



REAAA Newsletter

Road Engineering Association of Asia and Australasia





REAAA Newsletter

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Message from the President



Dr. Sung-Hwan Kim
President of REAAA

Welcome to this edition of the REAAA Newsletter!

On behalf of the Council members, I want to say thank you, the members, for the honour of representing your interests for this term. I also thank all Council members for stepping forward to meet the challenges to ensure that the Association continues to meet its collective needs, today and in the future.

Currently, we have 1,119 members in 22 countries. Many of you have been engaged in efforts on behalf of the Association for the continued advancement of our collective interests through your participation in various working committees. Thank you to the members who have taken the time to contribute to these various initiatives.

I look forward to the ongoing participation of our many dedicated committee appointees, and I urge any members who may be interested in learning more about such opportunities to contact the Honorary Secretary-General. We all benefit from new perspectives, particularly as we consider ways to increase our relevance to our members, and to our vision. As always, the new term will see challenges and opportunities. Work will continue to be undertaken to enhance the voice of REAAA, through the Newsletter, Journal, Compendia, the REAAA K-Hub/website and the REAAA LinkedIn page. REAAA is your association. REAAA works for you. We exist to provide and share information that assists you and thereby make REAAA successful. We greatly look forward to another productive term and, as always, we are ready to listen to you and learn from you.

Stay safe and healthy.

2021 60th Anniversary of China Road Federation

China Road Federation (CRF)

Introduction

The history of China Road Federation (CRF) can be traced back to 1960. At the invitation of the International Road Federation (IRF), organizational work was commenced in Taiwan's transportation community by Mr. Tse-Pin Lin, who was the Director of the Directorate General of Highways and later became CRF's first President upon its formal establishment over 60 years ago on 20 March 1961.

The passing decades have brought Taiwan an astounding amount of experience and technical expertise and considerably strengthened its road engineering capabilities. Significant progress has been made throughout the years in road engineering, with concepts such as smart technology and sustainability.

Taking Taiwan's freeways as an example, in the 1970s, economic and safety considerations were at the core of the design philosophy. National highways were distinctly oriented towards functional performance and smooth flow of goods and people between the country's north and south. In the 1990s, another key notion was introduced to national highways – landscape design. Factors such as function, environmental protection, landscaping, management and others were integrated with overall emphasis being placed on blending of routes well with their surroundings. In the following decade, ecological assessments were added to the route corridor selection process to avoid ecologically sensitive areas and to create more sustainable and environmentally friendly highway operations.

With the expansion of Taiwan's highway network and various limitations in terms of resources available for its maintenance in recent years, the concept of "preventive maintenance" has gradually replaced the more traditional approach to road maintenance. By adopting a complete life cycle approach, carefully observing the damage sustained by the infrastructure, assessing and forecasting its service life, and performing well-timed repairs as needed, a good state of the road facilities is continuously preserved to meet the public's expectations for the road service quality.



Mr. Shing-Hua Jaw, CRF President

At the same time, much is done by Taiwan's road authorities at all levels to promote various traffic management measures, balancing supply and demand and upholding appropriate service standards on the island's roads. Efforts are also directed to steadily increase the smart transport component in Taiwan's road management, collecting various traffic-related data to more accurately prevent accidents, improving traffic flow efficiency, and maintaining good traffic order. As mobile services become more widespread, traffic management has made great strides towards intelligent, technology- and cloud-based solutions with continuous upgrades to the software, hardware and information systems, providing the public with more timely, convenient and thoughtful travel services.

Building a harmonious and prosperous nation is impossible without a successful implementation of road construction projects. It will not only bring increased traveling convenience but also foster sustainable development and coexistence with the natural environment. CRF is fully committed to using its technical expertise in combination with innovative thinking and smart technologies to create an even better road environment for the nation and its people.

Highway projects rely on professionals with passion and enthusiasm who never stop thinking and researching ways to greater improvements. They accumulate and embody decades of wisdom and experience. Although CRF reaches its 60th anniversary milestone at a time when the global COVID-19 pandemic is causing a serious negative impact on domestic transportation, our members defy the challenges and stay in contact both physically and online with their partners at home and abroad to keep the road construction projects and academic exchanges going forward. We are confident that unity and teamwork will help us overcome these challenges, opening the door for even greater future accomplishments.



CRF 60th Anniversary Publication

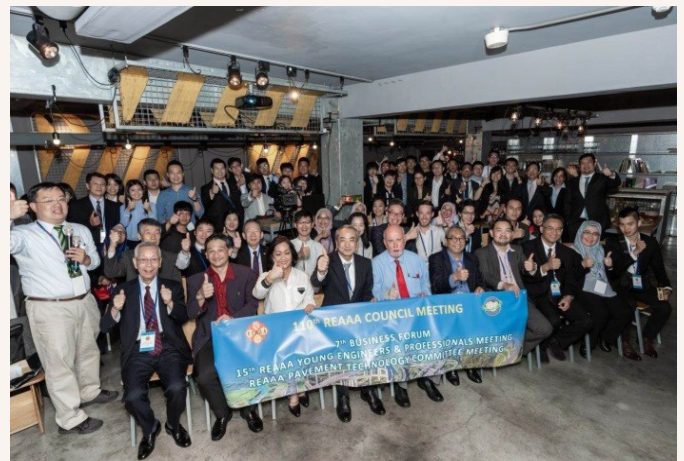
Key Achievements

Nurturing new talent and empowering a new generation of young professionals

CRF has been actively and consistently promoting participation of Taiwan's young professionals in the activities held by the Road Engineering Association of Asia and Australasia (REAAA) for Young Engineers and Professionals (YEP), strengthening their engagement with the international engineering community and helping cultivate future talent with top-notch leadership skills. In 2011, during the term of CRF President Mr. Chia-Juch Chang, Dr. Jason Ni represented CRF with Ms. Christine Chin from Australia and other members established to REAAA Young Engineers Committee. In 2019, the 15th REAAA YEP meeting hosted by CRF was held in Taiwan. About 80 delegates from Japan, Korea, Philippines, Australia, Malaysia, Indonesia, Brunei, and Taiwan attended the meeting. Presentations were delivered by the YEP representatives showing the results of group discussions on various engineering topics including social and ethical issues in engineering, and public transportation developments. In 2020, the CRF Young Engineers Committee was established and various networking events were organized for young engineers to exchange ideas and to gain better access to international resources and opportunities enabling them to keep improving themselves and reaching new levels of excellence.



CRF YP dinner in Taiwan in 2019



The 15th YEP Meeting in 2019

Gaining International Recognition

- 2021 Mino Best Project Award

In 2021, the South Link of Taiwan Provincial Highway No. 9 – Anshuo to Caopu Section Improvement Project received the top honor of the Mino Best Project Award by REAAA for technical excellence and dedication to ecological protection and natural resource preservation. This project was administered by the Directorate General of Highways of Taiwan with the design and construction supervision carried out by CECI Consultants, Inc. Taiwan. Aside from the remarkable quality of work, this project showed the determination toward the sustainability of the infrastructural industry in Taiwan.



Elevated Highway in Anshuo to Caopu Section of the South Link of Taiwan Provincial Highway No. 9



Key Members of the South Link of Taiwan Provincial Highway No. 9- Anshuo to Caopu Section Improvement Project

• IRF Global Road Achievement Awards (GRAA) and IBTTA Toll Excellence Awards

Four major road projects in Taiwan have won the IRF Global Road Achievement Award in recent years, including the National Freeway No. 1 Widening Project - Wugu to Yangmei Section in 2015, the Electronic Toll Collection (ETC) System of Taiwan’s National Freeways in 2016, Carbon Management and Environmental Impact Mitigation for the West Coast Expressway- Ba-Dong-Liao to Jiu-Kuai-Chou Section in 2019, and Improvement for the Suhua Highway of Provincial Highway No.9- Mountainous Section in 2020. Furthermore, the ETC System of Taiwan’s National Freeways has received the 2015 Toll Excellence Awards held by International Bridge, Tunnel and Turnpike Association (IBTTA).



National Freeway No. 1 Widening Project— Wugu to Yangmei Section



Mountainous Section Improvement for the Suhua Highway of Provincial Highway No.9



Environmental Impact Mitigation and Carbon Management for the West Coast Expressway- Ba-Dong-Liao to Jiu-Kuai-Chou Section



Electronic Toll Collection System on Taiwan’s National Highway

Enhancing international participation

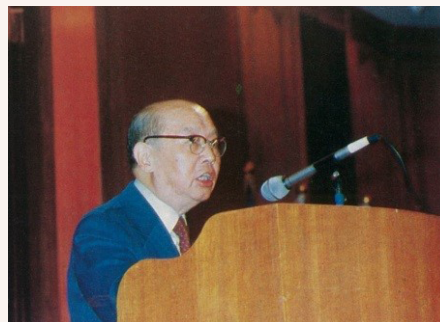
REAAA was one of the most important platforms for CRF to build connections with international road engineering communities. The initiative of association was proposed by Dr. Za-Chieh Moh during his tenure at Asian Institute of Technology, and the heads of road engineering authorities of Thailand, Malaysia, and Singapore in the 1960s. The 2nd REAAA Conference in Manila was the first major REAAA event which CRF participated. With the efforts led by the then CRF President Mr. Chang-Ching Wang, Taiwan obtained the right to hold the 3rd REAAA Conference in Taipei in 1981. The 3rd REAAA Conference was opened on 20 April 1981. Mr. Yun-Suan Sun, the then Premier of Executive Yuan, Taiwan, delivered an opening speech for the conference on the topic “Road Engineering and Energy Conservation”. Mr. Chia-Kan Yen, former President of Taiwan, addressed the closing ceremony with concluding remarks on the importance of a well-developed road system for energy saving.



The 3rd Conference of REAAA- Opening Ceremony



Opening address delivered by the then Premier Mr. Yun-Suan Sun



Closing address delivered by formal President Mr. Chia-Kan Yen

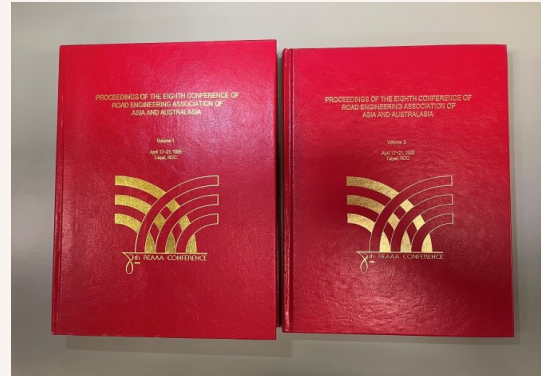


Mr. Chang-Ching Wang being presented with Honorary Membership of REAAA certificate by Mr. Donald Aitken

Mr. Arthur Chen succeeded the president of CRF in 1991 and was elected as the 8th REAAA president the next year. The 8th REAAA conference was held in Taiwan during the term of office of his presidency. Dr. Zhan Lian, the then Premier of Taiwan, delivered the opening address for the conference. With the theme of “Road Engineering for Future Development”, more than 690 attendees including representatives from the United States, Canada, France, Germany, Iran, and other member countries of REAAA participated the conference.



Dr. Chin-Der Ou, the then Minister of Public Construction Commission, Executive Yuan, delivered the speech



Proceedings of the 8th REAAA Conference

Until March 2022, the REAAA Governing Council Meetings have been held 117 times wherein CRF has hosted the 21st, 92nd, and 110th Meetings within the terms of office of Mr. Chang-Ching Wang in 1981, Mr. Chia-Juch Chang in 2011, and Dr. Yung-Hui Chou in 2019, respectively.



The then CRF President Mr. Chia-Juch Chang in the 92nd REAAA Council Meeting in Taipei



The 92nd REAAA Council Meeting

The 110th Governing Council Meeting of the REAAA together with the 7th Business Forum, 15th Young Engineers Conference and Pavement Technology Committee Meeting was held in Taipei in April 2019. Sixty-four representatives from 10 countries including New Zealand, Australia, the Philippines, Thailand, Indonesia, Japan, Korea, Malaysia, Brunei, and Taiwan attended the council meeting. As Mr. Richard Moh was designated as the vice-chairman of the organizing committee by the chairman Dr. Yung-Hui Chou, many young fellows including Assistant Professor Yu-Min Su, Assistant Professor Yen-Yu Lin, Associate Professor Min-Chih Liao, Associate Professor Yu-Ting Hsu, Professor Jieh-Haur Chen, and their students joined in the preparation for the meetings. Participation of the younger generation symbols starts of passing on the duties and responsibility for keeping the deep and close rapport between CRF and REAAA that was established in the past by Dr. Za-Chieh Moh, Mr. Chia-Juch Chang, Mr. Men-Feng Wu, Mr. George S. Y. Chen, Mr. Ching-Peng Shen and other pioneers to the younger generation.



The 110th REAAA Council Meeting was held in Taipei, Taiwan

A person with outstanding eminence and long experience in the science and practice of road engineering and also has contributed outstanding services to the association may be elected to REAAA honorary membership by the council. Due to the high threshold standards, only 38 persons have been elected as honorary members thus far. Among all the honorary members, Mr. Chang-Ching Wang (H.0002), Dr. Za-Chieh Moh (H.0011), Dr. Chia-Juch Chang (H.0023), and Dr. Chi-Kuo Mao (H.0037) elected in the years of 1981, 2000, 2013, and 2017, respectively, are from Taiwan.



Left : Dr. Za-Chieh Moh received the certificate of honorary membership from the then REAAA President Dr. Mino in the 10th REAAA Conference

Right : Dr. Chi-Kuo Mao received the honorary membership at the 15th REAAA Conference

In the celebration ceremony of CRF 60th Anniversary, the president, immediate past president of REAAA along with the president of IRF and other honorary members sent their congratulatory messages via videos to express their deep and meaningful friendship under the severe pandemic. It is envisioned that the deep and close relationship between CRF and REAAA and IRF will be further strengthened in the future.



Dr. Sung-Hwan Kim
President of REAAA



Mr. Romeo S. Momo
Immediate Past President of REAAA



Mr. Kieran Sharp
Chair of the REAAA Technical Committee
and Honorary Member



Prof. John Metcalf
REAAA Honorary Member



Mr. Patrick Sankey
President of IRF

Moving forward and embracing the latest industry trends: service enhancement, smart transportation management, whole life cycle management

Road construction is not simply about providing a convenient and safe transportation network but is closely related to the intricacies of urban planning and development. With the introduction of digital technology, highways can be shaped into quality landscapes helping further promote a country's image as a top tourist destination, at the same time bringing transportation services much closer to the needs of the public. For example, various digital technologies are being increasingly integrated into the planning and design of national highways, allowing for continuous improvements in safety, transportation efficiency, and service quality. Taiwan's adoption of the "service enhancement, smart transportation management and full life cycle management" philosophy stresses its unwavering commitment to strengthening basic infrastructure, as well as the ability to cope with climate change, comprehensively promoting efforts in the three key directions: disaster prevention, greening, and ecological protection.

In terms of service standards, a sustained focus is placed on improving narrow or dangerous sections of roadways, providing a higher degree of integration for the network of freeways and expressways, strengthening the connectivity of Taiwan's airports and harbors, improving access to transportation in rural areas, constructing a more comprehensive and convenient highway network to enhance the overall operating efficiency and save energy, reduce carbon, and contribute to the regional economic development.

Much is being done in the field of intelligent transportation technologies. Cloud technology, big data analysis, AI image recognition, the Internet of Things, and other innovative technologies are being constantly incorporated into road facilities. Specific achievements here include: ePARKING – a smart parking system implemented in a number of rest areas; Bluetooth broadcasting service on National Highway 5; traffic control central computer cloudification; advanced AI ramp metering; regional coordination traffic control; introduction of AI image recognition technology; and the application of 5G high-speed internet and AI analysis for real-time, high-definition image collection and incident detection. These technologies and services enhance incident management efficiency and provide a safer driving experience for the public. In the future, the safety and efficiency of the transportation system will continue to be improved.

Another important aspect worth mentioning is the promotion of the whole life cycle management approach. Qualitative descriptions are being converted into quantitative indicators to better assist with the analysis and application of data, which translates into more effective decisions. An example of this is the Taiwan Freeway Bureau's ongoing collaboration with the Central Weather Bureau to set up 79 automatic weather stations that exchange real-time weather information with the central computer system of the Freeway Bureau and enable immediate activation of contingency measures. Another instance of proactive use of weather information is the Directorate General of Highways' utilization of the local rainfall data system to automatically and in real-time calculate the probability of landslides. Should the rainfall amount reach the alert threshold, advance analysis and deployment operations are activated in accordance with the disaster prevention and warning mechanism and simultaneous notification of the current traffic risks is sent out to Directorate General of Highways' official website and mobile application. All this allows disaster prevention management to no longer be just a series of passive responses, but a preventively deployed mechanism that can be utilized in advance.

Modern road systems use advanced technology to assist in developing appropriate disaster prevention strategies and making precise decisions before the occurrence of hazards induced by extreme weather

conditions. CRF will be dedicated to carrying out its continuing mission of bringing convenience, benefits and welfare to the public by providing useful insights for road construction and traffic operations management, contributing to the government's ongoing efforts for road network optimization, and making constructive suggestions for the never-ending capacity development for the transportation sector.

Development of Pavement Manuals for Community Roads in Myanmar

1 Mr. Kazunari Hirakawa
Japan Road Association

2 Mr. Yasumasa Torii
Japan Road Association

3 Mr. Kieran Sharp
Chair, REAAA Technical Committee



Introduction

Road pavements in Asia in urban areas or on trunk highways connecting large cities have largely been developed. In contrast, however, roads in rural areas, including those connecting cities with villages and those within local communities where traffic is light, are often unpaved.

Few countries have fully established technical standards for these lightly-trafficked pavements. Practice is generally to adopt the standards introduced by colonial governments or those with a powerful economy.

Especially in rural areas where poverty is widespread, labour-intensive infrastructure development, including community-participation, is important in terms of securing employment. Therefore, promoting the development of lightly-trafficked roads that can be constructed and maintained by the local community will result in an improvement in the quality of life of local communities in poor areas. It is also important to develop high-quality pavements for trunk roads which link these roads.

Ayeyarwady is a rice-producing area in Myanmar. Sufficient infrastructure such as roads has not been adequately developed, and it is difficult to transport rice and other agricultural crops. In addition, those of working age who live in the area are moving to Yangon in search of employment opportunities, which further affects the economy of the region.

To add to the problems, Cyclone Nargis struck the area in May 2008, which resulted in 2.4 million casualties, including 14,000 killed and missing. In response to this situation, the Myanmar government launched an emergency road project to construct 11 new routes and 840 km of road in the Ayeyarwady region. However, since there were no technical standards for labour-intensive, community-based road construction, it was difficult to carry out intensive construction and the project was not properly implemented.

In response to these problems, Japan Infrastructure Partners, in cooperation with the Japan Road Association, saw the need to prepare a manual that would contribute to community-inclusive road development in Myanmar. The decision was based on the successful technical transfer of the Japanese penetration macadam method into a local community in Mongolia in 2006 (Yano & Onon (2015)). Following the preparation of the manual, two technical manuals for asphalt pavements and cement-concrete pavements were compiled to help meet the future needs of the country. These manuals were later combined into one manual.

Most of the road projects in rural areas in Myanmar are controlled directly by the Department of Public Works or, currently, the Ministry of Construction (MOC). Urban streets are surfaced with cement-concrete, while the country's conventional penetration macadam method is usually applied on suburban roads. However, whilst the method is popular, it differs a great deal from the penetration macadam pavement constructed in Japan. A typical Japanese penetration macadam pavement is shown in Figure 1.

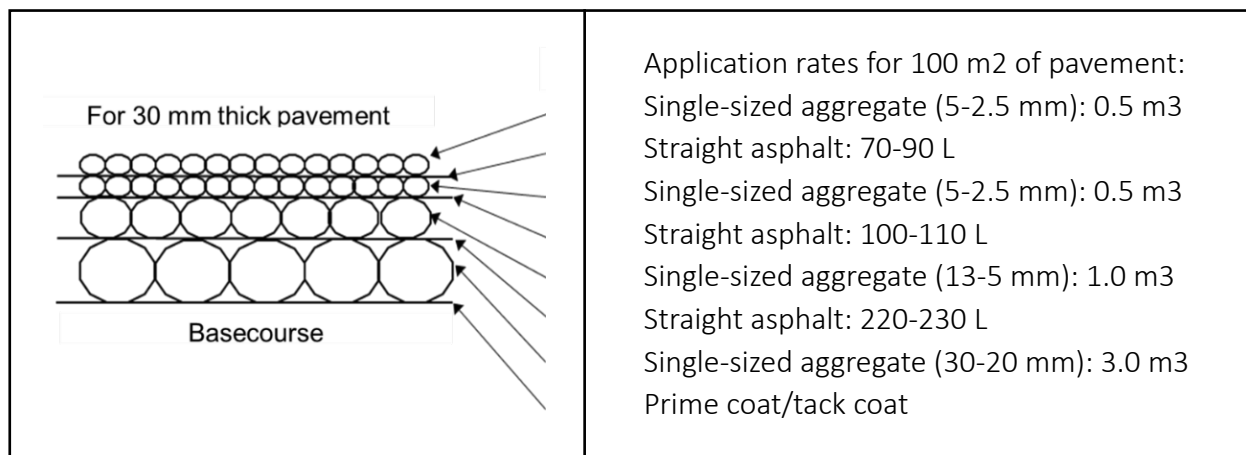


Figure 1: Cross-section of typical Japanese penetration macadam pavement

Swampy areas are widespread, so early distress of the pavement can be observed all the year round on rural roads, where conventionally-specified structures are seemingly not suited. During the rainy season, edge shoulders are often eroded due to the weakened ground (Figure 2). The narrowed lane width inevitably makes it very difficult, if not impossible, for vehicles to pass each other (Figure 3).



Figure 2: Normal condition of a rural road



Figure 3: Damaged roadway after flooding

Penetration Macadam Pavement

The project involved two phases, one from June 2012 to September 2014 and the other from April 2016 to December 2019. A section of pavement in Yegare village, 120 km west of Yangon, was selected for the trial. It is located in a rural, poor agricultural area, which was directly and hardest hit by the 2008 Typhoon Nargis. On the journey from Yangon, gravel roads were uneven and rutted with many potholes. The ground was soft and houses had been flooded prior to the rainy season. The pavements had to be repaired every time they were severely damaged. An example of a road damaged by flooding is shown in Figure 3.

The cross-section of the trial pavement was selected to match the penetration macadam pavement used in Japan (Figure 1). In addition to the construction method, advice was given on other technical matters, including planned surveying, the control of materials, the management of road roughness, joint treatment, and other key issues that contribute to pavement durability.

Before the implementation of the penetration macadam pavement, it took three to four hours to travel by car from Yangon to the region where the trial was conducted. Three years later, the improved road surface greatly reduced travel time to just 60 to 90 minutes. As a side effect, the village started to develop, with an increased number of stores and bus stops emerging along the roadside as shown in Figure 4 and Figure 5.



Figure 4: Activity before project



Figure 5: Activity three years later

A *Manual on community-inclusive type pavement works for low-traffic-volume roads* was produced during Phase 1 of the project. Full details are provided in Yano & Onon (2015).

Asphalt Pavement

Following the successful technology transfer of the penetration macadam pavement in Phase 1 of the project, trials of high-grade pavements such as hotmix asphalt pavements and concrete pavements were conducted. They will become necessary for the development of national and local roads in the future Myanmar.

Since there were few asphalt plants in rural areas in Myanmar, and those were owned by private companies, engineers and staffers in the Ministry of Construction (MOC) had little experience in paving with hotmix asphalt, although the MOC intends to install more batch asphalt plants in the future.

For these reasons, the focus of the hotmix asphalt trials was as follows.

- Demonstrate the Japanese empirical design method of pavement design based on local ground conditions and expected traffic loadings.
- Demonstrate the importance of the correct construction of the hotmix asphalt surface layer.
- Make counterparts aware of the importance of quality control of the materials used, and production management at the batch plant.

As in Phase I, technical advice was provided at the trial site. As a result, the MOC agreed to develop an asphalt paving standard for their engineers by compiling a manual based on the findings of the trial.

The trial construction with hotmix asphalt was completed in January 2018. Fortunately, the asphalt plant used had already been in operation for an Asia Development Bank (ADB) project, so the manufacturing quality was stable. In addition, a certain level of construction quality was ensured by the technical advice provided by the Japanese advisors in cooperation with the Myanmar authorities.

Photos of the pavement before and after construction are shown in Figure 6 and Figure 7.



Figure 6: Site before trial



Figure 7: Site after trial

In order to popularize the use of asphalt pavements in Myanmar, MOC staff members are expected to be given more opportunities to get involved in, and gain a better understanding of, the design, construction and quality control of hotmix asphalt materials.

Concrete Pavement

In Myanmar, though manually-constructed concrete pavements are used on some urban streets, they are rarely used on local roads. As with hotmix asphalt pavements, ready-mixed concrete mixing plants are owned by private companies, so the application of concrete pavements varies greatly from region to region. For this reason, the MOC staff's knowledge and expertise differed depending on the area to which they were assigned.

As was the case with the hotmix asphalt pavement trial, it was decided to carry out a trial concrete pavement construction and provide technical advice on the construction, leading to the compilation of a paving manual for concrete pavements for MOC staff.

The main aims of the project were to:

- compare two cross-sections – one using Myanmar’s design method and the other using the Japanese empirical method
- clarify points to note regarding the constructing of the surface layer using mechanical plant
- demonstrate the importance of material quality control and manufacturing control at the ready-mixed cement concrete plant.

The trial project was completed in January 2018. Despite active cooperation from the Myanmar staff, a number of errors were made, and it was necessary to provide basic information to inexperienced field engineers. This was not helped by the fact that a number of tasks had to be conducted in a short period of time. Consequently, sufficient quality could not be attained in the field. For example, although the compressive strength of the on-site curing specimens exceeded the standard value, the construction quality was below the required quality, with some partial cracks propagating near the joints. The long-term performance of each pavement section continues to be monitored and will be evaluated in the future.

Photos of the pavement before and after construction are shown in Figure 8 and Figure 9.

A comprehensive Handbook on pavement works was compiled by Japanese engineers during the trial. It addresses mix production at the plant, the installation of formwork, field construction, curing, etc. This will be helpful for all users in the future.



Figure 8: Pavement before the project



Figure 9: Pavement after the project

Summary

The following two manuals and a handbook were produced in the project:

- a Manual on community-inclusive type pavement works for low-traffic-volume roads, which was produced during Phase 1 of the project in 2014
- a Manual on pavement works using hot mix asphalt and ready-mixed concrete, which was compiled during Phase 2 of the project in 2018
- a Handbook on pavement works, which was completed in 2019.

Even under different weather and soil conditions in Myanmar compared to Mongolia, the penetration macadam pavement introduced to Myanmar was successfully transferred in Phase 1 of the project. As was the case in Mongolia, the transfer of knowledge was made through technical assistance and the compilation of manuals reflecting the local conditions. The technology transfer of high-grade asphalt and concrete pavements in Phase 2 faced various problems such as insufficient experience in basic surveying. The technical manuals that were developed during the project that address these issues will be very useful in terms of successful technical transfer in developing countries in Asia.

Full details of the Myanmar projects are contained in Hirakawa (2022).

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Early-warning Mechanism and Risk Mitigation for Bridges and Mountain Highways under Extreme Heavy Rainfall

Mr. Chin-Fa Chen

Deputy Chief Engineer, Directorate General of Highways, MOTC, Taiwan

This paper is the summary of the lecture presented by the author in PIARC International Workshop “Road Disaster Management Using Latest Information Technologies” in Kyoto on June 30, 2022.



Introduction

In recent years, loss of life and severe damage to transportation infrastructure resulting from natural disasters brought about by global climate change inducing extreme weather patterns has been recorded all over the world, including Taiwan. To enhance the effectiveness of risk strategies, risk management associated with heavy rainfall has changed from being reactive to proactive, with the goal being to provide sufficient time for risk mitigation, mobilization, and the evacuation of vulnerable people prior to the occurrence of the hazards.

Watershed Management for Highway Bridges

In Taiwan, a new watershed management program was developed for mitigating the impacts and reducing the risks of extremely heavy rainfall on highway bridges. Aside from taking advantage of the database of historical hazard events, this new program took account of the hydro-geomorphic features of rivers from upstream to downstream. While rainfall and flow conditions are monitored upstream, necessary response measures can also

be deployed for bridges located in the midstream and downstream. Rather than simply instrumenting and monitoring bridges at specific sites, pre-warning alerts can be issued as early as possible and risk response for bridges in the midstream and downstream can be integrated as a whole. Figure 1 illustrates the concept of watershed management for highway bridges.



Figure 1: Schematic of watershed management for highway bridges

Historical rainfall patterns and critical flow conditions were summarized and analyzed to identify the types of potential hazards and threshold values of accumulated rainfall, rainfall intensity, and the reoccurrence of hazardous rainfall events. These threshold values were converted into risk indices based on the results of calibration by incorporating factors such as representative rainfall stations, reliability of analyzed rainfall patterns, traffic conditions, and the availability of evacuation resources. The practicability of the watershed management program was validated by Typhoon Fanabi, which hit Taiwan on 19 September 2010.

Proactive Risk Management for Mountain Highways

Risk is defined as the multiplication of probabilities of failure and the consequences caused by the failure of protected objects. For mountain highways, additional risk management measures, including the identification and analysis of slopes with a high potential of failure and localized precipitation effects, were incorporated into the program. Hazard control points and necessary resources for hazard control can thus be deployed based on the results of hazard potential analyses implemented by highway authorities to make up for the deficiency of traditional prediction models. This program is able to provide a needed function for hazard prevention and risk mitigation by prompt mobilizing of rescuing and restoring upon the occurrence of hazard events.

The proactive risk management approach for mountain highways was developed based on historic hazard events, hazard alerts on precipitation thresholds, quick response plans and actions, and real-time monitoring. Supplies for emergency protection or restoration can be deployed for selected hazard control points. Precipitation thresholds specified based on historic records of hazard events were adopted as the baseline for setting up the responding protocol. Responding actions can thus be mobilized more efficiently.

Hazard alerts are divided into three levels – early warning, warning, and action – in line with the specified precipitation thresholds shown in Figure 2. To date, 64 monitoring sections have been set up by highway authorities in Taiwan on mountain highways.

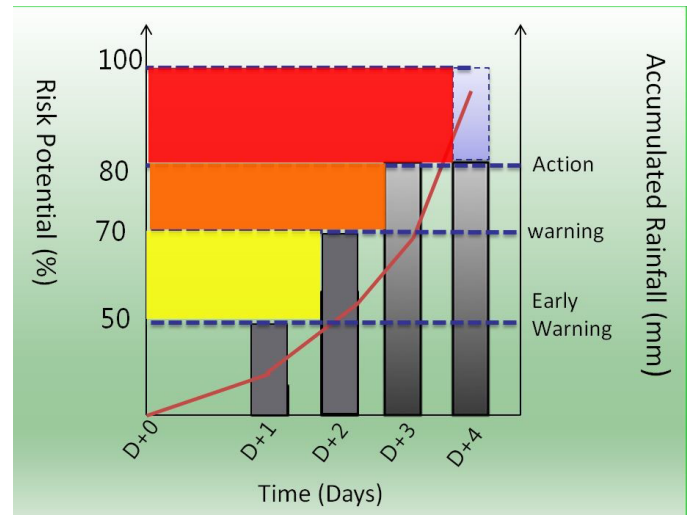


Figure 2: Three levels of risk alert

Early-warning Alert and Response Mechanism for Highway Hazard Mitigation

As shown in Figure 3, hazard precaution commences 2 days before the predicted emergency. Hazard information, including rainfall and flood prediction and pre-calibrated historical data, are analysed to set up early warning criteria. This is followed by decision-making in terms of the selection of the precaution measure. The deployment of joint forces, including local government, police, emergency rescue teams, and medical supplies commences once the precaution measures are confirmed. 4 hours prior to the predicted event, an early warning alert will be sent out via various media channels including local broadcast stations (LBS), network, and local changeable message (CMS) signs to warn highway users and residents. The response protocol will be activated as per the level of alerts when a hazardous event is impending or occurring.

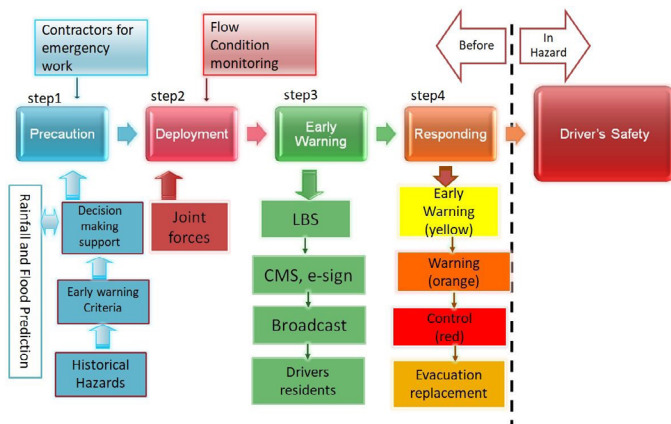


Figure 3: Flow chart of alert and responding mechanism

When the hazard is impending or occurring, risk responses are evaluated every 10 minutes according to the pre-set precipitation thresholds. Details of traffic control and broadcast information are shown on highway message boards. When conditions reach a certain level, traffic control measures such as road closures and guidance to emergency shelters are initiated. Usually, information broadcasting is launched 4 hours prior to the road closure.

Historic records, including the route, rainfall distribution, and rainfall associated with typhoons affecting Taiwan are available in the database of the Central Weather Bureau (CWB) of the Ministry of Transportation and Communications (MOTC). The CWB has also developed the “Extreme Weather Simulating System” (QPESUMS) for the prediction of critical weather conditions over the next 1 hour as illustrated in Figure 4. The hazard prevention and emergency response measures can be calibrated using the simulation program when necessary.

Case Study Verification

The applicability of the proactive risk management approach for mountain highways was verified by five extreme heavy rainfall events that hit Taiwan in 2011: Typhoon Sanda, Typhoon Ma-on, Typhoon Nanmadol (about 1100 mm of rainfall), Typhoon Nalgae (about 1600 mm of rainfall) in May, July,

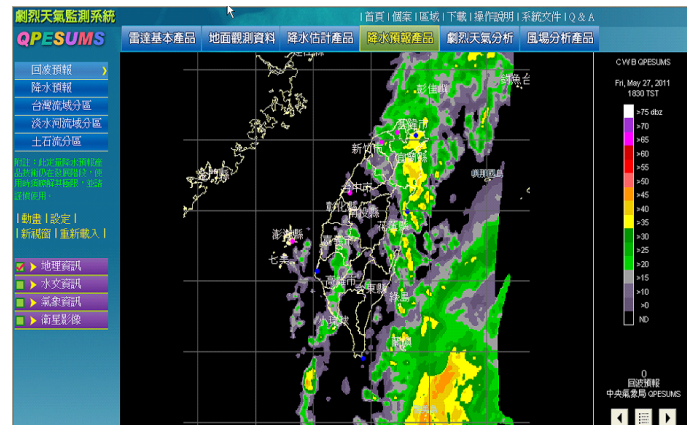


Figure 4: Example of precipitation prediction model (QPESUMS, CWB)

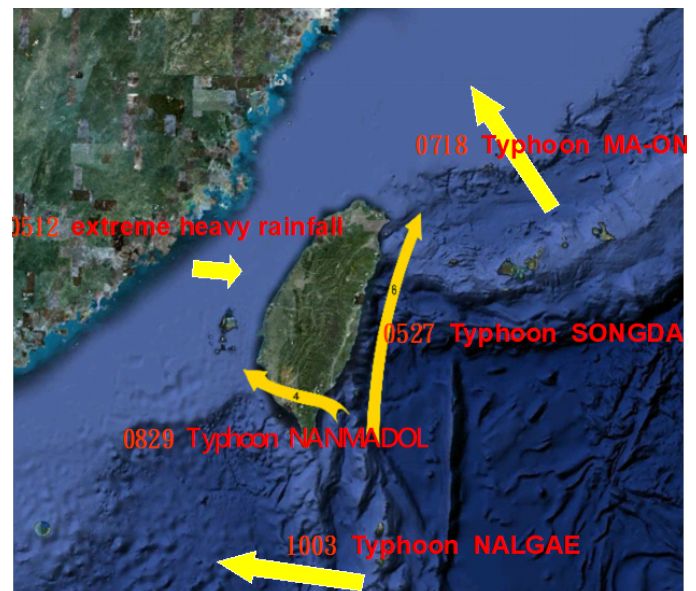


Figure 5: Routes of typhoons and heavy rainstorm in 2011

August, and October, respectively (Figure 5).

As shown in Figure 6, a total of 79 roads were closed by highway authorities during the extreme weather events in 2011 after the issuing of hazard alerts and decisions made with the assistance of QPESUMS simulations. The heavy rainfall resulted in debris flow, landslides or slope failures at 27 control points along the 79 roads. No casualties occurred at any of the control points affected by the weather events. Taking advantage of the proactive risk management approach, all actions regarding evacuations, medical and food supplies, and the provision of shelter

were carried out successfully, to the extent that the impacts of the hazards were minimal. Figure 7 shows images of the occurrence of hazards after the highways were closed.

The results of the verification confirmed the effectiveness and applicability of the Watershed Management and Risk Management Approach

for highway bridges and mountain highways. Systematic and integrated application of historic data, monitoring, early warning alerts, QPESUMS simulation, traffic control, and evacuation plan under the threat of natural hazards induced by extreme weather conditions can significantly mitigate the risks to the population, infrastructure and property.

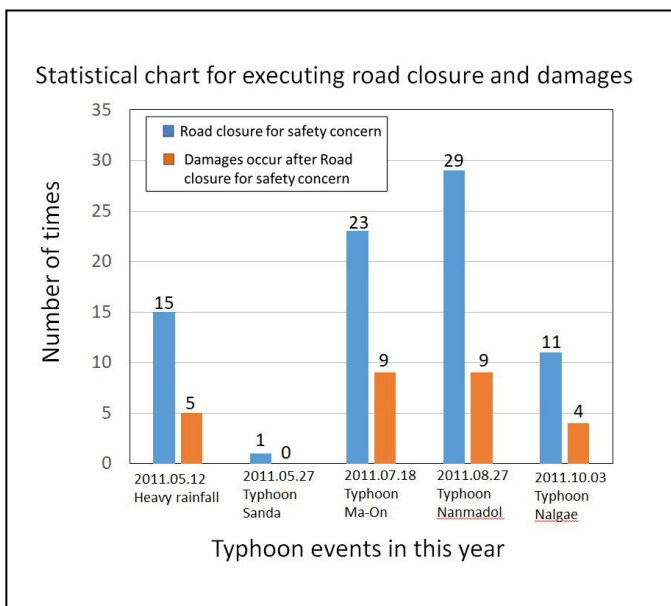


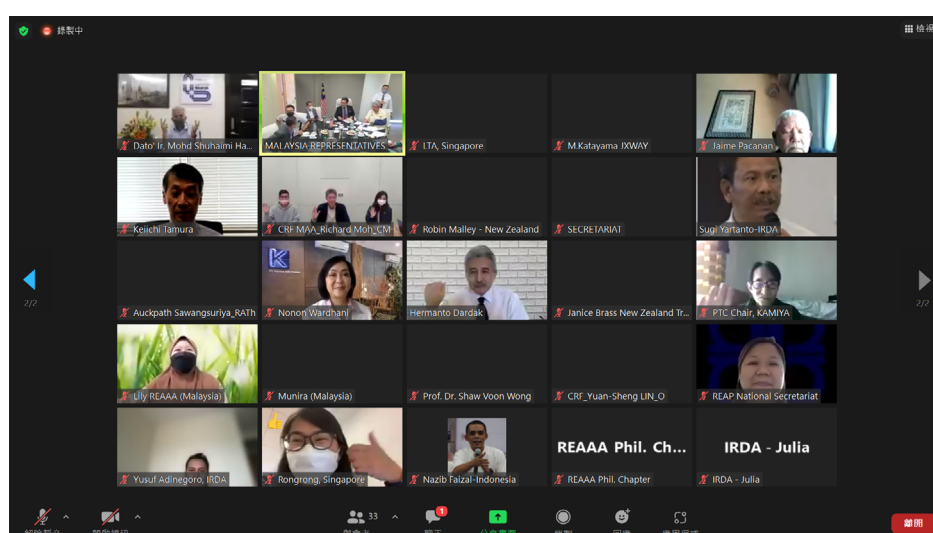
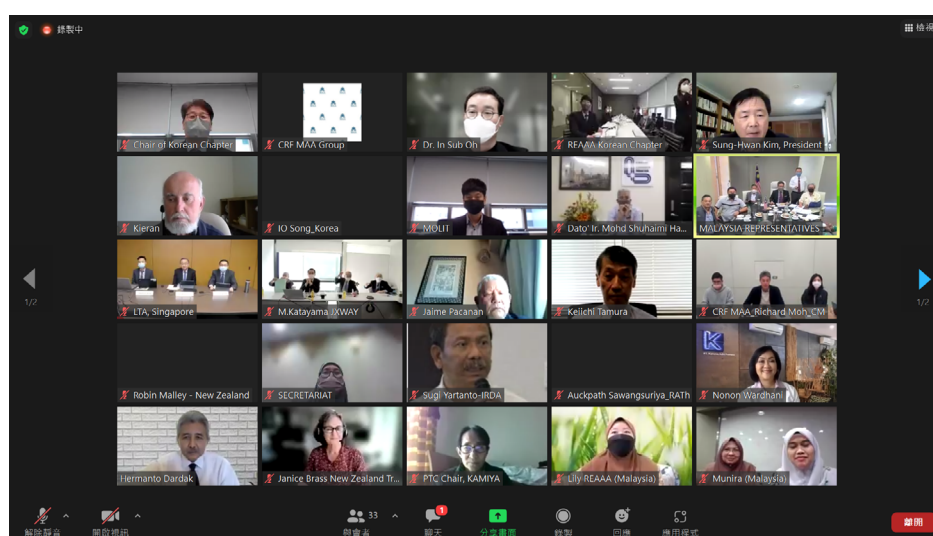
Figure 6: Number of road closures and occurrence of hazardous events due to extreme heavy rainfall in 2011



Figure 7: Images of hazards after road closure induced by heavy rainfall

117th REAAA Governing Council Meeting

The REAAA Governing Council held its 117th meeting on 25th March 2022 via the Zoom platform. The meeting was successful, with 35 out of the 38 Council Members attending.



The meeting was called to order by the REAAA President, Dr Sung-Hwan Kim. Reports were tabled by the Finance Committee, Honorary Secretary-General, Technical Committee, and the Membership Promotion Committee. Reports addressing the REAAA website and Business Forum were also approved at the meeting.

Several important decisions were also made, and key proposals were adopted, including:

- REAAA :The Way Forward 2022-2025
- preparation for the 118th REAAA Governing Council Meeting in Christchurch, New Zealand
- input into forthcoming events to be conducted in REAAA member countries.

The Finance Committee made a sincere request to Chapters and Council members to help in the collection and remittance of overdue membership subscriptions. The Finance Committee recorded its appreciation to members for their assistance in the collection of membership dues.

The Honorary Secretary-General's report covered various activities of the Secretariat for the period from October 2021 to February 2022. The Secretariat has been actively participating and facilitating numerous activities, as well as executing specific responsibilities as directed by the chairs of various committees. A number of decisions made at the 116th Governing Council meeting have been carried out by the Secretariat, including the requirements of Registrar Society Malaysia, bank issues, membership issues, and follow-up actions after the brainstorming session at the 17th Council Term.

Vice-Presidents

The Council Meeting unanimously endorsed the list of Vice Presidents as follows:

- Dr. Mike Shackleton, Chief Research Officer, Australian Road Research Board
- Dato' Seri Ir. Haji Mohamad Zulkefly Sulaiman, Director-General, Public Works Department of Malaysia
- Mr. Katsuji Hashiba, Chairman, REAAA Committee, Japan Road Association
- Dr. Hedy Rahadian, Director-General, Directorate of Public & Highway, Republic of Indonesia.

Co-opted Council members

The following individuals and organisations were elected as co-opted Council members to assist the Association in various aspects, including technical, finance, management, and administration:

- Mr. Kieran Sharp (Australia)
- Mr. Destiawan Soewardjono Simoen (Indonesia)
- Mr. Rachman Arief Dienaputra (Indonesia)
- Dr. Ir. Danis Hidayat Sumadilaga (Indonesia)
- Mr. Yoonsang Lee (Korea)
- Mr. Kyu-Young Hwang (Korea)
- Mr. Yasumasa Torii (Japan)
- Dr. Koji Kuroda (Japan)
- Dato' Ir. Dr. Dennis Ganendra (Malaysia)
- Dato' Ir. Haji Zulakmal Haji Sufian (Malaysia)
- Ts. Ir. Dr. Muhammad Marizwan Abdul Manan (MIROS, Malaysia)
- Professor Dr. Wong Shaw Voon (Malaysia)

Committees and Chairs

Following are the list of Committees and the elected Chairpersons:

- Steering Committee (C1): Dr. Sunghwan Kim
- Nominations Committee(C2): Dr. A Hermanto Dardak
- Special Task Committee (C3): Mr. Romeo Salazar Momo
- Technical Committee (C4): Mr. Kieran Sharp
- International Coordination Committee(C5): Dato' Seri Ir. Haji Mohamad Zulkefly Sulaiman
- Katahira & Mino Fund Committee (C6): Mr. Michio Katayama
- Hwang Fund Committee(C7): Mr. Jong Gon Park
- Finance Committee(C8): Ms. Lydwina Marchiela Wardhani
- Membership Promotions Committee (C9): Dr. Hedy Rahadian

Brainstorming Session

Two brainstorming sessions were held on 21st October 2021 and 13th January 2022 to review the REAAA Strategic Plan 2022–2025. Tasks were assigning tasks to all Council Members and Co-opted Members. The outcomes of the brainstorming sessions REAAA 2022-2025 – The Way Forward were presented by the Honorary Secretary-General.

Following the endorsement of Committee Chairs and the Owners of Working Committees, responsibilities and tasks were assigned to the appointed personnel.

The Committee Chairs are required to:

- advise Working Committees under their respective Main Committees
- hold coordination meetings every quarterly to monitor the implementation of programs and projects by Working Committees
- generate additional income from activities conducted by various working committees
- report progress for discussion at REAAA Governing Council Meetings.

The Owners of Working Committees are required to:

- appoint suitable members from member countries as members of the Working Committee
- hold frequent Working Committee meetings to plan and implement programs and projects
- prepare program and project progress reports for discussion by the main Committee and Governing Council meetings.

REAAA Technical Committee

Working Committee on Pavement Technology (C4WC1) Activities

Dr. Keizo Kamiya

Chair, REAAA Pavement Technology Committee
NEXCO Research Institute, Japan

The new REAAA President, Dr Sung-Hwan Kim, asked the Chairs of the various Technical Sub-Committees to prepare project briefs for their committee. The preparation of the project brief for the Pavement Technology Committee – renamed the Working Committee on Pavement Technology (C4WC1) – has been approved by the Leader of the Special Task Committees (formerly Technical Committee) Mr Kieran Sharp.

The first project being conducted by Working Committee C4WC1 is, *Sharing experiences and knowledge on pavement maintenance and repair practices in Asia*. The rehabilitation of damaged pavements in urban or rural areas is an important issue for each member country. The purpose of the project is to investigate the practices or challenges used in member countries to improve the life of damaged pavements, by focusing on factors such as structure, mix design, materials, repair techniques, etc. It is proposed that case studies of practices that have been used, or tried, to rehabilitate damaged pavements in urban or rural areas be collated.

Because of the timeline, the collection of the practices needs to be finalised by the end of 2022. The Chair is assisting PTC members to identify their interesting repair practices through online research.

Meanwhile, in response to the request from PIARC TC 4.1 (Pavements), the Chair included in the PTC action program a half-day face-to-face joint seminar to be held in conjunction with their TC 4.1 meeting on 7th–8th March 2023 in Kuala Lumpur.

It is suggested that each PTC member keep to the following schedule.

Key Deliverables	Expected completion date
Ask each member of Working Committee to consider what kind of case study is possible	end of June 2022
Receive responses to the request	end of September 2022
Report progress at 118 th Governing Council meeting	October 2022
Collate responses and prepare draft report for comment by Working Committee	end of December 2022
REAAA PTC and PIARC TC 4.1 joint seminar	7-8 March 2023
Prepare final draft of report for approval by Governing Council	end of March 2023
Prepare presentation for approval by Governing Council	end of March 2023
Publication of Technical Report	end of June 2023
Presentation of results at selected events	to be advised

REAAA Technical Committee

Working Committee on Road Safety & Database and Technical Information (C4WC2): Progress Report

Dr. Muhammad Marizwan bin Hj Abdul Manan

Chair, REAAA Road Safety Committee

Director, Road Safety Engineering and Environment Research Centre, Malaysian Institute of Road Safety Research (MIROS)

The goals of the REAAA Road Safety Committee reflect issues of major concern in REAAA member countries. Initially, there are four strategies and outputs that cover the issues of vulnerable road users (VRUs) which are the main tasks and deliverables of the committee: human factors and design, catalogues of design safety problems, potential countermeasures for LMIC, and road safety audit guidelines.

In view of the magnitude and seriousness of powered two-wheeler (PTW) issues in REAAA member countries, especially in South East Asia, the committee decided to investigate existing strategies or plans related to the safety of PTW riders in terms of providing the appropriate infrastructure to address these issues. The work is in line with that being conducted by PIARC Committee TC 3.1 (Road Safety). Dr Keiichi Tamura from Japan is a member off both the REAAA and PIARC committees. The work is also in line with the work of the iRAP Global Technical Committee (GTC), which is developing assessment models for PTW vehicles in urban areas.

The questionnaire was developed with the intention of gathering information on general road safety information, road infrastructure programs, and guidelines or materials related to PTW, supplemented with case studies.

The questionnaire consists of three parts:

Part A: General road safety information – statistics related to PTWs. This information is vital if the safety of PTW drivers is to be gauged and the data from each country compared. Statistics should be based on the latest data available or data from three years back from 2022. Participants also need to declare, or cite, the source of the data.

Part B: Road infrastructure program, guidelines, or material related to vulnerable road users (VRU) – details of issues and implemented countermeasures relevant to all type of VRUs addressing road safety improvement. An example is provided in the Appendix to the questionnaire.

Part C: Case Studies – one example from Part B in terms of the safety issues related to VRUs, details of the implemented countermeasure and the effectiveness of this implementation. An example is provided in the Appendix to the questionnaire.

Abbreviations and detailed explanation on the type of PTWs are provided, together with examples to assist participants to answer Part B and Part C.

The results of the questionnaire will be used to produce a technical report addressing PTW safety issues in REAAA member countries.

The questionnaire was circulated to member countries at the end of February 2022. Progress to date has, however, been slow, with responses only received from Japan and Taiwan. This no doubt reflects the impact of the COVID pandemic and conflicting demands on resourcing. Members have been reminded to submit their questionnaires as soon as possible.

At the request of the REAAA President, the focus of the committee has recently been changed to also address databases and technical information. This will be addressed after the current task is completed, hopefully by the end of 2022.

REAAA Technical Committee

Working Committee on Climate Change, Resilience and Emergency Management (C4WC3) Activities

Ms. Caroline Evans

Chair, Climate Change Resilience and Emergency Management Committee
Department of Transport, Victoria, Australia

Mr. David Rolland

Chair, Climate Change Resilience and Emergency Management Committee
Government of Victoria, Australia

The aims of this committee are to:

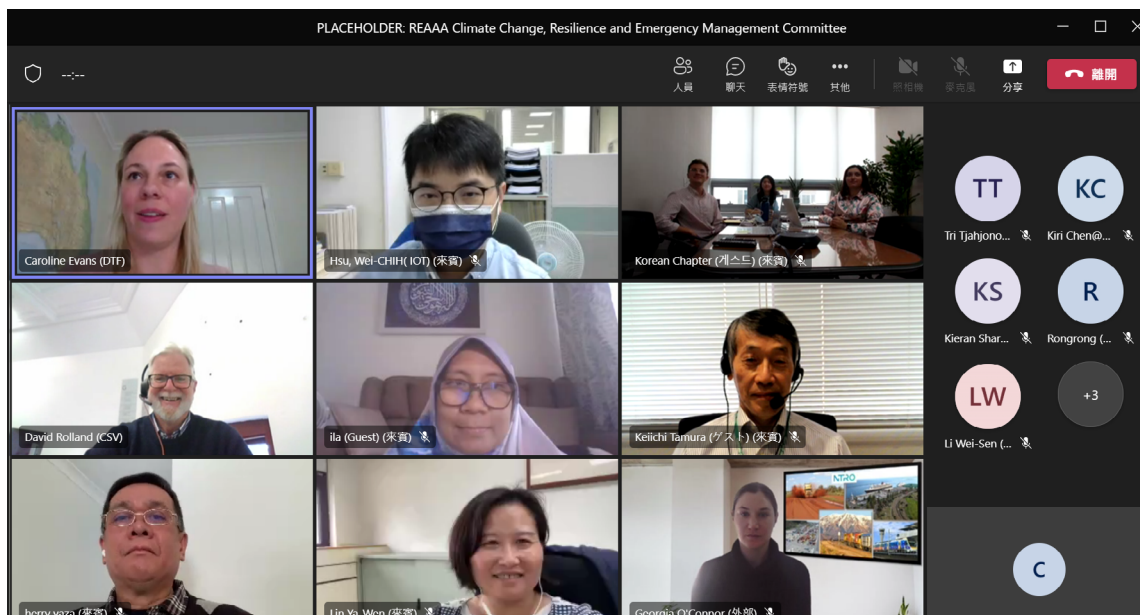
- address issues of relevance to REAAA member countries in the area of infrastructure resilience to climate change
- where relevant, mirror the topics addressed by PIARC TC.1.4 (Climate Change and Resilience of Road Networks) and TC.1.5 (Disaster Management)
- act as a liaison between the REAAA member countries and PIARC Committees TC.1.4 and TC.1.5.

There are clear connections between the Associations through the provision of inputs into PIARC's work program and the sharing of PIARC information to REAAA.

The REAAA committee's Work Plan includes the dissemination of information on adaptation strategies, climate change adaptation frameworks, and the sharing of information related to natural disasters between the Associations. The Work Plan also provides an opportunity for more specific key issues in Asia and Australasia to be explored. The aim is to develop two reports:

1. Extend the recommendations/issues identified in a Forum of European National Highway Research Laboratories (FEHRL) Scanning Tour on Infrastructure Resilience (Evans 2018).
2. Identify how climate change resilience can be implemented into asset management and strategic decision-making processes.

A survey was sent to members of this Committee last year. The aim of the survey is to facilitate the collection and analysis of case studies, relevant to PIARC's and REAAA's objectives, from member countries. To date, case studies have been provided by Australia, Indonesia and Taiwan. The case study survey has also been disseminated to the relevant members of the REAAA Australian Chapter. Members of countries which have



not yet submitted case studies were requested to do so by the end of August.

REAAA Technical Report TC-10 – *Report on FEHRL Scanning Tour to South Korea and Japan: Infrastructure Resilience* – presents the details of a Forum of European National Highway Research Laboratories (FEHRL) Scanning Tour to Korea and Japan on ‘Resilience of the Infrastructure’ conducted in 2018. The purpose is to assess and integrate the findings of the Scanning Tour report, and to develop a report on best practice approaches to addressing challenges and opportunities by way of case study examples, and identify new innovative approaches which have been undertaken since the publication of this report. A template to allow members to prepare their case studies in a common format is being developed. The aim is to develop the draft report by the end of 2022, with the final report to be tabled for approval by the Governing Council in March 2023.

A (virtual) meeting of the committee was held on 17th June 2022. About 20 delegates attended the meeting from Australia, Indonesia, Japan, Korea, New Zealand, Malaysia and Taiwan. Dr Yukio Adachi, the Chair of PIARC TC 1.5, also attended the meeting. Case studies from Indonesia and Taiwan were presented at the meeting. A report on the meeting outcomes will be available shortly. The next meeting of the committee will be held in December 2022.

An *International Workshop on Road Disaster Management using Latest Information Technologies* will be held on 30th June 2022. It is organised by the World Road Association (PIARC), the Japan Road Association and REAAA with special (REAAA) with special supported by the Hanshin Expressway Company Limited. The aim of the workshop is to share world case studies on disaster management through the exchange of information between countries. The Workshop program includes discussions of recent road infrastructure maintenance technologies, and a panel discussion of strategies for road disaster resilience. REAAA has been invited to contribute to the Workshop, and a presentation will be provided on the collaboration between PIARC and REAAA by Caroline Evans, PIARC Chair TC.1.4 and REAAA Co-Chair Climate Change, Resilience and Disaster Management Working Committee.

Reference

Evans, C 2018, Report on FEHRL scanning tour to South Korea and Japan: infrastructure resilience, REAAA

9th REAAA Business Forum

Smart Construction Technology in Road Engineering

1 Mr. Frank Loveland

Assistant Coordinator Intern, Korea Road Association



2 Ms. Josette Pinto

Assistant Coordinator Intern, Korea Road Association



The 9th REAAA Business Forum was held as a hybrid event on March 24th in Seoul, Korea. It was organized by the REAAA Korean Chapter and the Ministry of Land, Infrastructure and Transport (MOLIT), with support from the Korea Agency for Infrastructure Technology Advancement (KAIA) and the Korea Expressway Corporation (KEC).

The opening remarks were given by Mr. Jong Gon Park, the Chair of the REAAA Korean Chapter. This was followed by the Director of Technology Policy Division from MOLIT, Mr. Seong-Hoon Lee who, in his congratulatory remarks, emphasized how the growing dependence of digital technology during the COVID-19 pandemic must be seen as an indication of the increasing relevance that smart technologies will hold in the future. Ms. Wardhani, the REAAA Business Forum Coordinator, also delivered congratulatory remarks from Jakarta about the long, successful history of the business forum, leading REAAA to become the most dynamic road association in Asia and Australasia. She emphasized

the importance of the business forum as both a promoting platform for REAAA and an opportunity to build partnerships in member countries. In total, 16 international speakers from six REAAA member countries shared their experiences and challenges in the practice of Smart Construction Technology in road engineering.

The first keynote speech was presented by Dr. Sung-min Michael Cho, the Director of the Center for Smart Construction Technology of the KEC who shared a thorough analysis of “Technology Trends Shaping Smart Construction and its Industrial Application in Korea.” He highlighted the ambitious national research program for smart construction technology that the Korean government implemented in 2020. The goal of this newly-established program is to increase the amount of evidence and data that can be used to improve productivity, innovation, and safety in future road construction.



Mr. Jong Gon Park, Chair of REAAA Korean Chapter, gave the opening remarks



Mr. Seong-Hoon Lee, Director of Technology Policy Division in Ministry of Land, Infrastructure and Transport, gave the congratulatory remarks



Ms. Lydwina M. Wardhani, REAAA Business Forum Coordinator, gave the congratulatory remarks

Following that, in the first session titled “Industry 4.0 – What is Smart Construction and How We Prepare”, five speakers from Indonesia, Taiwan, Thailand and Korea presented current practices of Smart Construction within the context of their own countries. The first presentation, presented by Mr. Gildam Satria, focused on how industry 4.0 is reshaping road construction in Indonesia. He spoke about the efforts being made to integrate digital processes and increased sustainability. Prof. Suphawut Malaikrisanachalee presented Thailand’s push for smart highway construction and management with the use of BIM, AR, and other technologies during pre-construction and site layout for an improved user experience. Ms. Yu-Han Yen of Moh and Associates, Inc., Taiwan, addressed the iRoad system and Common Utility Duct Management which generates live 3D visualizations which are sent to a management system for users to access publicly. Finally, Ms. Shao Chen Chiang spoke about the use of big data with traffic congestion analysis and BIM models used in bridge construction in Taiwan.

The thematic of Session 2 revolved around “the Future of Road Engineering”. It focused primarily on analyzing how different technologies like BIM, visualization technology, and metaverse are integrated to facilitate work in areas that support Disaster Management and New Capital City Development.

Mr. Alan Nah, Executive Director of a leading civil engineering and construction contractor in Singapore, Hwa-Seng Builder Pte. His company uses BIM, a 3D design and modeling software package that creates detailed digital representations that can be used to virtually simulate the execution of potential infrastructure projects. Mr. Nah described the direct benefits that his company has experienced from incorporating digital technology; for example, they developed a virtual reality room to simulate real work activities on site and adopted an electronic permit to speed up the application process. The second speaker in this session was Mr. Yun-Ok Kim, CEO of Hanul CNB. Similar to Mr. Nah,

he reported the positive attributes BIM technology has provided in improving the efficiency of road and highway development in Korea. Ms. Kei Sasaki and Ms. Yin Lei Lei Swe of the Taisei Rotec Corporation then reported the efforts being undertaken in Japan to improve visualization technology using information and communication technology (ICT). Mr. Seokjoon You, Principal Research Engineer at Hanmac Engineering, focused on tracing the process his company has used to implement digital transformation into their construction projects.

The speakers in session 2 addressed the connection between the use of digital technology for Disaster Management and city development. Mr. Wei-Sen Li, Secretary-General of the National Science and Technology Center for Disaster Reduction in Taiwan, talked about how imperative it was to develop a public-private partnership between government agencies and private tech corporations for improving

data collecting systems, natural disaster prevention measures, and developing an effective response protocol. Mr. Danis Sumadilaga, the Head of Construction for Indonesia’s new Capital city working under the Ministry of Public Works and Housing, presented details of the long-term, ambitious development project the Ministry has in mind for relocating their nation's capital from Jakarta to the East Kalimantan Province.

The last session took the form of a Panel, which discussed the new business opportunities that are emerging in relation to Smart Construction Technology and how to deal with pre-existing regulations and customs. The panel emphasized the importance of digitalization in construction companies and demands from clients for smart technology as well as the hurdles that exist in the application of new technologies despite their benefit.



Session #1 Industry 4.0 – What is Smart Construction and How We Prepare



Session #2 Future of Road Engineering



Panel Discussion – Smart Construction Technology and New Business Opportunities

In summary, the REAAA 9th Business Forum successfully brought together some of the most prominent leaders and advocates for digital transformation and smart technology in road engineering in Asia. The information presented reflected the increasing unity and collaborative efforts that are being taken in the region to increase the knowledge and understanding of how digital technology can be proactively used to facilitate the process of construction development and execution.

As a hybrid event, approximately 50 people participated on-site (Seoul) and 1,223 viewers participated on YouTube live streaming. The program and its booklet are available on the Korea Road Association's YouTube channel (<https://youtu.be/fanZQNmlquQ>) and its website (<http://irc.kroad.or.kr/>).

Comments from the REAAA Business Forum Coordinator

The aim of REAAA Business Forum is to facilitate road sector business collaboration in road engineering or related sectors and to enhance REAAA membership.

The forums take place in conjunction with REAAA Governing Council Meetings and Conferences. The 9th Business Forum was very successful and accomplished as a Hybrid event.

Hopefully in the future, REAAA Business Forum can be used as a platform to explore and engage opportunities, attract new members, and foster internal cooperation to support mutual development, including technology transfer and project development in REAAA member countries.



Ms. Lydwina M. Wardhani
REAAA Business Coordinator

21st REAAA Young Engineers and Professionals (YEP) Meeting

Ir. Hamzah bin Hashim

Chair, REAAA Young Engineers and Professionals Committee
Public Works Department, Malaysia

The 21st REAAA Young Engineers And Professionals (YEP) meeting was held virtually on 23rd March 2022 in conjunction with the 117th REAAA Governing Council Meeting and the 9th REAAA Business Forum. This was the first YEP meeting in the 17th Council term. It also marked the fifth time a YEP meeting was held through an online platform since the COVID-19 pandemic commenced in 2020.

The meeting was attended by YEP representatives from Malaysia, Korea, Indonesia, Taiwan, Australia, Japan, and Singapore. A total of 28 members, including the REAAA President and Honorary Secretary-General, Ir Mohd Shahrom bin Ahmad Saman, were present during the meeting. Governing Council members Mr Kieran Sharp from Australia and Mr Sugiyartanto from Indonesia also attended, along with Madam Zalilahwati, who represented the REAAA Secretariat.

The newly-elected REAAA President, Dr Sung-Hwan Kim, told delegates that the YEPs were the future leaders of REAAA and their involvement was important in terms of the sustainability of the association. He has therefore set up the YEPs as a core group during his presidential term. He also offered his assistance to carry out YEP activities. He wished the members a fruitful meeting.

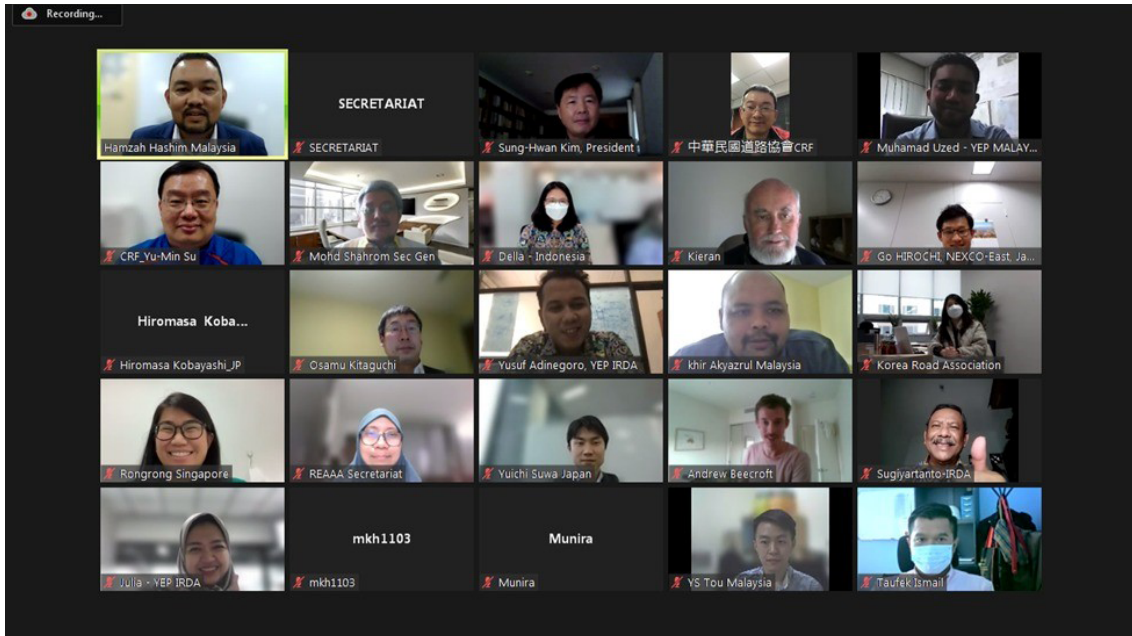
Representatives of each member country provided updates on their recent activities. They allow members to stay up to date with everybody and to gain ideas on what the YEPs in each country are planning and executing.

Since this is a new term of presidency and a new Governing Council, there were several points of discussion regarding future plans. The YEP Committee has decided to organize future meeting in a hybrid mode in order to encourage more members to participate, with the host country providing the facilities for the online platform. YEPs are welcome to join REAAA Technical Committee meetings as observers, enabling them to actively participate in the future. An invitation will be extended to them for the next meeting. The YEPs also decided to consider organizing bilateral events or meetings between two countries using an online platform to encourage networking and plan future activities.

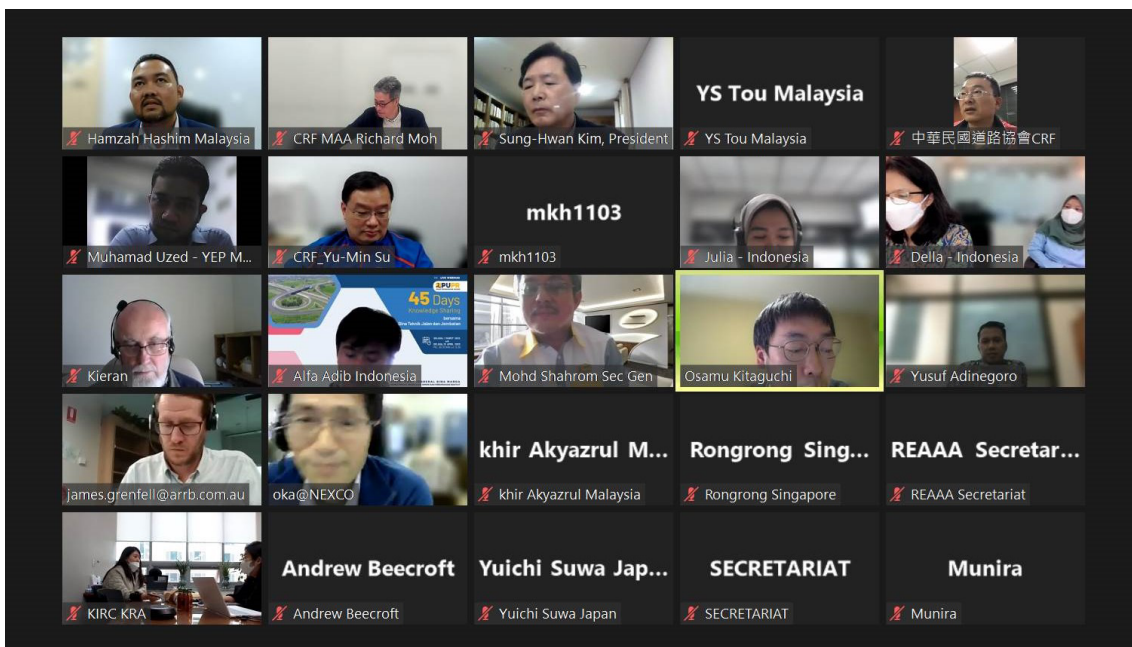
Mr. Sharp proposed that LinkedIn be used to encourage a wider network and interactive communication between members. He announced that the REAAA Australia Chapter has launched the REAAA LinkedIn page and he invited everybody to get connected. The link to the LinkedIn page is: <https://www.linkedin.com/company/reaaa/>

The YEPs also proposed activities that could provide deliverables to members such as short write-ups, technical facts or technical presentations.

The members are looking forward to meeting in New Zealand in October 2022 for the 22nd REAAA YEP meeting. We hope to meet new YEP members from New Zealand, who will be organizing the meeting.



Group Photo 1 of YEP Meeting



Group Photo 2 of YEP Meeting

In Memory of Tan Sri Dato Ir. (Dr.) Wan Abdul Rahman Bin Wan Yaacob

Compiled by Mr. Kieran Sharp

REAAA regrets to announce the passing of Tan Sri Dato' Ir (Dr) Wan Abdul Rahman Wan Yaacob in July 2022 at the age of 81.

Dato' Tan Sri obtained his Diploma in Civil Engineering from the Technical College, Kuala Lumpur, in 1963, and a Diploma in Civil & Structural Engineering from Brighton College of Technology, UK, in 1965. He also completed the Advanced Management Program of the Harvard Business School in 1993. He was conferred an Honorary Doctor of Engineering by The University of Birmingham in 1993.

Dato' Tan Sri dedicated 32 years of his professional career as a civil engineer in the public and private sectors. He was a former Director-General of the Public Works Department (JKR), Malaysia. He was the Chairman at Minconsult Sdn. Bhd. from August 1996 to December 2020. He was appointed as Mentor Director/Advisor of Minconsult in January 2021, operating as Project Director representing the Board on major consultancy assignments, and liaising directly with clients at the highest levels.

He was Chair of many companies during his career, including Disitu Holdings Sdn Bhd, IJM Corporation Berhad, Lingkaran Trans Kota Holdings Bhd (LITRAK), Lysaght Galvanised Steel Berhad, IJM Construction Sdn Bhd, and Saujana Consolidated Berhad.

He was a Fellow of the Institute of Engineers Malaysia, a Fellow of the Chartered Institute of Building UK, a Fellow of the Academy of Sciences Malaysia, a Fellow of the Institute of Civil Engineers

UK, and a Fellow of the Chartered Institution of Highways & Transportation, UK (IHT) and Malaysia Branch (CIHT).

He was a member of the REAAA Governing Council from 1994 to 2013. He was awarded the Gold Medallion at the 10th Malaysian Road Conference & Exhibition 2018 and PIARC International Seminar for his contribution to REAAA. He was awarded the Lifetime Achievement Award from the Road Engineering Association of Malaysia. In 2021, he was the recipient of the inaugural REAAA Hwang Award for his ongoing commitment and dedication to REAAA.



Eng.(Hon.)(Birmingham), P.Eng., FIEM, C.Eng., FASc., FCIQB, FICE, FIHT, MACEM, PSM, SPMT, DPMT, JSM, AMN

Valediction for Tan Sri Dato Ir. (Dr.) Wan Abdul Rahman Bin Wan Yaacob

Puan Sri Ailin Ton Dato Isahak

At the outset I want to thank the Road Engineering Association of Asia and Australasia (REAAA) for giving me the honour of writing a valediction for my late husband Tan Sri Dato Ir. (Dr.) Wan Abdul Rahman Bin Wan Yaacob. I am delighted to do it although I am still struggling to cope with the recent sudden and great loss of a loved one. There are so much reminders of the wonderful company I had, feeling an emptiness, although a continuous stream of family and friends have been calling with condolences. Many have taken the trouble to come by to keep me company, albeit for a brief moment; perhaps they feel so sad seeing my grief.

As I write I hope readers are mindful that my field of expertise is not engineering. I graduated with a B.Sc. from the University of Malaya in 1975 and did my Masters in Agricultural Journalism (Development Communications) at the University of Wisconsin, Madison in 1978. After graduation I spent 32 years of my professional life as a public servant, the bulk of it with MARDI where I served as Senior Research Officer. On early retirement from MARDI, I joined the Sime Bank and later worked at SEGi University and then UNIRAZAK as Director of Business Development.

Please therefore accept my apologies if I seem to overstate or especially understate the significance of the qualifications, designations, awards and honors bestowed on Tan Sri Wan Rahman. I hope both any understatement or overstatement I might make will not diminish the "giant" stature of the person Tan Sri Wan Rahman was.

He was born on 21 June 1941 in Pulau Duyong, Terengganu, and passed away, aged 81, in KPJ Damansara Hospital on 2 July 2022.

He came from a humble background. His father, Wan Yaacob, was the Headmaster of Khairiah Religious Secondary School and his mother, Wan Teh Maimunah, taught him in his childhood the virtues and values of self-reliance and doing the best at whatever one is doing and wherever one is present.

He learnt to be independent very early in his life. At the tender age of 10 he was already learning to manage life away from the protective arms of his parents when he went to an elite boarding school, the Malay College Kuala

Kangsar (MCKK). He was a quiet person but that quietness belied a young boy who was humorous in nature, always wanting to reach out and ready to help friends in need. The MCKK boys bonded very closely and met for lunch every second Wednesday of the month until today.

He graduated with a B.Eng. (Hon.) degree from the University of Birmingham) P.Eng., FIEM. For a non-engineer like me I understand that the designation P.Eng. "represents the highest standards of engineering knowledge, experience and professionalism". I know also that FIEM means Tan Sri Wan Abdul Rahman was a Fellow of the Institution of Engineers Malaysia.

Tan Sri Dato Ir. (Dr) Wan Abdul Rahman Wan Yaacob lived a life so much fulfilled both at the personal and professional level. As I write, I think of family, friends and the engineering fraternities.



The latter group know him very well – his professional qualifications, the honours he was awarded, the chairmanships and directorships he held and his contribution to the engineering fields as well as to Malaysia through all the public positions he held as well as his stewardship in the private sector organizations.

He was given ten awards. I must confess it is difficult for me to make out what these abbreviations are: C.Eng., FASc.,

FCIOB, FICE, FIHT, MACEM, PSM, SPMT, DPMT, JSM, AMN. But I have not the slightest doubt that he valued them all. I am sure he was ecstatic when he received each one of them. He was eternally grateful for the recognition that each of these awards represent.

He was also a Fellow of the Institute of Engineers Malaysia, a Fellow of the Chartered Institute of Building United Kingdom, a Fellow of the Academy of Sciences Malaysia, a Fellow of the Institute of Civil Engineers United Kingdom and a Fellow of the Chartered Institution of Highways & Transportation, UK (IHT) and Malaysia Branch (CIHT).

My late husband Tan Sri Wan Rahman – or just simply Wan from the time we became husband and wife – must surely have been an extremely busy man. How could he not be? His grey matter and creative juices were much sought after. He was Chairman of 11 organizations and Director of another 11 organizations or outfits, some of these running concurrently. Notable among this was his Chairmanship of Minconsult from 1996-2021. Thereafter the Board created a position I seldom hear, a Mentor Director. That I interpret as a mark of great respect to the man. It's like saying "Sir, we still want you around with us...till death do us part?"

With all those responsibilities, Tan Sri must have been fantastically astute in time management. Given that he was a person who took his job very seriously I can imagine he was seldom late to the meetings he chaired or the Board meetings he had to attend. Oh My God Wan, had I been with you during all those years perhaps I would have not allowed you to be so zealous. I do not like the word workaholic at all. I hope people around him then did not refer to him as a workaholic. The Wan I knew simply loved his job as he spoke very very fondly of his "busy" time. He was certainly not a person involved in "busy-ness", rather he was a person who valued his business.

An avid sportsman who played golf, tennis and cricket, Tan Sri Wan Abdul Rahman was the Deputy President of the Malay Cricket Association till his demise.

It was the sunset years of his life journey that I was lucky enough to have met him in matrimony. We were married on 9 July 9 2016. I was his chosen one so to speak though not without certain hurdles. But I truly believe that Allah's plan is always the best plan. And I am eternally thankful "Masya Allah, Alhamdulillah Syukur!" that the six years three months and 11 days with my darling, Tan Sri Wan Abdul Rahman, were the most loving and caring time of our lives. As we aged, of course we had some kinds of ailments that entailed frequent visits to AviSenna Specialist Hospital, PMUM and IJN. But let me share with you that even on all those visits we had moments of love and laughter. It was Carpe Diem all the way.

Wan my darling passed away in KPJ Damansara on July 2, 2022. Oh My God, I miss him so very much. Some friends are curious how he died, but I'd rather concentrate on how he lived his life, particularly the later years of his life. My tears are flowing like rain as I write this part of the story.



May 7, 2022

He wasn't well when he became my husband but he was so full of love during the many moments we were together. We traveled the world in the first three years of our marriage. He was funny, he joked and laughed a lot as we toured places and chatted with fellow travelers along the way.

I personally would consider one of the highlights of his journey was when we were at the convocation of University College Terengganu Advance Technical Institute (UCTATI) where he served as the Chancellor for 12 years. Tan Sri was also the Chancellor of IUKL for many years.



Wan loved music too: I karaoke-ed with him looking on, his eyes sparkling to hear me singing. It didn't matter to him that I was not even half of Celine Dion or Saloma. It was not just my singing that got his attention but we were in fixed eye contact and rapt attention all through these two favorite songs: Johnny Mathis' "A certain smile" and Neil Sedaka's "You are the answer to my lonely prayer". It was as if he could deeply empathize with me through these two songs. Wan was a smiling person, a pleasant personality and that was what attracted me to him. For me Allah indeed answered my lonely prayers – I lived as a single mum for 13 years after I separated from my first husband – and Tan Sri Wan was Allah's "gift" to my prayers after all those lonely times.

Whilst he was an introverted person, he could open up and liven up the room with bursts of laughter – boardroom not excluding – once he got comfortable with a person. He sure could sing but was too shy to take the mic. Yes of course he could sing! He was at his most relaxed and easy self at what became our regular 'sing-a-long' evening drive.

Being an introverted person, there was something wonderful he did on the quiet. He donated very generously in cash and in kind to the needy. He did not like any fanfare to go along with it. Allah the Almighty knows!

We went places: I know he must have travelled a lot as part of his position and responsibilities. But Tan Sri and I began our 'new' life honeymoon so to speak for 10 days in New Zealand. He was absolutely loving and loved the outdoors there. Wan, being a keen golfer, combined travel with golf. He joined the late Tun Ahmad Sarji's golf trips to Vietnam and Indonesia. The Kyoto-Osaka Cherry Blossom time became more cheerful than otherwise with the daily dosages of humour I got from Wan all the time as we walked in cool comfort under those cherry trees amidst those pleasant and very polite Japanese.

Wan also much enjoyed his 10-day trip to Manchester in England. Though golf, and cricket were his passion, Manchester United was also on his radar.

The latest and what turned out to be his last trip was the Baltic Cruise that covered nine countries, including Denmark, in 16 days. It was simply fantastic! I can cry right here right now remembering that engineer who was always smiling, funny – that could get his golf buddies bursting out laughing – humorous and romantic. *Alhamdulillah syukur!*

The first love of his life, the late Puan Sri Rohani Awang Chik, bore him five children. Their eldest son, Wan Adlan, a businessman with an Engineering Degree, is a single-handicap golfer. Their second son, Wan Anwar, is an accountant who manages a string of restaurants. Their

daughters are twins. The elder twin, Wan Marlini, is a Senior Manager in PETRONAS, and the younger twin, Wan Marlina, is an architect. Their youngest daughter, Wan Munerah, is a Senior Manager at Permodalan Nasional Berhad (PNB).



Of course, we immersed ourselves a fair amount of time on matters of the hereafter. I know he is in heaven now looking not just at me all the time but also family, friends and all the fraternities he left behind.

I should mention that Puan Sri Rohani and I were very good friends from the times she was teaching and Tan Sri was still a civil servant. People often say it is very important how one lives one's life towards the end of the journey.

People say:

"Wan Rahman found the love of his life Puan Sri Ailin Ton and the last six years of his life was a life filled with much love and tender care. Ailin was by his side every moment of the day."



In Memory of Tan Sri Dato Ir. (Dr.) Wan Abdul Rahman Bin Wan Yaacob

His ambition was to be an engineer. An engineer he was indeed. It was a path trodden with success however way we care to look back at it.



After the Telekom Malaysia Foundation, Board Meeting

Tan Sri was conferred the Lifetime Achievement Award by the Road Engineering Association of Malaysia (REAM). His latest achievement was the conferment, on 15 September 2021, of the inaugural REAAA Hwang Award for his ongoing commitment and dedication to REAAA.

In short, the late Tan Sri Dato Ir. (Dr.) Wan Abdul Rahman Bin Wan Yaacob lived a life well lived, leaving a legacy of great contributions. May God bless his soul.

Innalillahi wainna ilaihirajjun. Al-Fatihah



118th REAAA Governing Council Meeting



Secretary
REAAA New Zealand Chapter Inc
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22 June 2022

REAAA Council Members

To whom it may concern,

Invitation to REAAA NZ Chapter Roadshow seminar and 118 REAAA Governing Council Meeting, Christchurch, New Zealand

The New Zealand Chapter of the Road Engineering Association of Asia & Australasia is pleased to announce that the 118th REAAA Governing Council Meeting and REAAA NZ Chapter roadshow seminar will be held in Christchurch from 17- 19 October 2022.

The REAAA Roadshow seminar will be held on Monday 17 October 2022 and the 118th REAAA Governing Council meeting will be held on Tuesday 18 October with a technical tour of projects and sites of interest of Christchurch being held on Wednesday 19 October.

If you require any further information please do not hesitate to contact Ila from the REAAA Secretariat reaaa.technical@gmail.com or Lisa Pallister, Secretary, REAAA NZ Chapter lisa.pallister@reaaa.co.nz

Yours sincerely



Robin Malley
Chairperson

Calendar of Events

Seminars, Conferences, Workshops and Meetings of the Association: 2022

Date	Event	Place	Type	Remarks
12-14 September	SURF 2022- 9 th Symposium on Pavement Surface Characteristics	Milano, Italy	PIARC Congresses	Physical
26-28 September	International Seminar " Building smart approaches for Freight, Road Network Operations and ITS Technology"	Buenos Aires, Argentina	PIARC Seminars	Physical
5-6 October	Electronic Toll Collection & Road User Charging Conference	Belgrade, Serbia	IRF Conference	Physical
11-13 October	IRF Asia Pacific Regional Congress & 11 th Malaysian Road Conference & Exhibition 2022- "Towards Resilient Road Infrastructure"	Kuala Lumpur, Malaysia	IRF Congress	Physical
12-14 October	International Seminar "Implementing BIM in road asset management: challenges and opportunities" Seminar Flyer	Mexico City, Mexico	PIARC Seminars	Physical
17-19 October	118 th REAAA Governing Council Meeting & REAAA NZ Chapter roadshow seminar	Christchurch, New Zealand	REAAA Meeting	Physical

Calendar of seminars, conferences, workshops
and meetings of the Association: 2022

Date	Event	Place	Type	Remarks
18-20 October	7 th Regional Conference for Africa & Piarc International Seminar Call for papers	Cape Town, South Africa	PIARC Seminars	Physical
25-28 October	2 nd PIARC International Conference on Road Tunnel Operations and Safety & VIII Spanish Tunnels Symposium	Granada, Spain	PIARC Congresses	Physical
31 October- 3 November	IRF R2T Global Conference	Washington DC, USA	IRF Conference	Physical
2-6 October 2023	XXVIIth World Road Congress	Prague, Czech Republic	PIARC Congresses	Physical

NEW MEMBERS

The membership of REAAA as of 25th March 2022 was 1199. The REAAA Council and Chapters have approved the following new members for the period between 1st August 2021 to 28th February 2022.

The list of new members approved at the 117th REAAA Council Meeting by zoom platform on 25th March 2022 is as follows:

Institutional Members

1.	Surechem Sdn Bhd	I.0383 Malaysia
2.	Primode Engineering Sdn Bhd	I.0384 Malaysia
3.	Clutha District Council	I.0385 New Zealand
4.	GHD Pty Ltd	I.0386 Australia

Life Members

1.	Jong-Gon PARK	L.0430 Korea
2.	Moon Kyu Choi	L.0432 Korea

Status Changed from Ordinary to Life

1.	Ts. Dr. Siti Zaharah Ishak	O.3767 to L.0431 Malaysia
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Ordinary Members

1.	Datuk Ir. Ruslan Bin Abdul Aziz	O.3837 Malaysia
2.	Dato' Ir Ahmad Redza Bin Ghulam Rasool	O.3838 Malaysia
3.	Ahmad Faiz Bin Nassir	O.3839 Malaysia

New Members

4.	Mohd Norhosni Bin Hassan	O.3840 Malaysia
5.	Ts. Dr Rusdi Rusli	O.3841 Malaysia
6.	Ir. Dr. Mohd Farid Bin Ahmad	O.3842 Malaysia
7.	Ir. Ts. Akhtar Nurfitri Mat Zain	O.3843 Malaysia
8.	Prof. Dr. Wong Shaw Voon	O.3844 Malaysia
9.	Dr. Umer Khalil Chaudhry	O.3845 Australia
10.	Ir. Ibrahim Bin Esa	O.3846 Malaysia
11.	Ahmad Zaidi Bin Mat Said	O.3847 Malaysia
12.	Barry Beaurain	O.3848 New Zealand
13.	Kaine Jaquierey	O.3849 New Zealand
14.	Danny Richmond	O.3850 New Zealand
15.	Ir. Sazali Bin Harun	O.3581 Malaysia
16.	Ir. Ts Nur Najwani Binti Kamarulzaman	O.3852 Malaysia
17.	Richard Isted	O.3853 Australia
18.	Evan Styles	O.3854 Australia
19.	Roy Mumu	O.3855 Australia

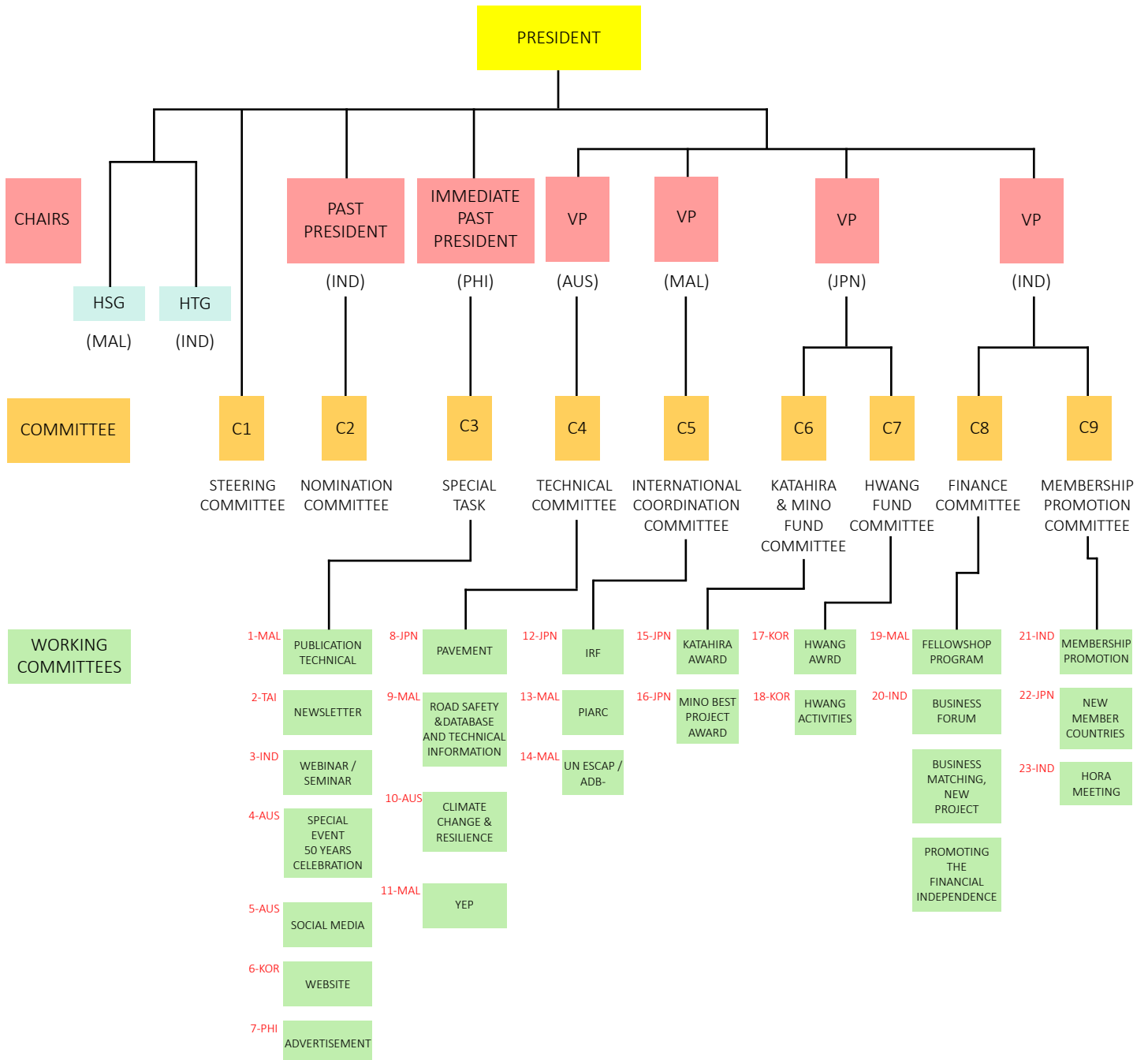
Status Changed from Ordinary to Institutional

1.	Jim McNeill	O.3798 to I.0386 Australia
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Reinstated

1.	Ir. Othman Abdul Rahim	O.2061 Malaysia
2.	Ir. Dr Ng See King	O.1357 Malaysia

New Structure of Working Committees



Total working committees: 23

AUS:AUSTRALIA, BRU:BRUNEI, IND:INDONESIA, JPN:JAPAN, KOR:KOREA, MAL:MALAYSIA, NZ:NEW ZEALAND, PHI:PHILLIPINES, SIN:SINGAPORE, TAIWAN:TAI, THA:THAILAND

New Structure of Working Committee

WORKING COMMITTEES					
COUNTRY	COMMITTEE/CHAIR	CODE	WORKING COMMITTEES	OWNERS OF WORKING COMMITTEES	STATUS
1-KOR	C1-STEERING COMMITTEE (CHAIR: DR SUNG-HWAN KIM)	C1	STEERING COMMITTEE	Dr Sung-Hwan Kim	PR
2-IND	C2-NOMINATIONS COMMITTEE (CHAIR: DR A HERMANTO DARDAK)	C2	NOMINTIONS COMMITTEE	Dr A Hermanto Dardak	PP
1-MAL	C3-SPECIAL TASK COMMITTEE (CHAIR: MR ROMEO S MOMO)	C3WC1	PUBLICATIONS: TECHNICAL REPORTS/ JOURNAL/CONFERENCE PROCEEDINGS	Dato' Ir Haji Zulakmal Haji Suffian	CO
2-TAI		C3WC2	REAAA NEWSLETTER	Mr Shing-Hau Jaw	CM
3-IND		C3WC3	WEBINARS/SEMINARS	Dr Ir Danis Hidayat Sumadilaga	CO
4-AUS		C3WC4	SPECIAL EVENT- 50 YEARS CELEBRATION	Mr Kieran Sharp	CO
5-AUS		C3WC5	SOCIAL MEDIA	Dr Richard Yeo	CM
6-KOR		C3WC6	WEBSITE	Mr Yoonsang Lee	CO
7-PHI		C3WC7	ADVERTISING	Dr Maria Catalina Estamo Cabral	CM
8-JPN	C4-TECHNICAL COMMITTEE (CHAIR: MR KIERAN SHARP)	C4WC1	PAVEMENT TECHNOLOGY	Dr Keizo Kamiya	Member
9-MAL		C4WC2	ROAD SAFETY & DATABASES & TECHNICAL INFORMATION	Ts Ir Dr Muhammad Marizwan Abdul Manan	CO
10-AUS		C4WC3	CLIMATE CHANGE, RESILIENCE & EMERGENCY MANAGEMENT	Ms Caroline Evans & Mr David Rolland	Member
11-MAL		C4WC4	YOUNG ENGINEERS & PROFESSIONALS (YEP)	Ir Hamzah Hashim	Member
12-JPN	C5-INTERNATIONAL COORDINATION COMMITTEE (CHAIR: DATO' SERI IR HAJI MOHAMAD ZULKEFLY BIN SULAIMAN)	C5WC1	INTERNATIONAL ROAD FEDERATION (IRF)	Mr Katsuji Hashiba	VP
13-MAL		C5WC2	WORLD ROAD ASSOCIATION (PIARC)	Dato' Ir Mohd Shuhaimi Hassan	CM
14-MAL		C5WC3	UN ESCAP/ADB	Ts Ir Dr Muhammad Marizwan Abdul Manan	CO
15-JPN	C6-KATAHIRA& MINO FUND COMMITTEE (CHAIR: MR MICHIO KATAYAMA)	C6WC1	KATAHIRA AWARD	Mr Michio Katayama	CM
16-JPN		C6WC2	MINO BEST PROJECT AWARD	Mr Katsuji Hashiba	VP
17-KOR	C7-HWANG FUND COMMITTEE (CHAIR: MR JONG GON PARK)	C7WC1	HWANG AWARD	Mr Jong Gon Park	CM
18-KOR		C7WC2	HWANG ACTIVITIES	Mr Kyu-Young Hwang	CO
19-MAL	C8-FINANCE COMMITTEE (CHAIR: MS LYDWINA MARCHIELA WARDHANI)	C8WC1	FELLOWSHIP PROGRAM	Dato' Ir Dr Dennis Ganendra	CO
20-IND		C8WC2	BUSINESS FORUM	Ms Lydwina Marchiela Wardhani	HTG
			BUSINESS MATCHING, NEW PROJECTS		
PROMOTING FINANCIAL INDEPENDENCE					
21-IND	C9-MEMBERSHIP PROMOTION COMMITTEE (CHAIR: DR IR HEDY RAHADIAN)	C9WC1	MEMBERSHIP PROMOTION	Mr Sugiyartanto	CM
22-JPN		C9WC2	NEW MEMBER COUNTRIES	Dr Koji Kuroda	CO
23-IND		C9WC3	HEADS OF ROAD AUTHORITIES (HORA) MEETINGS	Dr Ir Hedy Rahadian	VP

Notes:

AUS:AUSTRALIA, BRU:BRUNEI, IND:INDONESIA, JPN:JAPAN, KOR:KOREA, MAL:MALAYSIA, NZ:NEW ZEALAND, PHI:PHILLIPINES, SIN:SINGAPORE, TAIWAN:TAI, THA:THAILAND

Status:

PR: PRESIDENT, PP: PAST PRESIDENT, VP: VICE-PRESIDENT; CM: COUNCIL MEMBER, CO:CO-OPTED COUNCIL MEMBER, MEMBER: ORDINARY MEMBER, HTG: HONORARY TREASURER-GENERAL. HSG:HONORARY SECRETARY-GENERAL

The Governing Council for the 17th Council Term : 2021-2025

President

Dr. Sung-Hwan Kim (Republic of Korea)

Immediate Past President

Engr Romeo S Momo (Philippines)

Past President

Dr. Achmad Hermanto Dardak (Indonesia)

Vice President

Dr. Michael Chater Shackleton (Australia)

Mr. Katsuji Hashiba (Japan)

Dato' Seri Ir. Haji Mohamad Zulkefly bin Sulaiman (Malaysia)

Dr. Ir. Hedy Rahadian. M. Sc. (Indonesia)

Honorary Secretary-General

Ir. Mohd Shahrom Bin Ahmad Saman (Malaysia)

Honorary Treasurer-General

Ms. Lydwina Marchiela Wardhani (Indonesia)

Council members:

Dr. Richard Eng Yat YEO (Australia)

Mr. Md. Salleh Bin Abd. Karim (Brunei)

Mr. Rafitra Razak (Brunei)

Ir. Sugiyartanto (Indonesia)

Mr. Michio Katayama (Japan)

Dr. In Sub Oh (Republic of Korea)

Mr. Jong Gon Park (Republic of Korea)

Dato' Ir. Mohd Shuhaimi Hassan (Malaysia)

Ir. Ibrahim Bin Esa (Malaysia)

Ms. Janice Raewyn Brass (New Zealand)

Mr. Robin Malley (New Zealand)

Dr. Maria Catalina Estamo Cabral (Philippines)

Dr. Jaime Abarsoza Pacanan (Philippines)

Mr. Yap Boon Leong (Singapore)

Mr. Shing-Hau Jaw (Republic of China)

Mr. Richard Jen-Chuen Moh (Republic of China)

Mr. Aram Kornsobut (Thailand)

Co-opted Council Members

Mr. Kieran Gerard Sharp (Australia)

Mr. Destiawan Soewardjono Simoen (Indonesia)

Mr. Rachman Arief Dienaputra (Indonesia)

Dr. Danis Hidayat Sumadilaga (Indonesia)

Mr. Yasumasa Torii (Japan)

Dr. Koji Kuroda (Japan)

Mr. Yoonsang Lee (Republic of Korea)

Dr. Kyu-Young Hwang (Republic of Korea)

Mr. Moon-Kyu Choi (Republic of Korea)

Dato' Ir. Dr. Dennis Ganendra (Malaysia)

Dato' Ir. Haji Zulakmal Bin Sufian (Malaysia)

Ts. Ir. Dr. Muhammad Marizwan Abdul Manan (Miroso, Malaysia)

Prof. Dr. Wong Shaw Voon (Malaysia)