



# **The 5th International Conference on Highway Engineering 2024**

**“Future-Proofing Roads for Asia and Beyond”**

**& PIARC International Seminar  
on the Transport Agency of the Future**

**4 – 6 September 2024**  
Bangkok International Trade  
& Exhibition Centre (BITEC)  
**Bangkok, Thailand**



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## Table of Content

Page

Messages from Host	
Ministry of Transport (MOT)	01
Department of Highways (DOH)	03
Roads Association of Thailand (RATh)	04
Message from iCHE2024	05
Messages from PIARC & REAAA	06
Scientific Committees	07
Conference Partners	08
Conference Program	09
Exhibition Layout	10
Exhibitors	11
Keynotes Addresses	12
Workshops	13
Public Forums	16
Technical Sessions	17
iCHE Special Sessions	21
PIARC Workshop TC 3.1	22
PIARC International Seminar	23
REAAA Activities	27
REAAA Business Forum	28
REAAA Special Session	29
Technical Visit: M-Flow Tour	31
Venue Guide	32
General Information	33
Thank You to Our Sponsors	34

## Ministry of Transport (MOT)

Welcome Remarks by His Excellency Mr. Suriya Jungrungreangkit  
Ministry of Transport of the Kingdom of Thailand  
for the 5th International Conference  
on Highway Engineering (iCHE2024)



It is a great honour to welcome you to the 5th International Conference on Highway Engineering. On behalf of the **Ministry of Transport of the Kingdom of Thailand**, I extend my sincere appreciation for your presence and contributions to this important gathering where innovation and expertise converge.

As evidenced by the successful infrastructure missions completed in Thailand, including advancements in air and land transport, water infrastructure, and mega projects across the country over the past decades, I am proud to affirm that Thailand and the Ministry of Transport remain committed in our ongoing efforts to continuously advance and enhance our transportation systems.

In addition to the substantial infrastructure development, we also emphasise construction and systems which consider global environmental conditions. In Thailand, we are dedicated to fostering innovations and adapting to align with the global transformation. On this occasion, I would like to extend an invitation to investors, companies, and enterprises to explore opportunities to invest in our major initiatives. In addition to participating in academic discussions and knowledge exchange, I encourage all to take this gateway to enjoy the natural beauty and tourist attractions that our country has to offer.

Lastly, I would like to express my true appreciation that is well deserved to the distinguished speakers and participants, especially the private sector contributors who have played a key role in facilitating this stately exhibition. Your involvement has essentially contributed to the success of this event. I am confident that our interactions here will be mutually beneficial, creating a chance for materials selection and establishing new corporate connections. I hope all business industry participants find a valuable trade potential through this conference.

I also wish to convey my profound gratitude to the organisers for their unwavering dedication and hard work. I am honoured that the Department of Highways, Ministry of Transport, has taken the initiative to host such a grand and significant assembly. This reflects the capability of the personnel within the Ministry of Transport and their readiness and expertise in engineering and transportation. It demonstrates their ability to present this knowledge to the global community. I hope we can continue to arrange similar exhibitions whenever new techniques emerge to ensure that all Thai engineers possess the necessary knowledge and understanding to implement modern developed technology to road construction projects throughout the nation.

I extend my best wishes for the conference's great success and hope that everyone will achieve meaningful outcomes.

Thank you.



**Mr. Suriya Jungrungreangkit**  
Minister of Transport,  
The Kingdom of Thailand

## Ministry of Transport (MOT)



**Dr. Chayatan Phromsorn**

Permanent Secretary  
Ministry of Transport,  
The Kingdom of Thailand

### Greetings

It is a privilege and a high honor to witness the 5th International Conference on Highway Engineering (iCHE2024) held in Bangkok this year. As the **Permanent Secretary of the Ministry of Transport**, I am delighted to recognize the significant role and mutual collaboration of the Department of Highways and Roads Association of Thailand in hosting this renowned event, which is the best showcase for cutting-edge civil engineering and technological advancement. It is with great pleasure and profound appreciation that I acknowledge the generous support of leading global organizations in the field of infrastructure for this event

Our Ministry of Transport’s vision “The Center of Modern Transportation Management” means that we have aimed to build a transport system that is not only efficient and innovative but also sustainable and resilient. We strive to enhance the quality of life for all citizens through the development of infrastructure that integrates seamlessly with environmental considerations. Our mission is to advance the transportation system of Thailand through strategic oversight, international cooperation, and sustainable practices, while enhancing safety, stakeholder engagement, and professional development. Accomplishing the abovementioned vision and mission are challenging endeavor. I will exert my greatest effort to ensure the success of our vision and mission.

The objectives of iCHE2024 resonate strongly with our vision and mission. The conference focuses on civil engineering issues based on climate change, new technologies, urbanization, demographic changes, sustainable infrastructure, and various global megatrends. Attending the iCHE2024, especially for civil engineers, will support our vision and mission of establishing a transport system that is both environmentally conscious and resilient; in addition, attending this event not only obtains knowledge, but also enhances the network among participants, specialists, professionals, decision-makers, and industry leaders, which will facilitate the vision and mission we are striving to achieve.

I would like to express my deepest gratitude to the organizers, distinguished speakers, and participants of iCHE2024, both local and international, for coming together to create an event that will undoubtedly be a remarkable and memorable milestone for all. Contributing to this event is crucial in furthering the knowledge necessary for a sustainable future. The ideas and perspectives exchanged during this conference will surely lead to significant progress and practical applications in civil engineering and other associated fields.

Ladies and Gentlemen:

I extend my warmest wishes for a highly productive and inspiring conference. I am confident that the knowledge shared and the relationships forged here will significantly advance our collective objectives.

Please accept my appreciation and sincere thanks.

I eagerly anticipate the opportunity to welcome each of you.

Thank you.

## Department of Highways (DOH)

Greetings to all,

On behalf of the **Department of Highways (DOH)**, Ministry of Transport, the Kingdom of Thailand, I am pleased to welcome you to the 5th International Conference on Highway Engineering 2024 (iCHE2024), Bangkok. This conference offers a platform for global leaders, academics, innovators, decision-makers, and industry professionals across the globe. iCHE2024 is scheduled to be held on 4th to 6th September 2024 at the Bangkok International Trade and Exhibition Center (BITEC), Thailand, with the theme of “Future-Proofing Roads for Asia and Beyond”.

As Thailand national highway network is moving towards more efficient, more accessible, more environment-friendly, and safer system adhering to road hierarchy international standards with the benefits for nationwide society, it is very timely for sharing and networking with global professionals, leading industries, innovators, researchers, and stakeholders. The theme in this conference, “Future-Proofing Roads for Asia and Beyond” will broaden the boundaries of 21st century roads and road transport, confront forthcoming challenges and opportunities, and shape the better future of road transportation. Participants at this event will discover cutting-edge advancements, gain exposures and experiences in road engineering and technology with foremost concepts and insights through a series of comprehensive program including executive meetings, technical sessions, keynote addresses, workshops, forums, exhibitions, and site visit.

This iCHE2024 is expected to be one of the foremost and memorable events ever in the DOH history with over a thousand of participants worldwide. The event also celebrates our commemoration of the 112th anniversary of the establishment of the DOH.

On this occasion, I welcome your active participation and look forward to a successful conference.

With the warmest regards.



**Mr. Sarawut Songsivilai**

Director-General  
Department of Highways,  
Ministry of Transport,  
The Kingdom of Thailand

## Roads Association of Thailand (RATh)



**Dr. Montri Dechasakulsom**

President  
Roads Association of Thailand  
and Deputy Permanent Secretary,  
Ministry of Transport,  
The Kingdom of Thailand

Sawasdee Krub,

As the President of the Roads Association of Thailand and the Deputy Permanent Secretary of the Ministry of Transport, the Kingdom of Thailand, I am truly honored and delighted to be part of the 5th International Conference on Highway Engineering 2024. The **Roads Association of Thailand (RATh)** is co-organizing this conference with the Department of Highways (DOH). The event is scheduled to be held on 4th – 6th September 2024 at the Bangkok International Trade and Exhibition Centre (BITEC).

RATh, established in 1963, has been actively in operation and a national platform for roads and road transport community in Thailand for more than six decades. The RATh provides a variety of road information services ranging from highway maps, workshops, seminar, road engineering projects to road transportation activities with its mission to promote global networking of Thailand highways toward engineering advancement. Our association is also a co-founder and a long-lasting member of the Road Engineering Association of Asian and Australasia (REAAA). Therefore, the conference theme of “Future-Proofing Roads for Asia and Beyond” aligns well with our association’s mission and fosters the advancement of road engineering in Thailand.

On behalf of the Roads Association of Thailand, I would like to take this special occasion to cordially extend my warm invitation for everyone who is interested in roads and road transport to attend this conference, to engage with the global specialists, professionals, decision-makers, industry leaders in the field of road engineering as well as to explore the future of road transportation advancement. My sincere appreciation goes to the Ministry of Transport, the Department of Highways, the World Road Association (PIARC), the REAAA and to those who organize this memorable conference.

Khob Khun Krub

## Chairman of iCHE2024

Dear All,

This time is such a wonderful opportunity; we, the Department of Highways, Ministry of Transport, Thailand, have accommodated the greatest season for all gathering here in Thailand for the so-called “The 5th International Conference on Highway Engineering 2024; iCHE2024,” with the conference’s theme, **Future-Proofing Roads for Asia and Beyond**.

The event has been handled collaboratively closely between the Department of Highways and the Roads Association of Thailand, with great support from various international and domestic organisations, and it’s held on 4 – 6 September 2024, at the Bangkok International Trade and Exhibition Center (BITEC), a place where you can find convenience in transportation, a variety of restaurants, and plenty of parking lots. Furthermore, when it comes to meeting locations, BITEC is the best option in Thailand due to its world-class status as a centrally located meeting, incentive, conference, and exposition venue. With multiple expansive, multifunctional event spaces and extensive exhibition services, BITEC is the go-to option for global organisers of conferences and exhibitions.

As the Deputy Director-General of the Department of Highways and the chairperson of the Conference Organising Committee, I am extremely delighted and believe that participating in the iCHE2024 serves many benefits. Firstly, it provides a platform for networking with fellow professionals, researchers, and industry leaders, facilitating the exchange of ideas and potential collaborations. Seminars showcase lectures on cutting-edge technology, optimal approaches to road design and construction, and advancements in materials and sustainability. This ensures that attendees stay updated on the most recent discoveries and trends. Furthermore, these events provide chances for ongoing education and skill enhancement through workshops and technical sessions, improving participants’ understanding and expertise in road engineering principles and methods. In addition, seminars can enhance creativity and problem-solving skills by exposing participants to a variety of viewpoints and practical road infrastructure difficulties, which enhances their ability and success in the field of road engineering.

I earnestly hope that all attendees of the iCHE2024 conference, both local and international, will engage attentively with the lectures and workshops designed around the theme “Future-Proofing Roads for Asia and Beyond.” The conference will cover a range of essential topics, including efficient, inclusive, and safe road management; advancements in smart mobility, digital technology, and innovation for road systems; as well as strategies for the sustainability and resilience of road networks. During the workshop sessions, engineers and other interested individuals will be able to apply and practice these concepts, gaining hands-on experience with current practices, challenges, and solutions. By actively participating in lectures and workshops, attendees will acquire comprehensive knowledge that integrates theoretical insights and practical applications. I firmly believe that the expertise gained from this event will be instrumental in advancing future road construction and development.

I trust that this conference will provide each individual with new insights and a lasting impression.

Thank you.



**Dr. Piya Pong Jiwattanakulpaisarn**

Deputy Director-General for Engineering,  
Department of Highways  
Chairperson, iCHE2024 Organising Committee

## Secretary General of PIARC



**Mr. Patrick Mallejacq**  
Secretary General,  
World Road Association  
(PIARC)

Thailand will organise the 5th International Conference on Highway Engineering 2024, taking place in Bangkok, 4 to 6 September 2024. On behalf of **PIARC, the World Road Association**, let me congratulate the organisers, the Department of Highways and the Roads Association of Thailand, for their vision and leadership.

At a time of growing pressure on roads, with the need to adapt to the consequences of climate change and to mitigate the consequences of road transport, the theme of the conference, "Future-Proofing Roads for Asia and Beyond", could not be more topical. It resonates very well with our own priorities of resilience and decarbonization, and this is why PIARC is particularly glad to have been invited to contribute to this momentous event. We will organise a workshop on road safety, as well as a seminar in four sessions on the transport administration of the future. Our international experts from more than 20 countries from all continents have agreed to come in order to share their best practice and experience, and to engage with distinguished speakers and panellists from Thailand. This will be a unique knowledge-sharing experience for all, be they academics, practitioners or decision-makers.

The conference will also offer the perfect opportunity to welcome the Roads Association of Thailand to the community of our National Committees. In doing so, Thailand joins the United States, Japan, France, South Africa, Argentina and many other world leaders. This new PIARC National Committee will undoubtedly help Thailand share its excellent expertise on the world stage. We look forward to the official signature ceremony that will take place between the Department of Highways, the Roads Association of Thailand, and PIARC, in Bangkok.

See you in Bangkok!

## President of REAAA

I sincerely congratulate you on the successful opening of the 5th International Conference on Highway Engineering (iCHE). I extend my deepest gratitude to everyone who has worked hard to organize this important event. On behalf of the **REAAA** members, I sincerely hope that this international conference will be a great success.

We live in one large global village. Thanks to the rapid advancements in transportation and communication, we can now travel to the other side of the world in just one day and receive global news in real-time. Due to these changes, countries around the world are increasingly influencing each other across various fields, such as politics, economics, society, culture, and science, evolving into one large global community.

However, as the world becomes more interdependent, we are also sharing many global challenges, including climate crisis, AI advancement, nationalism, and the widening gap between the rich and poor. The role of road infrastructure has become more critical than ever in mitigating these international challenges.

In response to climate change, the construction of eco-friendly road infrastructure is increasingly required. Additionally, the adoption of AI can significantly enhance the economic efficiency and productivity of the road construction industry. AI is already transforming the construction industry, making the need for international cooperation on common issues and advanced technology exchange more urgent than ever. In this context, the timing of the iCHE24 conference is very appropriate, and I am deeply grateful for it.

I understand that the iCHE conference was temporarily halted due to the COVID-19 pandemic. I sincerely hope that this event will restore the conference's reputation and become a pivotal platform for technological exchange in the South Asian region.

In particular, I hope that this conference will lead to closer communication with international organizations and that our collaboration with REAAA will strengthen mutually beneficial cooperation in road technology and policy.


Thank you.




**Dr. Sung-Hwan KIM**  
President,  
Road Engineering Association  
of Asia and Australasia  
(REAAA)

## Scientific Committees


### Local Members


- 


**Prof. Dr. Saksith Chalermpong**  
Chulalongkorn University  
Thailand
- 

**Prof. Dr. Kasem Choocharukul**  
Chulalongkorn University  
Thailand
- 


**Prof. Dr. Kunawee Kanitpong**  
Asian Institute of Technology  
Thailand
- 


**Dr. Ponlathep Lertworawanich**  
Department of Highways  
Thailand
- 

**Assoc. Prof. Dr. Sorawit Narupiti**  
Chulalongkorn University  
Thailand
- 

**Prof. Dr. Vilas Nitivattananon**  
Asian Institute of Technology  
Thailand
- 


**Dr. Auckpath Sawangsuriya**  
Department of Highways  
Thailand
- 


**Prof. Dr. Agachai Sumalee**  
Chulalongkorn School of Integrated Innovation  
Thailand
- 


**Prof. Dr. Somnuk Tangtermsirikul**  
Sirindhorn International Institute of Technology  
Thailand
- 


**Dr. Sumet Ongkittikul**  
Thailand Development Research Institute (TDRI)  
Thailand

### International Members

- 

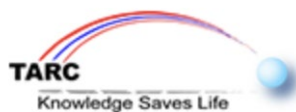
**Ms. Caroline Evans**  
PIARC Strategic Theme 1 Coordinator  
Australia
- 

**Dr. John Calvin Milton**  
Washington State Department of Transportation  
United States
- 

**Prof. Dr. Hiroaki Nishiuchi**  
Kochi University of Technology  
Japan
- 

**Mr. Christos S. Xenophontos**  
Rhode Island Department of Transportation  
United States

## Conference Partners




## Conference Program

### Day 1: Wed 4 Sep 2024

Start from 8:00	Registration				
09:00 – 09:30	Opening Ceremony [GH201] **Dress Code: Business Professional**				
09:30 – 10:00	Signing Ceremony with PIARC [GH201]				
10:00 – 10:30	Opening of Exhibition [GH202–203]				
10:30 – 11:00	Coffee Break				
11:00 – 11:45	[GH201] Keynote Session : Green Roads for All: Building Road Infrastructure for Sustainable Future				
11:45 – 13:00	Lunch Break				
13:00 – 14:30	[MR211–212] Track A: Efficient, Inclusive and Safe Road Management	[MR222–223] Track B: Smart Mobility, Digital Technology and Innovation for Roads	[MR224] Track C: Sustainability and Resilience of Road Networks	[MR214–215] PIARC TC3.1 Workshop : Future-Proofing Road Safety for Asia and Beyond	[GH201] Workshop 1: LED-Future of Road Lighting
14:30 – 15:00	Coffee Break				
15:00 – 16:30	[MR211–212] Track A: Efficient, Inclusive and Safe Road Management	[MR222–223] Track B: Smart Mobility, Digital Technology and Innovation for Roads	[MR224] Track A: Efficient, Inclusive and Safe Road Management	[MR214–215] Track D: PIARC International Seminar (Innovation)	[GH201] Workshop 2: Toward Digital Construction for Smart and Innovative Infrastructure
16:30 – 18:00	[GH202–203] Networking Reception				

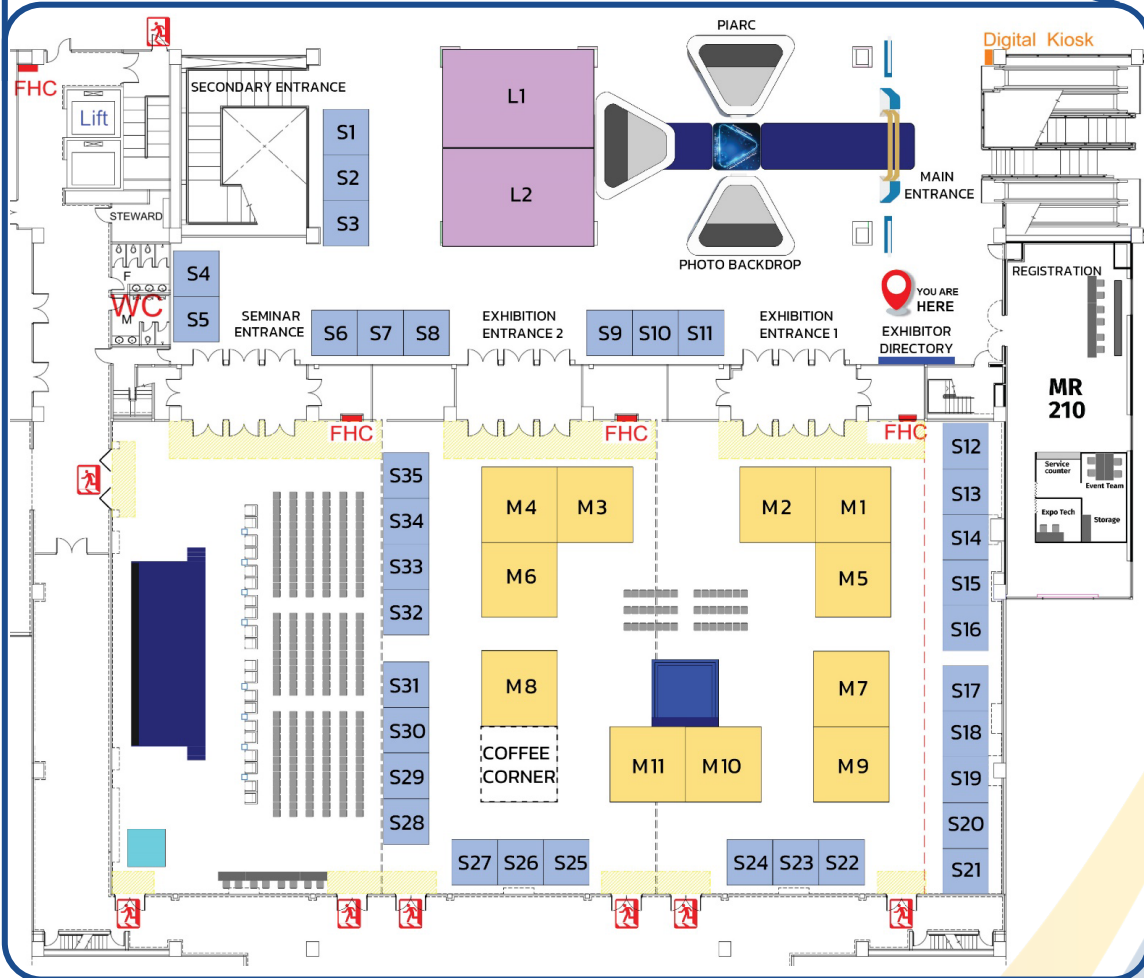
### Day 2: Thu 5 Sep 2024

09:15 – 10:00	[GH201] Keynote Session : Roads to Resilience: Adapting Infrastructure to Changing Climate				
10:00 – 10:30	Coffee Break				
10:30 – 12:00	[MR211–212] Track A: Efficient, Inclusive and Safe Road Management	[MR222–223] Track B: Smart Mobility, Digital Technology and Innovation for Roads	[MR224] Track C: Sustainability and Resilience of Road Networks	[MR214–215] Track D: PIARC International Seminar (Creating a stronger future focused workforce)	[GH201] Workshop 3: Smart Mobility
12:00 – 13:00	Lunch Break				
13:00 – 14:30	[MR224] Track A: Efficient, Inclusive and Safe Road Management	[MR223] Track A: Efficient, Inclusive and Safe Road Management	[MR222] Track C: Sustainability and Resilience of Road Networks	[MR214–215] Track D: PIARC International Seminar (Public Value Creation by Transport Agencies)	[MR211–212] Workshop 4: Asphalt Hot In-plant Recycling: Paving the way for a green & sustainable road infrastructure
14:30 – 15:00	Coffee Break				
15:00 – 16:30	[MR224] Track A: Efficient, Inclusive and Safe Road Management	[MR223] Track A: Efficient, Inclusive and Safe Road Management	[MR222] Track C: Sustainability and Resilience of Road Networks	[MR214–215] Track D: PIARC International Seminar (Envisioning the TA of the Future)	[MR211–212] Workshop 5: Technology and Innovation for Road Safety
18:00 – 20:30	[GH201] Gala Dinner & Cultural Show (invitation only) **Dress Code: Business Casual**				
	10:30 – 11:00 Automatic Road Marking Machine Demonstration 13:00 – 17:00 and 14:00 – 18:00 Technical Visit: M-Flow 				

### Day 3: Fri 6 Sep 2024

09:00 – 10:00	[MR211–212] iCHE Special Session: Optimizing Road Safety and Accessibility for all	[MR222–223] iCHE Special Session: Advancing Mobility Through Digital Innovation	[MR224] iCHE Special Session: Building Sustainable and Robust Road Infrastructure	*09:00 – 10:30* [MR214–215] Special Session by REAAA Climate Change, Resilience and Disaster Management Working Committee	
10:00 – 12:00	[GH201] Public Forum : CAV Friendly-Road Infrastructure : What's next?				
12:00 – 13:00	Lunch Break				
13:00 – 15:00	[GH201] Public Forum : Future-Ready Roads for EV				
15:00 – 15:10	Room preparation for the closing ceremony				
15:10 – 16:00	[GH201] Outstanding Paper Awards & Closing Ceremony				
16:00	End of the Conference				

# Exhibition Layout



## Exhibitors

	3M (THAILAND) CO., LTD.	M3		O.C.R. CO.,LTD.	M1
	ASIAM INFRA CO.,LTD.	S16		P.A.T. INNOVATIVE SOLUTION COMPANY LIMITED	S27
	BESCON (THAILAND) CO., LTD.	S29		PIARC – WORLD ROAD ASSOCIATION	S35
	BRIGHT AND NORTH CORPORATION CO., LTD.	S2		PSD ROAD SOLUTION CO.,LTD.	L2
	CHOR RUNG SANG LIGHTING COMPANY LIMITED	S5		ROADS ASSOCIATION OF THAILAND	S21
	CIVIL STATES CO., LTD.	S14		S.D.M. CO., LTD.	S17
	CLEANOZONE TRAFFIC (THAILAND) CO., LTD.	L1		S.R. PE GROUP CO., LTD.	M7
	DEPARTMENT OF CLIMATE CHANGE AND ENVIRONMENT	S13		SCALAR TECHNOLOGY CO., LTD.	S4
	FETC INTERNATIONAL (THAILAND) CO., LTD.	M2		SETIA BINTANG ENGINEERING SDN BHD	S24
	FREYSSINET (THAILAND) LTD.	M10		SHINDO INDUSTRY CO.,LTD.	S19
	I SMART – 8 CO.,LTD.	S11		SIGNIFY COMMERCIAL (THAILAND) COMPANY LIMITED	S10
	INFRAPLUS CO., LTD.	M9		SYNNEX THAILAND & AUTODESK	M8
	ITALTHAI INDUSTRIAL CO., LTD.	S23		T. SUBSIRI COMPANY LIMITED	S3
	KEMREX CO., LTD.	S33		T.M.S. ENGINEERING CO., LTD.	M6
	KISTLER INSTRUMENT (THAILAND) CO.,LTD.	S20		TANATTORN COMPANY LIMITED	S6
	KRUNGTHAI BANK PUBLIC COMPANY LIMITED	M11		TANATTORN COMPANY LIMITED	S7
	LEKISE LIGHTING CO., LTD.	S30		TANATTORN COMPANY LIMITED	S8
	LIUZHOU OVM MACHINERY CO.,LTD.	S25		TENSOR INTERNATIONAL LIMITED	S32
	MACCAFERRI (THAILAND) CO., LTD.	S15		THAILAND GREENHOUSE GAS MANAGEMENT ORGANIZATION (PUBLIC ORGANIZATION)	S12
	METROPOLITAN EXPRESSWAY CO., LTD.	S26		TOLLTECH COMPANY LIMITED	S9
	MIDAS IT AND SPAN SYSTEMS INTERNATIONAL	S28		TRANSCODE CO.,LTD.	S1
	MULTIPHASE CORPORATION CO., LTD.	S31		TTM2016 (THAILAND) CO., LTD.	S22
	NATIONAL COMMITTEE PIARC IN THE REPUBLIC OF KAZAKHSTAN	M4		VIGOR MERGER COMPANY LIMITED	S34
	NEW TREND DEVELOPMENT CO., LTD.	M5		ZOLA ASPHALT CO.,LTD.	S18

## Keynotes Addresses

### Topic Green Roads for All: Building Road Infrastructure for Sustainable Future

**Date & Time:** 4 September 2024, 11.00 – 11.45

**Venue:** GH 201 Main Hall

#### Description:

This session will explore the critical importance of integrating sustainability into road infrastructure development to meet the challenges of increasing trade demand, rapid urbanization and climate change, with a focus on East Asia. In this context, it is important to strategize for incorporating climate resilience, reducing carbon emissions, preserving biodiversity, and ensuring social inclusivity. The session will highlight the World Bank's role in promoting sustainable and green transport investment, sharing successful case studies from within the Southeast Asia region and neighboring countries, and outlining the economic benefits of green infrastructure.



#### Mr. Sadig Aliyev (Singapore)

Lead Transport Specialist, World Bank

**Mr. Sadig Aliyev** is Lead Transport Specialist with the World Bank, based in Singapore. He has worked in designing and implementing operational and analytical works in infrastructure and transport sectors in East Asia and Pacific, and Europe and Central Asia regions over the past 15 years with the World Bank. His focus areas include transport policy and regulatory reforms, regional connectivity and integration, infrastructure financing, rural accessibility, road asset management, and urban mobility. He holds an MPA in Public Finance and Policy Analysis from Indiana University Bloomington, USA.

### Topic On the Road to Resilience: Adapting Infrastructure and Road Transportation to Changing Climate and to Disasters

**Date & Time:** 5 September 2024, 09.15 – 10.00

**Venue:** GH 201 Main Hall

#### Description:

Addressing the scale and impact of climate change events is a challenge faced across the world. Extreme weather conditions such as intense rainfall, heavy snowfall, high temperatures, droughts, with forest fires becoming more severe and frequent. These pose serious challenges to road management. Road administrators need to be prepared for disasters by providing ways to increase the robustness of infrastructure against disasters and encouraging road management systems to react quickly against disasters. From a planning perspective, disaster-resilient road networks and urban structures are required. This session will be in two parts. First, a presentation will be provided on work being undertaken in Australia to assess the benefits of adapting infrastructure to the changing climate. It will include a discussion of methodologies to assess the risks, ways to identify and assess adaptation options, and describes recommendations to better assess and prepare infrastructure for the impacts of climate change, including opportunities to reduce greenhouse gas emissions of infrastructure. Second, the session will present the recommendations established on resilience by PIARC Committees on disaster management, pavements, bridges and other infrastructure. It will also focus on the Climate-Change Adaptation Framework, which is an extensive and detailed guide that aims at helping decision-makers, administrations, and operators, embed climate change resilience in their strategic plans.



#### Ms. Caroline Evans (Australia)

Chair PIARC Strategic Theme 1 Coordinator  
& Co-Chair REAAA Climate Change,  
Resilience and Disaster Management Working Committee

**Ms. Caroline Evans** is the PIARC Strategic Theme 1 Coordinator, and is also Co-Chair of the Road Engineering Association of Asia and Australasia (REAAA) Working Committee on Climate Change, Resilience and Disaster Management. Caroline has been actively involved in PIARC for 13 years in the areas of climate change and resilience. She oversees 5 PIARC Technical Committees relating to the Performance of Transport Administrations, Contribution of Roads to Economic and Social Development, Finance and Procurement, Planning the Resilience of Road Networks and Disaster Management. She has experience in key climate change and resilience projects focusing on the analysis of climate risks, identification of adaptation and economic evaluation of adaptive action.



#### Mr. Patrick Mallejacq (France)

Secretary General of PIARC (World Road Association)

**Mr. Patrick Mallejacq** is a French civil servant (« ingénieur général des ponts, des eaux et des forêts »). Before joining PIARC, Patrick was instrumental in organising the Transport Research Arena conference in Paris in 2014 and in developing EU-sponsored research programmes and projects at IFSTTAR-France. He held positions at SETRA-France and at the French ministry of transport, mainly on road safety and ITS issues, and led « EasyWay » implementation projects. Patrick was posted at the French Embassy in Tokyo and started his career at IGN, the French national mapping institute.

## Workshops

### Workshop 1 LED-Future of Road Lighting

**Date & Time:** 4 September 2024, 13:00 – 14:30

**Venue:** GH 201 Main Hall

**Coordinator:**

**Mr. Jakraphob Watcharamonthian (Thailand)**

Head of LED Road Lighting Specification Drafting Committee  
Department of Highways



#### Description:

Road lighting technology has evolved tremendously during past decades. From simple lighting solution to a new smart technology, which can reduce energy consumption, increase visibility and safety. The LED Road Lighting has become more and more industrial standard due to the longevity of the luminaire and high lumen/watt efficiency. Also, the new smart lighting system can provide a new solution for road lighting maintenance and operation. Users can know the condition of the lighting system real-time and can control the amount of illumination suitable for road safety function yet smart energy consumption for any situation. The Workshop will have speakers from two of the industry leading companies to show how to bring the right solution for the benefit of road lighting system. Smart and Connected Lighting System will be discussed. International/real-world experience will be provided.



**Mr. Eng Young Liang**

Global Segment Manager,  
Road & Street and Cities Professional Business,  
Systems and Services: Signify  
(Singapore)



**Mr. Benjamin Tan**

Commercial Director,  
Southeast Asia: Schreder  
(Singapore)



Speaker from Pemerintahan Daerah  
Provinsi Daerah Khusus Ibu Kota Jakarta  
(Indonesia)

### Workshop 2 Toward Digital Construction for Smart and Innovative Infrastructure

**Date & Time:** 4 September 2024, 15:00 – 16:30

**Venue:** GH 201 Main Hall

**Host:** Synnex (Thailand) Co., Ltd.  
and Tata Steel (Thailand) Co., Ltd.

**Coordinator:**

**Dr. Sukit Yindeesuk (Thailand)**

Civil Engineer, Expert Level  
Department of Highways



#### Description:

The "Toward Digital Construction for Smart and Innovative Infrastructure" workshop aims to explore the latest advancements in Building Information Modeling (BIM) and digital construction technologies, specifically applied to large-scale infrastructure projects such as highways, expressways, and long-span bridges. Attendees will gain insights into the integration of digital tools and methodologies that enhance project efficiency, sustainability, and innovation. Industry experts will share their experiences, case studies, and best practices, providing a comprehensive understanding of the future of digital construction.



#### Opening Speech by

**Mr. Piyadit Atsavasirisuk**

Civil Engineering Public Company Limited and Thai Contractors Association Under H.M. The King's Patronage



**Mr. Eddie Hong**

Global Business Team Lead:  
Midas IT Co., Ltd.  
(South Korea)

*Topic: Integrating BIM in  
Highway and Expressway  
Projects*



**Mr. Win Lee**

Business Development  
Manager Midas IT Co., Ltd.  
(South Korea)

*Topic: Advanced Digital  
Construction Technologies  
for Long-Span Bridges*



**Dr. Eng. Francesca Brighenti**

University of Trento and Nplus S.r.l,  
(Italy)

*Topic: Smart Infrastructure: IoT  
and Sensor Integration in BIM*



**Mr. Ankur Agarwal**

Business Development Manager  
SEAP Region, Maccaferri  
(Malaysia)

*Topic: Sustainable Infrastructure  
through BIM and Digital  
Construction*

# Workshops

## Workshop 3 Smart Mobility

**Date & Time:** 5 September 2024, 10:30 – 12:00  
**Venue:** GH 201 Main Hall  
**Host:** FETC International (Thailand) Co., Ltd

**Coordinator:**  
**Ms. Lenna Low (Malaysia)**  
Assistant Manager,  
Business Development & Marketing Department  
**Ms. Sinunpat Tangchaitrakul (Thailand)**  
Assistant Manager,  
Business Development & Marketing Department

### Description:

This workshop will cover Taiwan's Multi-Lane Free Flow (MLFF) systems and their use of advanced technologies and data for extended Intelligent Transportation System (ITS) applications. Speakers will discuss the current global adoption of free-flow tolling, and the national-level traffic management across Asia-Pacific countries. Additionally, the latest advancements in Thailand's M-Flow system and innovative designs for future tolling systems, especially in Motorway M6 and M81, will be highlighted. The workshop will conclude with insights into next-generation tolling systems that combine AI technologies and 5G.



**Mr. Kenny Chen**  
Managing Director of FETC International (Thailand) Co., Ltd. (Taiwan)



**Dr. Agachai Sumalee**  
Professor at Chulalongkorn School of Integrated Innovation (Thailand)



**Dr. Tongkarn Kaewchalemton**  
Chairman of Transportation and Logistics Working Group, at ASEAN Federation of Engineering Organizations (AFEO) (Thailand)



**Dr. Thanasak Wongtanakitcharoen**  
Director of Inter-City Motorway Division Department of Highways (Thailand)

*Topic: AI 5G Driving the Future: Smart Mobility Solutions for Green and Smart Cities*

*Topic: M-Flow Technology Platform Solution for the First Thailand Free Flow Tolling*

*Topic: Integration of Intelligent Transport System (ITS) for Smart Highways*

*Topic: M-Flow: The Challenges and Lessons Learned of Thailand's First Free Flow Toll System*

## Workshop 4 Asphalt Hot In-plant Recycling: Paving the way for a green & sustainable road infrastructure

**Date & Time:** 5 September 2024, 13:00 – 14:30  
**Venue:** MR 211 – 212  
**Moderator:** Department of Highways

**Coordinator:**  
**Dr. Tunwin Svasdisant (Thailand)**  
Director of Bureau of International Highways Cooperation Department of Highways



### Description:

Asphalt Hot In-Plant Recycling is a promising solution for advancing green and sustainable road construction, as it rejuvenates existing pavement by processing reclaimed asphalt pavement (RAP) at a central facility, producing high-quality and environmentally friendly pavement. This method significantly reduces the need for new raw materials, conserving natural resources and decreasing the environmental impact associated with asphalt production. By recycling existing materials, it lowers energy consumption and greenhouse gas emissions, contributing to a reduced carbon footprint. Additionally, Hot In-Plant Recycling minimizes waste and provides cost savings, while delivering durable and reliable pavements that support sustainable infrastructure development.



**Mr. Surachai Junkao**  
Director of Bituminous Surface Design and Inspection Branch Department of Highways (Thailand)

*Topic: Overview of Asphalt Hot In-plant Recycling*



**Mr. Kazunari Hirakawa**  
Director of International Working Japan Road Contractors Association (Japan)

*Topic: Implementation of Asphalt Hot In-plant Recycling in Japan*



**Mr. Katsuhiro Kawamura**  
Executive Officer, Head of Research and Development Department, Engineering Division, NIKKO Co.,Ltd. (Japan)

*Topic: Nikko Initiatives for Recycled Hot Mix*



**Ms. Jantapa Phitsanuvaisayavat**  
Managing Director Zola Asphalt Co.,Ltd. (Thailand)

*Topic: Sustainable Pavement Case Studies: Thailand/Netherlands/Japan*



**Ms. PITCHCHANAN PITPAN**  
Head of Quality Control Division Zola Asphalt Co.,Ltd. (Thailand)



**Ms. Yanisa Buachan**  
Head of Research and Development Division Zola Asphalt Co.,Ltd. (Thailand)

# Workshops

## Workshop 5 Technology and Innovation for Road Safety

**Date & Time:** 5 September 2024, 15:00 – 16:30  
**Venue:** MR 211 – 212

**Coordinator:**  
**Dr.Wasin Rujikietgumjorn (Thailand)**  
Civil Engineer, Expert Level  
Department of Highways



**Description:**

Road accidents are a significant public health and safety concern worldwide, impacting individuals, communities, and economies. The three main factors contributing to road accidents are human behavior, vehicle conditions, and environmental factors, such as road conditions. The Vision Zero concept, which aims to eliminate all traffic fatalities and severe injuries, is crucial in modern road development. This workshop will introduce technologies for enhancing road safety, including road safety equipment, and the installation of traffic devices during construction. Not only focusing on the road, this workshop will introduce the Structural Health Monitoring (SHM) for enhancing bridge safety.



**Dr. Imposa Giacomo**  
Business Development Structural  
Health Monitoring (SHM)  
Kistler Instrumente AG  
(Switzerland)

*Topic: Bridging the Gap: Enhancing Infrastructure safety with Innovative Measuring technologies integration*



**Mr. Jae Hyeon Kim**  
Manager,  
SHINDO INDUSTRY Co. Ltd.  
(South Korea)

*Topic: Shindo Road Safety Products*



**Mr. Bo Mortensen**  
Sales Director of Borum,  
Cleanozone Traffic Co. Ltd.

*Topic: Reducing accidents and traffic blockages with high-performance road marking machines*



**Mr. Supong Thanasiwilai**  
Senior Engineer Company,  
Cleanozone Traffic (Thailand) Co. Ltd.



## Public Forums

### Public Forum 1 CAV Friendly Road-Infrastructure: What's next?

**Date & Time:** 6 September 2024, 10:00 – 12:00  
**Venue:** GH 201 Main Hall

**Moderator:**  
**Dr. Tongkarn Kaewchalermtong**  
 (Thailand)  
 President, ITS Thailand



#### Description:

Join us for an insightful session on Connected and Autonomous Vehicles (CAV) that examines the critical role of infrastructure in their successful deployment. This discussion will explore how advancements in infrastructure, such as smart traffic signals, dedicated CAV lanes, and enhanced communication networks, contribute to the seamless operation and safety of autonomous vehicles. We will address the challenges and opportunities in developing a robust infrastructure, including regulatory frameworks, cybersecurity concerns, and the necessity for public-private partnerships to build a cohesive ecosystem. Through real-world case studies, attendees will gain practical insights into the implementation of CAV-friendly infrastructure and the innovative solutions being devised to address existing barriers. This session is essential for policymakers, urban planners, technologists, and industry stakeholders who are interested in understanding the pivotal infrastructural elements that support CAV integration and how cities can effectively prepare for a driverless future. Engage with industry experts, share knowledge, and discover the roadmap to creating a connected, efficient, and future-ready transportation infrastructure.



**Mr. Johnny Wang**  
 Director of Business Development  
 APAC and China Region, TIER IV  
 (Japan)



HwaCom Systems Inc.  
 (Chinese Taipei)



**Mr. Gonzalo Alcaraz**  
 Deputy Director General,  
 International Road Federation  
 (Switzerland)



**Mr. Dongzhe Su**  
 Director of Smart Mobility, Chief  
 Engineer of V2X System,  
 Communications Technologies, ASTRI  
 (Hongkong)

### Public Forum 2 Future-Ready Roads for EV

**Date & Time:** 6 September 2024, 13:00 – 15:00  
**Venue:** GH 201 Main Hall  
**Host:** Electric Vehicle Association of Thailand

**Moderator:**  
**Mr. Alex Guberman**  
 "E for Electric" Creator & Host/  
 Social Media Influencer



#### Description:

In today's world, the severity of climate change cannot be ignored. One significant contributor to these issues is the emission of greenhouse gases from human activities, particularly from the combustion of fossil fuels in the transportation sector. Compounding this problem, fossil fuel reserves are dwindling. Consequently, electric vehicles (EVs) have gained immense popularity in the transportation industry. Advances in technology have made EVs more affordable and accessible than they were a decade ago. This shift in technology is not only changing the energy sources of vehicles but also altering the behaviors of vehicle owners compared to traditional combustion engine vehicles. As a result, the demand for a new, reliable, and efficient infrastructure is imperative. A couple of important questions arises: what direction should the EV infrastructure development take to ensure sustainability? What are the emerging trends in the current EV infrastructure? These topics will be explored in the Public Forum "Future-Ready Roads for EV," scheduled for 6 September 2024, from 1 pm to 3 pm at the International Conference on Highway Engineering 2024, held at the Bangkok International Trade & Exhibition Centre (BITEC), Thailand.



**Mr. Suroj Sangsrit**  
 President of Electric Vehicle  
 Association of Thailand  
 (EVAT)



**Dr. Yossapong Laoonual**  
 Head of Mobility and Vehicle  
 Technology Research Center  
 (MOVE)



**Mr. John Jorn Stech**  
 Principal  
 Shiftgate Consulting LLC



**Ms. Ingrid Sagorz**  
 Product Manager  
 Kistler Instrumente AG



**Mr. Karel Kucera**  
 Managing Director  
 Continental Tyres (Thailand)



**Mr. Patiphan Kalvibool**  
 CTO  
 Huawei Digital Power Thailand

## Technical Sessions

### Track A: Efficient, Inclusive and Safe Road Management

#### Day 1 Wed 4 Sep 2024, 13:00 – 14:30

**Venue MR 211-212**

##### Topic A-1 Management

**Moderator Dr. Pattarathep Sillaparcharn**

- ID 1633 B-WIM Statistical Analysis Unveiling Extreme Live Load Effects on Indonesian Bridges  
*Widi Nugraha*
- ID 1762 Identification of Maintenance Prioritization across Multiple Highway Categories  
*Pornchita Arundachachai, Thitipong Chaiwannakupt and Kanisa Rungjang*
- ID 1232 Urban Road Maintenance in Taoyuan City, Taiwan Exploring the Benefits of Performance-based Contracting  
*Yi-Shain Chiou, Pin-Yu Song, Min-Che Ho, Li-Ling Huang, Cheng Ju Huang and Ping-Jen Song*
- ID 599 Innovative Analysis and Design Approach for Horizontally Curved Bridges  
*Wanakorn Prayoonwet and Yasuhiko Sato*
- ID 740 Effectiveness of Early Rehabilitation of Pavement and Development of FWD Prediction Model  
*Keizo Kamiya and Kazutaka Suzuki*
- ID 713 Investigating the Impact of COVID-19 on Speed Profiles: A Case Study of Rama2 Road, Thailand  
*Somsiri Siewwuttanagul, Phosawee Kettreerkorn, Puttipan Seraneeprakarn and Natachai Wongchavalidkul*

#### Day 1 Wed 4 Sep 2024, 15:00 – 16:30

**Venue MR 211-212**

##### Topic A-2 Safety

**Moderator Dr. Poranic Jitareekul**

- ID 1470 Improving Urban Road Safety: Balancing Obstacle Protection with Environmental Integrity  
*Roberto Impero and Stefano Maria Caterino*
- ID 628 Analysis of Motorcycle Accidents at Signalized Intersections on National Highways in Thailand: Same-direction Collisions  
*Pasakorn Kuenpet, Thaned Satiennam, Ponlathep Lertworawanich and Chaiwit Kanjanasantisuk*
- ID 1340 Exploring The Risk Time of Fatal Injury Crash from Road Accidents in Chonburi's Urban Areas, Thailand  
*Piyawan Tanudtanusilp and Surames Piriyawat*
- ID 1345 iRAP Star Rating Implementation on Soedijatmo and Dalam Kota Toll Road, Indonesia by PT Jasamarga Tollroad Maintenance  
*Yonathan Elia Munthe, Ahmad Saleh Lubis and Selvira Salsabila*
- ID 1356 Data-Driven Decision-Making Protocol for Road Friction Improvement: Correlating International Friction Index with Accident Rates in Blackspots  
*Peerapong Jitsangiam, Kritsanaphong Chaikla and Nopadon Kronprasert, Weerachai Wongweeranimit, Nuntawat Lersinghanart, Theeraruk Maneenart*
- ID 1773 Evaluating the effectiveness of traffic calming measures in Silver Zones  
*Jamie Cheong, Puay Ping Koh, Andrew Tan, Chandrasekar*

#### Day 1 Wed 4 Sep 2024, 15:00 – 16:30

**Venue MR 224**

##### Topic A-3 Operation

**Moderator Dr. Gridsana Pensomboon**

- ID 742 Study of Tunnel Operation and Maintenance Management of Davao City Bypass Tunnel  
*Keiko MUNAKATA*
- ID 1167 Study on countermeasure for traffic congestion by utilizing the Directional Loudspeaker  
*Taichi Kumagai, Dai Tamagawa and Keisuke Ota*
- ID 1242 A Survey and Analysis of User Perceptions Towards the M-Flow Toll Collection System  
*Thitima Wasanapitranont and Arnon Phuekphon*
- ID 1521 Innovation of Bridge Slab Maintenance Development of Specialized Waterproofing Materials for Manual Pavement Work  
*Gaku Suzuki and Yuki Hiramatsu*
- ID 1782 Reclaimed Walkway Utilization at Skytrain Station in Suburban Area: Khu Khot Station, Pathum Thani, Thailand's Experience  
*Pornchai Silarom*
- ID 597 Fatigue Resistance Assessment of RC Bridge Deck Slabs  
*Nuttapong Kongwang and Yasuhiko Sato*

#### Day 2 Thu 5 Sep 2024, 10:30 – 12:00

**Venue MR 211-212**

##### Topic A-4 Survey + AI

**Moderator Dr. Chairat Supachawarote**

- ID 1255 Inspection and Rehabilitation Design of Teluk Baru Cantilever Concrete Bridge  
*Andrew Standyarto, Eko Hartono and Eko Yuniarsyah*
- ID 1514 The Application of UAV and AI Technologies in Road Construction Progress Management  
*HUANG WEN-CHUN, WENG SHU-CHIN, YU CHUNG-JUNG and RICHARD MOH*
- ID 1759 Detecting Lateral Offset Distance on Rural Road in Thailand by Using Point Cloud Data : A Case Study  
*Nutvara Jantarathaneewat, Chenxi Liu, Shucheng Zhang and Yin Hai Wang*
- ID 1383 The AI-Driven Road Infrastructure Monitoring and Maintenance: A Case Study of Rasta.ai's Model for Road Defect Detection: Road Development and Management Tool  
*Rahul Andhale, Ameya Joshi, Narendra Kale*
- ID 1463 Enhanced YOLOv8-Based Object Detection of Road Assets Utilizing Generalized Focal Loss: A Case Study on Thai Highway Imagery  
*Natthasiri Rattanachona, Pawarisorn Thungthin, Nattapat Subsompon, Sittinun Thongbai, Weerachai Wongweeranimit, Teerapong Panboonyuen and Ruttanawadee Phukham*

## Technical Sessions

### Track A: Efficient, Inclusive and Safe Road Management (Cont.)

**Day 2 Thu 5 Sep 2024, 13:00 – 14:30**

**Venue MR 224**

**Topic A-5 Survey + AI**

**Moderator Dr. Rajwanlop Kumpoopong**

- ID 1262 Machine Learning-Based Stability Analysis of Circular Tunnels in Cohesive Frictional Soil for Efficient Road Infrastructure Management  
*Warit Wipulanusat and Divesh Ranjan Kumar*
- ID 1312 Improvement of Pavement Surface Conditions on Expressways According to the Mental Stress of Road Users  
*Kazuya Tomiyama, Masamitsu Ito, Kenichi Meguro, Taichi Nakamura and Masakazu Sato*
- ID 1537 Utilizing 3D Point Cloud Data for Effective Road Maintenance Work in Thailand  
*Eakarat Witchukreangkrai, Kimura Shun and Mashiko Naoto*
- ID 1604 Predictive Modeling of 2D Circular Tunnel Stability in Spatially Variable Anisotropic Clay using Machine Learning: XGBoost Approaches  
*Kongtawan Sangjinda, Suraparb Keawsawasvong and Natakorn Phuksuksakul*
- ID 1757 Path Watcher: AI-enabled Automated Footpath Inspection System  
*Benjamin W.L. Aw, Andy S.C. Low, Desmond A.B. Lim, Cadmon Kwan, Dean D.Y. Su, Daniel W.T. Cheng, Evan R.C. Sim, P.B. Phua, Colin Khor, Z.Q. Lim and S.Y. Foo*

**Day 2 Thu 5 Sep 2024, 13:00 – 14:30**

**Venue MR 223**

**Topic A-6 Efficient, Planning & Inclusive**

**Moderator Dr. Puttipan Seraneeprakarn**

- ID 688 Pedestrian Safety in Indonesian Urban Areas: A Walkability Index for Indonesian Urban Areas  
*Alfa A Ash-Shiddiqi and Jany Agustin*
- ID 1776 Evaluation of Pedestrian Level of Service on Foot Over-Bridges' Staircases in Dhaka City  
*Rakibul Haque, Mahbubur Rahman, Mamun Kaysar, Joy Prakash Chowdhury, Waliur Rahman, Nurul Alam and Nazmus Sakib*
- ID 659 Adapting the Macroscopic Fundamental Diagram for Motorcycle-Dependent Cities: A Case Study of Cần Thơ City, Vietnam  
*Siti Raudhatul Fadilah, Hiroaki Nishiuchi and An Minh Ngoc*
- ID 1361 Operational Analysis of Lane-specific Speed Variations on Multilane Highways  
*Moe Sandi Zaw, Nopadon Kronprasert and Pongthep Pisetsit*
- ID 1349 Operational Analysis of Temporary Median U-Turn Intersection Design: A Case Study of Highways No. 121 and No. 1317  
*Moe Sandi Zaw, Nopadon Kronprasert and Pongthep Pisetsit*

**Day 2 Thu 5 Sep 2024, 15:00 – 16:30**

**Venue MR 224**

**Topic A-7 Efficient & Planning**

**Moderator Mr. Rapee Tangsongsuwan**

- ID 1519 Traffic Operational Performance for A Corridor Analysis: A Case Study of Main Road Link Type 1 and 2 of Department of Highway  
*Ladda Tanwanichkul, Pattharin Sarutipand, Wuttikrai Chaipanha and Jumrus Pitaksringkarn*
- ID 1758 Introducing Big Data Analysis in National Freeway Widening Project  
*Shing-hau Jaw, Sheng-fa Lin, Ge-ping Pan and Yi-Hsien Chen*
- ID 685 Corridor Capacity of Public Transportation using Matador-cum-Bus- A Case Study of Jammu City  
*Prabhjot Singh Gandhi and Chandrakanth Doti*
- ID 1335 Determining the Level of Importance and Implementation for Road Classification Development in Indonesia  
*Herry Kurniawan, Latif Budi Suparma and Suryo Hapsoro Tri Utomo*
- ID 1189 Investigation and Analysis of Traffic Lane Overlapping Driving Behavior at Combined Curves on Multi-Lane Highways  
*Napon Srisakda and Sorawit Narupiti*
- ID 1395 A Study of Truck Drivers' Behavior for Determining Appropriate Truck Parking Spaces  
*Warakorn Bunyot and Supornchai Utainarumol*

**Day 2 Thu 5 Sep 2024, 15:00 – 16:30**

**Venue MR 223**

**Topic A-8 Safety**

**Moderator Dr. Suphat Chummuneerat**

- ID 1117 Safety Impact of Average Speed Control in Taiwan  
*PIN-YI TSENG and YOU-ZONG SHI*
- ID 1164 A Case Study for Tollway Safer Road Assessment Using iRAP Star Rating  
*Ekarin Lueangvilai, Sakda Panwai and Anoma Urit*
- ID 1324 Injury Severity Prediction of Motorcyclist Crashes by the Integration of Heterogeneity Model and Data-Driven Method  
*Natakorn Phuksuksakul, Warit Wipulanusat, Divesh Kumar and Suraparb Keawsawasvong*
- ID 593 A Efficient, Inclusive and Safe Road Management: Measures of Improving Road Safety  
*Moradana Rammandayalage Chandana Udayanga Alwis*
- ID 664 Revisiting Blackspot definitions across the globe – a Heuristic evaluation  
*Prabhjot Singh Gandhi and Chandrakanth Doti*
- ID 1420 The Role of Knowledge and Awareness in Road Safety: An Evaluation of Road Traffic Accidents in Indonesia  
*Firza Aulia Syafina, Ni Kadek Dinda Paramitha and Hadi Mizan Nur Arifin*

## Technical Sessions

### Track B: Smart Mobility, Digital Technology and Innovation for Roads

#### Day 1 Wed 4 Sep 2024, 13:00 – 14:30

**Venue** MR 222-223

##### Topic B-1 AI in Road Transport

**Moderator** Dr. Niphan Yaiaaroon

- ID 570 Zero-Shot Learning Based on Non-Motorized Vehicles Perception Based on a Surveillance System  
*Sruangsang Chaikasetsin, Mehrdad Nasri, Chenxi Liu and Yinhai Wang*
- ID 1136 Development of Machine Vision-Based Road Surface Maintenance Techniques for Climate Change  
*In Bae Kim*
- ID 1260 A Automatic Recognition of Pavement Deterioration using Deep Learning: Using an AI-driven system for automatic pavement damage recognition, validating the identified damages and calculating the Pavement Condition Index (PCI) scores  
*SZU-HAN LU, Jyh-Dong Lin and Yi-Shian Chiou*
- ID 1276 Prediction and Variable Explanation of International Friction Index (IFI) using Deep learning: A Case Study in Thailand  
*Punnawat Siripatthiti and Ponlathap Lertworawanich*
- ID 1304 Real-time Traffic Data Collection at Mid-block and Intersection by UAVs and Computer Vision  
*Ponlathap Lertworawanich, Peerapol Sittivijan and Theerada Rungruangjarensuk*

#### Day 1 Wed 4 Sep 2024, 15:00 – 16:30

**Venue** MR 222-223

##### Topic B-2 Smart Mobility

**Moderator** Mr. Apivat Jotisankasa

- ID 1175 Optimizing Vehicle-to-Building Integration: A Sustainable, Adaptable Energy Management Framework  
*Yu-Shin Hu and I-Yun Lisa Hsieh*
- ID 1162 Current Status and Future Development of Autonomous Electric Bus Initiatives in New Taipei City  
*Ming-Shi Zhong, Ying-Fan Lin, Yu-Chi Kuo, Huei-Ju Yang and Cheng-Yen Wu*
- ID 1210 Multi-Objective Optimization in Energy Management using Vehicle-to-Building (V2B) Strategy and Energy Storage System  
*Jian Hern Yeoh, Kai-Yun Lo and I-Yun Lisa Hsieh*
- ID 1256 Exploring a Possible Mobility-as-a-Service Platform from the Perspective of Transport Policy Makers and Regulators in Thailand  
*Sirawit Chinvanichai and Sorawit Narupiti*

#### Day 2 Thu 5 Sep 2024, 10:30 – 12:00

**Venue** MR 222-223

##### Topic B-3 Highway and Traffic Engineering

**Moderator** Dr. Kiettipong Jierranaitanakit

- ID 648 The study of the reflectance ratio on highway pavement surfaces by using High-Pressure Sodium (HPS) lamp type  
*Ratanachai Meeampol, Chainarong Benjapornthavee, Pattanapong Ngosorn and Pattarapon Sedokbuab*
- ID 756 Assessing BIM Implementation Success through Defined KPIs in Indonesia's Road and Bridge Infrastructure Projects  
*Heru Tri Saksena*
- ID 1145 Simulation-Based Analysis of Variable Speed Limit for Traffic Performance and Safety During Incidents  
*S. Hemapan, A. Karoonsoontawong and K. Kanitpong*
- ID 1390 Evaluating Driver's Characteristics During Multiple Rear-end Collisions on Freeway Corridors  
*Ryuya Seki and Hironori Suzuki*

## Technical Sessions

### Track C: Sustainability and Resilience of Road Networks

#### Day 1 Wed 4 Sep 2024, 13:00 – 14:30

**Venue MR 224**

#### Topic C-1 Resilient Road Infrastructure and Disaster Management for Extreme Natural Events

**Moderator Dr. Jutha Sunitsakul**

- ID 1274 Post-Earthquake Performance Evaluation of the Suramadu Bridge Using Structural Health Monitoring System (SHMS)  
*Rangga Bayu Prasetya, Chandra Syah Parmance and Herry Irpanni*
- ID 1243 Predicting Highway Flood Risk in Thailand using Machine Learning  
*Pongsakorn Chullabodhi, Pichaya Rungruangvirojn, Suladda Sapsin, Supakron Meelap and Waritz Rattanasiriphan*
- ID 1341 Adoption of Carbon Mineralised Concrete for Precast Concrete Segments in Singapore North-South Corridor Project  
*Anson Lim, Adam Cheong and Rebecca Yeow*
- ID 1250 Assessment of Seismic Performance Level of Bridge in Indonesia Based On Geometric Parameter Analysis of Earthquake Resisting Element  
*Veby Citra Simanjuntak and Iswandi Imran*
- ID 1305 Business Continuity Plan (BCP) for urban expressway in preparation for a major earthquake  
*Kazuya Iwakura, Ryoya Yabuchi and Noriyasu Kinoshita*

#### Day 2 Thu 5 Sep 2024, 10:30 – 12:00

**Venue MR 224**

#### Topic C-2 Climate Change Adaptation Actions for Road Infrastructure

**Moderator Dr. Patthanapong Tongsup**

- ID 825 Lessons Learned from an Application of Geotextile Reinforcement with In-Plane Enhanced Drainage for Pavement Resiliency in Thailand  
*Auckpath Sawangsuriya and Tack Weng Yee*
- ID 1100 Examining Climate Change Events on Road Infrastructure in Archipelagic Regions: Impacts, Scales, and Adaptation Measures for Indonesia  
*Gede B. Suprayoga, Hilmi Bashoir and Diyanti*
- ID 1424 A Digital and Comprehensive Tool for Sustainable and Climate Resilient Transport Network  
*Danilo Ebbinghaus, Koji Negishi and Renaud De Montaignac*
- ID 1741 Capacity Needs Assessment and Review of Existing Methods and Tools for Assessing Loss and Damage from Climate Change for Road Infrastructures in Cambodia  
*Phat Chandara, Vilas Nitavattananon, Seak Sophat, Spoann Vin, Thath Rido and Malay. Pramanik*
- ID 1768 Synergizing Pathways for Climate Mitigation and Adaptation in the Road Freight Transport-Energy Sector in Laem Chabang Sub-region, Eastern Thailand  
*Sutinee Choomanee, Vilas Nitivattananon, Kampanart Silva, Kunnawee Kanitpong and Jai Govind Singh*

#### Day 2 Thu 5 Sep 2024, 13:00 – 14:30

**Venue MR 222**

#### Topic C-3 Environment Sustainability in Road Infrastructure and Transport

**Moderator Dr. Bhanitiz Aursudkij**

- ID 734 A Framework of Green Highway Structures of Department of Highways (DOH) in Thailand  
*Siwakorn Dumduang, Surachead Lekhacharakul and Sukit Yindeesuk*
- ID 686 Green Initiatives for Roads and Pathways in Singapore  
*Than Than Nyunt, Wei Guo Lum, Wanxi Lin, Shengyu Gu and Chandrasekar Palanisamy*
- ID 1215 Analyzing the Benefits of Improving Sustainability in Provincial Highways through Preventive Maintenance Techniques  
*Li-Ling Huang, Jyh-Dong Lin, Wei-Hsing Huang, Min-Che Ho and Chun-Hung Kuo*
- ID 1219 Assessing the Effectiveness of Using Green Connotation to Create Sustainable Road Environments  
*Chun-Yao Chen, Jun-Roung Guo, Jen-Ming Jan and Cheng-Ying Chang*
- ID 1462 Promoting Non-Motorized Transport Networks in Transit-Oriented Development: A Case Study of Implementation in Addis Ababa, Ethiopia  
*Elias Nesreddin, Hyun-Seok Lee and Chunho Yeom*
- ID 1403 : Real-World Insights into Carbon Emissions: Pioneering Green Logistics in Cold Chain Transportation  
*Hung-Jui Lin, Pei-Ci Chen, Hsuan-Po Lin and I-Yun Lisa Hsieh*

#### Day 2 Thu 5 Sep 2024, 15:00 – 16:30

**Venue MR 222**

#### Topic C-4 Advancing Sustainable Transportation: Reducing the Carbon Footprint and Addressing Environmental, Economic, Social, and Engineering Aspects

**Moderator Dr. Kitti Subprasom**

- ID 1331 Environmental and Economic Analysis of Hot-Mix Asphalt and Warm-Mix Asphalt Pavement Construction: A Case Study in Thailand  
*W. Kaewmakoon, K. Kanitpong and P. Sarutipphan*
- ID 689 Carbon Reduction initiatives by Indonesian Road Administrator: Promoting the utilization of Natural Asphalt  
*Alfa Ash-Shiddiqi*
- ID 1368 Study of Low Carbon Hydraulic Cement in Road Applications  
*Thanit Kruepanya, Taweesak Assawachaiwan, Supakorn Moulikul and Poranic Jitareekul*
- ID 1761 Policy Preference Analysis for Investment in Electric Vehicle Infrastructure Development  
*Thitipong Chaiwannakupt, Kanisa Rungjang and Pongsak Suriyavanagul*
- ID 1764 Engineering and Economic Analysis of Stone Mastic Asphalt for Rutting Resistance in Thailand  
*Nutchanon Phantapanichakul and Boonchai Sangpetngam*
- ID 1779 Addressing socio-economic development challenges through road infrastructure projects  
*N. Malinga and S.J. Benade*

# ICHE Special Sessions

## Safety

## Optimizing Road Safety and Accessibility for all

**Date & Time:** 6 September 2024, 09:00 – 10:00  
**Venue:** MR 211 – 212

**Moderator:** Dr. Bhanitiz Aursudkij  
Department of Highways (Thailand)



Bangkok Metropolitan Administration  
(BMA)  
(Thailand)



**Dr. Pairoj Saonuam**  
Deputy Manager,  
Thai Health Promotion Foundation  
(Thailand)



**Dr. Wasin Rujikietgumjorn**  
Director of Standard and Environment Design,  
Bureau of location and design,  
Department of Highways  
(Thailand)

*Topic: Current Situation of  
Highway Safety Issues in Thailand*

## Technology

## Advancing Mobility Through Digital Innovation

**Date & Time:** 6 September 2024, 09:00 – 10:00  
**Venue:** MR 222 – 223

**Moderator:** Dr. Kiattipong Jierranaitanakit  
Department of Highways (Thailand)



**Mr. Pittaya Thanavanichkul**  
Deputy Governor of the Expressway  
Authority of Thailand (EXAT)  
(Thailand)



**Dr. Agachai Sumalee**  
Professor at Chulalongkorn  
School of Integrated Innovation  
(Thailand)



**Mr. Prach Boonsener**  
Manager,  
PTT Public Company Limited  
(Thailand)



**Mr. Potchara U-thong**  
Manager, Innovation and New  
Energy Business Department  
PTT Public Company Limited  
(Thailand)

*Topic: Advanced in Transport Data  
Analytics in Thailand*

*Topic: Mobility Data Technology & CAV Sandbox*

## Green

## Building Sustainable and Robust Road Infrastructure

**Date & Time:** 6 September 2024, 09:00 – 10:00  
**Venue:** MR 224

**Moderator:** Dr. Rajwanlop Kumpoopong  
Department of Highways (Thailand)



**Dr. Weeradej Cheewapattananuwong**  
Civil Engineer, Advisory Level  
Department of Rural Roads (DRR)  
(Thailand)



**Dr. Preecha Soparat**  
Plan and Policy Analyst, Expert Level  
Department of Rural Roads (DRR)  
(Thailand)



**Dr. Viroon Kamchoom**  
Associate Professor,  
Department of Civil Engineering,  
King Mongkut's Institute of  
Technology Ladkrabang  
(Thailand)



**Dr. Peerapong Jitsangiam**  
Associate professor,  
Department of Civil Engineering,  
Chiang Mai University  
(Thailand)

*Topic: Lanta Bridge Project and  
Songkhla Lake Bridge Project*

*Topic: Lanta Bridge Project and  
Songkhla Lake Bridge Project*

*Topic: Nature-based solutions for  
road embankments in Thailand:  
Vetiver grass and its role in  
mitigating climate extremes*

*Topic: Green Roads Ahead:  
Pioneering Sustainable Solutions for  
CO2 Reduction in Pavement Design  
and Construction*

## Track D: PIARC International Seminar on Transport Agency of the Future



### PIARC Workshop TC3.1 “Future-Proofing Road Safety for Asia and Beyond”

**Date & Time:** 4 September 2024, 13:00 – 14:30

**Venue:** MR 214 – 215

#### Description:

The future-proofing road safety for Asia and all regions of the world requires fully understand how or why countries make progress in road safety. High-income countries (HICs) with a mature road safety approach are expected to move in the direction of a Safe System Approach, which deals with human behavior in a proactive and integral way by creating an environment for safe human behavior. While, the road safety in many low- and middle-income countries (LMICs) lacks of almost everything including leadership, funding, expertise, political will, enforcement etc. Although LMICs could learn from HICs, they cannot simply adopt successful strategies from HICs because of the difference in local contexts. The fundamental principles of successful strategies could be effectively implemented but the priorities and the action plans should be adapted to local contexts. LMICs should invest in local capacity building to create effective road safety communities that involves all key stakeholders.

**Moderator:** TC3.1 Chair



#### Introductory Presentation by PIARC TC3.1 Chair

**Speaker:** Dr. John Milton (United States)

Director of Transportation Safety & Systems Analysis, WSDOT  
Chair of PIARC Road Safety TC3.1 Committee



#### Topic 1: Bicycle Highways & Design of Urban intersections for Cyclists – Insights from Germany

**Speaker:** Dr. Marco Irzik (Germany)

Federal Highway Research Institute (BAST)  
Head of Section VI – Highway Design, Traffic Flow, Traffic Control



#### Topic 2: External and Internal Constraints for Developing Road Safety among LMICS

**Speaker:** Dr. Carnis Laurent (France)

Director of Research, Universite Gustave Eiffel



#### Topic 3: Is the Safe System Approach Sufficient for LMICs to Improve Road Safety?

**Speaker:** Dr. Kunnawee Kanitpong (Thailand)

Professor in Transportation Engineering,  
Department of Civil and Infrastructure Engineering (CIE), Asian Institute of Technology,  
Director of Thailand Accident Research Center (TARC)

## Track D: PIARC International Seminar on Transport Agency of the Future



### IMPLEMENTING INNOVATION – THE CRITICAL STEP

**Date & Time:** 4 September 2024, 15:00 – 16:30

**Venue:** MR 214 – 215

**Moderator:**

Mr. Patrick Mallejacq (France)

Secretary General of PIARC (World Road Association)



**Description:**

The challenges trends and external influences that Road and Transport Administrations face are becoming increasingly more complex. To deliver the best public value and services to society equitably, efficiently, and with the highest quality possible, they must embrace and implement a culture of innovation aligned with the organization's goals, societal megatrends, and focused, for example on technology, process, and people. The ability to successfully implement an idea, a new technology, engineering, or service solution, can transform the public sector's ability to maximize its delivery of policy goals, provide relevant and useful value to customers and stakeholders and improve the image of the organization.

This Workshop will investigate the keys to the successful identification, adoption, deployment and implementation of new innovating ideas and solutions by Road and Transport Administrations, from both top-down or bottom-up approaches, examine barriers and challenges faced in the successful implementation of innovations, and identify ways to establish whether innovations are having the expected and right impact and to measure their success.

It will provide practical examples of how different Road and Transport Administrations approach innovation within their organization, including points of view from academia and private sector. The topic will be addressed from both the local perspective of Thailand, as well as from different international perspectives.

**Introduction:**



Christos XENOPHONTOS (United States)

Assistant Director For Administrative Services, RIDOT

**Speakers:**



Jonathan Spear (United Kingdom)

Transport Policy & Strategy Advisor, ATKINS

Topic: Managing Innovation in Transport Agencies – Overview of a PIARC Special Project



José Manuel BLANCO SEGARRA (Spain)

Spanish Secretary

Topic: Implementing the DGC (Spain) new approach to Innovation.



Anne-Séverine POUPELEER (Flanders/Belgium)

Agency for Roads and Traffic, Head of Division Flemish Brabant

Topic: The role of transport agency in responding to and shaping new technologies and service models: 'PMO Innovation & Change'



Mark Henry RUBARENZYA (Uganda)

Head Research and Development

Topic: Innovation Policies in LMICs: Lessons from the UNRA Research, Development & Innovation Framework



Dr. Kitti SUBPRASOM (Thailand)

Deputy Director Office of Highway15 (Prachuap Khiri Khan),  
Thailand Department of Highways

Topic: District Watch Mobile Application

## Track D: PIARC International Seminar on Transport Agency of the Future



### CREATING A STRONGER FUTURE FOCUSED WORKFORCE

**Date & Time:** 5 September 2024, 10:30 – 12:00

**Venue:** MR 214 – 215

**Moderator:**

Christos XENOPHONTOS (United States)

Assistant Director For Administrative Services, RIDOT



**Description:**

The ability of transport agencies to meet the challenges faced in their respective environments rely heavily on the capacity and ability of their workforce to meet those challenges. The transformational and technological disruptions faced by the road transport sector requires the continuous development of the workforce. Attracting, training, and retaining talent with the diverse skillset required is a challenge that transport and road agencies face universally, many times competing for the same talent with the private sector. Furthermore, public agencies have a responsibility to ensure that they create an environment that values diversity, equity, and inclusiveness.

This Workshop will explore one of the most critical and universal issues facing the entire transportation industry, which includes the inter-related issues of:

- Workforce shortages,
- Talent management,
- New competencies required because of new technological disruptions taking place within the transportation sector,
- Improving diversity, equity, and inclusiveness, and
- Identifying what makes an attractive employer.

It will present the results of PIARC's TC 1.1 in the 2020-2023 cycle and expand on the issues of strengthening the workforce through modernizing skills, enhancing diversity, equity, and inclusion under the umbrella topic of the Transport Agency of the Future.

**Speakers:**



**Karen A. BOBO (United States)**

Chief – Workforce Programs Division, FHWA USAPIARC Special Project

**Topic: Creating a Future-Focused Transportation Workforce: Where We Started and Where We Hope to Go**



**Alan COLEGATE (Australia)**

Acting Executive Director Strategy and Communications, Strategy and Communications Directorate Main Roads Western Australia

**Topic: Using Infrastructure Investment to Create Employment Opportunities**



**Mr. Piyadit ATSAVASIRISUK (Thailand)**

CEO Civil Engineering PCL

Vice President of Thai Contractors Association under Patronage of His Majesty the King

## Track D: PIARC International Seminar on Transport Agency of the Future



### PUBLIC VALUE CREATION BY TRANSPORT AGENCIES

**Date & Time:** 5 September 2024, 13:00 – 14:30

**Venue:** MR 214 – 215

**Moderator:**

Christos XENOPHONTOS (United States)

Assistant Director For Administrative Services, RIDOT



**Description:**

The Workshop will explore how road and transport agencies are measuring the efficiency and effectiveness of customer experience and public value creation and how the principles of public value can be considered by transport administrations as they redefine strategic frameworks to better represent a focus on more holistic societal expectations.

This work is important to road and transport agencies because they must prioritize work that creates value and contributes positively to society. The adopted approach should be aimed at improving outcomes in areas not traditionally measured by transportation and to which no importance was attached. Many emerging measures are closely tied to diverse societal goals through a more comprehensive strategic framework.

The workshop will look to address the following key research questions:

1. What drivers should transport agencies consider in their strategic framework review that are linked to public value creation?
2. How can Transport Agencies communicate the public value created and improve their overall image with the public?
3. Can the use of customer experience in evaluating the implementation of new technologies contribute to increasing the acceptance of new technologies and increasing public value?
4. Is there any evidence that links improved design and planning approaches that include more comprehensive engagement that improves public value creation?
5. What would agencies need to change in their existing strategic frameworks in order to capture more holistic societal expectations?
6. How can agencies measure their progress in these emerging areas?

**Speakers:**



Deanna K. Belden (United States)

Director of Performance,  
Risk and Investment Analysis at the Minnesota Department of Transportation (MnDOT)



Andreas FROMM (Austria)

Managing Director of ASFINAG Bau Management GmbH



Sisanda Dyubhele (South Africa)

Senior Strategist at the South African National Roads Agency Ltd (SANRAL)



Anne-Séverine POUPELEER (Belgium)

Agency for Roads and Traffic, head of division Flemish Brabant



Matthew W. DAUS, Esq. (United States)

President, International Association of Transport Regulators



Pawinee IAMTRAKUL (Thailand)

Associate Professor Faculty of Architecture and Planning, Thammasat University

## Track D: PIARC International Seminar on Transport Agency of the Future



### ENVISIONING THE TRANSPORT AGENCY OF THE FUTURE

**Date & Time:** 5 September 2024, 15:00 – 16:30

**Venue:** MR 214 – 215

**Moderator:**

Christos XENOPHONTOS (United States)

Assistant Director For Administrative Services, RIDOT



**Description:**

Over the last decade, there have been unprecedented and disruptive changes in transportation with the rise of new technological and service models, new pressures such as climate change, and the evolution of a complex mobility ecosystem at a fast pace. Additionally, the transport sector is facing important challenges from the systemic changes taking place in society, the economy, and the environment.

The rapid development and fusion of multiple disruptive and innovative technologies over the last decade are changing the behaviour and the expectations of customers and stakeholders all over the world. At the same time demographic, economic, environmental, technological, and other trends are changing the demand and mobility options for moving people and freight. Furthermore, the COVID-19 Pandemic, the increased frequency and intensity of extreme weather events, and recent geopolitical conflicts have directly impacted the transport sector and the capacity of transport agencies to carry out their mission.

Transport Agencies must be able to address these disruptions while continuing with their central mission of providing essential services in the safe, efficient, sustainable, and inclusive movement of passengers and freight, maintaining critical infrastructure, as well as ensuring resilience and environmental responsibility.

This Workshop will continue the discussion that began at the XXVIIth PIARC World Road Congress in Prague, and continued at the Transportation Research Board’s (TRB) 2024 Annual Meeting in Washington, DC, and at the Transport Research Arena (TRA) 2024 in Dublin, on the Transport Agency of the Future and the need for Transport Agencies to embrace transformative visions that require a change of mindset and adoption of collaborative and open innovation not only in the movement of people, goods and services, but also in internal structures, processes and resources.

**Speakers:**



Mr. Patrick Mallejacq (France)

Secretary General of PIARC (World Road Association)

Introduce Topic



Jonathan Spear (United Kingdom)

Transport Policy & Strategy Advisor, ATKINS

Topic: Envisioning the Transport Agency of the Future – Early PIARC Work and Findings from the 2024 – 2027 Cycle



Mark Henry RUBARENZYA (Uganda)

Head Research and Development

Topic: Adapting to Change: Transformative Solutions for Transport Agencies in LMICs



Matthew W. DAUS, Esq. (United States)

President, International Association of Transport Regulators

Topic: IATR’s “Mobility Agency of the Future”



Dr. Wisanu SUBSOMPON (Thailand)

Deputy Governor of Bangkok

## REAAA Activities



**REAAA** is the Road Engineering Association of Asia and Australasia. The REAAA, established in 1973, is a regional body set up to promote and advance the science and practice of road engineering and related professions in the Asia Pacific region through developing professional and commercial links within and between countries in the region. Regional co-operation and technical harmony are the underlying principles of the Association. For over 12 member countries, the REAAA holds regular events including a Council Meeting (twice a year), Heads of Road Authorities (HORA) meeting (annual) and the REAAA Conference (four years) to promote regional cooperation and technical exchange.

The icHE2024, Thailand will host the following REAAA events:

### ▪ 122nd REAAA Governing Council Meeting

The Management of the Association is vested in a Council which holds regular meetings to make policy decisions and set directions for the Association. On 5 September 2024, it will be on its 122nd Governing Council Meeting in Bangkok, Thailand after the 94th REAAA Council Meeting between the 20th and 21st of April 2012 at the Centara Grand and Bangkok Convention Centre, Bangkok, Thailand.

### ▪ 26th REAAA Young Engineers and Professionals (YEP) Meeting

Another important initiative of REAAA is the Young Engineers and Professionals or YEP Meeting. It reaches young members of REAAA to actively involve in multi-national cooperation made possible by the Association. Each year the YEP meets to discuss ideas or promote activities to improve the capacity of young its members. The 26th REAAA YEP Meeting will be held in Bangkok, Thailand for its first time.

### ▪ 11th REAAA Business Forum

REAAA Business Forum is designed to facilitate road sector business to business collaboration. The objectives are to create business to business collaborations in road engineering projects or related sectors and to enhance membership from business persons, institutions or companies.

Website: <https://www.reaaa.net>

#### REAAA Activities 4 – 5 September 2024 at BITEC

Wed 4 Sep 2024		
13:00 – 16:00	MR 220	11 <sup>th</sup> Business Forum
16:30 – 18:00	TBC	Networking Reception
Thu 5 Sep 2024		
09:00 – 12:00	MR 220	26 <sup>th</sup> YEP Meeting
12:00 – 13:00		Lunch Break
13:00 – 16:00	MR 220 – 221	122 <sup>nd</sup> REAAA Governing Council Meeting
18:30 – 20:30	GH 201	Gala Dinner & Cultural Show

\*\* 10:30 – 11:00 and 14:30 – 15:00 Coffee Break



## REAAA Business Forum

### 11th REAAA Business Forum "AI Application in Road Engineering & Management- The Potentials, Challenges, and Future Directions"

**Date & Time:** 4 September 2024, 13:00 – 16:00  
**Venue:** MR 220

**Chairman:**  
**RATH** Executive Committee

**Coordinator:**  
**Ms. Lydwina Marchiela Wardhani (Indonesia)**  
Honorary Treasurer General of REAAA  
President Director of PT Karunia Adhi Pradana



#### Description:

In various countries worldwide, road project commonly faces challenges such as engineer shortages, escalating costs, and project delays. We believe that leveraging AI presents a new opportunity to address these issues. Examples of AI applications include Traffic Management, Predictive Maintenance, Infrastructure Design & Construction, Asset Management, Intelligent Transportation Systems, Public Transportation Optimization, and Environmental Impact Assessment. Overall, AI has the potential to revolutionize road engineering and management by enabling more efficient resource utilization, enhancing safety, and improving the overall quality of transportation infrastructure and services. AI applications, however, will also pose challenges to regulators and engineers. **AI APPLICATION IN ROAD ENGINEERING AND MANAGEMENT** – The Potentials, Challenges and Future Directions, encompasses the technical issues of AI application in road engineering and management, exploring its immense potential value and its challenges to policies, engineering, management as well as to individual engineers.



**Mr. Richard Moh (Taiwan)**  
Council Member of REAAA  
Executive Director of CRF  
Chairman of MAA Group Consulting Engineers  
**Moderator**



**Dr. Jia-Ruey Chang (Taiwan)**  
Professor, Graduate Institute of  
Architecture and Sustainable Planning  
National Ilan University  
*Topic: Current Developments of AI  
Technology in Road Maintenance in Taiwan*



**Dr. Kunihiro Takahashi (Japan)**  
Senior Manager, International Projects Division  
Infrastructure Business Department  
Metropolitan Expressway Company Limited  
*Topic: Cutting Edge AI Technology  
in Metropolitan Expressway*



**Mr. Tong Kum Kong (Singapore)**  
Deputy Director  
Road & Commuter Infrastructure Development  
Land Transport Authority  
*Topic: Exploiting AI in Singapore  
Land Transport Authority*



**Dr. Inbae KIM (Korea)**  
Principal Researcher  
Korea Expressway Corporation  
*Topic: Development of Machine Vision-  
Based Road Surface Maintenance  
Techniques for Climate Change*



**Dr. Thanasak Wongtanakitcharoen (Thailand)**  
Director of Inter-city Motorway  
Department of Highways  
*Topic: M-Flow: An AI Application in  
Thailand's Barrier Free Toll System*



**Dr. Ponlathep Lertworawanich (Thailand)**  
Bureau Director  
Road Research and Development  
Department of Highways  
*Topic: International Friction Index (IFI)  
Prediction with Machine Learning for  
Pavement Management System*



**Dr. Ekarin Lueangvilai (Thailand)**  
General Manager  
Asiam Infra Company Limited  
*Topic: AI for Pavement Inspection:  
a Rapid Response After Flood*



## Special Session by REAAA Climate Change, Resilience and Disaster Management Working Committee

### REAAA Special Session Increasing the Resilience of Roads and Recovering from Disasters

**Date & Time:** 6 September 2024, 09:00 – 10:30

**Venue:** MR 214 – 215



**Moderator:**

**Dr. Auckpath Sawangsuriya (Thailand)**

Civil Engineer – Expert Level – Department of Highways

Member of REAAA Climate Change

Resilience and Disaster Management Working Committee

**Description:**

Road owners and operators are increasingly required to manage many threats, including climate change and extreme weather, and natural disasters. These have significant impacts on the availability and functionality of roads, and safety of its users, and communities. Consequently, owners and operators must address these challenges and provide accessibility and mobility of goods, services and people in our society, whilst minimizing these impacts in the most efficient way possible. Climate change and resilience is an area of great interest to the Road Engineering Association of Asia and Australasia (REAAA). As a result, the REAAA Climate Change, Resilience and Disaster Management Committee was established to address infrastructure resilience for REAAA member countries. This session provides an overview of the key actions being undertaken by this REAAA Working Committee and collaborative activities with other road associations such as PIARC. The session also highlights activities in REAAA member countries being used to improve the resilience of roads through adaptation solutions, best-practice learnings to recover from earthquakes and effective ways to manage disasters.

### Presentation Abstracts:

#### Overview of the REAAA Climate Change, Resilience and Disaster Management Working Committee's Activities



**Ms. Caroline Evans**

Chair PIARC Strategic Theme 1 Coordinator  
& Co-Chair REAAA Climate Change  
Resilience and Disaster Management  
Working Committee  
(Australia)

The REAAA Climate Change, Resilience and Disaster Management Working Committee was established in 2021. It is one of 3 REAAA Working Committees established together with the Pavement Technology and Road Safety Working Committee's. Climate change, resilience and disaster management are all issues of relevance to REAAA member countries, and the impacts of these events are increasing in frequency and intensity. This presentation provides an overview of the activities and developments by the committee, including opportunities for collaboration with other associations such as PIARC. It discusses emerging themes in the areas of resilience and identifies case study examples of ways to adapt and improve the resilience of road infrastructure.

#### Experience in nature-based solutions for erosion control and slope stabilization for highway slopes in Thailand



**Dr. Apiniti Jotisankasa**

Associate Professor,  
Department of Civil Engineering  
Kasetsart University Bangkok  
(Thailand)

This presentation explores various nature-based solutions (NBS) for erosion control and slope stabilization on highway slopes in Thailand. It highlights the effectiveness of several vegetation techniques, including the vetiver grass system, capillary barriers, and erosion control blanket systems, when combined with simple, low-carbon engineering methods such as gabion walls, flapped soil bags, and screw piles. The potential of biochar-amended soils to enhance the sustainability of vegetated slopes and function as carbon sinks is also emphasized. Long-term field monitoring of selected sites on highways and rural roads in Thailand will be discussed to demonstrate the performance of these systems. The findings show that the carbon emissions of NBS are significantly lower than those of traditional concrete structures, underscoring the potential of NBS to achieve carbon neutrality in highway slope construction in Thailand.



## Special Session by REAAA Climate Change, Resilience and Disaster Management Working Committee

### REAAA Special Session Increasing the Resilience of Roads and Recovering from Disasters

**Date & Time:** 6 September 2024, 09:00 – 10:30

**Venue:** MR 214 – 215

#### Presentation Abstracts:



**Mr. Keijiro Tsurukawa**  
Project chief at NEXCO-West  
(Japan)

#### Disaster Response of Expressways in Kumamoto Prefecture, Japan, due to the Torrential Rain in July 2020

In recent years, unprecedented flood damage due to torrential rains has occurred in many areas of Japan. Under such severe conditions, expressways are required to function as "Roads for Life. The torrential rains in July 2020 caused extensive damage, mainly in Kumamoto Prefecture. Although the expressway was spared from long-term road closures, the concrete slabs of the tunnels were lifted, and the slopes collapsed. The Kumamoto Expressway Office of West Nippon Expressway Company worked to restore the road as soon as possible to minimize the impact on road users. In addition, as a support for the affected areas, Expressway charges were waived, and emergency gates were opened for residents in the area. This report summarizes our responses during natural disasters.



**Dr. Agus Setyo Muntohar**  
Professor,  
Department of Civil Engineering  
Universitas Muhammadiyah Yogyakarta  
(Indonesia)

#### Slope Failure Cases Related to Roads in Java, Indonesia

The climate in Indonesia is predominantly hot and humid, with rainfall primarily concentrated in low-lying areas. Mountainous regions, on the other hand, tend to have lower temperatures. The wet season spans from November to April, while the period from May to October is generally characterized by dry weather. Indonesia undergoes arid circumstances during El Nino and humid conditions during La Nina. The rapid development of the roadway in Jawa Island has changed the natural slope into a steeper cut slope. The slopes may be more likely to be unstable during an intense rainfall or earthquake. Java is characterized by a central hilly to mountainous volcanic belt comprised of deeply weathered Tertiary ashes and tuffs resting on a relatively weak and unstable sedimentary sequence dominated by mudstones. The region is one of the most tectonically active in the world. This paper overviews three roadside slope failure cases in Central Jawa and East Jawa. These roadside slopes' conditions were mainly comprised of weathered rock and silt sand. The main problem of these roadside slopes is the construction of cut slopes. It is also suggested that a geometrical method, such as terracing and gravity wall, may be beneficial.

## Technical Visit



The iCHE2024 offers the opportunity to visit “M-Flow.” You can join the programme when registered.



### What is M-Flow?

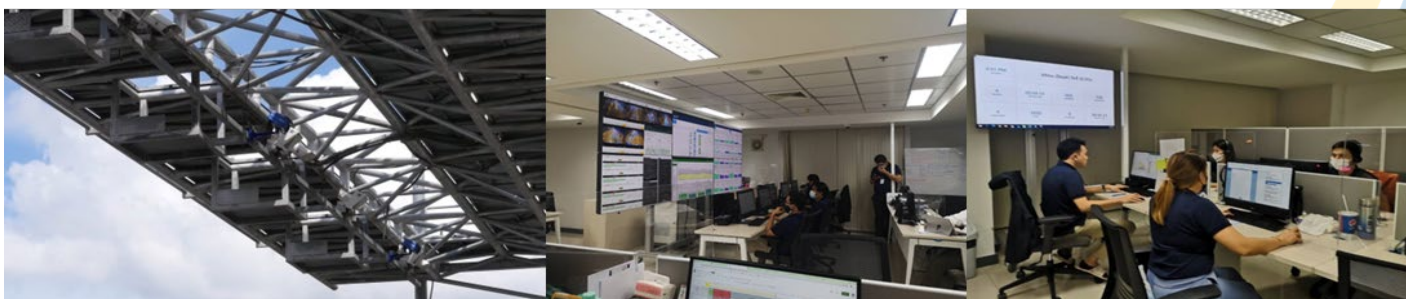
In a strategic initiative aimed at mitigating traffic congestion at toll plazas, the Ministry of Transport in Thailand has successfully deployed an innovative electronic tolling system known as M-FLOW. M-Flow seamlessly integrates cutting-edge technologies, incorporating transponders and automatic license plate recognition (ALPR), to adeptly identify vehicles and streamline transaction processing. With an impressive throughput capacity, the M-Flow system effortlessly accommodates 2,000 – 2,500 vehicles per hour per lane, achieving speeds up to five times faster than traditional barrier-based tolling methods.

Motorists now experience a seamless traverse through toll plaza areas, eliminating the need for halting or deceleration, thereby significantly reducing delays—a long-standing challenge contributing to travel time inefficiencies. This groundbreaking system optimises toll payment processes and directly addresses a substantial component of travel time delays encountered at toll plazas.

In February 2022, the Department of Highways (DOH) achieved a significant milestone by inaugurating its first M-Flow implementation on the M9 motorway. This accomplishment involved transforming four toll plazas—Tap Chang 1, Tap Chang 2, Thanya Buri 1, and Thanya Buri 2—into a hybrid system, combining partial M-Flow tolling with conventional barrier-based tolling methods. Presently, the M-Flow system boasts 590,000 registered members and approximately 760,000 registered vehicles. The user base has witnessed a remarkable increase from 57,000 vehicle/days in the first month to 127,000 vehicles per day as of December 2023, constituting 40 percent of motorway users, with this proportion continuing to rise. Total transactions have surpassed 71 million to date.

M-FLOW has proven instrumental in reducing traffic queue lengths at toll plazas from 4 kilometers to 0.5 kilometers during peak times. Furthermore, the system’s benefits evaluation demonstrates a reduction in travel time delays by over 3.3 million hours annually, a decrease in gas consumption by more than 14 million liters per year, and a notable contribution to environmental conservation—reducing carbon dioxide (CO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>) emissions by 37,000 tons/year and 150 tons/year, respectively.

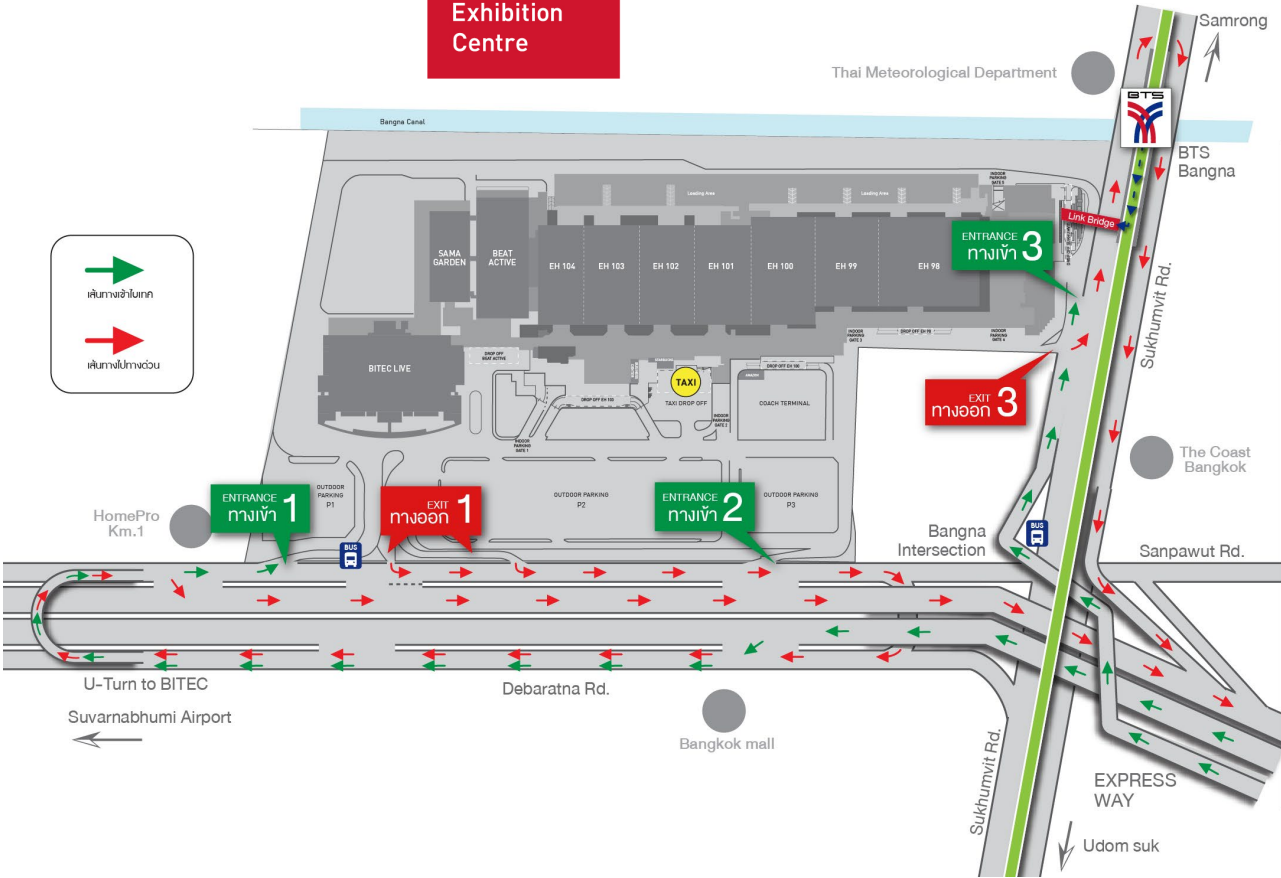
With these considerable benefits, the Ministry of Transport aims to extend M-FLOW implementation across the DOH’ motorways and EXAT’s expressways within the next five years. This will involve a hybrid system applied to currently operational motorways, including M7, and expressways such as Chalong Rat Expressway, Burapha Withi Expressway, Si Rat Expressway, Si Rat-Outer Ring Road Expressway, Chaloem Maha Nakhon Expressway, and under-construction motorways, namely M6 and M81. Additionally, fully open-road tolling systems will be implemented on the presently under construction motorway M82, and the Rama III – Dao Khanong-Outer Ring Road Expressway M82, and upcoming motorway M5 and M9 Bang Khun Tien – Bang Bua Thong. The successful implementation of M-FLOW represents a substantial leap forward in enhancing toll collection efficiency and reshaping the driving experience on Thai motorways and expressways.



# Venue Guide

**Bangkok International Trade & Exhibition Centre**

# MAP TO BITEC

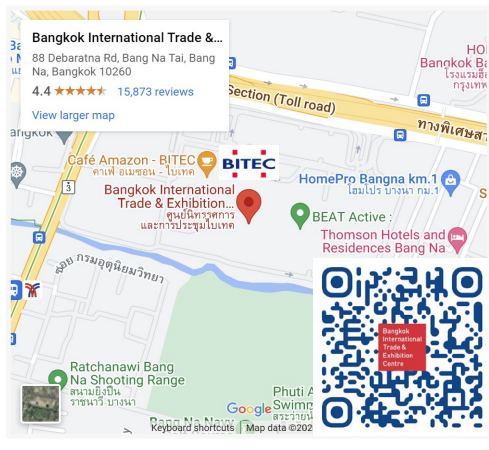


## General Information



### Location

Google Map

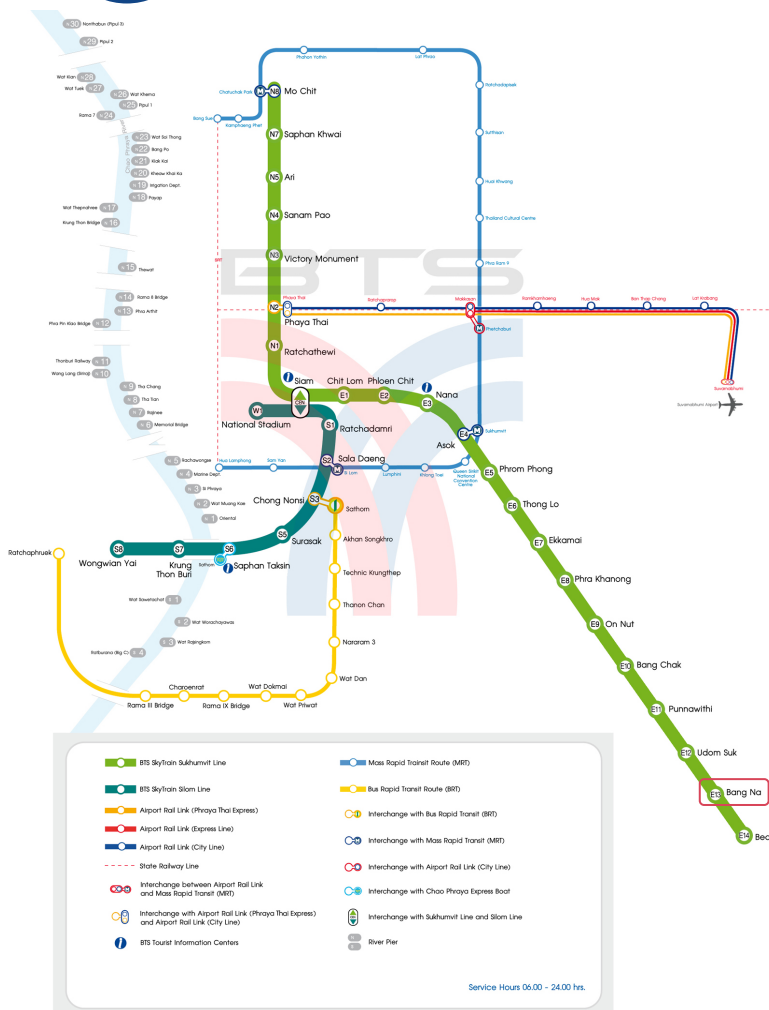


### Attraction Points

- The Grand Palace and The Temple of The Emerald Buddha
- Bangkok Art and Culture Centre
- Khon, masked dance drama in Thailand
- Hop On Hop Off Bangkok – Bus Tours
- Maha Nakhon Sky Walk
- Icon Siam
- Chatuchak Weekend market
- Yaowarat Night Market (China town)



### Transportation



### Registration



### Information



[www.iche2024.com](http://www.iche2024.com)  
[contact@iche2024.com](mailto:contact@iche2024.com)



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