Climate Change Adaptation for International Transport: Preparing for the Future

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Preserving Road Infrastructure: A Focus on Adaptation to Climate Change

Presentation by

Susanna Zammataro
Director General
International Road Federation (IRF)

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Preserving Road Infrastructure: A Focus on Adaptation to Climate Change

Susanna Zammataro
IRF Director General

www.irfnet.ch

The International Road Federation

Global, Independent, Not-for-profit Organisation
Established in 1948. Based in Geneva, Switzerland
UN Ecosoc status since 1951.

Assisting public and private stakeholders in Roads & Mobility sector for the past 70 years with:

3 Strategic Pillars of Activities
1. Knowledge
2. Connections
3. Advocacy

Members & Partners in more than 90 countries

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Thematic Streams

IRF Environment & Climate Change Work

IRF Manifesto on Climate Change Adaptation

CHANGER Greenhouse Gas Calculator

Innovative Practices for Greener Roads

IRF Policy Statement Environment

Sustainable Asset Valuation Tool ROADS

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WRS in a nutshell

• Edited yearly since 1964 (55 years)
• More than 205 countries, 45 indicators, 9 sections
• Data collected from primary statistical sources (Ministries, Road Authorities, National Statistical Offices)
• Definitions based on the Glossary of Transport Statistics (ITF/EUROSTAT/UNECE) and The World Bank
• Data used by Governments, Investment & Development Banks, Public & Private Companies, Research Institutes & Universities, NGOs, International Organizations, etc.
Impacts of climate change on infrastructure
## Impacts of climate change on infrastructure

<table>
<thead>
<tr>
<th>Event</th>
<th>Impact on Road Infrastructure</th>
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<tbody>
<tr>
<td>Increased temperature</td>
<td>Damage to concrete and bridge expansion joints;</td>
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<tr>
<td>Heat waves</td>
<td>Buckling, fissuring of asphalt pavement</td>
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<td></td>
<td>Rutting</td>
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<tr>
<td>Fewer colder days and shorter winters</td>
<td>Reduced snow removal but increased freeze-thaw degradation of asphalt</td>
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<td>Sea levels rise and tidal surges</td>
<td>Intermittent or permanent flooding</td>
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<td></td>
<td>Surface damaged</td>
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<td></td>
<td>Weakening of key infrastructure support (bridge pilings)</td>
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<td></td>
<td>Damage to critical drainage infrastructure</td>
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<tr>
<td></td>
<td>Increased costal erosion – road collapse</td>
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<tr>
<td></td>
<td>Exacerbate salinity (corrosive effect)</td>
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<tr>
<td>Extreme precipitations</td>
<td>May overwhelm drainage infrastructure</td>
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<tr>
<td></td>
<td>Erosion, scouring, slop failure, flooding</td>
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<tr>
<td>Extreme winds and storms</td>
<td>Wind damages bridges, gantries, signs, electricity networks, lightning</td>
</tr>
<tr>
<td></td>
<td>Storm surge means damage from increased wave height and strength</td>
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</tbody>
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Increasing Climate Resilience of Roads

1. Understand **vulnerabilities** of the network;
2. How **level of risk** changes over time;
3. Identifying potential **adaptation responses**;
4. **Actions** to reduce risk;
5. **Strategic planning** decisions on the ground (materials, design, maintenance procedures)

**Identify vulnerabilities and future risks**

1. **High quality asset data** (incomplete or not adequate, difficult to access)

**ASSESS RISK:**
- General asset information (location, design, materials)
- Geology, topography, hydrology and use of adjacent land
- Climate thresholds of assets beyond which failure occurs
- Asset characteristics which increase vulnerability
- Climate change projections, future developments of the area
Example: Flooding

The Blue Spot Concept
Chain of procedures to systematically analyse, adapt and protect road network.

TWO PARTS:
A. Computer methods
B. Field inspections and action

Barriers

1. Counterproductive policies
   eg. EU Water Framework Directive: limit to the amount of water that can be discarded from a site.

2. Lack of funding (reduced budget for maintenance)
   Barrier to introduction of new approaches

3. Challenges in developing general guidelines (local info)
Adjusting standards: The French example

2015 Systematic review of standards and guidelines for design, maintenance and operations of transport infrastructure;
Revision of 800 standards for roads;
3 groups:
a) No need for revision (eg. Noise, landscaping design)
b) Need revision (eg. Pavement design)
c) Need for further climate parameters (maintenance of urban roads)

Standards for design, maintenance and operation are based on specific values of climate-related variables, whereas climate projections are often given as ranges of values.
IRF Manifesto on Climate Change Adaptation

- Released in 2016 at COP22
- 13 recommendations for climate change adaptation

Endorsed by
It is necessary to plan and make climate change adaptation policy based on complete, relevant, accurate, and up-to-date data.

Asset inventories and asset management systems do not always contain the data required to assess resilience, or the data is difficult to access.

The establishment of a national data warehouse containing data on all transport assets, land use, the regional economy, weather, and climate change data should be set as a priority in every country.

The creation of an open access global transport infrastructure database of adaptation oriented policies, measures and projects would greatly help.
1. Level of risk → Budget constraints  
   (monitoring asset/doing nothing)

2. Identify most cost-effective time for action

3. Decide on level of acceptance of risk  
   (type of road, traffic volumes, strategic value, ...)

IRF Manifesto Recommendations
Prioritising Adaptation Action

Investors need to rethink traditional approaches to cost-benefit analysis so that investments capture as many of the different impacts of transport as possible.

SAVi Tool
IRF Manifesto Recommendations

Importance of Technology

Technology can deliver the transformation needed not only in terms of risk mapping and assessment but also when it comes to respond and manage risk in climate change adaptation.

• The challenges posed by climate change cannot be adequately met using the traditional approaches (pure hard/soft engineering measures).
• Need adaptive policy/decision making.
• Need high quality asset data.
• Need clear value management (prioritise protection and spending).
• Need to develop skills – people
• Need to create conditions for private sector to invest.

Institutional arrangements are key and so is to connect Adaptation to the delivery on other SDGs
Thank you

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