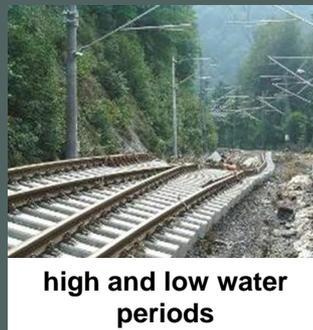




INTERNATIONAL UNION  
OF RAILWAYS

*unity, solidarity, universality*

# Development of an International Climate Change Adaptation Framework for Rail Infrastructure



21 January 2016

# Project Objective

- To develop a framework that provides guidance and a process for decision makers such as rail asset owners, operators and managers to use to understand and address the impacts of climate change on their networks, assets and operations.
- **Process**
  - Literature review
  - Consultation with IM & TOCs
  - Framework drafting and review
  - Framework finalisation



# Weather Parameters influencing rail operations

- **Temperature:** Impacts of increasing temperatures, increasing heatwave frequency and severity, increased number of very hot days, changes to freeze-thaw cycles
- **Precipitation:** Impacts of increased number of prolonged and/or heavy precipitation events, increased number of storms, increased number of dry spells and drought, fluctuating groundwater levels
- **Sea-Level and Storm Surge:** Impacts of sea level rise, coastal erosion, rising groundwater levels and changes in salinity
- **Permafrost Thaw:** Impacts of increasing average temperatures on rail built on permafrost foundations
- **Snow Melt Hydrology:** Impacts of changing snowfall and snowmelt patterns and seasons

# Literature review

- To collate information on existing approaches to capturing, understanding, recording and managing the impacts of climate change on rail infrastructure and their operations
- To include existing frameworks, data sources, tools and other literature
- To ensure representation of the full range of global economic, social, environmental and climatic conditions
- To include and draw upon recent relevant work conducted by UIC and its members (Tracca, ARISCC..)

- Climate Change Risk and Vulnerability Assessments
- Guidance
- Climate Change Adaptation Frameworks
- Adaptation Tools

- National and local strategies and programmes
- Technical reports
- Academic papers
- Press articles
- Case studies

# Consultation with IMs & TOCs

Consultation with several Infrastructure managers (Consultation Workshops) to discuss the work already being undertaken within their company (i.e if because of incumbent policy) relating to climate change adaptation and resilience and to understand what they would like to see from the Framework in terms of its structure, content and functionality.

## Proposed Framework

**Phase 1:** Identifying Scope, Variables, Risks and Data

**Phase 2:** Assessing Risk and Vulnerability

**Phase 3:** Developing and Assessing Adaptation Responses

**Phase 4:** Integrating Findings into Decision Making Processes

- **Phase 1: Identifying Scope, Variables, Risks and Data**
  - Establish assessment scope and aims, defining key tasks and delivery plan
  - Assessing vulnerability and adaptive capacity (Workshop, )
  - Assessing CC and scenarios
- **Phase 2: Assessing Risk and Vulnerability (Workshop)**
- **Phase 3: Developing and Assessing Adaptation Responses**
  - Identifying adaptation responses and best practices (Workshop)
  - Developing an adaptation action Strategy
  - IRS?
  - Or develop the right methodology
- **Phase 4: Integrating Findings into Decision Making Processes**
  - Developing business case
  - Awareness, training

Designed to:

- Be iterative
- Be applicable to the full range of potential users, scales, priorities and risk types
- Help address and take account of resource and knowledge gaps

# Timeline

- **M1 = January 2016 :**
- **Total time 24Months**
  
- **Short summary report outlining literature review findings: by 30 June 2016**
- **Consultation and Workshops April 2016 September 2017**
- **Draft Framework for review by EES Platform and selected IMs : by October 2017**
- **Final Framework deliverables submitted to UIC GA: November/December 2017**

# STIG

## Smart Transport Infrastructure Governance

- H2020 Project – Infrastructure Call
- Project submitted 15/10/2015
- 3 Mio € Funds asked for 30 months
- Possible start in first semester 2016
- 17 European partners from railway and road operators, universities, consultancies, meteo service providers...
  
- Project Management, Dissemination: UIC
- System Planning : EFRTC
- Procurement: Civity Management Consultants
- Capacity Planning: Systra
- Asset Management : Network Rail
- Climate Change Adaptation: UIC (195k€ )



# STIG

## Smart Transport Infrastructure Governance

- To develop a decision support tool to assist rail decision-makers in developing appropriate climate change adaptation responses for their rail and road infrastructure and their operations.
- **The project will:**
  - accelerate and cost effective delivery of infrastructure adaptation
  - Build competence for infrastructure management and governance (spare capacity planning)
  - Improve capacity planning (but also preventative track maintenance)



# Proposed Global Project on Climate Adaptation in Railways

- Previous (European) Experiences at UIC:
- ARISCC Project: produced a comprehensive survey of how European railways manage weather information (past and present) and natural hazards.
- **Winter weather Project** delivered Delivered Good Practice Infra/RS/Operations
- Open questions:  
Are future climate changes being considered for new infrastructure projects, and maintenance programs?
- Slow adaptation will impair performance and introduce additional costs
- The project will identify key climate change vulnerabilities of the railway system (infrastructure, weather impacts, processes, design, maintenance, rolling stock) & priority actions based on safety, performance and investment. It will develop a guidance material for cost benefit analysis and common model for resilience.