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

SC.1, 116th session
13-15 October 2021

Lukasz Wyrowski

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

the Group's key tasks:

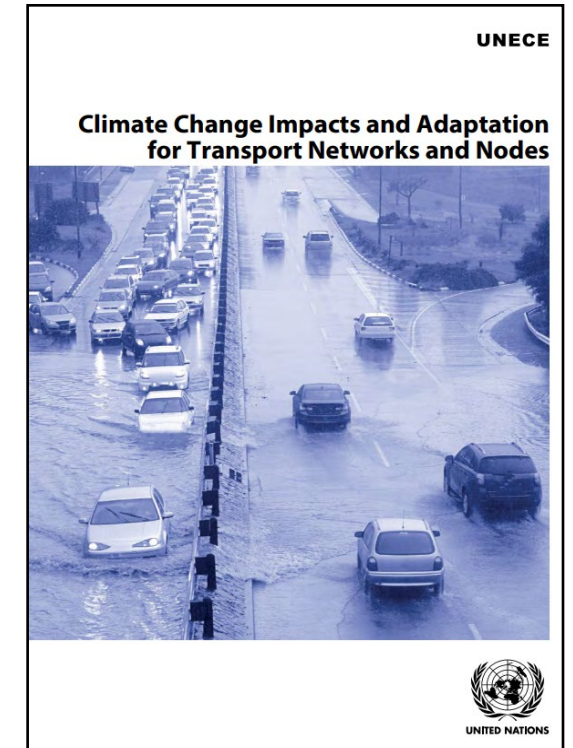
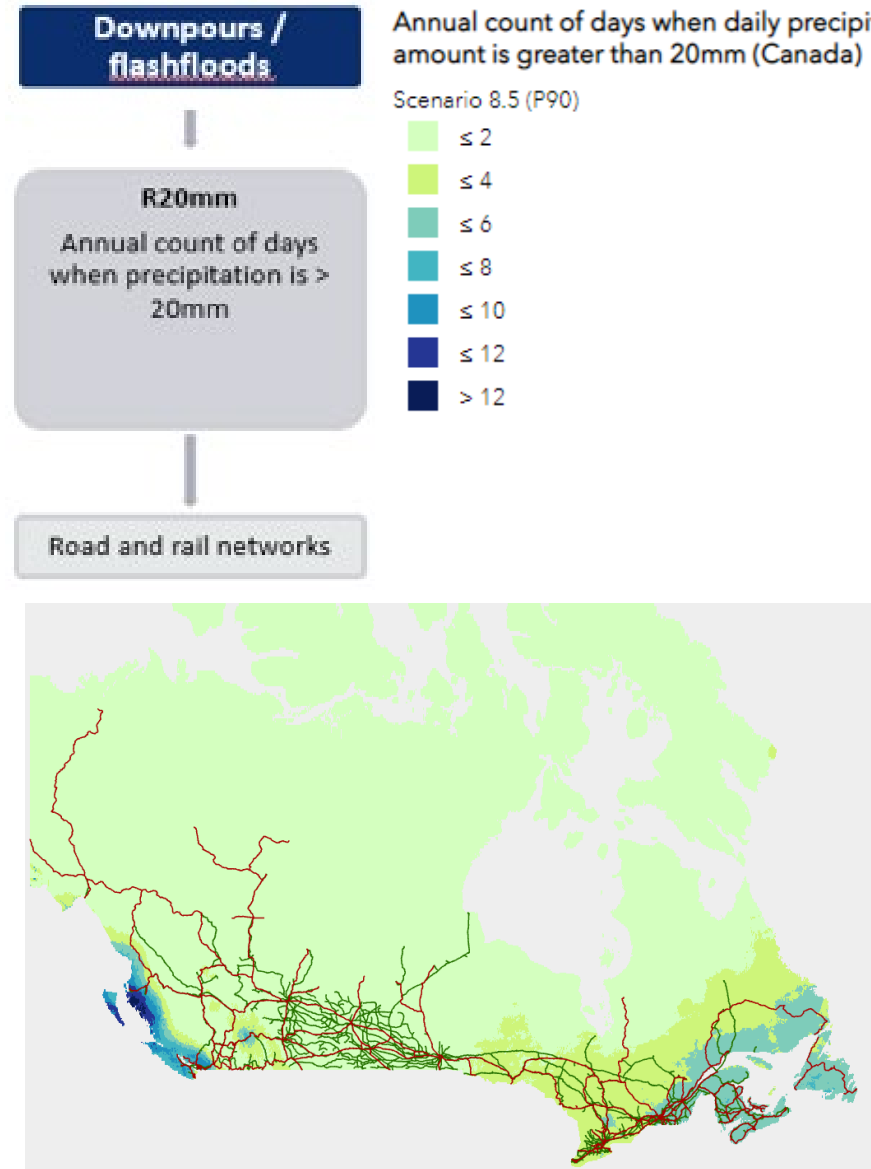
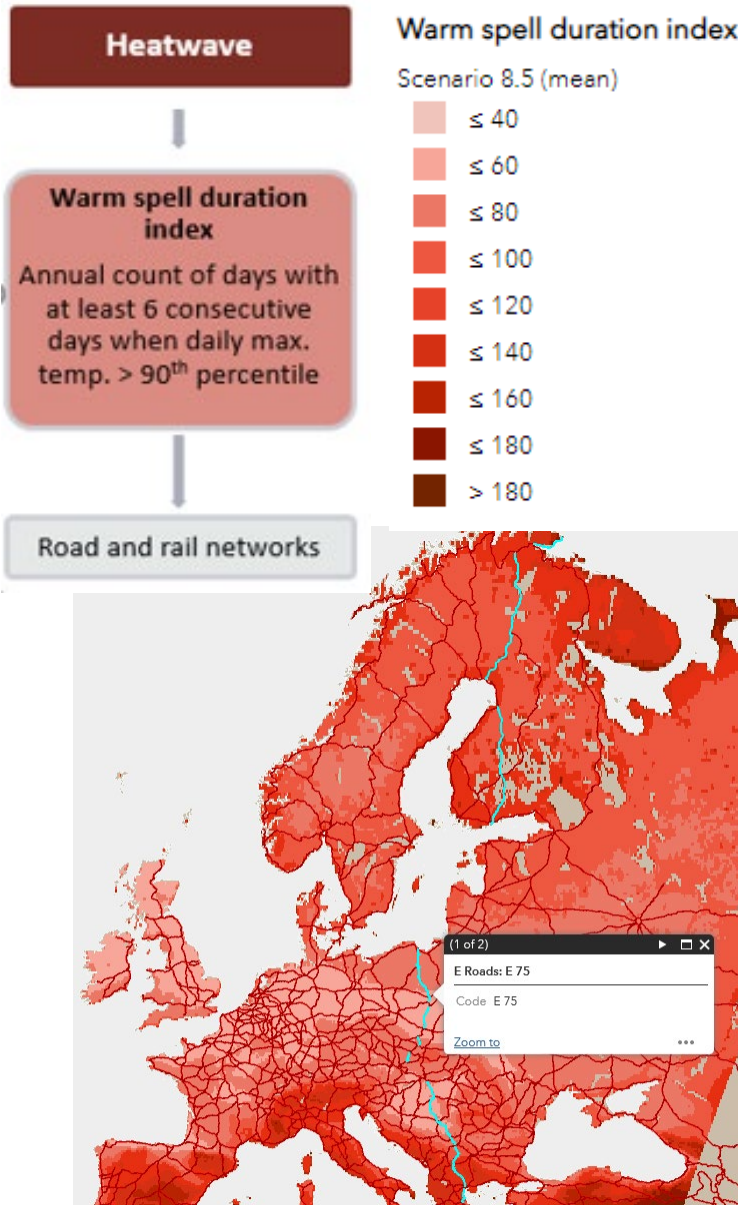
- (i) raise awareness, build capacity and integrate knowledge from countries and the scientific community on climate change impact assessment and adaptation for transport, and
- (ii) further advance the state of knowledge, the analysis of climate change impacts on inland transport and identification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

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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

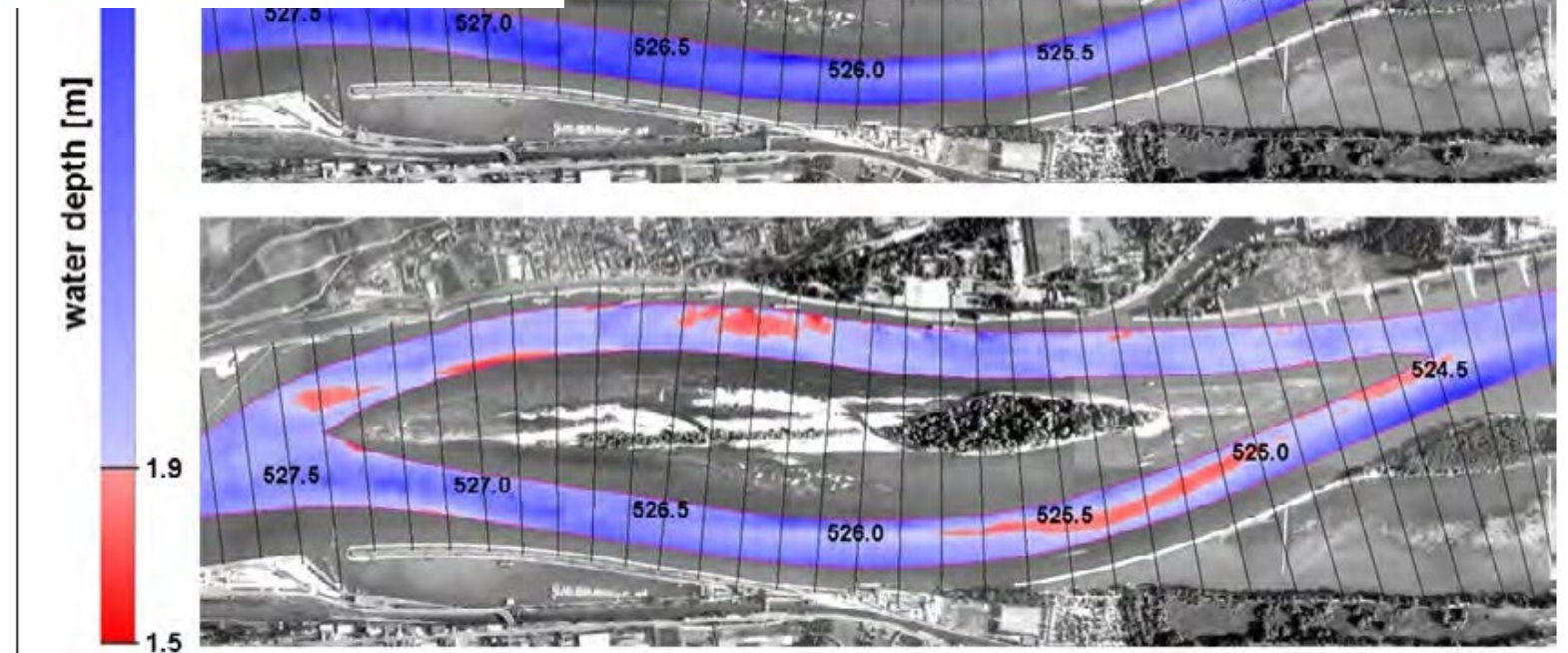
Examples of climate change impacts on transportation infrastructure and operations

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

Examples of climate change impacts on transportation infrastructure and operations

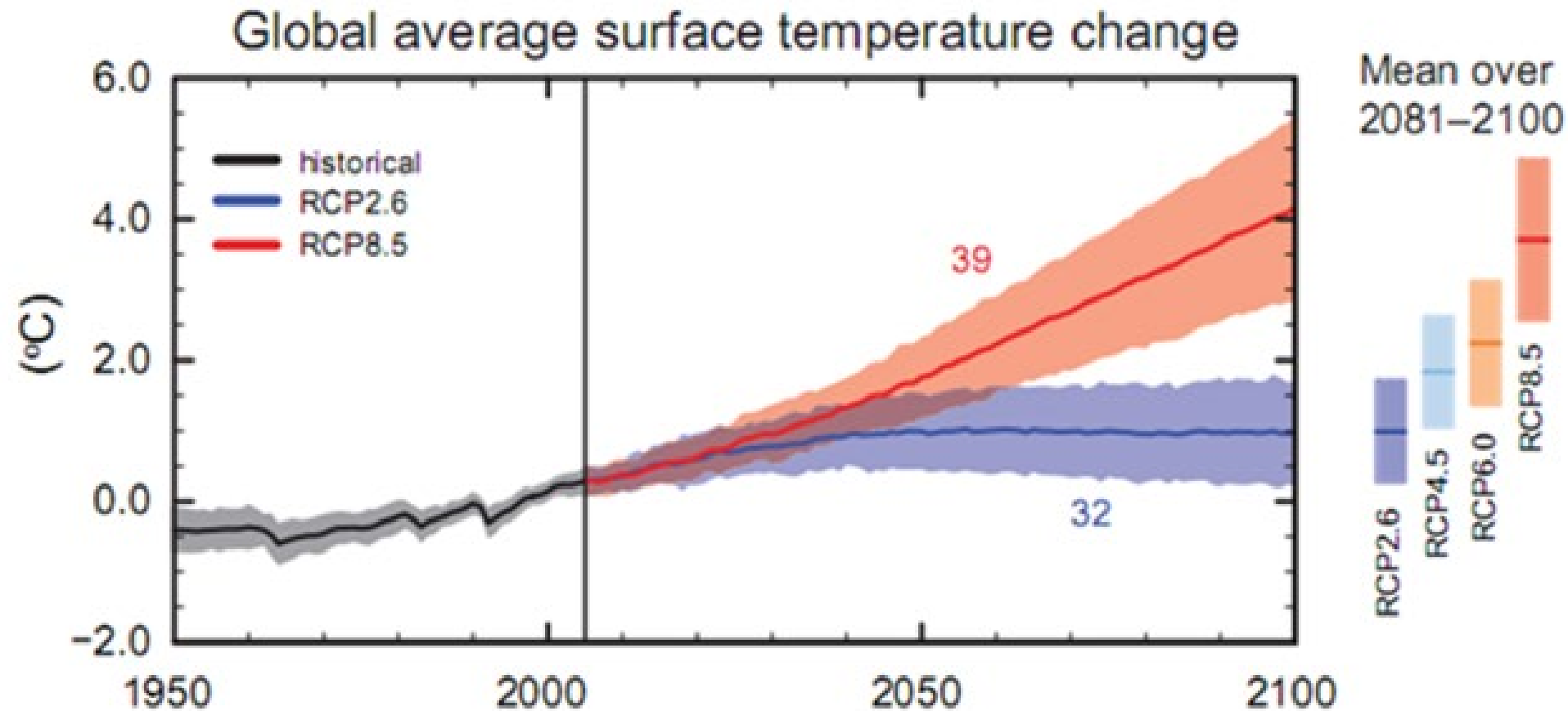


Source: Transport Canada, page 41 of 'Climate Risks & Adaptation Practices for the Canadian Transportation Sector 2016' report



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

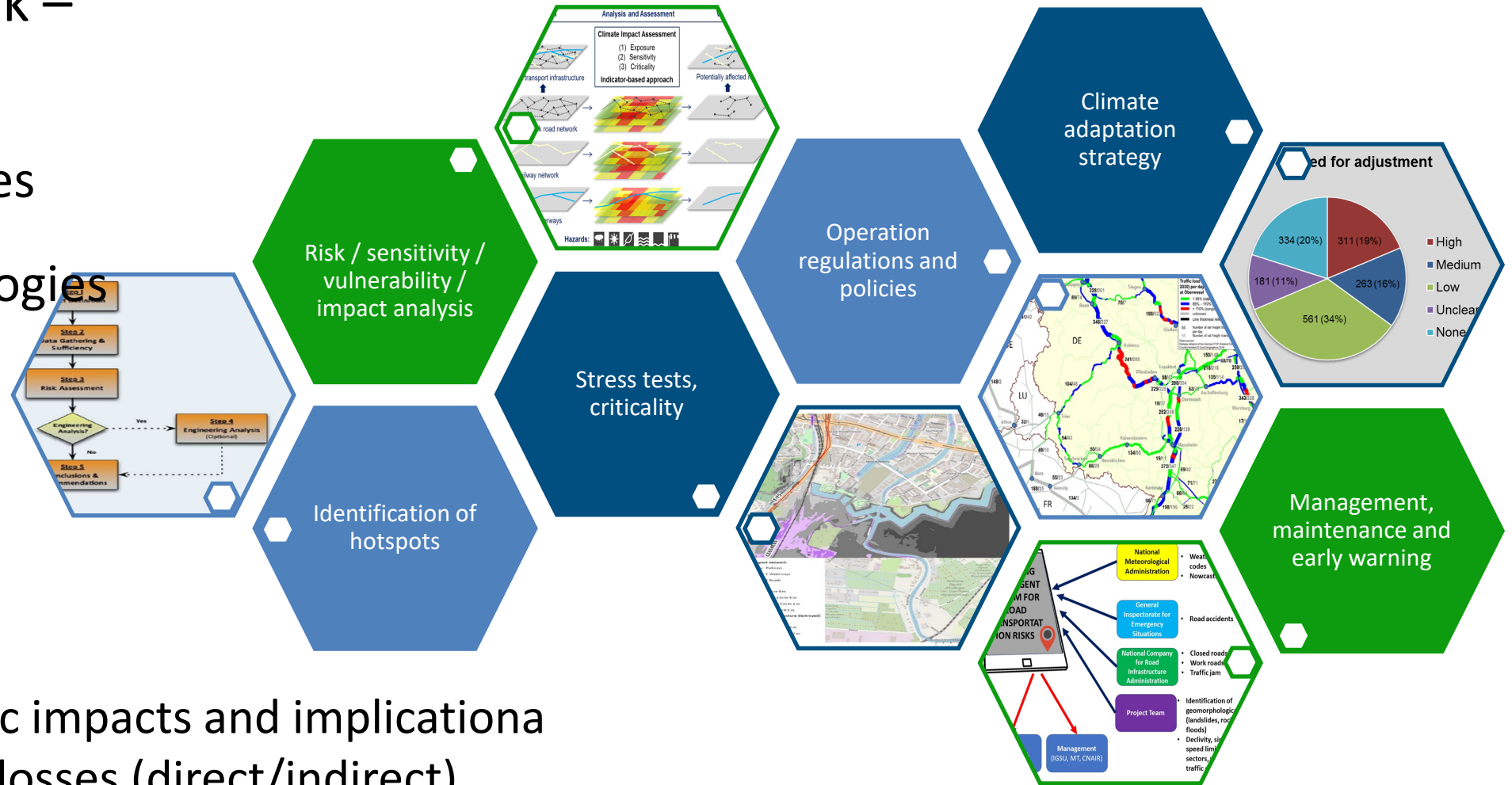
Current impacts vs future potential impact



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

- Ongoing

Preparations of a conference to raise awareness about needs to adapt transport systems to climate change

Assessment of Climate Change Impacts: Deployment of New Technologies and Materials for Maintaining Design Road Characteristics During Adaptation of Transport Infrastructure to Climate Change?

Moscow (*and online*), on 15-16 November 2021

Thank you

Lukasz Wyrowski

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