

# PIARC (World Road Association) Strategic Plan - 2024-2027

## TECHNICAL COMMITTEE 1.5 – DISASTER MANAGEMENT

### Overview

In recent years, extreme weather conditions have emerged in many parts of the world, including higher temperatures, heavier rainfall, heavy snow fall, droughts, and forest fires. These extreme weather events are becoming more severe and frequent and there is concern that the effects may spread for a longer period of time. These hazards pose serious challenges to road management.

In an advanced supply chain, the process from the production and delivery of a product to the final customer relies on an efficient and dependable logistics infrastructure. Roads are one of the most basic modes of logistics, and even during disasters caused by extreme weather events, roads must always function to maintain the logistics process at all times. Roads also play a critical role in disaster response operations, ensuring access to impacted areas for rescue workers and the delivery of emergency supplies. Roads must stay functional at all times.

Therefore, road administrators need to be prepared for these extreme disasters by providing road infrastructures resilient against new magnitudes of disasters and also by developing robust road management systems that react quickly against disasters. In other words, road maintenance, improvement, and disaster mitigation is an investment in building a resilient society in the future.

PIARC TC1.5 “DISASTER MANAGEMENT” in the 2024-2027 cycle will focus on disaster management against “Extreme weather” and will work on exploring “Operational planning aspects of enhancing extreme weather resilience” under the three topics listed below. These topics will help guide investments in future roads.

1.5.1 Coping with extreme weather

1.5.2 Social resilience within communities and public authorities for extreme weather

1.5.3 Infrastructure resilience for supporting supply chain during extreme weather events

#### 1.5.1 Coping with extreme weather

**Purpose:** The purpose of this research is to find out how we use our experience to better respond to and recover from disasters while also improving future resilience to extreme weather. In order to achieve this goal, this work will examine world-wide case studies to identify improvement strategies for responding to and coping with extreme weather disasters and building resilience into road networks. Case studies providing beneficial information will be included in an update to the PIARC Disaster Management Manual.

**Preliminary research questions:** This research works to analyse how road administrators expedite and improve recovery efforts to minimize impacts to transportation systems and society, also how past experience is used to improve future resilience by producing a show case demonstrating world-wide cases studies examining all aspects of successful mitigation, preparedness, response and recovery efforts specifically related to extreme weather.

This research will also identify a new initiative effort to regenerate and revitalize transportation infrastructure in the context of climate change adaptation and opportunities of evolving new mobility patterns (e.g. integrated, digitized, sustainable).

Additionally, work will include an update of the Disaster Management Manual to enhance case study contents (case studies collected in this research work) and develop French and Spanish versions of the Disaster Management Manual.

**Importance to roads agencies:** This work is important to road agencies/road industry because EC1) responding to extreme weather events is the first priority in the external challenges to the road sectors. This work will also contribute to EC8) Improving the image of the road sector and raising awareness of roads contribution to sustainable transport solutions.

**Audience:** This research will benefit both decision makers and practitioners related to disaster management to improve the resilience of road and road network systems, especially on extreme weather.

**Deliverables:** Technical report, case studies, high impact summary, articles in Routes/Roads, webinar, seminar, workshop or conference, manual.

**Background to TC/s work on this topic:** In the previous discussions of the Technical Committee, the management of extreme weather hazards has been an important topic in the discussion of a variety of challenges. In recent years, extreme weather-related disasters have become more severe and more frequent, making it necessary to study and share information specifically on this topic.

In addition, TC1.5 will explore the possibility of partnerships and collaboration with regional road-related organizations in collecting and sharing case studies in addressing this challenge.

**Low and lower-middle income countries:** This research will be of benefit to all countries impacted by extreme weather events. LMICs are mostly vulnerable to and impacted by the extreme weather events. This research will explore the possibility of collaborating with regional road associations to collect various case studies among the world.

**Gender inclusion & diversity:** Disaster management often treats drivers as a single category. Recently, not many, but certainly a growing number of studies have found on consideration for disaster vulnerable groups such as the elderly, infants, disabled, language minorities, or sometimes digitally challenged. TC1.5 will broadly consider issues related to "gender", "diversity" together with "vulnerable groups" and address new ways of disaster management that take gender, diversity, and vulnerable groups into consideration.

**Potential duration:** It is expected that the research period will be 4 years.

### 1.5.2 Social resilience within communities and public authorities to cope with extreme weather

**Purpose:** The purpose of this research is to identify the new activity of building social resilience within communities and public authorities in the area of road administration. This research is also expected to explore potential case studies in terms of social equity and decarbonization strategies in road disaster management.

**Preliminary research questions:** This research will analyse considerations for social resilience in disaster preparedness, mitigation, response and recovery. Social resilience, in the context of road administration, may refer to the collaboration between road managers, road users, communities and public authorities. Community preparedness activities such as education and training, along with involvement/input in response activities such as participating in drills and exercises will also be discussed in this work.

This research will also explore considerations for social equity in each disaster management phase. New efforts related to decarbonization strategies are also in target such as multi-functional infrastructure, debris/waste management, or reduction/recycling of disaster debris.

Additionally, this work includes an update of the Disaster Management Manual to enhance case study contents (case studies collected in this research work) and develop French and Spanish versions of the Disaster Management Manual.

**Importance to roads agencies:** This work is important to road agencies/road industry because EC1) responding to extreme weather events is the first priority in the external challenges to the road sectors. This work will also contribute to EC8) Improving the image of the road sector and raising awareness of roads contribution to sustainable transport solutions.

**Audience:** This research will benefit both decision makers and practitioners related to disaster management to improve the resilience of road and road network systems, especially on extreme weather.

**Deliverables:** Technical report, survey, high impact summary, articles in Routes/Roads, webinar, seminar, workshop or conference, manual.

**Background to TC's work on this topic:** Social resilience is currently one of the key topics in general disaster management. However, there is no intensive study in road disaster management field or our technical committee activities. Some new initiative case studies are displayed in the Disaster Management Manual. In addition, TC1.5 will explore the possibility of partnerships and collaboration with regional road-related organizations in collecting and sharing case studies in addressing this challenge.

**Low and lower-middle income countries:** "Public, private and civil society participation in disaster management" is one of the key messages of the Hyogo and Sendai frameworks for disaster reduction. The research document will be beneficial to LMICs to implement these frameworks in the road disaster management field. This research will explore the possibility of collaborating with regional road associations to collect various case studies among the world.

**Gender inclusion & diversity:** Disaster management often treats drivers as a single category. Recently, not many, but certainly a growing number of studies have found on consideration for disaster vulnerable groups such as the elderly, infants, disabled, language minorities, or sometimes digitally challenged.

TC1.5 will broadly consider issues related to "gender", "diversity" together with "vulnerable groups" and address new ways of disaster management that take gender, diversity, and vulnerable groups into consideration.

**Potential duration:** It is expected that the research period will be 4 years.

### 1.5.3 Infrastructure resilience for supporting supply chain during extreme weather events

**Purpose:** The purpose of this research is to share knowledge and experience in road preparation and operation to keep roads open during extreme weather events in order to support supply chain resilience. This research is also expected to explore digital technologies/tools for improving our disaster management capacity.

**Preliminary research questions:** This research will analyse recent considerations on continuity of operations planning and system redundancy by road administrators in order to keep roadways open at all times to support the supply chain. This study will cover the strategies, management tools and actions such as pre-designated alternate routing, managed asset use, ITS, incident management and quick clearance. Additionally, it will examine digital technologies/tools for expanding our disaster management capacity, improving situational awareness and increasing our ability to mitigate supply chain issues during extreme weather. This research will also explore a new disaster management initiative; creating resilient interconnections between transportation assets and other critical infrastructures.

Additionally, this work includes an update of the Disaster Management Manual to enhance case study contents (case studies collected in this research work) and develop French and Spanish versions of the Disaster Management Manual.

**Importance to roads agencies:** This work is important to road agencies/road industry because EC1) responding to extreme weather events is the first priority in the external challenges to the road sectors. This work will also contribute to EC8) Improving the image of the road sector and raising awareness of roads contribution to sustainable transport solutions.

**Audience:** This research will benefit both decision makers and practitioners related to disaster management to improve the resilience of road and road network systems, especially on extreme weather.

**Deliverables:** Technical report, survey, high impact summary, articles in Routes/Roads, webinar, seminar, workshop or conference, manual.

**Background to TC's work on this topic:** Management of disasters caused by extreme weather has been a major topic of the previous cycles. Today, supply chain resilience has become one of the most important concerns in disaster management. Previous Technical Committees have not studied this subject as primary concern.

In addition, TC1.5 will explore the possibility of partnerships and collaboration with regional road-related organizations in collecting and sharing case studies in addressing this challenge.

**Low and lower-middle income countries:** This research works will be of benefit to all countries impacted by extreme weather events. LMICs are mostly vulnerable to and impacted by the extreme weather events. This research will explore the possibility of collaborating with regional road associations to collect various case studies among the world.

**Gender inclusion & diversity:** Disaster management often treats drivers as a single category. Recently, not many, but certainly a growing number of studies have found on consideration for disaster vulnerable groups such as the elderly, infants, disabled, language minorities, or sometimes digitally challenged.

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