



Activity of the PIARC Tunnel Committee and 3rd International PIARC Tunnel Conference

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PIARC TC4.4 Chair





VI International Tunnel Forum, Bielsko-Biala, Poland,
13th -15th May 2024

PIARC priorities for the Work Cycle 2024 - 2027

- Decarbonization / Sustainability
- Adapting to the digital economy
- Resilient Infrastructure / CC Adaptation
- Active and Reduced Mobility Users
- Road Traffic Safety
- Ensuring gender inclusion and diversity
- Foster knowledge exchange with Low and lower-middle income countries



Structure according to Strategic Plan 2024-2027

Strategic Theme 1 Road Administration 	Strategic Theme 2 Road Mobility 	Strategic Theme 3 Safety and Sustainability 	Strategic Theme 4 Resilient Infrastructure 
Technical Committees			
TC 1.1 Performance of Transport Administrations	TC 2.1 Roads for Accessibility and Mobility in Urban and Peri-urban Areas	TC 3.1 Road Safety	TC 4.1 Pavements
TC 1.2 Contribution of Roads to Economic and Social Development	TC 2.2 Roads for Equity, Accessibility and Mobility in Rural and Interurban Areas	TC 3.2 Winter Service	TC 4.2 Bridges
TC 1.3 Finance and Procurement	TC 2.3 Sustainable Freight	TC 3.3 Asset Management	TC 4.3 Earthworks
TC 1.4 Planning the Resilience of Road Networks - Climate Change and other Hazards	TC 2.4 Road Network Operations and ITS for Sustainability	TC 3.4 Environmental Impacts of Road Infrastructure and Transport	TC 4.4 Tunnels
TC 1.5 Disaster management	TC 2.5 Road infrastructure for Connected and Automated Mobility	TC 3.5 Road infrastructure for road transport decarbonization	TC 4.5 Decarbonization of road Construction and Road Maintenance
Task Forces			
TF 1.1 HDM-4 (postponed)			TF 4.1 Road Design Standards
Cross-cutting committees			
Terminology Committee			
Road Statistics Committee			

4.4.1 Sustainability of tunnel operation: new approaches

- Best practices on design and construction including self-supplying of energy at tunnels.
- Criteria for the design and construction of more sustainable and cost-effective tunnels.
- Best practices on sustainable and cost-effective road tunnel operation.
- Criteria for the monitoring of the energy consumption related to sustainable and cost-effective road tunnel operation.
- Current experience to identify possible state-of-the-art measures for energy efficiency during the road tunnel operation phase.
- Technical and organizational possibilities around safety equipment and its operation are considered.



Photo: Autobahn NL Nordbayern



Photo: BAST

Background: Existing Report 2017R02EN « *First steps to a sustainable approach* », to be updated

4.4.2 Impact of the development of active modes of transport (walking, cycling, wheelchairs) in road tunnels

- Roadway sharing issues (coexistence of road traffic, cycles and sometimes pedestrians) / separate tube for active mobility users.
- Geometric considerations, necessary cross sections, design aspects.
- Possibilities for retrofitting of existing road tunnels.
- Safety measures to protect road users (like pedestrians, cyclists, reduced mobility users) incl. evacuation issues, ventilation and air quality issues.
- Intermodal aspects (e.g. bus stops in underground facilities).
- “Good practices” to carry out sustainable and safe operation of tunnels with users of different means of transport.
- Impact on risks for safety and how to take them into account in risk analyses and in the safety documentation.



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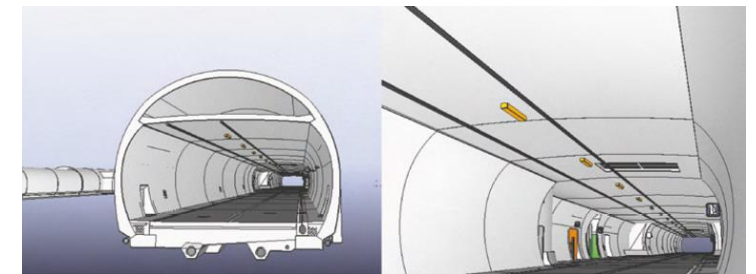
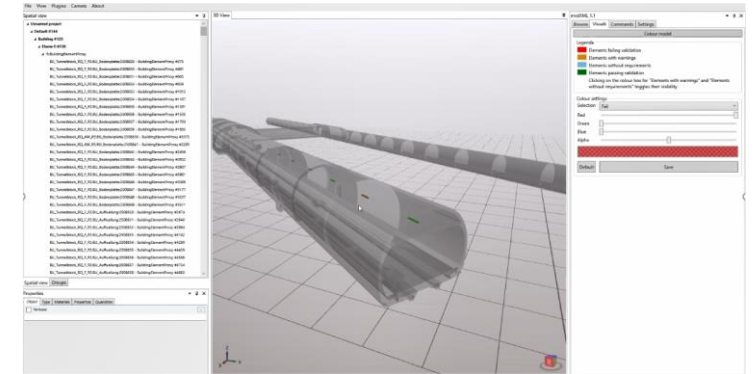


Photo: CETU

Background: Existing Report 2019R20EN « *General principles to improve Accessibility for Persons with Reduced Mobility in Road Tunnels* »

4.4.3 Digitalization of Road Tunnel Design and Management

- Provide an overview of the importance of digitalization in road tunnel design and management.
- Highlight the potential benefits and challenges associated with digital transformation.
- Conduct a comprehensive review of existing literature on digitalization in road tunnel design and management.
- Identify key trends, technologies, and case studies relevant to this topic.



Figures: BAST

Background: No existing technical reports, but similar topics already addressed (e.g. Resilience; RAMS; Real-time communication with users)

4.4.4 Road Tunnel Operation and Safety Issues related to the Usage of New Energy Carriers (NEC) in Road Vehicles

- Incidents with NEC vehicles, collection of data internationally, probability of incidents, improvement of data reliability.
- Review and synthesis of new test data (fire / explosion).
- New developments in battery technologies, e-fuels (hydrogen, synthetic fuels) vehicles.
- Impact of NEC powered HGV vehicles / busses e.g. on fire size.
- Impact of explosions on tunnel structures, operational consequences (closure, repair).
- Prevention and mitigation measures for dangerous phenomena: e.g. detection, permanent ventilation, etc.
- Intervention / incident management, implications of incidents (e.g. with busses).
- Impact on risk assessment methodology.



Photos: TU Graz / BRAFA project

Background: Joint on-line workshop with ITA-COSUF in October 2021, Existing Report 2023R34EN « *Impact of New Propulsion Technologies On Road Tunnel Operations and Safety* »

Other / ongoing topics

- **4.4.5** Continuous updating of the Online Road Tunnel Manual
Background: existing RTM, as updated during the 2020-2023 cycle
- **4.4.6** Preparation of the 3rd International Conference on Road Tunnel Operation and Safety (2026)
Background: 2nd Int. Conference organized in Granada (Spain) in Oct.2022
- **4.4.7** Dissemination and possible update of DG-QRAM
(further training sessions; feedback collection from users; possible new improvements)
Background: DG-QRAM version 4.10 updated during cycle 2020-2023; worldwide seminar was organized; training sessions were organized
- Organization of Seminars in low- and middle-income countries



Photo: ENALOS



3rd International PIARC Conference on Road Tunnel Operations and Safety – Cracow, Poland 2026

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INTERNATIONAL TUNNELLING
AND UNDERGROUND SPACE
ASSOCIATION

ITA



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Thank you for your attention!



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