A solid orange horizontal bar is positioned at the top left of the slide.

# Activities of the Group of Experts on Assessment of Climate Change Impacts and Adaptation for Inland Transport (2020-2025)

WP.5, 34<sup>th</sup> session  
15-17 September 2021

---

Lukasz Wyrowski

## **Group of Experts on Assessment of Climate Change Impacts and Adaptation for Inland Transport (2020-2025)**

### **the Group's key tasks:**

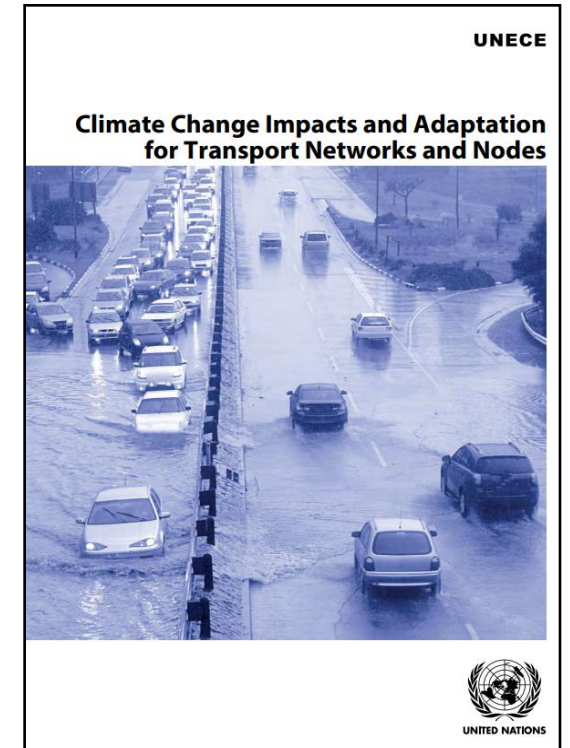
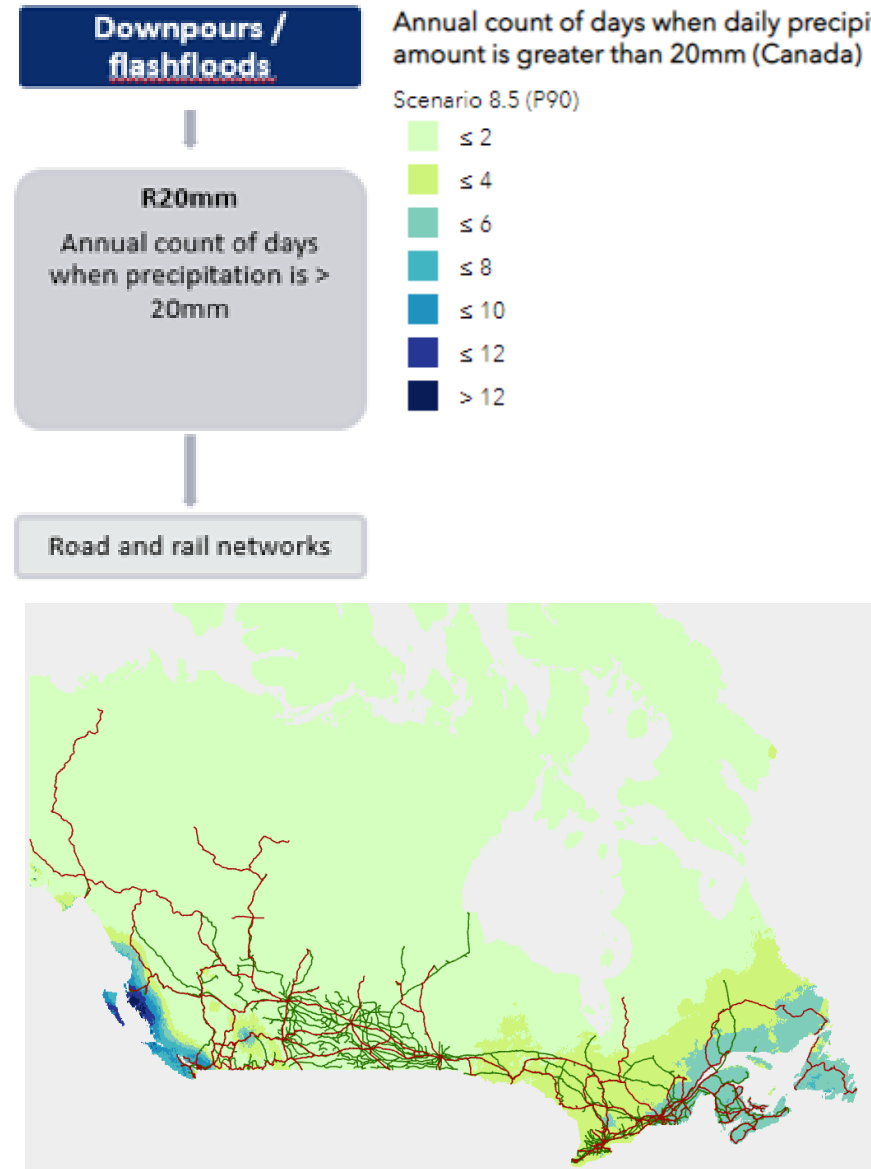
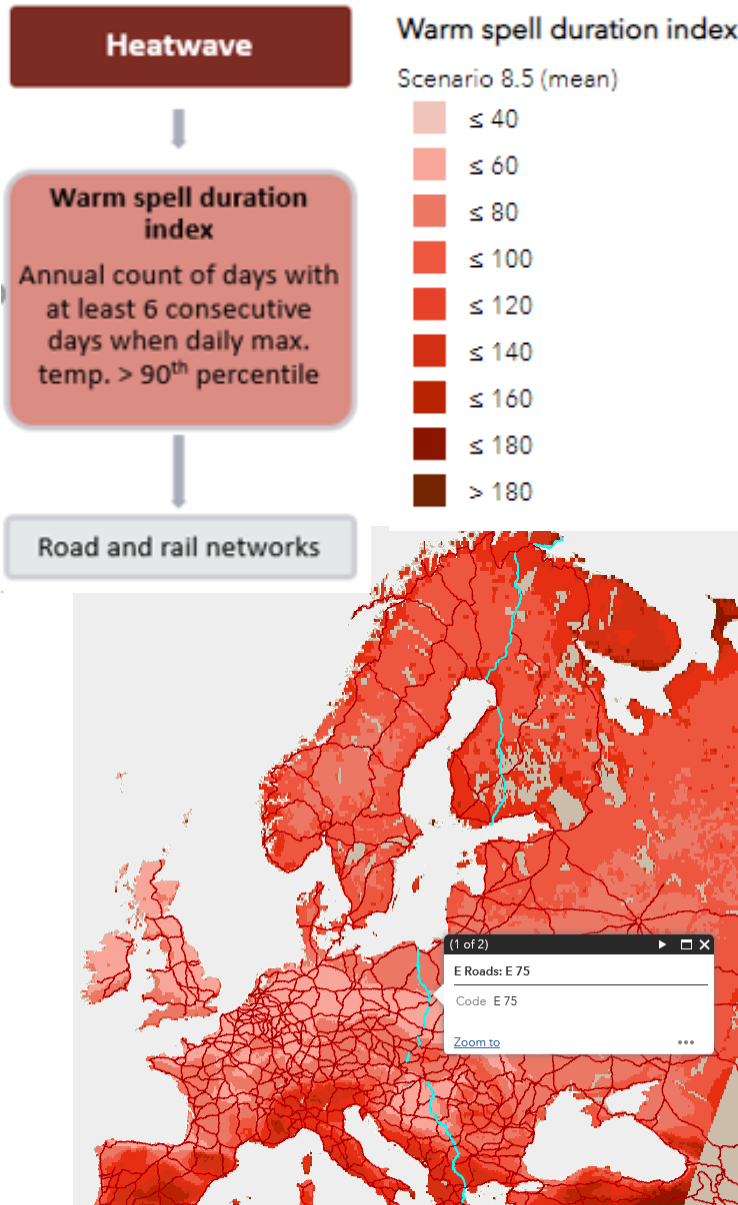
- (i) raise awareness, build capacity and integrate knowledge from countries and the scientific community on climate change impact assessment and adaptation for transport, and
- (ii) further advance the state of knowledge, the analysis of climate change impacts on inland transport and identification of suitable and costs-effective adaptation measures

## **Group of Experts on Assessment of Climate Change Impacts and Adaptation for Inland Transport (2020-2025)**

### **Expected outputs:**

- Maps overlaying climate change projections and transport assets
- Analysis of possible impacts, areas of vulnerability
- Review of national projects
- Database of (successfully implemented) adaptation measures
- Guidelines for integrating climate change considerations in planning and operational practices

# Maps overlaying climate change projections and transport assets/ Analysis of possible impacts, areas of vulnerability






# Maps overlaying climate change projections and transport assets/ Analysis of possible impacts, areas of vulnerability



## Ongoing work:

- Identification of climate impacts of interests to transport professionals – maps for entire UNECE region
- Identification of climate impacts of interests to transport professionals – maps for a selected corridor/geographical area
- Impacts => proxy indices / stress tests => analysis (thresholds) (network criticality)
  - ⇒ Resource material around understanding changing thresholds
  - ⇒ Guidance on criticality assessment / criticality indicators
  - ⇒ Guidance around stress tests

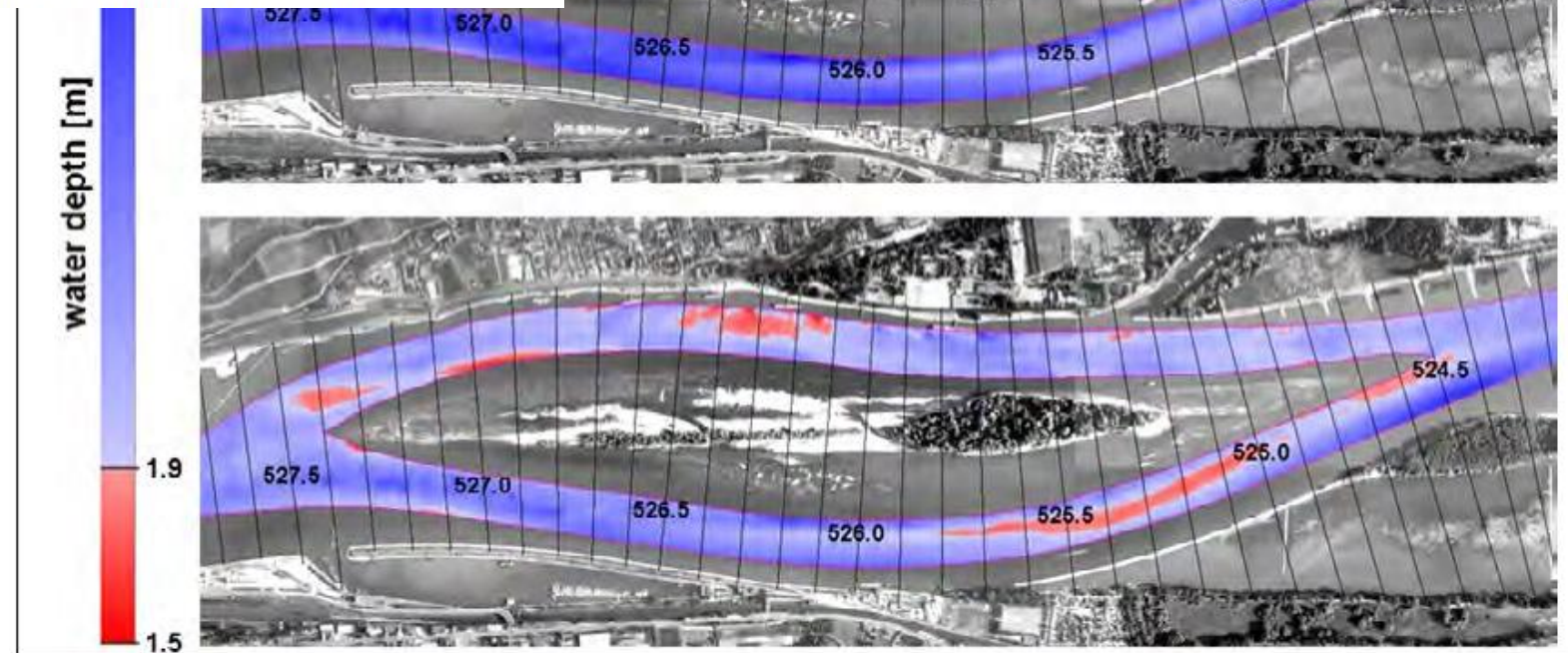
# Examples of climate change impacts on transportation infrastructure and operations

			
<b>Temperature</b> <ul style="list-style-type: none"> <li>Higher mean temperatures; heat waves/droughts; changes in the numbers of warm and cool days</li> <li>Reduced snow cover and arctic land and sea ice; permafrost degradation and thawing</li> </ul>	<b>Road</b> <ul style="list-style-type: none"> <li>Thermal pavement loading and degradation</li> <li>Asphalt rutting</li> <li>Thermal damage to bridges</li> <li>Increased landslides</li> <li>Reduced integrity of winter roads and shortened operating seasons</li> </ul>	<b>Rail</b> <ul style="list-style-type: none"> <li>Track buckling</li> <li>Infrastructure and rolling stock overheating/failure</li> <li>Slope failures</li> <li>Signaling problems</li> <li>Speed restrictions</li> <li>Asset lifetime reduction</li> <li>Higher needs for cooling</li> <li>Shorter maintenance windows</li> </ul>	<b>Waterways and ports</b> <ul style="list-style-type: none"> <li>Damage to infrastructure, equipment and cargo</li> <li>Higher energy consumption for cooling</li> <li>Potential reductions in snow/ice removal costs</li> <li>Occupational health and safety issues during extreme temperatures</li> </ul>
<b>Precipitation</b> <ul style="list-style-type: none"> <li>Changes in the mean values; changes in intensity, type and/or frequency of extremes</li> </ul>	<ul style="list-style-type: none"> <li>Inundation, damage and wash-outs of roads and bridges</li> <li>Increased landslides</li> <li>Impacts on bridges</li> </ul>	<ul style="list-style-type: none"> <li>Flooding, damage and wash-outs of bridges</li> <li>Problems with drainage systems and tunnels</li> <li>Delays</li> </ul>	<ul style="list-style-type: none"> <li>Infrastructure inundation</li> <li>Navigation restrictions in inland waterways due to river water levels changes</li> </ul>
<b>Sea levels/storm surges</b> <ul style="list-style-type: none"> <li>Mean sea level rise</li> <li>Increased extreme sea levels</li> </ul>	<ul style="list-style-type: none"> <li>Erosion of coastal roads</li> <li>Flooding, damage and wash-outs of roads and bridges</li> </ul>	<ul style="list-style-type: none"> <li>Bridge scour, catenary damage at coastal assets</li> <li>Disruption of coastal train operation</li> </ul>	<ul style="list-style-type: none"> <li>Asset inundation</li> <li>Navigation channel sedimentation</li> <li>Maintenance costs</li> </ul>

## Examples of climate change impacts on transportation infrastructure and operations

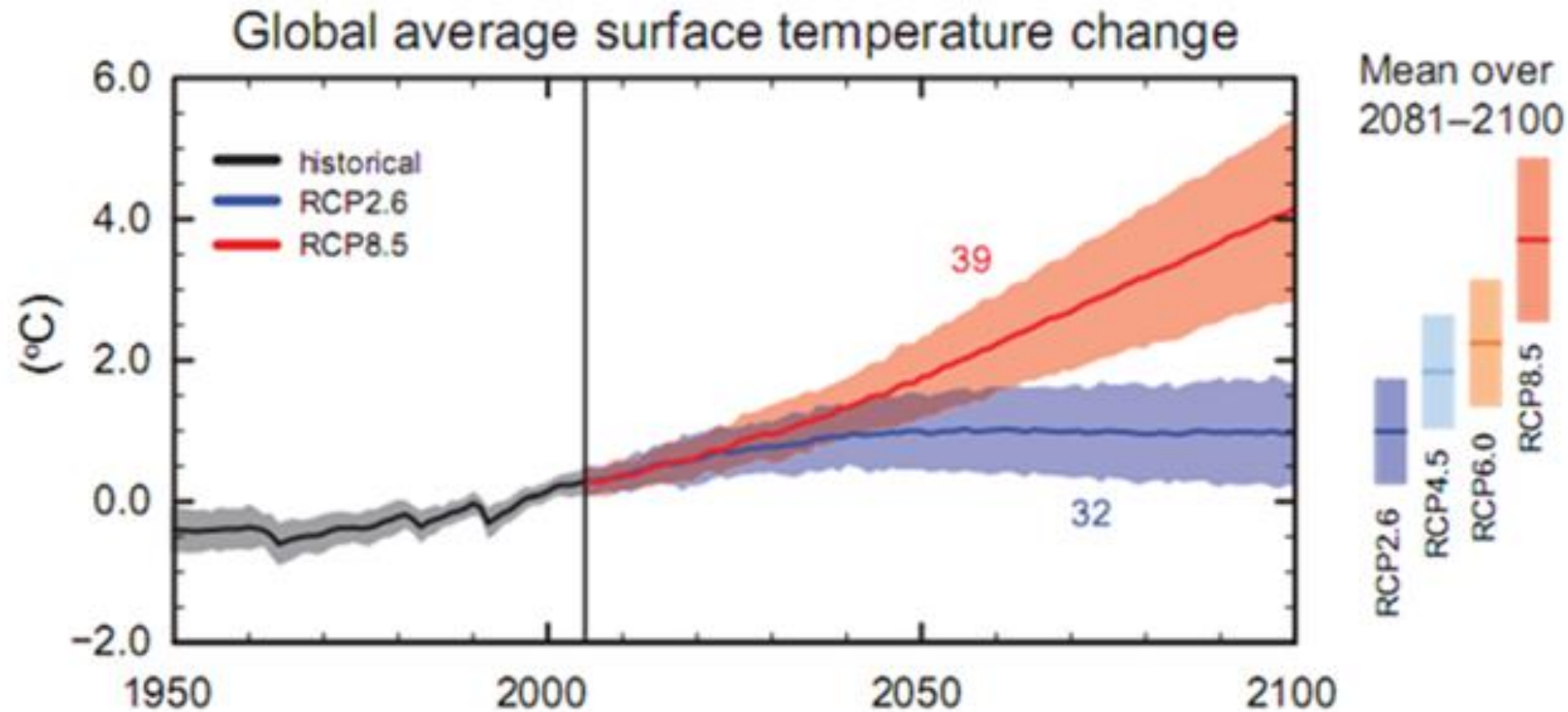


Source: Transport Canada, page 41 of 'Climate Risks & Adaptation Practices for the Canadian Transportation Sector 2016' report



Source: Low flow extremes of the Rhine river – Causes, impacts and adaptation of the most important inland waterway in Europe

## Current impacts vs future potential impact

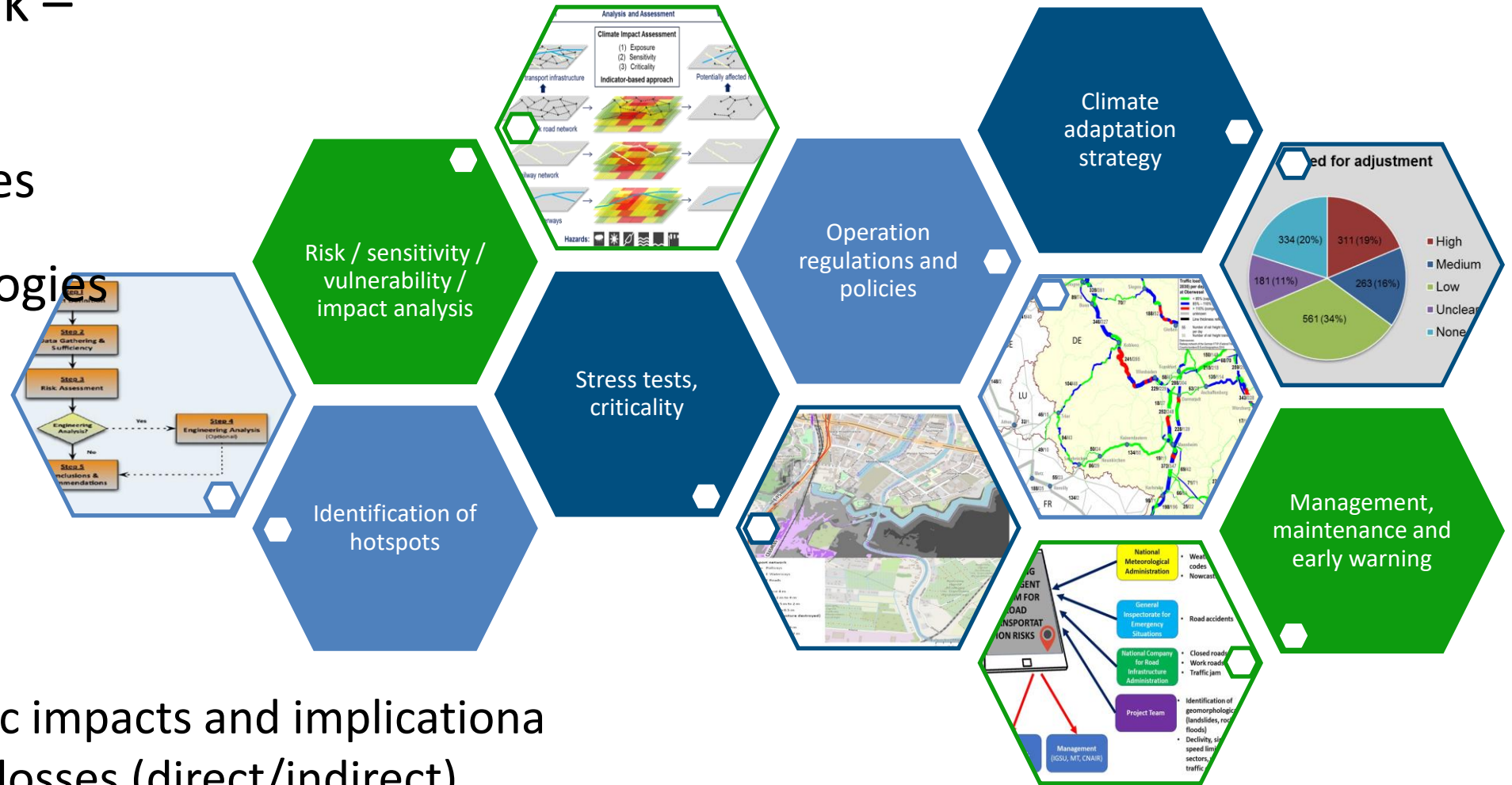




# Review of national projects

Ongoing work – review of:

- Approaches
- Methodologies
- Practices
- Tools



Socioeconomic impacts and implications

⇒ Economic losses (direct/indirect)

⇒ Data collection tool

## Ongoing work:

- Review of what is available and gap analysis
  - Asset facts sheets / case studies / expert-judged adaptation measures associated to key impacts

⇒ identification of a product

## - Implemented

- Workshop on considerations of physical climate change risks in transport planning and operational processes (Geneva and online 26 March 2021)

### Outcomes

- ⇒ Business cases for adaptation (economic losses)
- ⇒ Clarification of timelines (from risk assessment to adaptation – thresholds?)
- ⇒ Asset management cycles for adaptation
- ⇒ Monetize prevention of losses
  
- ⇒ More dialogues with transport professionals to better assess their needs

# Guidelines for integrating climate change considerations in planning and operational practices



## - Ongoing

Preparations to a new workshop to raise awareness about needs to adapt transport systems to climate change

**Climate resilience of transport systems – what do we need to know?**

Moscow (*and online*), in November 2021

# Thank you

Lukasz Wyrowski

Secretary, Group of Experts on Assessment of Climate Change Impacts and Adaptation for Inland Transport

*Lukasz.Wyrowski@un.org*