GLOBAL TRANSPORT COLLABORATION

2024 REPORT

NTRO
Innovation Driven

GTC24 CHINA

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GLOBAL TRANSPORT COLLABORATION

INSIGHTS FROM CHINA

BEIJING - QINGDAO - SHANGHAI - NANJING - SHENZHEN

JUNE 24, 2024 – JULY 5, 2024

CHINA, a nation renowned for its rapid economic growth and technological advancements, has also emerged as a global leader in transportation innovation. To gain insights into these groundbreaking developments, a delegation of NTRO decision-makers embarked on a comprehensive tour of the country, visiting key cities and engaging with industry leaders. The trip's primary objective was to understand China's multimodal integration, automation, and sustainability advancements.

By learning from the experiences of companies like Alibaba, BYD, and NIO, as well as research institutions such as the China Academy of Railway Sciences, the delegation sought to apply these insights to global transport challenges. The delegation began their journey in Beijing by visiting the Research Institute of Highway (RIOH). This visit provided valuable insights into China's road infrastructure development and maintenance approach. The team was particularly impressed by RIOH's innovative use of AI-driven technologies and a focus on the safety and efficiency of the country's vast road network.

THE DELEGATION travelled from Beijing to Qingdao, a coastal city known for its advanced port infrastructure. They visited Qingdao Port and the Shandong Port Group, gaining firsthand experience of China's cutting-edge port logistics and automation systems. These visits highlighted the country's commitment to improving port efficiency and reducing environmental impact.

Nanjing, a historical city in the Yangtze River Delta region, offered a unique perspective on transportation innovation. The delegation explored the city's approach to port sustainability, intermodal connectivity, and integrating modern technologies in highway and bridge infrastructure. Nanjing's experience balancing tradition with innovation provides valuable lessons for other cities facing similar challenges.

Shanghai, a global financial centre, is at the forefront of electric vehicle development and data platform innovation. The delegation's meetings with the International Automobile City, NEV data platform, and NIO provided a deep dive into the latest advancements in these fields. These companies are leading the way in developing sustainable and efficient transportation solutions.

The final stop on the delegation's journey was Shenzhen, a rapidly growing city known for its infrastructure development. The team visited the BYD and Shenzhen Expressway Group, where they learned about innovative approaches to highway expansion and environmental management. Shenzhen's experience building a modern transportation network offers valuable insights for other cities facing similar challenges.

The trip provided invaluable insights into China's leading role in transportation innovation. The delegation's engagements with industry leaders and visits to cutting-edge facilities highlighted the country's advancements in multimodal transport, automation, and sustainability. The information and contacts gained during this trip will be instrumental in shaping future projects and collaborations.

NTRO'S ENGAGEMENT WITH CHINA'S TRANSPORTATION LEADERS HAS STRENGTHENED OUR POSITION AS A GLOBAL INNOVATOR, POSITIONING US TO SHAPE THE FUTURE OF SUSTAINABLE TRANSPORT.

BEIJING

THE FUTURE OF TRANSPORT RESEARCH

As the capital of China, Beijing offered a wealth of opportunities to delve into the nation's transportation innovations. Visits to the Research Institute of Highway and the China Academy of Railway Sciences provided insights into cutting-edge technologies and future research directions. These institutions are at the forefront of China's road infrastructure and railway systems advancements, respectively.

RESEARCH INSTITUTE OF HIGHWAY
COLLABORATIVE TECHNICAL EXCHANGES

OBJECTIVE: Continue collaborative relationships and explore technical exchanges.

IN BEIJING, the delegation visited the Research Institute of Highways (RIOH) to continue collaborative relationships and explore technical exchanges.
The team engaged in detailed discussions with RIOH leadership, including President Mr Sun Yonghong, focusing on the ongoing collaboration between the organisations and the future research outlook.

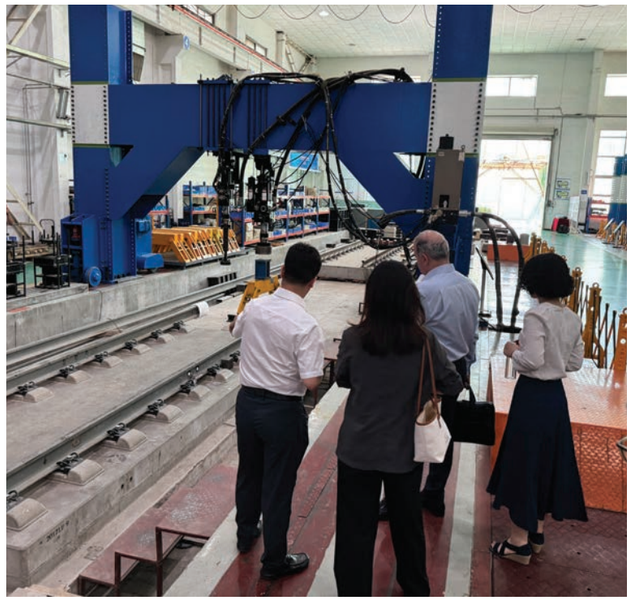
Part of this visit was the tour of RoadMaint's survey vehicle manufacturing facilities. The delegation was thoroughly impressed by the innovation and precision involved, particularly the advanced AI-driven pavement crack assessment processing.

WITNESSING RIOH'S ADVANCED AI-DRIVEN PAVEMENT CRACK ASSESSMENT PROCESSING WAS A HIGHLIGHT. THE LEVEL OF INNOVATION AND PRECISION INVOLVED IS REMARKABLE.

KEY MEETINGS:

+ Discussions with President Mr Sun Yonghong and other Research Institute of Highways (RIOH) leadership team members focused on our continued collaboration between the organisations and the research outlook.

CHINA ACADEMY OF RAILWAY SCIENCES
ESTABLISHING NEW RELATIONSHIPS



OBJECTIVE: Establish collaborative relationships and explore technical exchanges.

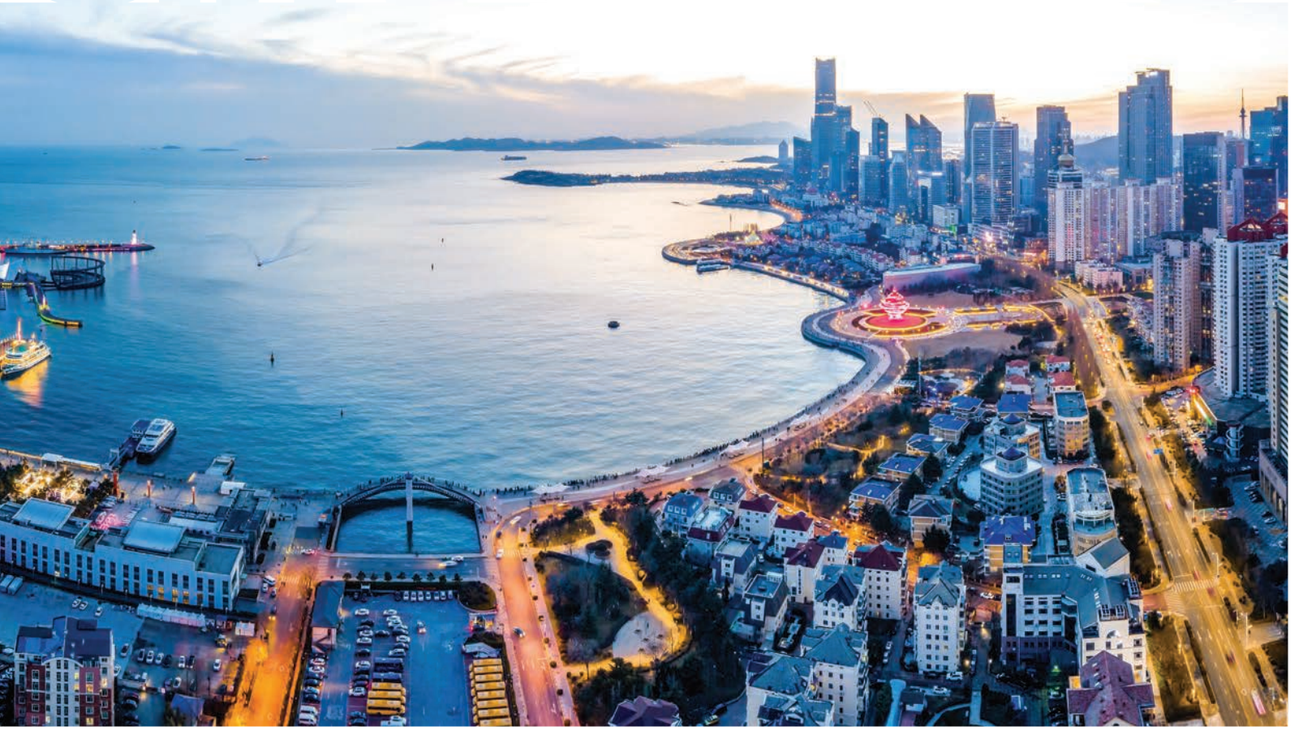
THE NEXT SIGNIFICANT VISIT in Beijing was to the China Academy of Railway Sciences (CARS). Here, the delegation aimed to establish collaborative relationships and explore technical exchanges. Discussions with President Jiang Hui and other members of the CARS leadership team centred on integrated transport and railway innovation, with a particular emphasis on high-speed rail and urban transit systems.

KEY MEETINGS:

+ Discussions with President Jiang Hui and other CARS leadership team members focused on integrated transport and railway innovation.
+ Examination of research outlooks with emphasis on high-speed rail (HSR) and urban transit systems and urban transit systems.
+ Invitation to the HSR International Conference in Beijing in July 2025.

A NEW AGREEMENT BETWEEN NTRO AND CARS HAS OPENED NEW PATHWAYS FOR TECHNICAL EXCHANGE, SETTING THE STAGE FOR FUTURE COLLABORATION AND DEVELOPMENT OF INTEGRATED TRANSPORT INITIATIVES.

QINGDAO



THE FUTURE OF TRANSPORT AUTOMATION

Qingdao Port represents the bleeding edge of an intelligent-autonomous transport future for safety, efficiency and interconnectivity. Following NTRO's exploration of Beijing's transportation landscape, the delegation ventured to Qingdao, a coastal city renowned for its stunning beaches and vibrant culture that serves as a central transportation hub, offering a unique glimpse into China's advancements in port logistics and automation.

WORLD TRANSPORT CONVENTION

NTRO'S VISION ON THE GLOBAL STAGE

OBJECTIVE: Our delegation's objective in Qingdao was three-fold:

+ To present NTRO's vision and research on the global stage.
+ To share and exchange knowledge on transport innovation with international leaders.
+ To showcase Australian transport innovations at the China-Australia Forum on Sustainable Development.

AT THE WORLD TRANSPORT CONVENTION, NTRO set out to share its vision and research on the global stage. The event provided a platform for the organisation to engage with international leaders in transport innovation and showcase Australian advancements in the field, particularly at the China-Australia Forum on Sustainable Development. Michael Caltabiano, CEO of NTRO, delivered a compelling keynote speech on the opening day along with other dignitaries, emphasising NTRO's forward-thinking approach to transport innovation and highlighting the organisation's efforts to address global transport challenges through innovative solutions.

Throughout the convention, NTRO team members actively participated in discussions, sharing their expertise and learning from other researchers and industry experts.

The outcomes of NTRO's participation were significant. The keynote and presentations facilitated a valuable exchange of ideas with international experts, further solidifying NTRO's position as a leader in transport innovation. The organisation's presence at the convention also opened doors for future collaborations with global partners, including a request to continue the China-Australia Forum at future conferences.

KEY ACTIVITIES:

+ **Keynote Address by Michael Caltabiano:** NTRO CEO Michael Caltabiano delivered a keynote speech at the World Transport Convention, emphasising NTRO's vision for the future of transport innovation. In his speech Mr Caltabiano highlighted NTRO's contributions to exploring innovative solutions for global transport challenges.

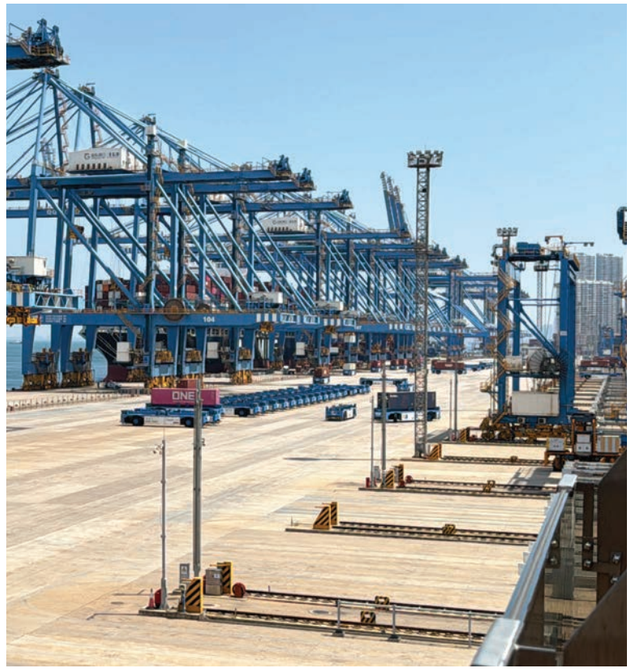
+ **Participation in the World Transport Convention:** NTRO engaged with global leaders in transport innovation, sharing insights and learning from other researchers and industry experts during the event's sessions. NTRO team members presented their research and expertise to an international audience.
+ **The China-Australian Forum on Sustainable Transport Development:** organised by China Highway and Transport Society (CHTS) and NTRO.

OUTCOMES:

+ The keynote address and presentations at the China-Australia Forum on Sustainable Development facilitated the exchange of knowledge and ideas with international experts.
+ NTRO's participation in the event strengthened its position as a leader in transport innovation, fostering opportunities for future collaborations with global partners.
+ Request for ongoing China-Australia Forum at future conferences.
+ The next one will be at the 2025 NTRO International Conference.

QINGDAO PORT & SHANDONG PORT GROUP

INSIGHTS FROM PORT LOGISTICS AND AUTOMATION



OBJECTIVE: Study China's port logistics and automation.

IN QINGDAO, the delegation's focus shifted to port logistics and automation. Visits to Qingdao Port and meetings with the Shandong Port Group provided a deep dive into China's advanced automation and logistics management systems. The team analysed port operations, including the management of millions of tonnes of cargo throughput, and discussed the challenges of maintaining efficiency while reducing carbon emissions.

KEY VISITS:

+ **Qingdao Port:** Explored port operations, which include advanced automation and logistics management systems.
+ **Shandong Port Group:** Met with key leaders to discuss port efficiency, data needs, and challenges handling millions of tonnes of cargo throughput.

NTRO MADE SIGNIFICANT DISCOVERIES ABOUT HOW TECHNOLOGY CAN ENHANCE PORT AUTOMATION, PROMOTE LOW-CARBON LOGISTICS, AND DRIVE EFFICIENCY IMPROVEMENTS.

SHANGHAI

ELECTRIFICATION AND DATA PLATFORMS

Leaving behind the coastal charm of Qingdao, our delegation headed to the bustling metropolis of Shanghai. As a global financial centre and a symbol of China's rapid economic growth, Shanghai offered a unique opportunity to explore the city's cutting-edge transportation innovations, particularly in electric vehicles and data platforms.

SHANGHAI INTERNATIONAL AUTOMOBILE CITY NEW ENERGY VEHICLE (NEV) DATA PLATFORM AND NIO

OBJECTIVE: Understand advancements in electric vehicles and data platforms.

SHANGHAI offered a closer look at the advancements in electric vehicles and data platforms. The delegation engaged with leaders from NIO and focused on EV development, battery life cycles, and autonomous vehicle testing. Detailed discussions with the International Automobile City, the New Energy Data Collection and Monitoring Centre explored the future of battery technology and its impact on urban transport, while the meetings with NIO delved into their innovative Battery as a Service (BaaS) model and forward-looking autonomous vehicle projects.

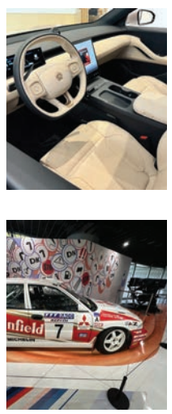
KEY MEETINGS:

+ **Shanghai International Automobile City, the New Energy Data Collection and Monitoring Centre:** The delegation engaged in detailed discussions on the future of battery technology, automation, and their impact on urban transport, as well as the future vehicle developments and expansion across China. They also visited the Shanghai Automobile Museum and met with the Shanghai New Energy Vehicle Data Collection and Monitoring Centre.

+ **NIO:** Engagements with leaders from NIO, focusing on electric vehicle (EV) development, battery life cycles, and autonomous vehicle (AV) testing. The delegation explored NIOs innovative Battery as a Service (BaaS) model and future-oriented autonomous vehicle projects, showcasing NIO advancements in battery swapping infrastructure and technology.

OUTCOMES:

+ Gained a deep understanding of China's rapid advancements in EVs, battery technology, and the challenges and opportunities of transitioning to autonomous driving.



INTERMODAL CONNECTIVITY

Nanjing, the capital of Jiangsu province, is a bustling metropolis in the Yangtze River Delta region of Eastern China. With a population exceeding 9.4 million, Nanjing is not only a city rich in history, dating back to the third century B.C., but also a modern economic powerhouse.

JIANGSU PROVINCIAL EXPRESSWAY MANAGEMENT AND MAINTENANCE CENTRE

CONNECTED TRANSPORT SYSTEMS

OBJECTIVE: To explore the city's advanced port sustainability practices, intermodal connectivity, and the application of modern technology in highway and bridge infrastructure.

KNOWN as one of China's ancient capitals, Nanjing has evolved into a crucial transport hub, boasting the world's largest inland port and the second-largest railway station. The city also holds a significant place in China's national identity, particularly its iconic bridge over the Yangtze River. The focus was on understanding how these systems contribute to optimising Nanjing's transport network and its role as a key logistics hub.

KEY VISITS:

+ **Visit to Port Longtan Authority:** The delegation visited the Port Longtan Authority to gain insights into the sustainability initiatives and intermodal connectivity at the world's largest inland port. Discussions concerned the port's strategic importance in China's logistics network and the integration of sustainable practices in port operations.

+ **Jiangsu Provincial Expressway Network Management and Maintenance Centre, Jinagsy Yangzi River Expressway Management Co. Ltd and Jiangsu Communications Holding CO. Ltd.:** A significant part of the visit was to the Jiangsu Expressway Network Management and Maintenance Centre. Here, a toll road network of 5,200 km of expressways across the province is managed, monitored, and traffic coordinated via advanced digital technologies. The delegation observed the use of connected transport systems, which are vital for managing regional traffic flow. The control centre is crucial in coordinating transport operations, ensuring smooth connectivity between road networks and other transport modalities.

+ **Jiangsu Modern Road and Bridge Company:** The delegation also visited the Jiangsu Modern Road and Bridge Company and its material and maintenance laboratories. The company applied advanced design, construction, materials testing, engineering maintenance research, and technologies to its highways, long-span bridges, and tunnel works.

OUTCOMES:

+ The Nanjing visit was instrumental in understanding the city's approach to port sustainability, intermodal connectivity, and the application of modern technology in transport infrastructure. Even though Nanjing is an older city, it has integrated transport systems to inform future projects to enhance transport efficiency and sustainability in other regions as they age and grow.

INFRASTRUCTURE DEVELOPMENT AND MANAGEMENT STRATEGIES

The delegation's visit to Shenzhen provided an opportunity to examine China's infrastructure development and management strategies. Key visits included the Shenzhen Expressway Group, where discussions highlighted innovative approaches to highway expansion and environmental management practices. The team also explored the integration of AI in road monitoring systems and automated fare collection systems.

SHENZHEN EXPRESSWAY GROUP & BYD
MANAGEMENT PRACTICES AND AI INTEGRATION

OBJECTIVE: Examine China's infrastructure development in a new city and management strategies.

KEY VISITS:

+ **Shenzhen Expressway Group:** Visits highlighted new innovative approaches to highway expansion, including the construction of the world's largest tunnel and next-generation environmental management practices. Further discussions explored their ambitious project leveraging digital twins to optimise on-ramp and off-ramp traffic flow and the integration of AI in road monitoring systems and automated fare collection systems.

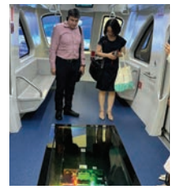
+ While in Shenzhen, the Shenzhen-Zhongshan Link, a crucial corridor connecting the two cities, was officially opened. This significant development marks a milestone in regional transportation infrastructure.

+ **BYD:** The delegation visited BYD, a leading electric vehicle manufacturer, establishing a comprehensive ecosystem for sustainable transportation. Their innovative Blade Battery offers superior fire resistance, and they continue to invest heavily in research and development, evidenced by their 22 research institutes and over 1,000 patents. BYD's commitment to electric vehicles and associated technologies is evident in its diverse offerings, including electric cars, buses, and light rail services.

OUTCOMES:
Identified potential collaboration opportunities in applying AI-driven monitoring systems and sustainable infrastructure development practices.









OUTCOMES

THE ENGAGEMENTS WITH INDUSTRY LEADERS HIGHLIGHTED CHINA'S ADVANCEMENTS IN MULTIMODAL TRANSPORT, AUTOMATION, AND SUSTAINABILITY.

GLOBAL TRANSPORT COLLABORATION

OUTCOMES

BEIJING - QINGDAO - SHANGHAI - NANJING - SHENZHEN

GTC CHINA 2024 provided invaluable insights into China's leading role in transportation innovation. The engagements with industry leaders and visits to cutting-edge facilities highlighted the country's advancements in multimodal transport, automation, and sustainability. The information and contacts gained during this trip will be instrumental in shaping future projects and collaborations.



NTRO

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欢迎各位专家提
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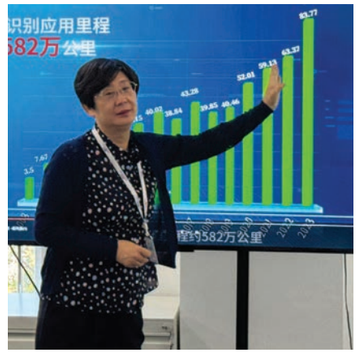
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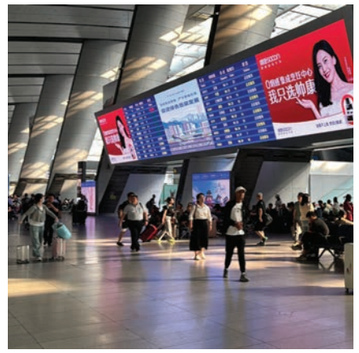


THE CHINA GTC PROVIDED INVALUABLE INSIGHTS INTO THE NATION'S LEADING ROLE IN TRANSPORTATION INNOVATION.

THE INFORMATION AND CONTACTS GAINED DURING THIS TRIP WILL BE INSTRUMENTAL IN SHAPING FUTURE PROJECTS AND COLLABORATIONS.

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