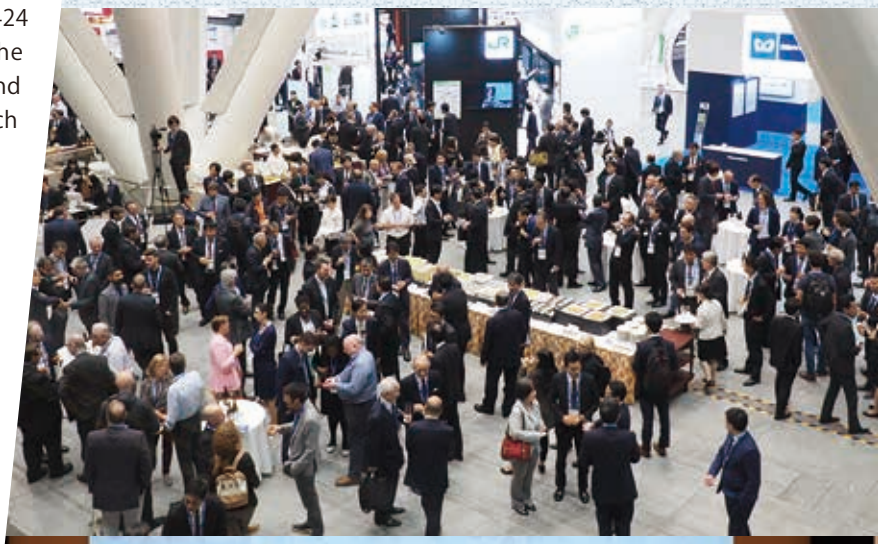
WCRR 2019 — Toward Enhanced Customer Experience

993 railway professionals gathered in Tokyo

The 12th World Congress on Railway Research, WCRR 2019 was held from October 28 to November 1, 2019 at the Tokyo International Forum under the theme "Railway Research to Enhance the Customer Experience." WCRR is an international congress organized by the WCRR Organizing Committee composed of Union Internationale des Chemins de fer (UIC), Société Nationale des Chemins de fer Français (SNCF), Deutsche Bahn AG (DB AG), Trenitalia, Rail Safety and Standards Board (RSSB), Transportation Technology Center, Inc. (TTCI) and Railway Technical Research Institute (RTRI). A total of 993 people, 424 from 37 countries and 569 from Japan, participated in the congress. Three Plenary Sessions, 10 Organized Sessions, and 60 oral and interactive poster sessions covering eight research fields were provided. A total of 353 papers were presented.

Dr. Tetsuo Uzuka
General Director
International Division
Former General Secretariat of WCRR 2019



Dr. Ikuo Watanabe
Chairperson of the WCRR 2019 Organizing Committee
(Executive Vice President of RTRI)

Opening Ceremony welcomed delegates from around the world

The Opening ceremony of WCRR 2019 started with remarks by Dr. Ikuo Watanabe, Chairperson of WCRR Organizing Committee and Executive Vice President of RTRI, followed by the welcome speech by Dr. Norimichi Kumagai, President of RTRI, who mentioned his hope that the congress would trigger the move to build a better future for railways. Mr. Nobuhide Minorikawa, State Minister of Land, Infrastructure, Transport and Tourism, Mr. Takashi Nakajima, Director, Bureau of Urban Development, Tokyo Metropolitan Government and Prof. Gianluigi Castelli, Chairman of UIC, Chairman of Ferrovie dello Stato Italiane (FS) Group made congratulatory speeches.

Plenary Sessions highlighted innovation enablers and key research areas

Three Plenary Sessions were organized with top executives of railway operators, rail-related manufactures and research organizations. These Plenary Sessions were conducted to identify innovation enablers and key research areas where we should be targeting in order to elevate the value of railways. Plenary Session 1, which was moderated by Prof. Anson Jack, University of Birmingham, UK, had the theme "The role of Railway Operators in Enhancing the Customer Experience." Plenary

From top to bottom

Mr. Nobuhide Minorikawa
State Minister of Land, Infrastructure, Transport and Tourism

Dr. Norimichi Kumagai
President of RTRI

Mr. Takashi Nakajima
Director, Tokyo Metropolitan Government

Prof. Gianluigi Castelli
Chairman of UI, Chairman of Ferrovie dello Stato Italiane (FS) Group

Session 2, which was moderated by Mr. Nick Kingsley, Managing Editor, Railway Gazette International, had the theme "Contribution of Railway Suppliers to Elevating the Value of Railways." Plenary Session 3, which was moderated by Prof. Roderick Smith, Future Railway Research Centre, Imperial College London, UK, had the theme "Research and Development for Future Railways." The details of these Plenary Sessions are described in the articles contributed by each moderator that appear in this issue of Ascent magazine.

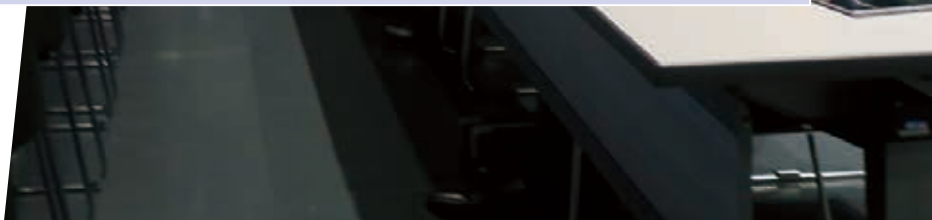
10 Specially prepared Organized Sessions, moderated by world's leading experts, invoked active and in-depth discussion

The Organized Sessions were included in the congress program for the first time. They were intended to encourage in-depth discussions on the world's hottest topics and were characterized by unified topics and flexible styles of presentation. Forty-four presentations (ten from Japan) were made at the Organized Sessions under the leadership of the chairpersons who are outstanding experts in each field.

As is depicted in Table 1, six out of ten Organized Sessions were concerned with cutting-edge technologies attracting high attention from the railway community. The other four Sessions were related to more general, cross-cutting themes.

Table 1: List of Organized Sessions

Organized Sessions for Cutting-Edge Technologies	Decision-Aid for Real-Time Railway Operation Control
	Autonomous Trains on Main Lines
	Digital Technologies for Predictive Maintenance
	On-Board Monitoring for Vehicle/Infrastructure Diagnostics and CBM
	Integration of On-Board and Wayside Measurements with Virtual Methods Towards Safer, More Cost-Effective, Risk-Conscious and Innovation Spurring Assessment Methods for Running-Dynamics
	Maglev Systems
Organized Sessions for Cross-cutting Themes	Horizon Scanning for the Railways: An International Collaboration Perspective
	Global Certification for Innovative Product Development
	Global Vision for Railway Development
	From Research to Benefits: How to Accelerate the Innovation Process

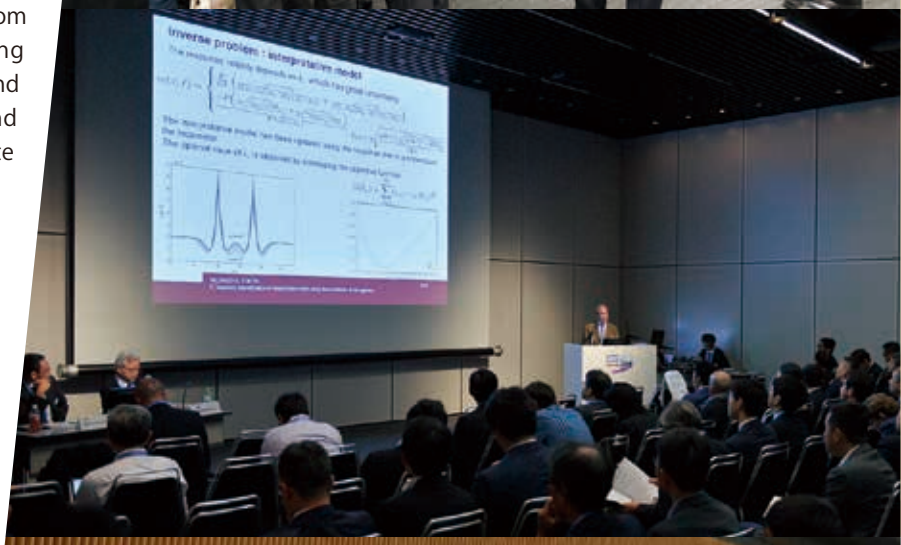


Oral Sessions/Interactive Poster Sessions covered 8 main categories of railway research

At the oral and interactive poster sessions, 167 oral presentations (44 from Japan) and 142 (59 from Japan) interactive poster presentations were made in the following eight categories:

- Improvement of Service Quality, Speed, Time to Destination, and Functionality
- Economics, Policy and Planning
- Sustainability
- Safety and Natural Hazard Management
- Rolling Stock
- Infrastructure
- Railway System Interface
- Maglev and New Transport Systems

It is worthy of special mention that we had as many as six sessions, two Organized Sessions and more than 50 papers regarding condition-based maintenance (CBM), which is one of the essential technologies for digitalized maintenance. Sessions on the application of digital technologies to railway operations, including autonomous trains, attracted much attention from the audience, reflecting the rail community's increasing interest in these areas. I believe it is time for us to apply and develop digital technologies to actual rail operations, and that we are already in the phase of working out a concrete methodology.



Exhibition and Social Events provided networking opportunities for railway professionals

In addition to presentations in the sessions mentioned above, we provided delegates with opportunities for exchanging their ideas and experiences in a more informal and relaxing atmosphere. These opportunities included the technical exhibition, which took place in the same Congress venue, and a variety of social events.

The exhibition provided opportunities for rail-related organizations in Japan and overseas to present their research works and latest technologies to the congress delegates. Major exhibitors were the JR group (represented by RTRI), JR East, Shift2Rail Joint Undertaking, China Academy of Railway Science, RSSB, and the University of Birmingham.

The Welcome Reception, which was the first formal gathering of this congress, was held on the first day

of the congress and the participants enjoyed the ideal networking opportunity as well as visiting each exhibition booth. The Tokyo Bay Reception was held on the second day and provided opportunity for the participants to mingle with each other and enjoy a light meal and drinks on a cruise boat.

The Gala Dinner was held on the third day of the congress as the official congress banquet at TOKYO KAIKAN (reopened in January 2019 after refurbishment), which has been serving as an authentic venue of social exchange in Tokyo since 1922. About 800 people attended the Gala Dinner, where Prof. Eisuke Masada, Chairman of RTRI, Mr. Kazuyoshi Akaba, Minister of the Land, Infrastructure, Transport and Tourism and Mr. Yuji Fukasawa, President and CEO of East Japan Railway Company gave welcome greetings.

Delegates experienced state-of-the-art Japanese railway technologies through 11 Technical Visits

Delegates chose from 11 Technical Visits to railway related facilities and construction sites that were provided. Thanks to the cooperation by JR companies, Japan Railway Construction, Transport and Technology Agency, Tokyo Metro and other railway-related companies, these visits gave participants good opportunities to see the technologies that support the high level of safety, efficiency, convenience and environmental performance of Japanese railways. They included two tours of RTRI's facilities: one to the RTRI and Railway Information Systems Co., Ltd. in Kunitachi, and the other to RTRI's Wind Tunnel Technical Center in Maibara and the Kyoto Railway Museum. These tours were joined by 53 and 26 delegates respectively.

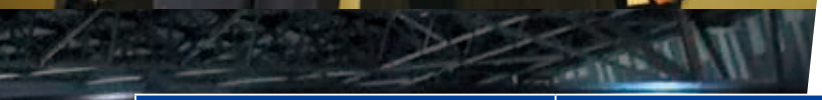
From top to bottom

Mr. Kazuyoshi Akaba
Minister of Land, Infrastructure, Transport and Tourism

Mr. Yuji Fukasawa
President and CEO of East Japan Railway Company

Prof. Eisuke Masada
Chairman of RTRI

Kagami-Biraki (Breaking open a ceremonial sake barrel)



Congress summary and announcement of the WCRR 2022 were presented at Closing Ceremony

At the Closing Ceremony, WCRR 2019 Organizing Committee Chairperson, Executive Vice President Watanabe of RTRI summarized the events of the Congress and mentioned some key points discussed during the sessions. He highlighted the importance of digital technologies in improving railway operations and maintenance processes. Following Dr. Watanabe's concluding remarks, awards were given to the best paper in each field and the young researcher. Ms. Luisa Moisio, Program Director of RSSB and Prof. Anson Jack, University of Birmingham announced that the next WCRR will be held in Birmingham, UK in 2022. Dr. Watanabe handed over the WCRR plaque to Ms. Moisio and Professor Jack.

Best paper award winners

Category	Title	Presenter
Improvement of Service Quality, Speed, Time to Destination, and Functionality	**Maximization of passengers' punctuality by real-time junction rescheduling**	**François RAMOND, SNCF, France**
Economics, Policy and Planning	**The Hungarian railway reform process and the implementation of periodic timetable (Taktfahrplan)**	**Balázs ÁCS, University of Szeged, Hungary**
Sustainability	**Towards a sustainable railway infrastructure**	**Matthias LANDGRAF, Graz University of Technology, Austria**
Safety and Natural Hazard Management	**Taking a Human Factors Approach to Safety Critical Training: A Case Study**	**Ann MILLS, RSSB, UK**
Rolling Stock, Maglev and New Transport Systems	**Development of rolling stock under floor visual inspection system by image processing technique**	**Hiroyuki NAKAJIMA, Tokyo Metro, Japan**
Infrastructure	**System for Preventing Flaking of Lining Concrete in Subway Tunnel Using Four Methods**	**Hirotake NOGUCHI, East Japan Railway Company, Japan**
Railway System Interface	**Development of a High-Speed Adjustable Perturbation Slab Track**	**Dingqing LI, TTCI, USA**
Condition-based maintenance, condition monitoring, inspection and detection, including data and predictive analytics	**Wearing models for pantograph stripes condition-based maintenance**	**Alfredo BIANCUCCI, Trenitalia, Italy**
Young Researcher	**Adaptable Communication System for all Railways**	**Ulrich GEIER, Kapsch CarrierCom Deutschland, Germany**