The Central Asia Regional Economic Cooperation (CAREC) Institute

CAREC Institute Chai Talk: "Revolutionizing Road Asset Management with AI"

Webinar

10th September 2025

14:50 – 16:30 (Beijing time)

Background:

Road networks serve as critical infrastructure that drives economic growth, enables regional connectivity, and fosters social development. To maximize these benefits, efficient road asset management is essential to ensure safety, optimize durability, and maintain cost-effective operations throughout the asset lifecycle.

This is particularly critical in regions like CAREC, where roads enable crucial cross-border trade and regional integration, effective road asset management becomes an economic imperative. The CAREC Transport Strategy 2030 identifies Road Asset Management (RAM) as one of the strategic directions reflecting the commitment of CAREC member countries to implement investment and transport initiatives along CAREC corridors with a focus on multimodal connectivity, road asset management, and road safety. Given that road transport dominates regional freight movements[1], quality infrastructure can reduce logistics costs significantly, savings that directly benefit both businesses and consumers. Yet conventional management methods, dependent on periodic manual inspections and breakdown-based repairs, are proving both costly and unsustainable in meeting these demands.

In 2015, the first workshop was held, which introduced national experts to modern RAM practices. The importance of improving road asset management was highlighted at the CAREC 18th Transport Sector Coordinating Committee Meeting (TSCCM) in Tashkent, Uzbekistan on 25-26 April 2019. During this meeting, the CAREC Institute promised to hold RAM improvement workshops and road safety workshops in CAREC countries in 2020. As the results, the second RAM workshop was held in Dushanbe, Tajikistan in February 2020, and a four-day virtual workshop on RAM Systems on 10-13 August 2020 involving relevant senior CAREC government officials and experts. These workshops provided a broad platform for interaction with key CAREC RAM influencers and experts, as well as for expert discussions on various aspects of RAM. In order to determine the individual needs of member

[1] CAREC Transport Strategy 2030 https://www.adb.org/sites/default/files/institutional-document/559456/carec-transport-strategy-2030.pdf

countries for RAM skills, during 2020-2021, a RAM maturity assessment through self-assessment was completed for each CAREC member country that showed a significant gap in competencies in various aspects of RAM across countries. Based on this assessment, the CAREC Institute has transformed its capacity building interventions to avoid one-off events and to offer cascading and research-based capacity building to member countries. Starting from 2022, the CAREC Institute, in collaboration with ADB, delivers country-specific workshops to address the diverse capacity needs of member countries. Workshops were held in a hybrid format−a combination of in-person and virtual presenters−as the first round in Azerbaijan and Georgia in 2022, as the second round in the Kyrgyz Republic and Tajikistan in 2023, and as the third round in Uzbekistan and Kazakhstan in 2024. Workshops will be held consecutively in the remaining CAREC countries. The main objective of workshops is to provide the target participants with specific guidance on RAM maturity assessment, methods of data collection and utilize their support for country-specific RAM assessment. The workshops are fully interactive and in the form of training of trainers

While Artificial Intelligence (AI) offers transformative solutions by enabling predictive maintenance, automated damage detection, and data-driven decision-making improving accuracy, efficiency, cost-effectiveness, and safety for road asset management. For regions like CAREC, where roads are vital for cross-border trade and economic integration, AI offers faster corridor maintenance, transparency in infrastructure spending and smart traffic management using AI-powered tools. AI-powered predictive analytics offer forecast road failures before they occur, optimizing maintenance schedules, and computes high-frequency road condition assessments. Moreover, machine learning models help prioritize investments, ensuring funds are allocated where they have the highest safety and economic returns. For CAREC countries, AI-driven RAM ensures seamless cross-border transport, reducing delays and boosting trade under initiatives like the CAREC Transport and Trade Facilitation Strategy 2030.

Global practices suggest that AI is transforming road maintenance through several innovative approaches. Predictive maintenance leverages AI algorithms to analyze historical data, weather patterns, traffic loads, and current conditions, enabling accurate predictions of road deterioration, optimized maintenance schedules, and prioritization of repairs based on risk and cost-benefit analyses. Automated condition assessment utilizes computer vision to analyze camera and LiDAR data from inspection vehicles, with machine learning detecting cracks, potholes, and surface defects with over 90% accuracy; drones further enhance this process by providing aerial views of hard-to-reach infrastructure. Resource optimization is achieved through AI models that recommend the most cost-effective treatment options, optimize routes for maintenance crews, and manage inventories of materials and equipment efficiently. Real-time monitoring is facilitated by IoT sensors embedded in roads, which continuously provide condition data; AI processes this information to detect emerging issues and alert managers to urgent problems, enabling proactive responses. Despite these advancements, challenges such as data quality and standardization, system integration, high initial costs, workforce training, and regulatory considerations remain. Looking ahead, emerging applications like digital twins for scenario simulation, autonomous repair robots, blockchain for asset history tracking, and AI-powered communication tools promise to further revolutionize road management, making it more efficient, cost-effective, and responsive.AI is not just an upgrade, it’s a necessity for sustainable, safe, and cost-effective road networks. Countries and agencies that adopt AI early will gain a competitive advantage in infrastructure resilience and economic growth.

Modality of the event:

The CAREC Institute Chai Talk event provides a platform for experts from the region and partner organizations to gather and openly discuss trending topics while enjoying a cup of tea or coffee. In line with this, the CAREC Institute will host a Chai Talk event on 10th September 2025 at 15:00 Beijing time, focusing on artificial intelligence in road asset management. The online event will feature experts, who will share their views, insights and knowledge toward evolving role of AI in modernizing road asset management, including both emerging challenges and opportunities in AI adoption for RAM.

Directing questions:

1. What is the current state of RAM in CAREC region?

2. How might AI affect the RAM in the CAREC region countries, and world experiences?

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https://carecinstitute-org.zoom.us/webinar/register/WN_EwG6Py6rR_K2kTuuSzRPkQ

Agenda

10 September 2025 (Beijing time)

14:50-15:00	**Virtual Connection to the Webinar and Speakers' Group Photo**
	Sukhdelger Sosorbaram, Senior Capacity Building Specialist, CAREC Institute
15:00-15:10	**Opening Remark**
	Charymuhammet Shallyyev, Director, The CAREC Institute
15:10-15:15	**Introduction of the Speakers by the Moderator**
	Ilhom Abdulloev, Chief, Capacity Building Division, CAREC Institute
15:15-16:40	**Speakers**
	Dr. Ian Greenwood, Chartered Professional Engineer and Fellow of Engineers New Zealand
	Dr. Omidreza Shoghli, Associate Professor, William States Lee College of Engineering, and Affiliate Faculty, School of Data Science, University of North Carolina
	Dr. Theuns F.P. Henning, Associate Professor of Civil Engineering and Associate Dean International, University of Auckland, New Zealand
	Ritu Mishra, Transport Specialist, Transport Sector Office, ADB
	Project Officers, Transport team, AIIB
16:40-16:55	**Q&A and Discussion:** moderator will pick up questions from the audience and engage in discussion with panelists
16:55-17:00	**Concluding Remarks**
	Ilhom Abdulloev, Chief, Capacity Building Division, CAREC Institute

Notes:

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