



**PRESENTATION TO**  
**Regional conference on Climate Change Impacts**  
**and Resilience of Transport Infrastructure**

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15 November 2021

**BUILD**  
**THE FUTURE**

# Climate change widespread, rapid, and intensifying

## Intergovernmental Panel on Climate Change (IPCC), 2021



NOAA

# The two sides of climate action

## Mitigation

- reducing climate change

Involves reducing the flow of heat-trapping greenhouse gases into the atmosphere



## Adaptation

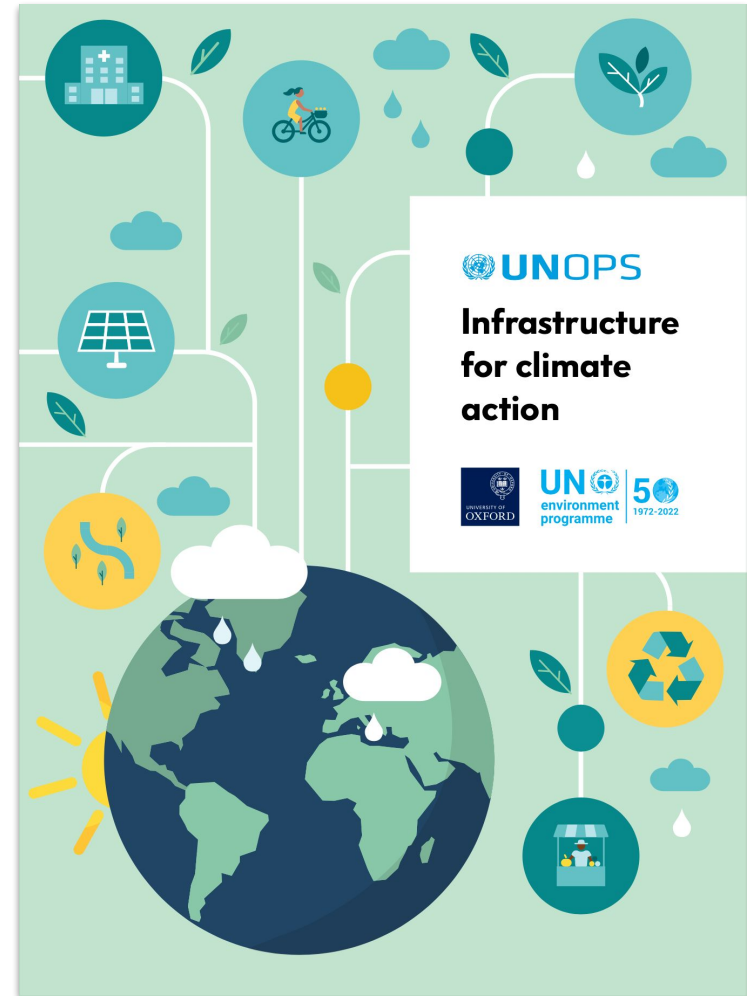
- adapting to life in a changing climate

Involves adjusting to actual or expected future climate



# Infrastructure for climate action

- UNOPS position on infrastructure and how it can be a force for good for climate action
- Developed in collaboration with UNEP and the University of Oxford
- Launched on October 12th 2021
- Publicised at COP 26 in Glasgow



# Report key message 1

## Infrastructure is of central importance for climate action, as well as the SDGs

### Climate action:

- Mitigation: Infrastructure is responsible for **79% of all GHG emissions**
- Adaptation: Infrastructure accounts for **88% of all adaptation costs**

*We cannot think about infrastructure without thinking about climate change and we cannot think about climate change (and action) without thinking about infrastructure - highlighting its significance*

### Sustainable development:

- Infrastructure can influence **92% of the targets of the SDGs**

*Achievement of the Paris Agreement and SDGs will be determined by how we plan, deliver and manage our infrastructure into the future*





# Report key message 2

## Infrastructure provides multiple opportunities to drive climate action in practice

- 18 key climate actions are presented for each sector
- Actions cover the whole lifecycle
  - Planning, delivery and management
- Actions not only relate to build assets, but also to natural solutions and the enabling environment
- Key actions for policy makers



### Climate mitigation

The transport sector comprises the facilities, networks, assets, vehicles and institutional structures responsible for the movement of people and goods and can be split into several subsectors, including road, rail, air, urban, maritime and inland water navigation. Given that fossil fuels remain the dominant source of energy consumption in transport, the sector is responsible for approximately 16 per cent of global greenhouse gas emissions, making it the third largest contributor to GHG pollution after energy and buildings.<sup>34</sup>

### Climate adaptation

Increased incidence and intensity of hazards linked to climate change threaten to disrupt and damage transport networks, including vital connections to economic, educational, health, or other opportunities or services. These impacts may fall most heavily on vulnerable populations, including women and girls, particularly in areas where availability of alternative routes or other transport options is poor. This necessitates adaptive measures to ensure continued function, accounting for ten per cent of

global adaptation costs, and may include protective barriers, drainage, or natural buffers to protect roads, railways, airports and coastal infrastructure from increased flood hazards.<sup>34</sup> Other engineering or technology upgrades, such as the use of new or innovative materials, can protect transport infrastructure from the effects of higher average temperatures or increased rainfall.

### Sustainable development

The transport sector can influence 76 SDG targets across all 17 SDGs (45 per cent).<sup>35</sup> Transport outcomes are directly represented in several goals, including SDG 3 (road safety), SDG 11 (access to public transport), and SDG 14 (marine conservation). Beyond that, transport infrastructure facilitates the achievement of many other SDG targets by connecting individuals to infrastructure services and to each other, providing communities with access to essential services and enabling the mobility of people and freight, including internationally. Transport infrastructure is thus essential to sustainable development and to regional, national and transnational cooperation and can improve a country or region's global competitiveness.<sup>36</sup>

Tables: Key actions to promote mitigation, adaptation and sustainable development in the transport sector, accompanied by illustrative examples

### Transport - Planning stage

Mitigation	Adaptation	Development
<p><b>Geospatial data and modelling capacity:</b> Conduct modelling of projected needs for municipal transport services to reduce the emissions of cities. In the transport sector, capacity to undertake network and origin-destination model analysis can enhance low-carbon transport opportunities by identifying pedestrian, cycling and public transportation routes, and enabling the adoption of sustainable technologies such as electric vehicles.</p>	<p><b>Incorporate redundancies into the system:</b> Reduce impacts of unexpected shocks due to climate hazards or disasters so that social and economic services can still be accessed. For example, plan for bus replacement services to be quickly deployed in the event of rail system failure.</p>	<p><b>Integrate responsiveness to end users in project planning to enhance systems accessibility:</b> Identify and incorporate needs of vulnerable people and local communities at planning stage helps ensure that transport systems will cater to the differentiated mobility needs of different users and enable their equal access to essential services. For example, defining the location (distance from schools or villages) and design of bus stops (safety measures, seating arrangements, shade and reliable and uninterrupted electricity) based on the travel patterns and needs of school children help ensure the safe and equal access to schools by boys and girls (SDGs 10 and 11).</p>
<p><b>Consider geographical characteristics and prioritize lower-carbon solutions:</b> Harnessing local topography, climate, soil, watershed and vegetation conditions can enable the identification and development of low-carbon infrastructure solutions. In the transport sector, enabling local conditions such as natural watercourses can enable the development of low-carbon transport corridors and foster the use of ferries and non-motorized boats, which are likely to be more appropriate to the local context and energy efficient when compared to other transport means.</p>	<p><b>Plan and coordinate role in inclusive response to emergencies such as natural disasters:</b> Develop a detailed plan of the sector's role and contribution to emergencies and disaster relief. Use appropriate network data and hazard assessment, to support rapid recovery with focus on vulnerable communities. For example, detail the role of the transport system in mobilizing aid and disaster response to affected areas across all modes (road, rail, air, water transport), and ensure that these critical assets are upgraded or retrofitted to withstand shocks and stresses.</p>	<p><b>Conduct appropriate assessments to identify negative environmental impacts:</b> Undertake strategic impact assessments to estimate the potential for the natural environment to support the proposed infrastructure asset construction, as well as the implications for local communities. This could include the impacts of roads or urban developments on habitat fragmentation, threats to wildlife or ecosystems services, as well as the interventions required for habitat rehabilitation. Based on this information, ensure that design standards (i.e., freeway weaving and relevant geometric design) will enable a reduction of GHG emissions and air and sound pollution associated with transport, helping protect local ecosystems and vulnerable households (SDG 15).</p>

# UNOPS Roads implementation (2015 - 2020)

## Unpaved roads

(rural & urban areas)



**Over 9,000 Km**

of unpaved roads planned, designed and constructed, often through labour-intensive projects.

## Paved roads

(rural & urban areas)



**Over 1,150 Km**

of paved roads implemented in both urban and rural areas.

## Highways



UNOPS planned, designed and constructed **over 100 Km** of highways on behalf of partners.

## Bridges



**Over USD 30 million** of budget delivery for the planning, design and construction of road bridges

# Case study: Serbia Flood Rehabilitation Support Programme

Partner: **Government of Serbia and Public Investment Management Office**

Funding Source: **EU, United Kingdom, France, Norway and Canada governments**

Year: **2014-2017** Budget: **22 million Eur** Sector: **Multiple**

## BUILDINGS AND CONSTRUCTIONS



**27** public buildings and **100** private houses ensured sustainable and resilience housing solution to the most vulnerable population.

## DISASTER RISK REDUCTION AND RECOVERY



The flood prevention system improved through **Action Plan for flood prevention** of the most impacted area by the floods. The equipment for early warning signs specified and measures to increase resilience.

## TRANSPORT INFRASTRUCTURE



**12 km** of Krupanj Korenite road rehabilitated along with **36** landslides and **14** bridges designed to sustain 100 year flood events, mitigating the risk of climate changes and natural hazards.

## WATER AND WASTE MANAGEMENT



Embankments of **5** rivers reconstructed and **2** pumping station repaired and equipped to ensure more resilient water management system to sustain climate change



# Case study: EU Support for the Reconstruction of the Roads Affected by the floods in Serbia Project

Partner: **Public Enterprise Roads of Serbia**

Funding Source: **EU**

Year: **2016-2018**

Budget: **10,5 million Eur**

Sector: **Infrastructure**

**9** bridges reconstructed  
**5** new constructed to sustain centennial water  
**44** landslides remediated and road section rebuilt with improved resilience and safety, limiting impact of climate change



# Case study: Resilient Transportation for Climate Change Adaptation

Partner: **Government of Saint Vincent; Government of Mexico**

Year: **2016-2019**

Sector: **Transport**

- In 2013, a tropical storm in Saint Vincent and the Grenadines led to intense flooding across the island.
- In response to this, UNOPS implemented the reconstruction project with a specific focus on community involvement and resilient design practices.
- This involved the reconstruction of
  - 1 main bridge (designed to withstand a category 5 hurricane);
  - 3 subsidiary bridges and repairs of 1.5 km of roads to connect the northern communities to the capital in the south, and enable access to critical services.





# Case study: Enhancing Capacity for Resilient Infrastructure in Bangladesh

Partner: **4 Government Ministries, UNDP, UNWomen, SIDA, FCDO**  
Year: **2018-2022** Sector: **Multiple**

- Improve the capacity of the government to achieve resilience through designing and constructing risk-informed, disability inclusive and gender-responsive infrastructure systems
- As one of the largest implementing arms of the government, the Local Government Engineering Department (LGED) is responsible for planning, developing, maintaining and managing local level infrastructure across Bangladesh. UNOPS is to support LGED in infrastructure asset management.
- The project will help LGED improve its procedures, processes, and systems to manage assets to ensure sustainable and resilient delivery of appropriate level of services to the community that meet the expectations and needs of the present and future



# Case study: Integrated Border Management Project (Kosovo-Serbia) Merdare Common Crossing Point

Partner: Ministry of Internal Affairs (Kosovo and Serbia); EU Office in Kosovo  
Year: **2016-2020**      Sector: **Rule of Law**      Value: **11M Euro**

**Objective:** Support the Kosovo and Serbian authorities to strengthen the rule of law by enhancing IBM, the implementation of readmission and reintegration framework and by aligning with and implementing the EU acquis.

**Output 1:** Design of green and resilient infrastructure for Three Common Crossing Point between Kosovo and Serbia:

**Output 2:** Construction management of green and resilient infrastructure for Two of three Common Crossing Points:

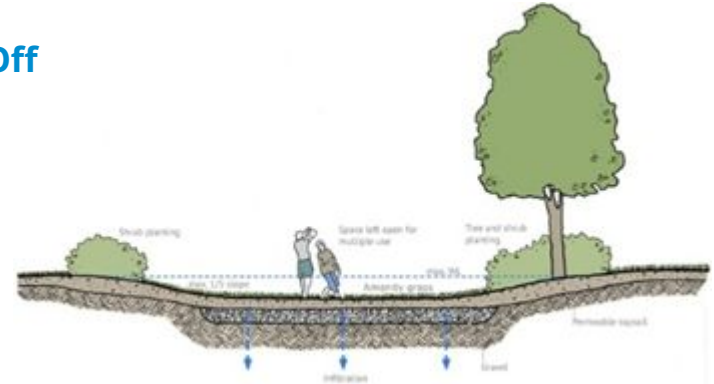
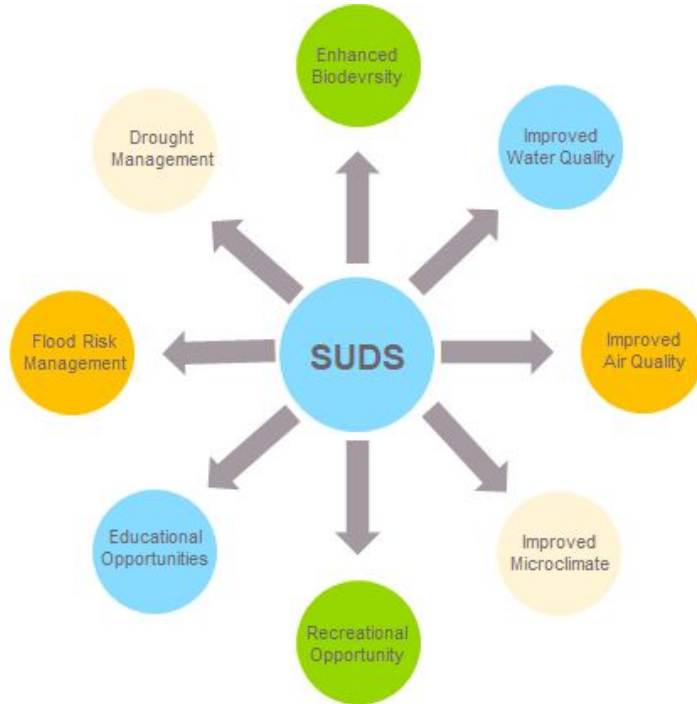
- All design included greater resilience against CC events through an increase in all load factors against EU standard codes to take account of changing weather patterns through foreseen lifetime of the facility, (Seismic, Wind, Snow, Rainwater)
- Inclusion of a sustainable Urban Drainage System of increased SW capture in storm conditions as well as natural environmental treatment of SW prior to release to natural habitat;





# Case study: Integrated Border Management Project (Kosovo-Serbia)

(SUDS) Sustainable Urban Drainage System for SW Run Off



# Conclusions

- Infrastructure is centrally important to climate action;
- Transport is a key sector for action through mitigation [contributing 16 % of all emissions] and adaptation [making up 10% of all adaptation costs]
- There are multiple opportunities to mainstream action across the infrastructure lifecycle: planning, design, delivery and management;
- UNOPS works in a variety of countries around the world implementing infrastructure projects and enhancing sustainable and resilient development;
- In the decade of action for the SDGs, the Paris Agreement and following the COP26 just held in Glasgow this month, it has never been a more critical time to take action;