CIHT Policy Project 2024

***Resilience and adaptation to extreme weather conditions in the highways sector***

**CALL FOR EVIDENCE**

**DEADLINE FOR SUBMISSION: 9th APRIL, 12:00 pm**

**SUBMISSION FORMAT: please fill in this document and return it , together with any attachments, to technical@ciht.org.uk with the heading: Resilience report: call for evidence**

CIHT is producing a report on the theme of ‘Resilience and Adaptation **to Extreme Weather Conditions** in the Highways Sector’.

For the purposes of this report, we are defining “Resilience” as:

*“The capacity of a system to effectively manage and withstand extreme weather conditions and/or hazardous weather events, while responding or reorganizing in a way that enables the uninterrupted provision of critical transportation services to both the economy and local communities, while maintaining the ability to adapt and innovate”. [[1]](#footnote-2)*

The report will explore successful examples of road infrastructure design, materials, and construction practices, identify best asset management practices for resilience, and provide evidence to support decision-making on infrastructure adaptation to extreme weather events.

**This call for evidence consists of 2 Tasks:**

**Task 1- Fill in the table below with possible solutions to tackle the impacts of extreme weather events on the road infrastructure.**

**Task 2- Provide examples of the solutions identified in the table.**

**Task 1:**

The table below identifies the impacts of different extreme weather events on the road infrastructure. Please fill in the column of “possible solutions” with examples of:

* Physical interventions that can mitigate the impacts of extreme weather events (think of new materials, construction processes and design of road infrastructure)
* Asset management and maintenance practices that can prevent or reduce the impacts of extreme weather events

You do not need to consider all impacts or fill in all parts of the table- feel free to contribute where you have knowledge and experience.

|  |  |  |
| --- | --- | --- |
| **Weather event** | **Impacts on road infrastructure** | **Possible solutions** |
| Rain & Flooding  *(includes river flooding, coastal flooding and heavy rainfall flooding)* | * Drainage systems get overwhelmed- not enough capacity * Roads flood * Increased pressure on riverbanks * Erosion of earthworks * Power lines affected * Premature deterioration of assets * Potholes and surface faults due to prolonged inundation * Bridge scour and failure * Erosion of pavements * Possible cause of rock/land slide |  |
| Increased temperatures | * Less shading due to less vegetation * Materials melt/become soft – bleeding (when a thin layer or film/asphalt appears on the surface making it slippery) * Increased dust * Material shrinkage or expansion * Bridges buckle * Rutting (vehicles creates depressions or grooves on softer surfaces) * Bridge swelling * Increase in thermal cracking |  |
| Snow & Ice | * Expansion of material (expansion and contraction causes cracking) * Effects of gritting on road surface material * Possible cause of rock/land slide |  |
| Wind | * Bridges shaking * Debris or vegetation blocking or damaging roads * Power lines affected * Possible cause of rock/land slide |  |
| Sea level rising | * Roads flood * Erosion of earthworks * Premature deterioration of infrastructure |  |

**Additional questions**

1. Are there any weather events or combination or sequencing of that are missing from the table above? What specific issues do they cause to the road infrastructure? What possible solutions can you identify?
2. What do you feel are the biggest knowledge gaps in the highways sector related to the extreme weather events and their impacts on road infrastructure?

**Task 2**:

Provide us with examples of the solutions you have identified in the table above. You do not need to provide a case study for all the solutions you have identified.

**We are looking for examples that go beyond standard good practice and that are innovative, that deliver added benefits and represent a sustainable and cost-effective approach to ensure infrastructure resilience.**

In this first instance, we are looking for an overview of your proposed case study- we might ask you to provide more details at a later stage if we decide to include your evidence in the report.

The table below contains the information we are looking for, please either fill in the table, send a case study that has this information or provide a link to where we can access the case study.

|  |  |
| --- | --- |
| **Title** |  |
| **Company/organization/authority** |  |
| **Name of the contact person** |  |
| **Email address** |  |
| **Problem**  Describe what problem(s) on the road infrastructure caused by a past or projected extreme weather events you were trying to tackle. Focus on the local context, what impacts this had or would have on the infrastructure, transport and local community.  Tell us why it was important to address this problem now. |  |
| **Location (urban/sub-urban/rural/coastal/)** |  |
| **Solution**  What solution(s) did you identify to tackle the problem described above?  Provide a clear definition of the outcomes your project/product/strategy/solution was trying to achieve and why.  Please describe the key milestones for the successful implementation of the work and why this was chosen as the best option at this moment in time.  Tell us if there are future or outstanding actions that will have to be taken to ensure the infrastructure keeps adapting. |  |
| **Results**  Please describe the results of your work providing quantitative and qualitative evidence. Tell us how the implemented work solved or managed the impacts of extreme weather events. |  |
| **Added benefits**  Tell us what added benefits your solution has achieved- where you can provide qualitative and quantitative data:   * Carbon emission reduction * Environmental benefits * Cost- saving * Social benefits |  |
| **Barriers, support actions required, challenges**  Describe any barriers or challenges in the implementation of your work(e.g. planning, design, delivery, risks management, possible unforeseen circumstances and how you manged them) and what systems you put in place to overcome them. |  |

1. Definition adapted from [Deeming, 2021](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1033573/lessons-learned-highway-sector-extreme-weather.pdf) [↑](#footnote-ref-2)