Transport Day
Break-out Session on Adaptation
Marrakech, 13 November 2016

Preserving Road Infrastructure: A Focus on Adaptation to Climate Change

Susanna Zammataro
Executive Director
International Road Federation
Geneva
The IRF has been assisting public and private stakeholders in the road infrastructure sector for nearly 70 years.
Not-for-profit organisation - Established in 1948. Ecosoc status at the UN and its agencies since 1951. Accredited by EU, ISO, CEN.

A huge network of and Members & partners in more than 90 countries.
Sustainable Mobility is a fundamental part of the quality of life of people and the backbone of the economy on any country in the world.
• A tool to assess GHG emissions
• Green Public Procurement
• Sustainability rating systems
• Innovative practices/case studies
Sea level rise & coastal erosion: roads

Better roads, better world
Coastal flooding: impacts on roads
Extreme precipitations in mountainous areas: impacts on roads and rails (Peru)
Buckling
Fissuring
Rutting ...
<table>
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<th>Event</th>
<th>Infrastructure</th>
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| Increased temperature       | **Damage to concrete and bridge expansion joints;**  
| Heat waves                   | **Buckling, fissuring of asphalt pavement**  
|                              | **Rutting**                                                                                                                                 |
| Fewer colder days and        | **Reduced snow removal but increased freeze-thaw degradation of asphalt**                                                                    |
| shorter winters              |                                                                                                                                              |
| Sea levels rise and tidal    | **Intermittent or permanent flooding**  
| surges                       | **Surface damaged**  
|                              | **Weakening of key infrastructure support (bridge pilings)**  
|                              | **Damage to critical drainage infrastructure**  
|                              | **Increased costal erosion – road collapse**  
|                              | **Exacerbate salinity (corrosive effect)**                                                                                                   |
| Extreme precipitations       | **May overwhelm drainage infrastructure**  
|                              | **Erosion, scouring, slop failure, flooding**                                                                                                   |
| Extreme winds and storms     | **Wind damages bridges, gantries, signs, electricity networks, lightning**  
|                              | **Storm surge means damage from increased wave height and strength**                                                                               |
Vulnerability
sensitive to and unable to cope with adversity

Risks

Resilience
Capacity to maintain core functions

Uncertainty
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
- 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.
Prioritising Adaptation Action

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, ...)

Better roads, better world.
Wrapping up:

- 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!
IRF Manifesto on Adaptation

on Climate Change Adaptation

It is now commonly recognized that growth, economic development and transport are inextricably linked. Just as development increases the demand for transport, the availability of transport stimulates economic development by enabling trade and economic specialization. Growth, poverty reduction, and a better quality of life cannot be realized without access to schools, hospitals, other amenities, jobs, and markets. Transport, thus, is the backbone of actions aimed at achieving the Sustainable Development Goals (SDGs), and providing sustainable transport infrastructure and services is fundamental to realize the sustainable development goals as described in the Post-2015 Development Agenda.

As climate change and the threats it poses become increasingly apparent, it is also becoming clear that the transport sector is likely to be heavily affected by the negative impacts of climate change and that measures to protect transport infrastructure and services have to be put in place. Much of this action involves adapting existing transport infrastructure to the threats posed by climate change, and building resilient new infrastructure.

The International Road Federation (IRF Geneva) and its members support global action aiming at proactively combat the potential adverse impacts of climate change on transport and make to this end the following recommendations:

- Adaptation in transport should not be viewed in isolation, nor reduced to just technical infrastructure asset. On the contrary, adaptation should be seen as part of a wider strategic approach, reflecting the interrelationships between transport (infrastructure and network operations), the local/regional economy and land use.

- Despite our ability to forecast the impacts of climate change with a reasonable level of accuracy, our knowledge about the specific local impacts of climate change in a particular area or region remains uncertain and incomplete. Coordinated efforts to document the knowledge base on adaptation in the transport sector should be encouraged and supported;

- A degree of uncertainty will always remain in planning for adaptation. This uncertainty can, however, be taken into account by robust planning approaches and adaptive policy/decision making and should not be used as a pretext not to plan for adaptation today.

Available on www.irfnet.ch
THEME
SAFE Roads & SMART Mobility as engines of economic growth

DATES
14-17 November 2017

SPECIAL FEATURE
Global Meeting of Ministers of Transport on 13 November 2017

Call for Abstracts open!
Thank you

www.irfnet.ch