



INTERNATIONAL ROAD FEDERATION
FEDERATION ROUTIERE INTERNATIONALE

Better roads, better world.

UNECE Group of experts on Climate Change impacts and
adaptation for international transport networks
Geneva, 24 April 2012



Adapting road infrastructure to climate change: overview of IRF members' practice around the world

Susanna Zammataro

Deputy Director General & Environment Expert



What is the IRF?

- **Global organisation supporting the road sector**
- **Not-for-profit non-governmental organisation**
- **Established in 1948**
- **Consultative status with the UN, BSEC, EU, CEN**

Mission: be the voice of road infrastructure sector

Vision: improve road networks worldwide

Values: commitment to safe, smart & sustainable roads



IRF Programme Centers and Chapters

- Geneva & Washington
- India Chapter- Delhi
- Russia Chapter – soon
- China Chapter





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Members worldwide

A world map where the landmasses are colored in a light blue shade, indicating the 115 countries that are members of the IRF. The map is centered on the Atlantic Ocean, showing North America, South America, Europe, Africa, Asia, and Australia.

**More than 490 members
in 115 countries**

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Who are our Members?

- Governments
- Contractors
- Consultants
- Materials suppliers
- Equipment manufacturers
- Research institutions and universities
- Associations



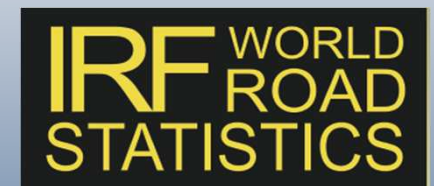


What do we do?

- Networking and contacts building
- Conferences, seminars, workshops
- Lobbying & Advocacy
- Dissemination of knowledge
- Education and training
- World Road Statistics



global Transport
Knowledge Partnership





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Focus Areas



Projects



Advocacy



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- A tool to assess GHG emissions
- Green Public Procurement
- Sustainability rating systems



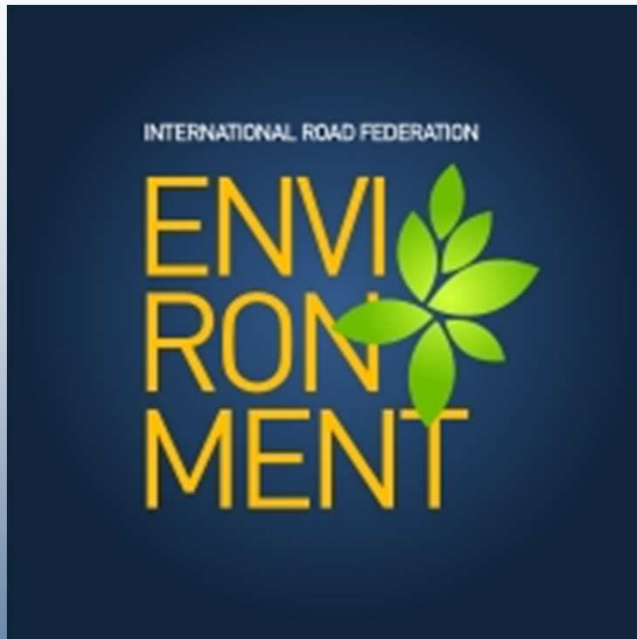
CHANGER
Greenhouse Gas Calculator



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IRF Environment Committee



- Platform to share knowledge
- A forum for case-studies
- Identify and test best practices
- Clearing house for R&E
- Provide hands-on expert advice



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Launch events:

- Geneva
- Washington
- New Delhi

IRF Policy Statement Environment



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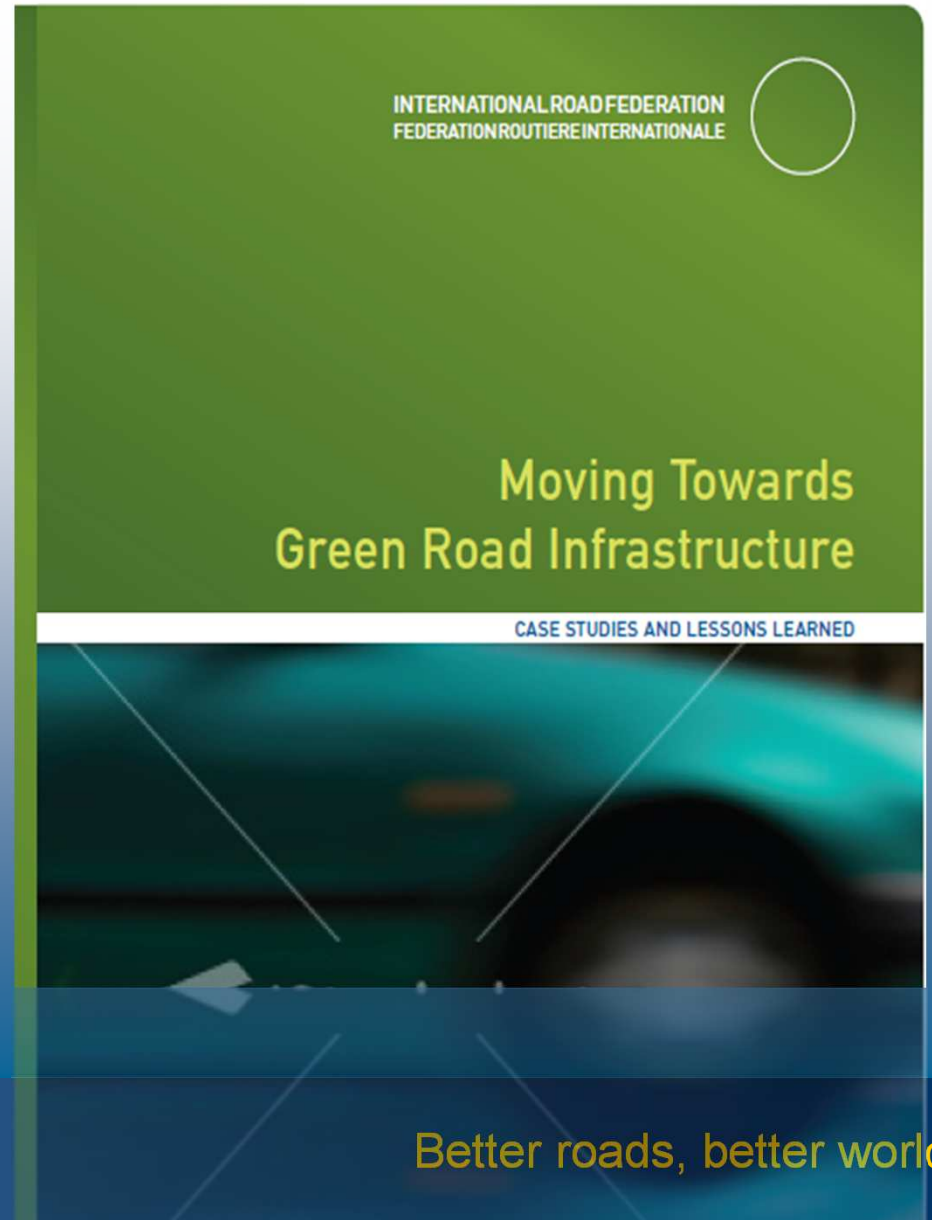


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International Road Federation
Innovative Practices for Greener Roads



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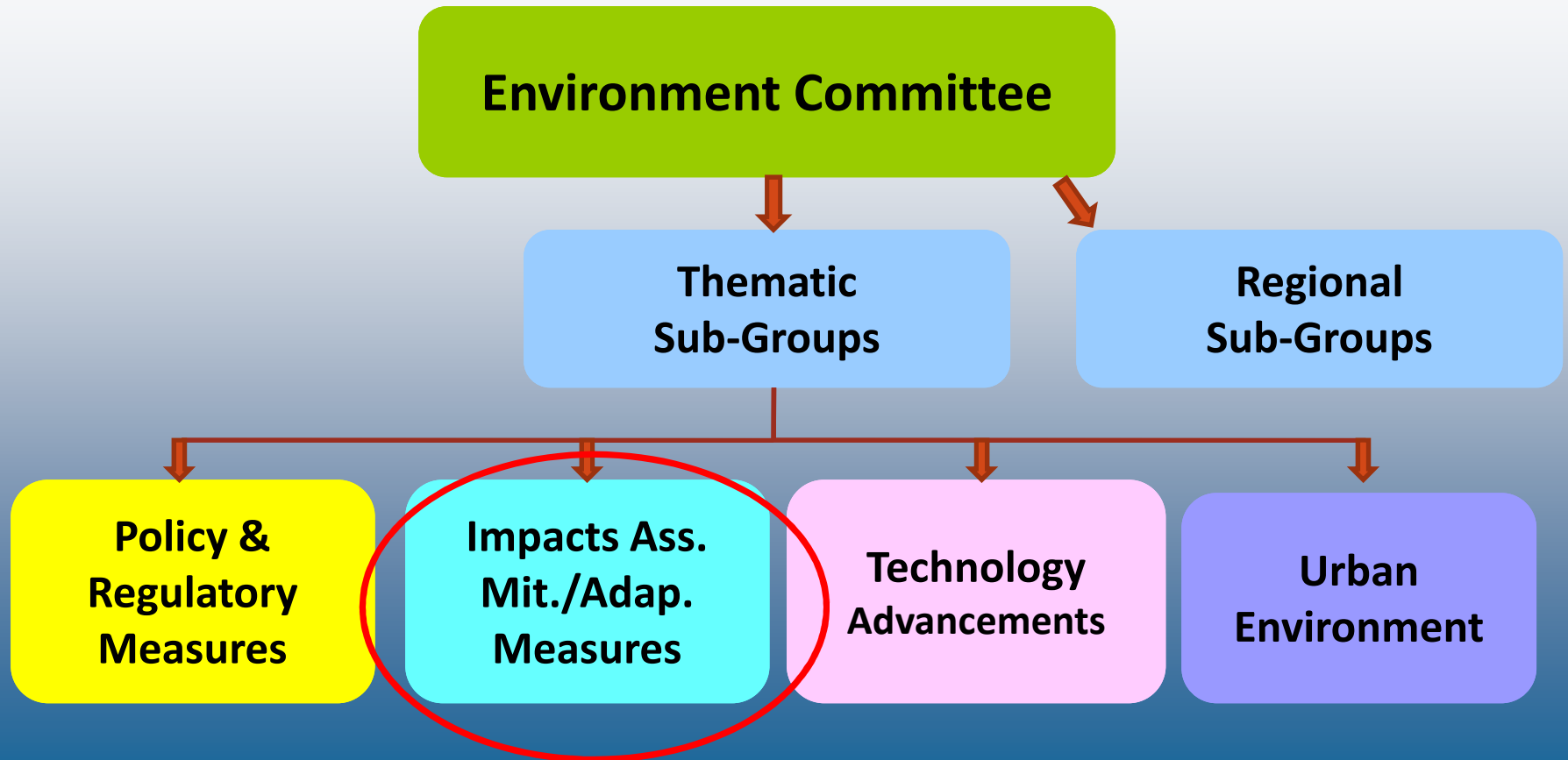
**Moving Towards
Green Road Infrastructure**

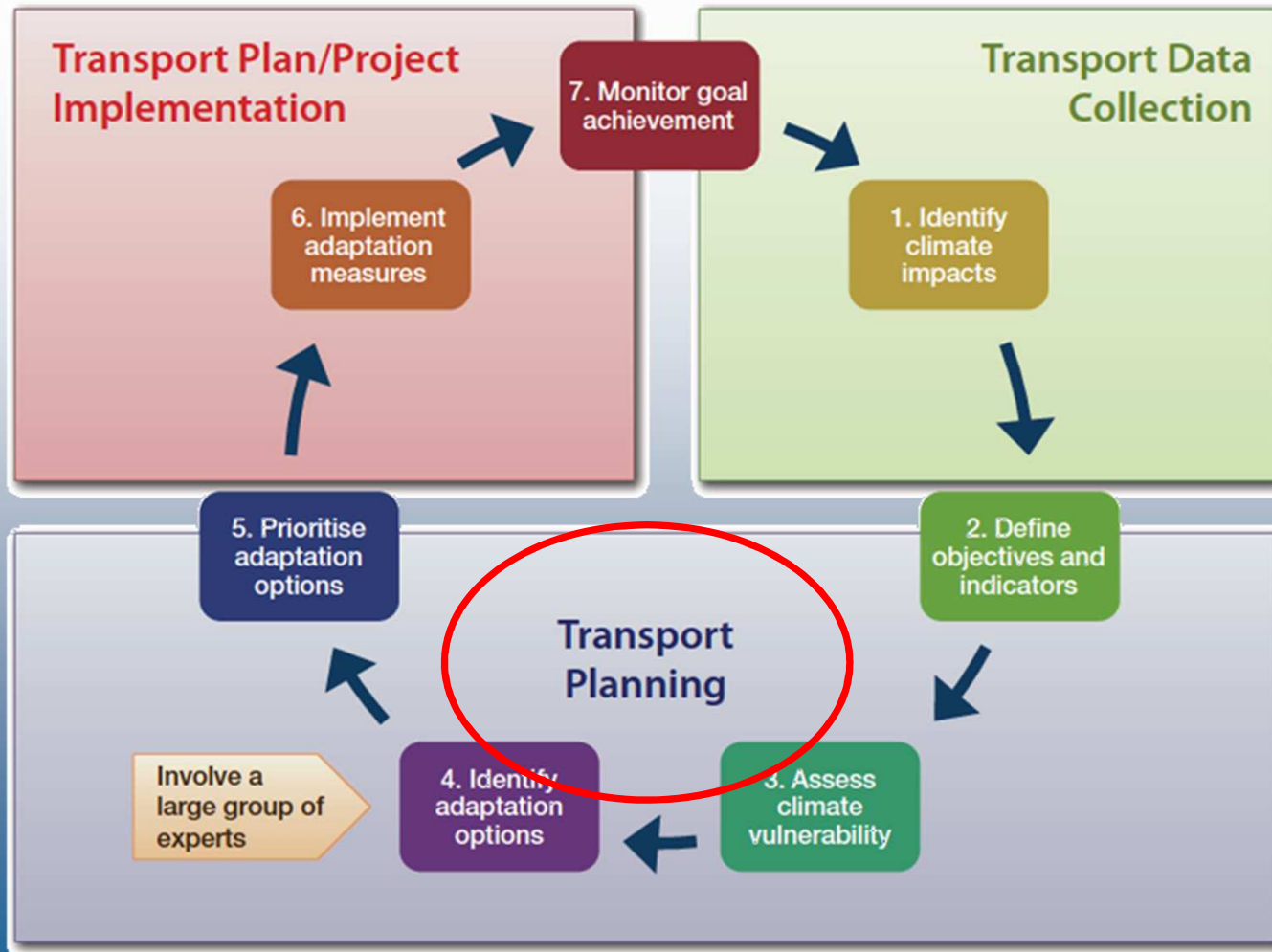
CASE STUDIES AND LESSONS LEARNED

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Scope & Structure





© GTZ 2009



Questions to ask in developing an adaptation strategy

- Which **changes** are most relevant?
- What are the **hazards** (e.g., flooding, storm surge coupled with sea level rise)?
- Which **assets** may be affected?
- How severe must a hazard be before action is required? Can **thresholds** be identified?
- How likely is it that a hazard will exceed the threshold, when, and where?
- What **level of risk** is acceptable?
- What **level of investment** (capital and operating) is needed to maintain different levels of service?
- Are there critical **levels of service** needed to protect health and safety?
- Who is empowered to make these judgments and decisions?
- What are the risks in case of **no action**?
- If action is necessary, how will **investment priorities** be determined?
- Who will make the necessary investments, and how will they be funded?



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Vulnerability

Risks

Resilience

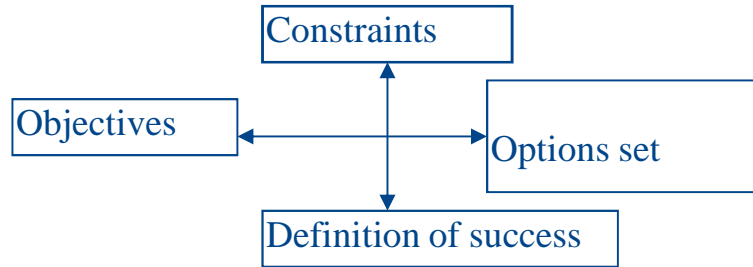
Uncertainty

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Framework for adaptive decision policy making

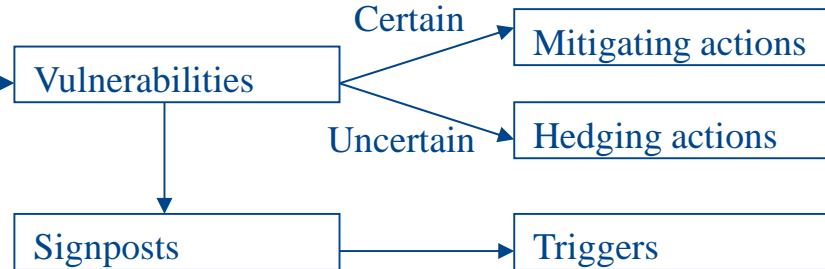
I. Stage Setting



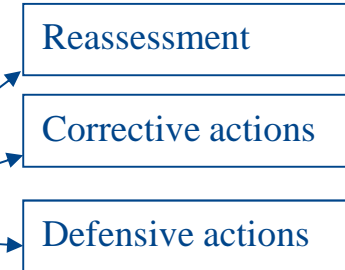
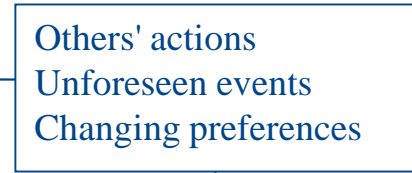
II. Assembling a basic policy



III. Specifying rest of policy and monitoring



IV. Adapting the policy



Dr A. Rahman





Examples of IRF Members' work



The 3 Counties Alliance Partnership (3CAP)

The Effect of Climate Change on 3CAP's
Highway Network Policies and Standards



- **Improving the resilience of transport Networks (New Zealand Transport Agency)**
- **Climate Change Framework (ARRB – Australia)**



The Adapting to Climate Change Tool (AtCCT)

- Understand the likely risks posed by climate change
- Develop adaptation responses to reduce the impact of these risks.
- For network owners, designers and decision-makers
- Applicable across regions & sectors

URS





Methodology

1. Identifying projected **climate changes** for the region;
2. Developing a local risk-based assessment of the network's **vulnerabilities**;
3. Identifying potential **adaptation responses**;
4. Identifying the **most effective** adaptation responses based on a 'multi-criteria analysis';
5. Developing and implementing an **Adaptation Action Plan**



Table 1: Climate Change Risk Register

Impact	Risk Score (RxPxI)
Pavement failure	18
Prolonged and/or more rapid growth of the soft estate	18
Lack of capacity in the drainage system and flooding	18
Heat damage to structures	12
Water scour to structures	12
Heat damage to pavement surface layers	12
Subsidence and heave	12
Less disruption by snow and ice	12
Landslips	8
Embankment erosion	8
Tree damage	8
Increased network use by cars and bikes as people avoid public transport during hot weather	4
Fire	3
Increased recreation and leisure-based travel	2
Plant and animal species changing. Shifting patterns of migration	2

Risk and probability assessment

- Risk impact
- Probability
- Influence



Table 2: Adaptation Action Plan

Adaptation Response	Score (Out of 3)	Timescale for implementation
Carry out a risk assessment to identify which structures are most at risk from climate change and recommend to inspection/maintenance regimes.	2.75	Immediate
Undertake a risk assessment to determine vulnerable drainage assets and establish a prioritised scheme for maintenance.	2.75	Immediate
Carry out inspections to assess which parts of the network are most at risk from excessive heat.	2.6	By 2012
Carry out flood studies to identify the most vulnerable areas of the network and establish actions to reduce the level of risk.	2.55	By 2014
Invest in asset management reviews and carry out drainage surveys to improve the knowledge of drainage assets, hydraulic capacity and asset ownership.	2.25	Immediate

Multi-criteria analysis (MCA)

Review current material specifications to assess their resilience to climate change Consider changing material choices.	2.15	Immediate
Increase verge maintenance frequencies to reduce the risk of 'root invasion' and vegetation ingress.	1.95	By 2015
Use polymer-modified and 'stiffer' binders that are less prone to binder stripping	1.85	By 2020



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Welcome to the global Transport Knowledge Resource Centre!

The global Transport Knowledge Practice (gTKP) is a comprehensive resource centre that features the latest, state-of-the-art information on road infrastructure and transport. Case studies, research papers, publications, reports, presentations – it's all at your fingertips! [Read more](#)

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IRF Publications:

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- IRF Bulletin Special Edition Rural Transport - Volume II
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- [Environment & Climate Change](#)
 - [Environment Overview](#)
 - [Emissions and Health](#)
 - [Air Pollution and Urban Mobility](#)
 - [Eco-Roads and Surfacing](#)
 - [Climate Change and Mobility](#)
 - [Climate Change and Mitigation](#)
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- ▶ Environment Overview
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 - ▶ Climate Change and Mitigation
 - ▶ Climate Change Negotiations
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[Home](#) > [Themes](#) > Theme pages

Climate Change and Adaptation

Definition

Adapting to climate change is about taking deliberate and considered actions to avoid, manage or reduce the consequences of a more extreme climate (warming of temperatures, more frequent flooding, rising of sea levels, increases in tropical storm and in hurricane intensities, migratory behaviour of wildlife species, etc...) and to take advantage of the opportunities that such changes may generate. The Intergovernmental Panel on Climate Change (IPCC) defines adaptation as the "adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities" (IPCC, 2007).



Adaptation can take many different forms. It includes education and training about climate change; revising emergency planning responses for more severe extreme weather events; revised planning standards for more vulnerable areas and managing and assisting our natural assets to improve their resilience to climate change impacts. It may also require more technical and scientific solutions.

Adaptation to environmental change is not a new concept. Human societies have shown throughout history a strong capacity for adapting to different climates and environmental changes. For example, farmers, foresters, civil engineers and their supporting institutions have been forced to adapt to numerous challenges to overcome adversity or to remove important impediments to sustained productivity.

Adaptation is a necessary complement to mitigation in addressing climate change. Mitigation is necessary to reduce the rate and magnitude of climate change, while adaptation is essential to reduce the damages from climate change that cannot be avoided.

Research

Despite considerable work examining climate change impacts and adaptation over the past two decades, relatively little attention has been given to built infrastructure and engineered systems, including transportation. Rather, much of the work on transportation and climate change has been directed toward mitigation issues. This is not surprising, considering that transportation accounts for a



Links

- Beyond borders: the need for strategic global adaptation. Dec, 2008
- Enabling Adaptation: Priorities for Supporting the Rural Poor in a Changing Climate (June, 2009)
- Financing Adaptation Action, publication by the Global Environment Facility (GEF), 2007

Documents

- Adaptation Guidance Manual
- Adapting Transport to Climate Change (Sustainable Transport: A Sourcebook for Policy-makers in Developing Cities)
- Assessing the Costs of Adaptation to Climate Change
- Potential Impacts of Climate Change on US Transportation
- Reducing the Vulnerability of the Poor through Adaptation
- The Effect of Climate Change on 3CAP's Highway Network Policies and Standards
- Transportation Adaptation to Global Climate Change

Recommended Links:

- Adaptation Fund Board
- Climate Proofing
- Global Environment Facility (GEF)
- The World Bank
- UNEP
- UNFCCC - Funding for Adaptation
- United Nations Framework Convention on Climate Change (UNFCCC)
- WeADAPT (Assessment & Design for Adaptation to Climate Change: A Prototype Tool)



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The Role of Coastal Zone Management Programs in Adaptation to Climate Change

This report is the second annual report on this topic to further explore the current and future roles of state coastal zone management programs in addressing climate change. The 2007 report, which remains the most comprehensive assessment of the various states' coastal program's climate change initi [Read More ...](#)

Type: Case Studies, Organization: Coastal States Organization, Published in 2008
Related theme(s): Environment & Climate Change

Adaptation of the Transportation System to the Impacts of Climate Change: Results of a Peer Exchange

This presentation on adaptation of the transport system explains how to respond to the impacts of climate change, both proactively and reactively. [Link: Adaptation of the Transportation System to the Impacts of Climate Change: Results of a Peer Exchange](#) [Read More ...](#)

Type: Case Studies, Organization: United States Department of Transportation, Federal Highway Administration, Published in 2009
Related theme(s): Environment & Climate Change

Reducing the Vulnerability of the Poor through Adaptation

A paper called Reducing the Vulnerability of the Poor through Adaptation explores and summarises the current state of knowledge on adaptation to climate change and the need for its integration into poverty eradication and sustainable development efforts. Ten agencies (UNDP, UNEP, World Bank, ADB, Af [Read More ...](#)



Input to UNECE Expert Group on Adaptation

- Distribution of questionnaire
- Share knowledge (gTKP as hub? fingerprinting?)
- Solicit IRF members to provide case studies for the final report (projects, policy, strategy, ...)



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Thank you
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