

14th International Road Safety Conference

GAMBIT 2023

NEW DECADE - NEW ACTIVITIES - NEW TECHNOLOGIES

Gdańsk University of Technology, 29-31 May 2023



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WORKSHOP ORGANIZERS



**14th International
Road Safety Conference**

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New Decade – New Activities – New Technology

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ACTIVITIES ON PIARC ROAD SAFETY COMMITTEE

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Content

- Snapshot of TC 3.1 Progress
- Seminars
- Special Projects
- Partnerships
- 27th World Road Congress
- 2024-2027 Cycle

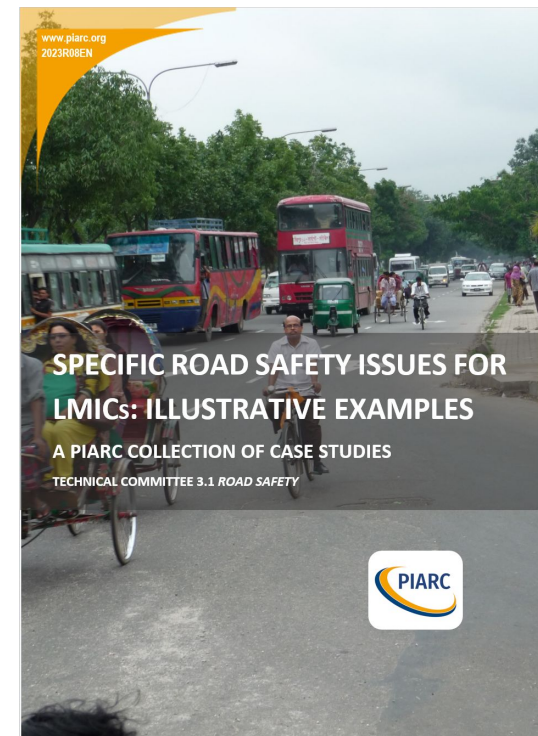
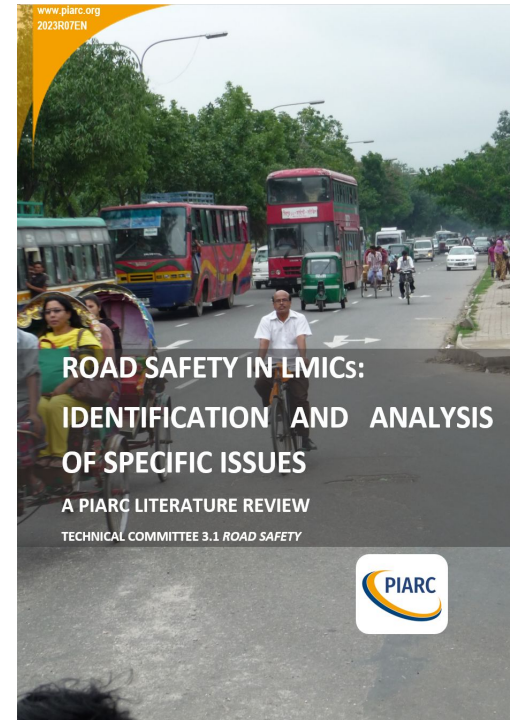
PIARC Road Safety Technical Committee

Technical Committee T.C. 3.1: Road Safety part of ST3:

- **WG3.1 Road safety issues for LMICs**
- **WG3.2 Proven countermeasures**
- **WG3.3 Update of Road Safety Audit Guidelines**
- **WG3.4 Implication of Connected and Automated Vehicles**
- **WG3.5 Update of the Road Safety Manual**

WG3.1 Specific Road Safety Issues for LMICs

- Specific road safety issues for LMICs
- Identify successful stories, paying special attention to those in LMIC countries, with specific examples of safety improvement and management of road safety (in terms of key performance indicators).
- Take into account safety of vulnerable users.
- Identify the existing tools, processes, checklist, etc. used to achieve success.
- Identify successful stories, paying special attention to LMIC



WG 3.2 Implementation of Proven Countermeasures

- Increase road safety through the implementation of proven countermeasures to reduce accidents in motorways, rural roads and urban roads, paying special attention to vulnerable road users, speed management and fatigue.
- Describe the process for selecting countermeasures given road user consideration and define good practices in strategies related to traffic safety in urban areas, paying special attention to vulnerable road users.

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PROVEN COUNTERMEASURES

BICYCLE BOXES

A **bicycle box**, also called an advanced stop line (ASL), advanced stop box (ASB), or bicycle waiting area, provides a designated area at the front of a signalized intersection exclusively for cyclists to wait for the opportunity to proceed. This feature is a low-cost but effective way of reducing conflicts and prioritizing cyclist right-of-way. The design consists of pavement markings to create a box and stop-line, typically in front of motorists, that serves to increase cyclist visibility and reduce the risk of collisions with turning vehicles. Cyclists stopped in front of motorists are then allowed to proceed through the intersection first when appropriate. Bicycle boxes are typically marked by white painted borders and/or coloured paint with a white bicycle symbol inside.

While a variety of designs exist, the main objective is to maintain a distance between bicycles and motor vehicles (in space and/or time) to prevent conflicts between the two modes. This feature is often used in conjunction with other signalized intersection safety strategies such as protected left-turn phasing and/or prohibiting right-turn-on-red (RTOR). Studies have shown a decrease in the number of bicycle-vehicle conflicts at signalized intersections because of the improved visibility. However, once traffic is moving, bicycle boxes do not mitigate the risk of conflicts involving turning motorists not noticing cyclists approaching from the side.

Figure 1. Example Bicycle Box
Source: City of Portland, OR (USA)

Bicycle boxes must be well-designed and sized with consideration for the number of cyclists using it, the maneuvers cyclists need to make when entering and leaving the box, and the space between the cyclist's stop line and the stop line further back for vehicles. Experience also suggests that deeper bike boxes or a buffer space between the vehicle stop line and the bike box can reduce vehicle encroachment into the bike box by stopped vehicles, as well as improve the view of cyclists from larger, higher vehicles with frontal blind spots. Also, the use of color, which varies according to national standards, is a popular design feature, though not required and not always used.

Figure 2. Bicycle Box Explanation
Source: City of Burlington, VT (USA)

Figure 3. Bicycle Box Layout
Source: Flanders (OVW) (Belgium)

Figure 4. Buffered Bicycle Box
Source: NZTA (New Zealand)

DISCLAIMER: The purpose of the Proven Countermeasure informational summaries is to demonstrate global experience, disseminate knowledge, and raise awareness of interventions, treatments, and strategies worth strong consideration. Effectiveness of each Proven Countermeasure is noted where available, but can vary significantly from one country to another. The appropriateness for and quality of the implementation also influences effectiveness, so practitioners must also consider location suitability, national and local laws, regulations, standards, and practices, prior to utilization.

<https://roadsafety.piarc.org/>

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PROVEN COUNTERMEASURES

BICYCLE BOXES

Education is key for bicycle boxes to work effectively. Users must understand their role and use the box as it is intended. Non-compliance, such as encroachment by vehicles into the bicycle box, or bicycles into the pedestrian crosswalk, can limit overall value for all users.

When bicycle boxes are provided, possible turning routes that might be used depend on local regulations. As shown in the figure below from Belgium, the solid line represents a direct path taken by a cyclist, depending on the arrival in the traffic signal cycle and level of assertiveness. The long-dotted line represents an indirect, two-stage route that uses the bicycle box to wait. The short-dotted line represents the path of a cyclist completing the turn walking the bicycle and using the crosswalk.

Figure 6. Example Bicycle Box (without Color)
Source: Danish Road Directorate (Denmark)

Figure 7. Example Bicycle Box (with Color)
Source: SWOV/Deel Schepers (Netherlands)

SAFETY EFFECTIVENESS

Bicycle Boxes improve cyclist safety at signalized intersections by:

- Reducing near-turn conflicts **6-64%**^{1,2} even with increasing cyclist volume.
- Increasing cyclist perceived level of safety up to **6-77%**^{3,4}.
- Putting cyclists at the head of the queue, making cyclists more visible, and decreasing cyclist signal delay^{2,5,6}.
- Creating connected networks of bicycle-favorable facilities that reduce the risk of crashes and injuries.

Figure 8. Possible Routes for Turning Cyclist
Source: Flanders Department of Mobility and Public Works (Belgium)

Countries with countermeasure experience featured in this informational summary: Belgium, Canada, Denmark, India, Netherlands, Norway, New Zealand, and United States.

Sidebar photo source location:
Top - PBIC/Sandep, Gandhi (India)
Bottom - PBIC/Carl Sandstrom (Canada)

Notes/References/Quotations:
1. Mahan, T.K.D., et al. "Advanced Stop Boxes and Their Effect on Traffic Conflict Rates between Cyclists and Turning Vehicles". Journal of Transportation Safety & Security Vol. 14/10 (2022)
2. Davy, J., et al. "Evaluation of Bike Boxes at Signalized Intersections". Oregon Transportation Research and Education Consortium, Portland, OR, US (2017)
3. Akar, G. and Wang, F. "Street Intersection Characteristics and Their Impacts on Intersection Cycling Safety". Ohio Department of Transportation, Columbus, OH, US (2018)
4. National Association of City Transportation Officials. "Urban Bikeway Design Guide". New York, NY, US (2019)
5. Hoar, A., Evers, R., et al. "Handbook of Road Safety Measures" (with access). Institute of Transport Economics, Norwegian Centre for Transport Research, Oslo, NO (2018)
6. SWOV Institute for Road Safety Research. "Infrastructuur for Pedestrians and Cyclists". SWOV, The Hague, NL (2020)

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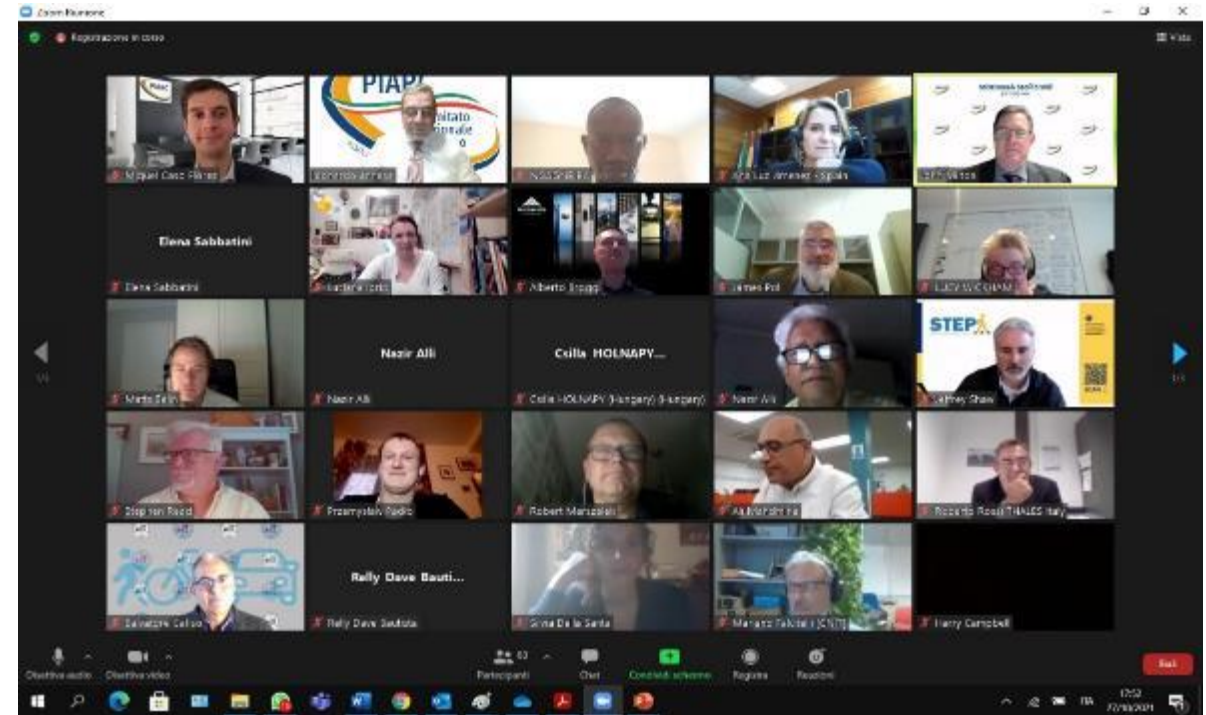
WG 3.4 Update of the Road Safety Audit Guidelines

- Update the Road Safety Audit Guidelines for Safety Checks on New Road Projects (2011).
- Add sections to provide exemplar guidance to LMICs



WG 3.4 Implication of the Connected and Automated Vehicles

- Analysis on classification of traffic accidents which automated vehicle can/cannot prevent.
- Evaluate implications of connected and automated vehicles in road safety from the point of view of road design considerations
- Identify best practices.
- Identify safety issues as far as transition period to automated driving concerns.



23 Speakers, a few hundred participants
2 days, 3 sessions focusing on
CAV Road Safety Implications
Psychological factor to CAV acceptance
A safe and connected Infrastructure System

WG 3.5 Update of the Road Safety Manual

- Updates of Road Safety Manual focus on the work carry out by the TC.



WELCOME TO THIS PIARC (WORLD ROAD ASSOCIATION) GUIDE

THE NEW ROAD SAFETY MANUAL (RSM) IS DESIGNED TO HELP COUNTRIES AT EVERY STAGE OF INFRASTRUCTURE DEVELOPMENT TO FULFILL ROAD SAFETY OBJECTIVES.

It is aligned with key pillars for the [United Nations Decade of Action for Road Safety 2011-2020](#):

- **Pillar 1:** Road Safety Management;
- **Pillar 2:** Safer Roads and Mobility;
- **Pillar 4:** Safer Road Users.

This comprehensive resource builds on the broad range of knowledge and experience provided by PIARC in the [first edition](#). It includes new thinking on road safety and offers a clear argument on why adopting a Safe System approach is crucial for your country.

The Safe System approach aims for a more forgiving road system that takes human fallibility and vulnerability into account. Under the Safe System approach, everyone (public agencies, automobile manufacturers, road users, enforcement officials, and others) must share the responsibility for road safety outcomes.

UPDATE OCTOBER 2019

The **third edition of PIARC RSM is now available**. It provides updates to each of the chapters by incorporating new information and details.

- Newly released PIARC publications are highlighted throughout by providing [RSM](#) user weblinks to each of them:

1. Land use and safety: an introduction to understanding how land use decisions impact safety of the

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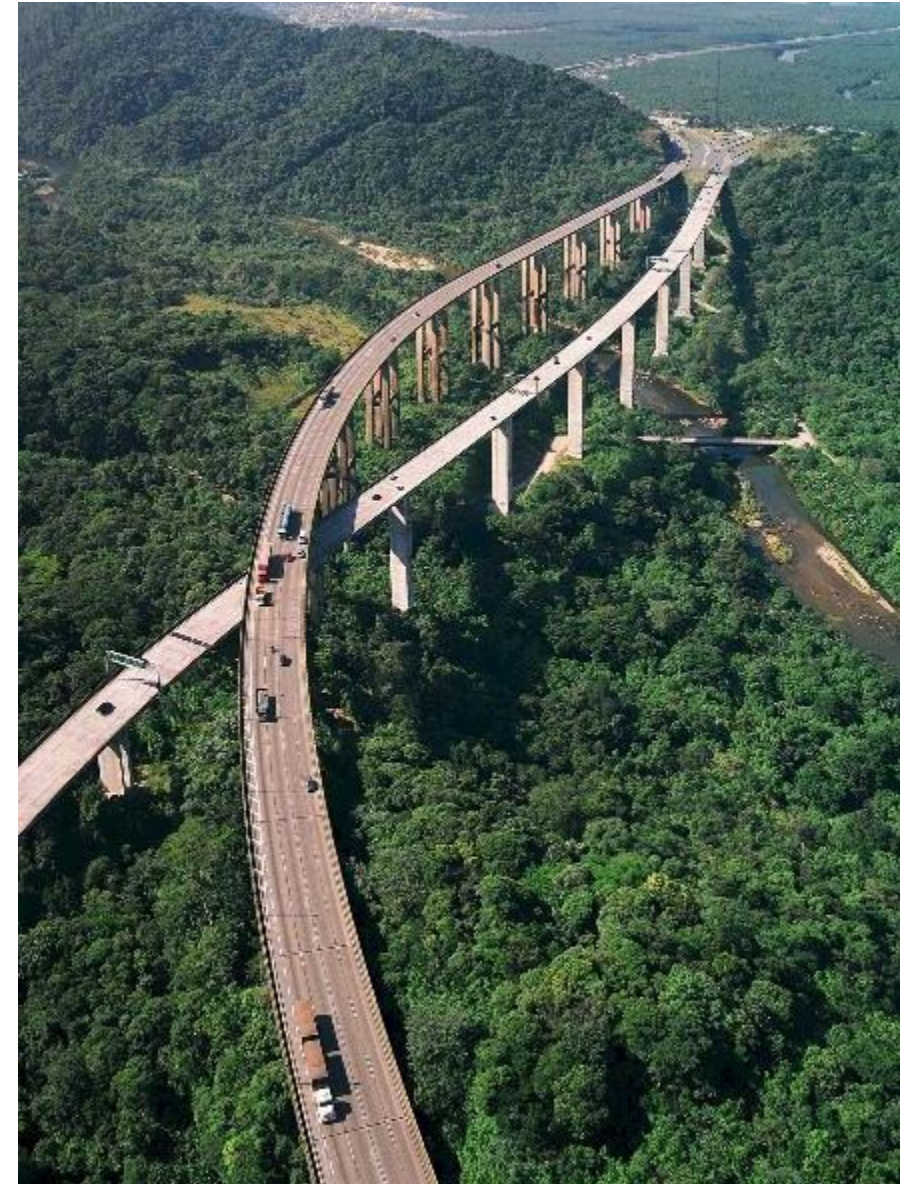
DO YOU WANT TO SEND US A REVIEW?

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Ongoing to World Road Congress

Seminars

- Road Safety in Low to Middle Income Countries, 18-20 May 2021, Tunis Tunisa
- South African Road Federation 7th Regional Conference for Africa, Cape Town, South Africa



Seminar on: “Road Safety in Low- and Middle-Income Countries: Issues and Countermeasures”

- 600 participants from 94 Countries on 4 continents
- Online
- 3 Days – 6 Session and 23 Presentations
- Partnership with Tunisian Road Association, Tunisian Ministry of Equipment, Housing and Infrastructure, Tunisian Ministry of the Interior via the National Road Safety Observatory



PIARC international seminar on: “Road Safety in Low- and Middle-Income Countries: Issues and Countermeasures”

- Adoption of **Safe System Approach** is necessary to prevent fatal and serious crashes.
- LMICs need to develop **strong lead agency, robust set of local guidelines** and regulations and **build road safety expertise**
- Important to carry out **Road Safety Audits** to ensure highway schemes operate as safely as practicable
- Enhance the use of **technology** and improve **Road Safety Data Systems**
- Implement a **comprehensive Road Safety Assessment** throughout the entire design process

2022 SARF/IRF/PIARC 7th Regional Conference for Africa Cape Town 18-20 October

- 500 Registrants from 30 Countries
- 14 Members onsite, 29 total
- 3 Days – Rural Mobility and Safety
- Moderated – 4 GS, 4 Safety, 3 Rural Road
- Presentations – 7 Safety



Outcomes:

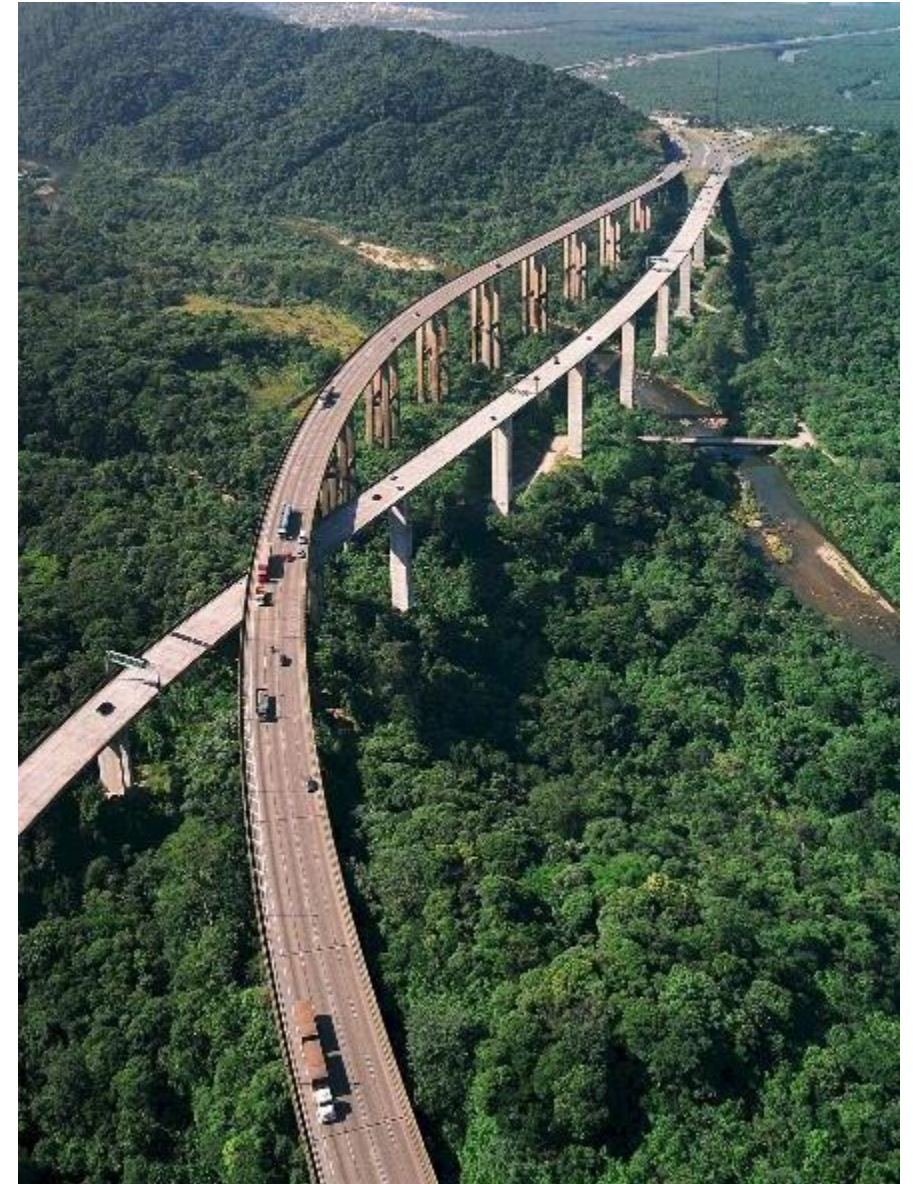


- Technical Committee was able to reach 30 Countries and provide technical rural safety and mobility outreach
- Positive response on seminar
- Interaction between Technical Committees on Rural Roads

Special Projects

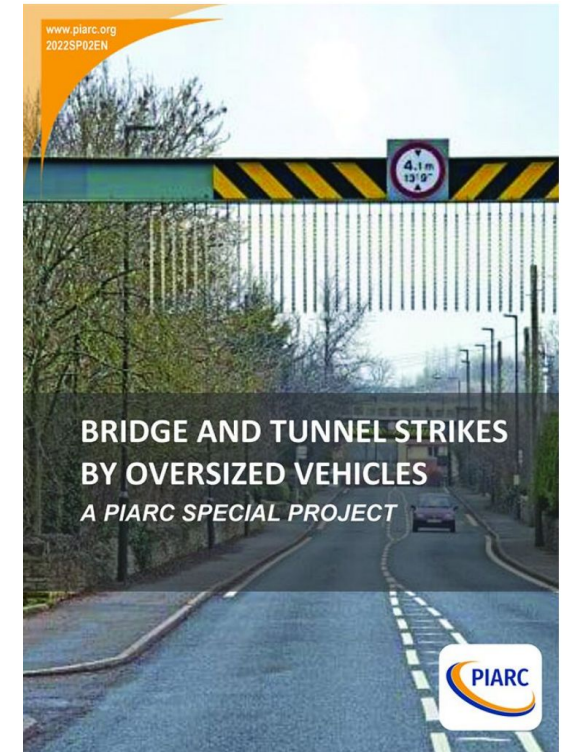
Safety Related Special Projects:

- Bridge and Tunnel Strikes by Oversize Vehicles'
- PIARC Global Road Safety Knowledge Exchange Project



Technical report: “Overweight vehicles: Impact on road infrastructure and safety”

- Overloading is a **common problem in LMICs** due to limited use of WIM (Weigh in Motion) and the largest overloads occur on secondary and rural roads
- Overweight freight vehicles contribute to **greater damage in case of collisions**
- Prevention and mitigation solutions include four steps:
 - **Legislation** – well-formulated legal text with little room for interpretation road users
 - **Prevention and education** – comprehensive information on potential consequences of overloading
 - **Detection and enforcement** – use of both static and movable scales along with law enforcement controls
 - **Penalisation** – financial, operational or institutional penalties.
- **Effective enforcement** of weight limits by deployment of more staff and increase in fines could lead to higher compliance and a decrease in safety risk.



PIARC Global Road Safety Knowledge Exchange Project

- Aiming to **promote knowledge sharing** through appropriate implementation aids that will reflect previous work of but not limited to PIARC
- Focus on spreading road safety knowledge to **Low- and Middle-Income Countries.**
- With the support of National Technical University of Athens (**NTUA**) and Austrian Institute of Technology (**AIT**)

Promotion Material

■ Newsletters

- Monthly newsletters for each Road Safety Area
- Subscribe to PIARC newsletter

■ Social Media Posts

- Weekly posts
- Follow PIARC on LinkedIn and Twitter

■ Pre-recorded webinars available on PIARC website and on YouTube

■ Presentations and Handouts

■ Factsheets

Tanzania Road Safety Ten Steps Project

- Consortium with International Road Federation, International Road Assessment Program, and PIARC
- Carry out Ten Steps program
- Focus on Assessment of current needs, design standards, workforce competency, and the development of a National Infrastructure Safety Strategy and Action Plan

Partnership with ITF/WB - Implementing the Safe System

- 100 road safety experts from around the world
- 17 road safety case studies were collected, and lessons of relevance to Safe System implementation documented
- A framework was developed to define Safe System components for projects, regions, countries or organisations, and map improvements

27th World Road Congress

October 2 - 6, 2023

- **Very rich technical content:**

- Road Safety
- Committee will present their work with Papers
- Call for papers on 2 topics,
- Workshop on Safety in LMIC
- Will participate in Foresight session

- **An excellent opportunity to :**

- Learn more about PIARC's work
- Discuss new ideas

- **International call for papers was in May 2022**

- Great success for Safety: 85 Abstracts for presentation or poster



<https://www.piarc.org/en/activities/World-Road-Congresses-World-Road-Association/XXVII-World-Road-Congress-Prague-2023>

Committee 3.1 Issues – Subject to finalization

- **Recommended items (as presented to ExCom):**

- **Securing Safety for Vulnerable Road Users**

- Potential for individual focus on different users, such as walking, biking, motorcycles and potential solutions to address each

- **Safe System in the LMIC Context**

- Safe System in action, getting started, how to advance, Issues for LMIC?.

- **Diagnosing Road Safety Problem and Opportunities**

- Intersection designs to accommodate all road users in different contexts.
- Safety of grade railroad crossings

- **Update of the Road Safety Manual**

- Incorporation of the 2004 RSM version 1 and addressing gaps.
- Update of the 2004 manual practices and procedures to supplement the RSMgrade railroad crossings

Thank you for your attention!



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