resilient roads with future engineering leadership". About 100 delegates attended the Forum.

The forum was opened by Dr Yung-Hui Chou, Chairman of the China Road Federation and Ms Nonon Wardhani, Coordinator of the REAAA Business Forum.

The four sessions in the Forum were as follows:

Session 1: Development of highway system in 40 years and beyond (moderated by Ms Wen-yuh Leu, Deputy Chief Engineer, Freeway Bureau, Ministry of Transportion and Communication).

Session 2: The sustainable development of roads and safety (moderated by Dr Min-Chih Liao, Assistant Professor, Department of Civil and Construction Engineering, National Taiwan University of Science and Technology).

Session 3: The practice of the application of smart roads (moderated by Dr Yu-Ting Hsu, Assistant Professor, Department of Civil Engineering, National Taiwan University).

Session 4: Disaster and risk management of resilient roads (moderated by Prof. Jieh-Haur Chen, Department of Civil Engineering, National Central University).

The Business Forum successfully explored how smart, sustainable and resilient roads are being developed in the region. As such, it successfully satisfied the needs of delegates by establishing connections, and entering into negotiations to work together cooperatively.

Hopefully in the future, REAAA Business Forums will be conducted regularly, reflecting the continuous growth in the region and encouraging more collaboration in road-related business. It is also hoped that future Business Forums will address a wider range of topics and that the outputs will reach a wider audience as a means of promoting REAAA in the region. Plans are underway to publish selected presentations in a future edition of the REAAA Journal.

The REAAA Business Forum history, vision and mission, as well as information related to the Forums, can be accessed at: *http://reaaabusinessforums.org//* and the REAAA website.

Nonon Wardhani
REAAA Business Forum Coordinator

Interview with Organizers

Richard Moh and Yu-Min Su

the 110th REAAA Council Meeting Organizing Committee

Would you introduce yourself and your work?

Richard: I am currently the Executive Senior Vice President and Special Assistant to the Chairperson of Moh and Associates, Inc., a member of MAA Group Consulting Engineers. Established in 1975, MAA Group is a multi-disciplinary consulting group of companies. It employs 1,200 engineers and architects and has offices in ten cities in east and south-east Asia. In recent years, I have been involved in various professional societies, including establishing Young Engineer Committees in the 108 years old Chinese Institute of Engineers and the Chinese Association of Engineering Consultants. I was also a founding member of the Youth Talent Development Working Group in the Federation of Engineering Institutions of Asia and the Pacific (FEIAP). In addition, I am a Director and committee chair for various other professional societies, including the International Affairs Committee of the China Road Federation (CRF), which is one of the earliest members of REAAA, joining in 1973.

I am currently a member of the REAAA Governing Council. The MAA has a long history with REAAA. The co-founder of MAA Group, Dr Za-Chieh Moh, an internationally renowned geotechnical engineer, played an active role in REAAA for many years from the 1980s to the early 2000s. Since the commencement of my participation in REAAA events two years ago, I have also played an active role in REAAA, including the organization of the 110th REAAA Governing Council meeting, which was held in Taipei in April 2019 in conjunction with REAAA's 7th Business Forum and the 15th Young Engineers and Professionals (YEP) meeting. I also participated, with Yu-Min, in the YEP meeting. As a Council member and a member of the YEP Committee, I will continue to contribute ideas and strive to achieve the objectives of REAAA as laid out by its founding fathers.

Yu-Min: I have been an Assistant Professor in the Department of Civil Engineering at the National Kaohsiung University of Science and Technology (NKUST) in Kaohsiung, Taiwan, since 2014. I received my PhD degree from the Department of Civil Engineering at the University of Florida in 2012.

I was awarded an International Road Federation (IRF) Fellowship in 2009. I am the sector coordinator for the IRF, a member of the Technical and YEP

Left : Mr Richard Moh **Right :** Prof Yu-Min Su

committees of REAAA, a member of the program committee of the SPIE smart structures and nondestructive evaluation conference, and a board of director for the CRF. My research interests include highway and pavement engineering, asset management, and smart technologies and their applications.

Can you share your experiences with organising the 110th REAAA Council meeting and related events, including the Business Forum and YEP meeting?

Organizing any event is no small feat. There are many decisions that need to be made, both within the host country and the REAAA community. Any event organizers require cohesive support from all parties. We first would like to thank the Board of Directors of the CRF, the members of the Executive Committee, the members of the Organizing Committee, the staff and students of NKUST for their on-site management, the sponsors, and of course the members of the REAAA Governing Council for their guidance, the REAAA secretariat, speakers, and visiting delegates for their patience and support. Every participant and people involved made the event meaningful and memorable.

What role did you play in organizing the events? Can you explain your work and the contribution of your team you worked with, such as CRF members, university staff and students?

Richard and Yu-Min: In the events, Richard played of Secretary-General and Yu-Min was the Deputy Secretary-General of the Organizing Committee. Many challenges were faced during the event planning process. The first challenge was that the 110th Council Meeting was held in April, 2019, when there were no other major related events being held in Taiwan that could coincide with the Council meeting. In order to ensure that the REAAA members gained the best benefit out of the visit, the organizing committee had to ensure that the Business Forum, YEP meeting, and technical visits were unique and different.

Thus, the theme of the Business Forum addressed not only current international challenges of sustainability, resilience and impact of current technology on road development, but also a review of the past forty to sixty years of highway development to determine future direction needs for each country. The Business Forum's focus was to share the practical and applicable technologies and policies from different countries, thus adding to the diversity of speakers in the event. After a long forum that went almost all day, a more relaxed atmosphere was created afterwards, with the YEPs encouraged to participate in a casual setting for networking and interaction with senior engineers in the host country and senior members of REAAA.

In addition to ensuring that the event was productive, the Organizing Committee also decided that the planning process should involve as many younger academics, engineers, and students as possible to bridge the "passing the baton" gap that operates in many countries. Students acting as volunteers supported the events and this gave them the opportunity to develop their organizing skills and understand the need to pay attention to details.

What do you think was the biggest reward from hosting the Council meeting and related events?

The biggest reward was that all the organizers were able to interact with the public and private sector, academia and REAAA members from different countries. Plus, of course, the friendships made and the knowledge shared to tackle similar and common challenges that each of the respective countries face.

Any words to add?

In today's volatile world, it is even more important that the profession continues to share knowledge, pursue technical excellence, maintain professional ethics, and build a strong and continual commitment between all generations. We believe that REAAA provides such an opportunity for its members.

Sophia Lee
Corporate Development Secretary
Moh and Associates

IO Song
REAAA Korean Chapter

Kieran Sharp
Chair of REAAA Technical Committee

REAAA Technical Committee - Pavement Technology Committee

Cooperation with the World Road Association (PIARC) has been a key strategic initiative of the REAAA Technical Committee for many years. Following discussions with PIARC and, in line with the establishment of a new REAAA Technical Committee for the current term (2017-2021), the following three areas of relevance to both REAAA and PIARC were identified as having the potential to be 'mirror groups' with the appropriate PIARC Committees:

- Pavement Technology
- Climate Change Resilience and Emergency Management
- Road Safety.

The topic of pavement technology has been a major focus of both PIARC and the REAAA Technical Committee since its inception. During its first cycle from 2010 to 2013, REAAA Committee TC-2 addressed 'Pavement durability' and organized a workshop on that theme during the 14th REAAA Conference in Kuala Lumpur in March 2013. The Sub-committee published a compendium on the same topic (Technical Report TC-5) in July 2015.

It was also involved in the compilation of another technical report (Technical Report TC-7) titled 'Incorporating Japanese pavement design practice for a community road in Mongolia', which was lodged on the REAAA website in November 2015.

During its second cycle from 2013-2017 the Committee addressed 'Pavement maintenance and rehabilitation practices' as its main theme, with 'Recycling of pavement materials' included as a sub-theme. An REAAA technical report on the main theme (Technical Report TC-8) was published in August, 2016 whilst Technical Report TC-9 addresses the sub-theme. These reports are available on the REAAA website.

The strategic directions guiding the work to be conducted by the new REAAA Pavement Technology Committee (PTC) in the current term are:

1. The performance of pavements from the viewpoint of sustainability and environmental considerations.
2. Review use of pavement monitoring and evaluation techniques.
3. Review of structural pavement design & rehabilitation procedures.

The first task being conducted by the PTC is the development of a compendium of the current structural pavement design and rehabilitation procedures adopted in each country including the identification of gaps. This information is being obtained using a questionnaire. The final report will present the survey results and accompanying analysis. The report will be presented at the 6th REAAA Conference, to be held in Manila in March 2021.

Members have been asked to respond to the questionnaire by the end of January 2020. Preliminary results will be reported at the next REAAA Council meeting in Indonesia in July 2020.

Note that PIARC commenced its new cycle in October 2019. The next PIARC Strategic Plan (2020-2023) is has been released and new Committees are currently being formed. The relevant committee(s) will be invited to nominate representatives on the REAAA Committees.

It should also be possible to organise a joint PIARC/ REAAA Seminar that addressed topic(s) of interest to both REAAA and PIARC and involve members of both committees, particularly those members of the PIARC Committees representing REAAA member countries.

Keizo Kamiya / Kieran Sharp

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	Ms Nyunt Than Than	Land Transport Authority
Taiwan	Dr Yu-min Su	China Road Federation
Thailand	Dr Montri Dechasakulsom	Department of Highways

Members of the REAAA Pavement Technology Committee

REAAA Technical Committee - Climate Change Resilience and Emergency Management Committee

'Climate change resilience and emergency management' is a major focus of the new REAAA Technical Committee – noting that this subject has not been previously addressed by REAAA. There are also clear connections between the Terms of Reference for the establishment of the REAAA Climate Change Resilience and Emergency Management and PIARC Committees TC.E.1 Adaptation Strategies and Resilience and TC.E.3 Disaster Management which operated under PIARC Strategic Theme E: Climate Change, Environment and Disasters in the previous PIARC term which concluded in October 2019. These Committees had strong representation from some key REAAA member countries.

In addition, whilst not the subject of a specific Sub-committee in the previous REAAA Council term, the topic was one of the drivers of thze activities of the former REAAA Technical Sub-committee TC.2 (Pavements). Led by Japan, relevant outputs during the previous terms included:

- REAAA Technical Report TC-2: Disaster Risk Management
- REAAA Technical Report TC-5: Pavement Durability.

The goals of the REAAA Climate Change Resilience and Emergency Management Committee reflect issues of major concern in REAAA member countries as well as PIARC; for example:

1. Provision of case studies/information.
2. Investigation of the opportunities and challenges for implementing climate change adaptation measures and adaptation frameworks.
3. Implementation of climate change resilience actions into asset management and strategic decision-making processes.

Topics and activities specific to REAAA regional activities will also be undertaken, including the investigation of opportunities for implementing road and infrastructure climate change resilience concepts in Asia and Australasia.

For example, Technical Report TC-10 – Report on FEHRL Scanning Tour to South Korea and Japan: Infrastructure Resilience, released in May 2018, recommended:

- the establishment of a dialogue on challenges for implementing more resilient infrastructure
- the establishment of mechanisms to share information and experiences regarding the management of resilient infrastructure
- the identification of practical applications of resilient infrastructure
- opportunities for future collaboration.

Some possible opportunities include:

- The further integration of big data and smart roads by way of enhancing V2V and V2I technologies.
- Rapid recovery post-natural and man-made disasters.
- Early warning systems for earthquakes, floods, storm surges and drought, and how to ensure that infrastructure and society are provided with information as quickly as possible.
- Awareness of ISO standards, and the importance of improving international standards. For example, the Railway International Standards Centre (RISC) was established in 2010 to review international rail standards; it is acting strategically to incorporate Japanese technical specifications and design concepts into international standards. It is a model which could be applied to roads.

The Terms of Reference will shortly be updated to take account of any new initiatives in the new (2020-2022) PIARC Strategic Plan.

The membership of the Committee is currently being finalised.

Kieran Sharp

REAAA Technical Committee - Road Safety Committee

KICK-OFF MEETING REPORT

The REAAA Road Safety Committee held its first meeting on 5th October 2019 in Abu Dhabi, in conjunction with the 111th REAAA Governing Council Meeting and the PIARC World Road Congress 2019.

During the Governing Council Meeting, Dr Siti Zaharah, the Chairperson of the Road Safety Committee, reported on the issue of the poor response to date from participating countries in terms of nominations for membership of the Committee. It was decided to proceed with the meeting with representatives who were present. It was also agreed that nominations would be made immediately after the first meeting. Countries that agreed to participate were Malaysia, as the lead country, Australia, Japan, Korea, Indonesia and Taiwan. The International Road Assessment Program (iRAP) also agreed to have a representative on the Committee.

During the first meeting, the Chairperson highlighted the Terms of Reference (TOR) that had been approved at the 110th Governing Council. The meeting then discussed the contributions that would be required from participating countries. A template for case studies was provided as a guideline for the required information addressing several expected outcomes as indicated in the TOR.

The agenda for the first meeting also included feedback from countries. Issues highlighted and suggested during the meeting included the need for a road safety masterplan, vehicle technologies, inter-agency cooperation supporting road safety, and the requirements for a systematic database.

The Chairperson highlighted the vital need for a road safety database; she referred to the World Health Organisation (WHO) report showing the progress of road safety in each country. The Chairperson also noted the need to have a good policy in each country to support the betterment of road safety as well as corporation and support from all stakeholders. Topics such as vehicle technology, enforcement, and safety standards could be considered by this Committee, however, they would need to align with the TOR.

The current timeline for the committee is two years. It is proposed that the next meeting be held in July 2020 in Indonesia and in September 2020 in New Zealand. The membership of the Road Safety Committee will be finalised before the next Governing Council meeting in Indonesia.

Dr Siti Zaharah, MIROS
Chair of Road Safety Committee

REAAA Fellowship Program

At the 103rd REAAA Council meeting in Dubai in March 2016, it was agreed that REAAA would establish a Fellowship Program. The objective of the program is to provide financial support to REAAA members from developing countries to attend REAAA events as a speaker.

At the 111th REAAA Council meeting in Abu Dhabi, Council agreed to continue the Fellowship Program at the 8th REAAA Business Forum, to be held in Jakarta, Indonesia, in July 2020.

This event is tailored to meet the needs of young professionals in the road industry.

The benefits of the Fellowship Program include:

- Industry Development: Investment in the Fellowship Program provides a powerful stimulus for the advancement of the road industry in the region. Companies that compete for business in the region will be among the beneficiaries.
- Tomorrow's leadership: An investment in the REAAA Fellowship Program ensures that the best and brightest professionals are supported in their ambitions to become tomorrow's industry leaders.
- Corporate philanthropy: Many corporate leaders are motivated to support education as a long-term investment in human capital. Supporting the REAAA Fellowship Program provides opportunities to engage with employees while, at the same time, supporting a worthy cause.
- Networking potential: With rapid globalization, the world is getting smaller and companies need to think globally in terms of their responsibilities az tvnd opportunities. As a supporter of the REAAA Fellowship Program, companies have an opportunity to develop long-term personal and professional relationships with young industry professionals who will one day be key industry representatives.

Applications for Sponsorship

REAAA is seeking contributions of US $2,000-$3,000 for each Fellowship from:

- the organisers of conferences/forums
- companies who are willing to sponsor members to attend the conferences/forums.

Applications for Fellowships

All REAAA members who are currently employed in the roads industry in the region are eligible to apply for a Fellowship. Financial assistance of US$2,000-$3,000 will be provided to meet travel & accommodation costs. The criteria for the provision of financial support for attendance at these events are as follows.

- Applicants must confirm their attendance at the conference/forum.
- Applicants must confirm that they are giving a presentation at one of the technical sessions or a specialist event such as a workshop or business forum.
- The selections of the Fellows will be based on current and future contributions to the road industry in the region.

Members wising to be considered for an REAAA Fellowship should contact the REAAA Secretariat (exec.sec@reaaa.net) and submit:

- a short CV
- the abstract of the paper that will be presented
- a copy of tertiary qualifications.

We invite your organisation to be one of the sponsors for this upcoming event.

Please contact the REAAA Secretariat (exec.sec@reaaa.net) for further information.

Dennis Ganendra, Minconsult, Malaysia
REAAA Fellowship Program Coordinator

Group photo of Council members, speakers and Fellows at the 4th REAAA Business Forum in Bali, Indonesia, held in conjunction with the 15th REAAA Conference

Left to right: Ambassador of Mongolia, Her Excellency Shagdar Battsetseg; Director General Public Works of Mongolia, Ms Dorjkhand Dashdorji; Honorary Treasurer-General/Coordinator of REAAA Business Forum, Ms Wardhani (Nonon); REAAA Council Member/ Coordinator of REAAA Fellowships Program, Dato' Ir Dr Dennis Ganendra

Group photo of Council members, speakers and Fellows of Fellowship Program, 5th REAAA Business Forum, Manila, Philippines

Fellows from Pakistan and Bangladesh and Committee members of 4th REAAA Business Forum, Bali, Indonesia

REAAA
Mino Best Project Award

What is the Mino Best Project Award?

The Mino Best Project Award was established in 2016 to recognise outstanding road and/or bridge projects which have recently been constructed in the Asian and Australasia region. It is funded by the Mino Fund, which was donated by the REAAA's 10th President from 1998 to 2000, the late Mr Sadamu Mino. The Award will be presented to the owners of road and/or bridge projects selected by the Mino Best Project Award Committee from the nominated candidates.

Schedule

1st January 2020	Call for nomination of projects
30th June 2020	Deadline for nominations
September 2020	Report on the award to the 113th Governing Council Meeting
19th March 2021	Second Mino Best Project Award Ceremony at 16th REAAA Conference, Manila, Philippines

How are the projects evaluated?

Nominated projects will be evaluated by the Mino Best Project Award Committee from the points of view of social effectiveness, technical excellence and environmental friendliness/awareness.

The members of the Mino Best Project Award Committee are:

Mr Katsuji Hashiba (Chair)	Japan
Mr Kieran Sharp	Australia
Dr Taufik Widjoyono	Indonesia
Dr Sung-Hwan Kim	Korea
Mr Zulakmal Bin Sufian (Secretariat)	Malaysia
Mr Abdul Fatak Pandapatan	Philippines
Dr Yung-Hui Chou	Taiwan

We are waiting for your nomination!

The First Mino Best Project Award Ceremony at the 15th REAAA Conference held on 23rd March 2017 in Bali, Indonesia

What projects could be candidates?

In order to be considered for the Award, nominated projects must meet the following conditions:

- Category I (high-volume road) – high-volume expressways/major highways which contribute to the economic and social development in the region.
- Category II (community road) – community and rural roads which contribute to community and social development in the local region.
- Only projects which have been constructed in Asia and Australasia are eligible for consideration.
- Nominated projects must have been completed between August 2016 and July 2020 (up to four years prior to the deadline of nomination).
- Both members of REAAA and non-members can nominate a project. However, all nominations must be lodged by a member of the REAAA Governing Council.

More information

More information about the Second Mino Best Project Award, including the nomination form, will be lodged on the REAAA Website soon: www.reaaa.net/

REAAA Katahira Awards

Eligible authors are invited to nominate papers submitted for presentation at the 16th REAAA Conference in Manila, Philippines, in March 2021 for the prestigious Katahira Conference Awards. Winners will be awarded a cash prize and a certificate which will be presented during the Conference.

The Katahira Awards were established in 1991 in memory of the late Dr Nobutaka Katahira, who was the Association's President for the 5th Council term from 1983 to 1986.

The main objective of the Awards is to encourage keen participation among young engineers in the promotion and advancement of science and technology in road development and road-related engineering. The Awards entry rules are as follows:

1. The author must be under 40 years of age as of 1st September 2020 (at the point of review). If there is more than one author, either the first or second-named author must be under 40 years of age.
2. The author must be either an Ordinary/Associate member of REAAA or an employee of an Institutional member of REAAA at the time of the submission of the paper.
3. Where there is more than one author, one member of REAAA as co-author is sufficient for the paper to be eligible for the award. It is not essential for that author to be under 40 years of age. However, either the first or second author must be under 40 years of age as stated above.
4. Papers must not have been published elsewhere in the same form.

The members of the Katahira Award Evaluation Committee are as follows:

Name	Country
Mr Kieran Sharp	Australia
Dr Tri Tjahjohno	Indonesia
Dr Koji Kuroda	Japan
Dr Char Ching Lim	Malaysia
Prof Chen-Min Feng	Taiwan
Road Engineering Association of the Philippines (REAP)	Philippines

- Deadline for Abstract Submission (300 words): 30th April 2020
- Deadline for Full Paper Submission: 31st August 2020
- Format: doc or docx format (double spaced on A4 size paper)

Please e-mail to **technicals@16threaaaconference.com** and **reaaa.technicalcommittee@gmail.com** for paper submission and further enquiry.

Dr Koji Kuroda
Chair of Katahira & Mino Fund Committee

REAAA HWANG AWARD 2021

The REAAA Hwang Award was established with the generous support of an Honorary Member, Mr Hwang Gwang-ung, who is also a Co-opted Council Member of the Association. It recognizes any REAAA member who has made a significant contribution to the development of the road sector and regional cooperation in Asia and Australasia. This is the first time that the Hwang Fund Award will be presented.

1. Eligibility

Any individual REAAA member, who is nominated/ recommended by a REAAA Governing Council Member (* Candidates should not be currently a member of the Hwang Fund Committee.)

2. Selection Criteria

The Hwang Fund Committee would select a professional who has made a significant contribution to REAAA and its activities by fulfilling key roles and responsibilities for an appreciable period, to ensure the Association to achieve its goals that are emphasized in the Constitution, Article 3 (see below). The Committee also would recognize his/ her dedication to establish a solid foothold for more exposure of REAAA and its activities at the international level.

ARTICLE 3. OBJECTIVE

1. The objectives of the Association shall be:-

(a) To promote and advance the science and practice of road engineering and related professions.

(b) To encourage communication between persons charged with the technical responsibilities for theplanning, design, construction and maintenance of roads and allied structures.

(c) To obtain and diffuse among the members, information on road engineering and related matters affecting the profession, and to print, sell, publish, issue and circulate the records of transactions of the Association or any papers, periodicals, books, circulars and other itinerary undertakings or any extracts therefrom as may seem conducive to any of these objects.

(d) To educate and seek to improve, extend and elevate the technical and general knowledge of members and persons concerned with road engineering.

(e) To serve as a focal point for exchange of ideas related to road engineering

(f) To conduct, encourage and collate research in road engineering

(g) To establish, form and maintain an index of available or existing literature and articles of interest in connection with road engineering

(h) To co-operate, as may seem conducive to any of these objectives, with national and international organisations and to support and supplement their work.

3. Award

- A trophy and prize money (10,000 US Dollars) will be awarded to the winner.

4. Applications

The application must include:

- a completed application form (e-mail soft copy to kirc@kroad.or.kr and exec.sec@reaaa.net)
- a letter of nomination/recommendation from a member of the REAAA Governing Council (sealed original copy)

Application forms can be obtained from the REAAA Korean Chapter (io.song@kroad.or.kr / kirc@kroad.or.kr).

5. Schedule

Call for Nominations	20th July 2020
Deadline for submission of nomination	31st August 2020
Endorsement of Awardee (113th REAAA Council Meeting)	September 2020
Notification of winner	October 2020
Hwang Fund Award (16th REAAA Conference)	March 2021

6. Further Information

Ms. IO Song (REAAA Korean Chapter)
Tel.: +82-2-3490-1057
E-mail: io.song@kroad.or.kr / kirc@kroad.or.kr

IO Song
REAAA Korean Chapter

PIARC International Seminar and Workshop on "Safer Roads by Infrastructure Design and Operation"

The International Seminar and Workshop on Safer Roads by Infrastructure Design and Operation was successfully held on 23rd – 25th April 2019 at the Berjaya Times Square Hotel, Kuala Lumpur, Malaysia. This seminar was hosted by the World Road Association (PIARC) in collaboration with the Malaysian Institute of Road Safety Research (MIROS), through PIARC's Technical Committee C2 'Design and Operation of Safer Road Infrastructure'.

The honourable guests and participants of the seminar

The seminar was supported by the:

- Ministry of Transport (MOT) of Malaysia
- Public Works Department (PWD)
- Ministry of Works of Malaysia
- Road Engineering Association Malaysia (REAM)
- Institute of Engineers Malaysia (IEM)
- Road Engineering Association of Asia and Australasia (REAAA)
- Intelligent Transport Association Malaysia (ITSM) Universiti Teknologi MARA (UiTM).

Exhibition

The semainar session

The objectives of the Seminar were to promote the latest knowledge on current issues and facilitate technical discussions and debate among industry stakeholders especially related with road safety. The objectives of the Seminar were to promote the latest knowledge on current issues and facilitate technical discussions and debate among industry stakeholders especially related with road safety.

The seminar was officially opened by the Deputy Minister of the Ministry of Transport Malaysia, Dato' Haji Kamarudin bin Jaffar. The Plenary session commenced with a presentation by Dr Siti Zaharah Ishak, Director General of the Malaysian Institute of Road Safety Research (MIROS), who highlighted road safety issues in ASEAN countries. This was followed by a presentation by Prof. Dr Wong Shaw Voon, Chairman of PIARC Committee TC.C2. Prof. Wong presented the roadmap for road safety, including the PIARC Road Safety Manual and other recent publications produced by PIARC.


Workshop 1: Human Factors and Safer Design

Speakers from Australia, the USA, Mexico, Japan, Italy and Malaysia gave presentations that addressed the following six themes: safer design for better road safety, designing for better bicycle lanes, road maintenance, vulnerable road users, road safety audits and speed and traffic management. Time was allowed for questions and answers to allow discussion among participants and speakers.

A Closing Remarks Forum was chaired by Datuk Suret Singh, Chairman of MIROS. Two distinguished panel members were Ir Haji Abdul Rahman from the Ministry of Works, Malaysia, and Associate Prof. Dr Kulanthayan KC Mani, from Safe Kids Malaysia. The main issues discussed were funding for road infrastructure improvement, especially for vulnerable road users, and the safety of road users in Malaysia.

Two parallel workshops were also conducted on the third day of the event.


Workshop 2: Intelligent Transport System (ITS) for Safer Road

The first workshop, 'Human factors and road design' included presentations from experts from PIARC – Dr Sibylle Birth and Prof. Dr. Lorenzo. The workshop was facilitated by MIROS's technical experts, who also shared their expertise by showcasing local case studies, e.g. Genting Highland crashes.

The topic of the second workshop was 'Intelligent transport systems (ITS) for road safety'. Dr Fadhlan Hafizhelmi Kamaru Zaman (UiTM) and his colleague, Dr Azlee Zabidi (UMP), showcased their expertise in the development of automotive vehicle and programming language used for sensors. A technical visit to 3M Innovation Centre was arranged on the same day.

Technical Visit to 3M Innovation Centre

Exhibition booths were also provided for sponsors to showcase their products and services. A total of ten exhibitors took part in the exhibition, including PLUS Malaysia Berhad, 3M Malaysia Sdn Bhd, ASEAN NCAP, UEM Edgenta Berhad, Geoinfo Services Sdn Bhd, Safetyverse Sdn Bhd, the Public Works Department Malaysia and MIROS.

Special thanks to the Secretariat from MIROS and PIARC for their support in ensuring the success of this International Seminar and Workshop and to REAAA for supporting this event.

Dr Siti Zaharah Ishak
Director General of MIROS Malaysia

Sharing Knowledge, Experience, Friendship and More:

Korea's Capacity Building Efforts to Grow Together




Mr Rafitra Razak and Ms Rosmawati Binti Hj Emran, the REAAA family from Brunei, visited Korea just before the completion of the country's mega project, the construction of the Temburong Bridge. Daelim Industrial Co. Ltd, in cooperation with the Korea Expressway Corporation, invited them to interact with Korean experts on bridge operation and maintenance.

On a chilly October morning in Seoul, there was an interesting seminar taking place. Dr Heungbae Gil from the Korea Expressway Corporation (KEC) Research Institute of Korea was sharing KEC's cable bridge operation and maintenance experiences with the delegation from the Public Works Department, Ministry of Development, Brunei. When he started to talk about recent incidents and accidents that had occurred on cable bridges in Korea, the discussion livened up!

After the seminar, the group moved to Seohae Grand Bridge (Seohaedaegyo) and continued discussions on site.

Since the Seohae Grand Bridge is located in Asan Bay, which is frequently subjected to heavy traffic and foggy conditions, a disaster prevention system is in place, including a sophisticated incident detection system against traffic accidents and extreme weather conditions. There were many questions related to new technologies associated with bridge health monitoring and maintenance, and the functions of the Safety Control Center.

In 2015, Daelim Industrial Co. Ltd secured the contract for Section 2 of the Temburong Bridge construction project. As a part of this project, Daelim, in cooperation with the KEC, specially organized the visit of the Brunei delegation to support operation management after the bridge construction is completed.

Through this seven-day program, various scenarios related to the Temburong Bridge were discussed, including Korea's experience with bridge accidents and plans to counter them.

Delegates at Seohae Grand Bridge

Delegates during the Program

Many programs of this type are held in Korea. They involve partnering with various organizations, including the Ministry of Land Infrastructure and Transport (MOLIT), KEC, Korea International Cooperation Agency (KOICA) and the private sector. MOLIT has been running invitational programs of this type, called the 'Knowledge & Experience Sharing Program of Korea (KESP)', since 2013. Approximately 700 high-level government officials from 79 countries all over the world have taken part in the program to date. KEC is also running a variety of invitational programs focused on road construction and operations, bridge and tunnel technologies, pavement, ITS, etc.

As Korea was able to achieve successful infrastructure development in a short period of time thanks to partner countries' assistance, sharing Korea's good and bad experiences – in order to provide practical solutions to help neighboring countries in the region – is very important. Through continued invitational programs of this type, it is hoped that close partnerships, based on mutual learning, will be fostered so that the road/bridge community in the region can grow together and achieve common goals. The REAAA Korean Chapter also will continue to play a role for this endeavor, facilitating the regional learning.

Dr Sunghwan Kim
Chair of REAAA Korean Chapter

[Article] Innovative Pothole Fixer - Asphalt Concrete Brick

Min-Tse Hung,
Sunn-Jer Hwang
Yen-Po Chen
Directorate General of Highways
Ministry of Transportation and Communications,
Republic of China (Taiwan)

Moisture susceptibility is a major issue pertaining to the use of hot mix asphalt (HMA) pavements because the moisture can infiltrate and diffuse to the structure of the asphalt mix. The excessive moisture causes a decrease in the cohesive strength of the asphalt binder and loss of the adhesion bond between the aggregate and the binder. This can result in stripping, cracking, and the formation of potholes, as shown in Figures 1 and 2.

Figure 1:
Surface cracking (Courtesy of Pavement Interactive)

Figure 2:
Pothole

In Taiwan, moisture susceptibility is a primary cause of pavement distress, owing to the hot and humid climate in summer. Monsoon (Plum) rainfalls, typhoons and thunderstorms result in more than 2 metres of rainfall every year. Figure 3 shows the accumulated precipitation that occurred on 18th May 2019; some areas received more than 300 mm of rainfall in 24 hours. Potholes can develop very quickly after heavy rainfall. Emergency patching tasks are usually carried out very quickly by contractors. However, poor patching can induce more cracking and potholes and endanger the safety of motorists. Examples of good and poor patching are shown in Figure 4.

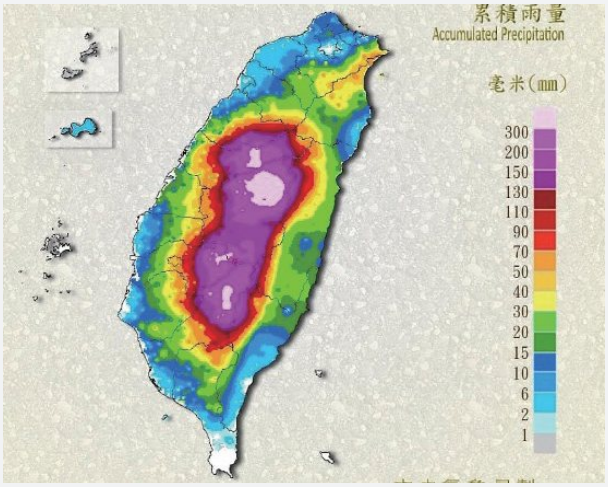

Figure 3:
Accumulated precipitation in Taiwan on 18th May 18 2019 (Courtesy of Central Weather Bureau, MOTC)

Engineers and professionals in the Directorate of General Highways (DGH) of the Ministry of Transportation and Communication in Taiwan strive to mitigate hazards and improve safety for all road users by finding a better way to repair cracks and potholes effectively. As a result, a research project was commissioned in 2014 to examine the feasibility of utilizing innovative 'Asphalt Concrete Bricks' (ACB). The project involved both laboratory and field work.

The process of manufacturing was first investigated in order to determine how to produce ACB in the laboratory. Cores of dense-graded ACB 100 mm, 150 mm and up to 300 mm in diameter were manufactured to appropriate levels of compaction using the normal concrete compression machine. The process involved adding a suitable amount of HMA mix into the designated mould, compacting on one side with a fixed rate 50 mm/min of displacement control, and repeating the same compacting process on the other side.

Figure 5: Manufactured asphalt concrete bricks of various diameters

The next step was to evaluate the performance of the ACB using the Hamburg Wheel Tracking Device in accordance with AASHTO T324 (2019). Testing was conducted in the asphalt laboratory located in the Material Testing Institute of DGH. Over 20,000 cycles of loading were required for the ACB to achieve a nominal rut depth of 20 mm, compared with the regular patching material, which achieved a rut depth of 20mm after only 500 cycles, shown in Figure 6.

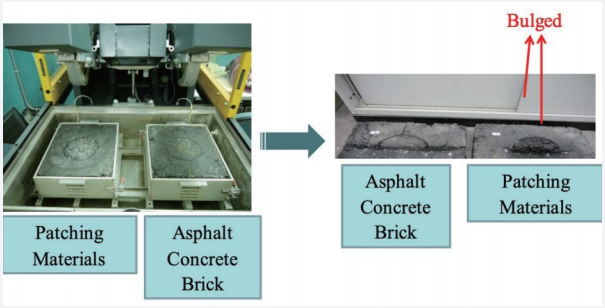

Figure 6: Assessing ACB and normal patching material using Hamburg Wheel Tracking Device

Several ACB specimens were also installed in the field to evaluate on-site performance. The ACB and patching materials were used to repair holes resulting from the drilling of QA/QC cores. It was found that the cores repaired by the ACB were smoother and more durable than those repaired using the regular patching materials, as shown in Figure 7.

At some sites, the cores repaired by the ACB stayed intact and performed well for more than three years.

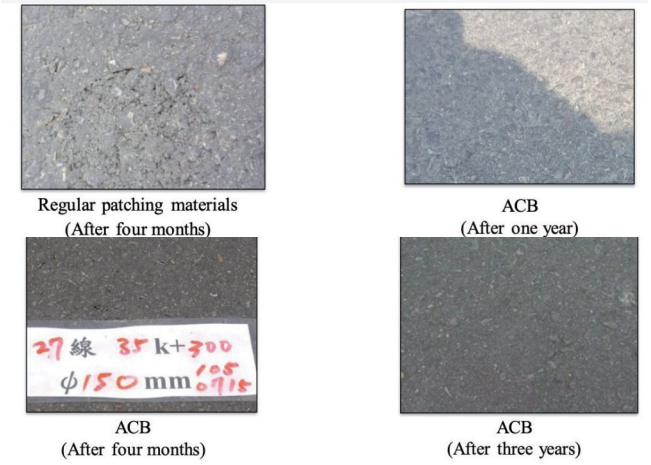

Figure 7: Short-term monitoring of ACB in the field

ACB is an innovative way to repair various sizes of potholes, it is easy to produce in-house and convenient to install in the field. The DGH has been utilizing ACB to repair potholes and refill the holes after cores have been taken for QA/QC purposes for past couple of years. There are currently thousands of ACB applications in service on all DGH-owned roadways. Long-term monitoring of performance is continuing. In summary, ACB is a durable alternative for repairing potholes, resulting in cost savings and improved safety of motorists. The DGH, as a member of China Road Federation, looks forward to collaboration of efforts with the public and private sectors as well as academia with the REAAA countries to help build smarter, more sustainable, and safer roads.

Reference

AASHTO T324: 2019, Standard method of test for Hamburg Wheel-Track testing of compacted asphalt mixtures, AASHTO: Washington.

[Article] The Construction of the First Elevated Toll Road in Eastern Indonesia

Dr A Hermanto Dardak
Indonesian Road Development Association

Urban Development in Indonesia

Indonesia is undergoing a rapid structural transformation, from a predominantly rural and agricultural economy to an urban and service-based economy. It is a significant structural shift. This shift creates a phenomenon called 'urban sprawl', which is related to the dynamic interaction between spatial planning and transport policy. This requires more attention from urban planners and related specialists because of its rapidly-growing scale and also because its effects are not always desirable.

Cities in Indonesia are growing faster than other Asian countries. Over the last ten years, Indonesia's urban population increased by an average of 4.7% annually, compared to the urban populations of China, India, and Thailand, which only grew by 3.8%, 3.1% and 2.8% respectively (World Bank 2012). In 2012, 52% of Indonesians lived in cities; however, by 2025 it is estimated that 68% of the population will live in urban areas (Figure 1) (World Bank 2014)avoid a middle-income trap, and leave no one behind as it tries to catch up with high-income economies. Can Indonesia achieve them? This report argues that the country has the potential to rise and become more prosperous and equitable. But the risk of floating in the middle is real. Which pathway the economy will take depends on: (i. However, the rapid urbanization in Indonesia is having a negative influence on the economy, compared to other countries: a 1% increase in urbanization is only generating a 2% growth in GDP growth, compared to China (6%), Vietnam (8%) and Thailand (10%) (World Bank, 2012) Severe traffic congestion, pollution and low basic infrastructure services are hindering economic growth in Indonesia.

The development of an urban area is highly related to the transportation system. The provision of an efficient transportation system plays a major role in economic sustainability, stability and public service.

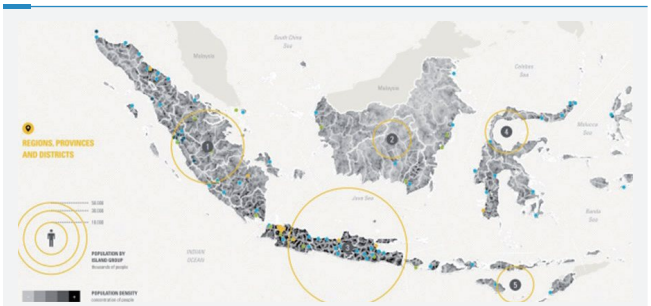

Figure 1: Urban growth in Indonesia (Source: World Bank 2014)

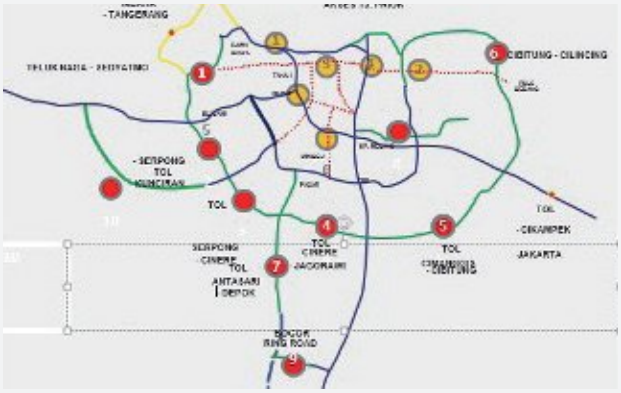

Figure 2 : Ring and radial roads in Jakarta's metropolitan area (JMA) (Source: Bina Marga)

Modern cities such as Jakarta develop highways networks to expand the city's economic capacity. The concept is known as the 'ring and radial network'. A ring network offers the opportunity to concentrate a large amount of mainly medium and outer traffic, thus relieving city centres of excess traffic and short-distance travel. As shown in Figure 2, the JMA radial road network consists of the Jakarta-Cikampek toll road, Jagorawi toll road, Jakarta-Tangerang toll road, Jakarta-Serpong toll road, and the Soekarno Hatta International Airport toll road. The JMA ring road network, on the other hand, consists of the Jakarta Inner Ring Road, Jakarta Outer Ring Road, Jakarta Outer Ring Road 2, and the inner ring road known as Six Intra City Toll Road, which is currently under construction: Sunter-Semanan, Sunter-Pulogebang, Duri Pulo-Kp. Melayu, Kemayoran-Kp. Melayu, Ulujami-Tanah Abang, Pasar Minggu-Casablanca.

Makassar Toll Road

As part of the Asian Highways (AH2) project from Bali to Iran, Indonesia constructed the Trans Java Toll Road and the Trans Sumatera Toll Road. The island of Java is serviced by toll roads from the western part of Banten (Merak) to East Java Province (Banyuwangi). The area of Java and Sumatera accounts for less than 30% of the total land area of Indonesia (about 2 million km^2); however, it contributes more than 82% of the nation's economy. Therefore, the current Five Years Development Plan for Indonesia promotes the speeding-up of development in the Eastern Region. Apart from the islands of Java and Sumatra, the construction of a toll road in the city of Makassar – and the toll road of Manado-Bitung on the Island of Sulawesi in the Eastern Region – are examples of this development.

The toll road in Makassar is designed to support the growing urbanization in the Makassar Metropolitan Area (Mamminasata) which consists of Makassar City, Maros Regency, Takalar Regency and Gowa Regency (Sungguminasa area). The mix of local and regional traffic in the Makassar city centre, and the increasing urbanization generally, has created significant traffic congestion issues. A map showing the location of the toll road is presented in Figure 3.

Mamminasata is a regional economic center in eastern Indonesia. The city of Makassar, as the provincial capital, has established the concept of an integrated economic area, supported by several infrastructure projects, including the Makassar Port (Soekarno-Hatta) container terminal, Sultan Hasanuddin airport at Mandai, and the Makassar Industrial Area (KIMA). The effective connection of all elements is important; a toll road is therefore essential to support the growth in economic activity.

The economic growth rate of Makassar reached 7.9% in 2017, higher than the average national economic growth rate. This is causing increases in traffic volumes and a subsequent increase in road congestion. PT Bosowa Marga Nusantara and PT Jalan Tol Seksi Empat – the toll road operators in Makassar and both members of the Marga Utama Nusantara Toll Road Company – have initiated projects that are expected to help reduce the level of congestion in Makassar City: (1) the extension of the existing BMN's (Bosowa Marga Nusantara)'s toll road into the congested area of Pettarani, and (2) a Traffic Information System to assist in better traffic planning and mobilization.

Figure 3: Makassar toll road (Source: PT Margautama Nusantara)

Pettarani Elevated Toll Road

One innovative project is the Pettarani Elevated toll road. The construction of the toll road (Section III) will enhance Sections I and II of the Makassar toll road, which is part of the integrated economic zone of Mamminasata (Figure 4). The Pettarani project was developed through the additional scope and amendments to the existing Toll Road Concession Agreement and connected to Toll Road Sections I and II.

Figure 4: Pettarani elevated toll road (Source: Margautama Nusantara)

Construction commenced in April 2018, commencing at the intersection of Urip Sumoharjo Road and AP Pettarani Road to the junction with Sultan Alauddin Road. The scope includes the construction and operation of an elevated toll road, 4.3 km long, above the existing Pettarani arterial road. After completion, BMN will operate 10.35 km of road, comprising an open collection system covering Section I (3.05 km), Section II (3 km), and Section III (4.3 km).

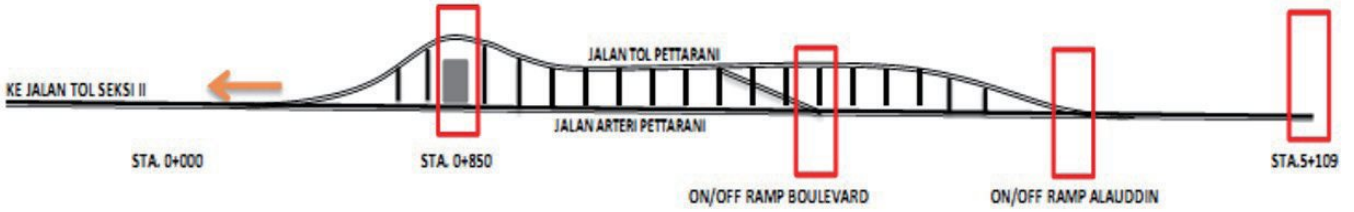

Figure 5: Vertical cross-section of Pettarani elevated toll road

The Pettarani elevated toll road is equipped with Urip Sumoharjo exit ramp, Boulevard exit ramp, and the Alauddin exit ramp, which will serve vehicles coming from the Section I and Section II toll roads. The ability of vehicles to travel from the port or Sultan Hasanuddin Airport directly to the Boulevard-Hertasning Business District and Gowa Regency without crossing the crowded Pettarani arterial road is predicted to reduce congestion by 25%. The vertical cross-section of the Pettarani elevated toll road is shown in Figure 5.

Innovative Toll Road Development

The Pettarani elevated toll road has many innovative aspects, including traffic information systems to integrate the previous three sections with the under construction toll road section (see Figure 6), and the usage of the latest girder construction method (Figure 7).

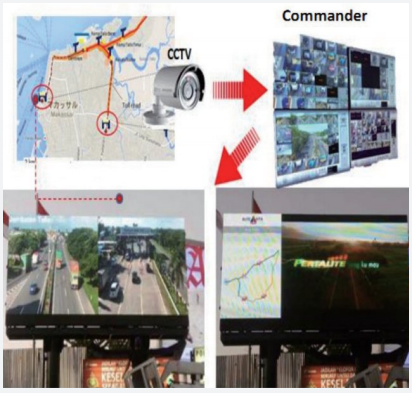

Figure 6: Traffic information system platform: Pettarani elevated toll road (Source: Margautama Nusantaraa)

The successful development of an information system platform to help road users choose their traffic route is essential for efficient and effective mobilization. The platform was constructed by installing active CCTVs at various locations along the main lane, including on/off ramps, and a fibre-optic toll gate that connects the traffic information to the control room. This information is then channelled onto an LED screen (videotron) at some central points of Makassar city prior to entering the toll road.

The Traffic Information System (TIS) – which is considered to be the pioneer in the application of the TIS Toll concept in Indonesia – is equipped with unique features, including active CCTV view, user plan trip, travel time estimation, emergency detection, and event reporting (peak hours/traffic jam, emergencies, accidents). The aim of the platform is to provide traffic information that will benefit the many stakeholders by providing better information access to road users, improved traffic control and integrated security management, better response time to any accidents or other events, and improved customer service and satisfaction generally. It has the potential to be installed throughout the city of Makassar as a Smart City concept.

This is a massive construction project. The inner-city toll road is planned to be entirely elevated, using the Pettarani median to place piers, starting from the end of Section II, a length of 850 meters from the intersection of Jl.

Urip Sumoharjo and involving an adjustment to the existing flyover, then passing through the Jl. Boulevard Panakukkang interchange and Jl. Hertasning, and ending at the junction with Jl. Alauddin. The width of the Pettarani road (right of way) is about 41-47 m, which is just enough to accommodate the toll road using the median for pier placements. A section of the girders and elevated structure of the toll road is shown in Figure 7.

Figure 7: Girders and elevated structure of Pettarani elevated toll road (Source: Margautama Nusantara)

The limited construction area on the busiest road in Makassar controls the choice of construction method and traffic management supported by the Traffic Information System, particularly on the pier head works and the erection of the segmental box girders. The pier head work involves: (i) shoring the bearing pedestal installment; (ii) constructing the supporting beams, main beams and working floor; (iii) constructing the wing form; (iv) constructing the side form and Pierhad rebar; and (v) constructing the pier head concrete casting. The box girder is being erected span-by-span using a crane to elevate and hang segments so it does not need to be balanced, as would be the case if cantilever methods were used. A photograph of segmental box girders is shown in Figure 8.

Figure 8: Segmental box girder of Pettarani elevated toll road

Closing Remarks

The urban area in Indonesia is growing rapidly, not only in Java but also in the east of Indonesia. This rapid growth has created issues that require attention, including densely-populated areas, limited areas for development, and an increase in the middle-income population. As a result, spatial developments which are compatible with both land use and road transport needs have been undertaken, including, initially, a bypass and then ring and radial highways, initially at grade and then elevated urban toll roads such as in Makassar. The construction of the Pettarani Elevated Toll Road in Makassar, supported by the installation of a traffic information system, is essential to support traffic mobility and the economy of Metropolitan Mamminasata. It can become a future model for the development of urban transport infrastructure in Indonesia.

References

Dardak, H 2010, Menata Jaringan Jalan untuk Optimalisasi Struktur Ruang di Pulau Sulawesi, Direktorat Jenderal Bina Marga.

Marga Utama Nusantara 2018, Developing strategic toll roads, annual report.

World Bank 2012, Indonesia – the-rise-of-metropolitan-regions-towards-inclusive-and-sustainable-regional-development.

World Bank 2014, Indonesia: avoiding the trap – Chapter IX: Managing disaster risk, building resilience.

REAAA Calendar of Events: (2020-2021)

Date	Event	Location
13th – 16th July 2020	112th REAAA Governing Council meeting	Jakarta, Indonesia
	17th YEP Meeting	
	8th REAAA Business Forum	
	13th HORA Meeting	
21st-24th September 2020	113th REAAA Governing Council meeting	Christchurch, New Zealand
	18th YEP Meeting	
	9th REAAA Business Forum	
17th-19th March 2021	16th REAAA Conference	Manila, Philippines
	114th & 115th REAAA Council Meetings	
	10th REAAA Business Forum	
	19th YEP Meeting	
	14th HORA Meeting	

What's New?
- Are you on LinkedIn?

Some time ago, the Australian Chapter set up an REAAA LinkedIn group which can be accessed using the following link: https://www.linkedin.com/groups/5096552/

Currently there are over 100 members of this group, not only from Australia but also other countries in the region. However, the link is not being used as much as it could be, perhaps because members have been unaware of its existence or have forgotten about its existence.

The group administrators are Brendan Marsh, James Grenfell, Ray Cook and Kieran Sharp from the Australian Chapter, Nonon Wardhani (Indonesia) and Mike Dreznes (IRF).

Some months ago, I issued invitations to several members (from both inside and outside of Australia), to join the group but the response has been disappointing. LinkedIn is an excellent way for members to communicate with each other at a professional level. I would like to think that we could start populating the link with local news and information of interest to all members.

Please consider joining this group and making contributions.

Kieran Sharp
Chair of REAAA Australian Chapter

REAAA Welcomes New Members

Existing members as at 1st April 2019	1,442
Add : Newly-elected/Status changed /Reinstated	40
Less : Resigned/Lost contact/Deceased/Suspended/Status changed	29
Total as at 31st August 2019	**1,453**

The list of members approved at the 111th REAAA Governing Council Meeting on 5th October 2019 follows.

Institutional Members

1. Perunding Irzi Sdn Bhd	Malaysia	2. Edgenta Propel Berhad	Malaysia

Life Members

1. Daisy D. Amistad	Philippines	3. Ir Maria Soosay a/l Francis	Malaysia
2. John Philip M. Rivera	Philippines	4. Ir Dr Leong Lee Vien	Malaysia

Status Changed from Ordinary to Life

1. Sung-Gyu Noh	Korea	5. Ir Pooh Yih Fang	Malaysia
2. Dato' Sri Suhaizan Wahid	Malaysia	6. Muhammad Khairul Amilin Ismail	Malaysia
3. Prof Dr Ratnasamy a/l Muniandy	Malaysia	7. Peter Chu	Malaysia
4. Ir Lee Shiuh Yeh	Malaysia	8. Dr MA Shahid	Malaysia

Ordinary Members

1. Mohd Shafie Nemmbang	Malaysia	12. Mohd Fahizan Ibrahim	Malaysia
2. Ir Kuang Kok Leong	Malaysia	13. Nur Emmy Fazliyanti Abu Yazid	Malaysia
3. Zainuddin Abdullah	Malaysia	14. Badrul Nizam Ismail	Malaysia
4. Mohd Rosman Alias	Malaysia	15. Mohd Sallehin Ibrahim	Malaysia
5. Dato' Ir Mohd Shuhaimi Hassan	Malaysia	16. Amirul Rafik Anwar Taufeek	Malaysia
6. Rafiuddin Yeob Ramli	Malaysia	17. Dr Mohd Rasdan Ibrahim	Malaysia
7. Muhammad Adzha Ibrahim	Malaysia	18. Dr Herda Yati Katman	Malaysia
8. Ir Dr Yuen Choon Wah	Malaysia	19. Ir Mohamad Zain Hashim	Malaysia
9. Ir Ahmad Zawawi Mohamed	Malaysia	20. Ir Zulfairul Zakariah	Malaysia
10. Nur Qistina Abdullah	Malaysia	21. Dr Siti Zaharah Ishak	Malaysia
11. Ir Wan Hasnan Wan Musa	Malaysia		

Reinstated

1. Pathmanathan a/l Krishnan Kutt	Malaysia	4. Tang Soon KongMalaysia	Malaysia
2. Ir Mohd Rosly Bin Hj Hussin	Malaysia	5. Dr Rizati Hamidun	Malaysia
3. Md Zarulazam Md. Eusofe	Malaysia		

JABABEKA INFRASTRUKTUR

PT. Jababeka Infrastruktur as a subsidiary of PT. Jababeka Tbk which in charge in Estate Management at Jababeka Industrial Estate rensposible for developing and enhancing the infrastructures in Kota Jababeka to complement the city development. Infrastructures that managed directly by Jababeka Infrastruktur are Water Treatment Plant, Waste Water Treatment Plant, Fiber Optic Network, Environment Lab, and Gas & Pipeline.

Our Services

Clean Water Supply

Manages 2 units of Water Treatment Plant to supply Clean water for industrial estate and residential estate with capacity around 6.000 m^3

Waste Water Treatment

Manages 2 units of Wastewater Treatment Plant (WWTP).
Combined Capacity :
208 liters / second for Industrial Estate
125 liters / second for Residential

Fiber Optic Network

One of Jababeka Infrastruktur subsidiary that focuses to develop Fiber Optic network technology within the Jababeka Industrial area.

Environtment Lab

Laboratory analysis service providers with special attention to the analysis of air, clean air, drinking water, wastewater, residual water from production processes and land for various industries.

Gas & Pipeline

City gas is present in the community to provide safe, practical and economical gas distribution of natural gas reach to 4,000 consumers.

Cikarang Dry Port Toll Road Access

We do collaborate with national/local governments and also strategic partners to develop and innovate concepts of investing in line with the latest technological developments, providing human resources and physical facilities infrastructure to support the development of the city, and actively promote the expansion of the group to multinational corporations in order to develop our business and inderectly support the government to enhance local and national economy.

One of our subsidiary company, Cikarang Dry Port that engaged in logistic sector and serve as an extenstion for Port of Tanjung Priok has successfully reduce dwelling time in Port of Tanjung Priok through the hub & spoke concept. It was inseparable from collaboration between Jababeka Infrastruktur and Ministy of Public Works and Housing of Indonesia to build direct access between Port of Tanjung Priok and Cikarang Dry Port through Jakarta-Cikampek Highway Access in KM 29 and Fly Over Pasir Gombong. Those infrastructure has been a tremendous support for logistic and shipping eficieny both for Industrial Estates in Karawang on national scale.