



Statens vegvesen

Veger og klimaendringer

Et utvalg internasjonale aktiviteter



Foto: Knut Opeide



Statens vegvesen



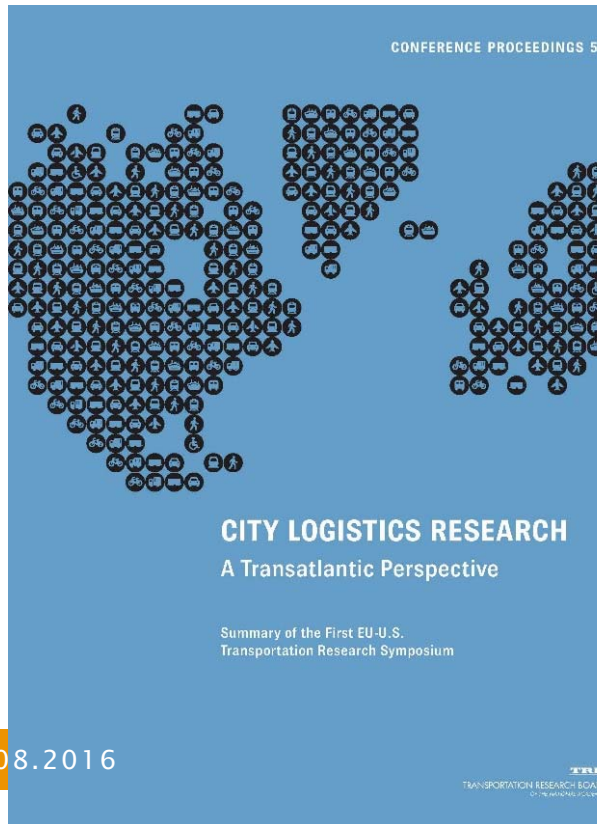
Brussel juni 2016

EU–USA Symposium «Adaptation to Climate Change and Extreme Weather Events”



EU-USA Symposium Main features

- 4th symposium of this kind
- City logistics, Transport research implementation, Road transport automation opportunities



Towards Road Transport Automation Opportunities in Public-Private Collaboration Third EU-U.S. Transportation Research Symposium

Summary of a Symposium

Katherine F. Turnbull
Rapporteur

April 14-15, 2015

National Academy of Science Building
Washington, D.C.

Organized by
U.S. Department of Transportation
European Commission
Transportation Research Board

TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

Washington, D.C.
2015
www.TRB.org



EU-USA Symposium

Main features

- **Organizers:** European Commission (EC), US Transportation Research Board (TRB) and US Department for Transportation (US DOT)
- **Chair** Prof Alan McKinnon, Kühne Logistics University, Kiel,
Co-chair Prof Richard Wright, Univ of Maryland
- **Planning committee** 3 EU + 3 US + organisers
- 50 participants altogether
- Preliminary paper – provided by US partners
- Symposium white paper – by Gerry Schwartz (US) and Lóri Tavasszy (EU)



EU–USA Symposium

Goals of the Symposium

- Review the current state of research in the field: identify gaps and hot topics
- **Stimulate more research**: redress the mitigation / adaptation imbalance
- Provide guidance on future research agenda for adaptation studies
- **Foster trans–Atlantic research collaboration** in this field
- Promote **cross–disciplinary research**: break down subject siloes
- Increase relevance and impact of the research: practitioner engagement

Specialisms, Transport Modes and Countries Represented at the Symposium

subjects

Climate science

Civil engineering

Transport planning

Risk analysis

Decision theory

Economics

Hydrology

Logistics

Public policy

Insurance

Coastal adaptation

Infrastructure design, construction, maintenance and management

transport modes

Highways

Aviation

Rail

Ports

Public transit

Shipping

Inland waterways

United States

+

14 European countries



Scope of the Symposium

nature of the risk

*climate change
extreme weather*

nature of the impact

*excess rainfall / flooding
extreme heat / drought
hurricanes / storms
sea level rise*

extent of the impact

*transport infrastructure
transport operations / services
related critical infrastructures
socio-economic impacts*

transport mode

*road
rail
inland waterways
ports
aviation
inter-modal*

time frame

*short / medium / long term
2020 / 2050 / 2100*

geography

*urban
inter-urban
regional
national*

Conceptual and analytical frameworks
Methodologies
Technologies
Governance structures

Developing / refining research agendas



EU-USA Symposium

Work plan & structure

	Avoiding disruption	Handling disruption	Recovering after disruption
Planning			
Infrastructure			
Operation			
Social economics			
	Case study: sea level rise	Case study: floods	Case study: heat wave

>>> **Topics for research and collaboration!!**

State of adaptation

- Global reports:
 - US and 5 EU countries in Adaptation Top 10
 - mostly work on groundwork activities (frameworks, tooling, data) and little on implementation
- Consensus on R&D needs
 - *Need for integrative research*
 - Specific substantive gaps
 - Costing methods and statistics for specific cases;
 - Impacts of the new high end scenarios of climate change;
 - Rural development, including resilience of cultural landscapes;
 - Information needed to manage agricultural and forestry systems
 - Methodological work; regional level

How to achieve resilience: issues

1. Define objectives, acquire practice in the design of measures
2. Improve sense-and-respond capabilities
3. Address system resilience (cross-modal, cross-sectoral...)
4. Adopt planning approaches for climate resilience
5. Implement risk-based approaches to managing assets
6. Address impacts from social and physical perspective



EU–USA Symposium

Preliminary conclusions

Summary of the symposium: TRB Dec. 2016

Some key points:

- The need to **upgrade methods of risk management** in the transport sector.
- The vulnerability of our transport infrastructure has to be carefully assessed and mapped, taking account of **inter–connections with other critical infrastructures**, particularly the **electricity grid and communication network**.



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Conference of European Road Directors

CEDR Transnational Research Programme – Climate change



Annual Calls for Proposals since 2008

- Climate Change (2008)
- Road Safety (2009)
- Asset Management (2010)
- Call 2011
- Call 2012
- Call 2013
- Call 2014
- Call 2015

road  net



CEDR Transnational Research Programme

How are calls prepared?

1. **Proposal of broad topics** (e.g. “Climate Change”). Proposed by TG Research for each annual call and approved by CEDR GB.
2. **Identify specific research needs** within these topics (e.g. “risk management methods”), determined through consultation
3. **Thematic workshops**: NRA experts on specific research areas produce basis for **Descriptions of Research Needs (DoRNS)**.
4. **DoRNs then written** by Task Forces, whose members are proposed by Thematic Workshops and approved by TG Research. Each DoRN defines a research programme and its contents are confidential until launch of Call.



CEDR Transnational Research Programme

What value does the TRP bring to CEDR?





CEDR – Transnational Research Programme

2008 «Road owners getting to grips with CC»

Objective

Aimed at providing road authorities all across Europe with the **knowledge and tools necessary to "get to grips" with climate change** and its effects on all elements of road management by adapting design rules, updating and improving data collection, and developing risk management methods.



- **RIMAROCC** (SE, FR, NL, NO)
 - Risk Management for Roads in Climate Change
- **SWAMP** (DK, SE)
 - Storm Water Prevention - Methods to predict damage from the water stream in and near road pavements
- **IRWIN** (FI, SE)
 - Improved local Road Winter Index to assess maintenance needs adaptation costs in climate
- **P2R2C2** (UK, SI, NO, FI)
 - Pavement Performance and Remediation Requirements following Climate Change

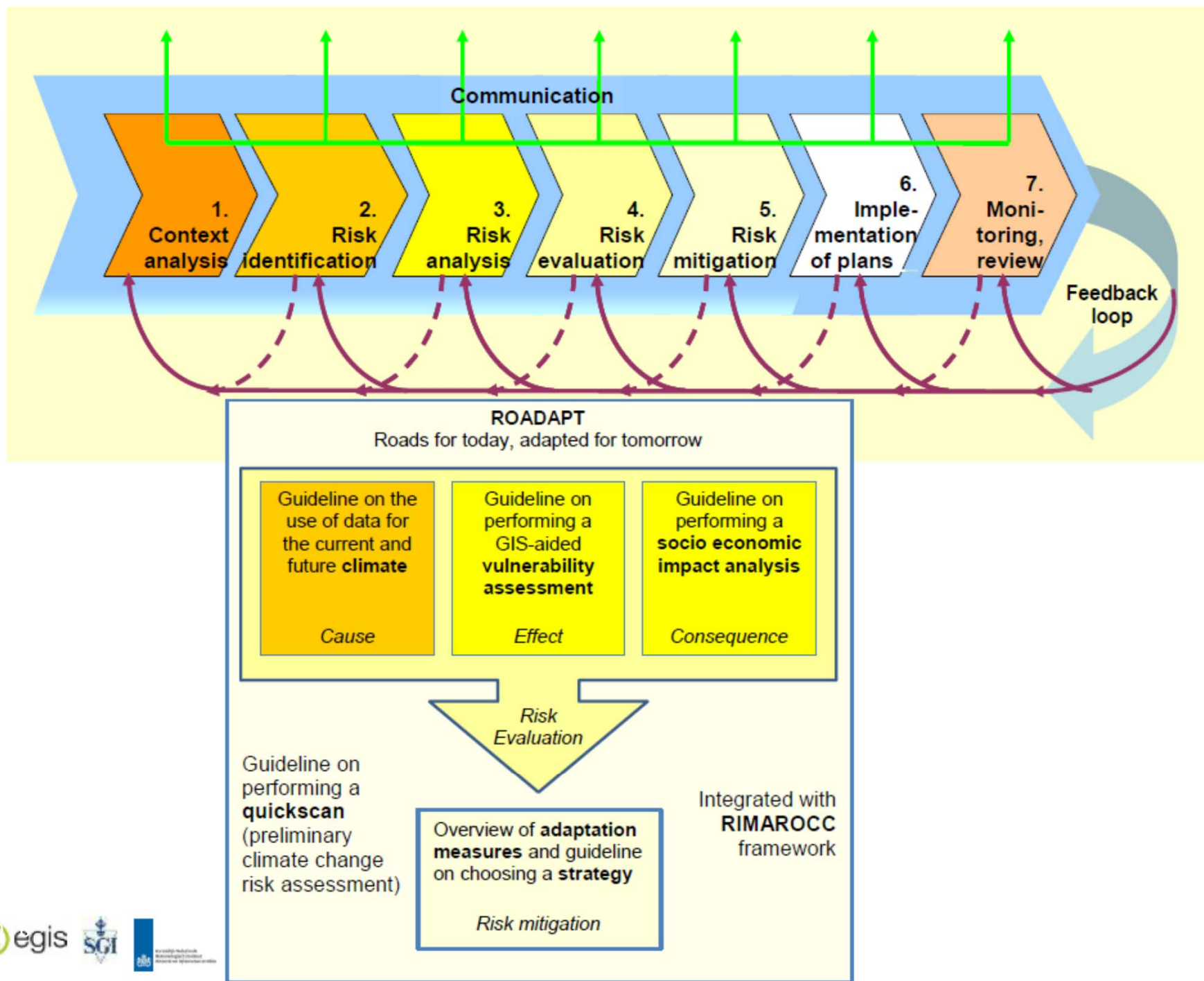


CEDR – Transnational research Programme

2012: «Road owners adapting to CC»

Objective

To provide owners with **adaptation technologies** and the **models and tools to support decision-making** concerning adaptation measures for the road infrastructure.





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CEDR – Transnational research Programme

2015: «Climate Change – From Desk to Road»

Objective

Implementation!

+ + +

Call 2015: Climate Change: From desk to road

- Economic costs associated with integrating climate change into decision-making
 - Embedding climate change into practice and procurement
 - Transnational approach to water management
 - Diagnosing driver decision-making in a changing climate
-
- Funded by Germany, Netherlands, Ireland, Norway, Sweden, Austria
 - **Objective: Integrate Climate Change into decision-making processes through implementation of research**
 - Total budget EUR 1.050million: Available budget **EUR 0.900million**

CEDR Transnational Road Research Programme Call 2015

Financial Commitments for CEDR Call 2015

Road administration	A: Climate Change		B: Freight &		C: User Needs		D: BIM		Total per NRA	
	per Year €k	Total (3 years) €k	per Year €k	Total (3 years) €k	per Year €k	Total (3 years) €k	per Year €k	Total (3 years) €k	per Year €k	Total (3 years) €k
Germany	100	300	100	300	100	300	100	300	400	1,200
Netherlands	50	150	50	150	50	150	50	150	200	600
Belgium - Flanders							50	150	50	150
Finland					25	75	50	150	75	225
Ireland	50	150			50	150			100	300
Norway	50	150	50	150			50	150	150	450
Sweden	50	150	50	150	25	75			125	375
Austria	50	150							50	150
Denmark							50	150	50	150
Programme total	350	1,050	250	750	250	750	350	1,050	1,200	3,600

Total commitment:
9 funding partners
EUR 3.600million

Costs (estimated)		
Programme management	30,000	2.9%
Dissemination	50,000	4.9%
Contingency	50,000	4.9%
Total	130,000	12.6%
Research Budget	900,000	87.4%



PIARC World Road Association

Technical Committee E «Climate Change, Environment and Disasters»

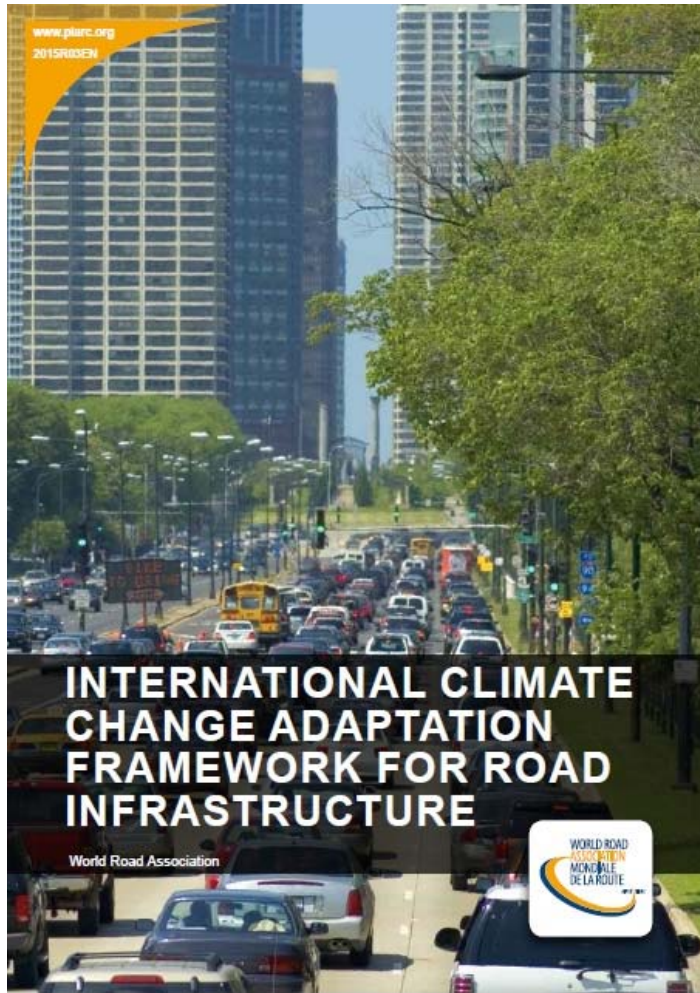
E.1 Adaptation Strategies/Resiliency

E.2 Environment Considerations in Road
Projects and Operations

E.3 Disaster Management



PIARCS TC E.1 Adaptation Strategies / Resiliency CC Adaptation Framework



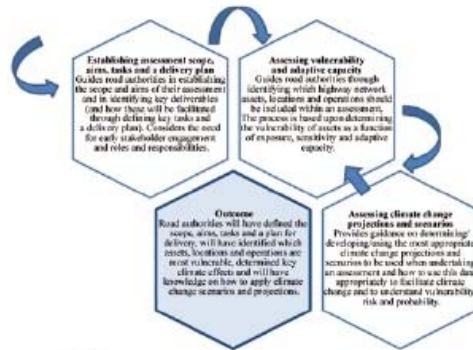
Published in 2015, is being updated to:

- include feedback, experience from implementation
- test regarding existing adaptation measures and strategies

PIARCS TC E.1 Adaptation Strategies / Resiliency CC Adaptation Framework

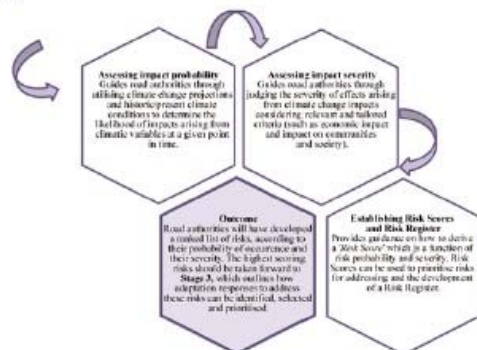
Stage 1: Identifying scope, variables, risk and data

Stage 1 of the framework guides road authorities through a series of steps to allow for the identification of assessment scope and activities and to define which assets, locations, risks and climate change

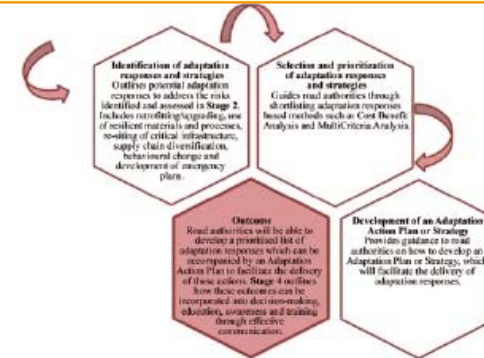


Stage 2: Assessing and prioritising risk

and holistic way.

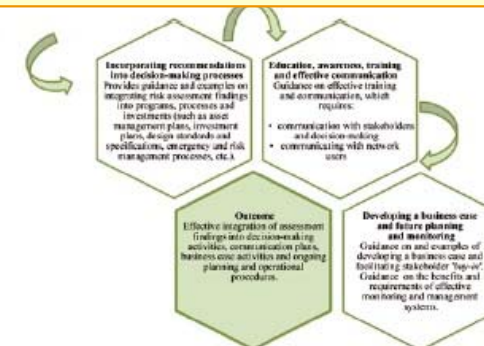


Stage 3: Developing and selecting adaptation responses and strategies



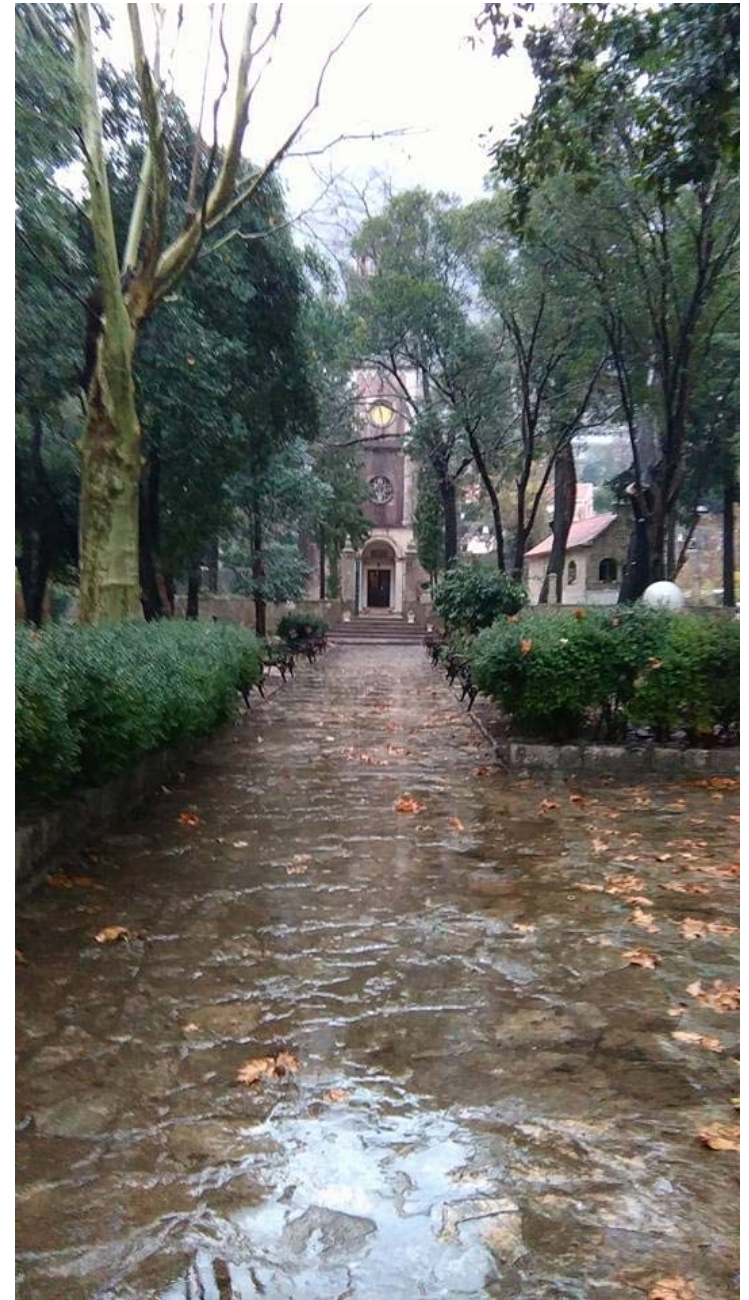
STAGE 4 - INTEGRATING FINDINGS INTO DECISION-MAKING PROCESSES

Stage 4: Integrating findings into decision-making processes



Thank you!

Questions?



11.08.2016