



## Current status of the work in PIARC's Technical Committee 4.4 "Tunnels"

Ingo Kaundinya, Chair TC 4.4 "Tunnels"

IV International Tunneling Forum  
Wroclaw, Poland, 31 May 2022

# What is PIARC?

- PIARC is the World Road Association
- We were founded in 1909 as a non-profit, non-political Association
- Our goal is to organise exchange of knowledge on all matters related to roads and road transport
- PIARC has a Consultative Status to Economic and Social Council of United Nations since 1970
- Acknowledged for the quality of its outputs
- The activities of the Association are guided by a Strategic Plan of 4 years



# Structure according to Strategic Plan 2020-2023

Strategic Theme 1 Road Administration	Strategic Theme 2 Mobility	Strategic Theme 3 Safety and Sustainability	Strategic Theme 4 Resilient Infrastructure
<b>TECHNICAL COMMITTEES</b>			
TC 1.1 Performance of Transport Administrations	TC 2.1 Mobility in Urban Areas	TC 3.1 Road Safety	TC 4.1 Pavements
TC 1.2 Planning Road Infrastructure and Transport to Economic and Social Development	TC 2.2 Accessibility and Mobility in Rural Areas	TC 3.2 Winter Service	TC 4.2 Bridges
TC 1.3 Finance and Procurement	TC 2.3 Freight	TC 3.3 Asset Management	TC 4.3 Earthworks
TC 1.4 Climate change and resilience of Road Network	TC 2.4 Road Network Operation/ITS	TC 3.4 Environmental Sustainability in Road Infrastructure and Transport	TC 4.4 Tunnels
TC 1.5 Disaster management			
<b>CROSS-CUTTING COMMITTEES</b>			
Terminology Committee			
Road Statistics Committee			
<b>RESPONSE TEAM</b>			
PIARC Covid-19 Response Team			
<b>TASK FORCES</b>			
TF 1.1 Well-Prepared Projects	TF 2.1 New mobility and its impact on road infrastructure and Transport	TF 3.1 Road Infrastructure and Transport Security	TF 4.1 Road Design Standards
TF 1.2 HDM-4	TF 2.2 Electric Road Systems		

# TC 4.4 Tunnels

- 150 members
- 37 Countries around the world represented
- Work is organized in TC meetings and 7 working groups and task forces



# TC 4.4 Tunnels

- Working groups and task forces

WGs cycle 2020-2023	Leader	Co-leader	Responsible for Topic (Strategic Plan 2020-23)
WG 1 “Sustainable Operations and Maintenance”	Arthur Kabuya	Urs Welte	4.4.2
WG 2 “Safety and Resilience”	Ronald Mante	Bernhard Kohl	4.4.1
WG 3 “ITS in Tunnels”	Henric Modig	Martin Kelly	4.4.4
WG 4 “New Propulsion Technologies & Ventilation”	Peter Sturm	Gary Clark	4.4.3
Task Force “Knowledge Management / Tunnel Manual”	Salvatore Giua	Hing-Wai Wong	4.4.5
Task Force “International Conference”	Rafael Lopez	Ignacio del Rey	4.4.6
Task Force DGQRAM	Christophe Willmann		4.4.7

# Activities in the current work cycle 2020 - 2023

## 1. Measures for increasing resilience of tunnels (4.4.1)

- **Literature Review Report on Tunnel Resilience (2021LR01EN)**
  - More than 100 literature sources were reviewed and the results were synthesized
- **Briefing Note including Collection of Case Studies (2022R04EN)**
  - 18 case studies collected from 12 countries world-wide
- **Full Technical Report (2023)**
  - Containing practical road map to manage and improve resilience;
  - Containing “measure sheets” with assessment of effectiveness and cost-effectiveness of various resilience measures with main focus on recovery



# Activities in the current work cycle 2020 - 2023

## 2. Best practices in management in urban and heavily trafficked tunnels (topic 4.4.2)

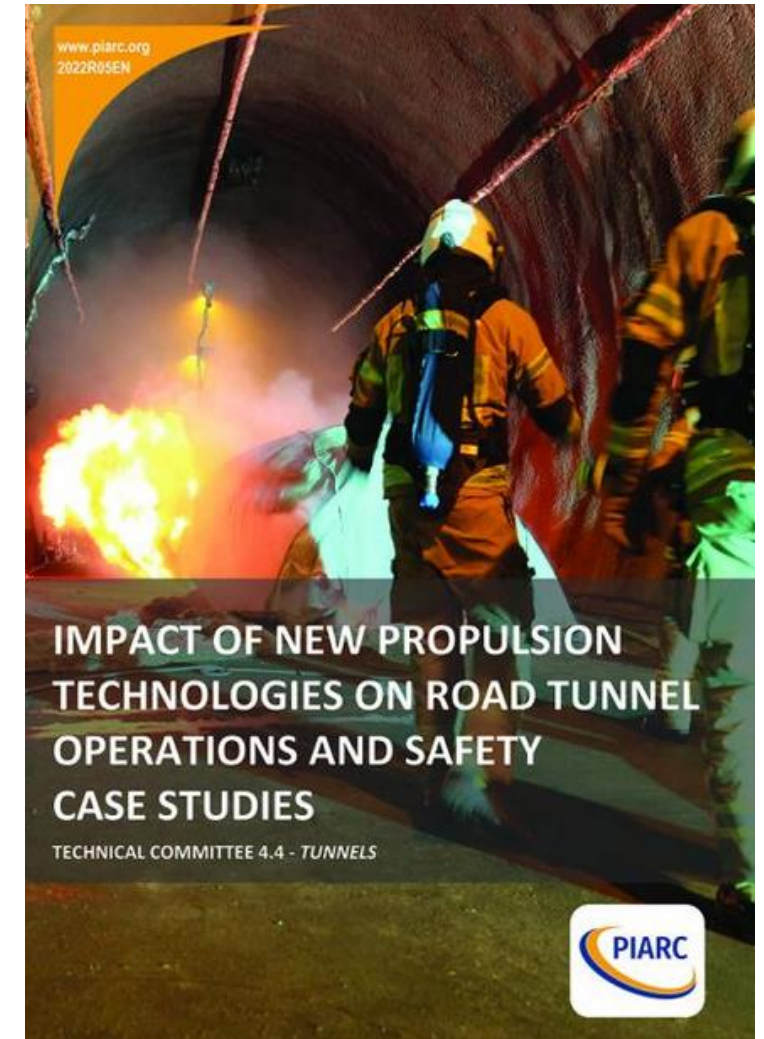
- **Collection of Case Studies Report (2022R06EN)**
  - 11 case studies collected, including
    - Implementation of the "quick responders" concept with different approaches,
    - Measures to organize work and to reduce nuisance to users during the renovation of tunnels,
    - New tools for maintenance and operation.
- **Full Technical Report (2022)**
  - Recommendations in the fields of traffic, operation maintenance, equipment, refurbishment strategies



# Activities in the current work cycle 2020 - 2023

## 3. Impact of new propulsion technologies on road tunnel operations and safety (topic 4.4.3)

- **Joint Workshop PIARC & ITA Cosuf: Webinar 20./21. October 2021,**
  - Successful event with more than 200 participants,
  - Report & presentations available at [www.ita-cosuf.org](http://www.ita-cosuf.org) & in the Case Studies Report
- **Case Studies Report (2022R05EN):**
  - Results of recent research projects and
  - Some limited information about accidents and fires in road tunnels involving NEC vehicles.
- **Full Technical Report (2023)**





# Activities in the current work cycle 2020 - 2023

## 4. Intelligent Transportation Systems in tunnels (topic 4.4.4)

- **Full Technical Report (2022)**

- Identification of technological advances in ITS and their impact on road tunnel operation and user safety
- Highlight of the main expectations of the tunnel community regarding these systems
- Current topics: Platooning, GPS pilot in Stockholm Southern link, UN regulation No. 157 for ALKS (automated lane keeping systems) – SAE Level 3



# Activities in the current work cycle 2020 - 2023

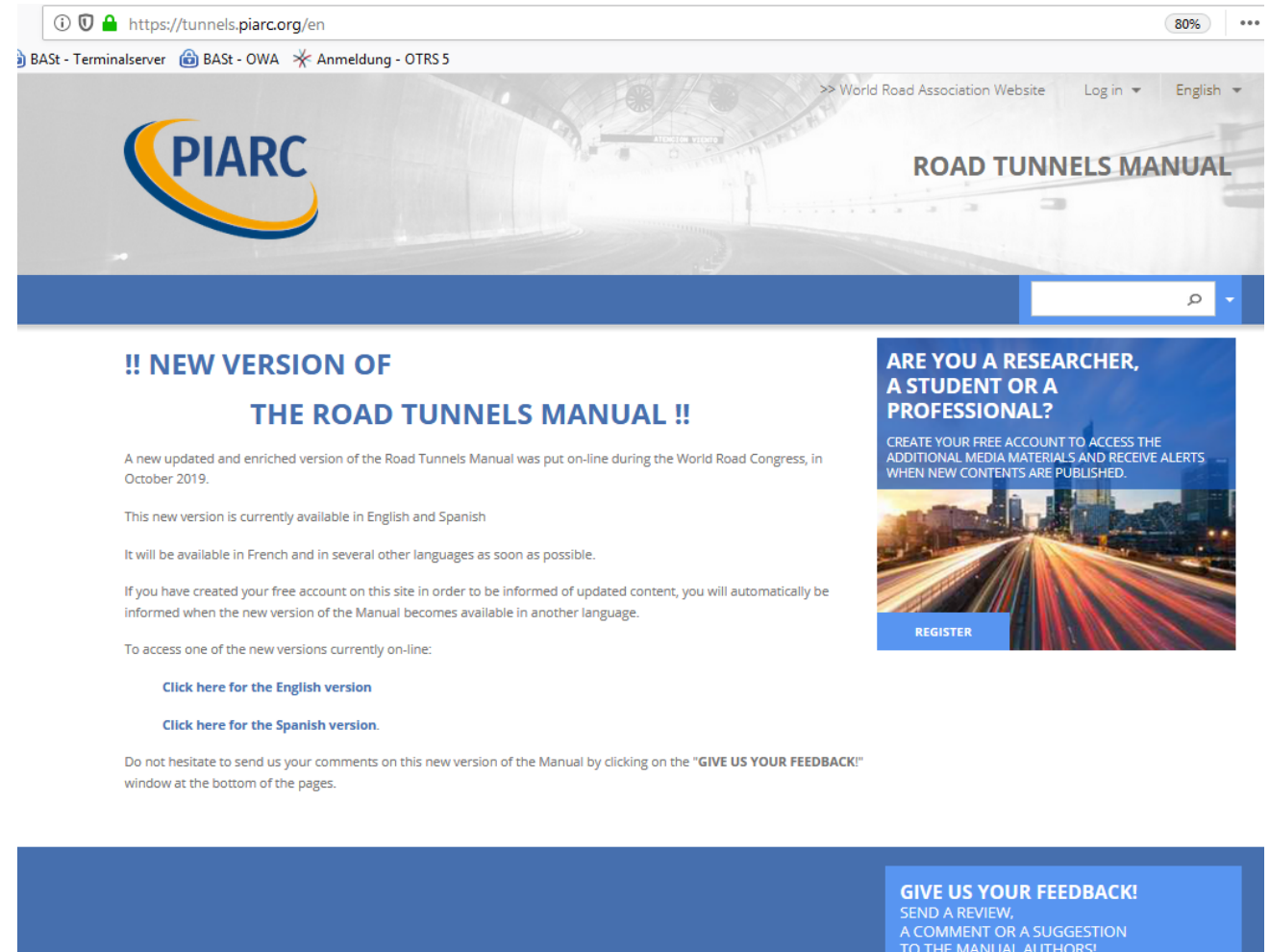
## 5. Update of the Online Road Tunnels Manual (topic 4.4.5)

Ongoing revision of the Road Tunnels Manual:

- NEW (2019) version available (English and Spanish, French to be added soon)
- New pages on civil works in preparation
- Recent content will be added (e.g. hyperlinks to new reports)

-> All PIARC knowledge on tunnels

<https://tunnels.piarc.org/en>



https://tunnels.piarc.org/en

BASSt - Terminalserver BASSt - OWA Anmeldung - OTRS 5

World Road Association Website Log in English

PIARC

ROAD TUNNELS MANUAL

!! NEW VERSION OF THE ROAD TUNNELS MANUAL !!

A new updated and enriched version of the Road Tunnels Manual was put on-line during the World Road Congress, in October 2019.

This new version is currently available in English and Spanish

It will be available in French and in several other languages as soon as possible.

If you have created your free account on this site in order to be informed of updated content, you will automatically be informed when the new version of the Manual becomes available in another language.

To access one of the new versions currently on-line:

[Click here for the English version](#)

[Click here for the Spanish version.](#)

Do not hesitate to send us your comments on this new version of the Manual by clicking on the "GIVE US YOUR FEEDBACK!" window at the bottom of the pages.

ARE YOU A RESEARCHER, A STUDENT OR A PROFESSIONAL?

CREATE YOUR FREE ACCOUNT TO ACCESS THE ADDITIONAL MEDIA MATERIALS AND RECEIVE ALERTS WHEN NEW CONTENTS ARE PUBLISHED.

REGISTER

GIVE US YOUR FEEDBACK!  
SEND A REVIEW,  
A COMMENT OR A SUGGESTION  
TO THE MANUAL AUTHORS!

# Activities in the current work cycle 2020 - 2023

## 6. Support for updating and improving of DG-QRAM Software (topic 4.4.7)

- Update phase 2 of the software is in progress
- New Software Version: DG-QRAM license V 4.04 (phase 1) could be ordered at PIARC ([www.piarc.org](http://www.piarc.org)). Discount if you are already a user of the software
- Video and presentations from the QRAM webinar available at [www.piarc.org](http://www.piarc.org)

Worldwide webinar on the DGQRAM software


**A dangerous goods transport risk assessment tool** that is being upgraded!



DGQRAM (Dangerous Goods Quantitative Risk Assessment Model) is a software developed under the aegis of PIARC (World Road Association). This software can be used to assess the societal risks of transporting dangerous goods through a tunnel or along a given route. It provides quantitative indicators and curves. Results can be aggregated and/or compared between one another and to given criteria. This software is currently used in 26 countries and is in the process of being upgraded.


**23rd June 2021 11:00 – 13:00 UTC**  
07:00 - 09:00 US-DC / 13:00 - 15:00 FRA / 19:00 - 21:00 CN  
20:00 - 22:00 JPN / 21:00 - 23:00 NSW  
Click [here](#) to register

PIARC CETU



**Transport of Dangerous Goods through road tunnels: Quantitative Risk Assessment Model (v. 4.04)**

Technical Committee D5 Road Tunnel Operations  
World Road Association

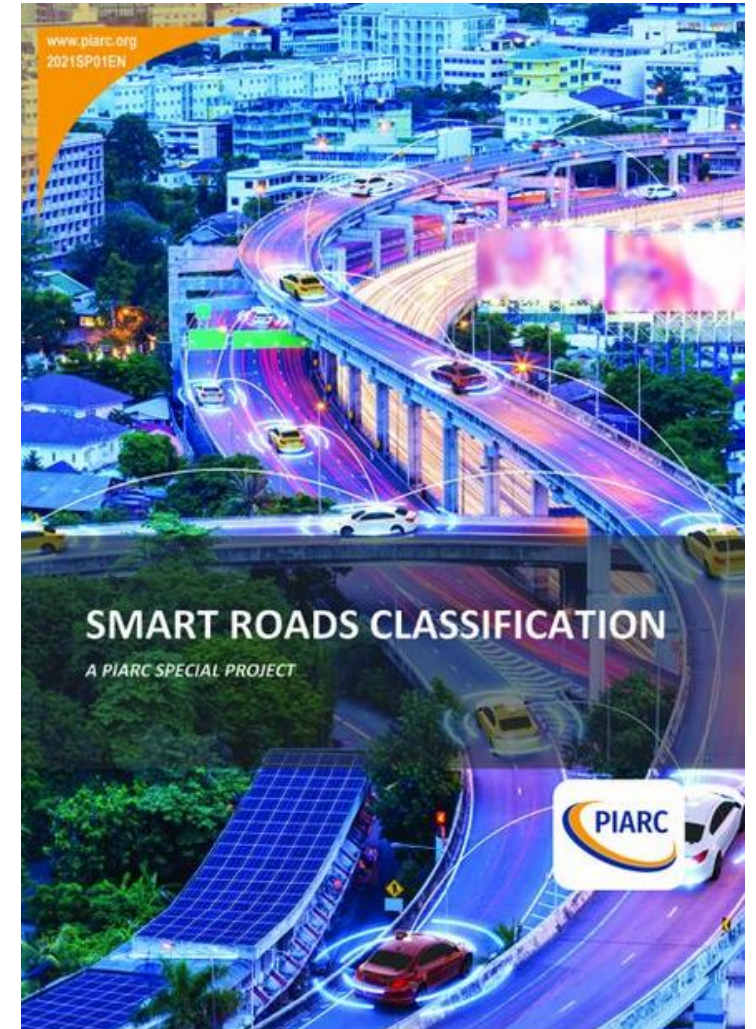
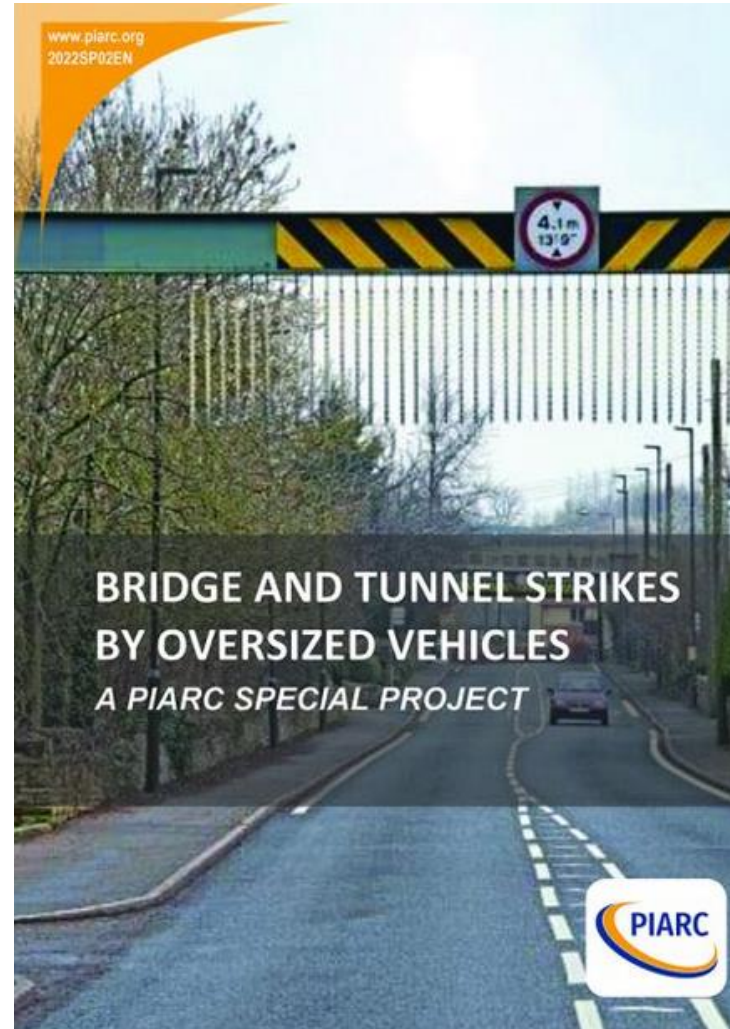


PIARC

# Activities in the current work cycle 2020 - 2023

## 7. PIARC Special Projects 2021

- Supported by TC4.4 members
- Reports available on PIARC website



# Activities in the current work cycle 2020 - 2023

## Past events


International Webinar on „Road Tunnel: Recent Trends, Innovations and Way Forward“

Streamed from Delhi / India (5<sup>th</sup> – 6<sup>th</sup> May 2021)

Organized by:



Organizing Partners:



**INTERNATIONAL WEBINAR ON**  
**ROAD TUNNEL : RECENT TRENDS, INNOVATIONS AND WAY FORWARD**

5<sup>th</sup> & 6<sup>th</sup>  
May 2021  
14:00-17:30 Hrs [IST]

**REGISTER NOW**  
Click here

With the Presence of

**Shri Nitin Gadkari**  
Hon'ble Union Minister RTH & MSME,  
Government of India

**General (Dr) V.K. Singh**  
PWSM, ANSM, YSM (Retd)  
Hon'ble Minister of State (RTH&H)  
Government of India

**Objectives of the Webinar:**  
The webinar will provide a common platform to all national/international stakeholders to discuss and identify the constraints, best available practices/ technology around the globe and to recommend the strategy and action plan to overcome the constraints and enhance the road tunneling works. Besides the webinar provides an excellent opportunity for practitioners to exchange their views as well as to get the exposure to the challenges, recent trends, innovations best available solutions, practice, in the area of road tunnels.

**For more information click here..**

**SESSION 1**  
Inaugural Session & Key Note Lecture "Overviews of Road Tunnel Works Across the Globe"

**SESSION 2**  
Survey, Investigation and DPR Preparation for Tunnel Works

**SESSION 3**  
Tunnel Excavation Technology & Support System, Extra Ordinary Geological Occurrences (EGOs) and Related Contractual Issues

**SESSION 4**  
Fire, Ventilation, Safety & Digitalization of Tunnel

**SESSION 5**  
International & Indian Experiences/ Case Studies on Tunnel

**SESSION 6**  
Panel Discussion & Summing up webinar with Implementable Recommendations

5<sup>th</sup> May  
6<sup>th</sup> May

# Activities in the current work cycle 2020 - 2023

## Past events

Technical workshop on road tunnels at 34<sup>th</sup> Japan Road Conference (4<sup>th</sup> Nov 2021)

パネルディスカッション

PIARC (世界道路協会)の  
取組ワークショップ  
～TC4.4 トンネルでの取組(共催)～



砂金氏



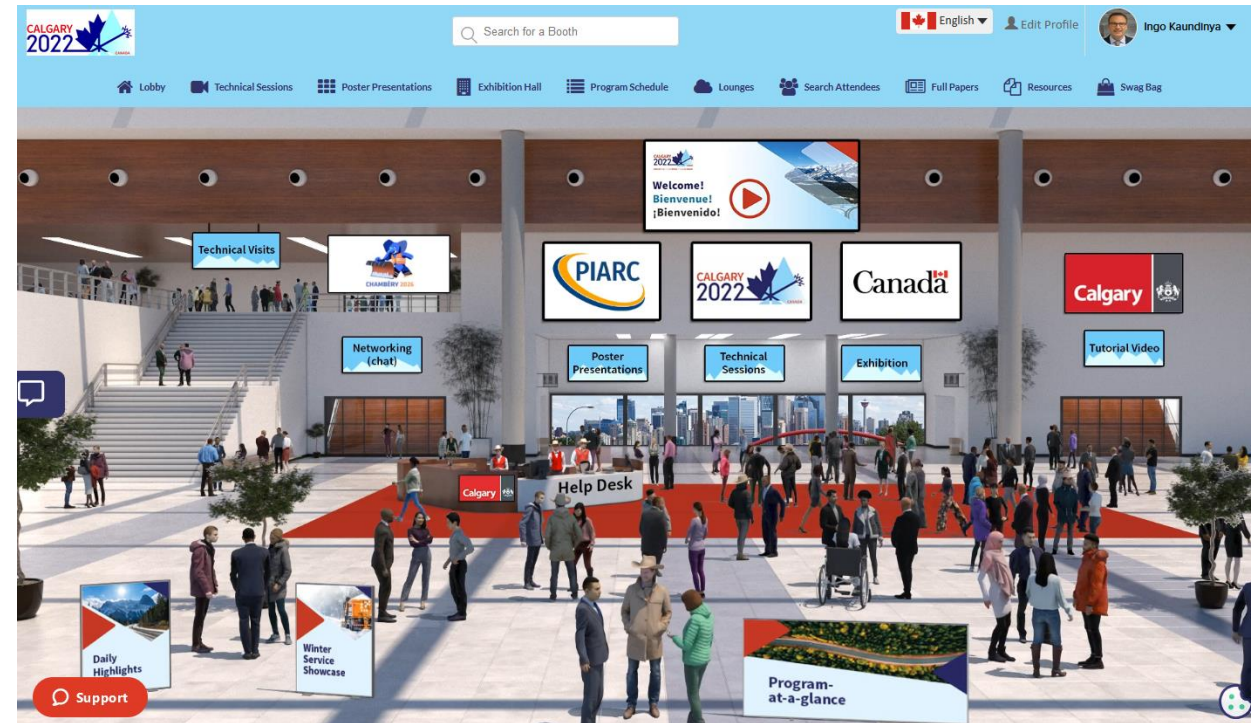
(上段左から) 日下敦氏, Bernhard Kohl 氏, Tshibela Arthur Kabuya 氏,  
(下段左から) Ronald Mante 氏, Arild Sovik 氏, Ingo Kaundinya 氏



# Activities in the current work cycle 2020 - 2023

## Past events

Technical Session R14 „Increasing Resilience of Tunnels“ at the virtual 16<sup>th</sup> World Winter Service and Road Resilience Congress (9<sup>th</sup> Feb. 2022)



# Activities in the current work cycle 2020 - 2023

## Past events

World Tunnel Seminar Medellín, Colombia (29<sup>th</sup> March – 1<sup>st</sup> April 2022)



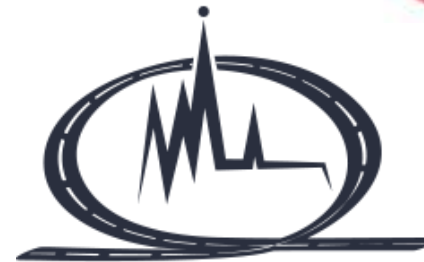


# Future PIARC Tunnel events

- 2nd PIARC International Conference on Road Tunnel Operations and Safety, 25 – 28 October 2022 – Granada (Spain) (<https://www.piarc-tunnels-spain2022.org/>)
- PIARC International Seminar "Advances in Design, Construction and Maintenance of Tunnels" 20 – 22 April 2023 – Delhi/Dehradun (India)
- 27th World Road Congress 2-6 October 2023, Prague (Czech Republic) (<https://www.wrc2023prague.org/>)



सत्यमेव जयते



**XXVII<sup>TH</sup> WORLD  
ROAD CONGRESS  
PRAGUE 2023**

**Thank you for your kind attention!**  
***Dziękujemy za uwagę!***



**Ingo Kaundinya**

**Chair**

**PIARC TC 4.4 Tunnels**

**PIARC.TC4-4@bast.de**

World Road Association (PIARC)  
Grande Arche – Paroi Sud – 5<sup>o</sup> étage  
92055 – La Défense Cedex – France



@PIARC\_Roads



World Road  
Association PIARC



World Road  
Association PIARC



World Road  
Association PIARC

**[www.piarc.org](http://www.piarc.org)**

