Climate Change, Urban Mobility and Green Growth
### Objectives

- Establish a general understanding of climate change, its causes, and adverse impacts to development and transport.

- Give an overview of global initiatives and financing landscape to address climate change.

- Introduce the concept of climate change mitigation and adaptation in the transport sector.

- Give examples of best practices addressing climate change in the transport sector.
Setting Context
Climate Change: what is it and what causes it

Climate change is long-term change of climatic patterns

It results in an increasing frequency and intensity of extreme climatic events

Climate change is caused by the Greenhouse Effect

Instead of the sunlight bouncing off the surface of the Earth, it gets trapped in the blanket of GHGs

Most of the heat is absorbed by greenhouse gases and reflected in all directions, warming the Earth
Climate Change – raise of global temperature and sea levels

Source: IPCC Climate Change 2014 Synthesis Report Summary for Policymakers
Climate change jeopardizes hard earned development outcomes

Climate Change forces 26 million people into poverty each year

Impact of extreme natural disasters is equivalent to a global $520 bn loss in annual consumption

Source: Resilience.org
Transport is both a driver and a victim of Climate Change

Transportation is a major source of global GHG emissions

Global GHG Emissions by Sectors

- Agr. Forestry and Land Use: 24%
- Electricity and Heat Production: 25%
- Industry: 21%
- Building: 6%
- Other Energy: 10%
- Transportation: 14%

Transport assets and services are hit hard by climatic risks

Direct damage caused by natural and climatic hazards to global transport infrastructure about $15 billion a year

Costs of the influence of extreme weather events on the transport system in EU is about €2.5 billion a year

Source: IPCC Climate Change 2014


Climate change, urban mobility and green growth
Global Initiatives and Financing
Global Initiatives to Tackle Climate Change

United Nations
Climate Change
Conferences of
Parties (CoP)

Reached historic Paris Agreement at COP 21 in 2015 aims to keep the rise in global temperature in the 21st century below 2 degrees Celsius.

United Nations 2030 Agenda for Sustainable Development calls for urgent actions to combat climate change and its impacts under SDG 13 Climate Action.

United Nations 2030 Sustainable Development Goals

Turning Commitments into Actions
Global Climate Finance to tackle Climate Change

Multilateral Development Bank Climate Finance Hit Record High of US$ 43.1 Billion in 2018
Transport initiatives by Non State Actors for Paris agreement goals

Urban Transport
- Eco-Mobility Alliance
- Taxi4SmartCities
- C40 Clean Bus Declaration

Freight and Logistics
- Global Green Freight Action Plan
- Navigating a Changing Climate coalition

Electric Mobility
- EV100
- Below50
- Urban electric mobility initiative

Cycling and Walking
- Global Sidewalk Challenge
- Cycling delivers on global goals
- Train for Future

Transport Technology
- ITS for Climate
Climate Change and Transport
Climate Change Mitigation and Adaptation in Transport

**Climate Change Mitigation in Transport Sector**

- Reducing GHG emissions from transport by avoiding transport demand, shifting to less emissive modes, or improving fuel efficiency

**Climate Change Adaptation in Transport Sector**

- Making the transport assets and services more resilient to climatic hazards and shocks by integrating risks into transport lifecycle management
Climate change and transport
Deep Dive on Mitigation
Transport is the fastest growing contributor to GHG emissions

Transport sector CO2 emissions by mode in Gt, IEA 2018

Road vehicles account for nearly three-quarters of transport CO2 emissions

Aviation

Shipping
Climate Mitigation in transport – Avoid, Shift, Improve
Mitigation case study: Seoul and green transport

Increased the bus routes and improved reliability of the service

Introduced and integrated fares with free transfers between buses and metro

The results was:

✓ Energy consumption in road sector lowered
✓ Congestion and congestions costs decreased
✓ CO2 emissions from the transport sector were reduced

Seoul
Climate change, urban mobility and green growth

Mitigation Case Study: Impact of BRT System in Mexico City

Mexico City 200km of metro were insufficient to handle the demand.

The city invested in a Bus Rapid Transit System (Metrobus) which comprise 7 routes and has a daily ridership of 1.8 million.

The benefits achieved are:

✓ Alleviated traffic and reduced commuting time for the BRT route from 1.5 to 1 hour.
✓ Reduced the CO2 emission by 35,000 tons annually.

Source: OECD
Climate Change and Transport
Deep dive on Adaptation
Transport assets and services are vulnerable to climate shocks

- **Heat Waves**: Road pavement melting
- **Flooding**: Rural connectivity cut off
- **Snow Storms**: Railway operation disruption
- **Cyclone**: Maritime asset damaged
Climate adaptation in transport – Risk informed asset management

Transport System Planning based on climate risk profiles
- Flood Prone
- Schools
- Markets
- Geo-spatial risk analysis
- Network level climate vulnerability assessment

Engineering Design to integrate resilient measures
- Improve national design standards and drawings
- Use of local resilient materials

Operation and Maintenance to sustain resilience
- Performance based contract
- Define resilience service level and indicator

Contingency Programming for shock response
- Pre-qualify service providers
- Speedy procurement
Adaptation case study: Tokyo’s underground cathedral

Tokyo has the is the world’s largest diversion floodwater facility.

The pumps in the Discharge Channel could empty a 25m swimming pool in less than three seconds.

Tokyo's rivers - so beautiful for much of the year - can pose a danger in times of heavy rainfall.

Source: BBC
World Bank on Climate Change: Lead by example
Strong results achieved under World Bank climate action plan

WBG is making all operations climate informed through four mainstreaming efforts

- Climate and Disaster Risk Screening
- Climate Co-Benefits
- GHG Accounting
- Internal Carbon Price

18 gigawatts of additional renewable energy into electricity grids
Investing $784 million in improving climate-resilient transport systems
Providing 38 million people in 18 countries with access to reliable climate information and early warning systems

All data are as of April 2018
The World Bank committed for a new ambitious plan towards 2025

1. Deepening Climate Mainstreaming and Increasing Direct Climate Financing
2. Increasing Leverage of Private Finance and Creating Markets for Climate Action
3. Systematically Investing in a Better Adapted World
4. Driving Larger Systemic Impact at the Country Level
5. Elevating Climate Actions in Key Sectors and Areas

Low-Carbon and Resilient Cities

100 Cities with low-carbon and compact urban planning

100 Cities with integrated city-based resilience approach